Understanding transactions prices in the credit default swaps market

Dragon Yongjun Tang a,*, Hong Yan b,1

a School of Economics and Finance, The University of Hong Kong, Pokfulam Road, Hong Kong
b Shanghai Advanced Institute of Finance, Shanghai Jiaotong University, 211 West Huai Hai Road, Shanghai 200030, China

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Abstract
The price determination of over-the-counter derivatives is a major concern for market participants and policy makers since the recent global financial crisis, which triggered substantial law-making and new regulations. We use a unique, comprehensive dataset to examine the tick-by-tick price changes associated with both trades and quotes on credit default swaps (CDS). We find that, while fundamental factors such as volatility are important drivers of CDS spread changes, especially during the crisis period, CDS spread movements are also affected by supply–demand imbalance and market liquidity, reflecting the impact of slow-moving capital, as well as the capacity constraints of financial intermediation.

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*Corresponding author. Tel.: +852 22194321.
E-mail addresses: yjtang@hku.hk (D.Y. Tang), hyan@saif.sjtu.edu.cn (H. Yan).
1 Tel.: +86 21 62932031.

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1. Introduction

Recent studies have raised serious questions about the pricing mechanism of credit default swaps (CDS) despite their popularity as credit risk benchmarks. For instance, Hilscher, Pollet, and Wilson (2015) argue that CDS hardly contribute to price discovery. Understanding better the over-the-counter derivatives markets in general, and the CDS market in particular, is an important task, as it is one of the major responsibilities of the Office of Financial Research at U.S. Department of Treasury, which was set up under the mandate of the Wall Street Reform and Consumer Protection Act (“Dodd-Frank Act”). Most extant studies on CDS pricing, however, are based on dealer quotes rather than actual transactions. In this paper, we analyze tick-by-tick trade and quote data to provide a comprehensive depiction of the price determinants in the CDS market.

CDS spreads have been increasingly used as a measure of credit risk in practice. For example, Deutsche Bank provides an online mapping from CDS spreads to default probabilities for sovereign entities, and Moody’s calculates CDS-implied expected default frequencies for companies. Major media outlets such as Bloomberg have also frequently used CDS spreads as a barometer for the financial health of corporations and sovereign entities. Such interpretations often equate CDS spread increases to higher levels of default risk. However, this usage of CDS spreads has raised concerns about its accuracy as most CDS contracts are sparsely traded. Indeed, the Bank for International Settlements (BIS) cautions that “the same CDS spread in numerical terms may not necessarily imply the same risk” (BIS, 2010, p. 38). Jarrow (2012) also questions the practice of inferring default probabilities from CDS spreads. In contrast, the International Monetary Fund (IMF) in its 2013 Global Financial Stability Report argues that CDS spreads are an effective gauge of credit risk for sovereign entities (IMF, 2013, Chapter 2). This debate calls for a systematic investigation of the relative importance of various determinants that drive the changes in CDS spreads.

CDS are insurance-type contracts providing protection against losses of debt instruments in pre-specified credit events. Trading in CDS contracts is done over-the-counter (OTC), mostly facilitated by inter-dealer brokers. While some contracts have multiple trades in a day, for many contracts the time span between two consecutive trades can be measured in days and weeks. This sparse trading pattern contributes to the concern about the information content of CDS spreads (Kapadia and Pu, 2012; Hilscher, Pollet, and Wilson, 2015; Marsh and Wagner, 2016), and highlights the importance of liquidity in CDS pricing (e.g., Bongaerts, de Jong, and Driessen, 2011; Tang and Yan, 2012). To properly account for this feature of infrequent trading, we examine the change in CDS spreads between two consecutive trades, based on time-stamped transactions data on North American corporate names from the GFI Group. Using both trades and quotes data has the advantage of producing more reliable inferences. Our sample period spans from 2002 to 2009, covering the period of the global financial crisis from late 2007 to early 2009. In this study, we provide insights into the determinants of short-run price movements in the OTC credit derivatives market.

We find that, consistent with the literature on the changes in credit spreads, changes in macro-economic conditions and firm-level fundamentals are important determinants of CDS spread changes. Among the firm-level fundamental variables, changes in stock return volatility and changes in leverage ratio are the most dominant. Stock returns on their own account for about 6% of the variation in CDS spreads, but that explanatory power is substantially reduced once other firm-level variables are controlled for. Among the market-level variables, changes in VIX, the so-called “fear factor” that proxies for the market-wide risk, have more significant explanatory power than others. The prominent role of stock return volatility, both at the firm level and at the market level, in explaining CDS spreads changes is consistent with the evidence in Ericsson, Jacobs, and Oviedo (2009), Zhang, Zhou,
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