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Endogenous liquidity in credit derivatives ☆

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ABSTRACT

We study the determination of liquidity provision in the single-name credit default swap (CDS) market as measured by the number of distinct dealers providing quotes. We find that liquidity is concentrated among large obligors and those near the investment-grade/speculative-grade cutoff. Consistent with endogenous liquidity provision by informed financial institutions, more liquidity is associated with obligors for which there is a greater information flow from the CDS market to the stock market ahead of major credit events. Furthermore, the level of information heterogeneity plays an important role in how liquidity provision responds to transaction demand and how liquidity is priced into the CDS premium.

1. Introduction

The infrastructure of the credit default swap (CDS) market has undergone significant transformations in recent years, such as the standardization of documentation and settlement, more streamlined trade processing and confirmation, the mitigation of counterparty risk with central clearing, and improved transparency through the reporting of transaction statistics (Intercontinental Exchange, 2010a; Duffie, Li, and Lubke, 2010). While these developments make it natural to consider a migration toward exchange trading, the CDS market has so far remained an over-the-counter structure dominated by major banks.[1] Through

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[1] The recently formed clearing facility for credit default swaps, ICE Trust, counts these prominent financial institutions as its members: Bank of America, Barclays Bank, BNP Paribas, Citibank, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan Chase, Merrill Lynch,

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direct or electronic communications, often with the assistance of inter-dealer brokers, these banks disseminate bids and offers to potential clients seeking to trade credit protection.[2] Consequently, they play a crucial role in providing liquidity to the market. Despite its clear academic and practical relevance, not much is known about the behavior of liquidity provision in the credit derivatives market. In this paper, we offer insights into liquidity determination in the single-name CDS market by exploiting available data on an important dimension of liquidity—the number of distinct dealers providing quotes about a given obligor on any given day, which can be considered as an empirical proxy for market depth.

Operating primarily as a quote-driven dealership market, the CDS market nonetheless shares a few characteristics with limit order markets. First, although major banks play a significant role in this market, the barrier to entry is likely to be low because the total number of entities providing quotes can be quite large.[3] This blurs the traditional boundary between dealers and non-dealers; rather, it is the decision to supply or take liquidity that distinguishes the participants. Second, electronic trading systems have been developed to facilitate access to dealer quotations. To the extent that investors can obtain quotes from multiple dealers in these trading systems, they may have access to what resembles a small portion of a limit order book. These features suggest that we can think of CDS liquidity from the perspective of the recent literature on endogenous liquidity provision in limit order markets.

One potentially important consideration in the decision to supply or demand liquidity is the nature of information possessed by traders. The dominant players in the CDS market, i.e., major banks, may have access to non-public information on CDS obligors through their lending and investment banking activities, and can potentially trade on this information. In an important recent study, Acharya and Johnson (2007, AJ hereafter) analyze the lead–lag relation between the CDS market and the stock market. They show that the information flow from the CDS market to the stock market becomes stronger when a CDS obligor's credit condition deteriorates, and that this information flow is positively related to the number of the obligor's relationship banks.[4] This looks, then, like evidence of insider trading or at least informed quote revision by the banks.

In classical market microstructure models such as Kyle (1985) and Glosten and Milgrom (1985), an uninformed market maker provides liquidity to other uninformed traders and an informed insider who submit market orders. When the information advantage of the insider increases, the market maker widens the bid-ask spread or decreases the market depth to protect herself against the risk of being exploited by the insider. In other words, an increased presence of information asymmetry is associated with a reduction in liquidity provision by an uninformed market maker.

The more recent literature on limit order markets recognizes the decision to provide liquidity as endogenously shaped by the strategic competition among trading agents who might be differentially informed. In this setting, informed traders emerge as natural liquidity providers because their superior information mitigates the adverse selection risk associated with the use of limit orders. In an experimental setting, Bloomfield, O'Hara, and Saar (2005) find that informed traders initially use market orders to exploit the value of their information, but switch to limit orders as this value starts to dissipate. Kaniel and Liu (2006) argue that long-lived private information increases the execution probability of limit orders and makes them more appealing to informed traders. Empirically, they show that limit orders are more informative than market orders on the NYSE. Goettler, Parlour, and Rajan (2009) numerically solve the equilibrium of a dynamic limit order market in which traders decide whether to acquire information about the fundamental value of the traded asset before placing market or limit orders. They show that traders with no inherent motive to trade have the most incentive to acquire information and that they submit most of the limit orders. Overall, these papers confirm that informed traders play an important role in providing liquidity to the market.

Much of this literature assumes the sequential arrival of traders and focuses on the resulting dynamics of the limit order book. Meanwhile, the nature of private information is greatly simplified, typically, by assuming common information about the value of the asset among informed traders. In the credit derivatives market, however, major dealers' information about credit risk could be diverse. For instance, the differential information major banks had about the state of the U.S. housing market likely resulted in different exposures to subprime mortgages during the recent credit crisis (e.g., Lehman Brothers vs. Goldman Sachs).

A model of endogenous liquidity provision that incorporates heterogeneously informed traders is provided by Boulatov and George (2010). In an extension of the Kyle (1985) model, they assume that informed traders can submit price-contingent supply schedules (which are essentially a collection of limit orders) or market orders. In their model, diverse private information results in imperfect competition among informed traders, who want to earn additional rents by providing liquidity. However, the limit orders that they place can partially reveal their information to the rest of the market.

(*footnote continued*)
Morgan Stanley, Nomura, Royal Bank of Scotland, and UBS (Intercontinental Exchange, 2010b).

[2] The process of trading in the CDS market usually begins with clients receiving indicative quotes from dealers through information providers such as Bloomberg. They then initiate an RFQ (request-for-quote) with a single dealer or multiple dealers by phone, email, or through an electronic trading platform. Dealers can respond with competitive binding quotes that often result in actual transactions. They can also respond with non-competitive quotes with wide bid-ask spreads or choose not to provide quotes if they do not wish to trade.

[3] According to the Markit.com User Guide (2008), 74 global banks and two brokers contribute data to Markit's credit derivatives database as of December 2006.

[4] This measure is constructed by counting the number of a firm's active lead lenders in the bank loan market at any point in time. For details, refer to Section 2.