LISBOA SCHOOL OF ECONOMICS & MANAGEMENT

MESTRADO

Monetary and Financial Economics

TRABALHO FINAL DE MESTRADO

DISSERTAÇÃO

SOVEREIGN SPREADS, MONETARY AND FISCAL POLICY EVENTS: EVIDENCE FOR EU

JOSÉ DIOGO GAIVÃO DE MELO BEIRÃO

OUTUBRO - 2014

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SOVEREIGN SPREADS, MONETARY AND FISCAL POLICY EVENTS: EVIDENCE FOR THE EU

By José Diogo Beirão

This study provides an empirical analysis on how the communication of economic policy conducted by the ECB and the European Commission affects the European bond market. For this purpose, it was collected a set of periodic news from the beginning of the Euro until 2013, related with the monetary and fiscal policy events. The results of the study show that sovereign spreads reflect three sources of risk, credit risk through economic activity and competiveness, liquidity risk and international risk. The monetary events play a role in the bond market and they seem to be anticipated. On the other hand, fiscal policy events related with the "arms" of the SGP do not have a key role in this context.

1. Introduction

In 1989 the European Council reinforced the Commitment of a progressive economic and monetary integration within the European Economic Community member states. To this purpose it was constituted a committee that was represented by Jacques Delors, at that time president of the European Commission. The main goal of this committee was to study and propose an optimal path to develop an economic and monetary union. The study resulted in the report named as "Delors report", which projected a three step process in order to achieve the monetary and economic union. The three steps were constituted as followed.

On step one, that started in the 1st of July of 1990, the targets were an increase of the economic convergence (price and exchange rate stability as well as sound public finances) between the member states, achieving total freedom of capital circulation, an increase in the co-ordination of central banks and free use of the European Currency Unit, which was created for accounting purposes in 1979 in the development of the European Monetary System.

Stage two started in the 1st of January of 1994, and projected the end of the Central Banks's credit granting, an increase on the coordination of the monetary policies and stronger economic convergence. At this stage, it was created the European System of Central Banks, which presupposes the independence of the national Central Bank. In the preparation of the final step it was presented, in June of 1997, the Stability and Growth Pact (SGP) (the main aim is the surveillance of the member states public finances) and the European Central Bank (ECB), which was founded in the 1st of June of 1998.

The last stage was in the 1st of June of 1999, where the participants in the Euro fixed their exchange rates. The European System of Central Banks started to conduct a single monetary policy and the SGP was already fully implemented.

In line with the literature[1] this study provides some insight about the impact of fiscal and monetary policy events on the European Union (EU) sovereign bond market. For this purpose, it is conducted an event study collecting monthly data (from 1:1999 until 12:2012) for 10 EU countries long-term government bond yield.

The empirical analysis is done both in a panel data estimation and for a country-by-country purpose we also use a seemingly unrelated regression (SUR) system of equations. According to the literature, a way to capture the effects of the events on the bond market is to consider the long-term government bond yield of a country vis-à-vis a benchmark. For the EU countries the German long-term yield is generally accepted as the benchmark. On the theoretical side, the control variables considered to explain the sovereign spreads were chosen to reflect essentially three features: Credit Risk, Liquidity Risk and International Risk aversion behavior.

[1] See for example Afonso and Strauch (2007) or Andersson et al. (2009)

Some important results of this study can be outlined as follows: sovereign spreads reflect the three sources of risk, credit risk through economic activity and competiveness, liquidity risk and international risk. Monetary events are playing a role in explaining sovereign spreads and markets seem to anticipate these events. Fiscal policy events related with the SGP are generally non-significant. On the other hand, the ones related with the financial assistance programs not only are affecting the countries where these programs were implemented but also present spillover effects.

This study is organized in five sections. After the introduction, section 2 gives a survey of the literature divided in the determinants of the sovereign spreads and the event studies, section 3 provides some insights about the monetary and fiscal policy conduction in the EU, section 4 presents some stylized facts about the data and variables, section 5 deals with the empirical analysis divided by panel estimation, SUR estimation and a further spillover effects study, finally section 6 concludes.

2. Literature Review

2.1. Sovereign Spreads Determinants

When studying sovereign spreads determinants, there are broadly three main drivers in the literature: a) credit risk b) liquidity risk and c) and international risk aversion.

When referring to credit risk, one can relate to risk of default associated with countries that have no conditions to comply with their financial obligations. This type of risk is linked with the specific country macroeconomic fundamentals, such as the evolution of economic indicators and fiscal soundness. The rational is when a country suffers a considerable worsening of their macroeconomic fundamentals (an abrupt fall of GDP or a rapid deterioration of public finances) that may lead to a default situation.

Derived from the problem of default, two more types of risk can be associated to the general category of credit risk. First, a risk associated with the re-pricing of bonds, i.e. the bond price of a country that is suffering from worst macroeconomic fundamentals is expected to fall, as a result of the worsening of the buyers' perception of the bond value. Second, a risk related with the rating agencies power, which can shape market perception of the bond value, through a country rating downgrade or a worsening of country economic outlook.

The liquidity risk is associated with the ability of a bond to be sold or to be bought easily. The amount of newly traded bonds, national issuing policy and a liquid futures market (so that market participants can hedge their positions) are factors that will shape this type of risk. The common proxies to measure this type of risk are bid-ask spreads or the ratio between the total debt that issuer holds and the total debt issued in the EU market. This type of risk is highly interconnected with the credit risk.

The third type of risk, international risk aversion, is related with uncertainty. A high level of uncertainty tends to reduce the willingness of market participants to take risk. So, in times of great uncertainty one would expect a reallocation of investments from riskier assets towards safer assets, for example, a shift from the corporate bond market to the sovereign market, which is viewed as safer. A way to capture this effect can be done through a spread, such as between the yields of AAA US corporate bonds and the yield of the 10-year US government bonds or through indexes of the US stock market implied volatility.

The literature on the determinants of the sovereign spreads has addressed both the pre-crisis period and the crisis period.

In the group of studies covering the pre-crisis period there is some disagreement in the literature about the importance of the three sources of risk.

Evidence shows that credit risk is generally an important source of risk in this period. The macroeconomic fundamentals and the specific fiscal positions of the countries seem to be an important driver of spreads even after the EMU foundation (Afonso and Rault, 2010; Ardagna et al., 2004; Bernoth et al., 2004; and Codogno et al., 2003). In the work done by Codogno et al. (2003) and Ardagna et al. (2004) the emphasis is on the fiscal position, the debt and deficit level, but Bernoth et al. (2004) pointed out that the main variable explaining the credit risk, more than government debt and the deficit level, is the debt service.

The start of the EMU only gave more power to the debt service, since the other sources of risk such as the debt level have showed a convergence path towards the benchmark. In addition, the work done by the Afonso et al. (2012) and Arghyrou and Kontonikas (2012), in the pre-crisis period pointed out that markets did not seem to price the macro fundamentals with exception of the fiscal deficits. It appears that in the pre-crisis period for the EU, markets where essentially focused on pricing credit risk based on the fiscal deficit, and the implementation of the SGP only gave more emphasis to the fiscal deficit targets as it is pointed out by Arghyrou and Kontonikas (2012).

In terms of the liquidity risk there is a disagreement in the pre-crisis literature. Afonso and Rault (2010), Favero et al. (2010) and Manganelli and Wolswijk (2009) report the importance of this source of risk to explain sovereign spreads, while Codogno et al. (2003), is in disagreement, putting a higher weight in other risk sources. The lack of consensus continued with Favero et al. (2010), arguing that illiquidity is an additional source of risk since it creates transaction costs for investors who are holding less liquid securities, thus they should be compensated with a higher return given that they are bearing higher costs. Bernoth et al. (2004), for the period of the transition for the single currency, found out that after the euro implementation there was a great fall in the

importance of liquidity factors. The authors explained this evidence as a result of a higher financial integration within the EMU members.

In terms of international risk aversion for the pre-crisis period, Codogno et al. (2003), Favero et al. (2010), and Manganelli and Wolswijk (2009) found evidence of an important role of this source of risk. Codogno et al. (2003) report that in some cases the international risk aversion is a function of a specific country debt level, so countries more indebted will be more exposed to this source of risk.

For the period during the international financial crisis, there is a general consensus in the literature that the fiscal position of the countries is one of the main drivers of sovereign spreads (Afonso et al., 2012; Arghyrou and Kontonikas, 2012; Attinasi et al., 2009; Caceres et al., 2010; Haugh et al., 2009; Schuknecht et al., 2010; and Sgherri and Zoli, 2009). Afonso et al. (2012) and Caceres et al. (2010) argue that since the summer of 2007 markets have been continuously pricing bonds based on the basis of country specific macroeconomic fundamentals. This coincided with a reaction of investors known as "flight-to-quality" where the German Bund and some of the core European countries securities enjoyed a flux of capital arising from riskier securities.

Another agreement in the literature is related with the increased importance of the international risk aversion role (Afonso et al., 2012; Arghyrou and Kontonikas, 2012; Attinasi et al., 2009; Barrios et al., 2009; Caceres et al., 2010; Haugh et al., 2009; Schuknecht et al., 2010; and Sgherri and Zoli, 2009). As mentioned before, the international risk aversion arises with an increase in uncertainty and in periods of financial tightening as mentioned by Codogno et al. (2003). Haugh et al. (2009) conjectured that in the period before the financial turmoil a low level of international risk aversion was obscuring the importance of the countries fiscal positions. Barrios et al. (2009) and Haugh et al. (2009) found that there was a significant interaction between

the international risk aversion and macro fundamentals, amplifying the role of fiscal positions to explain spreads.

2.2. Event Studies

In this section, it is going to be presented some of the latest developments in event analysis available in the literature, which we divide in three major groups: macroeconomic events, monetary events and rating news.

First, regarding macroeconomic events studies (Afonso and Strauch, 2007; Arru et al., 2012; and Andersen et al., 2005), there is a wide range of work done with different methodologies and goals. Arru et al. (2012) conducted a study including six countries from the EMU where the authors gauge about the impact of macroeconomic data releases from several macro-areas such as US, Japan and EU. Using weekly data for the period from 2005 until 2010, the treatment that the authors gave to the macroeconomic data released is an application of a method used by Balduzzi et al. (2001) and Andersen et al. (2005) where they compute the so called standardized news[2]. Their main findings are firstly a reaction by the sample countries, excluding Spain, from positive news in the US. Secondly, macroeconomic surprises on the Euro-area business cycle affect the volatility of the series for four of the six sample countries and these reactions are only captured by negative surprises.

Andersen et al. (2005) have studied the impact of macro news releases in the prices from six different futures markets[3] in EU and US. Using daily data with a time span from 1998 until 2002 for the EU and 1992 until 2002 for the US, they found that bad macroeconomic news, using the same standardized news method as Arru et al.

[2] Given by the difference between the news released of some variable from some macro-area at some point in time minus the median value of the respective forecasts prevailing on financial markets and surveyed by Bloomberg. The result of this calculation it is divided by the historical standard deviation.

[3] That includes US Treasure Bonds, S&P500, FTSE 100 index, British 10-year Treasury note, DJ Euro Stoxx and Euro Bobl futures.

(2012), have a negative impact during contractions, which it is expected, but in times of expansion they have a positive impact. Moreover, they also found significant cross-market and cross-country linkages, which points to the evidence of spillovers between equity markets from the EU and the US. Finally Afonso and Strauch (2007), assembled fiscal policy news released along the year 2002 and evaluated the impact of these news on the long-term bond market for 13 countries from the EU. Using daily data their main finding is that markets were not penalizing default risk premium as a consequence of the fiscal policy events.

Second, on monetary policy events literature gives some important insights about how markets react to central bank's monetary policy. For the Euro area, Andersson et al. (2009) and Bernoth and Hagen (2004) found evidence in the German long-term bond market and in EURIBOR futures market that agents predict well the ECB´s monetary policy, reflecting transparency in ECB´s monetary policy conduction. Ehrmannp and Fratzscherp (2002) made an empirical analysis during the foundation of the EMU and pointed out that markets went through a learning process about ECB´s monetary policy. In recent years the increased role of M3 and the price level in explaining interest rate on the Euro area, achieved levels very similar to Germany prior the EMU. This suggests that markets have a perception about the ECB´s monetary policy very similar to the Bundesbank's policies. Attinasi et al. (2009) analyzed the beginning of the crisis, in the period between 31 July of 2007 and 25 March of 2009, and concluded that the main refinancing operations announcements had a positive contribution for the narrowing of the sovereign spreads in the Euro area. Interestingly, Brand et al. (2006), for the money market yield, found that expectations from monetary policy change considerably during ECB´s press conferences. These changes apparently have a significant impact on the medium to long-term interest rates and immediate

policy decisions only affect shorter-term maturities. Andersson (2007), compares the ECB and FED monetary policy and concludes that both US bond and stock markets react more to the FED´s monetary policy decisions than respectively the Euro area bond and stock market react to the ECB´s monetary policy decisions.

Third, the literature about rating news for the Euro area presents evidence that there is a significant linkage between the long-term government bond market and rating revisions (Afonso et al., 2011; Afonso et al., 2012; Arezki et al., 2011; De Santis, 2012; Manganelli and Wolswijk, 2009). Afonso et al. (2011) found evidence that not only rating announcements but also outlook revisions have an impact on the Credit Default Swaps (CDS) spreads. Afonso et al. (2011) and Manganelli and Wolswijk (2009) reached the same result, concluding that sovereign downgrades seems to play a key role explaining the higher risk premium paid by the downgraded countries.

In addition, rating announcements do not seem to be anticipated by sovereign spreads as Afonso et al. (2011) findings, but it seems to exist contagion from the lower rated countries to the other Euro-area countries (Afonso et al., 2011; Afonso et al., 2012) and the source of this contagion seems to depend from which rating agency rated. The spillover effect seems to be stronger when the downgraded country is Greece (Afonso et al., 2012; De Santis, 2012) and the effect is particularly stronger on countries with weaker fiscal positions.

3. Monetary and Fiscal Policy in the Context of the EU

Since the European Monetary Union (EMU) foundation there was a centralization of monetary policy, conducted by the ECB in coordination with the national central banks with a clear mandate of achieving price stability. However fiscal

policy is still decentralized giving member states the ability to control their public expenditures and revenues. As mentioned, the introduction of the SGP gave a minimum quality standard to the fiscal framework of the member states.

The SGP is divided in "two arms" and it is constituted by a set of rules. These arms are known as the preventive and the corrective arm.

The preventive arm is constituted by the assessment of the programs that are annually delivered by the member states where there should be an outline of economic developments, macroeconomic evolution projections and the so called medium term budgetary objective (MTO). The MTO is defined in structural terms so it is cyclically adjusted, at some extent, filtered of temporary measures letting only the discriminatory ones account to this purpose. All member states have to present their MTO, which usually is updated at the end of three years. They should, as a reference value, achieve an annual evolution of 0,5% of the GDP in structural terms.

The member states' MTO should be based essentially on three features. The existence of a safety margin against the breaching of the 3% deficit benchmark, a sustainable path for the debt ratio without neglecting the impacts of an aging population and leave some room for budgetary maneuvers in the case of a public investment need.

For the analysis of the MTO, the Commission considers an ex ante and an ex post assessment.

In the context of the ex ante assessment the Commission has to consider if the MTO is appropriate in light of the minimum requirements, if the member state is at his MTO or is in the path towards it (taking in account the business cycle, the sustainability risk and if the assumptions on which the MTO is based are realistic).

In the ex post assessment the Commission will evaluate, if enough effort towards the MTO was made against the benchmark (0.5% in structural balance of the

GDP). If the Commission considers that exists a significant deviation from the MTO, it will give a warning to the concerned member state and the ECOFIN Council will recommend a set of measures to converge to the MTO path. If a country is a member of the Euro area and does not comply with the ECOFIN Council recommendations it is obliged to make an interest-deposit of 0,2% of the GDP as a sanction.

The corrective arm of the SGP works through the excessive deficit procedure (EDP) so the member states implement the necessary measures to correct the excessive deficit.

The ECOFIN Council launches an EDP essentially on an ex post assessment once it is triggered by the breach of one of two benchmarks. A deficit above 3% of GDP or a government debt higher than 60% of GDP and it is considered that is not diminishing at the right rhythm ($1/20^{th}$ per year).

A member state facing an EDP is given a dead line period of 6 months (3 months if there was a serious breach) to implement the recommended measures by the ECOFIN Council. At the end of the period the member state is evaluated. Based on the ability to implement the measures that have been recommended, the Commission and ECOFIN Council put the procedure on hold, or recommends a stepping up of the efforts.

If the Commission and ECOFIN Council understands that no effective action has been made, than it is prepared new recommendations and is possible to set a new dead line. New sanctions can be made for the Euro area countries, the fine is 0,2% of the GDP and the countries that are receiving the cohesion funds may find them suspended. The EDP is abrogated once the excessive deficit is corrected.

4. Data and Variables

4.1. Sovereign Spread Determinants

As it was mentioned, this study uses a panel estimation including 10 EU countries: Austria (AT), Belgium (BE), Spain (ES), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL) and Portugal (PT).

The variables included to explain the long-term government bond yield spreads are the lags of 10-year government bond yield (spread), the industrial production growth index (gind), the real effective exchange rate (q), that were taken from the Eurostat web site, the expected government budget balance ratio (balance), the expected debt-to-GDP ratio (debt), which were collected from the European Commission twice a year seasonal forecasts, the 10 year government bond bid-ask spread (ba) that was provided by the ECB and the VIX (the logarithm of the S&P 500 volatility index) taken from Reuters.

The 10-year government bond yields, the industrial growth index, the real effective exchange rate and the VIX are monthly data. The expected government budget balance ratio and the expected debt-to-GDP are released in a biannually basis and transformed into monthly data by fixing their value during the six months until a new forecast is released. The bid-ask spread has a daily frequency and it is transformed into monthly data by taking the average of the corresponding month.

Following the literature, to construct the spread equation, the dependent variable chosen is the difference between the 10-year government bond yield of a given country and the benchmark that for the Euro area which is the 10-year government bond yield form Germany.

The growth of industrial production is employed as a difference to the benchmark. The goal of employing this variable is to measure the impact on spreads

from the evolution in the economic activity. So the expectation of a higher/lower economic activity has a negative/positive impact on the sovereign spreads.

The real effective exchange rate is in logs and also has a difference to the benchmark. This variable is associated with the credit risk and is used to weight the competitiveness of the countries. The rational is, when it is observed an/a increase/decrease in the real effective exchange rate, there is an/a appreciation/depreciation, so is expected a higher/lower sovereign spreads as demonstrated by Arghyrou and Tsoukalas (2011).

The expected budget balance ratio and the expected debt-to-GDP are also in difference to the one of the benchmark country and they represent the one-year ahead fiscal positions' forecast of the European Commission. The goal of using forecasts is to measure credit quality. So, a deterioration of the expected fiscal positions implies a higher risk. A better (worst) expected fiscal position implies lower (higher) risk to sovereign spreads, which will diminish (increase) accordantly.

The 10-year bid-ask spread is normally used to measure liquidity in the bond market. So a higher (lower) bid-ask spread is expected to increase (decrease) the sovereign spreads.

The VIX is a measure of international risk aversion, and an increase (decrease) in the VIX is associated with a request of higher (lower) returns from the government bonds and thus an increase (decrease) of the sovereign spreads.

4.2. Monetary and Fiscal events:

To construct the monetary and fiscal events, we gathered 215 monetary events plus 288 fiscal events since January 1999 until December 2012, which gives a total of 503 events. The variables are constructed by flag procedure assuming that there are two types of events, positive and negative events, which means that a positive (negative)

event may lead to a lower (higher) sovereign spread. Using monthly data, when there is a positive or a negative event on a given month we attribute the values -1 or 1 respectively and 0 for the non-event months.

The monetary events where selected by collecting the interest rate policy announcements done by the ECB during the sample period.

Table 1 - Monetary policy announcements

	MRO	LF	DF
Total number of events	215	215	215
Total number of events evolving variations	37	36	34
Positive variations	18	18	18
Negative variations	19	18	16
Nº of increases, 25bp	16	16	16
Nº of decreases, 25bp	10	8	7
Nº of increases, 50bp	2	2	2
Nº of decreases, 50bp	8	8	7
Nº of decreases, ≥75bp	1	2	2

Note: MRO - Main Refinancing Operations; LF – Lending Facility; DF – Deposit Facility; bp – basis points.

Source: European Central Bank

Table 1, describes the structure of the interest rate decision-making done by the ECB. Looking at the numbers one can understand two interesting features from the interest rate policy. First, the MRO is from the three policy interest rates the one which the object of more variations and second, when implementing monetary policy decisions the ECB apparently is more parsimonious with increases of the three rates when compared to decreases. This effect is visible given that 88.9% of the upward changes represent increases of 25bp whereas only 11.1% represent increases of 50bp. For negative variations, 25bp reductions account for 52.6% of the cases and 50bp reductions represent 42.1% from total variations. We can conclude that the strategy of the ECB seems to be opting for more mitigated negative impacts in the financial system from an abrupt increase in the interest rates. On the other hand, when facing an

economic slowdown, a more aggressive strategy of letting interest rates fall quickly to inject liquidity in the financial system seems to have been adopted.

The variable chosen to capture the monetary policy events will be the MRO and it will only be considered variations of this rate. Following Andersson et al. (2009) the yield to maturity of a representative bond can be decomposed, applying the Fisher decomposition principal, in the sum of the real interest rate, the expected average inflation (until the maturity of the bond) and a risk premium (that the investor asks in return for holding and bearing the risk associated to the asset). Given this hypothesis, we expect that when the ECB communicates an increase (decrease) in the MRO, the yield for a particular bond to rise (fall) and thus, to the spread increase (decrease). This effect on spreads is true, supposing that the benchmark bond yield is less susceptible to the ECB announcements when compared to the other sample countries. There are a total of 37 events, where 18 of them were considered negative for sovereign spreads receiving value 1 and 19 of them considered positive to spreads receiving the value -1.

The fiscal policy events (see Tables A1, A2 and A3 in the Appendix) were assembled based on the EU fiscal surveillance mechanism and were taken from the European Commission website. As already described, the surveillance mechanism is based on the preventive and corrective arm. With the purpose of capturing the fiscal policy conduction in the EU the assembled events were divided in three groups.

One is related with the preventive arm where essentially, as the Appendix Table A1 highlights, is a set of events that is composed by press releases resulting from the Commission assessment of the stability and convergence programs. In the so called European semester, member states should present their stability and convergence programs until April of every year. The events gathered in our analysis cover the assessment done by the Commission, which evaluate the member states MTO's and

gives country specific recommendations. In the sample period, for the 10 countries considered, there are a total of 15 events per country.

The second group which is linked with the corrective arm, is essentially composed by press releases related with the EDP´s that where implemented during the sample period (see Table A2). The EDP implementation in a member state normally starts with a press release with a first warning done by the Commission, alerting for a violation or a potential violation of the MTO. If the member state does not present measures to correct the imbalances or if the Commission believes that the presented measures are not ambitious enough, there is a press release informing that the Commission will proceed with the EDP. During the EDP the Commission gives a press release about the ability of the member state to implement the measures negotiated with the ECOFIN council and the Commission. At the end, if the necessary measures were implemented and the imbalances were corrected, there is a final statement where the Commission recommends to the ECOFIN council the abrogation of the EDP.

The final group of events is included in the fiscal policy events but is not related directly with the two arms of the SGP. The last group of events is associated with the financial assistance programs that were implemented in the countries that asked for financial rescue. The countries included in this group are Spain, Greece, Ireland and Portugal.

Spain received financial assistance in July of 2012 where it was agreed on a line of credit of €100 billion, but it was only used around €41.4 billion for recapitalization of financial institutions and the Spanish asset management company (Sareb).

In May of 2010 the Eurogroup agreed on the first financial assistance program to Greece, where €80 billion were provided through bilateral loans by the member states and the International Monetary Fund (IMF) participated with an additional €30 billion.

The second Economic adjustment program started in March of 2012, where the projected amount for the financial assistance until the end of 2014 is €164.5 billion, provided by the European Financial Stability Facility (EFSF) in co-ordinance with IMF.

Ireland's economic and adjustment program was formally agreed in December of 2010. The total financial assistance to Ireland amounted to €85 billion, of which, a part provided by Ireland's Treasury and National Pension Reserve Fund (€17.5 billion) and the bulk via external support (€67.5 billion), from the EFSF, the IMF, from bilateral loans (UK, Sweden and Denmark) and from the European Financial Stability Mechanism (EFSM).

In May of 2011 the Portuguese economic and stability program was negotiated between the Portuguese government, the ECB, the Commission and the IMF. The agreed amount for the financial assistance was €78 billion provided by the EFSM, EFSF and the IMF with €22.1 billion, €24.8 billion and €24.7 billion respectively. This group of events (see Table A3) comprises press releases related with the implementation and revisions of the different Economic Adjustment Programs of this set of countries.

To implement the flag procedure on fiscal events we attribute a rank based on the expectation that the impact of a particular event has on the sovereign spreads. An event can have one of three rankings: it can either be positive (+), negative (-) or inconclusive (#) (see Tables A1, A2 and A3). According to the ranking the flag will assume the value -1 if the ranking is positive, the value 1 if the ranking is negative and zero if the ranking is inconclusive.

The attribution of the rankings is based essentially on the MTO benchmark values (for the group related with the surveillances arm of the SGP) and subjective criteria of key words. Other authors propose such subjective methods applied to the ECB introductory monthly bulletin (see Heinemann and Ullrich (2005), Rosa and

Verga (2005) Gies (2005) and Gerlach (2004). Some key words for the press releases about the assessment of the stability and convergence programs by the Commission can go from "structural measures announced in the program are appropriate and in line with the Broad Economic Policy Guidelines" for positive news and "the updated program is not fully in line with the essential requirement of the Stability and Growth Pact" for negative news.

For the group related with the corrective arm events are essentially negative. When there is an announcement about the need to implement an EDP in a member state it is given a negative rank. During the assessment of the member state's ability to implement the agreed measures, it can be ranked as negative or positive based on the country performance. When the Commission gives a press release suggesting the abrogation of the EDP to the ECOFIN council this is ranked as positive (an as contributing to reduce the yield spread). When dealing with the events related with the review missions in the financial assisted countries, news are in general positive, where the key words are " the program is on track" or " the government has reaffirmed the commitment to the program". The only bad news for this group is press releases about the countries formal asking for financial assistance.

5. Empirical analysis

5.1. Panel data estimation

For the panel data analysis, we have conducted two different types of estimations for the following specification:

$$spread_{it} = \beta_1 + \beta_2 spread_{it-1} + \beta_3 gind_{it} + \beta_4 q_{it} + \beta_5 ba_{it} + \beta_6 balance_{it} + \beta_7 debt_{it} + \beta_8 vix_{it} + \beta_9 Decb_t + \beta_{10} Dedp_{it} + \beta_{11} Dcsp_{it} + \beta_{12} Dfap_{it} + u_{it}\,. \quad (1)$$

To account for a possible endogeneity problem between the dependent variable and the explanatory variables we used in addition to the simple Ordinary least square (OLS) estimator also a Two-stage least square (2SLS) method, both with fixed effects and cross section-weights which account for cross-sectional heteroskedasticity.

Following the literature we have included on the right-hand side a lag of the sovereign spreads, since one has to account for the persistence that is inherent to the spreads. As mentioned by Afonso et al. (2012) the inclusion of the lagged spread is fundamental to avoid bias resulting from important omitted variables as Hallerberg and Wolff (2008) also pointed out, but the inclusion of the lagged spread can generate a different source of bias since this term can be correlated with the fixed effects (see Nickell, 1981).

Nevertheless, as noted for instance by Hallerberg and Wolff (2008), the bias originated from the correlation effect gets smaller as the time span of the panel increases and for samples over 20 periods, this effect is very small.

The panel considered in our analysis covers the period 1:1999 to 12:2012, giving a time dimension of T=167 which is enough to suspect that there is no bias arising from the introduction of the lagged term.

Regarding the variables used in the study, $gind_{it}$ and q_{it} are the growth rate of industrial production and the real effective exchange rate which represent the macroeconomic fundamentals measuring internal economic activity as well as competitiveness. ba_{it} denotes the 10-year government bond bid-ask spread and is a proxy for bond market liquidity. $balance_{it}$ and $debt_{it}$ denote the expected (forecasted) fiscal position. In order to avoid possible bias resulting from a potential correlation between these two variables, they are not included together in the estimations. vix_{it} denotes the international risk aversion. $Decb_t$, $Dedp_{it}$, $Dcsp_{it}$ and $Dfap_{it}$ are dummy

variables created to capture the events gathered. $Decb_t$ contains the events of monetary policy. $Dcsp_{it}$ is capturing the events of the surveillance arm from the SGP. $Dedp_{it}$ is capturing the events of the corrective arm from the SGP. $Dfap_{it}$ is capturing the events related with the financial assistance programs.

Table 2 – Modeling Sovereign Spreads Using OLS and 2SLS

	OLS	2SLS		
	(1)	(2)	(3)	(4)
β_1	-0.249	-0.391	-1.082**	-1.781***
	(0.311)	(1.077)	(0.539)	(0.545)
spr_{it-1}	0.957***	0.959***	0.962***	0.968***
	(0.006)	(0.007)	(0.009)	(0.009)
$gind_{it}$	-0.011***	-0.011***	-0.087***	-0.082***
	(0.004)	(0.016)	(0.028)	(0.027)
q_{it}	0.034	0.063	0.210*	0.355***
	(0.066)	(0.231)	(0.112)	(0.116)
ba_{it}	0.002***	0.002***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
$balance_{it}$	-0.002		-0.009**	
	(0.002)		(0.004)	
$debt_{it}$		0.000		0.000
		(0.001)		(0.001)
vix_{it}	0.039***	0.041***	0.050***	0.058***
	(0.008)	(0.033)	(0.019)	(0.018)
$Decb_t$	0.014**	0.015**	0.049**	0.049**
	(0.006)	(0.025)	(0.021)	(0.020)
$Dedp_{it}$	-0.029*	-0.029	-0.095	-0.034
	(0.018)	(0.067)	(0.093)	(0.092)
$Dcsp_{it}$	0.004	0.006	-0.048	-0.068
	(0.011)	(0.044)	(0.081)	(0.075)
$Dfap_{it}$	0.448***	0.450***	0.137	0.118
	(0.065)	(0.090)	(0.202)	(0.192)
Ajd-R^2	0.979	0.978	0.976	0.976
N	10	10	10	10
T	167	167	167	167

Note: The asterisks ***, **, * indicate significance at the 1, 5, 10% level respectively. The instrumental variables used are the second and third lags of spreads and the first four lags of the independent variables.

When observing the results of Table 2, it can be concluded that for the non-dummy group of variables the estimated parameters are in line with the attributed ranks. As expected, the lagged term appears highly significant and is the variable with more explanatory power, which is in accordance with high persistence that is associated with the sovereign spreads. Economic activity, liquidity and international risk in both

methods and models are always significant at 99% proving the key role that these factors have in determining the value which markets attribute to the government bonds. In terms of the variable that measures competiveness, different estimators give different results in terms of statistical significance, where OLS for both models 1 and 2 estimates this factor as non-significant, the 2SLS gives for both models statistical significance at least at 95% of confidence. Another interesting result is related with the expected fiscal position variables, where the expected government's budget balance in the 2SLS estimation is statistically significant, which is in line with the literature on the post financial crisis.

For the dummy variables it is important to point out that for monetary policy, not only the sign is in line with the underlying rating (given the positive sign) of the events but this variable is also statistically significant, which implies that markets are incorporating ECB´s policy decision when pricing the bonds. For the dummy related with the EDP procedures the estimated sign was not according with expectations given the attributed ranks, since this variable appears with a negative impact which means that when it is attributed positive or a negative rank, the estimation is measures these ranks in the opposite way. In model (1) of OLS estimator, this variable appears statistical significant at 90% of confidence. The 2SLS for both models give an unexpected sign to the dummy related with the assessment of the convergence and stability programs, but this variable for all models is not statistically significant.

Finally, for the dummy that captures the events from the financial assistance programs, there is a great difference in the results from the different estimations. In the OLS estimations this variable is significant at 99% of confidence, where for the 2SLS models it appears non-significant.

Still in the panel estimation, it is done another exercise where is examined the prediction power of the sovereign bond market. To conduct this study we have introduced lags for the event dummies (see Table 3).

Table 3 – Modeling Sovereign Spreads, Testing Markets Prediction Power

	OLS		2SLS	
	1	2	1	2
β_{it}	-0.450	-0.547*	-1.238**	-1.765***
	(0.312)	(0.304)	(0.565)	(0.564)
spr_{it-1}	0.961***	0.962***	0.964***	0.969***
	(0.007)	(0.006)	(0.009)	(0.009)
$gind_{it}$	-0.012***	-0.012***	-0.109***	-0.108***
	(0.004)	(0.004)	(0.029)	(0.028)
q_{it}	0.071	0.091	0.236**	0.348***
	(0.067)	(0.065)	(0.118)	(0.120)
ba_{it}	0.002***	0.002***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
$balance_{it}$	-0.001		-0.006	
	(0.002)		(0.004)	
$debt_{it}$		0.000		0.001
		(0.001)		(0.001)
vix_{it}	0.048***	0.049***	0.060***	0.063***
	(0.009)	(0.008)	(0.020)	(0.018)
$Decb_{t}$	0.014**	0.014**	0.047**	0.039*
	(0.006)	(0.006)	(0.022)	(0.021)
$Decb_{t-1}$	0.027***	0.028***	0.035***	0.040***
	(0.006)	(0.006)	(0.011)	(0.010)
$Dedp_{it}$	-0.038**	-0.039**	-0.160	-0.197*
	(0.018)	(0.019)	(0.114)	(0.109)
$Dedp_{it-1}$	0.058***	0.059***	0.087***	0.094***
	(0.018)	(0.019)	(0.033)	(0.032)
$Dcsp_{it}$	0.007	0.007	-0.011	0.025
	(0.011)	(0.011)	(0.092)	(0.079)
$Dcsp_{it-1}$	0.002	0.002	0.001	0.003
	(0.011)	(0.011)	(0.019)	(0.017)
$Dfap_{it}$	0.461***	0.462***	0.267	0.286
	(0.065)	(0.065)	(0.200)	(0.193)
$Dfap_{it}$	0.121*	0.122*	0.137*	0.140*
	(0.064)	(0.065)	(0.071)	(0.071)
Ajd-R^2	0.979	0.979	0.976	0.975
N	10	10	10	10
T	167	167	167	167

Note: The asterisks ***, **, * indicate significance at the 1, 5, 10% level respectively. The instrumental variables used are the second and third lags of spreads and the first four lags of the independent variables.

Some important results arise from this exercise. For the events of monetary policy it seems that not only the signs are well estimated, and the lag term appears

statistically significant at 99% confidence for all models, independently from the estimator, which indicates that sovereign spreads anticipate well the future variations on the ECB interest rate announcements.

Another relevant result is that the lagged event dummies related with the EDP and the financial assistance programs appear with the expected sign. For the four models, independently from the estimator, they are statistically significant at 90% of confidence, which implies the possibility that the sovereign bond market anticipates these events. One could speculate that the information that is provided in these events is already from public domain, since that, for these particular events there is a lot of media cover and monitoring by a variety of different agents.

5.2 Seemingly Unrelated Regression Estimation

In this section we use a different approach for a country-by-country assessment, employing a SUR estimation. The idea is to try to capture how the different countries react to the different groups of events.

The SUR estimation is done by a system of equations enabling that different countries can have different coefficients but also that there is a contemporaneous correlation between the error terms associated with the individual equations.

Similar to the equation (1) the following specification was estimated:

$$spread_{it} = \beta_1 + \beta_2 spread_{t-1} + \beta_3 gind_t + \beta_4 q_t + \beta_5 ba_t + \beta_6 balance_t + \beta_7 debt_t + \beta_8 vix_t + \beta_9 Decb_t + \beta_{10} Dedp_t + \beta_{11} Dcsp_t + \beta_{12} Dfap_t + u_t . \quad (2)$$

The results presented in Table 4, show that the lagged term of the sovereign spreads still holds for every country as a fundamental variable. Economic activity only appears significant for Finland, France and the Netherlands, but for France the sign of the coefficient is not aligned with theory and this variable is only statistically significant in one of the models estimated.

Moreover, the competitiveness is not affecting the countries that suffered more with the crisis, (in this case Greece, Ireland and Portugal) but other sample countries since the variable q_{it} is statistically significant at least 10% for countries like Austria, Belgium, Finland, France, Italy and the Netherlands. Liquidity factors are only explaining sovereign spreads in the case of Belgium, Greece, Italy and Portugal. The fiscal position of the sample countries is affecting, as well, a small group of countries. Government budget balance seems an important factor in the case of Spain, Greece and Ireland which does not came as a surprise since this countries asked for financial assistance. Debt-to-GDP as presented in the results from the panel estimations appear with a residual role where only Finland and France have statistical significance for this variable, but the sign for Finland coefficient is not aligned with theory. International risk aversion factors appeared non-significant or in just only one model for the countries that received financial help.

In terms of the event dummies, the monetary events do not appear significant for any of the sample countries. The dummy related with the EDP events appeared significant for Belgium, Spain and Italy but once more with the non-expected negative sign. The estimated coefficient for the convergence and stability programs assessment are generally not significant and in the case of Austria appeared significant at 90% confidence, but with the wrong sign. Only for Finland this group of events appears to be important. The most interesting results appear from the group of financial assistance events, where they appeared significant at 99% of confidence for Spain, Ireland and Portugal.

For a better understanding of the impact from the event dummies, as it was done in the panel estimations, it is conducted an estimation of equation (2) including the lags of the event dummies (see Table 5).

The inclusion of the lagged term for the dummy related with the monetary events, show that sovereign spreads are in general anticipating this set of events with the exception of Greece, Ireland and the Netherlands. In case of Portugal, it seems that markets are anticipating these events but attributing an unexpected weight since the variable was estimated with a negative sign. For the other set of lagged dummies, they are generally not significant.

5.3. Spillover effects

As Afonso et al. (2012) and De Santis (2012) have showed, during the financial crisis it seems that there was some contagion effect in the Euro area long-term bond market from the lower rated countries that tend to have weaker fiscal positions to the high rated countries. In this last exercise, we present some estimation results to understand how did the events related with the financial assistance programs impacted the Euro area bond market, contributing for a better insight of the channels by which this contagion effects propagate.

With this idea in mind, the following SUR estimation was used:

$$spread_{it} = \beta_1 + \beta_2 spread_{t-1} + \beta_3 gind_t + \beta_4 q_t + \beta_5 ba_t + \beta_6 balance_t + \beta_7 debt_t + \beta_8 vix_t + \beta_9 Decb_t + \beta_{10} Dedp_t + \beta_{11} Dcsp_t + \beta_{12} Dfap_t + \beta_{13} Dfap_{ESt} + \beta_{14} Dfap_{ESt-1} + \beta_{14} Dfap_{GRt} + \beta_{15} Dfap_{GRt-1} + \beta_{16} Dfap_{IEt} + \beta_{17} Dfap_{IEt-1} + \beta_{18} Dfap_{PTt} + \beta_{19} Dfap_{PTt-1} + u_{t.} \quad (3)$$

As Table 6 shows, the events related with Spain seems to affect the financial assisted countries plus Italy and France. Interestingly, these events do not have the same impact on different countries. Contemporaneously, this has a positive impact on all countries for which this dummy is statistically significant, but the lagged term appears negative which can be translated as markets speculating possible bad news for Spain. Consequently countries that are geographically closer as France or with weaker fiscal positions such as Greece and Ireland, where Portugal is affected in both ways.

From the financial assisted countries, Greece's set of events presents more spillover effects. In general, the negative impact of both contemporaneously and lagged term has less effect in the countries with stronger fiscal positions such as Austria and Finland.

In the case of Ireland the spillover effects appeared contemporaneously significant and always with negative impact.

Finally, sovereign spreads seem to anticipate positively the impact of the review missions in Portugal. The number of countries affected contemporaneously by the events of the mission in Portugal are fewer and with different impacts. Belgium, Finland and France seem to be negatively affected by those events, but for Ireland it is the opposite way, by having a positive effect on sovereign spreads.

6. Conclusions

In this study we have analyzed the sovereign spreads determinants and how monetary and fiscal policy events in the context of European Union economic policy affect them.

In terms of sovereign spreads determinants, it seems that the liquidity factors, competitiveness, economic activity and international risk are the main drivers of spreads. The expected fiscal position of countries play a more marginal role, with expected budget balance showing more weight, when compared to the debt-to-GDP ratio, in shaping market participant's perception of credit worthiness.

The impact from the assembled events in sovereign spreads can be summarized as follows.

The monetary events play a role in the bond market and they seem to be anticipated, which is in line with the findings of Andersson et al. (2009) and Bernoth

and Hagen (2004). Events of fiscal policy related with the "arms" of the SGP do not have a key role and with some non-expected results for the events assembled for the corrective arm of the SGP where markets seem to weight those events in the opposite way of the attributed rank.

When assessing the impact of events related to the financial assistance programs, we have found, not only they play a key role in explaining the financial assisted countries, but also there is evidence of spillover effects, that have mixed results depending on the countries. The overall results is a negative impact from these events on the countries that did not asked for financial assistance, and this effect seems to be widespread when the events are from the review mission in Greece.

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Appendix.

Figure A1 - Events of Preventive Arm from the SGP

Country	Date	Description	Rank
Greece	30/09/1998	Commission assesses the Greek convergence programme	+
Finland	30/09/1998	Commission assesses Finland's stability programme	+
Netherlands	25/11/1998	Commission assesses the Dutch stability programme	+
Ireland	12/01/1999	Commission assesses Irish stability programme	+
Austria	12/01/1999	Commission assesses the Austrian stability programme	+
Portugal	03/02/1999	Commission assesses the Portuguese stability programme	+
Italy	03/02/1999	Commission assesses Italy's stability programme	#
France	16/02/1999	Commission assesses the French stability programme	+
Spain	16/02/1999	Commission assesses the Spanish stability programme	+
Belgium	16/02/1999	Commission assesses the Belgian stability programme	+
Netherlands	18/01/2000	Commission assesses the Dutch stability programme	+
Ireland	18/01/2000	Commission assesses Irish stability programme	+
Finland	18/01/2000	Commission assesses Finland's stability programme	+

Greece	18/01/2000	Commission assesses the Greek convergence programme	+
Spain	15/02/2000	Commission assesses the Spanish stability programme	+
Italy	15/02/2000	Commission assesses Italy's stability programme	+
Belgium	15/02/2000	Commission assesses the Belgian stability programme	+
Portugal	08/03/2000	Commission assesses the Portuguese stability programme	+
France	08/03/2000	Commission assesses the French stability programme	+
Austria	26/04/2000	Commission assesses the Austrian stability programme	-
Finland	15/11/2000	Commission assesses Finland's stability programme	+
Netherlands	15/11/2000	Commission assesses the Dutch stability programme	+
Austria	24/01/2001	Commission assesses the Austrian stability programme	+
Greece	24/01/2001	Commission assesses the Greek Stability programme	+
Italy	24/01/2001	Commission assesses Italy's stability programme	+
France	24/01/2001	Commission assesses the French stability programme	+
Ireland	24/01/2001	Commission assesses Irish stability programme	#
Portugal	28/02/2001	Commission assesses the Portuguese stability programme	-
Spain	28/02/2001	Commission assesses the Spanish stability programme	+
Belgium	28/02/2001	Commission assesses the Belgian stability programme	+
Netherlands	15/01/2002	Commission assesses the Dutch stability programme	+
Finland	15/01/2002	Commission assesses Finland's stability programme	+
Austria	15/01/2002	Commission assesses the Austrian stability programme	+
Belgium	15/01/2002	Commission assesses the Belgian stability programme	+
Portugal	30/01/2002	Commission assesses the Portuguese stability programme	-
Greece	30/01/2002	Commission assesses the Greek stability programme	+
Spain	30/01/2002	Commission assesses the Spanish stability programme	+
Ireland	30/01/2002	Commission assesses Irish stability programme	+
Italy	30/01/2002	Commission assesses Italy's stability programme	#
France	30/01/2002	Commission assesses the French stability programme	+
France	08/01/2003	Commission assesses the French stability programme	-
Finland	08/01/2003	Commission assesses Finland's stability programme	+
Greece	08/01/2003	Commission assesses the Greek Stability programme	#
Italy	08/01/2003	Commission assesses Italy's stability programme	-
Spain	30/01/2003	Commission assesses the Spanish stability programme	+
Ireland	30/01/2003	Commission assesses Irish stability programme	+
Belgium	30/01/2003	Commission assesses the Belgian stability programme	+
Portugal	19/02/2003	Commission assesses the Portuguese stability programme	+
Austria	30/04/2003	Commission assesses the Austrian stability programme	#
Netherlands	24/06/2003	Commission assesses the Dutch stability programme	+
Austria	07/01/2004	Commission assesses the Austrian stability programme	#
Finland	07/01/2004	Commission assesses Finland's stability programme	+
Greece	28/01/2004	Commission assesses the Greek Stability programme	#
Netherlands	28/01/2004	Commission assesses the Dutch stability programme	#
Ireland	28/01/2004	Commission assesses Irish stability programme	#
Italy	28/01/2004	Commission assesses Italy's stability programme	#
France	28/01/2004	Commission assesses the French stability programme	#
Portugal	18/02/2004	Commission assesses the Portuguese stability programme	#
Spain	18/02/2004	Commission assesses the Spanish stability programme	#
Belgium	18/02/2004	Commission assesses the Belgian stability programme	#
Netherlands	11/01/2005	Commission assesses the Dutch stability programme	#
Austria	11/01/2005	Commission assesses the Austrian stability programme	-
Belgium	02/02/2005	Commission assesses the Belgian stability programme	+

Finland	02/02/2005	Commission assesses Finland's stability programme	+
France	02/02/2005	Commission assesses the French stability programme	#
Ireland	02/02/2005	Commission assesses Irish stability programme	+
Italy	02/02/2005	Commission assesses Italy's stability programme	-
Spain	16/02/2005	Commission assesses the Spanish stability programme	+
Portugal	22/06/2005	Commission assesses the Portuguese stability programme	-
Finland	11/01/2006	Commission assesses Finland's stability programme	+
Belgium	01/02/2006	Commission assesses the Belgian stability programme	+
Austria	01/02/2006	Commission assesses the Austrian stability programme	+
Italy	22/02/2006	Commission assesses Italy's stability programme	+
France	22/02/2006	Commission assesses the French stability programme	#
Greece	22/02/2006	Commission assesses the Greek Stability programme	#
Ireland	22/06/2005	Commission assesses Irish stability programme	+
Netherlands	22/02/2006	Commission assesses the Dutch stability programme	+
Portugal	22/02/2006	Commission assesses the Portuguese stability programme	#
Spain	22/02/2006	Commission assesses the Spanish stability programme	+
France	23/01/2007	Commission assesses the French stability programme	+
Italy	23/01/2007	Commission assesses Italy's stability programme	#
Netherlands	23/01/2007	Commission assesses the Dutch stability programme	+
Finland	07/02/2007	Commission assesses Finland's stability programme	+
Ireland	07/02/2007	Commission assesses Irish stability programme	+
Greece	13/02/2007	Commission assesses the Greek Stability programme	+
Portugal	13/02/2007	Commission assesses the Portuguese stability programme	+
Belgium	07/03/2007	Commission assesses the Belgian stability programme	+
Spain	07/03/2007	Commission assesses the Spanish stability programme	+
Austria	30/05/2007	Commission assesses the Austrian stability programme	#
Finland	23/01/2008	Commission assesses Finland's stability programme	+
Netherlands	23/01/2008	Commission assesses the Dutch stability programme	#
France	30/01/2008	Commission assesses the French stability programme	-
Italy	30/01/2008	Commission assesses Italy's stability programme	-
Austria	13/02/2008	Commission assesses the Austrian stability programme	+
Portugal	13/02/2008	Commission assesses the Portuguese stability programme	#
Ireland	19/02/2008	Commission assesses Irish stability programme	#
Greece	19/02/2008	Commission assesses the Greek Stability programme	-
Spain	19/02/2008	Commission assesses the Spanish stability programme	+
Belgium	11/06/2008	Commission assesses the Belgian stability programme	-
Ireland	18/02/2009	Commission assesses Irish stability programme	-
Greece	18/02/2009	Commission assesses the Greek Stability programme	-
Spain	18/02/2009	Commission assesses the Spanish stability programme	-
France	18/02/2009	Commission assesses the French stability programme	-
Finland	18/02/2009	Commission assesses Finland's stability programme	+
Netherlands	18/02/2009	Commission assesses the Dutch stability programme	+
Italy	25/02/2009	Commission assesses Italy's stability programme	#
Portugal	25/02/2009	Commission assesses the Portuguese stability programme	#
Belgium	24/06/2009	Commission assesses the Belgian stability programme	-
Austria	24/06/2009	Commission assesses the Austrian stability programme	#
Greece	03/02/2010	Commission assesses the Greek Stability programme	-
Belgium	17/03/2010	Commission assesses the Belgian stability programme	-
Ireland	17/03/2010	Commission assesses Irish stability programme	-
Spain	17/03/2010	Commission assesses the Spanish stability programme	-

France	17/03/2010	Commission assesses the French stability programme	-
Italy	17/03/2010	Commission assesses Italy's stability programme	-
Netherlands	17/03/2010	Commission assesses the Dutch stability programme	-
Austria	17/03/2010	Commission assesses the Austrian stability programme	-
Finland	17/03/2010	Commission assesses Finland's stability programme	#
Portugal	14/04/2010	Commission assesses the Portuguese stability programme	#
Austria	07/06/2011	Commission assesses the Austrian stability programme	-
Belgium	07/06/2011	Commission assesses the Belgian stability programme	-
Finland	07/06/2011	Commission assesses Finland's stability programme	+
France	07/06/2011	Commission assesses the French stability programme	-
Greece	07/06/2011	Commission assesses the Greek Stability programme	#
Spain	07/06/2011	Commission assesses the Spanish stability programme	#
Italy	07/06/2011	Commission assesses Italy's stability programme	-
Netherlands	07/06/2011	Commission assesses the Dutch stability programme	-
Portugal	07/06/2011	Commission assesses the Portuguese stability programme	#
Ireland	07/06/2011	Commission assesses Irish stability programme	#
Belgium	30/05/2012	Commission assesses the Belgian stability programme	#
Ireland	30/05/2012	Commission assesses Irish stability programme	#
Greece	30/05/2012	Commission assesses the Greek Stability programme	#
Spain	30/05/2012	Commission assesses the Spanish stability programme	#
France	30/05/2012	Commission assesses the French stability programme	-
Italy	30/05/2012	Commission assesses Italy's stability programme	+
Netherlands	30/05/2012	Commission assesses the Dutch stability programme	-
Austria	30/05/2012	Commission assesses the Austrian stability programme	-
Portugal	30/05/2012	Commission assesses the Portuguese stability programme	#
Finland	30/05/2012	Commission assesses Finland's stability programme	+

Source: European Commission

Figure A2 – Events of Corrective Arm from the SGP

Country	Date	Description	Rank
Greece	10/11/1999	Commission recommends abrogation of Council decision on the existence of an excessive deficit in Greece	+
Portugal	16/10/2002	Commission considers that an excessive government deficit exists in Portugal	-
France	19/11/2002	Commission recommends to the Council to address an early warning to France	-
France	02/04/2003	Commission adopts report on government finances in France as a first step of the Excessive Deficit Procedure	-
France	07/05/2003	Commission considers that an excessive government deficit exists in France	-
France	08/10/2003	Commission proceeds with excessive deficit procedure for France	-
Portugal	28/04/2004	Commission recommends abrogation of Council decision on the existence of an excessive deficit in Portugal	+
Netherlands	28/04/2004	Commission proposes new steps in budgetary surveillance for Netherlands	-
Italy	28/04/2004	Commission proposes new steps in budgetary surveillance for Italy	-

Netherlands	19/05/2004	Commission recommends further steps under the excessive deficit procedure for the Netherlands	-
Greece	19/05/2004	Commission initiates budgetary surveillance for Greece	-
Greece	24/06/2004	Commission recommends further steps under the excessive deficit procedure for Greece	-
France	14/12/2004	Commission sees France on track to correct their excessive budget deficit	+
Greece	09/02/2005	Commission recommends further steps under the excessive deficit procedure for Greece	-
Netherlands	18/05/2005	Commission recommends taking the Netherlands out of the excessive deficit procedure	+
Italy	07/06/2005	Commission adopts report on Italian public finances	-
Portugal	22/06/2005	Commission assesses the Portuguese stability programme	-
Italy	29/06/2005	Commission recommends further steps under the excessive deficit procedure for Italy	-
Portugal	20/07/2005	Commission recommends further steps under the excessive deficit procedure for Portugal	-
Greece	16/05/2007	Commission recommends abrogation of excessive deficit procedure for Greece	+
Italy	07/05/2008	Commission recommends abrogation of excessive deficit procedure for Italy	+
Portugal	07/05/2008	Commission recommends abrogation of excessive deficit procedure for Portugal	+
France	24/03/2009	Commission takes steps under the excessive deficit procedure for France	-
Greece	24/03/2009	Commission takes steps under the excessive deficit procedure for Greece	-
Ireland	24/03/2009	Commission takes steps under the excessive deficit procedure for Ireland	-
Spain	24/03/2009	Commission takes steps under the excessive deficit procedure for Spain	-
Finland	23/04/2010	Commission adopts reports under excessive deficit procedure for Finland	-
Belgium	15/06/2010	Commission concludes effective action was taken by Belgium in excessive deficit procedure	+
Ireland	15/06/2010	Commission concludes effective action was taken by Ireland in excessive deficit procedure	+
Spain	15/06/2010	Commission concludes effective action was taken by Spain in excessive deficit procedure	+
France	15/06/2010	Commission concludes effective action was taken by France in excessive deficit procedure	+
Italy	15/06/2010	Commission concludes effective action was taken by Italy in excessive deficit procedure	+
Netherlands	15/06/2010	Commission concludes effective action was taken by Netherland in excessive deficit procedure	+
Austria	15/06/2010	Commission concludes effective action was taken by Austria in excessive deficit procedure	+
Portugal	15/06/2010	Commission concludes effective action was taken by Portugal in excessive deficit procedure	+
Finland	12/05/2010	Commission recommends to open excessive deficit procedure for Finland	-
Belgium	11/01/2012	Commission concludes effective action was taken by Belgium in excessive deficit procedure	+

Source: European Commission

Figure A3 – Events of Financial Assistance Programs

Country	Date	Description	Rank
Greece	23/04/2010	Joint statement by European Commission, European Central Bank and Presidency of the Eurogroup on Greece	-
Greece	05/08/2010	Statement by the EC, ECB, and IMF on the First Review Mission to Greece	+
Greece	23/11/2010	Statement by the EC, ECB and IMF on the Second Review Mission to Greece	+
Ireland	28/11/2010	European Commissioner for Economic and Monetary Affairs and Managing Director of the International Monetary Fund have issued a joint statement on Ireland on the economic program announced today by Ireland.	-
Greece	24/02/2011	Statement by the EC, ECB and IMF on the Third Review Mission to Greece	+
Ireland	15/04/2011	Statement by the EC, ECB, and IMF on the First Review Mission to Ireland	+
Portugal	05/05/2011	Statement on Portugal by European Commissioner for Economic and Monetary Affairs and Managing Director of the International Monetary Fund (IMF)	-
Greece	03/06/2011	Statement by the European Commission, the ECB and IMF on the Fourth Review Mission to Greece	+
Ireland	13/07/2013	Statement by the EC, ECB, and IMF on the Second Review Mission to Ireland	+
Portugal	12/08/2011	Statement by the EC, ECB, and IMF on the First Review Mission to Portugal	+
Ireland	09/09/2011	Statement by the EC, ECB, and IMF on the Third Review Mission to Ireland	+
Portugal	16/11/2011	Statement by the EC, ECB, and IMF on the Second Review Mission to Portugal	-
Ireland	19/01/2012	Statement by the EC, ECB, and IMF on the Fourth Review Mission to Ireland	+
Portugal	28/02/2012	Statement by the EC, ECB, and IMF on the Third Review Mission to Portugal	+
Ireland	26/04/2012	Statement by the EC, ECB, and IMF on the Fifth Review Mission to Ireland	+
Portugal	04/06/2012	Statement by the EC, ECB, and IMF on the Fourth Review Mission to Portugal	+
Spain	25/06/2012	Spain formally requests financial aid for Spanish banks	-
Ireland	12/07/2012	Statement by the EC, ECB, and IMF on the Sixth Review Mission to Ireland	+
Portugal	11/09/2012	Statement by the EC, ECB, and IMF on the Fifth Review Mission to Portugal	+
Ireland	25/10/2012	Statement by the EC, ECB, and IMF on the Seventh Review Mission to Ireland	+
Spain	26/10/2012	Statement by the EC and the ECB following the conclusion of the first review of the financial assistance programme for Spain	+
Portugal	19/11/2012	Statement by the EC, ECB, and IMF on the Sixth Review Mission to Portugal	+

Source: European Commission

Table 4 – SUR Estimation, the Sovereign Spread Determinants

	β_{it}	spr_{it-1}	$gind_{it}$	q_{it}	ba_{it}	$balance_{it}$	$debt_{it}$	vix_{it}	$Decb_t$	$Dedp_{it}$	$Dcsp_{it}$	$Dfap_{it}$	Ajd-R^2	Obs
AT	-2.369***	0.904***	0.002	0.470**	0.000	-0.005		0.082***	0.001	-0.018	-0.029*		0.924	164
	(0.861)	(0.027)	(0.009)	(0.185)	(0.000)	(0.004)		(0.020)	(0.015)	(0.050)	(0.017)			
	-2.091**	0.898***	0.000	0.401*	0.000		-0.002	0.092***	0.004	-0.004	-0.021		0.923	164
	(0.963)	(0.027)	(0.009)	(0.209)	(0.000)		(0.002)	(0.021)	(0.015)	(0.053)	(0.018)			
BE	-2.497**	0.947***	0.004	0.489**	-0.001**	-0.005		0.098***	0.025	-0.088**	-0.019		0.954	167
	(1.044)	(0.020)	(0.006)	(0.222)	(0.001)	(0.005)		(0.028)	(0.020)	(0.038)	(0.016)			
	-2.973**	0.954***	0.004	0.587**	-0.001**		0.000	0.104***	0.028	-0.098**	-0.016		0.953	167
	(1.316)	(0.020)	(0.006)	(0.283)	(0.001)		(0.001)	(0.028)	(0.020)	(0.039)	(0.016)			
ES	-2.197***	0.966***	0.01	0.450***	0.000	-0.010*		0.059	0.008	-0.284***	-0.028	0.233***	0.978	167
	(1.482)	(0.016)	(0.021)	(0.312)	(0.001)	(0.006)		(0.046)	(0.031)	(0.083)	(0.036)	(0.078)		
	-5.090***	0.973***	0.011	1.076	0.000		0.002	0.073	0.015	-0.300***	-0.024	0.226***	0.978	167
	(1.836)	(0.016)	(0.021)	(0.406)	(0.001)		(0.002)	(0.045)	(0.031)	(0.083)	(0.036)	(0.078)		
FI	-0.671**	0.843***	-0.012***	0.114**	0.000	-0.003		0.066***	0.004	-0.017	0.017*		0.929	167
	(0.326)	(0.027)	(0.004)	(0.069)	(0.000)	(0.002)		(0.013)	(0.008)	(0.024)	(0.010)			
	-0.219	0.848***	-0.011***	0.000	0.000		-0.002**	0.066***	0.002	-0.014	0.020**		0.93	167
	(0.398)	(0.025)	(0.004)	(0.090)	(0.000)		(0.001)	(0.013)	(0.008)	(0.024)	(0.009)			
FR	-1.493***	0.936***	0.016*	0.295**	0.000	0.000		0.052***	0.003	-0.003	-0.005		0.941	167
	(0.561)	(0.019)	(0.008)	(0.120)	(0.000)	(0.002)		(0.018)	(0.013)	(0.014)	(0.012)			
	-1.975***	0.840***	0.014	0.380***	0.000		0.001***	0.070***	-0.001	-0.002	0.001		0.949	167
	(0.489)	(0.025)	(0.009)	(0.103)	(0.000)		(0.000)	(0.017)	(0.012)	(0.016)	(0.013)			
GR	5.298	0.864***	-0.112	-1172	0.006***	-0.091*		0.047	-0.059	-0.101	0.185	-0.194	0.966	167
	(8.942)	(0.023)	(0.105)	(1.911)	(0.001)	(0.051)		(0.278)	(0.214)	(0.435)	(0.382)	(0.475)		
	-7.038	0.859***	-0.106	1.336	0.006***		0.013	0.182	0.045	-0.291	0.294	-0.151	0.966	167
	(7.861)	(0.035)	(0.105)	(1.626)	(0.001)		(0.011)	(0.292)	(0.209)	(0.435)	(0.381)	(0.471)		
IE	-7.536	0.881***	0.016	1.700	0.002*	-0.033*		-0.11	0.135	-0.276	-0.024	0.623***	0.963	85
	(9.201)	(0.055)	(0.043)	(2.024)	(0.001)	(0.018)		(0.176)	(0.118)	(0.174)	(0.192)	(0.297)		
	-12.456	0.881***	0.019	2.731	0.002		0.004	-0.002	0.104	-0.276	0.013	0.611***	0.963	85
	(8.753)	(0.061)	(0.043)	(1.938)	(0.001)		(0.003)	(0.169)	(0.117)	(0.173)	(0.191)	(0.296)		
IT	-2.787**	0.961***	0.027	0.524*	0.001***	-0.010		0.138***	0.024	-0.114***	-0.016		0.972	167
	(1.331)	(0.012)	(0.021)	(0.285)	(0.000)	(0.009)		(0.046)	(0.034)	(0.042)	(0.032)			
	-2.363	0.961***	0.028	0.455	0.001***		-0.003	0.152***	0.028	-0.103**	-0.011		0.972	167
	(1.642)	(0.011)	(0.021)	(0.338)	(0.000)		(0.003)	(0.048)	(0.035)	(0.041)	(0.032)			
NL	-1.198**	0.866***	-0.006**	0.238**	0.000	-0.002		0.042***	0.006	0.029*	-0.003		0.922	167
	(0.483)	(0.029)	(0.003)	(0.103)	(0.000)	(0.003)		(0.012)	(0.008)	(0.016)	(0.011)			
	-1.275**	0.873***	-0.006**	0.255**	0.000		0.000	0.041***	0.006	0.030*	0.000		0.922	167
	(0.512)	(0.024)	(0.003)	(0.110)	(0.000)		(0.001)	(0.012)	(0.008)	(0.017)	(0.011)			
PT	-1.989	0.847***	0.013	0.362	0.005***	-0.016		0.108	0.022	0.013	0.011	0.343***	0.993	167
	(3.425)	(0.014)	(0.021)	(0.743)	(0.000)	(0.020)		(0.057)	(0.044)	(0.071)	(0.075)	(0.080)		
	-2.877	0.838***	0.007	0.559	0.005***		0.003	0.110*	0.024	0.018	0.008	0.342***	0.993	167
	(2.973)	(0.021)	(0.021)	(0.641)	(0.000)		(0.004)	(0.057)	(0.044)	(0.070)	(0.074)	(0.079)		

Note: The asterisks ***, **, * indicate significance at the 1, 5, 10% level respectively.

Table 5 – SUR Estimation, Markets Prediction Power

	β_{it}	$spri_{t-1}$	$gind_{it}$	q_{it}	ba_{it}	$balance_{it}$	$debt_{it}$	vix_{it}	$Decb_{t}$	$Decb_{t-1}$	$Dedp_{it}$	$Dedp_{it-1}$	$Dcsp_{it}$	$Dcsp_{it-1}$	$Dfap_{it}$	$Dfap_{it-1}$	Ajd-R^2	obs
AT	-2.307***	0.906***	0.003	0.458**	0.000	-0.008*		0.080***	0.000	0.005	-0.029	0.055	-0.029*	-0.022			0.925	164
	(0.858)	(0.028)	(0.009)	(0.184)	(0.000)	(0.004)		(0.021)	(0.015)	(0.014)	(0.054)	(0.053)	(0.017)	(0.016)				
	-1.890**	0.907***	0.000	0.356*	0.000		-0.002	0.093***	0.004	0.010	-0.011	0.062	-0.019	-0.021			0.924	164
	(0.963)	(0.027)	(0.009)	(0.208)	(0.000)		(0.002)	(0.021)	(0.015)	(0.014)	(0.056)	(0.055)	(0.018)	(0.016)				
BE	-3.079***	0.977***	0.002	0.599***	-0.001**	0.000		0.118***	0.028	0.062***	-0.063	0.149***	-0.020	-0.012			0.959	167
	(1.001)	(0.022)	(0.006)	(0.211)	(0.001)	(0.006)		(0.027)	(0.019)	(0.018)	(0.042)	(0.043)	(0.017)	(0.016)				
	-3.118**	0.976***	0.001	0.607**	-0.001**		0.000	0.118***	0.028	0.063***	-0.074*	0.144***	-0.018	-0.011			0.959	167
	(1.300)	(0.021)	(0.006)	(0.279)	(0.001)		(0.001)	(0.027)	(0.019)	(0.018)	(0.044)	(0.044)	(0.017)	(0.017)				
ES	-2.478*	0.968***	0.009	0.498	0.000	-0.010		0.077	0.010	0.054*	-0.290***	-0.016	-0.024	0.021	0.233***	0.146*	0.978	167
	(1.483)	(0.017)	(0.022)	(0.311)	(0.001)	(0.006)		(0.047)	(0.031)	(0.030)	(0.086)	(0.083)	(0.036)	(0.037)	(0.077)	(0.079)		
	-5.230***	0.975***	0.012	1.092***	0.000		0.002	0.094**	0.016	0.063*	-0.309***	-0.018	-0.019	0.026	0.230***	0.114	0.978	167
	(1.858)	(0.016)	(0.022)	(0.410)	(0.001)		(0.002)	(0.045)	(0.031)	(0.030)	(0.086)	(0.083)	(0.036)	(0.037)	(0.078)	(0.080)		
FI	-0.725**	0.865***	-0.013***	0.124*	0.000	-0.003		0.066***	0.005	0.016*	0.013	-0.053*	0.019**	-0.001			0.931	167
	(0.323)	(0.028)	(0.004)	(0.069)	(0.000)	(0.002)		(0.013)	(0.008)	(0.008)	(0.028)	(0.029)	(0.010)	(0.010)				
	-0.261	0.864***	-0.011**	0.009	0.000		-0.002**	0.066***	0.002	0.013	0.013	-0.050*	0.022**	0.001			0.932	167
	(0.413)	(0.026)	(0.004)	(0.093)	(0.000)		(0.001)	(0.013)	(0.008)	(0.008)	(0.028)	(0.029)	(0.010)	(0.010)				
FR	-1.657***	0.950***	0.015*	0.326***	0.000	0.001		0.059***	0.003	0.026**	-0.003	0.008	-0.004	0.000			0.941	167
	(0.572)	(0.021)	(0.009)	(0.122)	(0.000)	(0.002)		(0.018)	(0.013)	(0.013)	(0.016)	(0.035)	(0.012)	(0.012)				
	-1.934***	0.848***	0.013	0.368***	0.000		0.001***	0.074***	-0.003	0.019*	-0.003	0.007	0.004	0.008			0.950	167
	(0.490)	(0.027)	(0.009)	(0.103)	(0.000)		(0.000)	(0.017)	(0.012)	(0.011)	(0.017)	(0.035)	(0.013)	(0.013)				
GR	9.168	0.854***	-0.112	-1.938	0.007***	-0.116**		-0.069	-0.073	-0.265	0.047	-0.121	0.116	0.063	-0.102	0.298	0.965	167
	(9.480)	(0.024)	(0.109)	(2.013)	(0.001)	(0.055)		(0.291)	(0.215)	(0.215)	(0.493)	(0.492)	(0.388)	(0.393)	(0.441)	(0.447)		
	-6.087	0.863***	-0.095	1.185	0.006***		0.011	0.123	0.052	-0.106	-0.106	-0.159	0.227	0.119	0.029	0.406	0.965	167
	(8.176)	(0.035)	(0.110)	(1.685)	(0.001)		(0.012)	(0.304)	(0.211)	(0.205)	(0.496)	(0.497)	(0.392)	(0.394)	(0.448)	(0.458)		
IE	-5.999	0.893***	0.029	1.359	0.002**	-0.027		-0.090	0.130	-0.045	-0.288	-0.146	0.021	0.013	0.635***	0.421***	0.965	85
	(9.047)	(0.054)	(0.042)	(1.995)	(0.001)	(0.018)		(0.176)	(0.120)	(0.110)	(0.297)	(0.291)	(0.184)	(0.190)	(0.171)	(0.162)		
	-10.498	0.890***	0.031	2.318	0.002*		0.004	-0.021	0.116	-0.064	-0.264	-0.129	0.040	0.032	0.645***	0.424***	0.965	85
	(8.560)	(0.059)	(0.042)	(1.897)	(0.001)		(0.003)	(0.174)	(0.119)	(0.108)	(0.294)	(0.289)	(0.183)	(0.189)	(0.169)	(0.162)		
IT	-3.027**	0.966***	0.031	0.564*	0.001***	-0.007		0.156***	0.021	0.062*	-0.121**	-0.004	-0.013	0.019			0.972	167
	(1.365)	(0.012)	(0.024)	(0.291)	(0.000)	(0.010)		(0.047)	(0.034)	(0.033)	(0.047)	(0.047)	(0.036)	(0.036)				
	-2.207	0.967***	0.034	0.411	0.001**		-0.004	0.172***	0.024	0.067**	-0.110**	-0.009	-0.007	0.024			0.972	167
	(1.700)	(0.012)	(0.023)	(0.348)	(0.000)		(0.004)	(0.049)	(0.034)	(0.033)	(0.047)	(0.047)	(0.036)	(0.036)				
NL	-1.181**	0.875***	-0.006*	0.234**	0.000	-0.001		0.041***	0.006	0.004	0.027	0.015	-0.004	0.004			0.922	167
	(0.479)	(0.030)	(0.003)	(0.103)	(0.000)	(0.003)		(0.012)	(0.008)	(0.008)	(0.017)	(0.017)	(0.012)	(0.011)				
	-1.167**	0.878***	-0.005*	0.231**	0.000		0.000	0.040***	0.005	0.004	0.027	0.017	-0.002	0.004			0.922	167
	(0.511)	(0.025)	(0.003)	(0.110)	(0.000)		(0.001)	(0.012)	(0.008)	(0.008)	(0.017)	(0.017)	(0.011)	(0.011)				
PT	0.305	0.826***	0.013	-0.117	0.006***	-0.032*		0.073	0.021	-0.084**	0.026	0.093	0.029	0.010	0.299***	-0.039	0.993	167
	(3.442)	(0.015)	(0.020)	(0.745)	(0.000)	(0.019)		(0.057)	(0.043)	(0.042)	(0.068)	(0.068)	(0.071)	(0.071)	(0.078)	(0.077)		
	-2.474	0.821***	0.006	0.494	0.006***		0.003	0.078	0.029	-0.073*	0.029	0.098	0.018	0.010	0.301***	-0.041	0.993	167
	(2.983)	(0.021)	(0.020)	(0.642)	(0.000)		(0.004)	(0.058)	(0.043)	(0.042)	(0.068)	(0.069)	(0.071)	(0.071)	(0.078)	(0.077)		

Note: The asterisks ***, **, * indicate significance at the 1, 5, 10% level respectively.

Table 6 – SUR Estimation, Contagion Effects

	$Dfap_{ESt}$	$Dfap_{ESt-1}$	$Dfap_{GRt}$	$Dfap_{GRt-1}$	$Dfap_{IEt}$	$Dfap_{IEt-1}$	$Dfap_{PTt}$	$Dfap_{PTt-1}$	Ajd-R^2	obs
AT	-0.016	-0.069	-0.059**	-0.102***	-0.122***	0.018	-0.035	0.053*	0.935	164
	(0.059)	(0.060)	(0.031)	(0.031)	(0.031)	(0.029)	(0.030)	(0.030)		
	-0.015	-0.076	-0.061*	-0.106***	-0.123***	0.017	-0.033	0.051*	0.934	164
	(0.059)	(0.060)	(0.031)	(0.031)	(0.031)	(0.030)	(0.031)	(0.031)		
BE	-0.024	-0.047	-0.070*	-0.224***	-0.051	-0.098***	-0.124***	0.099***	0.970	167
	(0.070)	(0.071)	(0.037)	(0.038)	(0.038)	(0.037)	(0.037)	(0.038)		
	-0.016	-0.042	-0.072*	-0.226***	-0.055	-0.104***	-0.130***	0.093**	0.970	167
	(0.069)	(0.070)	(0.037)	(0.037)	(0.038)	(0.036)	(0.037)	(0.037)		
ES			-0.068	-0.216***	-0.282***	-0.064	0.013	0.153**	0.981	167
			(0.071)	(0.070)	(0.071)	(0.069)	(0.073)	(0.072)		
			-0.072	-0.217***	-0.284***	-0.065	0.005	0.138*	0.981	167
			(0.071)	(0.070)	(0.071)	(0.069)	(0.072)	(0.072)		
FI	-0.045	-0.018	0.006	-0.042**	0.017	-0.001	-0.058***	0.037**	0.940	167
	(0.032)	(0.033)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.017)		
	-0.038	-0.025	0.000	-0.047***	0.012	-0.005	-0.060***	0.033**	0.940	167
	(0.032)	(0.033)	(0.017)	(0.018)	(0.017)	(0.016)	(0.016)	(0.017)		
FR	-0.049	-0.114**	-0.079***	-0.113***	-0.086***	-0.038	-0.049*	0.064**	0.952	167
	(0.052)	(0.052)	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.028)		
	-0.028	-0.094*	-0.064**	-0.102***	-0.080***	-0.037	-0.050*	0.061**	0.955	167
	(0.050)	(0.051)	(0.026)	(0.027)	(0.027)	(0.026)	(0.026)	(0.027)		
GR	2.028***	1.299*			-1.563***	-1.877***	0.447	2.623***	0.976	167
	(0.734)	(0.766)			(0.421)	(0.413)	(0.412)	(0.418)		
	2.079***	2.150***			-1.499***	-1.973***	0.383	2.693***	0.977	167
	(0.732)	(0.826)			(0.418)	(0.415)	(0.413)	(0.412)		
IE	0.609**	-0.662**	-0.348**	-0.550***			0.831***	0.239	0.977	85
	(0.279)	(0.294)	(0.176)	(0.165)			(0.151)	(0.147)		
	0.668**	-0.592**	-0.369**	-0.587***			0.859***	0.308**	0.978	85
	(0.271)	(0.287)	(0.169)	(0.160)			(0.145)	(0.146)		
IT	0.459***	-0.049	-0.177***	-0.329***	-0.517***	-0.156**	-0.073	0.003	0.98	167
	(0.128)	(0.130)	(0.069)	(0.069)	(0.072)	(0.069)	(0.070)	(0.070)		
	0.463***	-0.055	-0.181***	-0.335***	-0.512***	-0.158**	-0.079	-0.008	0.98	167
	(0.128)	(0.131)	(0.069)	(0.069)	(0.073)	(0.069)	(0.070)	(0.071)		
NL	0.059*	-0.046	-0.020	-0.021	-0.072***	-0.010	-0.019	0.037**	0.928	167
	(0.034)	(0.035)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)		
	0.060	-0.046	-0.020	-0.021	-0.073***	-0.010	-0.019	0.037	0.928	167
	(0.034)	(0.035)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)		
PT	0.515***	-0.655***	-0.173*	-0.214**	-0.569***	-0.045			0.994	167
	(0.171)	(0.175)	(0.096)	(0.095)	(0.101)	(0.099)				
	0.512***	-0.697***	-0.162*	-0.204**	-0.557***	-0.029			0.994	167
	(0.174)	(0.178)	(0.097)	(0.097)	(0.102)	(0.100)				

Note: The asterisks ***, **, * indicate significance at the 1, 5, 10% level respectively