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Liquidity in Credit Default Swap Markets☆

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ABSTRACT

This article explores the impact of liquidity on Credit Default Swap (CDS) spreads. We proxy for CDS liquidity using measures that capture several dimensions of liquidity. We characterize the relationship between liquidity and default swap spreads in two ways: first, we perform a panel data analysis to study the link between our liquidity proxies and CDS spreads. Our sample comprises a panel with more than 280 US firms. Second, we examine whether liquidity is priced by CDS investors by examining the interactions between our liquidity proxies and the risk premium embedded in CDS spreads. The default risk premium accounts for 40% of CDS spreads. Our results indicate that the bid-ask spread and noise measures are important factors in explaining the illiquidity of both CDS spreads and risk premia. The Fitch liquidity score and the number of contributors are poor measures of liquidity.

1. Introduction

Credit Default Swap (CDS, hereafter) contracts allow investors to trade on and transfer the credit risk of a company. Traditionally, CDS spreads represent the fair insurance price of the credit risk of a company. Because of their contractual nature, CDS contracts are less influenced by convenience or liquidity factors than are bond assets (Longstaff et al., 2005). However, recent empirical evidence suggests that CDS spreads may not be fully explained by credit risk factors related to the underlying company (Collin-Dufresne et al. (2001), Blanco et al. (2005), Tang and Yan (2008), and Fulop and Lescourret (2007), among others). Additionally, the soaring CDS spreads witnessed during the financial crisis of 2007–2011 raise the question of whether CDS prices are affected by factors other than default risk. Given the central role that CDS markets play in assessing the creditworthiness of firms and institutions and their ability to lead other markets (see Blanco et al., 2005; Forte and Peña, 2009), this question is of paramount importance.

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This article assesses the relevance of liquidity in default swap contracts when investors are trading under financially distressed conditions. We hypothesize that liquidity is an important element in CDS spreads for several reasons: first, liquidity can be a significant factor in default swap contracts due to the over-the-counter (OTC) nature of CDS markets. Although, at present, many default swap contracts are settled and executed in clearing houses, our sample spans in a period during which there was no central organized place or exchange where trading orders were matched. Instead, the CDS market operated through a decentralized and opaque dealer network.

Other factors such as information asymmetries suggest that liquidity plays an important role in CDS markets. For instance, Acharya and Johnson (2007) find evidence of insider trading in credit derivatives markets. They argue that many banks and financial institutions trade CDS of companies for which they provide financing. Therefore, CDS contracts allow those banks to exploit private information about their clients that is not available to the public. As a result, asymmetric information can lead to reduced liquidity (see, for instance, Easley et al., 1996; Brockman and Chung, 2003). As Acharya and Johnson (2007) note, credit derivative markets may be especially vulnerable to asymmetric information and insider trading problems because most of the players in CDS markets are insiders.

Finally, the CDS market is opaque and controlled by a small number of financial institutions.[1] This fact has implications for liquidity, as small markets are likely to be less competitive and are hence less liquid. The reason for the small number of market players may be the high cost of entry into CDS markets. During the second half of 2010, the CDS market constituted approximately 5% of the OTC derivatives market in terms of the notional amount outstanding. In nominal terms, the total amount outstanding in the CDS market was 29.9 trillion US dollars, compared to the 601.1 trillion US dollars in the overall OTC derivatives market (see BIS (2011) May report).

The efficiency of CDS markets is an important policy issue (Acharya and Johnson, 2007). CDS contracts were created to satisfy the demand for instruments that can provide accurate information about the creditworthiness of companies that they reference and the possibility of timely trading on the credit risk of their underlying companies. Hence, the presence of market frictions can distort the true measure of firms' creditworthiness. Additionally, since CDS markets are the common mechanism for shorting credit risk, having higher illiquidity associated with these markets can result in higher hedging costs for protection buyers.

We empirically analyse the relationship between CDS spreads and liquidity. We proxy for liquidity using a number of individual measures such as the absolute bid-ask spread, Fitch liquidity score – a synthetic indicator of liquidity provided by Fitch – and the number of contributors (NOC) providing quotes to Markit, one of the largest providers of default swap data. In addition, we consider the aggregate measure of illiquidity of Hu et al. (2013). Our analysis is based on a comprehensive panel of CDS spreads for 283 US firms taken from Markit. This dataset consists of a diversified sample of CDS names across different rating categories and sectors for a time period that covers the recent financial crisis of 2007–2011. Moreover, we have access to extensive data on bid-ask spreads and actual default probabilities from CMA Datastream and Moody's, respectively.

Our study is developed in two parts. First, we conduct a panel data analysis to study the relationship between changes in each of our liquidity proxies and plain CDS spreads. Second, we examine whether liquidity is priced in default swap contracts. Using the methodology developed by Pan and Singleton (2008) and applied by Longstaff et al. (2011), we are able to disentangle the extent to which CDS spreads are due to compensation for the risk premium or pure effects of default. Then, we analyse the relationship between our liquidity proxies and the default and risk premium components of default swap spreads. The risk premium denotes the compensation demanded by protection sellers that is associated with the unpredictable changes in the default risk environment. This premium is also known as the *distress* risk premium as opposed to the *default event* premium, which embodies the reward for changes in the bond price in the event of default (see Driessen, 2005; Berndt et al., 2008).

Our results show a strong and significant relationship between changes in illiquidity proxies and changes in default swap spreads. In particular, we find that changes in the absolute bid-ask spread and noise measure are significant determinants of changes in CDS spreads during the period 2004–2007. Moreover, illiquidity measured by bid-ask spreads and noise intensifies as the credit crisis worsens. Moreover, changes in the Fitch liquidity score and NOC also exhibit a statistically significant relationship with changes in CDS spreads. However, the signs of their coefficients are contrary to expectations, potentially because the NOC variable (or related variables such as the Fitch score) proxies for CDS demand rather than liquidity.[2]

Additionally, our results on the two components of CDS spreads, risk premium and default risk, also show a significant interaction between CDS constituents and our liquidity proxies. With regard to the risk premium, we document a consistent deviation in the parameters governing the dynamics of the instantaneous, risk-neutral arrival rate of a credit event ($\lambda^{\mathbb{Q}}$) under risk neutral ($\mathbb{Q}$) and physical ($\mathbb{P}$) measures in the corporate CDS market. We impose an Ornstein–Uhlenbeck (OU) mean-reverting structure for the logarithm of the risk-neutral default intensity $\lambda^{\mathbb{Q}}$. The Maximum Likelihood (ML) model estimates reveal a substantially high (low) mean-reversion rate under $\mathbb{P}$ ($\mathbb{Q}$) measures. To place these findings in perspective, investors anticipate a worsening credit-risk environment over time. Pan and Singleton (2008) also interpret this fact as evidence that an important fraction of systematic risk is being priced via the distress premium in the context of sovereign CDS markets. According to our results, the risk premium (on average) ranges from 22.24 bps for AA-rated companies to 254.09 bps for B-rated companies. In terms of their relative contribution, the risk premium represents approximately 28% (42%) of the total

[1] See "EU hits banks with Credit Default Swap probe", Reuters, April 29, 2011.
[2] We thank the referee for noting the relationship between the number of contributors and the demand for default swap contracts.

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