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Liquidity and credit risk before and after the global financial crisis: Evidence from the Korean corporate bond market



Dongheon Shin, Baeho Kim*

Korea University Business School, Anam-dong, Sungbuk-Gu, Seoul 136-701, Republic of Korea

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ABSTRACT

We study the impact of the recent global financial crisis on the determinants of corporate bond spreads, in particular, focusing on the impact of liquidity and credit risk on yield spreads using data regarding financial and non-financial bond issuers listed on the Korea Exchange (KRX). Our main findings reveal that the selected liquidity variables explain a relatively larger portion of the variation in yield spreads *before and during* the crisis period, whereas the credit risk component has become a more influential determinant of yield spreads *after* the crisis. This observation implies that investors in the Korean corporate bond market require more default risk premium in the post-crisis period in response to the increased uncertainty in the financial market with the amplified economic vulnerability.

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1. Introduction

The recent global financial crisis immensely affected financial investors' risk perception and preference. Although a large number of studies have been made on the U.S. financial markets by examining the impact of the *global* financial crisis, little attention has been given to non-U.S. markets. Did such blow, combined with increasing uncertainty in the financial market, make investors reluctant to buy investment goods, possibly leading to future welfare losses? If so, what are the key determinants of the risk premia *before and after* the onset of the crisis? How can we measure and decompose their powerful influences on the market prices of risky assets? These questions are of substantial academic interest with profound implication to professional practices, as they illustrate critical insights into novel value opportunities in the post-crisis era.

* Corresponding author. Tel.: +82 2 3290 2626; fax: +82 2 922 7220.

E-mail addresses: sdhdotcom@korea.ac.kr (D. Shin), baehokim@korea.ac.kr (B. Kim)

URL: <http://biz.korea.ac.kr/~baehokim> (B. Kim).

There is ample academic research¹ on the risk factors of corporate bonds to elucidate the determinants of yield spreads.² Among many others, Collin-Dufresne et al. (2001) find that the changes in credit spreads are attributable to the supply/demand shock, which is independent of the proxies for both liquidity and credit risk. Huang and Huang (2012) demonstrate that credit risk explains a small portion of the yield spread for investment-grade bonds, if structural models are also to be consistent with historical default experience and equity risk premia. By proposing a new illiquidity measure, Dick-Nielsen et al. (2012) find a dramatic increment with the onset of the subprime crisis in the spread contribution from liquidity factors in the corporate bond market. In contrast, Longstaff et al. (2005) discover that credit risk is the main determinant of corporate yield spreads.³ Covitz and Downing (2007) report similar findings with Longstaff et al. (2005) through investigating very short-term commercial paper issued by non-financial U.S. corporations.

Our study analyzes corporate bond yield spreads to shed additional light on the yield contribution from liquidity and credit components to the non-U.S. bond market before and after the recent global financial crisis. Particularly, the post-crisis period—specifically, the Korean bond market's post-crisis reaction to liquidity and credit risk—is of interest to us. In fact, previous literature regarding the global financial crisis tends to focus on how illiquidity component contributed to the yield spreads with *the onset* of the financial crisis. Thus, they are prone to overlook how the relative importance between liquidity and credit risk changes *after* the global crisis. To give additional insight into the topic, this paper explores not only the spread contribution from liquidity and credit factors before the crisis (including times of crisis), but also how their contribution to bond spreads varies during the post-crisis period.

For this purpose, our data set incorporates both financial and non-financial corporate bond issuers listed on the Korean Exchange (KRX). It is noteworthy that despite the significant role the financial sector plays in the economy, prior related research has devoted little attention to financial firms.⁴ This negligence is not irrelevant to the estimation of firm-specific leverage or distance-to-default, a measure of the volatility-adjusted leverage of a firm, in a consistent and universal manner.⁵ Specifically, traditional Moody's KMV method suggests that the standard level of distance-to-default is solely determined by the firm's current liabilities and its long-term debts, even though financial firms in general possess a large amount of liabilities that cannot be simply categorized as such. Hence, this conventional approach for estimating the distance-to-default tends to neglect a substantial part of a financial firm's debts, producing unreliable estimates for their likelihood of default; see Eom et al. (2004) for a similar standpoint. To overcome this challenge, we obtain distance-to-default estimates from the website of the Risk Management Institute at the National University of Singapore (NUS—RMI), which provides such estimates of listed firms worldwide, including both financial and non-financial firms listed on the KRX, by adopting the methodology proposed by Duan and Wang (2012).

For evaluating the role of liquidity and credit risk in determining corporate yield spreads, we run regressions of average corporate yield spreads on the proxies for liquidity (*Trade Volume, Cash over Asset, Maturity, and Roll*) and credit risk (*Rating, Coupon, Equity Volatility, and Distance-to-Default*) with data comprising 284 bond issues from 66 firms between 2007 and 08 (before the crisis) and 558 issues from 118 firms between 2009 and 11

¹ On the analysis of sovereign yield behaviors, Ejsing et al. (2012) classify the related literature into two major streams: The first employs proxies for liquidity and credit risk to explain the variations in the behavior of yield spreads. For example, using CDS spreads as a proxy for credit quality and effective bid-ask spreads as a measure of liquidity, Beber et al. (2009) discover that bond investors usually take both liquidity and credit risk into consideration; yet, their attention shifts toward the latter when the market is under stress. The second stream analyzes liquidity and credit risk by directly controlling either of the two factors. For example, Longstaff (2004) uses the difference in yields between Treasury and Refcorp bonds to examine whether a flight-to-liquidity premium exists in bond prices. Refcorp bonds have the same credit quality as sovereign bonds since they are fully guaranteed by the U.S. government.

² Several prior studies (e.g., Longstaff et al., 2005; Beber et al., 2009) use CDS spreads as a proxy for default risk. The recent evidence, however, shows that liquidity or liquidity risk is priced in the CDS spreads; see Bongaerts et al. (2011) and Junge and Trolle (2013) among others. To the best of the authors' knowledge, the research of whether liquidity components account for a substantial portion of CDS spreads in the Korean market is skimpy.

³ In this regard, Longstaff et al. (2005) assume that CDS spread is a pure measure of default risk. On the other hand, Bongaerts et al. (2011) find that a significant part of the CDS spreads reflects liquidity effects.

⁴ Huang et al. (2012) investigate the determinants of changes in the corporate yield spreads with U.S. transaction data. They find that the influence of proxies for credit risk increases remarkably for both industrial and financial firms in times of crisis.

⁵ Bharath and Shumway (2008) show that Merton's (1974) distance-to-default probability is useful for predicting default, but is seemingly insufficient to represent the statistics of default.

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