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Liquidity basis between credit default swaps and corporate bonds markets



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ABSTRACT

Liquidity risk has drawn much attention among academic researchers, institutional professionals and financial regulators in various financial markets. This paper empirically investigates the difference and relationship between the liquidities of CDS and corporate bond markets. The liquidity basis which is defined as the difference of liquidity between CDS and corporate bond are negative most of the time across different rating categories, implying more illiquid corporate bond market and the fact that CDS market moves quickly in reflecting credit quality changes. There exists significant Granger-causality from CDS liquidity to bond liquidity, and some bidirectional Granger-causality for some investment grade reference entities. The empirical tests are performed in the VAR system including the monetary policy variables and financial market variables. The relative bid-ask spread adopted by many researchers turns out to be less reliable as a measure of liquidity for CDS and corporate bond where the credit spread and liquidity risk are positively correlated.

1. Introduction

Financial markets have been experiencing periodic turbulences for the past several decades and these cyclical ups and downs are going to be repeated in the future. Some of them are associated with stock and fixed income market crashes and others are related to the speculative investments in derivative security markets. The 2007–2009 financial crisis is triggered initially by the burst of the U.S. housing bubbles but mainly by a liquidity shortfall in U.S. banking systems. Worldwide economies slowed down as credit condition is tightened, most financial assets became illiquid, and many large financial institutions and other major players in the market collapsed during this period.

Liquidity, or often called market liquidity, in general is defined as an ability of asset to be traded quickly in any quantity without causing significant movement in price and within a short period of time. Funding liquidity, on the other hand, refers to an ability of business to possess sufficient liquid asset to meet its obligation to pay its liability. Many empirical studies naturally found that the liquidity effect is an important economic factor, and significant in many asset prices. While the effect of market risk and credit risk in asset prices have been theoretically and empirically studied by many financial researchers and industry professionals, the research on liquidity risk has been less developed and the pricing impact of liquidity risk on financial instrument is relatively difficult to be measured and quantified. In addition, the valuation of the liquidity risk in the credit derivatives markets is a critical issue to be addressed from an investment perspective, since outstanding credit derivative contracts take significant portion in the global financial markets. In this paper, we empirically investigate the differences and interactions between the liquidities of CDS and corporate bond markets as measured by the transaction costs.

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Credit derivative is a financial contract whose value is derived from the credit risk of underlying basic financial asset. Since its introduction in the mid-1990s, it has been growing rapidly and evolving into many complicated products as investors and market participants become more sophisticated. However, the rapid expansion of the credit derivatives market, the lack of comprehension of the complex credit products and loose regulatory supervision have raised some policy concerns about the market stability and the adverse selection problem that can influence the liquidity of credit derivatives. A proper understanding of the liquidity structure and its pricing impact on the credit derivative market is essential for the adequate implementation of risk management and the efficiency and stability of financial markets as evidenced by the recent several financial crises. Among many credit derivative securities, credit default swap (CDS) is the most typical and widely traded security.

Past literatures on liquidity theoretically investigate the significance of liquidity risk in asset prices, and empirically find discrepancies of liquidity risk in stocks, bonds and other derivative securities in various markets. In equilibrium asset pricing framework, [Acharya and Pedersen \(2005\)](#) derive the liquidity-adjusted CAPM where the asset's required excess return depends on its expected illiquidity cost and on the covariance of the asset return and asset illiquidity cost with the market return and the market illiquidity cost. [Bongaerts, de Jong, and Driessen \(2011\)](#) extend this asset pricing model incorporating liquidity risk for derivative securities where equity assets are in positive net supply and the hedge assets are in zero net supply. They apply GMM estimation to test the liquidity effects empirically for equity and CDS markets. Both of these models found that liquidity is a priced factor that affects asset returns and liquidity risk and expected liquidity premiums are economically significant in equity and derivatives markets.

The liquidity effects in equity and bond markets are investigated and compared empirically in many literatures. [Chordia, Roll and Subrahmanyam \(2000\)](#) find the existence of macroeconomic commonality in stock market liquidity without recourse to asset pricing implication. [Amihud \(2002\)](#) shows that using the ratio of monthly average of the daily absolute return to dollar volume, expected market illiquidity positively affects *ex ante* stock excess return, but unexpected illiquidity is negatively related to contemporaneous stock returns.¹ [Chordia, Sarkar and Subrahmanyam \(2005\)](#) and [Goyenko and Ukhov \(2009\)](#) examine the joint behavior of stock and bond market illiquidity and find an interaction and lead-lag relationship between the illiquidity of these markets. [Goyenko, Subrahmanyam and Ukhov \(2011\)](#) extend the liquidity relations across different maturities for Treasury markets.

Another stream of literatures investigates the liquidity effects in the prices of the credit derivative instruments whose contractual nature and zero net supply distinguish them from the other traditional securities. [Blanco, Brennan and Marsh \(2005\)](#) examine the theoretical equivalence between CDS spread and bond yield spread, where CDS spread is calculated from CDS structural model and bond yield spread is measured from the difference between the bond yield to maturity and risk-free interest rate. They find that this parity relation holds as an equilibrium condition for investment-grade corporate reference entities, and the CDS markets are more liquid than corporate bond markets in the sense that new information is impounded into CDS spread more rapidly than corporate bond price. [Elton, Gruber, Agrawal and Mann \(2001\)](#) and [Delianedis and Geske \(2001\)](#) also report that only a small percentage of yield spread for investment-grade bonds is attributed to the credit default risk. [Tang and Yan \(2007\)](#) find the pricing effect of liquidity is significant in the CDS market using the comprehensive set of liquidity measures capturing the adverse selection, search frictions and inventory costs factors. In contrast, [Longstaff, Mithal and Neis \(2005\)](#) use the information in CDS to separate the default and nondefault components in corporate bond yield spreads, and claim that most part of the corporate yield spread is due to default risk which suggests that the market price of credit risk may be larger than implied by some structural models. However this result is mainly due to their assumption that CDS spread reflects only the default component of bond yield spread. [Pu \(2009\)](#) and more recently [Biswas, Nikolova and Stahel \(2015\)](#) analyze the liquidities in CDS and bond markets employing various liquidity measures including effective bid-ask spread estimated from the transaction data, and find commonality in the fixed income markets across all the various liquidity measures.

This paper aims to clarify the significance and pricing implication of liquidity risk in the CDS markets and compare directly with those in comparable corporate bond markets. Empirical tests are performed on the credit and liquidity risks implied in the prices of credit default swaps and corporate bonds. To our knowledge, this is the first paper to investigate and directly compare the liquidities in CDS and corporate bond markets for each credit rating category in time series data. We define the liquidity basis as the difference between the liquidities in CDS and corporate bond markets, and test the causality relationship between illiquidity measured by the bid-ask spreads in these markets. That is, we examine whether one market is more informative in predicting another market, and test the Granger-causality between the CDS liquidity and corporate bond liquidity, as well as among CDS spread or bond yield spread and CDS or bond liquidity. The deviation from the parity relationship between the yield spread of corporate bond and CDS spread is also investigated, where CDS spread is widely regarded as less prone to liquidity risk and more closely correspond to default risk than the yield spread in corporate bond market.

The remainder of this paper is organized as follows. Section II describes the data for CDS and corporate bond markets and the measures of liquidity. Section III presents the empirical results and the summary statistics for the sample period and discusses the Granger-causality relationship between the CDS and corporate bond markets. Section IV summarizes the major findings and makes concluding remarks.

¹ This liquidity measure of the ratio of the monthly average of the daily absolute return to dollar volume is first employed by [Amihud \(2002\)](#) and also used by [Acharya and Pedersen \(2005\)](#) and [Bongaerts, De Jong and Driessen \(2011\)](#) among many other researchers.

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