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## On the compensation for illiquidity in sovereign credit markets<sup>☆</sup>



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### ABSTRACT

This article analyzes the role of liquidity in the sovereign credit default swap (CDS) market. We employ a continuous-time specification to incorporate illiquidity as an additional pricing factor of default swap contracts for the most developed economies. The illiquidity discount process is identified as compensation to investors for the risk of unwinding their positions when trading in the less liquid part of the curve, and the information about illiquidity is directly extracted from the term structure of sovereign CDS spreads. Our empirical findings reveal that a positive time-varying illiquidity premium is embedded in sovereign default swaps. These risk premia exhibit substantial comovement across countries. Only unidirectional causality from default to liquidity is detected for the overall market.

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## 1. Introduction

The financial market turmoil that started in August 2007 resulted in a sharp rise in borrowing costs, leading to a systematic increment in the prices of insurance against default (Dieckmann and Plank, 2012). Under those extreme market conditions, the liquidity of many credit instruments evaporated, and concerns about the existence of a market-wide liquidity risk factor being priced in credit markets have made room for related studies in the financial literature. Along these lines, the empirical evidence about the existence of a liquidity risk factor that is priced in the corporate bond markets is conclusive. A non-exhaustive review of this literature comprises the early work of Longstaff et al. (2005), who were pioneers in capturing the illiquidity discount in corporate bonds using default swap spreads as pure measures of default risk. Bao et al. (2011) also find that bond illiquidity changes over time, exhibiting an important commonality in a cross-section of US corporate bonds, and Lin et al. (2011) provide evidence that market-wide liquidity is priced in bond returns. In addition, De Jong and Driessen (2012) show a significant liquidity premium in a sample of corporate bond indexes of US bonds, being larger for lower-rated firms, and Dick-Nielsen et al. (2012) document that the spread contribution from illiquidity increases dramatically with the inception of the subprime crisis. More recently, Bao and Pan (2013) find that illiquidity is related to the excess volatility of corporate bonds, and Acharya et al. (2013) show that liquidity risk becomes a significant determinant of US corporate bond returns, especially during financially stressed time periods.

Although there is consensus on the importance of illiquidity shocks in corporate credit markets, fewer papers have examined the role of liquidity in sovereign credit markets under stressed circumstances. For instance, Beber et al. (2009) and Arghyrou and Kontonikas (2012) find that during periods of market stress with large flows in the Euro-area bond market, liquidity explains a greater proportion of sovereign yield spreads than credit quality. There is also recent evidence that sovereign liquidity matters to institutions and institutional investors. Krishnamurthy and Vissing-Jorgensen (2012) document that decreases in Treasury supply raise the price of liquidity and drive down the yield on Treasuries relative to less liquid assets. Fontaine and Garcia (2012) study the role of financial intermediaries and find that funding liquidity is an important component of outstanding US Treasury bond returns, especially during crises. Hu et al. (2013) argue that abnormal noise in US Treasury prices is a symptom of shortage in arbitrage capital, and that this abnormal noise can be used as a proxy of illiquidity conditions of the overall market. A limited number of papers have suggested different liquidity effects at different maturities. Goyenko et al. (2011) note that during recessions the US Treasury market becomes more illiquid, and the increase in illiquidity is more pronounced for short-term maturities. Pan and Singleton (2008) indicate that illiquidity could be behind the idiosyncratic behavior of the short-term sovereign default swap maturities. Additionally, Bongaerts et al. (2011) suggest that unwinding a short-maturity CDS contract may be more costly than for a 5-year CDS. This preliminary evidence of different liquidity effects at different maturities motivates us to investigate whether there exists an illiquidity risk premium contained in the term structure of the CDS market to compensate those investors trading the most illiquid short-term contracts.

This paper studies the role of sovereign illiquidity risk, focusing on periods of financial distress. The information about default and liquidity is extracted from sovereign credit default swap (CDS) contracts, the preferred instrument of investors for shorting sovereign risk or speculating against the default of a country. CDSs are suitable tools for capturing the credit risk of the reference, as the informational content in default swap spreads leads stock and bond markets in terms of the price discovery process; see Blanco et al. (2005) or Forte and Peña (2009). The sample comprises the full term structure of sovereign CDSs for seven countries belonging to the G8 group (United States, Japan, Germany, France, United Kingdom, Italy and Russia) during the period from January 2006 to May 2013, covering the current financial crisis.

The modeling framework employed here builds on the spirit of Longstaff et al. (2005) and Arakelyan et al. (2013), who identify the illiquidity discount process as the unexplained component in bonds and

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