



# Short-term determinants of the idiosyncratic sovereign risk premium: A regime-dependent analysis for European credit default swaps



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## ABSTRACT

This study investigates the dynamics of the sovereign CDS term premium, i.e. difference between 10Y and 5Y CDS spreads. It can be regarded a forward-looking measure of idiosyncratic sovereign default risk as perceived by financial markets. For some European countries this premium featured distinct nonstationary and heteroskedastic pattern during the last years. Using a Markov-switching unobserved component model, we decompose the daily CDS term premium of five European countries into two unobserved components of statistically different nature and link them in a vector autoregression to various daily observed financial market variables. We find that such decomposition is vital for understanding the short-term dynamics of this premium. The strongest impacts can be attributed to CDS market liquidity, local stock returns, and overall risk aversion. By contrast, the impact of shocks from the sovereign bond market is rather muted. Therefore, the CDS market microstructure effect and investor sentiment play the main roles in sovereign risk evaluation in real time. Moreover, we also find that the CDS term premium response to shocks is regime-dependent and can be ten times stronger during periods of high volatility.

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## 1. Introduction

Tensions in the euro area sovereign debt market represent the most recent form of the global financial crisis. The succession of events following the beginning of the European sovereign debt crisis has clearly underscored that excessive systemic sovereign credit risk can lead to detrimental real macroeconomic effects and financial instability. Indeed, it is because of the risk of macroeconomic shocks and financial contagion that regulators and governments are currently so concerned about sovereign-specific credit risk. However, there is little theoretical and empirical basis on how to interpret the short-term dynamics of sovereign risk premia (i.e., compensation for sovereign risk as perceived in real time by financial markets), which have changed very abruptly in recent years.

The use of sovereign CDS has increased dramatically during the last decade. They represent key instruments for credit risk transfer related to sovereign exposures. However, since the onset of the U.S. subprime crisis they have become very controversial and many commentators have blamed them for exacerbating the credit crunch by allowing excessive leverage and risk-taking by financial

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institutions and even market manipulation (see Calice et al., 2013, for a discussion). CDS spreads are deemed to be a more direct measure of credit risk than sovereign bond yields, since they are not distorted by other risks unrelated to defaults and market microstructure (Longstaff et al., 2005). In particular, as CDS contracts do not require up-front funding, CDS spreads are less distorted by liquidity dry-up during crisis periods (Chen et al., 2007).

Despite a sizeable literature on credit risk, empirical studies on CDS that involve modeling of the entire credit curve are still rare. A major reason for this is that data on sovereign CDS premia for a wider range of maturities have only recently become available. Indeed, although CDS contracts on some sovereign issuers are extensively traded, the market is still rather illiquid. Consequently, there is a paucity of empirical work regarding their CDS term structure, with studies focused mainly on U.S. synthetic corporate indices such as the CDX (see Longstaff et al., 2005; Calice et al., 2012). Pan and Singleton (2008) explores the nature of default arrival and recovery implicit in the term structure of the sovereign spreads of Korea, Mexico, and Turkey.

Specifically, we posit that the CDS term premium embeds the economy-wide forward-looking default risks. We measure this term premium as the difference between sovereign CDS spreads at 10-year and 5-year maturities. These two maturities are the most liquid segments of the sovereign CDS market. Therefore, to our knowledge this is the first study to explicitly analyze the sovereign CDS term premium (Calice et al., 2012, examine the U.S. corporate CDX term premium). In general, the evolution of the CDS term premium across time resembles the behavior of the yield curve and follows a mean-reverting process, despite short-term spikes during periods of financial turmoil. These spikes can be seen as regime changes (normal times vs. turmoil). Consequently, we assume that the term premium can be decomposed by means of the unobserved component model into two components. The first is a stationary component, which corresponds to the theoretical behavior of the CDS term premium and as such should be driven by fundamental forces (see also Garratt et al., 2006). The second component, which is modeled as a driftless random walk process, represents a seemingly unpredictable component in the term premium. Essentially, this component captures market uncertainty, which induces random walk behavior in the overall CDS term premium. The apparent heteroskedasticity will also be accounted for. We do this by means of a Markov-switching model that allows for two different volatility regimes for each CDS term premium subcomponent.

Our study focuses on five European sovereigns whose CDS term premia experienced notable swings during the global financial crisis period, which in turn resulted in nonstationary patterns and abrupt changes in their volatilities. This applies both to countries of the EMU periphery (we consider Italy, Spain, and Portugal) and to Central European countries (we consider the Czech Republic and Poland).<sup>1</sup> Our central argument here is that the evolving pattern of the sovereign CDS term premium can provide the relevant authorities with more detailed information on financial market perceptions of the vulnerabilities in sovereign debt markets as well as on the sources of propagation of those vulnerabilities. A better and deeper understanding of these forces will in turn serve as a useful tool for the identification of systemic and contagion risks and will also potentially enable authorities to respond effectively in advance in order to mitigate shocks jeopardizing financial stability.

A number of important empirical results emerge from this analysis. First, we show that the decomposition of the CDS premium of a sovereign entity is relevant and major changes in the CDS term premium are driven by spikes in the nonstationary component. Second, decomposing the CDS term premium proves useful in understanding its short-term dynamics. Most selected financial market variables, observed at high frequency, significantly affect the dynamics of the nonstationary component, which is a seemingly unpredictable random walk. Third, the CDS term premium shows very pronounced regime-dependent behavior. In particular, the response of the CDS term premium to normalized shocks to some financial variables can be ten times stronger during periods of high volatility. All in all, our results show that CDS market microstructure effects (i.e., liquidity) and investor sentiment (as measured by stock market returns and the VIX) seem to play the main role in sovereign risk evaluation. The regime-dependent behavior suggests the existence of market overshooting during turmoil periods. These findings cast some doubt on whether short-term movements of the CDS credit curve should be interpreted in terms of changes in sovereign default risk rather than as a (sometimes exaggerated) response to other factors arguably disconnected from the actual risk of the sovereign concerned.

The remainder of the paper is organized as follows. Section 2 provides some theoretical considerations on the economic determinants of the sovereign CDS term premium and describes the data used in the analysis. Section 3 presents our methodology. Section 4 reports the results from the empirical analysis. Section 5 summarizes the results and makes concluding remarks.

## 2. CDS term premium

The CDS term premium is measured as the difference between spreads at 10-year and 5-year maturities and can be viewed as representing the default risk uncertainty over a 5-year time horizon. Therefore, the CDS term premium of a sovereign can be interpreted as a forward-looking measure of sovereign default risk as perceived by financial markets in real time. It also seems that this term premium tracks more closely the *idiosyncratic* part of sovereign credit risk, as it is arguably less prone to contagion than sovereign CDS/bonds of certain maturity. If the forces of international contagion are in place there is in principle no reason to believe that they might have a differential impact on 5-year and 10-year maturities and affect the term premium.<sup>2</sup>

<sup>1</sup> Data availability and reliability constrain our sample to these five countries, whereas countries such as Ireland and Hungary could be included as well, unlike Greece, whose sovereign CDS quotes were distorted and bear little economic significance in the face of the expected imminent credit event that was finally declared in March 2012.

<sup>2</sup> This is evident from simple correlation measures, which are substantially higher for pairs of sovereign CDS at certain maturity (5 or 10 years) than between the corresponding CDS term premia. Similarly, it is relatively straightforward to extract a single informative factor from a sample of CDS quotes than from a sample of CDS term spreads. Therefore, looking at the spread at a particular maturity implies the basic identification strategy of isolating idiosyncratic from common factors. This challenge has recently been tackled by several papers aimed at examining contagion, especially in the European context. By contrast, analysis of the slope of the sovereign CDS credit curve has been largely ignored in the literature.

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