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The Political Drivers of the Sovereign Bond Yield Spreads: Evidence from the Euro Area

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Preface and Acknowledgements

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With the hope to pursue furtherly in my academic career,

M.Sc. Edoardo Capomolla.

Abstract

This thesis explores the relationship between the political indicators and the sovereign bond yield spreads leveraging on a panel dataset European Monetary Union (EMU) countries from the early 2000 and December 2018. I test for the effect of three World Bank governance indicators (Government Effectiveness, Regulatory Quality and Political Stability) on the 10-year, 5-year and 2-year government bond yield spreads which respectively capture the long and short-term risk. The quality of the governance indicator (Government Effectiveness) appears to be relevant more in the short run rather than in the long term. To account for potential omitted variable bias, I control for macro-economic indicators that capture the credit and liquidity risk in the financial markets. Results suggest that this is particularly driven by the peripherical EMU countries. The results are robust to different specification, in which I add additional economic control variables and I assume a non-linear relationship between the political indicators and the sovereign risk measures.

Keywords: Sovereign Bond Yield, Political Economy, Political Risk, Panel Data, EMU

JEL Classification: C01; C23; D53 G12; P16; G32; B22

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1. Introduction

The concept of government bond yield spread has become widely used as an indicator of the healthiness of countries' economy. Sometime used by politicians as an instrument of threat against opponent parties around economic topics in the Eurozone, people have become more familiar to the meaning of the term "spread" as a proxy of how well their country is performing in the all economy. In the last decades, some concerns among researchers and economists (Barrios, Iversen, Lewandowska and Setzer, 2009, Puig, Sosvilla-Rivero and Herrera, 2014, Chionis, Pragidis and Schizas, 2016) have raised in order to understand the different determinants of the government bonds worldwide. While most of the conducted studies have focused on the economic components that, potentially, could drive the sovereign bond yields, much scarce are the academics (Moser, 2007, Eischer, 2014) that have looked into the role played by politics. The role of the countries' government and, in particular, their capacity to manage financial and economic resources, has increased much concerns in the international financial markets. Nowadays, the political disorders – which have occurred in the last decades – are unquestionable in some regions of the developing world such, for example, Argentina, Venezuela or Honk Kong. However, by not going too far from the old continent, some political turmoil, also, have arisen in European countries such as Spain, Belgium or Italy. The increase of political uncertainty in some countries, together with the growth of the popularity, among professional and non-professional investors around political and economic conditions of the countries, makes the government bond yield spread a really interesting and important topic to exploit. This thesis, specifically, explores the relationship between the governance political factors, which capture the countries' socio-political components, and the government bond yield spreads in 11 selected European Monetary Union (EMU) countries – Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain – by using a yearly – from early 2000 to the end of the 2018 – panel data econometric analysis.

Differently from other researches, this thesis tries to address to the relationship between the political factors and the government bond yield spreads by using three different World Bank dimensions of the countries' political environment. First, Government Effectiveness – which accounts for the countries' quality of the governance – is used as a proxy to capture the

perception of the countries' public services. Second, the Regulatory Quality – which, also, reflects the quality of the governance dimension – is a measure of the ability of the governments to implement new policies and regulations in order to stimulate the private sector, and, third, the Political Stability – which captures the countries' internal political stability and accounts for the governments' selection, control and, eventually, replacing process – as a proxy of the degree of the political stability of countries' government and the likelihood that the governments would be disrupted. As mentioned, in order to assess more accurately the effect in the models, lagged values of political factors are taken reducing any potential reverse causality issues on the coefficients' estimation. By accounting for three different bond's maturities (the 10-year, 5-year and 2-year government bond yield spreads), I can focus on the long-term and short-term risks perceived by investors in their investment's decisions and portfolio's strategies. Moreover, additional economic control variables – which capture the credit risk, the liquidity risk and countries' macroeconomic fundamentals such as Debt to GDP ratio, Deficit to GDP ratio, Bid-Ask Spread, Real GDP Growth and Inflation's rate – are included in the model in order to reduce potential threats caused by omitted variables bias.

The baseline models provide some evidence of the effect of the political factors on the sovereign risks, principally, by showing how the countries' quality of the governance affects differently the sovereign short-term and long-term risk. While the political determinants do not appear to show any significant relationship with the bonds with longer maturities (10-year and 5-year government bond), the coefficients that capture the quality of the governance, Government Effectiveness, is negative associated (and highly significant) with the 2-year government bond yield spreads. Specifically, an increase by one of the lagged values of this variable at year "t-1" causes a decrease the 2-year government bond yield spreads at year "t" in the EMU countries by 1.074 percentage points. However, in the robustness analysis where I examine potential difference effect dividing for two countries sub-groups – central EMU countries (Austria, Belgium, France, Germany and The Netherlands) and peripherical EMU countries (Finland, Greece, Ireland, Italy, Portugal and Spain) – only those European peripherical countries seem to be particularly affected by this quality of the governance indicator. These results suggest that the estimated baseline coefficients are mainly driven by the peripherical EMU countries and that an increase by one of the Government Effectiveness

would cause a decrease by 0.891 percentage points of the 2-year government bond yield spreads. For the first time, this thesis provides evidence of the effect of the political indicators on the bonds with shorter maturity suggesting how investors are particularly concerned about the quality of governance in peripherical countries for the 2-year government fixed income security. Similarly, by accounting for the same two countries' subsamples, I test for potential different effects during the European sovereign debt crisis's period (from 2009 to 2012). Here, I provide evidence that lagged values of the Regulatory Quality tends to affect negatively the bonds with longer maturities (10-year and 5-year government bonds) and to be highly significant in the peripherical EMU countries during the crisis's period. An increase by one of this quality of regulation indicator would decrease by 7.299 and 8.791 percentage points, respectively, the 10-year and 5-year government bonds yields. Moreover, lagged values of the Government Effectiveness, also, preserve some negative (-12.54) and statistically significant results during the crisis's period only on the 5-year government bond yield spreads. The coefficient estimated in this first robustness checks suggest how the peripherical EMU countries' political components seem to affect the most the investors long-term risk's perceptions (captured by the 10-year and 5-year government bonds) during the crisis's period. The estimated baseline results appear to be robust and aligned with the performed sensitivity tests with additional included control variables – Current Account Balance to GDP, Unemployment's rate and VSTOXX. The magnitude of the significant Government Effectiveness's coefficient tends to be roughly the same (-1.151) compared to the baseline model regressing for the 2-year government bond yields. In the last of my robustness check, the non-linear relationship is assumed between the sovereign risk measures and the political indicators by performing a semi-logarithmic and a quadratic model. In both, the negative effect (respectively, -1.727 and -5.377) of the Government Effectiveness on the 2-year sovereign risk measure is estimated confirming the baseline results. These results might also tend to have important implication for the EMU countries. Policy makers and, in particular, politicians should start, indeed, caring about the investors' perception of the public service. The role played by the countries' governance captured by this indicator appear to be particularly relevant, especially for the peripherical EMU countries. A potential worsening of this indicator in those countries might, indeed, decrease the ability of the governments to obtain short-term

financing in the financial markets while strong and stable public administrations might have an easier access to the credit international markets.

This thesis is structured in six sections. Section 2 reports previous findings related the political factors and the economic variables. Section 3 lists and describes deeply all the dependent, the political variables of interest, the additional economic control variables. Following, Section 4 is introduced where I explain the adopted Methodology in this thesis. Here, the theoretical connection between the sovereign bond yield spreads and the political factors and the econometric approach are exploited. Section 6 reports the Results part where all the estimated results and tables of the baseline models and the robustness analyses are described. Finally, Section 6 concludes remarking the research motivation and summarize all main empirical findings, underlining potential policies' implication in the real world.

2. Literature Review

This section discusses the most important existing empirical studies and finding regarding the determinants of the sovereign bond yield. I divide this section in two parts distinguishing for, the political as well as economic determinants on the government bond yield spreads.

2.1. Political Determinants

The effect of political determinants on the government bond yield spreads has been recently adopted by researches to explain variations of those over time. In this thesis, the political factors represent the main variables of interest whose effects are tested. One of the most relevant paper that captured the effect of political factors on the government bond yields is written by Eichler (2014). Here, he introduces a panel data analysis on 27 emerging countries over a period between the 1996 and the 2009. The Government effectiveness and the Regulatory Quality appear to show statistically significant results in each of the performed model. Those variables, indeed, show negative and significant effects when additional control variables such as Debt to GDP ratio and Inflation are included in the model. Based on this study, this thesis wants to introduce a similar approach for the EMU countries by using lagged values of the political indicators.

Harms and Ursprung (2002) underline already the role played by the political risk factors and their influence in the markets between the 1987 and the 1995. Specifically, they look at the effect of political stability risk measures on equity investment's strategies. Here, significant and positive results are found for the variable that capture the political risk factor implying, hence, a positive relationship with equity foreign investment's strategies.

In a more recent research, Eichler and Plaga (2017), similarly, focus on the role of the political factors. More specifically, looking at the effect of the political factors on the US investor government bond holdings on 60 countries worldwide, they try to investigate this relationship accounting for election periods, internal stability and different political ideology among countries. The election variable, here, shows slightly negative significant results on the performed models which accounted for economic control variables. Due to the low significance of the variable that captures the effect of election within a country, I decide to not include it in this analysis.

Huang, Wu, Yu and Zhang (2015) look at the effect of international political risk factor effects on the government bond yield accounting for four different maturities (3-year, 5-year, 7-year and 10-year) between the 1988 and the 2007.By looking at difference sources of risk such as Regulatory Quality, they assess a panel data analysis accounting for international political crisis in 34 countries. Showing a negative and highly significant relationship between the government bond yield spreads and the variable capturing the quality of the regulation within the countries, I include the latter in my model estimation. Differently, the role of these political indicators is tested together with broadly recognized economic drivers of the interest rate differentials in order to deal with any threats caused by omitted variable bias.

Political turmoil, hence, might have the power to influence investor's perception of the countries' creditworthiness, as graphically illustrated by Balduzzi, Brancati, Brianti and Schiantarelli (2020). This patterns, however, are already analysed by Jeanneret (2018) looking at the influence of the political risk factors on the sovereign CDS spread between 2001 and the 2016 on 76 countries worldwide distributed. He considers difference sources of political risk by using actual values of political indicators such as Voice and Accountability, Rule of Law, Government Effectiveness, Regulatory Quality, Control of Corruption and Political Stability. Among them, Government Effectiveness and Regulatory Quality are the indicators that show

the most significant results in the paper underling a negative relationship between the sovereign CDS spread and the political risk factors. Moreover, in a robustness analysis, the coefficient that captures the Political Stability also show negative and significant results when control for countries belonging to the Organisation for Economic Co-operation and Development (OECD). Accordingly, I include lagged values of all of these three variables in the model in order to control for potential reverse causality threats.

A similar approach can be found in the paper written by Baldacci, Gupta and Mati (2011) where they investigate the effect of the political stability's determinants on the government bond yield spreads between the 1997 and the 2008 in 46 countries. Using a constructed index that captured the political expropriation risk, they find a significant and negative relationship with the sovereign bond yield. However, what remain uncovered in the analysis were two points. Firstly, the authors do not mention which kind of government bond maturity they use to perform the estimations. In my thesis, I repeatedly performed the analysis over three different bond maturities accounting for long and short-term risk perceptions. Secondly, the authors perform the studies using the annual mean spread as dependent variables in a FGLS model specification. Doing so, it can be argued that the authors might have lost, eventually, some of the variations and heterogeneity of the annually data. Differently from all the above-mentioned studies, I assess the analysis concerning the potential reverse causality issues between the dependent and the independent variables, an issue that none of the mentioned paper covered fully in their analysis and this thesis fills this gap in the literature.

2.2. Economic Variables

The explanatory power of economic variables has been largely discussed and investigated in order to understand the fluctuations of the sovereign bond yields in the last decades. More specifically, macro-economic indicators (used to capture the economic healthiness of countries) have been used in mostly of these studies to estimate their effects on government bonds yields. Edward (1984) is one of the first researchers who had tried to detect their relationship using the government bond yield spreads between the 1976 and the 1980. In a cross-sectional time-series analysis, he accounts for the of effect macro-economic fundamental variables such as Debt to GNP ratio on 19 worldwide countries. Here, this variable shows the most interesting

and the most statistically significance results that suggests how, the level of countries' debt, affects positively the government bond yield spreads.

In a more recent period, Klepsch and Wollmershäuser (2011) try to exploit the effect of additional economic factor on 10-year government bond spreads within the European Monetary Union countries. Using weekly data between the beginning of 2000 and the 2010, they use the Debt to GDP and the total amount of debt held by a country relative to the overall amount of debt in the European Union as proxies for credit-risk and liquidity risk related variables. Here, they do not capture any statistically significant results of the credit risk variable in any of the regressions performed. The choice of this particular time period might be potentially the source of such low significant results. Indeed, despite they account for time-varying fixed effects to capture the yearly effect of the financial crisis using dummy variables, they can only partially capture the effect of the housing market's bubble busted in the 2007. Still, considering a period of time up to the 2010, they can only slightly account for the effect of the sovereign debt crisis that occurred in the 2009 to the 2012 (Lane, 2012). In this thesis, accordingly, I extend for such period which accounts for the sovereign debt crisis in the Euro area. Furthermore, they introduce in the model an additional variable that capture the influence of the European Central Bank (ECB) on the government bond yield. To do that, this variable capture the purchase program of government debts launched by the ECB in the Euro area. While they show statistically significance results of such variable, I do not account for that in this thesis. However, differently, I account for the countries' inflation rate to capture the effect of the ECB purchase program on the government bond yield spreads. One of the purposes of the ECB program is, indeed, the stability of the inflation's rate in Euro-area in order to prevent any drops of such macro-economic indicator (Andrade, Breckenfelder, De Fiore, Karadi and Tristani, 2016).

Bernoth and Erdogan (2012) analyse the impact of the credit and fiscal variables such a Debt to GDP ratio and Deficit to GDP ratio on the German government bond yields between the 1999 and the 2010 using a panel data approach. Here, again, the key role played by the Debt to GDP ratio is remarked. Moreover, while they underline how the role of Deficit to GDP ratio is partially decreasing over time in last two decades, they find an increase significance of this variable after August 2008 (beginning of the financial crisis) pointing out

how investors start paying more attention at the credit and fiscal conditions in the EMU countries. Furthermore, those findings appear to be in line with the previous researches. In the 2010, indeed, Gerlach, Schulz and Wolff (2010) show the positive and significant impact of such variable on the government bond yields on EMU countries. According to those studies, the Deficit to GDP ratio tends to be and fundamental aspects for investors accounting for credit and fiscal components. Although none of them (Debt to GDP ratio and Deficit to GDP ratio) are the variables of interest, they are both included in the model to account for such credit and fiscal risk.

Similarly, Beirne and Fratzscher (2013) assess a panel data analysis on the determinants of the sovereign bond risk estimating the effect of the liquidity risk and credit risk on the 3-month government bond yield spreads in 31 worldwide distributed countries. In particular, this paper underlines the different effects of such risk on the government bond yield accounting for geographic and time differences in the Eurozone. Peripherical (such as Spain, Italy, Greece, Portugal, etc.) and Central (such as Germany, France, The Netherlands, etc.) countries are spitted in two samples to control for potential different effects. Still, the authors divide the time period (from the 2002 to 2012) in a pre-sovereign debt crisis period and the period in which, actually, the crisis occurred. In this thesis, I follow the same approach in a robustness analysis extending the study up to 2018. Furthermore, while the variable capturing the credit risk factor was stressed to be Debt to GDP ratio, they introduce the CDS sovereign spread as a proxy for the liquidity risk factors. However, Favero, Pagano and Von Thadden (2010) already try to estimate the best approach to account for liquidity risk factors in the early 2010. Controlling for the effect of different potential sources of such risk such as the bid-ask spread, the trading volume for the benchmark bond, the bid-side market depth, the ask-side market depth and the maximum quantity available at the best five prices, they remark how only the first one (Bid-Ask Spread) represents the most relevant liquidity factor. In this thesis, I introduce the Bid-Ask spread, (respectively for each of the considered sovereign bonds) as proxy for the liquidity risk and I test it along-side to the additional credit risk determinants above-mentioned. Moreover, while in their paper, they account for the effect on 10-year and 5-year government bond yield spreads, I extend the analysis including the 2-year government bonds and account for potential different determinants within those three different maturities.

Gadanecz, Miyajima and Shu (2018) show the effect of the exchange rate on the sovereign bond risk in emerging market economies (EMEs). Performing a panel data analysis using a Two Stage Least Square (2SLS) model, they instrument lagged values of their variables of interest in order to capture the causal effect. While, in the one hand, this approach might be useful to address the causality effect, on the other hand, the exclusion restriction and independence assumption might likely be violated due to correlation with error terms (or other independent variables) becoming a source of potential selection bias (Lousdal, 2018). Here, the local exchange rates appear to affect positively the government bond yield in the EMEs. However, while these variables might be significance for emerging countries and local currencies, it cannot be the same for European developed countries. Given that, I decide to not implement such variable in my model. However, I follow the approach of this paper in two ways that differ, also, from the performed studies above-mentioned. Indeed, the authors address the issue of reverse causality in the estimation using forecasted values of the economic-related variables and lagged values of the exchange rates as instrumental variables. As above explained, the assumption of exclusion restriction and independence of the instrument is likely to be violated. For that reason, in this thesis, forecasted values of the economic variables and lagged values of the political variables of interest are taken into account in order to deal with any potential reverse causality issues.

3. Data

This section introduces all the variables that are used to perform the analysis. In order to perform the models, I consider a time period between 2000 (first year of the common currency) and December 2018 and 11 European Monetary Union (EMU) countries – Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain – listed, also, in the Table 1. Those countries have been all part of the EMU since the 1999. All the variables are taken at a yearly basis.

3.1. Sovereign Bond Risk Variables

To capture the sovereign bond risk, I use the government bond yield spread at three different maturities. By focusing on three different maturities, I can study the implications on the short-term and long-term risk (respectively to the bonds with lower and higher maturity) perceived by the investors in the market. As shown in Table 2, lower maturity bonds tend to show higher variance (6.332) than higher maturity bonds (2.95). The dependent variables used in the thesis are listed:

(i) *10-Year Government Bond Yield Spread;*

(ii) *5-Year government Bond Yield Spread;*

(iii) *2-Year government Bond Yield Spread.*

Given each of the country's government bond yield, I estimate the spread ($\mathbf{s_{i,t}}$) taking the difference between the country's government bond yield ($\mathbf{i_t}$) and the benchmark ($\mathbf{i_{b,t}}$) (shown in Equation (1)).

$$\mathbf{i_{i,t} - i_{b,t} = s_{i,t}} \tag{1}$$

The German's government bond yield – largely considered the most riskless investment among the European fixed income securities and, hence, used by academics and investors as benchmark (Dunne, Moore and Portes, 2007)– is used for the calculation of the 10-year and the 2-year government bond spread. For the 5-year government bond yield spread, following to Favero, Pagano and Von Thadden (2010), I use the French 5-year government bond yield. The French securities, indeed, tend to fit better than the German ones at five-year maturity and investors seem to rely much more on this benchmark by basing their portfolio's adjustments and investment's decisions in the financial markets. All the government bond yield values are taken from Bloomberg and are collected at the end of each year. Figure 1 shows the variations of the 10-year, 5-year and 2-year government bond yield spreads (respectively in the panel (a), (b) and (c)) over time (from 2000 to 2018) in the selected EMU countries. Looking at the panels, the sovereign bond yields appear to be similar across the EMU countries in the period before the sovereign debt crisis in 2009. Afterward, while Ireland shows the hugest increase of the 10-year and 5-year government yields, Greece records the sharpest increase on the 2-year government bond yields during the European sovereign debt

crisis. Around the 2012, a substantial decrease is recorded in all the government bond yields at different maturities. However, some countries (such as Ireland, Greece) still do not appear to be fully recovered and reach pre-crisis levels on the 10-year, 5-year and 2-year government bond yields. Table 3 reports the correlation between these three sovereign risk variables. While the 10-year government bond yield spreads appear to be more positive correlated to 5-year sovereign bond yield spreads, the 2-year government bonds are positive correlated with 10-year and 5-year government bonds with less magnitudes (respectively, 0.132 and 0.114).

3.2. Political Determinants

Following Kaufmann and al. (2009), the political risks, which are the variables of interest, are captured by the following factors:

(i) *Government Effectiveness* measures the perception of the public service, the quality of new policies and government credibility within a country. Higher values imply higher governance credibility;

(ii) *Regulatory Quality* indicates the ability of governments to implement new policies and regulations in order to stimulate the development of the private sector. Higher values imply higher regulatory quality;

(iii) *Political Stability* measures the likelihood of potential political instability of governments. Higher values imply higher political stability.

According to Eichler (2014), those three indicators help me to capture, eventually, changes in the "quality of the governance" (Government Effectiveness and Regulatory Quality) and the "political stability" (Political Stability) within the countries. Those variables are taken from the World Bank Dataset (World Development Indicator) and are collected at the end of each year. They assume values between -2.5 (the lowest value) and +2.5 (the highest value). Lagged values of those variables are used in the model in order to address the relationship between the political factors and the government bond yield spreads from the right-hand side to the left-hand side of the regression. Figure 2 plots the relationship between the political factors and the 10-year, 5-year and 2-year government bond yield spreads. Looking at the right panels (a), (d) and (g), the relationship between the 10-year government bond yields and the three political variables is plotted. Similarly, the central panels (b), (e) and (h) capture the

linear relationship between the 5-year government bond yield spread and the three political determinants. Finally, the left panels (c), (f) and (i) show the relationship between the 2-year sovereign bond yields and the political factors. In each of the panels from (a) to (i), the blue lines show the generated fitted values which capture graphically the linear relationship between the variables. Although the 5-year government bond yield shows a slightly positive relationship with the Regulatory Quality and Political Stability, all the other panels capture the negative relationship between the EMU government securities and the quality of the governance indicators.

Figure 3 shows the differences among these three political indicators (Government Effectiveness in the panel (a), Regulatory Quality in the panel (b) and Political Stability in the panel (c)) across the selected EMU countries in 2000 and 2018 which respectively reflect the beginning and the end of sample period. Looking at panel (a), all the countries show a worsening of the quality of governance indicator apart from Portugal that shows a slight improvement by 0.2 points in the 2018. Finland, France are the countries which report the highest values (above 2) of the Governments Effectiveness in both 2000 and 2018. On the contrary, Greece and Italy appear to be the worst among the EMU countries in both periods. Moreover, Belgium and Spain seem to be the countries characterized by the biggest drop by, respectively, around 1 and 1.5 points between the two years. Panel (b) shows different a pattern for the Regulatory Quality's values. In particular, while Austria, Belgium, France and Germany show an increase of this indicators, countries such as Finland, Greece, Ireland, Italy, The Netherlands, Portugal and Spain show a decrease between the beginning and the end of the period. The Netherlands is the one that has the highest values in 2000 and 2018, suggesting the greatest capacity on the development of the private sectors among the selected European countries. The countries that report the lowest values are, again, Greece and Italy. Especially, the former reports the biggest decrease by around 1 point compared to the other countries. Finally, Political Stability differences between the 2000 and 2018 are reported in the panel (c). All the EMU countries report a decrease on their level of political stability over the two years, apart from Austria and Spain. The latter, particularly, is the country that show the highest rise (by around 2 points) and value of this indicators in the 2018 while, Finland and The

Netherlands, appear to be the countries with highest values in the 2000 but, both, report the biggest drop of this indicators at the end of 2018.

While Table 2 reports the descriptive statistics, Table 3 captures the correlations between the three political factors. While the three political factors do seem to be particularly uncorrelated with the 5-year government bond risk measures, the quality of governance indicators (Government Effectiveness and Regulatory Quality) show negative correlation with the 10-year government bond (-0.200 and -0.165). However, all the three variables of interest appear to be negative correlated with the 2-year government bond yield spreads. Moreover, Government Effectiveness and Regulatory Quality show the highest positive correlation (0.837). Political Stability is positive correlated to the Government Effectiveness and to the Regulatory Quality reporting, respectively, correlations equal to 0.601 and 0.609. Naively analysing these values, I expect find negative and significant coefficients, especially, related to the 2-year government bond risk measure.

3.3. Economic Control Variables

To account for potential omitted variable bias, I include in the empirical analysis control variables that aim to capture economic condition as well as proxies for credit risk and liquidity risk. While the credit risk variables capture the ability of a country's government to repay its own obligations, the liquidity risk proxy account for the velocity to cash out an investments and trade it in the market. As measures of the credit risk and to capture the part related to the fiscal component, I consider *Debt to GDP* ratio *Deficit to GDP* ratio. Those variables are taken from the Organization for Economic Co-operation and Development (OECD) Database and are collected in term of expectation at the beginning of the year. Doing so, they reflect the forecast values they would assume at the end of the year. I select the *Bid-Ask Spread* of government bond yields which, according to Favero, Pagano and Von Thadden, 2010, provides the best proxy to measure the liquidity risk Specifically, the Bid-Ask Spread is calculated by taking the difference between the "Bid Price" and the "Ask Price" of, respectively, each county's government bond and they capture the highest price the buyers are willing to pay (Bid-Price) and the lowest price at which sellers are willing to sell (Ask-Price) the security. Eventually, lower values of this difference imply that the prices would coincide, and the

liquidity would be less pronounced in the bond's market. These two variables are taken from Bloomberg. Finally, I introduce some macro-economic variables as control variables such as *Real GDP Growth* and *Inflation*, respectively, for each of the country. The role played by the controls is to account for omitted variables bias and take away some endogeneity from the explained independent variables. Those variables are also taken from the OECD database at beginning of each year in term of expectations. Again, they capture the expected values they would assume at the end of the year. While lagged values of the political variables of interest are taken into account, forecasted values for the economic factors are used. By adopting this approach, I reduce potential reverse causality issues in the estimation and address with more accuracy the relationship from the right-hand side to the left-hand side of the regression. (Jalles, 2019, Barrios, Iversen, Lewandowska and Setzer,2009). Forecasts values of periods ahead might help to reduce this issue accounting for investor's expectations on those fundamental macro-economic variables (Laubach, 2009).

Figure 4 plots the control economic variables over the sample period (from 2000 to 2018) of. The Bid Ask Spread of the 10-year, 5-year and 2-year government bond (respectively, panel (a), panel (b) and panel (c)) tend to increase during the European sovereign debt crisis. In particular, while liquidity risk tends to be present mainly in Ireland for the 10-year and 5-year government bond, the Bid Ask Spread shows highest values in Greece for the 2-year government bond during the crisis's period. The Deficit to GDP ratio (panel (d)) remains mostly the same for most of the EMU countries. However, Ireland shows a substantial drop during around the 2007 and 2009 followed by an increase to original levels in the years immediately after. In Belgium, also, one can also see this ratio increase in more recent years, from the 2016 to the 2018. The Debt to GDP ratio (panel (e)) remains at the same level in all the selected EMU countries until around 2007. Afterward, the countries' level of debt tends to increase (in particular, in Ireland and Greece) roughly until 2012 where it becomes more stationary for most of the EMU countries. Looking at panels (f) and (g), respectively, the Real GDP Growth and Inflation seem to come in waves and to be characterized by periods of higher and lower levels. While both the economic indicators appear to be the same across the EMU countries, the Real GDP growth assumes negative values during the European debt crisis and the Inflation tends to decrease, overall, between 2000 and 2018.

Table 2 and Table 3 list, respectively, the descriptive statistics and matrix of correlations of all variables, political and economic ones, mentioned so far. The liquidity risk variables – the Bid Ask Spread of the 10-year, 5-year and 2-year government bond yields – appear to be positively correlated, respectively, with the corresponding government security (0.865, 0.789 and 0.959). While, the Bid Ask Spread of the 10-year and 5-year government bond seem to be almost uncorrelated with the political factors, the 2-year security is negative correlated with all the variables of interest (-0.163, -0.205 and -0.149). On the contrary, Deficit to GDP ratio, Real GDP Growth are moderately negatively correlated with the dependent variables, but they assume a positive correlation with the political indicators. The inflation's rate does not show any significant correlations with all the bond's securities (0.031, -0.042 and -0.048) and it is almost uncorrelated with all the governance indicators (-0.045, 0.012 and 0.066) Ultimately, the Debt to GDP ratio is moderately positive correlated to the sovereign bond risk variables (0.286, 0.127 and 0.221) but it appears to be highly negative correlated to the political variables (-0650, -0.773 and -0.427). Table 4 lists all the variable above-mentioned with their sources. By simply looking at the correlation matrix, hence, I expect liquidity risk variable to be the most relevant in the estimations and that it would assume positive and highly significant coefficients. The Debt to GDP ratio might also assume negative and moderately significant values in the models. However, I do not expect the inflation' rate particularly statistically significant.

4. Methodology

This section introduces the theoretical model that supports the empirical analysis used in this thesis to study the relationship between the sovereign bond yield and the political factors. The standard definition of the sovereign bond risk (Beirne and Fratsscher ,2015) is given by the following equation:

$$\mathbf{i} = [\mathbf{1} - \mathbf{p(X)}](\mathbf{1} - \mathbf{u}) + \boldsymbol{\Omega} + \boldsymbol{\varphi} \tag{2}$$

Where $\mathbf{i}$ is the government bond yield of a particular country, $[\mathbf{1} - \mathbf{p(X)}]$ represents the probability of default of the country's government bond (with $0 \leq \mathbf{p(X)} \leq 1$), $(\mathbf{1} - \mathbf{u})$ represents the loss given default and the parameters $\boldsymbol{\Omega}$ and $\boldsymbol{\varphi}$ are the liquidity premia and the risk premia, respectively. In order to motivate and stress the connection between the political determinants and the sovereign bond yields, it is necessary to extent this framework. According to Baldacci, Gupta and Mati (2011) and Edward (1984), the probability of default of the sovereign bonds can be re-written as follows:

$$\mathbf{1} - \mathbf{p(X)} = \frac{\mathbf{E}(\mathbf{C})}{\mathbf{D}} \tag{3}$$

Where $\mathbf{E}(\mathbf{C})$ indicates the cost of debt repudiation and $\mathbf{D}$ captures macro-economic fundamentals that capture the overall economic healthiness of the countries. An increase of the cost of repudiation would, indeed, decrease the access to the international credit and financial markets (Eaton and Gersovitz, 1981) and, consequentially, would increase the probability of default. The cost of debt repudiation can be assumed (Edwards, 1984) as a convex function of the "monetary cost of default" ($\mathbf{L}$). Moreover, the monetary cost of default ($\mathbf{L}$) estimation, it can be formulated as the sum of fiscal risk variables ($\mathbf{y}$), which capture the fiscal condition of a country, and $\mathbf{R}$, which captures the political factors.

$$\mathbf{E}(\mathbf{C}) = \boldsymbol{f}(\mathbf{L}) \text{ with } f' > 0\,; f'' < 0 \text{ and where } \mathbf{L} = y + r \tag{4}$$

By replacing Equation (4) in Equation (3):

$$\mathbf{1} - \mathbf{p(X)} = \frac{\boldsymbol{f}(\mathbf{y} + \mathbf{R})}{\mathbf{D}} \tag{5}$$

Given this theorical setting, I could theoretically connect the political risk factors to the probability of default of the government bonds. Finally, substituting equations (5) into Equation (2), I obtain the following relationship:

$$\mathbf{i} = [\frac{\boldsymbol{f}(\mathbf{y}+\mathbf{R})}{\mathbf{D}}](\mathbf{1}-\mathbf{u}) + \boldsymbol{\Omega} + \boldsymbol{\varphi} \tag{6}$$

Equation (6), hence, summarizes theoretically the relationship between not only the liquidity and credit risk variables but also between political factors and the sovereign bond yields. Given this pattern, an increase of the countries' political indicators would cause a decrease of the probability of default and, ultimately, a decrease of the sovereign bond risk.

Based on the theoretical definition and model above-explained, I explore empirically the relationship between the political variables of interest and three measures of the sovereign bond risks by using the following OLS model as a baseline (Equation 7):

$$\mathbf{s}_{i,t} = \alpha + \beta'_1[\mathbf{X}_{i,t-1}] + \beta'_2[\mathbf{Y}_{i,t}] + \beta'_3[\mathbf{Z}_{i,t}] + \beta'_4[\boldsymbol{\psi}_{i,t}] + \boldsymbol{\partial}_t + \boldsymbol{\eta}_i + \boldsymbol{\varepsilon}_{i,t} \tag{7}$$

Where $\mathbf{s}_{i,t}$ is the government bond yield spread of country "i" at end of year "*t*" measured at each of the three different maturities (10YGBYS, 5YGBYS and 2YGBYS). $\mathbf{X}_{i,t-1}$ is a vector (nx1) including the political factors of country "i" at the end of the year "t-1", such as *Government Effectiveness* (GE), *Regulatory Quality* (RQ) and *Political Stability* (PS). By using lagged values of the variables of interest, I account for the relationship and address the relationship from the right-side to the left-side of the regression. This allows me to capture the effect of such political variables at the end of previous year "t-1" on the government bond yield spreads at "t". $\mathbf{Y}_{i,t}$ includes the *Bid-Ask Spread* (BA.S) of government bond for each country "i", $\mathbf{Z}_{i,t}$ includes the credit risk variables of country "i" such as *Debt to GDP* (DEBT) ratio and *Deficit to GDP* (DEF) ratio (which captures the fiscal component). $\boldsymbol{\psi}_{i,t}$ is a vector containing two control variables such as *Real GDP Growth* (GDP.G.) and *Inflation* (INFL). Again, those variables are taken in terms of expectations in order to reduce potential reverse causality issues in the estimation. Collected expectations (at the beginning of year "t') account for the values those variables would assume at the end of the year "t". $\boldsymbol{\partial}_t$ represents a dummy-variable (CRISIS) that assumes the value equals to 1 during the period of the sovereign bond crisis (October 2009 to June 2012) (Lane, 2012) or 0 otherwise (Gómez-Puig, Sosvilla-Rivero and Herrera, 2014). This helps me to account for time-varying factor and to capture, eventually, the overall effect of the crisis on the government bond yields. $\boldsymbol{\eta}_i$ is a country time-

invariant fixed-effect that captures any unobservable time-invariant characteristics of the countries. Finally, $\boldsymbol{\varepsilon}_{i,t}$ is the error term of the model. Robust standard errors are used to account for heteroskedasticity and serial correlation of the error terms. Doing so, I assume correlation between the unobservable coefficients in the regression ($\boldsymbol{\varepsilon}_{i,t}$) over time that affected the government bond yield spreads within the countries (and not between the countries).

In this thesis, I address my attention on the analysis of the coefficients that capture the effect of the *Government Effectiveness*, *Regulatory Quality* and *Political Stability* – respectively measures of the quality of the governance and the political stability – on the government bond yield spreads. Here, I expect to find a negative relationship between those three political variables and the dependents variables. Specifically, higher quality of governance might increase the quality of public finance in terms of a better economic financing and a better prosecution of tax evasion. Still, political stability might reflect the long-run fiscal policies implemented in a country. More stable country's governments, hence, might reduce uncertainty in the market and might increase the ability of those to stick to the economic goals. All those patterns, consequentially, lead to a decrease of the sovereign bond yield spreads. Moreover, I analyze the effect of the political variables of interest when the control variables are added in the model. This allows me to deal with potential omitted variables bias using the economic variables which are largely recognized in the literature as drivers of the sovereign bond yield. Additionally, I test the expected signs of the economic factor's coefficients. The Bid Ask Spread helps me to capture the effect of the liquidity risk of countries. Consequentially, I expect to find a positive sign of this variable. Higher Bid-Ask Spread values reflect an increase of the liquidity risk in the markets. Investor would, hence, demand for more reward leading to an increase of the government bond yields. As explained, the variables are included in order to capture the credit risk factors of each country are the Debt/GDP ratio and the Deficit to GDP ratio (accounting for the fiscal risk). According to the literature, higher levels of Debt of a country are expected, then, to increase the sovereign bond yield spreads. Therefore, I am expecting to find positive signs of the Debt to GDP ratio. Contrarily, the Deficit to GDP ratio captures the government balance of income and expenditure of the countries. Higher values of this variables, hence, would make become a county a 'net' lender

and decrease the sovereign bond yield spreads. For this reason, I am expected to find negative signs of this variables (Gill, 2018).

Finally, Real GDP growth and Inflation, respectively of each country is introduced as control variables. While I expect to find a negative relationship between the Real GDP Growth and government bond yield spreads, I test for the positive relationship with Inflation. Higher growing rate countries' economies are associated, indeed, to a better ability to repay their own obligations while low inflation's rates might increase the real value of government's debts increasing the bond's spreads (Eichler, 2014). Table 5 summarizes the expected signs described so far and hypotheses that are tested in the regressions.

5. Results

This section introduces all the estimated results. Starting for the baseline estimation, I present the main results of this thesis and, additionally, several robustness checks to assess whether the main results are robust to different specifications. By looking at the estimated coefficients the expected signs of the political indicators and control variables are tested.

5.1. Baseline Results

As a starting point of the analysis, the baseline results, regarding the effect of the political factors and economic variables on the sovereign bond yield spreads, are shown. As mentioned, I want to test the expected signs of the coefficients and see, eventually, their differences across different bond's maturities in the all-sample period (from 2000 to 2018) including all the 11 EMU countries in the sample. The baseline model refers to Equation (7). Table 6, Table 7 and Table 8 show the estimated coefficients, respectively, for 10YGBYS, 5YGBYS and 2YGBYS. Columns (1), (2) and (3) report the estimated results of the bivariate models when the political variables are regressed individually, and no controls are included. Columns (4), (5) and (6) show the relationship when I add to the model the liquidity risk (BA.S), credit risk variables (DEF and DEBT) and the time-dummy variable (CRISIS capturing the overall effect of the crisis period) in the model. The macro-economic control variables, Real GDP Growth (GDP.G) and Inflation (INFL), are added in Columns (7) and (8). Column (9) shows the coefficients of

the model performed with all the control variables. In each of the tables, the variable BA.S is accounted for, respectively, the corresponding government bond (for instance, Bid Ask Spread of the 10-year government bond yield is accounted when the 10-year government bond yield is the dependent variables and so on). Fixed effects, that accounts for unobservable country characteristics, are included in each performed model. By construction, the political variables tend to be highly positive correlated between each other (Kaufmann and al., 2011). Therefore, for this reason, I decide to not regress them simultaneously in order to avoid multicollinearity issues.

Table 6 shows the relationship between the political factors with the 10-year government bond yield spreads. While the magnitude of the effect of the variables of interest decrease once I include the additional controls to capture the credit risk, liquidity risk and macro-economic variables, none of the political determinants result to be statistically significant in each of the performed models. Lagged values of the variables of interest, hence, appear not to be associated with the 10-year government bond yield spreads. The Bid-Ask Spread tends to be the most highly significant coefficient at 1% confidence level in each of the models. The expected positive sign of this variable is confirmed, indicating that an increase by one of the liquidity risk measure appears to increase the sovereign security yield spreads by around four percentage points. Crisis's coefficients also show some significant results at a 10% confidence level affecting positively the 10-year government bond yield spreads. The R-squared values of the full model in column (9) captures around the 80% of the fluctuation of the 10-year government bond yield spreads.

Table 7 lists the estimated coefficients capturing the relationship with the lagged political variables of interest and the 5-year government bond yield spreads. In Column (1), Government Effectiveness shows some slightly significant results at a 10% confidence level accepting the null hypothesis of a negative sign (-2.451). However, the variable loses its significance once the additional credit, liquidity and control variables are included in the models (Columns (4) and (7)). The Bid Ask Spread tends to show significant results in each of the estimated models increasing around four time the 5-year sovereign bond yield spreads. Debt, also, appears to show some significant results at a 5% confidence level, affecting positively the sovereign spreads (0.0231 and 0.0231). The Crisis's variable only shows one

slightly significant result in Column (6) but does not tend to have relatively significant impact on the 5-year government bond yield spreads. The R-square values tend to increase dramatically when additional variables are added in the model. In particular, the full model tends to capture around the 75% of the variation in the dependent variable.

Finally, Table 8 lists the results regarding the relationship with 2-Year Government bond yield. Some interesting evidence are provided. By being insensitive to the inclusion of the sets of control variables, the Government Effectiveness's coefficients tend to be negatively associated (-2.528, -1.591 and -1.074) to the short term sovereign risk and statistically significant at 5%, 10% and 5% confidence level, respectively in Columns (1), (4) and (7). In the full model, higher lagged values of the Government Effectiveness at time "t-1" tend to reduce by around one percentage point (-1.074) the 2-year government bond yield spread at time "t". The Liquidity risk variable (Bid Ask Spread) and the Debt to GDP ratio, also, appear to have some explanatory power. Respectively, the Bid Ask Spread remarks its explanatory power showing the positive and statistically significant relationship with the sovereign bond yield spreads at 1% confidence level. Moderately significant results are shown by the credit risk variable (Debt to GDP) in column (7) at 10% confidence level and column (8) at 5% confidence level suggesting how higher level of debt, hence, tends to increase the government bond yield spreads. The R-squared values in column (9) explain around the 92% of the variation of the 2-year government bond yield spreads.

More generally, some interesting results are obtained from the baseline models. Contrarily of what suggested in the literature (Huang and al., 2015), the political factors do not show any particular effect on longer time to maturities (10-year and 5-year) sovereign bonds in the EMU countries. To the best of my knowledge, this thesis provides, for the first time, strong evidence about the short-term political implications on the sovereign yields in the EMU countries by underlining, potentially, a reduced access to the credit market for government which show higher values of the quality of governance indicator.

5.2. Robustness Analysis

In this section, I assess whether the estimated results above described are robust to several different specifications. By keeping in mind the baseline coefficients, I divide this subsection

in four parts where I assess for geographic and time differences in the selected EMU countries, for additional control variables and, finally, for non-linear relationship between the government bond yield spreads and the political determinants. From Table 9 to Table 15, the estimated coefficients are shown where I account for the full model that accounts directly the political factors with all the and control economic variable. In each of those tables, Columns (1), (4) and (7), capture the effect of the Government Effectiveness respectively on the 10-year, 5-year and 2- year government bond yield spreads. Similarly, Columns (2), (5) and (8), in each of the tables, measure the effect of the Regulatory Quality on the 10-year, 5-year and 2- year government bond yield spreads. Finally, Columns (3), (6) and (9), in each of the tables, indicates the effects of the Political Stability on the 10-year, 5-year and 2- year government bond yield spreads.

5.2.1. Core Countries vs. Peripherical Countries

In a first robustness check, I check whether the results differ across different geographic groups of the selected EMU countries. To do this, I divide the country sample in two groups: the core countries, composed by Austria, Belgium, France, Germany and The Netherlands, and peripherical EMU countries composed by Finland, Ireland, Italy, Portugal and Spain. The results are reported in Table 9 and Table 10.

Starting with Table 9, the results show important heterogeneity across the groups of the EMU countries. Specifically, none of the political factors and economic variables seem to be relevant for investors at any different bond's maturities when I focus on the central EMU countries. The Bid Ask spread shows some slightly statistically significance coefficients only when it is regressed with the 2-year government bond yield spreads. The full models tend to capture on average around the 50%, 19% and 20% of the variance of the 10-year, 5-year and 2-year government bond risk in the central European countries.

Differently, Table 10 shows a significantly different pattern for peripherical EMU countries. In line with the findings of the baseline models, the coefficient capturing the Government Effectiveness is highly statistically significant at 1% confidence level only when I take into account the 2-year government bond yield spreads. Remarking the negative relationship between those two variables (-0.891), the expected sign of the Government

Effectiveness is tested suggesting how a decrease by one of the values of this political indicator at time "t-1", hence, would lead to an increase by around 0.9 percentage points of the 2-year sovereign bond yield spread at time "t". Moreover, by assuming positive coefficients the Bid Ask Spread and the Crisis variables are both statistically significant at 1% and 10% confidence level, respectively. However, the latter (Crisis) does not seem to be relevant once I test for the effect on the 2-year government bond yield spreads. Here, the R-squared coefficients of the full models explain on average the 84%, 85% and 94% of the fluctuations of the 10-year, 5-year and 2-year government bond yield spreads. The baseline results, hence, appear to be mainly driven by the peripherical EMU countries and suggest how investors' portfolio strategies are particularly more focused on the quality of the governance in the peripherical EMU countries rather than in the central EMU ones.

5.2.2. The Effect of the Political Determinants During the European Sovereign Debt Crisis

In this second subsection, I control for the effect of the political determinants on the sovereign risk measures during the European sovereign debt crisis by only accounting for the observations included in the sample period from 2009 to 2012. Therefore, the dummy variable (∂_t) is removed from the models while I still account for the geographical differences (core or peripheric) among the EMU countries. The estimated results are reported in Table 11 and Table 12.

Table 11 lists the coefficients capturing the relationship between the central EMU countries' government bond yield spreads and the political factors. Similar to Table 9, the political factors do not appear to be statistically significant in any of the performed models. While the liquidity risk shows a positive effect (19.32, 19.68 and 21.77) and significant at 1% confidence level in the explanation of the 10-year government bond yield spreads, the Deficit to GDP ratio tends to have an higher explanatory power on the 2-year government bond yield spreads capturing the negative relationship between the fiscal component and the sovereign risk measure. The R-squared coefficients explain on average around the 78%, 55% and 80% of the fluctuation of the three measurements of sovereign risk.

Things get different when I control for the effect of the political variables of interest on the peripherical EMU countries' government bond yield spreads reported in Table 12. During the crisis's period, indeed, Regulatory Quality's coefficients show negative (-7.299 and -8.791) and highly significant (at 5% and 1% confidence level) effect on the 10-year and 5-year government bond yields. The results remark how the governments, characterized by higher capacity to implement new policies and regulations in the private sectors a time "t-1", show a decrease by around 7.2 and 8.7 percentage points, respectively, of the 10-year and 5-year government bond yield spreads. While Government Effectiveness show highly significant results accounting for the all sample time period on the 2-year government bond yield spreads (Table 8 and 10), it only results to be slightly significant when controlled for the effect on the 5-year government bond yields. Interestingly, the political factors tend to be more significant results account for long-term investments during the sovereign crisis. By preserving a positive relationship with the sovereign risk measures, the Bid Ask Spread keeps showing highly statistically significant results in each of the models. Inflation also tends to be positive and highly significant on the bonds which capture the long-term investor's risk perceptions (10-year and 5-year government bond). Higher forecasted values of the countries' inflation at the beginning of time "t" tends to increase by around 1.5 percentage points the 10-year and 5-year sovereign bond spreads. The R-squared values tend to show a quite high explanatory power in the models and explain on average the 96%, 94% and 97% of the fluctuation of the 10-year, 5-year and 2-year government bond yield spreads.

Overall, the political indicators tend to affect sovereign risk measures in a different way compared the results estimated in the baseline model by affecting the long-term risk in the selected peripherical EMU countries.

5.2.3. Additional Control Variables

The third sensitivity check includes additional control variables in the models. By doing so, I account for potential threats caused by omitted variable biases in order to obtain unbiased measurements of the political coefficients. In particular, I include the forecasted values of the Current Account Balance to GDP ratio (C.A.B.), which accounts for the countries' international transaction with the rest of the world, forecasted levels of unemployment

(UNEMPL), which accounts for the number of unemployed people to the total number of labour force in the countries, and VSTOXX, which captures the market sentiments within the Euro area measuring the implied volatility in the stock markets (Oliveira, Curto and Nunes, 2012). Those variables are taken, respectively, from the OECD database, the World Bank dataset and Bloomberg at a yearly basis.

Table 13 reports the estimated coefficients. Here, the baseline results appear to insensitive to the inclusion of the additional control variables. None of the estimated coefficients regarding the political variables of interest (Government Effectiveness, Regulatory Quality and Political Stability) show significant results when regressed with the 10-year and 5-year government bond yield spreads. What emerge by showing these results, it is how investors typically do not tend to pay attention to political indicators in the long run when I account for the completed time sample (from 2000 to 2018) and for the all EMU countries. On the contrary, only when the short-term sovereign risk is in place, they appear to be more concerned about the quality of governance. Indeed, the estimated coefficient of the Government Effectiveness (-1.151) appears to be negative and statistically significant at 5% confidence level, only when I consider the 2-year government bond yield spread. By accepting the null hypothesis, this result remarks how an increase by one of this indicator at time "t-1" tend to decrease by 1.151 percentage points the 2-year sovereign bond yield spreads. The economic variables also show some statistically significant results by remarking, once again, the positive and highly statistically significant relationship between the Bid Ask Spread's coefficients and all the three sovereign risk measures in each of the performed models at 1% confidence level. Moreover, the Debt to GDP ratio, tends to be negative and marginally significant at 10% confidence level when it is regressed for the 10-year and 5-year government bond yield spreads. The R-squared values tend to explain on average around the 81%, 75% and 93% of the variations, respectively, of the 10-year, 5-year and 2-year government bond yield spreads.

Overall, the estimated baseline results appear to be robust to the inclusion of the above-mentioned additional economic control variables. The Government Effectiveness is the political variable that tends to influence the sovereign bond yield spreads the most and the estimates suggest how this perceived measure of the countries' quality of the governance might influence investor's investment decisions and portfolio's strategies in the short run.

5.2.4. Non-Linear Relationship between the Political Determinants and the Sovereign Bond Yield Spreads

While all the other performed models so far have assumed a linear relationship between the sovereign bond yield spreads and the political variables of interest, I assume a non-linear relationship between those variables. Following the approach used by Eischer (2014) and some other econometric studies unrelated to the economic field (for example, Krivo and Peterson, 2000), I propose a semi-logarithm model by taking the natural logarithm of the lagged political indicators (**ln X)** in order to account for the non-linear relationship. By using the natural logarithm transformation of the independent variables I can test for the potential existing non-linear relationship still by using a linear model and maintain unchanged the ordering between the variables (Benoit, 2011). The logarithm transformation represents, indeed, a powerful instrument to linearize the assumed non-linear relationship in the studied variables (Hannon and Knapp, 2003). The above-mentioned additional control variables (C.A.B., UNEMPL and VSTOXX) are, also, included in the linear-log model.

Table 14 reports the OLS estimates. In line with the previous baseline findings, the Government Effectiveness still appears to be negative and significant at 5% confidence level. This, again, remarks its explanatory power and its effect on the 2-year government bond yield spreads and how, an increase by one of this indicator at time "t-1", tend to decrease by 1.7 percentage points times e (where e is equal to 2.71828) the 2-year sovereign bond yield spreads. Accounting for the non-linear relationship in the model, Government Effectiveness appears to have a higher impact and effect on the 2-year government bond yield spreads compared to the baseline results in Table 8 (-1,074), preserving the same statistically significance. Surprisingly I provide some evidence where the Political Stability's coefficients, also, show negative and significance results at 5% confidence level once I test for the effect on the 10-year and 5-year government bond yield spreads suggesting how an increase of such indicator by one at time "t-1" decreases by 0.416 and 0.378 (times e) percentage points, respectively the 10-year and 5-year sovereign bond yield differentials. Furthermore, the R-squared values, on average, explain around the 82%, 75% and 93% of the fluctuation, respectively, of the 10-year, 5-year and 2-year government bond yield spreads. It needs to be kept always in mind that, here, the non-linear relationship is solely assumed based on the graphical representations in Figure 2

and, unfortunately, not based on theoretical motivations. In the case the assumed non-linear relationship might have been actually linear, the logarithm transformation might have created synthetically an un-existing non-linear relationship between the variables (Hannon and Knapp, 2003, Land, McCall and Cohen, 1990). Based on that, I would suggest treating the above-estimated results carefully.

Alternatively, to the above-proposed semi-logarithm model, I assess a second sensitivity test – assuming the non-linear relationship between the variables – by using a quadratic model. This time, I add an extra polynomial term corresponding to the square values of the lagged political indicators to the regression ($\mathbf{X^2}$). The polynomial term would capture, eventually, the upward or downward curvature of the non-linear relationship between the variables.

Table 15 shows the estimated OLS results. Once again, the governance indicator (Government Effectiveness) shows statistically significant at 10% confidence level result in column (7). The coefficient tends to be more negative than the one estimated in the baseline model decreasing on the order of 4.303. Surprisingly, the squared value of the Regulatory Quality shows also some moderate statistically significant results at 5% confidence level in column (2) providing some evidence of the assumed non-linear relationship. The negative sign of the coefficient indicates a downward curvature and a concave function of the relationship between the Regulatory Quality and 10-year sovereign risk. Moreover, it suggests how higher values of this indicator would affect negatively much more the sovereign risk measure compared to lower values. The R-squared values explain on average respectively around of the 82%, 75% and 93% of the fluctuations of the three government risk measures.

6. Conclusion

The interest rate differential, commonly known as "spread", represents a general economic indicator which captures the economic countries' conditions. In particular, it reflects the part of the governments' financial and economic risk perceived by investors in the financial markets. Given the recent political disorders occurred around the globe, this thesis tries to capture the economic implications on the sovereign bond yield that might have been caused, eventually, by the lack of trustworthiness on the political institutions. By focusing on the selected EMU

countries between 2000 and 2018, I try to capture the effect of a difference source of risk driven by countries' political factors. In particular, I assess an empirical investigation on three different sovereign risk measurements to include short and long-term risk perceptions. Differently from the existing literature around this topic, I address the estimations in order to account for reverse causality between the political determinants (Government Effectiveness, Regulatory Quality and Political Stability) and the government bond yield spreads. Macro-economic variables, which captured the credit and liquidity risk in the markets, are introduced in the models in order to reduce potential omitted variables bias. Contrarily to the literature, the political factors do not tend to affect bonds with longer time to maturity. Only during the European sovereign crisis's period, investors tend to be worried about the capacity of the governments to introduce new regulations and policies (Regulatory Quality's indicator) in the long term (captured by 10-year and 5-year government bond yield spread). However, some interesting evidence are shown when I control for the short-term effect (2-year government bond yield spreads). Here, Government Effectiveness tends to be the indicator that shows negative and more significant results in the model. However, by assessing a robustness analysis dividing the selected EMU countries in two subsample – including central and peripherical European countries – the significance of the quality of the governance indicator tends to be principally driven by the peripherical EMU countries. Moreover, in the robustness checks, I furtherly assess different sensitivity tests in which I add some addiction control variables (Current Account Balance to GDP, Unemployment's rate and VSTOXX) and I assume non-linear relationship (by using a semi-logarithmic and a quadratic model) between the political determinants and the government bond yield spreads. Again, the effect of the governance indicator (Government Effectiveness) is confirmed.

Politics tend to matter in the international financial markets in the short term. That is what I can conclude, in particular, for the peripherical EMU countries by looking at the result in this thesis that might arise some interesting implications for policy makers and politicians. Above all, one thing is clear. From a bad quality of governance, none are the countries that can benefit from and public administrations need to be aware of it. Perceived government' credibility might be a really useful and powerful ally in certain circumstances, that does not need to be deteriorated if the access to the international credit market would be preserved.

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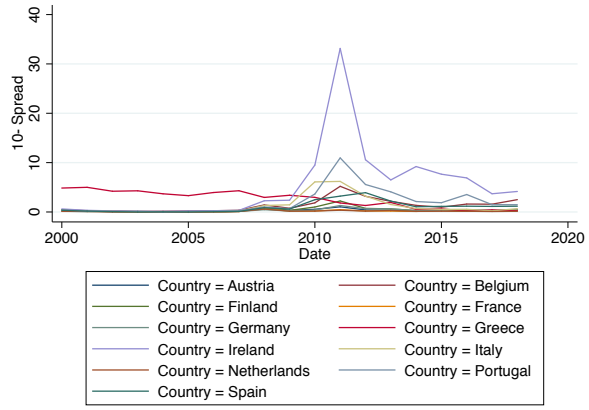
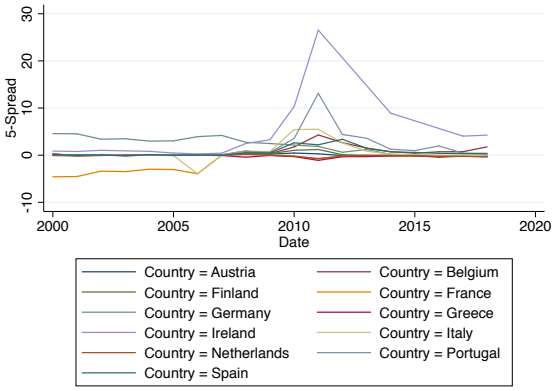
Appendix

Figure 1: Government Bond Yield Spread Across the EMU Countries

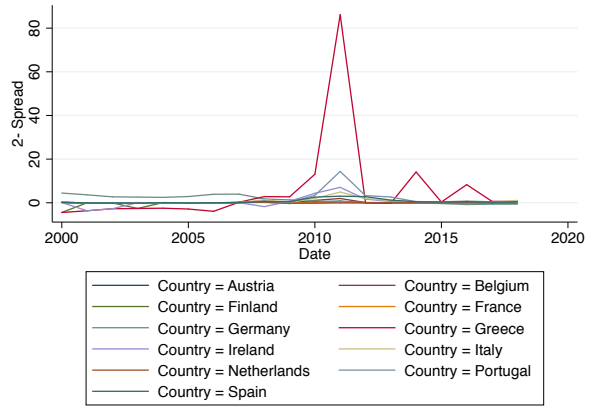
(a) 10YGBYS



(b) 5YGBYS



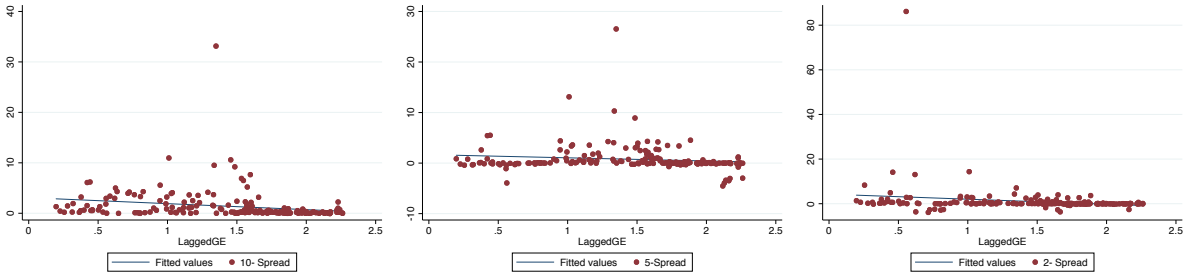
(c) 2YGBYS



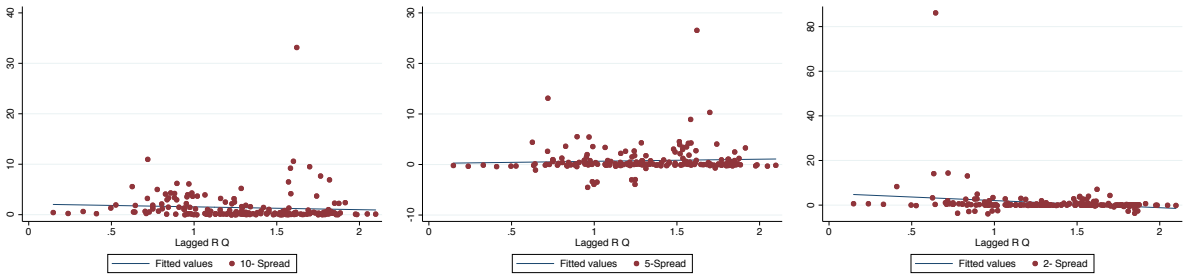
Notes: the figures report the variation of the government bond yield spread over time. The country sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. Respectively, Figure (a) shows the fluctuations of the 10-year government bond yield spreads (10YGBYS), Figure (b) shows the fluctuations of the 5-year government bond yield spreads (5YGBYS) and Figure (c) shows the fluctuations of the 2-year government bond yield spreads (10YGBYS) over time period.

Figure 2: Government Bond Yield Spread and Political Determinants

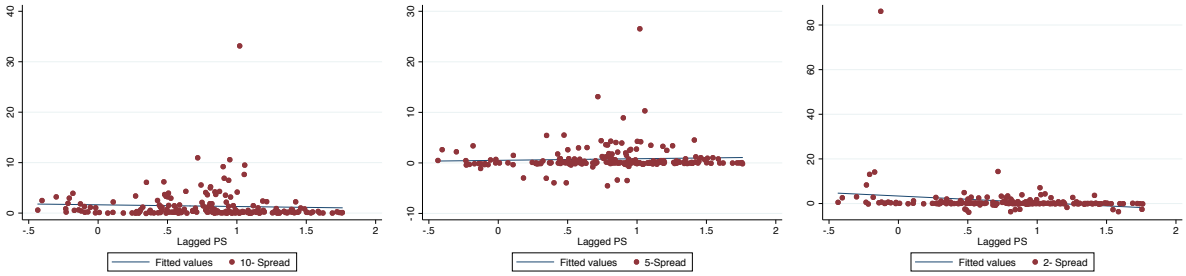
(a) 10YGBYS and GE (b) 5YGBYS and GE (c) 2YGBYS and GE



(d) 10YGBYS and RQ (e) 5YGBYS and RQ (f) 2YGBYS and RQ



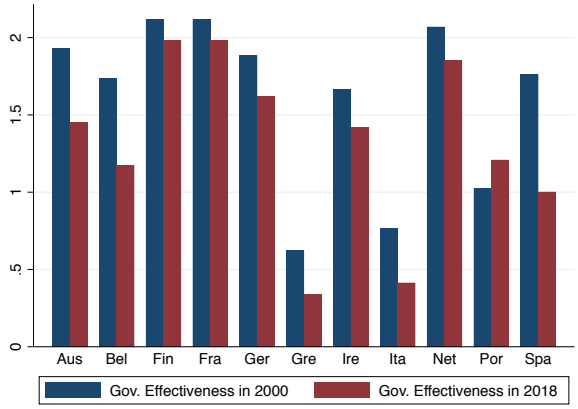
(g) 10YGBYS and PS (h) 5YGBYS and PS (i) 2YGBYS and PS



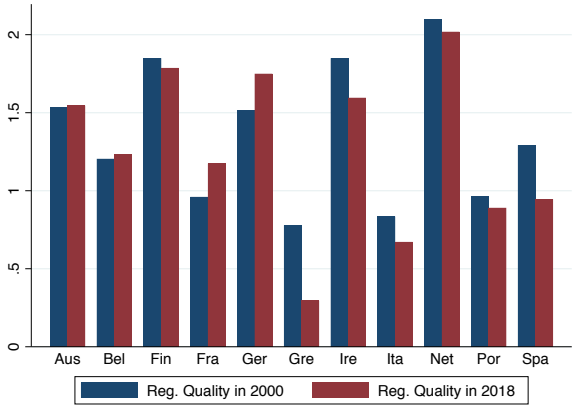
Notes: the figures report the empirical relationship between the government bond yield spread and the political determinants. The country sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The left panels, Figure (a), (d) and (g), show the relationship between the 10-year government bond yield spread and the lagged values of the political factors, Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS). The central panels, Figure (b), (e) and (h), show the relationship between the 5-year government bond yield spread and the lagged values of the political factors, Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS). The right panels, Figure (c), (f) and (i), show the relationship between the 2-year government bond yield spread and the lagged values of the political factors, Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS).

Figure 3: Political Determinants in 2000 and 2018 in the EMU countries

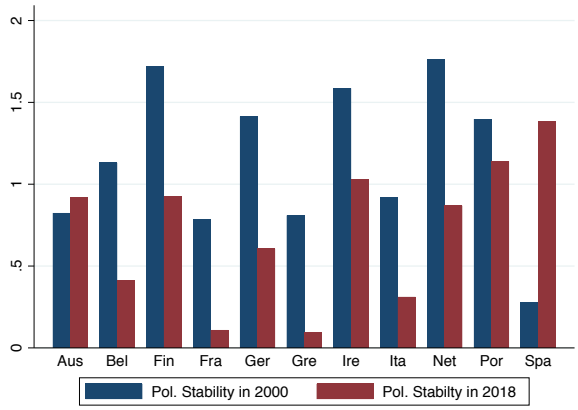
(a) GE



(b) RQ



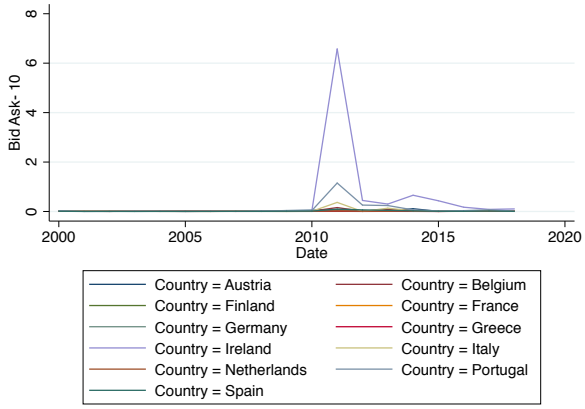
(c) PS



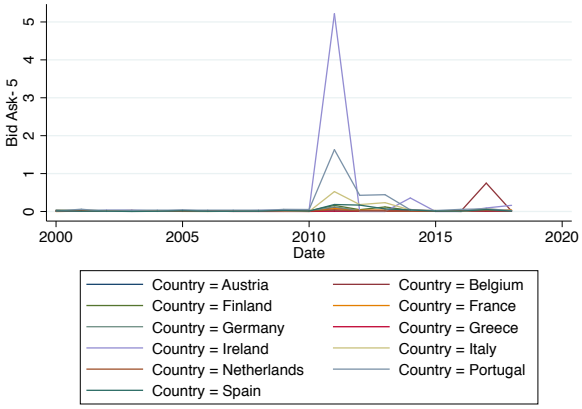
Notes: the bar charts report the differences on the political factors between the 2000 and the 2018. The country sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). Panel (a) reports the differences of the Government Effectiveness (GE) between the two periods. Panel (b) reports the differences of the Regulatory Quality (RQ) between the two periods. Panel (c) reports the differences of the Political Stability (PS) between the two periods. In each of the graphs the blue bars capture the values of the political indicators in 2000. The red bars capture the values of the political indicators in 2018.

Figure 4: Economic Variables Across the EMU Countries

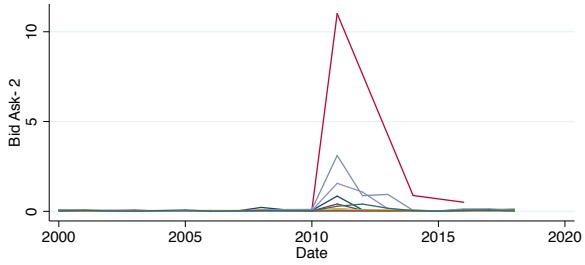
(a) 10-BA.S



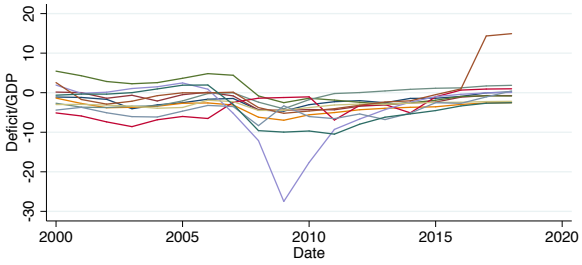
(b) 5-BA.S



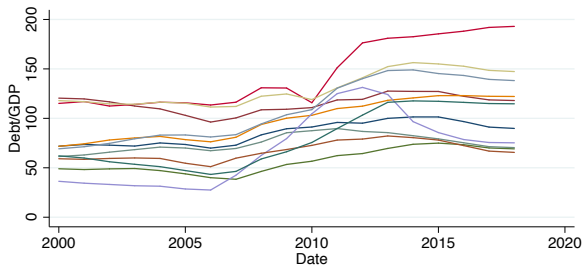
(c) 2-BA.S



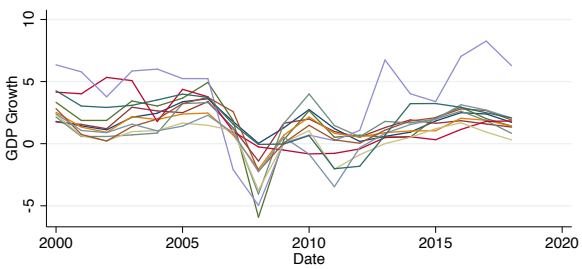
(d) DEF



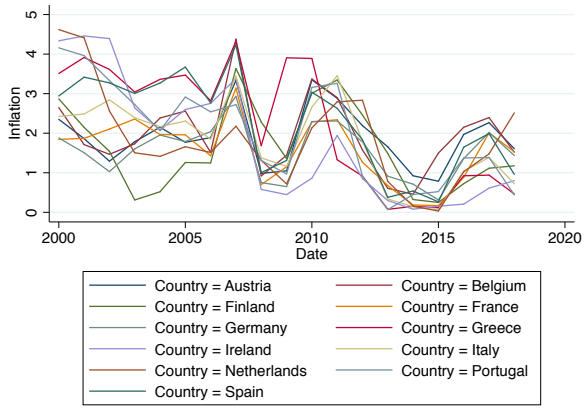
(e) DEBT



(f) GDP.G



(g) INF



Notes: the figure reports the fluctuations of the selected economic control variables over the period from 2000 to 2018. The country sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). Panel (a) reports the fluctuations of the Bid Ask Spread (10-BA.S) corresponding to the 10-year government bond. Panel (b) reports the fluctuations of the Bid Ask Spread (5-BA.S) corresponding to the 5-year government bond. Panel (c) reports the fluctuations of the Bid Ask Spread (2-BA.S) corresponding to the 2-year government bond. Panel (d) reports the fluctuations of the Deficit to GDP ratio (DEF). Panel (e) reports the fluctuations of the Debt to GDP ratio (DEBT). Panel (f) reports the fluctuations of the Real GDP Growth (GDP.G). Finally, Panel (f) reports the fluctuations of the Inflation's rate (INF).

Table 1: List of EMU Countries

Countries	From	Location
Austria	1999	Central
Belgium	1999	Central
Finland	1999	Peripherical
France	1999	Central
Germany	1999	Central
Greece	1999	Peripherical
Ireland	1999	Peripherical
Italy	1999	Peripherical
The Netherlands	1999	Central
Portugal	1999	Peripherical
Spain	1999	Peripherical

Table 2: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
10-year Government Bond	209	1.338	2.95	-0.073	33.138
5-year Government Bond	209	0.732	2.671	-4.587	26.537
2-year Government Bond	209	0.95	6.332	-4.446	86.15
Government Eff.ness	209	1.392	0.515	0.19	2.261
Regulatory Quality	209	1.313	0.411	0.148	2.069
Political Stability	209	0.79	0.481	-0.435	1.76
Bid-Ask 10-Year Gov.Bond	209	0.067	0.465	0	6.574
Bid-Ask 5-Year Gov.Bond	209	0.069	0.383	0	5.217
Bid-Ask 2-Year Gov.Bond	209	0.151	0.824	0.005	11.011
Deficit/GDP	209	-2.476	3.873	-27.49	14.925
Debt/GDP	209	93.518	34.572	27.51	193
Real GDP Growth	209	1.633	1.963	-5.92	8.261
Inflation	209	1.864	1.13	0.033	4.619

Table 3: Matrix of Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(13)	(14)
(1) 10-year Government Bond	1.000												
(2) 5-year Government Bond	0.858	1.000											
(3) 2-year Government Bond	0.132	0.114	1.000										
(4) Government Eff.ness	-0.200	-0.063	-0.202	1.000									
(5) Regulatory Quality	-0.165	0.013	-0.240	0.837	1.000								
(6) Political Stability	-0.076	0.050	-0.201	0.601	0.609	1.000							
(7) Bid-Ask 10-Year Gov.Bond	0.865	0.768	0.091	-0.012	0.020	0.024	1.000						
(8) Bid-Ask 5-Year Gov.Bond	0.871	0.789	0.108	-0.038	-0.016	0.004	0.979	1.000					
(9) Bid-Ask 2-Year Gov.Bond	0.205	0.145	0.959	-0.163	-0.205	-0.149	0.168	0.197	1.000				
(10) Deficit/GDP	-0.322	-0.276	-0.124	0.328	0.351	0.234	-0.147	-0.158	-0.134	1.000			
(11) Debt/GDP	0.286	0.127	0.221	-0.650	-0.773	-0.427	0.113	0.146	0.215	-0.297	1.000		
(13) Real GDP Growth	-0.116	-0.139	-0.208	0.179	0.200	0.118	-0.087	-0.129	-0.171	0.347	-0.264	1.000	
(14) Inflation	0.031	-0.042	-0.048	-0.045	0.012	0.066	-0.001	0.013	-0.032	0.094	-0.292	0.094	1.000

Table 4: List of Variables

Variable	Sources
10-YearGovernment Bond	Bloomberg and own calculations
5-Year Government Bond	Bloomberg and own calculations
Debt / GDP	OECD
Deficit / GDP	OECD
Real GDP Growth	OECD
Inflation	OECD
Bid – Ask Spread	Bloomberg and own calculations
Political Stability	World Development Indicator – World Bank
Government Effectiveness	World Development Indicator – World Bank
Regulatory Quality	World Development Indicator – World Bank

Table 5: Expected Signs of the Explanatory Variables

Variables	Expected Signs
(i) Political Risk Variables ($\mathbf{X_{i,t}}$)	
Government Effectiveness	(-)
Regulatory Quality	(-)
Political Stability	(-)
(ii) Liquidity Risk Variables ($\mathbf{Y_{i,t}}$)	
Bid-Ask Spread	(+)
(iii) Credit Risk Variables ($\mathbf{Z_{i,t}}$)	
Debt/GDP	(+)
Deficit /GDP	(-)
(iv) Control Variables ($\boldsymbol{\psi_{i,t}}$)	
Real GDP Growth	(-)
Inflation	(+)

Table 6: Baseline Regression Results (10YGBYS)

	10-Year Government Bond Yield Spreads (10YGBYS)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	-2.186			0.210			0.0630		
	(1.698)			(0.689)			(0.585)		
RQ_{t-1}		-1.400			2.021			1.988	
		(2.715)			(1.718)			(1.674)	
PS_{t-1}			-1.468			0.139			-0.00970
			(1.789)			(0.800)			(0.652)
BA.S				4.528***	4.497***	4.528***	4.481***	4.448***	4.482***
				(0.333)	(0.341)	(0.322)	(0.287)	(0.290)	(0.281)
DEF				-0.0640	-0.0495	-0.0622	-0.0812	-0.0668	-0.0814
				(0.0500)	(0.0437)	(0.0435)	(0.0674)	(0.0574)	(0.0602)
DEBT				0.0159	0.0239	0.0159	0.0224	0.0306*	0.0222
				(0.0192)	(0.0186)	(0.0162)	(0.0156)	(0.0153)	(0.0136)
CRISIS				0.946**	0.935**	0.952**	0.823*	0.818*	0.819*
				(0.391)	(0.409)	(0.375)	(0.397)	(0.413)	(0.373)
GDP.G							0.0469	0.0440	0.0483
							(0.100)	(0.101)	(0.0969)
INFL							0.185	0.182	0.187
							(0.147)	(0.160)	(0.125)
OBS	198	198	198	198	198	198	198	198	198
R2	0.022	0.006	0.019	0.790	0.797	0.790	0.795	0.802	0.795

Notes: the table reports the estimated coefficient of the baseline model. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable is the 10-year government bond yield spread (10YGBYS). Column (1), (2) and (3) report, respectively, the coefficient of the lagged Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS). Column (4), (5) and (6) include the liquidity risk variable, Bid Ask Spread (BA.S) and credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT). Additional control variables are included in column (7), (8) and (9), capturing the effect of the crisis's period (CRISIS), the Real GDP Growth (GDP.G) and the inflation (INFL). Country fixed effects are included in each of the models and robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Baseline Regression Results (5YGBYS)

	5-Year Government Bond Yield Spreads (5YGBYS)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	-2.451*			-0.0118			-0.0404		
	(1.304)			(0.270)			(0.319)		
RQ_{t-1}		-2.536			0.144			0.123	
		(1.681)			(1.731)			(1.688)	
PS_{t-1}			-1.653			0.0450			-0.0375
			(1.187)			(0.429)			(0.464)
BA.S				4.428***	4.424***	4.427***	4.329***	4.326***	4.328***
				(0.407)	(0.429)	(0.407)	(0.347)	(0.367)	(0.348)
DEF				-0.0840*	-0.0830	-0.0837**	-0.0895*	-0.0885	-0.0900*
				(0.0383)	(0.0462)	(0.0368)	(0.0463)	(0.0520)	(0.0441)
DEBT				0.0165	0.0172	0.0167	0.0231**	0.0238	0.0231**
				(0.0103)	(0.0158)	(0.00932)	(0.0103)	(0.0153)	(0.00997)
CRISIS				0.760	0.760	0.764*	0.607	0.609	0.604
				(0.422)	(0.424)	(0.407)	(0.432)	(0.436)	(0.413)
GDP.G							-0.0175	-0.0183	-0.0175
							(0.0748)	(0.0728)	(0.0736)
INFL							0.183	0.182	0.184
							(0.131)	(0.132)	(0.130)
OBS	198	198	198	198	198	198	198	198	198
R2	0.037	0.026	0.032	0.746	0.746	0.746	0.750	0.750	0.750

Notes: the table reports the estimated coefficient of the baseline model. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable is the 5-year government bond yield spread (5YGBYS). Column (1), (2) and (3) report, respectively, the coefficient of the lagged Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS). Column (4), (5) and (6) include the liquidity risk variable, Bid Ask Spread (BA.S) and credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT). Additional control variables are included in column (7), (8) and (9), capturing the effect of the crisis's period (CRISIS), the Real GDP Growth (GDP.G) and the inflation (INFL). Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Baseline Regression Results (2YGBYS)

	2-Year Government Bond Yield Spreads (2YGBYS)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	-2.528**			-1.591*			-1.074**		
	(1.012)			(0.750)			(0.433)		
RQ_{t-1}		-4.492***			-1.368			-1.383	
		(1.258)			(1.801)			(1.933)	
PS_{t-1}			-5.453			-1.871			-1.590
			(3.425)			(1.630)			(1.302)
BA.S				7.406***	7.375***	7.325***	7.317***	7.280***	7.252***
				(0.396)	(0.382)	(0.352)	(0.329)	(0.315)	(0.311)
DEF				0.0301	0.0173	0.00911	0.0797	0.0744	0.0616
				(0.110)	(0.109)	(0.0919)	(0.144)	(0.143)	(0.123)
DEBT				-0.00641	-0.00648	-0.00894	-0.0177*	-0.0201**	-0.0192
				(0.00973)	(0.0114)	(0.00854)	(0.00917)	(0.00874)	(0.0118)
CRISIS				0.204	0.283	0.114	0.402	0.461	0.273
				(0.655)	(0.701)	(0.523)	(0.619)	(0.622)	(0.458)
GDP.G							-0.207	-0.233	-0.209
							(0.237)	(0.241)	(0.207)
INFL							-0.383	-0.404	-0.337
							(0.291)	(0.299)	(0.234)
OBS	198	198	198	198	198	198	198	198	198
R2	0.005	0.011	0.047	0.923	0.922	0.925	0.927	0.927	0.929

Notes: the table reports the estimated coefficient of the baseline model. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable is the 2-year government bond yield spread (2YGBYS). Column (1), (2) and (3) report, respectively, the coefficient of the lagged Government Effectiveness (GE), Regulatory Quality (RQ) and Political Stability (PS). Column (4), (5) and (6) include the liquidity risk variable, Bid Ask Spread (BA.S) and credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT). Additional control variables are included in column (7), (8) and (9), capturing the effect of the crisis's period (CRISIS), the Real GDP Growth (GDP.G) and the inflation (INFL). Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Central EMU Countries Results

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	-0.928			-0.0384			-0.863		
	(0.761)			(1.024)			(0.784)		
RQ_{t-1}		0.173			0.0187			-2.302	
		(0.501)			(3.514)			(2.561)	
PS_{t-1}			-0.577			-0.0591			0.345
			(0.371)			(0.767)			(0.553)
BA.S	16.02	15.90	16.41*	0.0730	0.0831	0.0550	1.896*	1.664	1.799*
	(7.912)	(7.503)	(7.361)	(0.429)	(0.553)	(0.506)	(0.734)	(0.801)	(0.820)
DEF	0.00603	0.00560	-0.00125	-0.104	-0.104	-0.105	-0.0892	-0.0595	-0.0822
	(0.0133)	(0.0103)	(0.0110)	(0.133)	(0.123)	(0.128)	(0.107)	(0.0897)	(0.101)
DEBT	-0.00558	0.000725	-0.00191	0.0311	0.0313	0.0311	-0.00926	-0.00769	-0.00240
	(0.00491)	(0.00301)	(0.00333)	(0.0327)	(0.0336)	(0.0273)	(0.0143)	(0.0139)	(0.00926)
GDP.G	-0.0889*	-0.0890	-0.108	-0.103	-0.103	-0.105	-0.0213	-0.0821	-0.0168
	(0.0350)	(0.0545)	(0.0510)	(0.0730)	(0.0671)	(0.0867)	(0.0194)	(0.0459)	(0.0381)
INFL	-0.0355	-0.0321	-0.0244	0.189	0.189	0.190	0.181	0.207	0.182
	(0.0203)	(0.0214)	(0.0296)	(0.223)	(0.232)	(0.216)	(0.160)	(0.169)	(0.183)
CRISIS	0.330	0.327	0.314	-0.0792	-0.0794	-0.0804	-0.383	-0.339	-0.374
	(0.170)	(0.174)	(0.180)	(0.565)	(0.548)	(0.553)	(0.401)	(0.375)	(0.432)
OBS	90	90	90	90	90	90	90	90	90
R2	0.501	0.458	0.495	0.191	0.191	0.192	0.195	0.237	0.181

Notes: the table reports the estimated coefficients of the robustness check accounting for the central EMU countries (Austria, Belgium, France, Germany and The Netherlands). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients of the lagged Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients of the lagged Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients of the lagged Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables capturing the effect of the crisis's period (CRISIS), the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Peripherical EMU Countries Results

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	0.335			-0.339			-0.891***		
	(0.673)			(0.593)			(0.176)		
RQ_{t-1}		2.812			0.342			0.917	
		(2.483)			(1.555)			(2.691)	
PS_{t-1}			0.664			-0.164			-2.876
			(1.051)			(0.621)			(1.952)
BA.S	4.312***	4.238***	4.300***	4.292***	4.276***	4.293***	7.215***	7.214***	7.151***
	(0.260)	(0.289)	(0.241)	(0.434)	(0.487)	(0.429)	(0.269)	(0.258)	(0.268)
DEF	-0.120	-0.0721	-0.111	-0.0810	-0.0748	-0.0832	0.193	0.204	0.159
	(0.102)	(0.115)	(0.0848)	(0.0438)	(0.0450)	(0.0440)	(0.205)	(0.216)	(0.176)
DEBT	0.0313*	0.0452*	0.0322*	0.0252*	0.0277	0.0254*	-0.0270	-0.0228	-0.0297
	(0.0140)	(0.0180)	(0.0126)	(0.0122)	(0.0183)	(0.0115)	(0.0164)	(0.0224)	(0.0217)
GDP.G	0.155	0.126	0.146	0.0606	0.0495	0.0580	-0.319	-0.354	-0.271
	(0.118)	(0.127)	(0.104)	(0.0809)	(0.0695)	(0.0838)	(0.284)	(0.287)	(0.207)
INFL	0.362	0.392	0.320	0.266	0.255	0.266	-0.857	-0.902	-0.658
	(0.261)	(0.293)	(0.221)	(0.211)	(0.211)	(0.224)	(0.513)	(0.506)	(0.342)
CRISIS	1.488*	1.486*	1.619**	1.258*	1.280*	1.238*	1.391	1.428	0.856
	(0.712)	(0.735)	(0.587)	(0.570)	(0.610)	(0.529)	(0.974)	(0.970)	(0.590)
OBS	108	108	108	108	108	108	108	108	108
R2	0.838	0.846	0.840	0.846	0.846	0.846	0.942	0.942	0.946

Notes: the table reports the estimated coefficients of the robustness check accounting for the peripherical EMU countries (Finland, Greece, Ireland, Italy, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients of the lagged Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients of the lagged Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients of the lagged Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables capturing the effect of the crisis's period (CRISIS), the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Central EMU Countries Results during the European Sovereign Debt Crisis

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	2.843			2.065			-1.071		
	(2.807)			(3.477)			(1.425)		
RQ_{t-1}		-2.289			-5.649			-1.761	
		(2.659)			(3.622)			(1.058)	
PS_{t-1}			2.055			0.115			-0.679
			(2.653)			(2.632)			(1.519)
BA.S	19.32***	19.68***	21.77***	5.554	9.937	5.426	1.074**	0.955*	0.803
	(2.251)	(3.090)	(2.225)	(5.563)	(5.373)	(6.710)	(0.275)	(0.447)	(0.713)
DEF	-0.0550	-0.0592	0.0786	-0.590	-0.569*	-0.592	-0.443**	-0.447***	-0.487*
	(0.144)	(0.218)	(0.104)	(0.297)	(0.262)	(0.325)	(0.142)	(0.0968)	(0.178)
DEBT	0.0106	0.0301	0.00364	0.102	0.0749	0.128	0.0730	0.0470	0.0747
	(0.0564)	(0.0670)	(0.0395)	(0.0807)	(0.0533)	(0.0848)	(0.0384)	(0.0343)	(0.0532)
GDP.G	-0.173	-0.142	-0.0575	-0.0164	-0.00386	0.0269	-0.0284	-0.0813	-0.0722
	(0.162)	(0.168)	(0.109)	(0.203)	(0.195)	(0.201)	(0.110)	(0.0762)	(0.119)
INFL	0.0920	0.0868	0.0137	0.166	0.138	0.153	0.425	0.458*	0.456
	(0.195)	(0.230)	(0.208)	(0.304)	(0.192)	(0.357)	(0.238)	(0.183)	(0.251)
OBS	20	20	20	20	20	20	20	20	20
R2	0.807	0.789	0.788	0.507	0.616	0.483	0.791	0.814	0.784

Notes: the table reports the estimated coefficients of the robustness check accounting for the central EMU countries (Austria, Belgium, France, Germany and The Netherlands) during the European sovereign debt crisis (October 2009 to June 2012) at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients of the lagged Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients of the lagged Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients of the lagged Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables, the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Peripherical EMU Countries Results during the European Sovereign Debt Crisis

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	-10.71			-12.54*			7.725		
	(6.119)			(5.048)			(16.01)		
RQ_{t-1}		-7.299**			-8.791***			-4.399	
		(2.713)			(1.939)			(9.824)	
PS_{t-1}			-3.407			-5.737			-8.445
			(2.410)			(3.510)			(9.037)
BA.S	3.235***	3.423***	3.444***	2.739***	2.853**	2.628**	7.139***	7.152***	6.840***
	(0.171)	(0.104)	(0.0754)	(0.617)	(0.799)	(0.775)	(0.504)	(0.539)	(0.190)
DEF	0.0909	0.106	0.108	0.0516	0.124	0.208	-0.135	-0.157	-0.250
	(0.0737)	(0.0633)	(0.0679)	(0.180)	(0.232)	(0.218)	(0.246)	(0.215)	(0.175)
DEBT	0.0634***	0.0171	0.0563**	0.0666***	0.0126	0.0607**	-0.0766	-0.109	-0.0571
	(0.0152)	(0.00967)	(0.0179)	(0.0160)	(0.0185)	(0.0210)	(0.0869)	(0.139)	(0.0724)
GDP.G	0.0178	0.131	-0.0799	0.0452	0.171	-0.155	0.288	0.436	0.300
	(0.441)	(0.432)	(0.367)	(0.493)	(0.514)	(0.496)	(0.918)	(0.776)	(0.822)
INFL	1.714**	1.460***	1.218**	1.776**	1.471***	1.148**	-0.0343	0.367	-0.0135
	(0.500)	(0.318)	(0.322)	(0.519)	(0.294)	(0.356)	(0.825)	(0.403)	(0.520)
OBS	24	24	24	24	24	24	24	24	24
R2	0.971	0.969	0.965	0.941	0.940	0.938	0.971	0.970	0.973

Notes: the table reports the estimated coefficients of the robustness check accounting for the peripherical EMU countries (Finland, Greece, Ireland, Italy, Portugal and Spain) during the European sovereign debt crisis (October 2009 to June 2012) at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients of the lagged Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients of the lagged Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients of the lagged Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables, the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 13: Regression Results with Additional Control Variables

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	0.0782			-0.0898			-1.151**		
	(0.521)			(0.364)			(0.427)		
RQ_{t-1}		1.385			-0.0201			-0.481	
		(1.334)			(1.378)			(1.547)	
PS_{t-1}			-0.123			-0.133			-1.638
			(0.606)			(0.581)			(1.230)
BA.S	4.455***	4.438***	4.457***	4.277***	4.276***	4.276***	7.236***	7.217***	7.170***
	(0.302)	(0.307)	(0.299)	(0.353)	(0.364)	(0.354)	(0.320)	(0.312)	(0.306)
DEF	-0.0805	-0.0715	-0.0824	-0.0763	-0.0763	-0.0782	0.116	0.114	0.0946
	(0.0718)	(0.0648)	(0.0657)	(0.0467)	(0.0491)	(0.0466)	(0.155)	(0.155)	(0.136)
DEBT	0.0351*	0.0384*	0.0346*	0.0269	0.0272	0.0268	-0.036**	-0.0347*	-0.0379*
	(0.0183)	(0.0188)	(0.0170)	(0.0176)	(0.0199)	(0.0165)	(0.0159)	(0.0158)	(0.0180)
GDP.G	0.0774	0.0726	0.0834	0.0380	0.0360	0.0405	-0.211	-0.244	-0.195
	(0.102)	(0.103)	(0.0997)	(0.0746)	(0.0715)	(0.0762)	(0.239)	(0.238)	(0.191)
INFL	0.162	0.166	0.170	0.191	0.190	0.197	-0.366	-0.397	-0.305
	(0.136)	(0.146)	(0.123)	(0.147)	(0.146)	(0.140)	(0.282)	(0.285)	(0.216)
C.A.B	-0.0415	-0.0288	-0.0397	-0.0508	-0.0512	-0.0493	-0.0190	-0.0256	-0.00682
	(0.0476)	(0.0444)	(0.0470)	(0.0621)	(0.0640)	(0.0645)	(0.0652)	(0.0707)	(0.0686)
UNEMPL	-0.0817	-0.0683	-0.0822	0.0198	0.0195	0.0189	0.204	0.195	0.196
	(0.0748)	(0.0659)	(0.0732)	(0.101)	(0.0919)	(0.104)	(0.136)	(0.135)	(0.130)
VSTOXX	0.00687	0.00727	0.00811	0.0126	0.0124	0.0135	-0.00607	-0.00447	0.00947
	(0.0051)	(0.0046)	(0.0077)	(0.0078)	(0.0069)	(0.0079)	(0.0093)	(0.0090)	(0.0094)
CRISIS	0.838*	0.835*	0.822*	0.586	0.589	0.574	0.365	0.414	0.253
	(0.393)	(0.405)	(0.375)	(0.458)	(0.461)	(0.427)	(0.586)	(0.586)	(0.459)
OBS	198	198	198	198	198	198	198	198	198
R2	0.813	0.816	0.813	0.753	0.753	0.753	0.931	0.930	0.933

Notes: the table reports the estimated coefficients of the robustness check accounting for the additional control variables, Current Account Balance to GDP (C.A.B), Unemployment (UNEMPL) and VSTOXX. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients of the lagged Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients of the lagged Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients of the lagged Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables, the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 14: Semi-Logarithm Model Regression Results with Additional Control Variables

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\ln GE_{t-1}$	0.816			-0.0246			-1.727**		
	(1.031)			(0.478)			(0.686)		
$\ln RQ_{t-1}$		2.405			0.605			-0.842	
		(1.011)			(0.869)			(2.030)	
$\ln PS_{t-1}$			-0.416**			-0.378**			-0.240
			(0.178)			(0.165)			(0.223)
BA.S	4.434***	4.373***	4.248***	4.276***	4.244***	4.088***	7.247***	7.209***	3.154***
	(0.291)	(0.313)	(0.239)	(0.353)	(0.390)	(0.324)	(0.322)	(0.304)	(0.615)
DEF	-0.0715	-0.0481	0.00336	-0.0765	-0.0672	-0.0401	0.102	0.110	0.0624
	(0.0627)	(0.0578)	(0.0324)	(0.0463)	(0.0445)	(0.0378)	(0.150)	(0.154)	(0.0717)
DEBT	0.0368*	0.0435**	0.0336*	0.0272	0.0298	0.0235	-0.036**	-0.0355*	-0.00361
	(0.0178)	(0.0187)	(0.0151)	(0.0178)	(0.0200)	(0.0188)	(0.0158)	(0.0164)	(0.0077)
GDP.G	0.0537	0.0513	0.00730	0.0366	0.0310	0.0117	-0.187	-0.241	-0.175
	(0.0950)	(0.0954)	(0.0762)	(0.0753)	(0.0728)	(0.0815)	(0.235)	(0.236)	(0.0990)
INFL	0.140	0.172	0.0887	0.190	0.193	0.150	-0.331	-0.397	0.133
	(0.135)	(0.151)	(0.115)	(0.149)	(0.148)	(0.141)	(0.274)	(0.285)	(0.127)
C.A.B	-0.0452	-0.0225	-0.0204	-0.0509	-0.0484	-0.0396	-0.0134	-0.0281	-0.0652
	(0.0459)	(0.0446)	(0.0371)	(0.0620)	(0.0633)	(0.0584)	(0.0639)	(0.0663)	(0.0601)
UNEMPL	-0.0762	-0.0463	0.0683	0.0195	0.0295	0.122	0.193	0.190	0.191
	(0.0663)	(0.0615)	(0.0386)	(0.101)	(0.0928)	(0.141)	(0.128)	(0.134)	(0.113)
VSTOXX	0.00564	0.00773	0.0149***	0.0124	0.0127	0.0206**	-0.00083	-0.0046	0.0107*
	(0.0058)	(0.0043)	(0.00449)	(0.0077)	(0.0071)	(0.0066)	(0.0096)	(0.00916)	(0.00575)
CRISIS	0.866*	0.786*	0.851*	0.588	0.577	0.700	0.316	0.423	0.202
	(0.408)	(0.419)	(0.441)	(0.453)	(0.462)	(0.460)	(0.591)	(0.592)	(0.305)
OBS	198	198	198	198	198	198	198	198	198
R2	0.816	0.829	0.867	0.753	0.754	0.769	0.932	0.931	0.930

Notes: the table reports the estimated coefficients of the robustness check assuming non-linear relationship between the political indicators and the government bond yield spreads by using a semi-logarithmic model. Additional control variables, Current Account Balance to GDP (C.A.B), Unemployment (UNEMPL) and VSTOXX are included in the models. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients capturing the effect of the lagged natural logarithm Government Effectiveness (GE). Column (2), (5) and (8) report the coefficients capturing the effect of the lagged natural logarithm Regulatory Quality (RQ). Column (3), (6) and (9) report the coefficients capturing the effect of the lagged natural logarithm Political Stability (PS). The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables, the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 15: Quadratic Model Regression Results with Additional Control Variables

	10YGBYS			5YGBYS			2YGBYS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE_{t-1}	2.794			0.168			-5.377*		
	(3.638)			(1.702)			(2.599)		
$(GE_{t-1})^2$	-0.956			-0.0906			1.462		
	(1.144)			(0.518)			(0.833)		
RQ_{t-1}		9.087			5.527			-1.542	
		(6.303)			(4.159)			(7.123)	
$(RQ_{t-1})^2$		-3.121**			-2.220			0.399	
		(1.301)			(1.449)			(2.413)	
PS_{t-1}			1.996			0.231			-5.111
			(1.419)			(0.793)			(3.058)
$(PS_{t-1})^2$			-1.534			-0.264			2.498
			(0.851)			(0.514)			(1.417)
BA.S	4.437***	4.295***	4.399***	4.274***	4.132***	4.259***	7.240***	7.211***	7.112***
	(0.294)	(0.350)	(0.282)	(0.354)	(0.478)	(0.358)	(0.326)	(0.297)	(0.313)
DEF	-0.0657	-0.0372	-0.0729	-0.0748	-0.0500	-0.0763	0.0995	0.111	0.0932
	(0.0544)	(0.0587)	(0.0537)	(0.0446)	(0.0492)	(0.0434)	(0.145)	(0.156)	(0.124)
DEBT	0.0339*	0.0453**	0.0271*	0.0268	0.0342	0.0257	-0.0339*	-0.0354*	-0.0253
	(0.0180)	(0.0194)	(0.0147)	(0.0175)	(0.0214)	(0.0161)	(0.0154)	(0.0174)	(0.0141)
GDP.G	0.0632	0.0351	0.0461	0.0367	0.0154	0.0343	-0.190	-0.242	-0.133
	(0.0945)	(0.0814)	(0.0812)	(0.0769)	(0.0614)	(0.0699)	(0.229)	(0.234)	(0.146)
INFL	0.143	0.195	0.165	0.190	0.224	0.196	-0.331	-0.399	-0.272
	(0.129)	(0.138)	(0.109)	(0.145)	(0.138)	(0.140)	(0.269)	(0.290)	(0.194)
C.A.B	-0.0461	-0.0297	-0.0194	-0.0513	-0.0584	-0.0463	-0.0119	-0.0263	-0.0296
	(0.0477)	(0.0398)	(0.0547)	(0.0628)	(0.0618)	(0.0668)	(0.0641)	(0.0677)	(0.0773)
UNEMPL	-0.0632	-0.0341	-0.0425	0.0216	0.0480	0.0260	0.181	0.192	0.150
	(0.0605)	(0.0540)	(0.0398)	(0.101)	(0.0870)	(0.101)	(0.128)	(0.140)	(0.0991)
VSTOXX	0.00782	0.0105*	0.0121	0.0127	0.0152*	0.0142	-0.00184	-0.00476	0.00610
	(0.00475)	(0.00496)	(0.00819)	(0.00754)	(0.00711)	(0.00844)	(0.0101)	(0.0103)	(0.00735)
CRISIS	0.875**	0.700	0.862*	0.589	0.489	0.582	0.287	0.428	0.200
	(0.392)	(0.414)	(0.409)	(0.449)	(0.480)	(0.431)	(0.573)	(0.625)	(0.466)
OBS	198	198	198	198	198	198	198	198	198
R2	0.816	0.833	0.829	0.753	0.763	0.754	0.932	0.931	0.940

Notes: the table reports the estimated coefficients of the robustness check assuming non-linear relationship between the political indicators and the government bond yield spreads by using a quadratic model. The sample includes all the EMU countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal and Spain). The time sample accounts for observations from 2000 to 2018 at yearly basis. The dependent variable in Column (1), (2) and (3) is 10-year government bond yield spread (10YGBYS). The dependent variable in Column (4), (5) and (6) is the 5-year government bond yield spread (5YGBYS). The dependent variable in Column (7), (8) and (9) is the 2-year government bond yield spread (2YGBYS). Column (1), (4) and (7) report the coefficients capturing the effect of the lagged Government Effectiveness (GE) and its squared term (GE)^2. Column (2), (5) and (8) report the coefficients capturing the effect of the lagged Regulatory Quality (RQ) and its squared term (RQ)^2. Column (3), (6) and (9) report the coefficients capturing the effect of the lagged Political Stability (PS) and its squared term (PS)^2. The liquidity risk variable, Bid Ask Spread (BA.S), the credit risk variables, Deficit to GDP (DEF) and the Debt to GDP (DEBT), and the control variables, the Real GDP Growth (GDP.G) and the inflation (INFL) are included in each of the models. Country fixed effect are included in each of the models and the robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1.