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Liquidity study of SMEs collective notes in China

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ABSTRACT

Although a main way of enterprise financing, the issuance of bonds has many problems for small and medium-sized enterprise (SME). The main contradiction is that the investors believe too high a risk SMEs bonds have, and demand a higher risk premium, while the raiser consider it a too high cost. As liquidity premium is a main part of risk premium, we believe a higher liquidity will alleviate the above contradiction in some degree. On the basis of former research,we developed liquidity indicators suitable for China's SMEs bonds, and tested some common factors which may affect the liquidity. The empirical results show that the only significant factor is the investor's characteristics. It means that China's bond market is lack of investor adapt to SMEs bonds. We believe that the root of this problem is information asymmetry, and proposed some suggestions for improve SMEs bond liquidity.

KEYWORDS

SME bonds; Liquidity; Small institutional investors; Information asymmetry.

INTRODUCTION

Few people care about the liquidity of SME bonds from an empirical perspective in China, because they are almost of no liquidity and few transaction data. But liquidity is much more important for SME bonds from the practical perspective. For the various problems of SME bonds are derived from two basic problems: Fiance costs were considered too high for financiers, and the credit risk was believed too high for bond investors. However, liquidity can alleviate these two problems simultaneously for the following reasons.

As financial markets product, the price of bonds are their yields. Bond,s yield can be divide into two parts, the risk-free rate and the risk premium. Where the risk premium, following the risk categories, can be further broken down into market risk premium, credit risk premium and liquidity risk premium and so on. The study of bond liquidity risk is derived from credit risk research. The liquidity risk premium explain a large part of the bond risk premium which can not be explained by credit risk. Studies such as Amihud and Mendelson[2], Longstaff[13] have shown that liquidity risk than credit risk premium is more suitable to explain the premium of many financial instruments.

In practice, the problem of bonds liquidity have been taken seriously, not only because of the important share of the liquidity risk premium take in the whole risk premium. More importantly, liquidity is a necessary condition for sustained releasing of bond's credit risk. For a bond with potential risk, its price declined in a relatively continuous transaction process, and its credit risk is gradually released.

In addition, there is a special kind of market participants - speculators, who have a strong risk tolerance and a keen ability to judge risk. Participation of speculators either buffer outbreak risk, but also help to form a reasonable yield level. However, in some perspective, speculators are "scarce variety" because of their high environmental requirements - high liquidity of the market. But liquidity is what the bond market exactly lack of, especially for SME bonds.

In short, liquidity is a key problem to the development of SME bond's market. The purpose of this paper is to study the main factors which impact the liquidity of SME bonds, and propose potential measures to increase liquidity.

BONDS LIQUIDITY MEASURE AND ITS INFLUENCING FACTORS

The concept of liquidity was first proposed by Demsetz[5]. It was simply defined as the timeliness of the transaction. Different definitions of liquidity were given by other scholars later, but none of them is uniform and authority. To sum up, liquidity can be broadly described from two perspective : From the perspective of market, it can be described as the price stable capability under large transactions. From the perspective of investors, it can be described as the capability of liquidate with less loss of value.

The measure of bonds liquidity

The liquidity of financial markets is a fairly complex problems, scholars prefer to describe its characteristics. The three dimensions standard put forwarded by Kyle (1985) and four dimensions standard put forwarded by Harris[9] are the two most commonly accepted by others.

The three dimensions are tightness, depth and resiliency. This standard was adopted by BIS report. The four dimensions which is more often adopted by other literature are: (1) Breadth, the maximum range keep prices valid; (2) Depth, the biggest volume that price maintain stability; (3) Resiliency, the quickness of price readjust to its equilibrium after big deals shock; (4) Immediacy, the quickness of deals within the prescribed scope of price fluctuations.

There are various indicators for liquidity in empirical analysis, most of which are based on trading data. Liu Di[16] classified those liquidity indicators according to the four dimensions mentioned above. More than 40 are commonly used. These liquidity indicators can be classified into four

categories. Respectively, based on price, based on volume, combination of price and volume, and trading time/frequency. In addition, Chacko, Mahanti et al[4] proposed a "Latent Liquidity" indicator. The specific methods is: Calculate bond holder's total bond asset turnover as the turnover of a specific bond. Then calculate the weighted sum of turnover on its major holders as latent liquidity, the bond proportion hold as weights.Mahanti, Nashikkar et al[14] also adopted the same method. Latent liquidity is a clever way to measure liquidity, but it has not been widely adopted, because the data this method need is not easy to acquire.

Although numerous liquidity indicators of the existing literature, but for small and medium-sized enterprise bond of China, choice is very small. First, because of their extremely scarce trading. All indicators based on the premise of continuous trading are not applicable. Secondly, in a mature market bond trading often adopt market makers system, and the major market makers have trading data. So, indicators based on the bid-ask spread is favored by scholars. But it is nowhere to acquire the data of bid-ask spread in China.

Further more Hotchkiss and Jostova[10] believed that, increase in corporate bond trading is not necessarily reflected the liquidity, it may reflect the "speculative driven" derived from different understandings of information. So, indicators only based on volume or turnover can not be a good measure of liquidity. It is more rational to construct a liquidity indicator base on trading frequency for bonds with scarce tradings such as SMEs'.

In addition,[12] proposed that bonds trading with very low frequency exist "search costs". "Search costs" may correlate with the size of trading, and reflected on the price as an important part of the liquidity premium.

Based on the above analysis, we believe that liquidity measure of SME bonds need to consider three dimensions. They are price changes, trading size and frequency of tradings.

Impact factors of bond liquidity

There are extensive literature that study on factors that impact bond's liquidity. On the whole, these factors can be classified into three categories: factors relate to market environment, factors relate to the characters of bond issuers, and factors of bond's characters itself.

Factors relate to market environment include aspects of investor behavior, market trading mechanisms and other features. First, liquidity of markets are different due to investors' risk appetite, investment style, and so on. From this perspective, improve the structure of investor groups can increase market liquidity. Secondly, Different trading mechanisms can also affect bond's liquidity. Schultz [15]Ericsson and Renault[7] have proved that increase the number of competitive market makers can increase market liquidity. Because more potential counterparties can relatively reduce the search process of trading, but also conducive to decompose large transactions into smaller ones. Once again, transparency of trading data clearly helps to reduce information asymmetry, and increased disclosure of trading information may also help to increase liquidity. Goldstein, Hotchkiss et al.[6] found that the transparency of after transaction data can help increase liquidity. Edwards, Harris et al.[6] found that the transparency of after transaction can help reduce transaction costs.

Factors relate to the characters of bond issuers include the issuer's industry, the credit status of issuers, as well as the degree of information disclosure of issuers. Edwards, Harris et al.[6], Hotchkiss and Jostova[10] found that bonds issued by public listed companies have more liquidity and less premiums compared with those of non-public listed companies. Because public listed companies were more fully in information disclosure. But Alexander, Edwards et al.[1] also found that, bonds of non-listed companies are trading more actively than those of listed companies. Their explanation is that, for the same listed company, stocks and bonds are two securities can be chosen for trading. But there no similar choice for the bond investors of non-listed companies. The industry sector and the credit rating of the issuer's are considered also have influence on bond's liquidity. As Hotchkiss and Jostova[10]

believed that bonds whose issuers belong to industrial and financial sectors have more liquidity than those of utility companies. But there are more controversies in empirical conclusions.

Factors of bond's characters itself include the way of issue, the issue size, bond age, remaining term, coupon rate, various types of options and so on. Hotchkiss and Jostova[10] consider large-scale bond issuance in favor of market-maker inventory management, reduce transaction costs, which contribute to increase bond liquidity. But Mahanti, Nashikkar et al[14] have considered the issue size have thresholds. The positive correlation between the size and liquidity was only reflected when the issue size is above thresholds. Many empirical results support the views of liquidity decreased with bond age, because after their issuance, bonds are gradually hold to their maturity by cautious institutional investors such as pension funds. With the proportion of tradable bond decline, its liquidity reduced. However, those institutions are major holders of bonds of high credit rating. Term to maturity, coupon rates and options are also considered factors that may affect liquidity. However, empirical results differ greatly. There two main methods of issuance, public offerings and private placements. They are difference in information disclosure, also have difference in empirical studies. We believe that the two distribution methods are suit for different investors, compare between them is less meaningful.

In China, Min Xiao-ping[17] had a comprehensive literature review on impact factors of bond liquidity. Also, there are scholars applied these factors to China bond market research. For example, the empirical study of Wang Xiao-yi, Zhang Bing et al[18] showed that, in China bond market, volume of issuance, term to maturity and coupon rate have significant impact on liquidity of corporate bonds.

Model specification and data description

Model specification

1 Liquidity indicators

According to the scarcity of SME bond trading, it is unconvincing to construct a liquidity indicator only based on bond price or trade volume/turnover. We believe it better to use a combination of price and volume, or trading frequency, in constructing liquidity indicators.

Further more, SME bonds are mainly hold to maturity. It can be consider that what the SME bonds investors more concerned about is the ease of cashing. In another words, they are more concerned about the degree of wealth loss when they have to sell the bonds. The trade volume or trade frequency of SME bonds may not been keenly cared about.

Based on the above analysis, we construct two liquidity indicators (*liqu*). (1) From the perspective of price shocks: Trading volume / price changes; (2) Base on trading frequency: Times of trade per month. We take the first indicator in base model, and the second one in robust test.

2 Explanatory variables

It is rational that the average volume of each trade be the major character of SME bonds' trader. The larger the volume, the greater the price volatility. We will combine trading frequency and trading volume as an indicator constructed to describe the characteristics of investors (*Feat*): Monthly trading volume / month with trading days. It represents the average size of each trade, which in some extent reflect the size of traders level.

The size of the bond issue (*Issu*), terms to maturity (*Matu*), coupon rate (*Coup*), credit rate (*Cred*), issuer's industry (*Tech*), various of options(*Opti*), all these common indicators in various literature are taken into account as explanatory variables too. But some of them have contradictions between the different literature. We need to take some improvements on these variables, according to the character of SME bonds.

First, SME bond's credit ratings in China are generally high, because of the large involvement government credit, most of them are AAA rate. We use dummy variable which only divide credit into

two categories, 1 for AAA rate, and 0 for others; Second, for collective notes, each has more than one issuer. It is hard to make Specific distinction of issuer's industry. According to database of "Wind", they are only been classified as "comprehensive" and "non-comprehensive". So we take another dummy as 1 for comprehensive and 0 for non-comprehensive. Third, various of option items are often considered have impact on bond liquidity. However, we found non of collective notes has option item. We do not include a variable relate to option item in our model. Because options would materially affect bond's credit risk, there should be a high correlation between the option items and credit rating. We take the opinion that option items would have little impact on SME bond liquidity, in condition of high credit rating.

3 Model construction

Based on the above description, we constructed the following panel data regression model under specific indicators as explained above.

$$Liqu = \beta_0 + \beta_1 Issu + \beta_2 Matu + \beta_3 Coup + \beta_4 Feat + \delta_1 Cred + \delta_2 Indu + \mu \quad \textbf{(1)}$$

In which, *Feat* is used to describe the type of investor, relate to market environment. *Issu*, *Matu* and *Coup* are relate to the character of bond itself. *Cred* and *Indu* are relate to the character of issuers.

In econometric treating, OLS regression is biased due to the discontinuous trading data. We adopt monthly data, and take months with no trading as zero volume. Then we can use truncated regression. Specifically, we adopt random-effect tobit model with panel data.

Data description

Inter-bank bond market is China's largest bond market, whose stock and trading volume of bonds are both over 90% of the whole country. The SMEs collective notes which trading in inter-bank bond market is the most actively traded SMEs bond. Participants of inter-bank bond market are all institutional investors, who are considered to be more professional and rational with risks than individual investors. Based on the above considerations, we take SMEs collective notes as our objects in empirical study.

Samples are monthly trading data, selected from January 2012 till April 2014, including 79 SMEs collective notes listed, altogether 1459 observations. All data are adopted from "Wind" database, treated in stata 12.0.

THE RESULTS OF EMPIRICAL STUDY

TABLE1 : Coefficients of explanatory variables

	Liqu	***t*-statistic**
Issu	0.502	(0.80)
Matu	0.003	(0.03)
Coup	-0.137	(-0.11)
Feat	4.624***	(3.41)
Cred	1.768	(0.78)
Indu	-0.721	(-0.21)
_cons	-1.599	(-0.16)
sigma_u		
_cons	3.39e-15	(0.00)
sigma_e		
_cons	7.995***	(16.44)
Objects	1459	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The regression as a whole is significant. But individual effect is not significant, which can be seen from *sigma_u*. Which means that the difference of individual characteristics between collective notes are not significant.

As to the coefficients of explanatory variables, only the variable *Feat* is significant. It may not means that the characteristic of investors is the only factor affect liquidity of collective notes. But it really mean that the impact of other factors can be neglected, even the characteristic of bond itself. Coefficients of each explanatory variables are shown in TABLE 1.

From the empirical results we can draw the following conclusions:

First, maturity and credit rating reflect the credit risk of bonds, the level of coupon rates also reflects the credit risk premium. But all these variables are not significant, it means that credit risk is not the substantial impact factor of liquidity. This contrary to common sense. As we know, the study of liquidity risk is derived from the study of credit risk, there must be some relation between them. The only possible explanation is that the market of SME collective notes is too young to talk about liquidity. Because few investor in bond market notice its invest value.

Secondly, *Feat,* the variable reflect the characteristic is the only significant impact factor. It means that SMEs collective notes are gathered in a small part of investor, lacking of participants. In other words, dispersion of trading will help to increase liquidity. We also can draw the conclusion that, it is beneficial to the bond market to introduce small and medium sized investment institutions. For nowadays, all participants in inter-bank bond market are large institutional investors. Large institution may not suit for SMEs bonds.

For robustness, we take the frequency of trading as explained variable, and let the trade volume present *Feat* to avoid multicollinearity. Also use random-effect tobit model with panel data, and got a similar result.

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis all above, we believe that the most basic way to improve liquidity of SMEs bond is to develop the group of institutional investors with high variety, especially the small and medium sized ones. But not individual investors, no only because of the high credit risk but also the non-profession of individual investors.

Further more, increasing the participation of small and medium sized institution, there are two aspect of issues should considered. One is the access, namely how to filter qualified small investment institutions, in order to achieve the aim of increasing market liquidity without additional risks. The other is market environment. That is how to attract small institutional investors to participate in. Open market is passive, an attractive market for investors must be profitable and risk controllable. The key problem of both issues is information asymmetry.

From the perspective of supervisors, we believe they should do their best to alleviate information asymmetry, and let the market to solve other things. Here are some suggestions may feasible to alleviate information asymmetry:

First, to improve the credit rating system. Let credit rating system become an objective reference for investment. At present, it is almost a market consensus that bond rating is too high to reflect their risk levels. Most of SMEs collective notes are AAA rating. It makes investors not able to get information from credit rating to distinguish risk level between different bonds.

Second, various embedded options can be considered on designing bond items. It is proved to a kind of effective protection for information vulnerable parties.

Third, improve the competitive market maker system. Competitive market makers not only can reflect more behind information to the bond prices,. but also helps to make the transaction decentralized.

In addition, develop derivatives that SMEs bonds as underlying assets may also help to increase the liquidity of the bond. Credit derivatives can hedge credit risk, it helps to participation of small and medium sized institutions whose risk tolerance are relatively smaller. Laganá, Perina et al[12] also proved that credit derivatives have impact on the liquidity of the corporate bond market.

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