Political Uncertainty, Credit Risk Premium and Default Risk

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Abstract

I study the effect of political uncertainty on the credit risk premium (or *distress risk*) and on the default risk (or *jump-to-default risk*) embedded in the term structure of sovereign CDS spreads over the Euro zone. After calibrating the Pan and Singleton (2008) pricing model for sovereign Credit Default Swap spreads used to obtain a spread decomposition into two components, I find that the credit risk premium accounts, on average, for the 42 percent of the observed spreads in the European credit market. Therefore, relying on a Vector Autoregressive approach, I show how political uncertainty has a significant lead-lag relation with both credit measures, where a 10 percent increase in the degree of political uncertainty leads to a significant increase in the two components of the credit risk of about 3 percent after a month. Additionally, individual countries react differently to variations in the degree of political uncertainty, highlighting a sort of heterogeneity in the European credit market. Hence, this work enriches the understanding about the macroeconomic forces that have driven variations in sovereign risk over the Euro zone and introduce political uncertainty as a significant factor driving the European credit market.

[JEL No. G12, G13, G18]

Keywords: Political Uncertainty, Credit Default Swap, Credit Risk Premium, Default Risk, Panel VAR, Sovereign Debt, Term Structure

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Does political uncertainty in the Euro zone matter for investors around the world? In other words, how is the problem-solving ability of the European leading economies perceived by financial investors? Does political uncertainty affect symmetrically all the European countries, or could one configure a regional or a geographic effect?

Specific events can lead to dramatic changes in the willingness to bear sovereign credit risk, affecting adversely the financial markets. These changes are mostly reflected in credit spread variations, which have their own roots in the perceived default risk of that specific country, whose policy depends crucially on political decisions of the European Union. I analyze this issue through the lens of the sovereign credit default swap (CDS) market which allows for understanding the implied default risk of a country.

During a period of financial turmoil, making coherent political decisions in a short time is crucial for avoiding crisis worsening. The issue becomes more serious when the core of the discussion is a country's bailout. Greece was rescued on May 2010 after a long period of hesitation which took about four months. In fact, as reported by the New York Times in an article of February 15, 2010, "...opposition grew among Germans to bailing out what they call spendthrifts to the south after years of belt-tightening by workers at home". During those four months, investors were worried about the uncertainty concerning the first bail-out in the European Union history, such that the cumulative return, from the beginning of 2010 to the day before making the decision (May 10, 2010), accounted for a -26.89% for the Athens Stock Exchange index (ASE) and 67.22% for the 10-year Greek sovereign bond yield. Similar variations, just slightly different in magnitudes, were experienced also by other peripheral countries such as Ireland, Italy, Portugal and Spain.

The Greek situation may be seen as a signal that the EU political environment is still far from being stable. The rapid expansion of the CDS market over the period 2008 to 2012 may be seen as a signal of the increasing risk aversion in the credit market.

This study is related to the literature that explains empirically sovereign CDS spreads variations through a macroeconomic perspective.

It is closely related to the work of Pan and Singleton (2008), Longstaff *et al.* (2011) and And and Longstaff (2011). The former builds a sovereign CDS pricing model which allows for the spread decomposition into a market price of risk and a default risk. They find that the market price of risk of some emerging markets, such as Turkey, Mexico and Korea, is statistically correlated with some measures of financial market volatility (VIX), global event risk (US credit spread) and macroeconomic policy (currency-implied volatility). Longstaff *et al.* (2011) calibrate the same pricing model over a wider set of emerging markets and then regress the CDS spread components on local and global market variables, on different measures of risk premiums, such as equity, volatility and term premia and on global capital flows. They find that CDS-implied risk premia are more related to global economic measures than to local variables. Ang and Longstaff (2011) improve the Pan and Singleton (2008) sovereign model including a systematic risk and calibrating it cross-sectionally on two huge geographic areas, Europe and the US. Their main results are that the Euro zone shares a systematic credit risk greater than states in the US, and that credit risk is more affected by financial markets than by macroeconomic fundamentals.

Researchers have been analyzing the macroeconomic determinants of sovereign CDS spreads since the data availability has allowed for the investigation of a pure measure of credit risk. Several works have focused their attention on the sovereign debt situation in the Euro zone. Sgherri and Zoli (2009) analyze empirically the determinants of the common time-varying factor implicit in the credit spread of 10 EU economies over the period January 1999 to April 2009. They find that this factor is positively correlated with volatility in stock, currency and emerging markets. Dieckmann and Plank (2009) study the determinants of CDS spreads during the mid-2007 financial crisis for 18 European developed economies. They argue that the size and the pre-crisis health of both the world and country's financial market positively affect the CDS spread. Moreover, they stress the potential role of the private-to-public risk transfer channel - that is, more government guarantees on the financial sectors, significant extension of loans' amount to the banking system, etc. - which allows investors to form expectations about future financial bailouts. Related to this work is Acharya *et al.* (2011) which first models and then tests the two-way feedback effect between the sovereign credit risk and financial markets. When a sovereign comes into play to rescue its insolvent financial system with a debt expansion financed by taxes, it induces a positive signal in the market which then turns into a negative one owing to an increase in the marginal cost of raising the tax revenue (Laffer curve) and a more limited maximum debt capacity. Hence, a distressed sovereign may exacerbate the financial sector's solvency condition since it would no longer be able to make any transfer. Another interesting study has been conducted by Brutti and

Sauré (2012) who assess the contribution of financial linkages to the transmission of sovereign default risk. Thanks to a particular econometric tool, they are able to identify financial shocks that originated in Greece and spread overall European countries. They find that "a 10 percent increase in the exposure to Greek debt increases the rate of cross-country transmission of sovereign risk by 3.94 percent".

Alongside empirical studies on the macro-determinants of credit spread, theoretical and empirical works on the role of political decisions in both stock and capital markets have recently been developed. Pastor and Veronesi (2011a), Pastor and Veronesi (2011b) and Ulrich (2011), among others. The former theoretically investigates the effect of the government's policy decision on the stock prices in a Bayesian-learning equilibrium framework. Their main result is that, on average, the stock price drops down, with this reduction being larger when the announcement of a political change includes elements of surprise. Pastor and Veronesi (2011b)'s model allows for the equity risk premium's decomposition into three components related to three different shocks. While the first two are deemed as economic shocks, the third one is the political shock which "affect investors' beliefs about which policy the government might adopt in the future". Moreover, using the Baker *et al.* (2011)'s policy-related uncertainty index, they find empirical evidence that political uncertainty is state-dependent, since it is higher when worse economic conditions are in play. Lastly, Ulrich (2011) analyze the effect of political uncertainty on the bond market through a pricing model that incorporates political uncertainty. The latter regards the Ricardian equivalence uncertainty (or Knightian uncertainty), according to which investors expect a non-zero consumption growth rate after the implementation of a government policy. The model predicts that a government policy affecting the business cycle leads to a positive risk premium for investors.

My work introduces a novelty in the literature. To my best knowledge, it is the first in investigating the linkage between implied-CDS risk premium and political uncertainty. While the former requires a theoretical framework to be extracted from asset prices, it is challenging to measure the degree of political uncertainty over time. As a result, Baker *et al.* (2011) have created a monthly index able to proxy for policy-related uncertainty over time.

The analysis is conducted on a sample of 19 European countries, inside and outside the EU and EMU. For each country, I calibrate the Pan and Singleton (2008) pricing model for sovereign CDS to decompose the spread into the two components: the credit risk premium and the default risk. The former measures the compensation investors demand for bearing the credit risk of that country due to unexpected variations in the default intensity, namely, the probability of default, whereas the default risk is a residual measure that is a proxy for the (negative) jump in the value of the contingent claim upon default. Several results emerge from this analysis.

First, I find that the sovereign CDS market embodies credit risk features that allow countries to live in different clusters. In fact, the Cluster Analysis shows a certain geography of the credit risk, where the biggest group is comprised of the most efficient economies or *core economies*, such as Austria, Finland, France, Germany, Netherlands, Sweden and UK. Two more distinct groups are formed: the most worrying countries or *peripheral economies*, such as Italy, Spain, Portugal, Ireland and Belgium[1] and the Eastern countries, such as Estonia, Romania, Latvia, Lithuania and Poland. In two different and very distant clusters are Greece and Norway, deemed the riskiest and the safest countries of Europe, respectively.

Second, a principal component analysis, performed on the correlation matrix of daily variations of CDS spreads, reveals commonality across countries and regions. It is done across the three macro European regions as from the clusters' composition. On one hand, when the full sample is considered, the first three components explain the 84 percent of the variability, which becomes higher (over 90%) when the clusters are examined individually. Univariate regressions shows how the variations in the first PCs are significantly related to political uncertainty as well as European and US financial variables.

Third, alongside Pan and Singleton (2008) and Longstaff *et al.* (2011)'s works, the model calibration shows that the credit environment is worse under the risk-neutral probabilities than under the objective probabilities and provides larger and more persistent default intensities. Additionally, the credit risk premium accounts, on average, for the 42 per cent of the observed Credit Default Swap spread.

Fourth, panel regressions of the variations in the credit risk premia show how a 10%-increase in political uncertainty, after controlling for information already included in both the European and the US financial markets, leads to a significant increase in the credit risk premia of about 3.2 percent after a month. Such an increase is slightly smaller in the case of the default risk, that is, 2.9 per cent but still significant. Moreover,

[1] Belgium is included among the unstable countries since it has gone through a period of political instability from 2007 to 2011. A point which will be clearer later on.

relying on a panel vector autoregressive (*VAR)* approach, I confirm the significant lead-lag relation of political uncertainty with both the credit risk premia and the default risk. On an aggregate level, a shock to the credit market that increases the default risk decreases the degree of political uncertainty after three months the shock is generate. Such a result may signal the corrective or disciplinary role of the market in putting pressure on policymakers to act so as to reduce political uncertainty in the presence of a serious risk of default rather than "mere" variations in the risk aversion. Additionally, employing the VAR approach on a country level, I explore the heterogeneity of the European countries' credit market in responding to variations in the degree of political uncertainty and how the latter is influenced by the credit conditions of specific countries such as the core and peripheral economies. Lastly, aggregating both the credit risk premia and the default risk measures across the three macro regions, an interesting scenario emerges: a political shock has a significant impact on the risk premia of the peripheral economies after a month the shock is generated and on the default risk of the core economies after three months, whereas a shock to the premia of the core economies leads to an significant increase in the degree of political uncertainty after two months. Moreover, the corrective role of the market is confirmed also on a regional level.

The remainder of the paper is organized as follows: Section 1 introduces description of the data, together with the cluster analysis and the principal component analysis. The Pan and Singleton (2008) sovereign CDS pricing model is shown in Section 2 as well as the way the credit risk premium and default risk measures are extracted. Then, in Section 3, I calibrate the model, and, in Section 4, I stress and discuss the role of political uncertainty in the credit market. Section 5 concludes the analysis.

1 The Data

Two types of data are used for the analysis: Credit Default Swap spreads and the European policy-related uncertainty index.

A CDS is a financial derivative contract agreed between two parties: the buyer and the seller. The former commits himself to a periodic payment, usually quarterly or semiannual, to the seller and is compensated on the arrival of a specific credit event related to an underlying debt obligation such as a bond or a loan. While for a company a credit event may be the bankruptcy or default, for a country it is not correct to talk about a pure default. The most appropriate definition for sovereign credit event is provided by the International Swaps and Derivatives Association (ISDA), which references four types of credit events: acceleration, failure to pay, restructuring and repudiation. As pointed out by Pan and Singleton (2008), these events cannot happen simultaneously, and, therefore, the contract may be executed as soon as one of them occurs[2].

CDS spreads are collected from the Markit database and cover a period of 1336 days from December 3, 2007 to January 22, 2013 for the maturities 1, 3, 5, and 7 and for 19 European countries, inside and outside the European Union and the Economic and Monetary Union. Therefore, the total dataset consists of 101,536 daily spreads. The sample period is dictated by the data availability. Indeed, trading on CDS spreads of the wealthiest countries, such as Norway, Sweden and Germany, is not available before our starting date since the biggest worries about the debt situation have been in the game after the bankruptcy of Lehman Brothers, which involved sharp increases in the spreads.

The European policy-related economic uncertainty index, provided by Baker *et al.* (2011), is a weighted sum of two components: newspaper coverage of policy-related economic uncertainty and disagreement among professional economic forecasters. The former is obtained by counting the number of articles including policy relevant terms, such as "policy," "tax," "deficit" and so on, and then detrended in order to take into account the increasing number of news over years. Disagreement among forecasters is used as a proxy for uncertainty, as has already been explored by authors such as Boero *et al.* (2008), Bomberger (1996) and Lahiri and Sheng (2009), among others. Baker *et al.* (2011) utilize individual level forecasts regarding consumer prices and federal government budget balances since they are directly influenced by monetary policy and fiscal policy actions. Then, these two components are standardized and added up in order to form a monthly index[3].

I consider Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain, as member of both the EU and the EMU, Latvia, Lithuania, Poland, Romania, Sweden and UK as part only of the EU, and, finally, Norway as an extra-EU and- EMU state, deemed the safest country in all of Europe. In order to have a picture of European countries' performances over the concerning

[2] The literature has been focusing on CDS spreads instead of bond spread because they are not affected by both flight-to-quality effect and contractual arrangements, such as seniority, coupon rates, guarantees and embedded options.

[3] Index source: www.policyuncertainty.com for additional details.

period, Figure 1 depicts the average of the changes of the unemployment rate and the mean real GDP growth rate over the period December 2007 to January 2013 for each country.

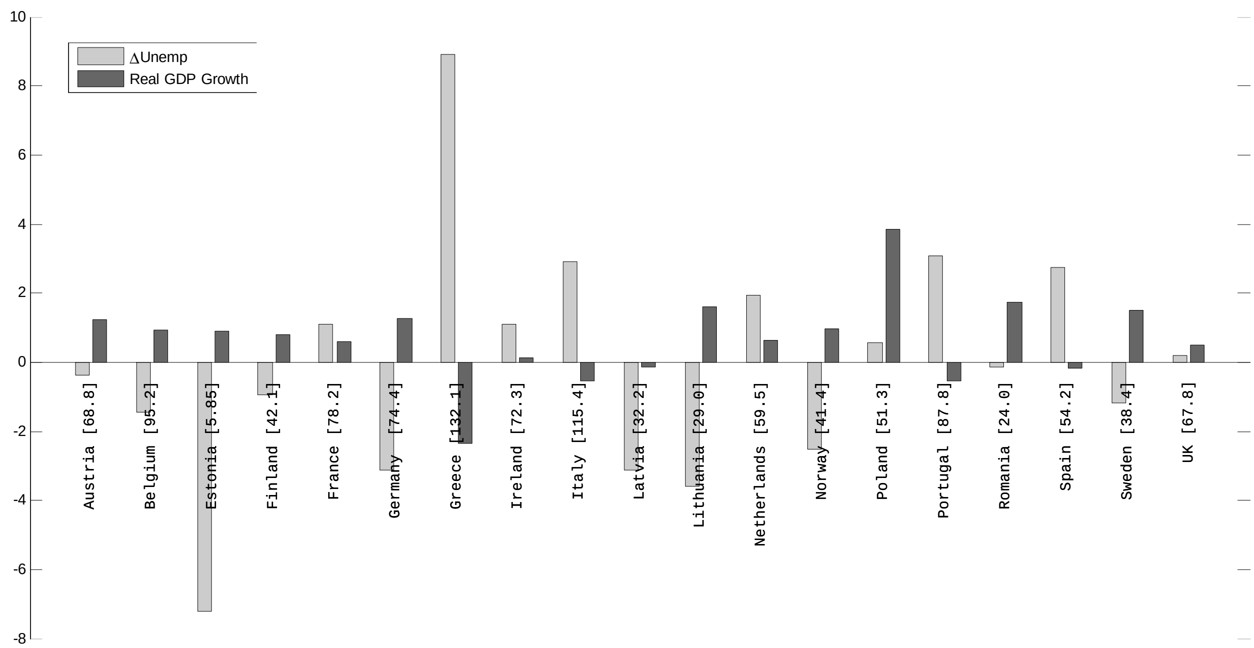

Figure 1. Performances of 19 European economies in terms of unemployment rate and real-GDP growth over the period 2007 to 2013. $\Delta Unemp$ is the average of changes in the quarterly unemployment rate from the last quarter of 2007 to the second quarter of 2012. $Real - GDPgrowth$ is averaged yearly over the period 2007 to 2013, where the last observation is a forecast. Average Debt over GDP ratios in brackets.

The emerging picture points out the structural differences faced by each country, with the peripheral economies, such as Greece, Italy, Portugal and Spain, showing the worst performances.

Table 1 shows summary statistics of both 5-year spreads and the policy-related uncertainty index. All the spreads are in basis points and, even if their underlying notional is in US dollars, they are free of units of account. The polar mean values are those of Greece and Norway, that is, over the sample period the protection buyer would pay, on average, 1391 bps per year to hedge against the Greek default risk, while investors are willing to pay just 21 bps to protect themselves against a remote Norwegian default. Again, the largest standard deviation is that of Greece, followed by Ireland and Portugal. The whole picture that emerges from this summary indicates that there is a consistent time variation in CDS spreads. The last row reports descriptive statistics for the policy-related uncertainty index.

1.1 The Geography of Credit Risk

Given the large number of countries used for the analysis, it may be worthwhile to check if they share some particular features such that they can live in clusters. Indeed, as shown by Figure 1, some economies share common features, such as the peripheral ones (Italy, Portugal, Spain Ireland and Greece) and the Eastern countries (Estonia, Latvia, Lithuania, Poland and Romania).

I perform a multivariate cluster analysis according to the *complete* method. Such a method is applied in the hierarchical cluster analysis whose purpose is to optimize an objective function which is usually a distance between a pair of clusters. Starting with each variable being a cluster, a cluster is formed at each new step such that the variation of the within-group variance, or the distance between cluster centers, is as small as possible, while the between-group variance is as large as possible. The algorithm uses the largest distance between objects in the two clusters. In this case, the distance is Euclidean and measures the similarity by computing the square root of the sum of the squared differences in the variables' values.

The cluster analysis is known to be performed according to several methods (or algorithms) and distances. Therefore, the choice is rationally dictated by the *cophenetic correlation* which measures the faithfulness of the pairwise distance between the original variables' values. In other words, the higher this correlation, the better the solution's quality.

First of all, I use the correlation matrix of daily changes of CDS spreads as a measure of similarity among objects. Then, I apply the method through an algorithm that attempts to form clusters at each step as indicated above. Moreover, such a method requires knowing the number of clusters *a priori*; therefore, I use a rule of thumb and select $N/4$ groups, where N is the number of variables.

Table 2 shows the cluster's composition over different periods. As expected, some European regions share common features. Over the full sample (Panel A), the largest cluster contains the *core economies* (Austria, Finland, France,Germany, Netherlands, Sweden and UK), the most worrying or *peripheral economies*' cluster (Belgium, Ireland, Italy, Portugal and Spain), the cluster of Eastern countries (Estonia, Latvia, Lithuania, Poland and Romania), and finally, Norway and Greece in two different and far groups. These two one-item groups confirms the polarity of their own credit risk. Indeed, Norway that is deemed the safest European country, has an average surplus and debt of 13.6 and 41.1, respectively, as a percentage of GDP over the period 2008-2011, while Greece is the first European country that has experienced a default after the constituency of the currency union. In fact, it has an average deficit and debt over GDP of 11.2 and 138.2, respectively, over the period 2008-2011. Thus, I name these two as *polar economies*.

The biggest and primary concerns about the debt situation in the Euro zone exacerbated early in 2010 when rising government deficits and debt levels together with a lot of companies' and sovereigns' downgrades led the European Finance Ministers and the IMF to approve a huge monetary rescue package for Greece, and lay basis for a deeper financial stability, creating the EFSF. Therefore, the Greek bailout can be considered as the biggest main event of the European debt crisis. According to this view, I divide the sample into two sub-periods in order to figure out whether this event has changed the credit risk composition in the Euro zone. Panel B of Table 2 illustrates the clusters over the period December 3, 2007 to May 2010, when the first rescue package was approved, while Panel C from the end of May 2010 to March 2012. I can see a different composition except for the Eastern countries which still share common credit risk features. It is interesting to note that the extra-EU country, Norway, always maintains a great distance from the rest of Europe. Greece comes out of the cluster of the peripherals due mostly to its orderly default, that is, the agreement reached by the majority of private sovereign bondholders on March 9th, 2012 which led to the suspension of trading on Greek CDS contracts. In addition to this, Table 2 reports also the cophenetic correlation which ensures the goodness of the fit.

1.2 Principal Component Analysis

The Principal Component Analysis (PCA) will help measuring the degree of heterogeneity in the European credit market. The PCA is performed on the correlation matrix of monthly log-changes of 5-year CDS spreads. Starting from daily observations, I pick up the mid most available spread of the month ending up with a monthly time series of 61 observations. The mid observation is chosen such that the sample is not affected by stale observation. Moreover, the log-transformation allows for scaling the very large Greek spreads.

The emerging correlation structure, not reported here, shows that almost 26 percent of the pairwise correlations is greater than 80 percent. This is common especially among the core economies, e.g., France and Germany, which have a correlation of 86 percent. Moreover, Greece and Portugal present the lowest average correlations of 12 percent and 0.8 percent, respectively.

Bearing this comovements' picture in mind, Table 3 reports the variance explained by the PCs across both the whole set of countries and the above clusters. The table illustrates that, over the full sample (Panel A) the first three components explains almost 84% of the variability of sovereign CDS spreads changes, which becomes bigger if performed across clusters. Indeed, the first three PCs explain the 91.2, 91.1 and 96.1 per cent for the Peripheral, the Core and the Eastern economies, respectively.

It may be worth notice that the first PC of the cluster of the Peripheral economies is only 3.8 per cent bigger than that of the whole set of countries. Such a small difference may be associated with the negative correlation between Ireland and Portugal over the last part of the sample, when on July 21, 2011 a draft statement drawn down by EU countries was approved, allowing the Irish government to pay a smaller interest rate on its bailout on a longer maturity[4]. This involved a trend inversion for Irish CDS spread.

Panel C of Table 3 reports univariate regressions of the first-differences of the first PCs for each cluster and for the whole set of 19 countries ($Europe19$). Interestingly, political uncertainty is positively and significantly related to the the first PCs of the three clusters with a stronger relation with the Core economies. In addition to this, all these variables are significantly related to the first PCs with the global market having the strongest relation. Both the financial uncertainty in the European stock market (V2X) and the creditworthiness of the European industrial sector (iTraxx) are significantly and positively related to the first PCs. Moreover, spillover effect from both the US financial market (VIX) and the US industrial sector (IG CDX) are significantly related to the credit risk in Europe. The TED spread is significant for the Eastern economies. This result is in line with the view that Eastern economies suffer the most liquidity problems since their non-well developed banking systems force them to rely heavily on foreign borrowing, especially from the biggest US banks.

The whole picture that emerges from this statistical analysis is that CDS spread variations embed credit

[4] Up to that day, Ireland had paid an average interest rate of 5.8% with a maturity of 7.5 years. The new agreement stated an interest rate of 3.5% and doubled the maturity.

risk features that can be clustered over specific European regions and that there is a certain correlation structure with political uncertainty and other European and US financial variables which lay the basis for a deeper understanding. In fact, the next goal is to test the effect of political uncertainty on what moves the European credit market, namely, the credit risk premium and the default risk, after controlling for information already embedded in the financial markets.

2 Credit Risk Premium and Default Risk

This section is preliminary for the empirical analysis since here I first present and then calibrate the Pan and Singleton (2008) pricing model for sovereign CDS to extract the main variables for the empirical analysis, namely, the credit risk premium and the default risk. Once again, the credit risk premium is the premium an investor asks to bear the risk of that asset due to unexpected variation in the default intensity, whereas the default risk is the negative jump upon default in the value of the contingent claim.

2.1 The Pricing Model

Even if a CDS contract written on a company's bond differ from that written on a sovereign bond in its own credit event definition, the theoretical pricing framework is still valid. Here I report a brief description of the Pan and Singleton (2008) reduced-form model for sovereign CDS spreads.

A CDS contract with maturity M consists of two components, the buyer's premium, defined as $CDS_t\left(M\right)$ and paid quarterly or semiannually, and the amount the buyer gets from the seller upon a credit event occurs. Assuming a semiannual payment and a notional equal to one, the premium leg, that is, the present value of the premium flows, is as follows

$$\frac{1}{2}CDS_t\left(M\right)\sum_{j=1}^{2M}\mathbb{E}_t^{\mathbb{Q}}\left[e^{-\int_t^{t+.5j}\left(r_s+\lambda_s^{\mathbb{Q}}\right)ds}\right]$$

where the term in brackets catches the risk-neutral survival-dependent nature of the payments, that is, they are discounted according to a risk-free interest rate, r_t, plus a default intensity, $\lambda_t^{\mathbb{Q}}$[5]. Instead, the present

[5] In reduced-form models, a default is modeled as the first arrival of a risk-neutral Poisson process whose stochastic intensity process is represented by $\lambda_t^{\mathbb{Q}}$. For more details, see Bielecki and Rutkowski (2002).

value of the amount the seller will pay upon a credit event is

$$L^{\mathbb{Q}} \int_{t}^{t+M} \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right] du$$

where $L^{\mathbb{Q}} = 1 - R^{\mathbb{Q}}$ is the loss given default, expressed as the face value minus the recovery rate, $R^{\mathbb{Q}}$.

As a plain IRSs, a CDS contract is written by both the buyer and the seller if it is worth zero at inception. This allows us to infer the contract-implicit spreads as follows:

$$\frac{1}{2} CDS_t\left(M\right) \sum_{j=1}^{2M} \mathbb{E}_t^{\mathbb{Q}} \left[e^{-\int_t^{t+.5j} \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right] = \left(1 - R^{\mathbb{Q}}\right) \int_t^{t+M} \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right] du$$

$$CDS_t\left(M\right) = \frac{2\left(1 - R^{\mathbb{Q}}\right) \int_t^{t+M} \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right] du}{\sum_{j=1}^{2M} \mathbb{E}_t^{\mathbb{Q}} \left[e^{-\int_t^{t+.5j} \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right]} \tag{1}$$

According to the way one interprets the fractional recovery, the pricing model can be different. Following Duffie and Singleton (2003), Pan and Singleton (2008) and Longstaff *et al.* (2011), I assume the *fractional recovery of face value* (RFV), which, under the independence assumption between the intensity of default and interest rate, allows for the expectation's splitting, that is,

$$\begin{aligned} \int_t^{t+M} \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(r_s + \lambda_s^{\mathbb{Q}} \right) ds} \right] du &\simeq \int_t^{t_M} \mathbb{E}_t^{\mathbb{Q}} \left[e^{-\int_t^u \left(r_s \right) ds} \right] \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(\lambda_s^{\mathbb{Q}} \right) ds} \right] du \\ &= \int_t^{t_M} D\left(t, u\right) \mathbb{E}_t^{\mathbb{Q}} \left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \lambda_s^{\mathbb{Q}} ds} \right] du \end{aligned}$$

where $D\left(t, u\right)$ represents the price of a default-free zero coupon bond issued at time t and maturing at time u, while the expectation term is nothing more than the risk-neutral death probability.

2.2 The Stochastic Default Intensity Process

The Pan and Singleton (2008) model is challenging for its assumption about the intensity process.

They assume that the arrival rate of a credit event, $\lambda_t^{\mathbb{Q}}$, follows a Black-Karasinski lognormal stochastic process, whose conditional expectation is known not to have a closed-form solution, since the seminal work of Black and Karasinki (1991).

The stochastic process, under the objective probabilities, has the following representation

$$d\ln\lambda_t^{\mathbb{Q}} = k^{\mathbb{P}}\left(\theta^{\mathbb{P}} - \ln\lambda_t^{\mathbb{Q}}\right)dt + \sigma_{\lambda_t^{\mathbb{Q}}} dB_t^{\mathbb{P}} \tag{2}$$

where $k^{\mathbb{P}}$ is the mean reversion speed, $\theta^{\mathbb{P}}$ the long-term mean level and $\sigma_{\lambda_t^{\mathbb{Q}}}$ the local volatility for local changes in $\ln\lambda_t^{\mathbb{Q}}$.

Assuming an affine market price of risk η_t,

$$\eta_t = \delta_0 + \delta_1 \ln\lambda_t^{\mathbb{Q}} \tag{3}$$

the Girsanov theorem shows that under an equivalent change of measure, the stochastic process under the risk-neutral probability becomes

$$d\ln\lambda_t^{\mathbb{Q}} = k^{\mathbb{Q}}\left(\theta^{\mathbb{Q}} - \ln\lambda_t^{\mathbb{Q}}\right)dt + \sigma_{\lambda_t^{\mathbb{Q}}} dB_t^{\mathbb{Q}}$$

with $k^{\mathbb{Q}} = k^{\mathbb{P}} + \delta_1\sigma_{\lambda_t^{\mathbb{Q}}}$ and $k^{\mathbb{Q}}\theta^{\mathbb{Q}} = k^{\mathbb{P}}\theta^{\mathbb{P}} - \delta_0\sigma_{\lambda_t^{\mathbb{Q}}}$ preserving the same characteristics as under the objective measure.

In order not to be confused about the notation, here I am considering the risk-neutral default intensity, $\lambda_t^{\mathbb{Q}}$, under both probability measures. The reason why I deal with such a probabilistic framework is readily shown by Yu, Fan (2002) who, analyzing such reduced-form pricing models, points out how they can only be applicable prior to default, since they suffer a survival bias, which is related to the process under the objective measure[6]. Therefore, the Pan and Singleton (2008) model is able to extract only the *default risk premium* (or *credit risk premium* or *distress risk*), which is the compensation investors demand for bearing the risk due to unexpected variations in the default intensity. It does not catch the *default event risk premium* (or *default risk* or *jump-to-default*), that is, the (negative) jump in the value of the contingent claim at default. As highlighted by Longstaff *et al.* (2011), the latter is typically measured as the ratio between the risk-

[6] This problem emerges when the default intensities under both measures are not asymptotically equivalent, allowing for a distinction between *default risk premium* and *default event risk premium*.

neutral and the objective intensity, $\lambda_t^{\mathbb{Q}}/\lambda_t^{\mathbb{P}}$. However, the objective intensity is hard to infer from prices alone because, being a rare event, it requires deeper understanding of the financial situation of a sovereign. Thus, from market prices one is able to infer only the risk-neutral intensity under the objective probabilities.

Such a lognormal process has its own advantages. Indeed, as we know, a lognormal distribution has fatter tails than the classical noncentral chi-squared distribution of the usually-used CIR process. Even if it preserves the mean reverting feature, is strictly positive and has a distribution skewed to the right, it may suffer the explosion problem. But the main shortcoming is that the outcoming survival probabilities are not available in closed-form.

Given the intensity dynamics as described by the SDE in equation 5, the risk-neutral survival probability $\mathbb{E}_t^{\mathbb{Q}}\left[e^{-\int_t^u \lambda_s^{\mathbb{Q}} ds}\right]$ is measured by approximating numerically its corresponding PDE with a fully implicit finite difference method[7].

2.3 Credit Risk Premium and Default Risk

This model can only infer the *distress risk* from CDS spreads. Such a risk may be priced in the market to the extent that the implied risk-neutral probabilities differ from the objective ones, which catch investors' expectations in the sovereign CDS market.

Therefore, following Pan and Singleton (2008) and Longstaff *et al.* (2011), I estimate CDS spreads under the objective probabilities, also known as the pseudo CDS spread, this is,

$$CDS_t^{\mathbb{P}}(M) = \frac{2\left(1 - R^{\mathbb{Q}}\right)\int_{tt}^{t+M} \mathbb{E}^{\mathbb{P}}\left[\lambda_u^{\mathbb{Q}} e^{-\int_t^u \left(r_s + \lambda_s^{\mathbb{Q}}\right) ds}\right] du}{\sum_{j=1t}^{2M} \mathbb{E}^{\mathbb{P}}\left[e^{-\int_t^{t+.5j}\left(r_s + \lambda_s^{\mathbb{Q}}\right) ds}\right]} \tag{4}$$

where the expectations are taken under the natural probabilities.

Accordingly, the market price of distress risk premium or credit risk premium, $CRP_t(M)$, is measured simply by the difference between the CDS spread under $\mathbb{Q}$ in equation 1 and the pseudo one in equation 4,

[7] A numerical approximation, like finite difference methods, may lose stability at boundaries when the underlying process turns out to be pure convection (drift equal to zero) or pure diffusion (volatility equal to zero). In order to avoid this, I apply the exponential fitted scheme which has good convergence properties and does not allow for spurious oscillations. For more details, see Duffy (2001)

that is,

$$CRP_t(M) = CDS_t(M) - CDS_t^{\mathbb{P}}(M) \tag{5}$$

What here I call *default risk* is nothing more than the residual from the distress risk. In other words, following the interpretation of the expected return given by Yu (2002), the risk premium deriving from the difference between a defaultable and a default-free bond, consists of the sum of two parties: the first is related to variations in the spread, namely, in the unpredictable intensity (*distress risk*) and the second is related to the default event (*jump-to-default risk*). Estimating the default event risk premium requires not only market prices but also financial statement data, thus, following Longstaff *et al.* (2011), I quantify it as the difference between the CDS and its implicit CRP.

3 Estimation Strategy

The model is calibrated according to the quasi-maximum likelihood (Q-MLE) method, using the term-structure of CDS spreads for the maturities 1-, 3-, 5- and 7-year. The approach is widely used in the term structure literature and is referred to the dated works of Longstaff and Schwarts (1992) and Chen and Scott (1993), and to the recent works of Duffee (2002), Pan and Singleton (2008) and Longstaff *et al.* (2011).

The underlying assumption is to assume that a CDS contract over a specific maturity is priced without error. In such a way, one can invert the model and get the latent variable, that is, the unobservable default intensity. This is possible thanks to the availability of a term structure of CDS spreads. A widely used empirical trick is to choose the most liquid maturity and thus, I choose the 5-year CDS spread whose trading volume has always been higher than other maturities[8].

The parameters are estimated with respect to the distribution of the implied-CDS default intensity. The intensity, given by the SDE in equation 2 under the objective probabilities, has a lognormal density with

[8] Longstaff et al. (2011) argues that "We spoke with several sovereign CDS traders to investigate this [liquidity] issue. These traders indicated that the liquidity and bid-ask spreads of the one-year, three-year, and five-year contracts are all reasonably similar, although the five-year contract typically has higher trading volume."

mean, m_t, and variance, v:

$$\begin{aligned} m_{\Delta t} &= \ln\left(\lambda_{t-1}^{\mathbb{Q}}\right) e^{-k^{\mathbb{P}}\Delta t} + \frac{\theta^{\mathbb{P}}}{k^{\mathbb{P}}}\left(1 - e^{-k^{\mathbb{P}}\Delta t}\right) \\ v_{\Delta t} &= \frac{\sigma^2_{\lambda_t^{\mathbb{Q}}}}{2k^{\mathbb{P}}}\left(1 - e^{-2k^{\mathbb{P}}\Delta t}\right) \end{aligned}$$

Letting $CDS_t(M)$ be the vector of CDS spreads[9] for maturities $M = 1, 3, 7$, I assume that the pricing error ϵ is normally distributed with mean zero and constant variance. Therefore, the model $CDS_t(M) = h\left(\lambda_t^{\mathbb{Q}}\right) + \epsilon_t$, where $h(\cdot)$ is the pricing function (equation 1) and ϵ_t the pricing error, is jointly estimated according to the following joint density

$$\begin{aligned} f^{\mathbb{P}}\left(\lambda_t^{\mathbb{Q}}, \epsilon_t|\mathcal{F}_{t-1}\right) &= f^{\mathbb{P}}\left(\lambda_t^{\mathbb{Q}}|\mathcal{F}_{t-1}\right) \times f^{\mathbb{P}}\left(\epsilon_t|\lambda_t^{\mathbb{Q}}, \mathcal{F}_{t-1}\right) \\ &= f^{\mathbb{P}}\left(\lambda_t^{\mathbb{Q}}|\lambda_{t-1}^{\mathbb{Q}}\right) \times f^{\mathbb{P}}\left(\epsilon_t|\lambda_t^{\mathbb{Q}}, \mathcal{F}_{t-1}\right) \end{aligned}$$

where the first term on the RHS comes from the Markov assumption of the stochastic process and $f^{\mathbb{P}}\left(\epsilon_t|\lambda_t^{\mathbb{Q}}, \mathcal{F}_{t-1}\right) \sim N(0, \Omega)$, where $\Omega = diag\{\sigma(1), \sigma(3), \sigma(7)\}$.

Finally, the parameter set consists of 8 parameters, that is, $\sigma_{\lambda_t^{\mathbb{Q}}}$, $k^{\mathbb{Q}}\theta^{\mathbb{Q}}$, $k^{\mathbb{Q}}$, $k^{\mathbb{P}}\theta^{\mathbb{P}}$, $k^{\mathbb{P}}$, $\sigma(1)$, $\sigma(3)$, $\sigma(7)$.

The daily risk-free discount functions are bootstrapped from constant maturity bonds collected from the H.15 release of the Federal Reserve system. Several methods can be used for getting discount functions from market data, but their effect in pricing CDS contract is negligible, since it enters the pricing function symmetrically. Moreover, as shown by Duffie (2003), under some specific conditions, a CDS contract can be replicated by an arbitrage-free portfolio by buying a default-free floater and shorting a defaultable floater. As we know, the sensitivity of these securities to interest rate variations is very small, endorsing the assumption about the method used to extract the discount function.

3.1 Parameters' Calibration

Table 4 reports the estimated parameters with standard errors in parentheses and average log-likelihoods[10].

[9] The pricing function is adjusted in order to account for the accrued credit-swap premium at default.

[10] Given the large number of parameters, I set the algorithm's convergence criterion equal to 10^{-17} in order to offset the starting value problem. Standard errors are computed numerically.

As we can observe from the standard deviations, the model fits the term structure well enough with some exceptions for the 1-year CDS contract. This is a model's feature already observed in Pan and Singleton (2008) where the shorter maturities seem to be priced with greater errors. Moreover, the calibration confirms other empirical characteristics: the credit environment is worse under the risk neutral probabilities than under the objective ones, $k^{\mathbb{Q}}\theta^{\mathbb{Q}} > k^{\mathbb{P}}\theta^{\mathbb{P}}$, allowing for larger and more persistent ($k^{\mathbb{Q}} > k^{\mathbb{P}}$) default intensities under $\mathbb{Q}$ than under $\mathbb{P}$ for the majority of countries. Finally, $k^{\mathbb{P}} > 0$ for each country, meaning that the process $\lambda_t^{\mathbb{Q}}$ is $\mathbb{P}$-stationary.

3.2 The Calibrated Credit Risk Components

Differences in the calibrated parameters across probabilistic environments allow for inferring that a credit risk premium is priced in the CDS market.

The credit risk premium for the 5-year CDS spread is computed as in equation 5. Table 5 reports summary statistics for both the credit risk premia (CRP) and the default risk (DRP).It is worth notice that the mean value goes from a minimum of 0.3 bps for UK to a maximum of 303.3 bps for Greece, whereas the default risk ranges from a minimum of 8 bps of Norway to a maximum of 1142 bps of Greece. The default risk is on average greater in magnitude than CRPs. This bigger magnitude is due to the way the default risk measure is built. On one hand, being a residual measure, one may conclude that it can contain everything (more than the default risk itself) except the credit risk premium. But, on the other hand, the theoretical issue explained above asserts that it may be indeed deemed as a reliable measure of the jump-to-default risk, which is not directly captured by reduced form models. In addition to this, the credit risk premium, on average, accounts for a 42 per cent of the Credit Default Swap spread in Europe. In order to have a broader view of the CRP's evolution over time, Figure 2 plots four panels where countries are grouped in clusters as shown in Section 1.1.

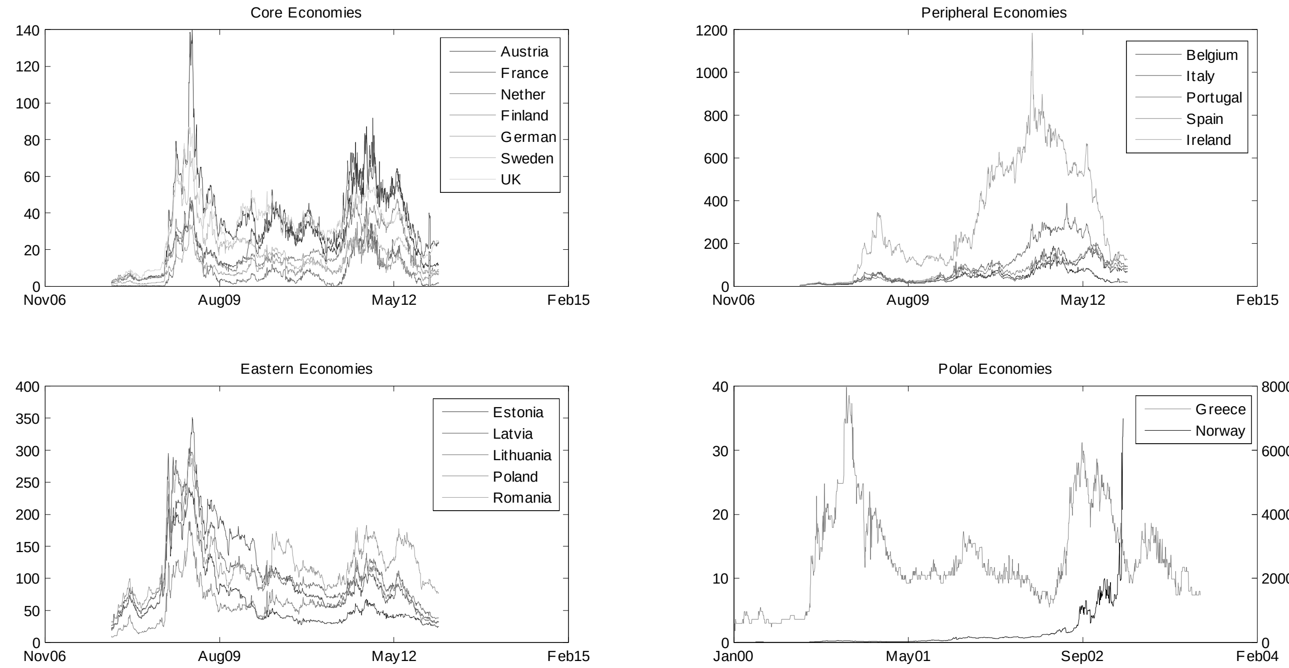

Figure 2. Credit Risk Premium (*CRP*) extracted from the country specific Credit Default Swap term structure by calibrating the Pan and Singleton (2008) Sovereign CDS pricing model. The *CRP*s are grouped into three macro regions according to the outcome of the Cluster Analysis: *Core, Peripheral* and *Eastern Economies* plus the group-stand-alone *Polar Economies*. Daily sample period December 3, 2007 to Janury 22, 2013.

This graphical perspective confirms that the sample can be readily split into two sub-periods, the Lehman Brothers' bankruptcy and the Euro zone debt crisis. During these two sub-periods, all the economies experience large variations in the CRP, recording spikes of different magnitudes. While for the core economies the CRP variations around the two macro events are comparable in magnitudes, the Eastern and peripheral economies show opposite paths, with the formers much more affected by the Lehman default rather than the Euro debt crisis. Such a result may support the view that the European Union has different speeds, not only for what is concerned with the growth rate or inflation rate, but also for the perceived credit risk, allowing for asymmetric effects stirred up by a common shock that makes inefficient a common policy intervention. Moreover, as outlined by the PCA results, the Eastern countries have suffered the most shocks from the financial crisis since these are economies with non-well developed banking systems that are forced to rely on foreign borrowing, thus, exposed to spillover effect.

4 Political Uncertainty and Credit Risk

Does political uncertainty affect the risk perceptions of investors in the European credit market? In other words, do investors require a higher risk premium in the presence of a higher degree of political uncertainty? Is the default risk affected by such an uncertainty?

I answer these questions by employing a set of panel regressions where I regress separately the two components embedded in the credit market on the policy-uncertainty index adding step-by-step financial control variables. The latter have the following purposes: firstly, they make the analysis more robust in case I can configure a significant relation between political uncertainty and credit market; secondly, they can dampen the main criticism on the policy-related uncertainty index, that is, the way it is built allows for catching also economic and financial uncertainty rather than only political uncertainty. In fact, including stock, credit and commodity markets in the analysis enables me to purify the political index from financial and economic information, leaving out only the political part. This is possible because the above mentioned markets are known to be very liquid, thus, they incorporate market information in a very fast way.

To this end, I include control variables such as the domestic stock market index as a proxy for the state of local economies[11], the Eurostoxx50 and S&P500 implied volatilities (*V2X* and *VIX*) to proxy respectively for the European and US stock market uncertainty, the iTraxx Euro CDX and the IG US CDX to proxy for the creditworthiness of the European and US industrial sector, respectively, the price-earning ratio of the Dax and Eurostoxx50 Indices to proxy for the investors' expectation on the growth in Europe, the TED spread for catching liquidity issues and the gold price that is deemed the safe-heaven asset during distress periods. Such variables are chosen to the extent that I can control for Europe-specific variables and spillover relations from the US market.

4.1 The Empirical Methodology: Panel Regressions

The analysis is performed on the log-differences in order to *i)* scale the variables such that the exponential increase in the Greek spread does not absorb all the variance, *ii)* measure the percentage effect or relationship

[11] I consider the following local stock markets: ATX (Austria), BEL 20 (Belgium), TALSE (Estonia), OMXH25EX (Finland), CAC 40 (France), DAX (Germany), ASE (Greece), ISEQ (Ireland), FTSE MIB (Italy), RIGSE (Latvia), VILSE (Lithuania), AEX (Netherlands), OSEBX (Norway), WIG (Poland), PSI 20 (Portugal), BET (Romania), IBEX (Spain), OMX (Sweden) and UKX (UK).

of the variables on the credit market. Moreover, to make the analysis more robust, I perform the panel regressions clustering the errors across time. In such a way, I will be able to catch possible time-varying dependences since it may be the case that during distress periods the correlation between markets increases dramatically making the estimation less reliable. The econometric model is the following:

$$\Delta \ln Y_{i,t} = \beta_1 \Delta \ln PolIdx_t + \beta_2 \Delta \ln PolIdx_{t-1} + \boldsymbol{\gamma} \mathbf{X}_{i,t} + \alpha_i + u_{i,t} \tag{6}$$

where Y is either the credit risk premium or the default risk, $PolIdx$ is the policy-related uncertainty index, $\mathbf{X}_{i,t}$ is the set of control variables and α_i captures country fixed effect.

Tables 6 and 7 report the estimation results for the credit risk premium and the default risk, respectively. The first column reports the benchmark regression where only the political index is regressed on the credit measures. In both cases, political uncertainty has a 1%-significant and positive effect, that is, a 10 per cent increase in the uncertainty leads, after a month, to an increase in both the credit risk premium and the default risk of 7.9 and 7.3 per cent. The effect remains still significant at 10 per cent level but weaker in magnitude when controlling for the domestic stock markets, the V2X and the iTraxx Euro CDX. Including the price-earning ratios does not alter totally the results since the lagged political uncertainty index remains still significant, and with the PE of Germany being significant at 1 percent level. This result states that the credit risk in Europe is negatively related to the performance of the German industrial sector. In column 6 I control for possible spillover relationship and I find that political uncertainty looses the effect on the credit market but the relation is still significant at 1 percent level. The status of the world economic situation is strongly significant and very large in magnitude, that is, a 10 percent improvement in the global situation is related to a 14 and 12 percent decrease in the credit risk premium and default risk, respectively. When both European and spillover control variables are included together, political uncertainty has still a 10%-significant effect on the credit market. In fact, a 10 percent increase in the degree of political uncertainty brings about an increase in the premium and default risk of 3.2 and 2.9 percent, respectively. The negative coefficient of the VIX Index highlights a fly-to-quality relation toward the US economy in line with what Ang and Longstaff (2011) find. The whole picture that emerges from Table 6 and 7 draw a clear and significant influence of political uncertainty in the European credit market, where the effect is stronger in magnitude on the credit risk premium that on the default risk. Interestingly, the set of variables is able to explain the 6 percent of the variation more in the default risk than those in the credit risk premium (R^2 of 46.9 against 40.8 percent).

4.2 The Empirical Methodology: the VAR Approach

The previous section highlights a significant effect of political uncertainty on the European credit market, but does not allow for catching a possible reverse relationship or effect. Indeed, it can be the case that it is the market to put pressure on governments, making them unable to implement some contingent measures rather than other ones. The latter case may be partially due to a view, commonly held by policy makers, according to which, financial speculators, through their huge bearish bets, have prevented the governments from setting adequate measures, worsening the crisis. To this end, I employee a panel Vector Autoregressive approach which is highly recommended when the goal is to study a phenomenon without any strong prior about the causality's direction.

There are several empirical studies that have already used both a VAR approach and a vector error correction model (VECM) in analyzing CDS markets. This is concerned with that part of the literature which has been dealing with understanding better whether the CDS market is more efficient than the underlying sovereign bond market. Arce *at al.* (2011) address the point at what market, CDS or bond, leads the price discovery process and find that the latter is state-dependent, that is, both markets alternated the supremacy over some specific events, such as the Lehman Brothers' default and the Bear Stearns' collapse. Similar findings are shown by Coudert and Gex (2011) who state that the bond market has its own supremacy over developed European economies, while the CDS market over emerging economies.

When dealing with VAR, the first step is to determine whether the VAR is performed in levels or first differences, and, whether any long-run relationship exists between the credit risk measures and the policy-related uncertainty index, by exploring their own time-series characteristics. On one hand, I can argue several reasons in favor of the stationarity of the CRP measures. First of all, given the short available sample, the non-stationarity can emerge as a small sample property, which cannot be avoided since the dataset contains also advanced economies for which no CDS contracts were traded before the mid-2007 financial crisis. In addition, the model I calibrated is based on the assumption of a mean-reverting process, which is stationary by construction. On the other hand, since I am going to use a VAR model, it is good and common practice to study the characteristics of time-series in detail to check if they are cointegrated. Indeed, as we know, the presence of cointegration leads to a different VAR representation: i.e., the VECM model. Therefore, I implement Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) unit root tests and cointegration test. The results are not reported here but available upon request. Basically, I find that the PP test fails to reject the hypothesis of non-stationarity more often than the ADF test at 5 percent level for both variables. Moreover, these variables are stationary in their first differences, allowing for inferring that they are integrated of order one. Given that unit root tests do not allow for a clear understanding about the stationarity hypothesis, I test the cointegration relationship with the Johanses's methodology (Johansen, S. (1991)). I estimate a bivariate VAR comprised of the political index and the credit risk measures. Results not reported here confirm the absence of cointegration between the variables.

Hence, the econometric VAR model is the following:

$$\Delta \ln Y_{i,t} = \sum_{p=1}^{3} \beta_p \Delta \ln Y_{i,t-p} + \alpha_i + u_{i,t} \tag{7}$$

where $Y_{i,t}$ is either $[PolIdx_t,\ CRP_t]$ or $[PolIdx_t,\ DRP_t]$ and α_i country-specific fixed effect. Control variables are not added since the lagged values already include aggregate market information. Table 8 report the panel VAR estimation. Interestingly, there is no evidence of the credit market Granger-causing the degree of political uncertainty. It is then confirmed the panel results in the previous section. In fact, the political uncertainty shows a longer and a grater effect in magnitude on the credit risk premium than on the default risk. But, according to Stock and Watson (2001) who state that "Because of the complicated dynamics in the VAR, these statistics [impulse response functions] are more informative than the estimated VAR regression coefficients or R^2's", I estimate impulse response functions (IRFs).

When dealing with IRFs, the main issue is to chose the best Cholesky ordering, namely, the order of the variables in the model because the first variable respond contemporaneously to the shock, whereas the second one react with a lag. In other words, there is a hierarchy in the way shocks hit the variables. Moreover, these functions require that a shock occurs only in one variable at a time, thus, a reasonable assumption is to have independent shocks. This is reached by orthogonalizing the covariance matrix of the residuals by using the Choleski decomposition. Therefore, I put political uncertainty first since my goal is to study the evolution and propagation of political shocks to the credit market. Figure 3 plots the IRFs for both systems as reported by Table 8.

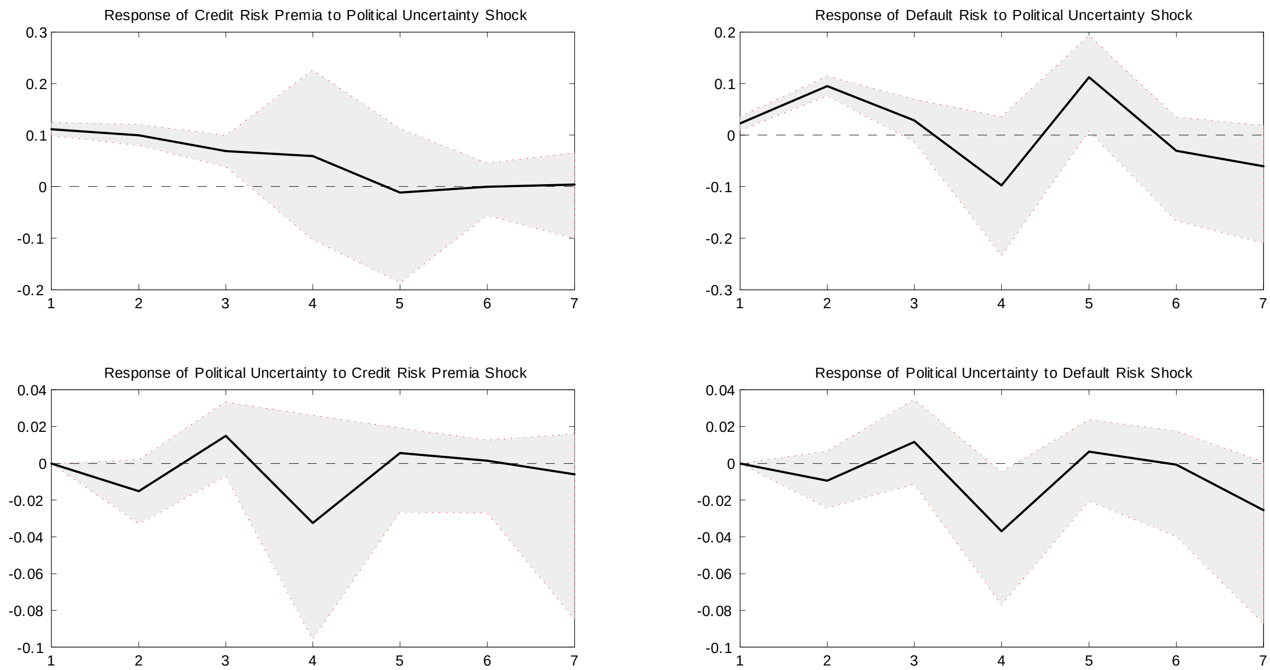

Figure 3. Impulse Response Functions estimated from the panel VAR for the systems Political Uncertainty/Credit Risk Premia and Political uncertainty/Default Risk. The impulse is a Choleski one-standard deviation. Red dotted lines indicate the 95% confidence intervals, generated by 500 MC simulations. Montlhy sample period December 2007 to January 2013.

The top-left graph of Figure 3 shows how a *political* shock of ten standard deviations increases the European credit risk premium of 1 percent and takes two months before disappearing. Additionally, a political shock has a positive and significant effect also on the default risk that reaches a peak after one month, for then decreasing and disappearing on the second month as shown by the top-right graph. Such a picture highlights a scenario where investors ask a premium when political shocks hits the European credit market with this effect being larger on the risk premia. The bottom-left graphs does not show any significant reverse response of political uncertainty to a credit risk premium shock. The bottom-right plot depicts an interesting and surprising scenario, that is, a shock to the credit market that increases the default risk in Europe leads to a significant decrease in the degree of political uncertainty after three months the shock is generated. This may signal the corrective or disciplinary role of the market in putting pressure on policymakers to act so as to reduce political uncertainty in the presence of a serious risk of default rather than "mere" variations in the risk aversion.

4.2.1 Exploring the Heterogeneity in the Credit Market

The cluster analysis in Section 1.1 shows that the European credit market masks specific credit risk features that can be clustered. In this section I investigate the relation between political uncertainty and the credit market on a country level. Thus, a bivariate VAR approach is employed since I believe that the Granger causality may be reverted for some countries. Indeed, it can happen that problems in the credit market of a country increase the degree of political uncertainty. The econometric model is the following

$$\Delta \ln Y_{i,t} = \sum_{p=1}^{3} \beta_p \Delta \ln Y_{i,t-p} + \boldsymbol{\gamma} \mathbf{X}_{i,t} + \alpha_i + u_{i,t} \tag{8}$$

where $Y_{i,t}$ is either $[PolIdx_t,\ CRP_t]$ or $[PolIdx_t,\ DRP_t]$, α_i captures country-specific fixed effect and $\mathbf{X}_{i,t}$ is the set of control variables that includes the local stock market, the VIX Index, the iTraxx Euro CDX, the price-to-earning ratio of the Dax Index, the TED spread and the gold price. All the controls are in log-differences.

Tables 9a and 9b report the estimation output for the system political uncertainty/credit risk premium. As expected, there is a sort of heterogeneity with which the credit risk premia react to variations in the degree of political uncertainty. In the majority of cases there is a significant and positive lead-lag relation between political uncertainty and the credit risk premia. Interestingly, the state of the local economy is negatively related to the premia in Europe, whereas the Eastern economies' credit risk premia are positively related to the uncertainty in the US financial market as shown by the VIX coefficients. Such a result still support, once again, the view that these economies have been relying heavily on foreign borrowing, thus, very exposed to spillover effect. Moreover, the core and peripheral economies' premia are significantly linked to the performance of the German industrial sector, as the price-to-earnings ratio shows a clear relation. Finally, all these variables explain, on average, almost the 56 percent of the variability in the credit risk premia throughout Europe. Additionally, Table 9b depicts a scenario of a reverse causality for few countries that have been experiencing serious debt issues such as Italy, Ireland, Spain and UK, where higher domestic distress risk affects significantly the degree of political uncertainty in Europe. Interestingly, political uncertainty is strongly and positively associated to spillover from the US financial market.

Slightly different are the scenarios concerning the default risk. Table 10a and 10b report the results. There exists a significant lead-lag effect for fewer countries' default risk than the credit risk premia. Indeed, this is the case of Austria, Belgium, Italy, Norway, Poland, Romania, Spain, Sweden and UK. Among those countries, Belgium, Italy, Spain and UK have dramatically increased their debt during the financial crisis and with the first three experienced heavy government crisis. Indeed, the beginning of the political instability in Belgium coincides with the beginning of the mid-2007 financial crisis, when after the elections held in the summer 2007, the government was formed only after 194 days. This was followed by another period of instability after the elections held in June 2010, when the government formation was reached only after 541 days. The electoral debates were actually focused on state reforms, to which the topics of public debt, deficit cuts and socio-economic reforms were added after the first Greek bailout. Similar worries were in play for the Italian and Spanish governments, which did no more than increase political instability in the Euro zone. Interesting is the reverse lead-lag effect of the default risk on the degree of political uncertainty. For more than half of the countries in the sample, higher default risk leads to an increase in the political uncertainty after two or three months. Comparing Tables 9b and 10b, there emerges that the one-month lead-lag relation with political uncertainty is negative, even if not significant at all, for almost all the countries. Such a scenario may confirm the corrective role of the market already highlighted on the aggregate level by the panel IRFs.

The whole picture that emerges shows how investors react heterogeneously to variations in the political uncertainty and how the latter may be significantly increased by investors' expectations on the country-specific default risk.

To further explore the heterogeneity, I follow Longstaff *et al.* (2011) and I build regional credit risk premia and default risk measures by taking the median value for each cluster, including Greece and Norway among the peripheral and core economies, respectively [12]. The econometric model is still a bivariate $VAR(3)$ as in equation 8. Tables 11 reports the results for the credit risk premia. The whole picture that emerges highlights a scenario where, on one hand, political uncertainty affects the credit risk premia of both the peripheral and Eastern economies, where a 10 percent increase in the degree of political uncertainty leads to an increase of about 3.5 percent in the credit risk premia of the peripheral economies. On the other hand, a 10 percent increase in the credit risk premium of the core economies leads to an increase in political uncertainty of about 1.7 percent. Additionally, there exists spillover relations among the macro regions as shown by the coefficients CRP_t^{Core}, CRP_t^{Periph} and CRP_t^{East}. Such a scenario is interesting in the sense that political uncertainty that is generated mostly by the core economies affects significantly the other two macro regions, but then, higher risk premia in these regions are associated with higher and significant risk premia in the core economies as highlighted by the variables CRP_t^{Periph} and CRP_t^{East}. Slightly different is the scenario on the default risk depicted by Table 12. Indeed, political uncertainty affects the default risk of only the core and the peripheral economies, but not the Eastern ones. This result is in line with their economic fundamentals. Eastern countries lay in better economic conditions in terms of GDP growth, unemployment rates and levels of indebtness with respect to their GDP. But there still exists spillover relations among the default risk measures across the three macro regions. Once again, both the credit risk premium and the default risk of the peripheral economies affect negatively and significantly the degree of political uncertainty. Thus, I can state that the corrective role of the market is mostly focused on the creditworthiness of the most indebted countries which may spread out serious contagion effects.

To shed further light on the linkage between the political uncertainty and the regional credit risk, the best practice is to look at what the impulse response functions do show about. Figures 4 and 5 plot the IRFs for both systems.

[12] To be more precise, Longstaff *et al.* (2011) use the mean value whereas I employ a more robust measure, the median, since the high values of Greece absorb the entire variance and so altering the aggregation process.

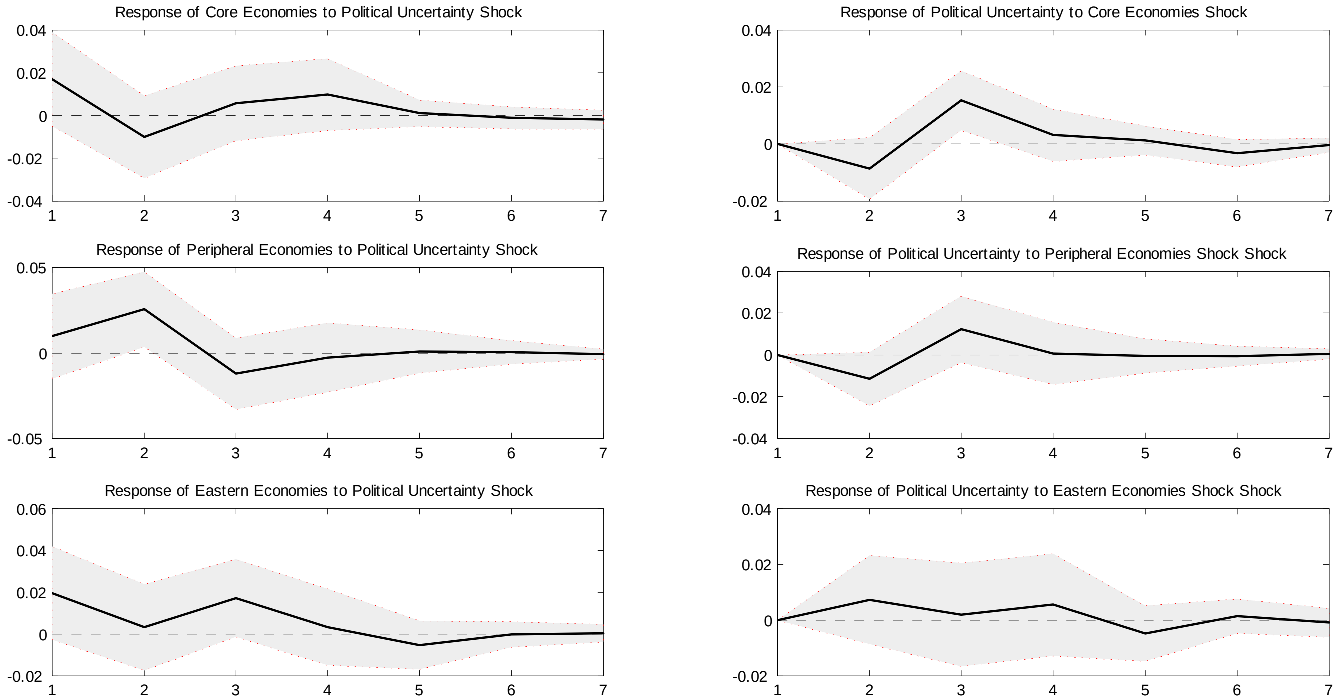

Figure 4. *Credit Risk Premia*: Impulse Response Functions estimated from the bivariate *VAR(3)* with regional credit risk premia and the policy-related uncertainty index. The impulse is a Choleski one-standard deviation. Red dotted lines indicate the 95% confidence interval.

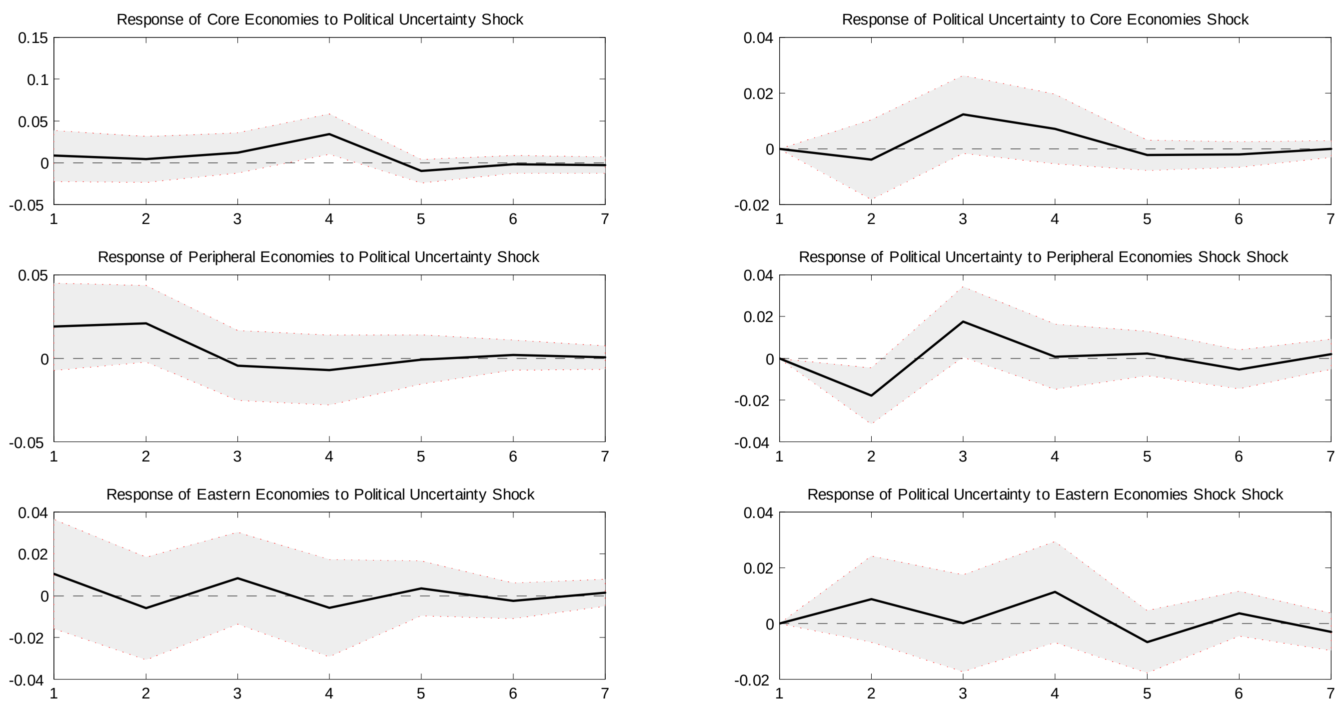

Figure 5. *Default Risk*: Impulse Response Functions estimated from the bivariate *VAR(3)* with regional default risk measures and the policy-related uncertainty index. The impulse is a Choleski one-standard deviation. Red dotted lines indicate the 95% confidence interval.

IRFs depict a scenario where a political shock has a significant impact on the risk premia of the peripheral economies after a month the shock is generated, and on the default risk of the core economies after three months, whereas a shock to the premia of the core economies leads to an significant increase in the degree of political uncertainty after two months. Interestingly, as already shown by Table 12, a shock to the credit market of the peripheral economies that increases their default risk brings about a decrease in the political uncertainty after a month. Such a result still confirm the above mentioned view that it may be a signal of the disciplinary or corrective role of the market, that is, a distress hitting highly indebted countries forces policymakers to act accordingly decreasing *de facto* the political uncertainty. In other words, policymakers react to signals sent by the market which moves according to the contingent economic and political situation.

5 Conclusions

In this work, I stress the role of political uncertainty in the European credit market.

I decompose the CDS spread into the sum of two components, namely, the credit risk premium or *distress risk* and the default risk or *jump-to-default risk.* The former catches the compensation investors demand for bearing the risk due to unexpected variations in the default intensity, whereas the *jump-to-default risk* captures the sudden (negative) jump in the underlying bond value in case of default. The results show a significant influence of political uncertainty on the sovereign credit risk. In particular, a 10%-increase in the degree of political uncertainty brings about a significant and positive variation in both the credit risk premia and the default risk of about 3 percent. Such a result is robust to controlling for information already embedded in the European and US stock and credit markets. Moreover, the control variables play an additional role in purifying the political uncertainty index from economic and financial information, leaving out only the political part.

A panel Vector Autoregressive approach and then the impulse response functions highlight an interesting result, that is, a shock to the credit market that increases the default risk in Europe leads to a significant decrease in the degree of political uncertainty after three months the shock is generated. This may signal the corrective or disciplinary role of the market in putting pressure on policymakers to act so as to reduce political uncertainty in the presence of a serious risk of default rather than "mere" variations in the risk aversion. Further analysis on an country-individual and regional levels show how such a corrective role of the market exists in the presence of a shock to the credit market of the peripheral economies, which are the most worrying ones, given their high level of indebtness.

The global picture that emerges from this work enables me to conclude that, on one hand, political uncertainty can be deemed as one the main driving factor of the European credit market, that contribute significantly to increase the investors' risk aversion, but, on the other hand, policymakers react accordingly to turmoils in the credit market when there exists a serious risk of default, rather than simple variations in the credit risk premia.

This work relies on a particular proxy for political uncertainty which has allowed me to study the phenomena on a time series basis, instead of a simple event study analysis. To my best knowledge, currently, there is no alternative way to proxy for variations in political uncertainty over time and on a monthly frequency. Therefore, future research may improve the results of this work and make them more robust by estimating the model on new and different time-series proxies for political uncertainty.

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	Mean	*Median*	*Std Dev*	*Min*	*Max*
Austria	71.6	68	46.3	4	269
Belgium	95.0	82.5	65.6	8	339
Estonia	178.8	114.5	152.5	45	736
Finland	35.8	30	21.9	4	92
France	58.9	53	38.2	5	199
German	32.3	31	17.7	4	91
Greece	1391.3	291	2742.1	14	23572
Ireland	335.7	224	267.5	11	1263
Italy	172.9	137	121.4	15	502
Latvia	364.2	269	225.7	87	1161
Lithuania	275.5	239	153.0	48	849
Netherlands	43.0	37	27.0	4	130
Norway	21.0	18	11.5	3	64
Poland	145.7	134	71.1	20	419
Portugal	389.2	278	387.1	13	1554
Romania	304.6	277	131.4	68	771
Spain	176.1	165.5	114.1	13	504
Sweden	39.8	36.5	28.9	5	158
UK	62.4	65	30.3	5	165
Pol Index	143.7	145.4	28.7	78.8	213.5

Table 1: The table reports summary statistics of 5-year Credit Default Swap spreads of 19 European countries over the daily period from December 2007 to Janury 2013. The last row reports summary statistics of the monthly policy-related uncertainty index.

Full Sample		$(Panel A)$	
Italy	Portugal		
Spain	Ireland	Greece	
Belgium			Norway
Finland	Germany	Estonia	Poland
Austria	UK	Latvia	Romania
France	Sweden	Lithuania	
Nether			
coph corr:	0.91		

Before	May 2010	$(Panel B)$	
Finland	Austria	Ireland	Italy
Nether	Sweden	Belgium	Spain
France		Greece	
Germany		Portugal	
Norway		Estonia	Poland
		Latvia	Romania
	UK	Lithuania	
coph corr:	0.89		

After	May 2010	$(Panel C)$	
Italy		Greece	
Spain			
Portugal			Norway
Ireland			
Austria	Germany	Estonia	Poland
UK	Nether	Latvia	Romania
France	Sweden	Lithuania	
Belgium	Finland		
coph corr:	0.89		

Table 2: Cluster Analysis' outcome applied on the correlation matrix of daily changes of 5-year CDS spreads over the full sample (*Panel A*) and two sub samples (*Panel B and C*). The method (*Complete*) and the distance (*Euclidean*) are selected to the extent that the cophenetic correlation (*coph corr*) is the highest.

	Panel A			*Panel B*					
	Europe19			*Peripheral*		*Core*		*Eastern*	
	% of Var	Total		% of Var	Total	% of Var	Total	% of Var	Total
First	72.5408	72.54		76.3721	76.37	81.7923	81.79	88.938	88.94
Second	6.7968	79.34		8.6969	85.07	5.1029	86.90	4.1697	93.11
Third	4.6732	84.01		6.1548	91.22	4.2056	91.10	2.9927	96.10
Fourth	2.6429	86.65		4.7432	95.97	2.8614	93.96	2.8152	98.92
Fifth	2.3833	89.04		2.2405	98.21	2.0703	96.03	1.0846	100.00

	Panel C								
	PolIndex	*MSCI*	*V2X*	*iTraxx*	PE^{Dax}	*VIX*	*IGCDX*	*TED*	*Gold*
Europe19	3.47**	-11.3***	2.20***	4.30***	-2.10**	2.20***	4.75***	1.08**	4.74
	[2.34]	[-7.14]	[3.04]	[4.80]	[-2.35]	[3.01]	[4.71]	[2.01]	[1.61]
Periphery	1.04*	-2.79***	0.62**	1.43***	-0.53	0.39	1.36***	0.33	0.71
	[1.69]	[-3.46]	[2.02]	[3.69]	[-1.41]	[1.24]	[3.05]	[1.50]	[0.58]
Core	2.69**	-8.77***	1.63***	3.21***	-1.74**	1.61***	3.56***	0.71	3.64
	[2.25]	[-6.68]	[2.76]	[4.35]	[-2.44]	[2.72]	[4.30]	[1.62]	[1.54]
Eastern	1.99**	-7.32***	1.44***	2.52***	-1.09*	1.71***	3.04***	0.87**	3.43*
	[2.13]	[-7.60]	[3.20]	[4.39]	[-1.92]	[3.92]	[4.87]	[2.64]	[1.89]

Table 3: Principal Component Analysis performed on the correlation matrix of monthly log-changes of 5-year CDS spread for the whole set of countries (*Europe19*) and for *Core* (Austria, Finland, France, Germany, Netherlands, Norway, Sweden, UK), *Peripheral* (Belgium, Greece, Ireland, Italy, Portugal, Spain) and *Eastern Economies* (Estonia, Latvia, Lithuania, Poland, Romania) over the period December 3, 2007 to January 22, 2013. The subtable in the bottom reports the univariate regressions (with a constant) of the first-differences of the first PCs for each cluster on the Policy-related uncertainty index (*PolIndex*), the MSCI Global Equity Index (*MSCI*), the Eurostoxx50 implied volatility (*V2X*), the iTraxx Euro CDX (*iTraxx*), the PE ratio of the Dax Index (*PE*), the *VIX*, the *IG CDX*, the *TED spread* and the *Gold price* . First PCs are in first differences wheras the variables are in log-differences. t-Stats in brackets. Level of significance: *1****, *5*** and *10* per cent*.

	$\sigma_{\lambda_t^{\mathbb{Q}}}$	$k^{\mathbb{Q}}\theta^{\mathbb{Q}}$	$k^{\mathbb{Q}}$	$\theta^{\mathbb{P}}$	$k^{\mathbb{P}}$	$\sigma\,(1)$	$\sigma\,(3)$	$\sigma\,(7)$	*avg llk*
AUT	0.99	5.96	-0.76	-2.42	0.23	0.04366	0.00004	0.00004	9.25
	(0.004)	(0.0081)	(0.0004)	(0.0044)	(0.0004)	(0.0002)	(0.000001)	(0.000001)	
BEL	1.21	1.29	-0.94	-3.24	0.11	0.07236	0.00031	0.00054	6.91
	(0.0171)	(0.0122)	(0.0024)	(0.0072)	(0.0013)	(0.0001)	(0.000006)	(0.000014)	
EST	0.5	-0.38	-1.02	-4.68	0.3	0.00367	0.00067	0.00096	6.74
	(0.009)	(0.0245)	(0.0075)	(0.011)	(0.0022)	(0.000079)	(0.000015)	(0.000022)	
FIN	0.72	5.08	-0.47	-2.57	0.28	0.00002	0.00003	0.00007	10.89
	(0.0037)	(0.0054)	(0.0004)	(0.0056)	(0.0005)	(0.000519)	(0.000002)	(0.00009)	
FRA	0.5	5.88	-0.67	-2.15	0.2	0.0639	0.00004	0.00007	9.22
	(0.0035)	(0.0096)	(0.0003)	(0.0073)	(0.0007)	(0.000082)	(0.000001)	(0.000003)	
GER	0.64	5.51	-0.56	-2.39	0.23	0.0515	0.00002	0.00002	9.87
	(0.0023)	(0.0052)	(0.0002)	(0.0055)	(0.0005)	(0.000042)	(0.000521)	(0.000001)	
GRE	1.03	-2.96	0.07	-3.13	0.07	0.00333	0.00014	0.00083	7.92
	(0.0157)	(0.0015)	(0.0004)	(0.0017)	(0.0004)	(0.000092)	(0.000004)	(0.001032)	
IRL	0.84	-0.69	-0.1	-6.91	0.71	0.00027	0.00017	0.00014	9
	(0.0144)	(0.0093)	(0.0015)	(0.0083)	(0.001)	(0.000006)	(0.000004)	(0.000003)	
ITA	1.09	5.56	-0.64	-2.13	0.25	0.00015	0.00017	0.00015	9.08
	(0.0029)	(0.0076)	(0.0008)	(0.0043)	(0.0005)	(0.000003)	(0.000006)	(0.000006)	
LAT	0.36	4.04	-0.95	-2.34	0.11	0.0007	0.001	0.0001	8.65
	(0.0059)	(0.0133)	(0.0023)	(0.0055)	(0.0007)	(0.000014)	(0.000002)	(0.000003)	
LTU	0.42	5.23	-1.05	-2.44	0.13	0.15222	0.00011	0.00008	8.28
	(0.0053)	(0.0119)	(0.0015)	(0.0054)	(0.0007)	(0.000018)	(0.000003)	(0.000002)	
NED	0.52	5.74	-0.57	-2.06	0.22	0.03743	0.00003	0.00003	9.69
	(0.0012)	(0.0051)	(0.0004)	(0.0046)	(0.0004)	(0.000038)	(0.000001)	(0.000001)	
NOR	0.41	4.96	-0.55	-1.82	0.24	0.04472	0.0001	0.00013	8.35
	(0.0027)	(0.0063)	(0.0004)	(0.0034)	(0.0003)	(0.000003)	(0.000003)	(0.000003)	
POL	0.26	5.63	-0.87	-2.53	0.36	0.03299	0.00075	0.00071	6.55
	(0.0025)	(0.0114)	(0.0012)	(0.0052)	(0.0007)	(0.000423)	(0.000017)	(0.000015)	
POR	0.79	-2.67	0.01	-2.86	0.03	0.00084	0.00039	0.00001	9.61
	(0.0046)	(0.0009)	(0.0002)	(0.001)	(0.0002)	(0.000018)	(0.000417)	(0.000265)	
ROU	1.16	-0.1	-0.27	-2.29	0.04	0.00044	0.00005	0.00013	8.91
	(0.008)	(0.0036)	(0.0007)	(0.0033)	(0.0004)	(0.000011)	(0.000001)	(0.000005)	
ESP	0.64	-0.21	0.01	-0.26	0.02	0.00063	0.00013	0.00003	8.26
	(0.0008)	(0.0001)	(0.00002)	(0.0001)	(0.00002)	(0.000112)	(0.000003)	(0.000001)	
SWE	0.54	6.18	-0.64	-2.28	0.22	0.04432	0.00002	0.00003	9.69
	(0.0013)	(0.0042)	(0.0004)	(0.0067)	(0.0006)	(0.000006)	(0.000001)	(0.000001)	
GBR	0.67	-1.61	0.23	-1.71	0.24	0.0001	0.00006	0.00004	9.54
	(0.0025)	(0.0005)	(0.0006)	(0.0005)	(0.0000)	(0.000003)	(0.000002)	(0.000001)	

Table 4: Calibration of the Pan and Singleton (2008) model for daily 5-year CDS spreads according to a quasi maximum likelihood method (Q-MLE). Numerical standard errors in parenthesis and average log-likelihoods (*avg llk*). The estimation is performed on the entire term-structure of 1-, 3-, 5- and 7-year CDS spreads covering the daily period December 3, 2007 to Janury 22, 2013.

Panel A							*Panel B*		
Credit Risk Premium			*Default Risk*				*Credit Risk Premium* (%)		
Mean	*Std Dev*	*Median*	*Mean*	*Std Dev*	*Median*		*Mean*	*Std Dev*	*Median*
34.1	22.8	32.1	37.5	23.5	36.1	Austria	47.1	1.0	47.0
41.5	28.4	35.9	53.5	37.2	46.2	Belgium	44.2	1.3	43.8
66.1	49.5	45.6	112.8	103.0	69.2	Estonia	38.9	2.5	39.6
18.4	11.8	15.2	17.4	10.1	15.0	Finland	50.4	1.9	50.6
28.3	17.8	25.9	30.7	20.3	27.4	France	48.6	1.1	48.5
10.6	6.4	9.7	21.7	11.3	21.1	Germany	31.6	2.1	31.6
257.3	577.8	55.0	1142.1	2193.5	236.6	Greece	19.0	1.5	18.9
303.3	251.4	196.2	32.4	16.3	27.7	Ireland	83.9	11.7	87.6
60.4	46.3	45.9	112.5	75.1	91.0	Italy	33.0	3.1	33.5
110.5	68.0	83.2	253.7	158.0	186.6	Latvia	30.4	1.4	30.3
103.7	53.6	91.8	171.9	99.5	147.1	Lithuania	38.3	1.5	38.4
8.5	9.7	4.8	34.5	17.8	32.3	Netherlands	14.4	9.0	12.8
13.0	7.2	11.1	8.0	4.3	6.9	Norway	61.5	0.6	61.7
65.0	32.6	59.5	80.7	38.6	75.0	Poland	44.3	1.0	44.4
99.7	93.3	75.1	289.5	293.8	201.5	Portugal	28.8	3.9	27.3
125.5	49.4	116.0	179.1	82.1	161.2	Romania	41.7	1.3	41.8
68.5	44.2	63.8	107.6	69.9	101.6	Spain	39.1	0.7	39.0
19.3	13.4	17.9	20.6	15.5	18.6	Sweden	49.4	1.6	49.2
0.3	0.2	0.3	29.2	14.3	30.3	UK	53.2	0.5	53.2
75.5	72.8	51.8	144.0	172.9	80.6	mean	42.0	2.5	42.0

Table 5: Descriptive statistics of the two components (*Panel A*) embedded in the 5-year CDS spreads. The estimation is performed on a daily basis with the Q-MLE method over the period December 3, 2007 to January 22, 2013. The data are in basis points. *Panel B* reports the Credit Risk Premia as a percentage of the observed 5-year CDS spread.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$	$\Delta \ln CRP_t$
$\Delta \ln PolIdx_t$	0.740***	0.432**	0.320*	0.304*	0.279	0.513***	0.452**
	[3.65]	[2.48]	[1.77]	[1.71]	[1.58]	[2.77]	[2.38]
$\Delta \ln PolIdx_{t-1}$	0.791***	0.367**	0.321*	0.320*	0.336*	0.268	0.318*
	[3.79]	[2.38]	[1.93]	[1.91]	[2.00]	[1.47]	[1.84]
$\Delta \ln Stock_t$		-1.241***	-0.950***	-0.939***	-0.946***		-0.504**
		[-5.50]	[-3.64]	[-3.70]	[-3.69]		[-2.15]
$\Delta \ln V2X_t$		0.0843	-0.0115	-0.0131	-0.00679		0.265
		[0.91]	[-0.12]	[-0.13]	[-0.07]		[1.57]
$\Delta \ln iTraxx_t$			0.437***	0.415**	0.399**		0.317
			[2.75]	[2.55]	[2.47]		[0.95]
$\Delta \ln PE_t^{Euro50}$				-0.0882			
				[-0.84]			
$\Delta \ln PE_t^{Dax}$					-0.151***		-0.119***
					[-2.72]		[-3.08]
$\Delta \ln MSCI_t$						-1.453***	-1.132***
						[-5.79]	[-4.22]
$\Delta \ln VIX_t$						-0.201	-0.477**
						[-1.50]	[-2.29]
$\Delta \ln IGCDX_t$						0.246	-0.0981
						[1.60]	[-0.28]
$\Delta \ln TED_t$						0.0663	0.0401
						[1.07]	[0.64]
$\Delta \ln Gold_t$						0.247	0.369
						[0.82]	[1.19]
cons	0.005	0.0006	0.0002	0.0009	0.0007	-0.002	-0.009
	[0.16]	[0.02]	[0.01]	[0.04]	[0.03]	[-0.09]	[-0.37]
N	1129	1129	1129	1129	1129	1129	1129
R^2	0.193	0.307	0.350	0.352	0.361	0.379	0.408

Table 6: *Credit Risk Premium*: Panel regressions of *CRP* on the policy-related uncertainty index (*PolIdx*), the domestic stock markets (*Stock*), the Eurostoxx50 and S&P500 implied volatility (*V2X* and *VIX*), the iTraxx Euro CDX and IG US CDX (*iTraxx* and *IGCDX*), the price-earning ratio of Eurostoxx50 and Dax Indices (PE^{dax} and PE^{Euro50}), the MSCI Global Equity Index (*MSCI*), the TED spread (*TED*) and the gold price (*Gold*). Tha variables are in log-differences. Country fixed effect included. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats in brackets, and errors clustered across time. Level of significance: *1****, *5*** and *10* per cent.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$	$\Delta \ln DRP_t$
$\Delta \ln PolIdx_t$	0.682***	0.418***	0.307*	0.291*	0.268*	0.465***	0.404**
	[3.79]	[2.75]	[1.95]	[1.90]	[1.76]	[3.01]	[2.48]
$\Delta \ln PolIdx_{t-1}$	0.730***	0.355**	0.310**	0.309*	0.324**	0.253	0.294*
	[3.99]	[2.51]	[2.01]	[1.98]	[2.07]	[1.54]	[1.83]
$\Delta \ln Stock_t$		-1.130***	-0.844***	-0.833***	-0.840***		-0.428**
		[-5.73]	[-3.99]	[-4.09]	[-4.08]		[-2.66]
$\Delta \ln V2X_t$		0.0610	-0.0335	-0.0351	-0.0289		0.167
		[0.75]	[-0.39]	[-0.40]	[-0.33]		[1.13]
$\Delta \ln iTraxx_t$			0.431***	0.409***	0.394***		0.300
			[3.06]	[2.83]	[2.76]		[0.99]
$\Delta \ln PE_t^{Euro50}$				-0.0870			
				[-0.87]			
$\Delta \ln PE_t^{Dax}$					-0.146***		-0.117***
					[-2.83]		[-3.44]
$\Delta \ln MSCI_t$						-1.280***	-1.002***
						[-5.59]	[-4.26]
$\Delta \ln VIX_t$						-0.184	-0.360**
						[-1.63]	[-2.04]
$\Delta \ln IGCDX_t$						0.260*	-0.0676
						[1.92]	[-0.21]
$\Delta \ln TED_t$						0.0631	0.0362
						[1.13]	[0.62]
$\Delta \ln Gold_t$						0.229	0.327
						[0.87]	[1.19]
cons	0.005	0.0007	0.0002	0.001	0.0007	-0.001	-0.007
	[0.16]	[0.03]	[0.01]	[0.04]	[0.03]	[-0.05]	[-0.29]
N	1129	1129	1129	1129	1129	1129	1129
R^2	0.227	0.351	0.408	0.411	0.422	0.442	0.469

Table 7: *Default Risk*: Panel regressions of *DRP* on the policy-related uncertainty index (*PolIdx*), the domestic stock markets (*Stock*), the Eurostoxx50 and S&P500 implied volatility (*V2X* and *VIX*), the iTraxx Euro CDX and IG US CDX (*iTraxx* and *IGCDX*), the price-earning ratio of Eurostoxx50 and Dax Indices (PE^{dax} and PE^{Euro50}), the MSCI Global Equity Index (*MSCI*), the TED spread (*TED*) and the gold price (*Gold*). Tha variables are in log-differences. Country fixed effect included. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats in brackets and errors clustered across time. Level of significance: *1****, *5*** and *10* per cent.*

Panel A: Credit Risk Premium						
	$\Delta \ln PolIdx_{t-1}$	$\Delta \ln PolIdx_{t-2}$	$\Delta \ln PolIdx_{t-3}$	$\Delta \ln CRP_{t-1}$	$\Delta \ln CRP_{t-2}$	$\Delta \ln CRP_{t-3}$
$\Delta \ln CRP_t$	0.827***	0.752**	0.836	-0.06	-0.00	-0.34
	[5.865]	[2.375]	[0.691]	[-0.49]	[-0.00]	[-0.88]
$\Delta \ln PolIdx_t$	-0.15**	0.102	0.472	-0.06	0.047	-0.11
	[-2.49]	[0.843]	[0.997]	[-1.42]	[0.933]	[-0.78]

Panel B: Default Risk						
	$\Delta \ln PolIdx_{t-1}$	$\Delta \ln PolIdx_{t-2}$	$\Delta \ln PolIdx_{t-3}$	$\Delta \ln DRP_{t-1}$	$\Delta \ln DRP_{t-2}$	$\Delta \ln DRP_{t-3}$
$\Delta \ln DRP_t$	0.759***	0.433	-0.88	-0.13	0.157	0.274
	[7.21]	[1.56]	[-1.07]	[-1.05]	[0.85]	[1.23]
$\Delta \ln PolIdx_t$	-0.17***	0.100	0.446	-0.04	0.022	-0.10
	[-3.27]	[0.99]	[1.33]	[-1.10]	[0.42]	[-1.07]

Table 8: Panel Vector Autoregressive approach: bivariate VAR(3) with Credit Risk Premium and Political uncertainty (*Panel A*) and Default Risk and Political uncertainty (*Panel B*). Tha variables are in log-differences. Country fixed effect included. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats in brackets. Level of significance: *1****, *5*** and *10** per cent*.

	$PolIdx_{t-1}$	$PolIdx_{t-2}$	$PolIdx_{t-3}$	CRP_{t-1}	CRP_{t-2}	CRP_{t-3}	$Stock_t$	VIX_t	$iTraxx_t$	PE_t^{Dax}	TED_t	$Gold_t$	$cons$	R^2
AUT	0.44	0.65**	0.48*	0.03	0.03	-0.04	-1.211*	0.08	0.16	-0.18**	0.042	0.665	-0.01	.63
BEL	0.30	0.51**	0.16	0.06	-0.12	0.04	-1.25***	-0.23	0.58***	-0.23**	-0.014	0.592	-0.01	.59
EST	0.35**	0.30*	0.04	-0.01	0.07	0.05	-0.04	0.20***	0.31**	0.01	0.097*	0.274	-0.02	.64
FIN	-0.01	0.45*	0.39*	0.14	-0.05	-0.04	-1.34**	0.04	0.23	-0.23***	0.014	0.466	-0.01	.58
FRA	0.43**	0.48**	0.19	-0.14	0.03	-0.10	-2.11***	-0.11	0.30	-0.27**	0.028	0.386	0.01	.62
GER	0.36	0.80**	0.44	-0.03	-0.26**	0.00	-1.83**	-0.07	0.41	-0.26**	-0.009	0.631	0.01	.44
GRE	0.63*	0.43	0.23	-0.34	-0.03	0.03	-0.58	-0.33	0.79**	-0.19	-0.036	0.096	0.10**	.43
IRL	0.31	0.45*	0.14	-0.03	0.10	0.06	-1.16*	-0.19	0.50	-0.12	-0.017	0.318	0.01	.39
ITA	0.63***	0.65***	0.32	-0.14	0.08	-0.23***	-1.15***	-0.15	0.53***	-0.20**	-0.009	0.348	0.01	.70
LAT	0.15	0.29	0.17	0.07	-0.13	0.02	-0.58**	0.29***	0.22	-0.06	0.013	-0.110	-0.02	.63
LTU	0.25	0.28*	0.06	0.06	0.08	0.04	0.09	0.23**	0.33**	-0.01	0.093	0.061	-0.01	.60
NED	0.88	1.90***	1.19	-0.17	0.03	-0.04	-4.11***	-0.39	0.57	-0.17	0.030	0.285	-0.01	.41
NOR	0.60**	0.52**	-0.03	0.09	0.04	-0.04	-0.26	0.22	0.39	-0.15*	-0.075	0.593	0.00	.56
POL	0.23	0.52**	0.07	-0.15	0.05	-0.09	-1.08**	0.09	0.62***	-0.12**	-0.016	0.022	0.00	.68
POR	0.34	0.07	-0.29	0.02	-0.15	0.16	-0.68	-0.24*	0.54***	-0.31*	-0.025	0.273	0.02	.46
ROU	0.20	0.56***	0.23	-0.05	-0.07	-0.10	-0.45	0.20*	0.19	-0.01	0.052	0.027	-0.01	.64
ESP	0.52***	0.37**	0.27	-0.15	-0.11	-0.16	-1.45***	-0.19	0.20	-0.21**	-0.024	0.645*	0.02	.59
SWE	0.55**	0.95***	0.51**	0.08	-0.18	-0.01	-1.71**	-0.22	0.47**	-0.15*	-0.009	0.193	0.00	.61
GBR	0.39	0.53**	0.63**	-0.06	-0.07	-0.01	-1.75	-0.19	0.31	-0.13	-0.023	0.360	0.01	.47

Table 9a: Vector Autoregressive: - *Credit Risk Premium as Dependent* - bivariate VAR(3) with Credit Risk Premium and Political uncertainty. The variables are in log-differences. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*

	$PolIdx_{t-1}$	$PolIdx_{t-2}$	$PolIdx_{t-3}$	CRP_{t-1}	CRP_{t-2}	CRP_{t-3}	$Stock_t$	VIX_t	$iTraxx_t$	PE_t^{Dax}	TED_t	$Gold_t$	$cons$	R^2
AUT	-0.26*	0.12	-0.06	-0.05	0.11**	0.04	0.44	0.32***	0.23	-0.058*	0.07	-0.19	0.02	.54
BEL	-0.35***	0.08	0.05	-0.06	0.04	0.04	0.20	0.25**	0.17	-0.04	0.08	-0.05	0.02	.47
EST	-0.43***	0.00	-0.07	0.03	0.14	0.06	0.22	0.24***	0.19	-0.04	0.08	-0.05	0.02	.49
FIN	-0.35***	-0.04	0.00	-0.07	0.16**	-0.01	0.17	0.29***	0.17	-0.02	0.07	-0.19	0.02	.52
FRA	-0.29**	0.01	-0.09	-0.14**	0.17**	0.03	0.05	0.26***	0.23*	-0.03	0.04	-0.24	0.02	.57
GER	-0.42***	-0.02	-0.03	0.02	0.04	0.05	0.19	0.25**	0.16	-0.05	0.07	-0.04	0.02	.47
GRE	-0.30**	0.10	0.07	-0.02	0.05	-0.04	0.28	0.22**	0.19	-0.05	0.10	-0.20	0.03	.52
IRL	-0.28**	0.08	0.02	-0.09	0.14**	-0.01	0.32	0.30***	0.16	-0.03	0.07	0.02	0.02	.56
ITA	-0.38***	0.02	-0.03	-0.08	0.12*	0.04	0.24	0.27***	0.27**	-0.02	0.06	-0.17	0.02	.53
LAT	-0.50***	-0.08	-0.10	0.10	0.11	0.13*	0.10	0.21***	0.19	-0.060**	0.10	-0.04	0.02	.51
LTU	-0.40***	0.09	-0.01	0.05	0.14	0.05	0.37**	0.28***	0.14	-0.051*	0.10*	-0.14	0.02	.51
NED	-0.33***	0.07	0.04	-0.04	0.04	0.00	0.11	0.30***	0.15	-0.03	0.04	-0.13	0.02	.49
NOR	-0.32**	0.07	-0.02	-0.11	0.11*	0.06	0.00	0.23***	0.15	-0.04	0.08	-0.09	0.02	.52
POL	-0.39***	-0.01	-0.09	0.02	0.09	0.07	0.48*	0.28***	0.23*	-0.069*	0.07	-0.05	0.02	.51
POR	-0.32**	0.11	-0.03	-0.07	0.08	0.03	0.77**	0.29***	0.33**	-0.03	0.06	-0.01	0.02	.56
ROU	-0.36**	0.04	-0.03	0.01	0.12	0.05	0.29	0.26***	0.19	-0.03	0.10	-0.01	0.02	.49
ESP	-0.33***	0.13	-0.01	-0.15**	0.05	0.10*	0.21	0.21***	0.29**	-0.03	0.08	-0.17	0.02	.54
SWE	-0.41***	-0.03	-0.05	-0.01	0.10	0.02	0.30	0.29**	0.18	-0.05	0.08	-0.14	0.02	.49
GBR	-0.31***	0.02	-0.05	-0.09	0.16*	0.03	0.51	0.31***	0.19	-0.01	0.08	-0.03	0.02	.53

Table 9b: Vector Autoregressive: - *Political Uncertainty Index as Dependent* - bivariate VAR(3) with Credit Risk Premium and Political uncertainty. The variables are in log-differences. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*

	$PolIdx_{t-1}$	$PolIdx_{t-2}$	$PolIdx_{t-3}$	DRP_{t-1}	DRP_{t-2}	DRP_{t-3}	$Stock_t$	VIX_t	$iTraxx_t$	PE_t^{Dax}	TED_t	$Gold_t$	$cons$	R^2
AUT	0.52*	0.70**	0.42	0.05	0.05	-0.07	-1.13**	0.17	0.02	-0.15**	0.08	0.56	-0.01	.62
BEL	0.36	0.53**	0.15	0.04	-0.11	0.03	-0.92**	-0.16	0.45*	-0.26***	0.06	0.76	-0.01	.56
EST	0.33	0.34	0.08	-0.14	0.11	-0.01	-0.83	0.14	0.12	0.05	0.17**	0.29	-0.03	.64
FIN	-0.10	0.28	0.42**	0.14	-0.02	-0.11	-1.14***	0.07	0.07	-0.17***	0.10	0.29	0.00	.57
FRA	0.41	0.35	0.12	-0.11	0.04	-0.08	-1.10***	0.09	0.33	-0.28**	0.05	0.51	0.02	.58
GER	0.35	0.59	0.33	-0.01	-0.19	-0.04	-0.76	0.14	0.25	-0.25**	-0.01	0.44	0.00	.40
GRE	0.64	0.54	0.29	-0.36*	-0.09	0.00	-0.74	-0.43	0.79*	-0.23	0.03	0.11	0.13***	.44
IRL	0.07	0.15	0.00	-0.07	0.18	0.01	-0.69**	-0.12	0.13	-0.02	0.02	0.20	0.00	.33
ITA	0.42**	0.52***	0.26	-0.12	0.04	-0.20***	-0.76**	-0.13	0.52***	-0.18**	0.01	0.31	0.02	.64
LAT	0.15	0.23	0.09	0.15	-0.05	0.04	-0.69*	0.15	0.07	-0.05	0.06	-0.30	-0.02	.62
LTU	0.15	0.19	0.06	-0.06	0.13	-0.04	-0.81*	0.16	0.14	0.02	0.145*	0.08	-0.01	.61
NED	0.49	0.46	0.29	-0.10	0.01	-0.03	-0.63	0.05	0.54*	-0.08	-0.05	0.64	0.00	.49
NOR	0.51**	0.43*	-0.01	0.02	0.10	-0.10	-0.87*	0.15	0.19	-0.11	-0.02	0.56	-0.01	.59
POL	0.20	0.50**	0.02	-0.18	0.06	-0.08	-0.94**	0.08	0.45**	-0.12**	0.02	0.02	-0.01	.65
POR	0.33	0.04	-0.36	-0.01	-0.19	0.16	-0.80	-0.35*	0.59**	-0.40**	0.01	0.37	0.03	.47
ROU	0.17	0.64***	0.24	-0.09	-0.03	-0.11	-0.92*	0.17	0.04	0.02	0.15	0.09	-0.01	.63
ESP	0.43*	0.27	0.12	-0.13	-0.16	-0.13	-0.81*	-0.16	0.36*	-0.24*	-0.01	0.48	0.03	.51
SWE	0.58*	0.76**	0.49*	0.12	-0.17	-0.08	-1.18***	-0.07	0.24	-0.18*	0.05	0.09	-0.01	.59
GBR	0.23	0.31	0.616**	-0.10	-0.03	-0.11	-1.48**	-0.10	0.00	-0.07	0.10	0.28	0.01	.51

Table 10a: Vector Autoregressive: - *Default Risk as Dependent* - bivariate VAR(3) with Default Risk and Political uncertainty. The variables are in log-differences. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*

	$PolIdx_{t-1}$	$PolIdx_{t-2}$	$PolIdx_{t-3}$	DRP_{t-1}	DRP_{t-2}	DRP_{t-3}	$Stock_t$	VIX_t	$iTraxx_t$	PE_t^{Dax}	TED_t	$Gold_t$	$cons$	R^2
AUT	-0.26**	0.10	-0.06	-0.06	0.11**	0.067*	0.56**	0.31***	0.30**	-0.074*	0.05	-0.19	0.02	.57
BEL	-0.29**	0.13	0.04	-0.03	0.02	0.06	0.47*	0.28***	0.26*	-0.05	0.05	-0.07	0.02	.51
EST	-0.32***	0.04	-0.08	0.05	0.05	0.12**	0.66**	0.29***	0.34**	-0.085*	0.04	-0.05	0.02	.53
FIN	-0.29**	0.03	-0.03	-0.05	0.153*	0.04	0.48*	0.32***	0.26**	-0.04	0.05	-0.15	0.02	.55
FRA	-0.23*	0.07	-0.08	-0.12**	0.14**	0.04	0.33	0.29***	0.29**	-0.04	0.03	-0.22	0.02	.59
GER	-0.32**	0.06	-0.04	0.03	0.03	0.085*	0.56**	0.29***	0.28**	-0.068*	0.04	0.00	0.02	.52
GRE	-0.27*	0.11	0.04	-0.03	0.05	-0.02	0.41	0.27***	0.22	-0.05	0.07	-0.17	0.02	.52
IRL	-0.29**	0.11	0.06	-0.15	0.18*	0.01	0.34	0.28***	0.20*	-0.05	0.06	-0.04	0.02	.53
ITA	-0.29**	0.08	-0.04	-0.09	0.15*	0.07	0.50**	0.31***	0.33**	-0.03	0.04	-0.18	0.02	.56
LAT	-0.34***	-0.02	-0.09	0.17*	0.02	0.21**	0.75**	0.30***	0.36**	-0.098***	0.06	-0.12	0.026*	.58
LTU	-0.32**	0.05	-0.05	0.05	0.04	0.11	0.62**	0.29***	0.32**	-0.07**	0.05	-0.06	0.02	.52
NED	-0.25*	0.10	-0.09	-0.03	0.08	0.11**	0.59**	0.31***	0.31**	-0.07	0.03	-0.02	0.02	.56
NOR	-0.28**	0.11	-0.03	-0.08	0.10	0.08	0.38	0.28***	0.24**	-0.06	0.06	-0.10	0.02	.54
POL	-0.34**	0.03	-0.07	0.03	0.07	0.09	0.58**	0.29***	0.31**	-0.074*	0.05	-0.05	0.02	.53
POR	-0.31***	0.11	0.02	-0.07	0.08	0.02	0.37	0.29***	0.23*	-0.03	0.05	-0.04	0.02	.52
ROU	-0.30**	0.08	-0.02	0.01	0.06	0.07	0.55**	0.29***	0.28**	-0.06	0.06	-0.05	0.02	.51
ESP	-0.28**	0.17	0.02	-0.13**	0.04	0.10**	0.36	0.23***	0.31**	-0.04	0.07	-0.13	0.02	.56
SWE	-0.31**	0.07	-0.07	0.00	0.09	0.075**	0.68**	0.33***	0.34**	-0.06	0.05	-0.16	0.02	.55
GBR	-0.26**	0.09	-0.04	-0.07	0.14	0.06	0.49	0.29***	0.29**	-0.03	0.05	-0.02	0.02	.56

Table 10b: Vector Autoregressive: - *Political Uncertainty Index as Dependent* - bivariate VAR(3) with Default Risk and Political uncertainty. The variables are in log-differences. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*

	Core Economies		*Peripheral Economies*		*Eastern Economies*	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	CRP_t^{Core}	$PolIdx_t$	CRP_t^{Periph}	$PolIdx_t$	CRP_t^{East}	$PolIdx_t$
CRP_{t-1}^{Core}	0.260***	-0.101				
CRP_{t-2}^{Core}	-0.101	0.171***				
CRP_{t-3}^{Core}	-0.0152	0.0532				
CRP_{t-1}^{Periph}			-0.194**	-0.119*		
CRP_{t-2}^{Periph}			0.0002	0.0627		
CRP_{t-3}^{Periph}			-0.0429	0.0692		
CRP_{t-1}^{East}					-0.108	0.0860
CRP_{t-2}^{East}					-0.0681	0.0712
CRP_{t-3}^{East}					-0.0723	0.0915
$PolIdx_{t-1}$	-0.200	-0.357***	0.352**	-0.342***	0.0692	-0.456***
$PolIdx_{t-2}$	0.0631	-0.0227	0.0349	0.0591	0.272**	-0.0425
$PolIdx_{t-3}$	0.163	-0.112	-0.0986	-0.0320	0.194	-0.0974
CRP_t^{Core}			0.627***	0.136	0.436***	0.0593
CRP_t^{Periph}	0.524***	0.134*			0.0146	0.150
CRP_t^{East}	0.505***	0.109	0.00852	0.112		
Dax_t	-0.800*	-0.570	1.601***	-0.155	-0.349	-0.438
$MSCI_t$	0.320	0.767***	-0.990***	0.666**	-0.340	0.950***
$V2X_t$	0.0869	-0.161	0.228	-0.144	-0.0193	-0.168
$iTraxx_t$	-0.266	0.483**	0.220	0.396**	0.132	0.365*
PE_t^{Dax}	-0.159**	-0.00994	-0.0783	-0.00524	0.157**	-0.0204
VIX_t	-0.0640	0.432***	-0.348**	0.382***	0.0876	0.457***
$IGCDX_t$	0.190	-0.373*	0.101	-0.217	-0.176	-0.183
TED_t	0.0144	0.0244	-0.00498	0.0295	0.0796	0.0300
$Gold_t$	0.222	-0.284	0.217	-0.173	0.0766	-0.135
cons	-0.00140	0.0183*	0.0221	0.0188	-0.0207*	0.0203*
N	58	58	58	58	58	58
R^2	0.865	0.645	0.776	0.585	0.774	0.578

Table 11: Vector Autoregressive approach on region level: bivariate VAR(3) with Credit Risk Premium and Political uncertainty. Variables: the policy-related uncertainty index (*PolIdx*), the domestic stock markets (*Stock*), the Eurostoxx50 and S&P500 implied volatility (*V2X* and *VIX*), the iTraxx Euro CDX and IG US CDX (*iTraxx* and *IGCDX*), the price-earning ratio of Eurostoxx50 and Dax Indices (PE^{dax} and PE^{Euro50}), the MSCI Global Equity Index (*MSCI*), the TED spread (*TED*) and the gold price (*Gold*). The variables are in log-differences. *Core Economies* are Austria, Finland, France, Germany, Netherlands, Norway, Sweden and UK; *Peripheral Economies* are Belgium, Greece, Ireland, Italy, Portugal and Spain; *Eastern Economies* are Estonia, Latvia, Lithuania, Poland and Romania. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*

	Core Economies		*Peripheral Economies*		*Eastern Economies*	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	DRP_t^{Core}	$PolIdx_t$	DRP_t^{Periph}	$PolIdx_t$	DRP_t^{East}	$PolIdx_t$
DRP_{t-1}^{Core}	0.142	-0.0323				
DRP_{t-2}^{Core}	-0.188**	0.0968*				
DRP_{t-3}^{Core}	0.0282	0.0836*				
DRP_{t-1}^{Periph}			-0.211**	-0.178***		
DRP_{t-2}^{Periph}			-0.0644	0.0745		
DRP_{t-3}^{Periph}			-0.148**	0.0922*		
DRP_{t-1}^{East}					-0.0666	0.0871
DRP_{t-2}^{East}					0.104	0.0457
DRP_{t-3}^{East}					-0.0515	0.109*
$PolIdx_{t-1}$	0.0407	-0.387***	0.329**	-0.349***	-0.0679	-0.448***
$PolIdx_{t-2}$	0.186	0.0483	0.147	0.124	0.0578	-0.0214
$PolIdx_{t-3}$	0.504***	-0.0943	-0.0664	-0.0801	-0.0150	-0.0759
DRP_t^{Core}			0.380***	0.0847	0.294***	-0.00158
DRP_t^{Periph}	0.600***	0.135			0.178	0.198**
DRP_t^{East}	0.454***	0.0381	0.254**	0.0617		
Dax_t	-0.141	-0.452	-0.211	-0.563	-0.140	-0.388
$MSCI_t$	0.0562	0.817***	-0.439	0.578**	-0.431	0.939***
$V2X_t$	0.274	-0.128	0.133	-0.156	-0.180	-0.143
$iTraxx_t$	-0.523	0.425**	0.689***	0.600***	0.00790	0.325
PE_t^{Dax}	-0.0725	-0.00714	-0.202***	-0.0164	0.131*	-0.0231
VIX_t	-0.278	0.395***	-0.368**	0.323**	0.357**	0.417***
$IGCDX_t$	0.493	-0.217	-0.620**	-0.376*	-0.0213	-0.0927
TED_t	0.0250	0.0313	-0.0565	0.0369	0.132**	0.0412
$Gold_t$	0.111	-0.159	0.433*	-0.162	-0.193	-0.147
cons	0.00135	0.0171	0.0229	0.0174	-0.0158	0.0198*
N	58	58	58	58	58	58
R^2	0.78	0.6	0.76	0.61	0.74	0.57

Table 12: Vector Autoregressive approach on region level: bivariate VAR(3) with Default Risk and Political uncertainty. Variables: the policy-related uncertainty index (*PolIdx*), the domestic stock markets (*Stock*), the Eurostoxx50 and S&P500 implied volatility (*V2X* and *VIX*), the iTraxx Euro CDX and IG US CDX (*iTraxx* and *IGCDX*), the price-earning ratio of Eurostoxx50 and Dax Indices (PE^{dax} and PE^{Euro50}), the MSCI Global Equity Index (*MSCI*), the TED spread (*TED*) and the gold price (*Gold*). The variables are in log-differences. *Core Economies* are Austria, Finland, France, Germany, Netherlands, Norway, Sweden and UK; *Peripheral Economies* are Belgium, Greece, Ireland, Italy, Portugal and Spain; *Eastern Economies* are Estonia, Latvia, Lithuania, Poland and Romania. Monthly sample period December 3, 2007 to January 22, 2013. t-Stats are not reported and robust standard errors. Level of significance: *1****, *5*** and *10* per cent.*