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The impact of distressed economies on the EU sovereign market

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ABSTRACT

Financially distressed economies inside the European Union (EU) are being blamed for producing a general increase in borrowing costs. This article analyzes the channels of default risk transmission within the EU countries using the information content in the sovereign Credit Default Swap (CDS) market. We proceed in two directions. First, we test the existence of cross-border volatility effects between the central and the peripheral EU countries. Second, we explore the effect of distressed economies on the default and risk premium constituents of sovereign default swaps. We show a significant volatility spillover from distressed to central European Economic and Monetary Union (EMU) economies. This causality pattern leads to a significant impact on the default swap risk premia. On average, the risk premium accounts for approximately 42% of central EMU spreads and 56% of the spreads for those countries outside of the EMU. The peripheral risk also affects the default component of central economies, although its impact is lower.

1. Introduction

Credit default swaps (CDS, hereafter) are financial instruments that allow debt holders to hedge against default risk. After appearing in the US in the late 1990s, the CDS market exploded over the subsequent decade to over 45 trillion US dollars in mid-2007, as reported by the International Swaps and Derivatives Association (ISDA, 2007). Although the notional outstanding CDS decreased during the financial crisis, it reached approximately 26 trillion at mid-year 2010 (ISDA, 2010). Default swaps focused primarily on municipal bonds and corporate debt during the 1990s, but after 2000, the CDS market expanded internationally into sovereign bonds and structured finance products, such as asset-backed securities. The increasing trading volume of the CDS market could be attributed to several aspects such as the lack of regulation (CDS are traded on over-the-counter markets) or the potential for speculative investors and hedge fund managers to manage these insurance contracts without going long on the underlying asset. According to Chen et al. (2011), the majority of CDS trades were interdealer transactions; however, these authors provide evidence of broad participation in the CDS market as aggregate trading activity did not appear to be concentrated among a small number of dealers.

Compared to the extensive literature on the connections between the CDS market and the bond and/or stock markets (see, for example, Blanco et al., 2005; Forte and Peña, 2009; Norden and Weber, 2009, or Delatte et al., 2012, among others), relatively little is known about the nature of default risk transmission in sovereign credit markets. Recent articles show the increasing interest in the sovereign default risk channels. Dötz and Fisher (2011) document how the market perceptions of European sovereign risk changed after the rescue of Bear Stearns in March 2008: default events within the Eurozone are currently perceived as having non-negligible probabilities, reflecting how some countries are seen as a domestic safe haven at the expense of others. Similarly, Favero and Missale (2012) analyze the intertemporal relationships between the sovereign yield spreads of the main European economies, finding empirical evidence for substantial contagion effects. Under this type of a scenario, where some government bonds have lost their previous role as a domestic safe asset, it becomes crucial to understand the linkages between changes and the volatility of sovereign credit spreads, in particular, among the Eurozone countries.

This article explores the nature of default risk transmission both inside and outside of the Eurozone using the information content in the sovereign CDS spreads. As noted by Longstaff et al. (2011), the use of CDS contracts leads to more accurate estimates of the credit spreads and returns than those based on sovereign

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bond data.[1] Instead of focusing on the potential destabilizing effects of default swaps on the security markets, we stress the crossing effects of the time-varying fluctuations of CDS spreads. Our major concern is to provide additional insights into the nature of default risk transmission in the Eurozone. In particular, we try to assess whether the interactions between the peripheral (Greece, Ireland, Italy, Portugal and Spain) and the core countries is affected by the sharing of the euro as the common currency. Additionally, we estimate which portion of the sovereign CDS increment is attributable either to changes in default probabilities or to investor compensation by means of risk premia. Finally, we also address the time-evolution of the impact of peripheral countries on the components of the CDS spreads.

Our methodological approach consists of three parts. First, we estimate two bivariate BEKK-GARCH models to analyze the spillover effects between peripheral, core and non-EMU countries. Second, we use the decomposition technique described by Pan and Singleton (2008) to break the CDS spread down into two drivers: (i) the risk premium and (ii) its default component. The risk premium represents the compensation to investors due to changes in the default environment, commonly referred as the *distress* risk premium[2] (see Pan and Singleton, 2008; Longstaff et al., 2011). Lastly, we conduct a regression analysis of the components of sovereigns CDS spreads for non-distressed economies against a risk factor that is representative of the behavior of the peripheral countries.

The contribution of the paper is threefold. First, we document a market segmentation between the central and the peripheral countries. A factorial analysis reveals two orthogonal components that distinguish the information content of the peripheral and the non-peripheral CDS spreads. These results extend to the CDS levels and their conditional volatilities, and, in accordance with Laubach (2009), they provide additional evidence supporting fragmentation in the credit markets. A preliminary analysis based on the use of the GARCH methodology for the CDS factors that drive distressed and non-distressed economies suggests a unidirectional volatility transmission pattern from the distressed to the non-distressed economies inside the European Economic and Monetary Union (EMU). A similar analysis for distressed and non-EMU economies does not reveal significant volatility spillover effects from inside to outside the euro, suggesting that retaining the local currency acts as a firewall.

Second, we estimate the compensation to investors for bearing the risk of default in non-distressed economies. According to Pan and Singleton (2008), our estimates are consistent with a systematic risk related to the future default uncertainty. The results also report an (averaged) median risk premium of 56% over the total CDS spreads. Although similar levels of risk premium are found on the median, this component is less volatile outside the EMU. Finally, our regression analysis supports the fact that the default contagion channels are represented not only by the risk premium but also by the default probabilities. Empirical evidence also indicates that the former channel is relatively more important than the latter. Our empirical findings are robust after controlling for both local and global macroeconomic and financial variables.

To summarize, this article analyzes the default risk channels between peripheral and central EU members using the information content of sovereign CDS spreads. The remainder of the paper is as follows. Section 2 introduces the data and its main features. Section 3 directly analyzes the volatility transmission in the CDS spreads. Section 4 explores the determinants of sovereign CDS spreads and Section 5 presents the decomposition of CDS spreads into default and risk premium constituents. Finally, Section 6 provides some conclusions.

2. Data analysis

This section first presents our dataset. We next analyze the heteroskedastic behavior of default swaps. Finally, we explore the existence of commonalities in our data.

2.1. The dataset

Our sample comprises weekly CDS spreads with 1-, 3- and 5-year maturities of Senior Unsecured Sovereign debt denominated in USD under the Old Restructuring clause.[3] Data are collected from CMA, which has been provided by Datastream.[4] Our dataset spans from January 2008 to July 2012, a period characterized by a significant increase in CDS levels, high volatility and uncertainty in the Eurosystem. We select the member countries of the EU since 1995 with available CDS spreads. More precisely, we collect the most important economies in terms of GDP that belong to the EMU – Austria, Belgium, Germany, Finland, France, Greece, Ireland, Italy, the Netherlands, Portugal and Spain – as well as some control countries – Denmark, Sweden and the United Kingdom (UK) – outside of the EMU area.

2.2. Univariate volatility analysis

A common feature in financial series is heteroskedasticity. This subsection analyzes the behavior of the univariate conditional variances for 5-year CDS spread increments, a matter of interest in a subsequent analysis. From the different families of GARCH models at our disposition, we select the Exponential GARCH, or EGARCH, introduced by Nelson (1991),

$$\Delta CDS_t = c + \varphi \Delta CDS_{t-1} + \epsilon_t \tag{1}$$

$$\ln(h_t) = \alpha_0 + \sum_{j=1}^{q} g_j(z_{t-j}) + \sum_{i=1}^{p} \beta_i \ln(h_{t-i}) \tag{2}$$

$$g_j(z_{t-j}) = \alpha_j z_{t-j} + \psi_j(|z_{t-j}| - E|z_{t-j}|) \quad j = 1, \ldots, q \tag{3}$$

$$z_t \sim iid\ N(0,1)$$

where the mean equation follows an AR(1) process, and p and q denote the lags for the variance and the innovations, respectively. There are several reasons behind our modeling choice. First, the EGARCH allows for an asymmetric response to shocks; in this way, the model captures whether upward movements in the CDS spread market are followed by higher volatilities than the down-

[1] The CDS spreads generally approximate the spreads of the referenced bonds. However, time-varying differences or basis risk between the CDS and the sovereign bond spreads could appear for several reasons. First, the empirical literature on the role of the CDS markets in the discovery process is consistent with the hypothesis that new market-wide information disseminates faster in the CDS than in the bond markets (Forte and Peña, 2009; Delis and Mylonidis, 2011). Second, cash-flow differences between default swap contracts and bonds can also cause differences in spreads (Longstaff et al., 2005). Finally, the sovereign CDS market is more liquid than the corresponding sovereign bond market. CDS contracts provide a simple way to short credit risk, a costly strategy when implemented in the secondary cash market (Blanco et al., 2005).

[2] The distress risk premium differs from the *default event* premium, i.e., the compensation required for the bond price changes at the event of default. The default event premium has been the subject of analysis in previous studies such as Driessen (2005) or Berndt et al. (2005). A theoretical discussion about the default event premium can be found in Jarrow et al. (2005) or Yu (2002).

[3] ISDA identifies six credit events: bankruptcy, failure to pay, debt restructuring, obligation default, obligation acceleration, and repudiation/moratorium. The Old Restructuring clause qualifies any restructuring event as a credit event, and any bond of maturity up to 30 years is deliverable.

[4] Mayordomo et al. (2010) provide empirical evidence that the quotes of the CMA database lead the price discovery process with respect to those provided by other databases such as Markit, JP Morgan or GFI, among others.