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FLEDGLING - CORPORATE BOND MARKET AND THE LIQUIDITY PATTERN

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Abstract: **The lack of depth and liquidity in corporate bond market can be attributed to structural weaknesses such as dilatory and ineffective legal regime; ceiling imposed on domestic and foreign institutional investors and cumbersome compliance procedures. The total value of outstanding corporate bonds issued by Indian firms stand at around 200 billion US $. FIMMDA is the most preferred platform for reporting of trades. Corporate bond issuances by Indian companies and turnover in the India market is not only low, they are far below the turnover seen in equities (only cash segment) on NSE. Most of the trading is concentrated in public sector bonds issued by infrastructure sector companies and financial institution. The market for bonds rated BBB and below is almost non-existent and majority of trading is concentrated in AAA rated bonds.**

Keywords: **Institutional investors, Corporate Bonds, liquidity, PSU JEL Classification: G 23, G 20, G 12.**

1. INTRODUCTION

Bond markets in India exhibit a mixed character with a large and robust government bond market and a small and struggling corporate bond market with low liquidity. Corporate bond market lacks enthusiasm with low number of public issuances, low trading resulting into relatively high yields for high rated bonds and absence of bonds with ratings below BBB. At the end of 2013 the size of government bond market stood at around USD $ 670 billion which makes it approximately 40% of India's GDP. In comparison to government bond market, corporate bond market stood at USD $ 47 billion (excluding PSU bonds, Institutional bonds and Bank bonds) which is approximately 2.67 % of India's GDP(at the end of financial year 2013, at current prices). If we take all the bonds issued by all the corporate then it stands at around 200 billion US $.

The lack of depth and liquidity in corporate bond market can be attributed to structural weaknesses such as dilatory and ineffective legal regime; ceiling imposed on domestic and foreign institutional investors and cumbersome compliance procedures.

SEBI authorized BSE, NSE and FIMMDA to set up platforms for reporting of corporate bond trading data in 2007. Since then OTC trades are reported to one of these platforms. The scope of Debt market is immense in India and with the concerted efforts of SEBI; the market has begun seeing encouraging trends. In the corporate debt market, `3,61,462 crore were raised through 2,489 issues by way of private placement listed at BSE and NSE in 2012-13 as compared to 2,61,282 crore through 1,953 issues raised in 2011-12, mirroring the stronger growth sentiments in the market

Liquidity is one of the most fundamental characteristic of an asset. A highly liquid asset incurs less cost of holding it as it can be readily traded, if and when required. A liquid market enables efficient price discovery, keeps transaction costs to minimum and also minimizes arbitrage opportunities. Negative correlation was found between value of bonds traded on any particular day and yield. Liquidity was more observed in public sector bonds than private sector bonds. Although bonds are issued with maturity ranging from 1 year to 20 years, the trading is concentrated in issues with maturity of less than 5 years. Trading in bonds is mainly in A-rated bonds, trading in bonds rated below A is almost non existent.

Objectives:

The purpose of this paper is to address a gap and contribute through an empirical work on liquidity pattern found in the corporate bond market in India.

- To identify and study the liquidity pattern found in the corporate bond markets and make comparison with equity markets.
- To do a comparative analysis of bond trading among different countries
- To estimate various liquidity measures using time series data
- To estimate the nature of relationship between trading volume and yield using time series data

Limitations:

The study has some important limitations; it is based upon a limited sample, some of the limitations stem from infancy of bond market. Data availability is another herculean task and utmost care needs to be taken to use data from website of stock exchanges. Bid and quote data were almost nonexistent and barely same bond share traded by more than one party. More robust measures of liquidity such as Amihud (2002) and Roll (1984), have not been estimated due to lack of data availability.

Relevance:

The paper is one of the first studies undertaken to study the liquidity pattern found in the corporate bond market in India. Various proxy measures of liquidity have been used to estimate and understand the corporate bond market liquidity. It can be of immense help for drawing attention of researchers and policy makers towards fledgling bond markets. Extensive literature survey was done to understand the nature and structure of liquidity and its implications on financial markets.

2. LITERATURE REVIEW

In simple terms Liquidity of a financial product means the ease with which it can be traded. Broadly liquidity is defined as a characteristic of a financial product which enables it to be traded in large quantities without adversely affecting its price. Academics hold diverse opinions when it comes to defining the concept of liquidity. It does not mean that there is no convergence in their definition. They vary in their degree of emphasis on various characteristics of liquidity. Some of the characteristics are depth, immediacy, width and resiliency. Depth signifies the maximum amount of a security which can be traded at a given price. Immediacy refers to the speed of doing a transaction. Width means bid-ask spread, which is the cost of accessing liquidity indicating a wider spread means lower liquidity. Resiliency captures how fast prices revert to their equilibrium after a transaction (Golaka)

Liquidity is one of the most fundamental characteristic of an asset. A highly liquid asset incurs less cost of holding it as it can be readily traded, if and when required. A liquid market enables efficient price discovery, keeps transaction costs to minimum and also minimizes arbitrage opportunities. Asset prices are largely determined by demand and supply of securities so a highly liquid market makes an efficient determination of price. More participants mean more information processing and increased number of quotes reflecting varied expectations. In fact liquidity provisioning of markets and its price discovery role are very much interlinked (O"Hara, 2003). Liquidity acts as arbitrage busters i.e. a liquid market seldom allows persistence of arbitrage opportunities for too long, market makers grab an opportunity of arbitrage in fraction of seconds and gobble up any riskless profit that may appear. Liquidity promotes market efficiency (Chordia, Roll, & Subrahmanyam, 2009). Bid and ask quotes are very much determined by liquidity present in the market. A liquid market makes market making smooth as there exist sufficient number of buy and sell orders in the market and this reduces liquidity premium. Liquidity risks add to the transaction cost of a bond and increase its illiquidity.

Liquidity shortage was one of the main reasons behind the unfolding of sub-prime crisis. Banks were not able to borrow to meet their liquidity requirement when they were under pressure of fulfilling their obligations. (Dick-Nielsen, Feldhutter, & Lando, 2011)analyzed the liquidity in corporate bonds from 2005 to 2009. They found that spread which was attributable to illiquidity increased sharply for speculative bonds but the impact on investment grade was slow. At the onset of the crisis the liquidity dried up and a lead underwriter got directly hit by the crisis, it was also observed that flight to quality was confined to AAA bonds.

The determinants can be grouped into macro factors and micro factors. The macro factors include factors such as size of the economy, developmental of financial system and legal factors which lubricate the markets. The micro factors will include factors such as cost of entering market, transaction costs, and number of participants. Transaction costs include brokerage charges, registration charges, taxes etc.

(Brunnermeie & Pedersen, 2008) Provided a model that links assets' market liquidity and trader's funding liquidity. Traders can provide liquidity to the market only if the posses' ability to do that and their ability to provide liquidity largely depends upon overall availability of liquidity in the financial system of a country. They empirically document that market liquidity can suddenly dry up, depend upon volatility of the market, they are subject to "flight to quality "and they co-move with the market.

(Raghavan, Sahoo, Hait, & Gosh, 2014) Conducted a regression analysis to investigate the factors and to what extent the factors are influencing the corporate bond market of India. They found significant relationship between total bonds outstanding (dependent variable) and factors such as stage of the economy, openness and size of the banking system.

Over the past few years many papers concerning the development of bond markets have been produced. Many of these papers analyzed the reasons for underdevelopment of market and put forward solutions for developing the market. The recommendations focus upon market microstructures, legal environment and procedural aspects. Till now no paper has been devoted for the study of liquidity pattern in the corporate bond market of India.

A number of studies have proposed various liquidity measures derived from daily return and volume data as a proxies of liquidity.(Houweling, Mentink, & Vorst, 2005)Consider nine different proxies for measuring corporate bond liquidity. They found little differentiation between various measures. The proxies are issued amount, listed, euro as currency, age, missing prices, yield volatility, number of contributors and yield dispersion. The use of proxies for measuring liquidity is not a new phenomenon and in fact most of the studies concerning bond liquidity are done using proxies. The recourse to proxies is taken mostly due to unavailability of data or the quality available data is not reliable. However, utmost care is taken in selecting proxies and a variety of tests are conducted to check the reliability and validity of proxies.

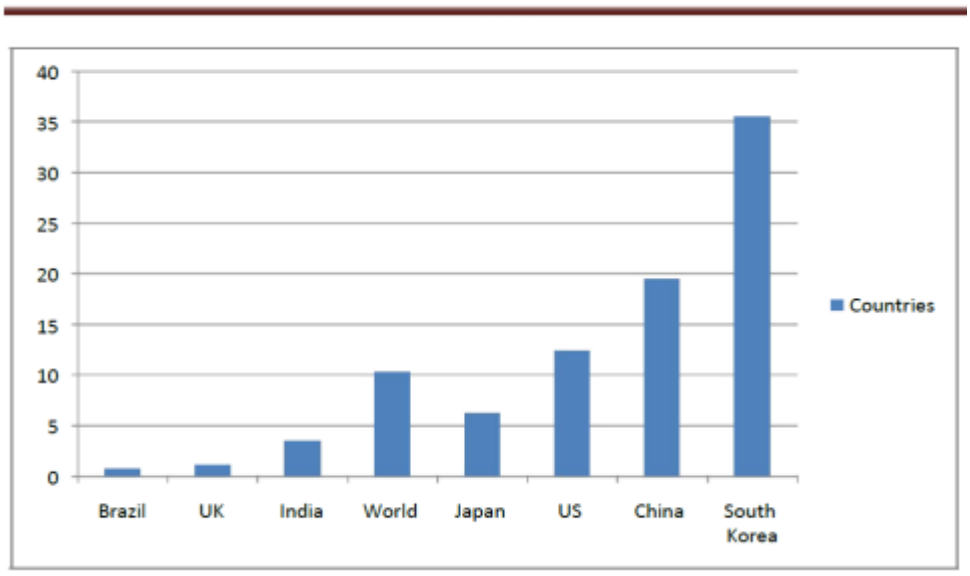
Similarly, (Goyenko, Holden, & Trzcinka, 2009) carried out comprehensive study of various liquidity measures. They found close association among these proxies. They assert that the proxies which are generally used for assessing liquidity are robust; however they conducted their study on stock markets.

Empirical papers that examined liquidity in bond or equity markets used both direct measures (based on transaction data) and indirect measures (based on bond characteristics and/or end-of-day prices). Examples of direct liquidity measures are quoted bid–ask spreads, effective bid–ask spreads, quote sizes, trade sizes, quote frequencies, trade frequencies and trading volume. Both theoretical and empirical evidence demonstrate that liquidity risk is priced in security markets. The market microstructure models of Amihud and Mendelson (1986), Boudoukh and Whitelaw (1993) and Vayanos (1998)show that transaction costs cause liquidity differences between securities, and that illiquid securities have higher expected rates of return than liquid securities (Houweling, Mentink, & Vorst, 2005).

3. METHODOLOGY, DATA DESCRIPTION AND ANALYSIS

SEBI authorized BSE to set up and maintain a reporting platform for corporate bonds. NSE was authorized later and it started to report from March 01, 2007. Both BSE and NSE report trading of corporate bonds on their website, however, as regards over the counter trades both have freedom to report the deals and NSE has been reporting OTC deals since then. It is mandatory for members dealing in corporate bonds to report their transactions either to BSE or NSE. In order to make the public issuing of bonds more acceptable and investor friendly SEBI has made changes in the structure, design, contents, format and organization of information in the application form and abridged prospectus.

Chart 1: Corporate issuance as a % of domestic securities:



Source: SEBI

Turnover is one of most common proxy that is used to measure liquidity. Turnover is the volume of securities that are sold in the market. Turnover is also understood as total value of securities traded in the market. Turnover can be measured daily, weekly, monthly or yearly. Turnover gives us information regarding various market participants and transactions. Some turnover indicators are; turnover rate = yearly trading/ outstanding, percent of GDP, average issue size etc.Annual corporate bond turnover shows the total value of bonds traded in a country. It's quite evident that India lags behind by a significant margin when it comes to annual bond turnover. It does better than Indonesia but performs poorly when compared developed as well as developing economies. Annual corporate bond turnover of India is 7,38, 632 Crore or around $ 120 billion in the year 2012-13.

Equity market turnover is way beyond bond market turnover despite being non-cash segment not included in the above comparison. To give an indication of size of non cash segment of equity marketWe see that equity turnover went down sharply in 2008; this can be accounted to the Sub-prime crisis that engulfed whole world. Bond markets remain unaffected as much daily volumes are concerned one reason can be is flight to safety when the crisis erupted. The fall in the equity turnover after 2009 and in bond turnover in the midst of 2011 can be attributed to the slowing of economy. The economic growth rate which was 9.3% in 2010-11 fell sharply to 6.2% in 2011-12 and hit the lowest figure of 4.5% in 2012-13.

The trading value on various platforms gives an indication the importance of the platforms. Majority of trades are reported to FIMMDA (fixed income money market and derivatives association of India) because corporate bond market in India is basically an otc market. The main focus, however, is upon increasing trading value, which has been growing at CAGR of 49%.

In December 2006, SEBI permitted BSE to set up a reporting platform to capture all information regarding trading of corporate bonds as accurately as possible. NSE was given the permission in March 2007 to establish a platform on the lines of BSE. In the same year after having discussed the various regulatory issues with different regulators, the scope of regulation was of various regulatory agencies was finalized. SEBI was tasked with the responsibility for primary market of corporate bonds. RBI was made responsible for keeping an oversight over the repo/reverse repo transaction in corporate debt. SEBI was made responsible for the regulation of secondary market for the corporate debt. This division of responsibility will be upheld irrespective of nature of parties (bank or non bank) involved in a transaction.

Since September 2007, members trading in corporate bonds over the counter have to report their trades either at BSE, NSE or FIMMDA. Exchange based trades are reported on the respective exchanges.

Trades reported on NSE have been used for conducting analysis. Two different samples have been used: first, for identifying maturity pattern of bonds traded, rating patterns of the bonds traded and sample of bonds traded in last six months has been used. Second, for doing a time series analysis of identifying correlation between trading value and yield, for calculating average trading size and standard deviation of trading done NSE a sample of 5031 trades.

To assess the relation between turnover and yield of bonds, we conducted a correlation analysis between daily bond turnover and the respective yield of the bonds. We did not take into account various other factors which affect this calculation such as various broad and specific factors which may directly influence the yields and turnover. In fact this needs to be further researched and tested to find out concrete and reliable estimates. The relation is negative which was expected but the variations are quite high. We see that all through the duration of our analysis the correlation between last traded value and last traded yield remains negative. This is a positive sign and as expected from a rational market. (David, 2005)Found that turnover was significantly negatively correlated in only 40% of the 23 emerging markets.

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The data is taken from NSE. All the Individual trades reported to NSE during January 1, 2014 to June 30, 2014 have been consolidated at one place for analysis. The data includes data traded over the counter and reported on the NSE platform. In total 7786 trades were reported, out of which security description – details of a security like maturity date, coupon rate etc- could not be retrieved for 2924 securities because of absence of the security in the master list. All our analysis in the subsequent part is based upon these 4862 trades.

The data has been sourced from the website of NSE. NSE generates a "bhavcopy", a kind of daily report which contains information about the bonds traded. The information is under eight heads, which are trading date, last traded price, last traded value and so on. The sample contains data from July 16, 2007 to December 23, 2013. The sample has been cleaned for inconsistencies and outliers by simply removing the data which is not in sync with remaining piece of data for e.g. Blanks have simply been deleted and outliers have been identified by observing the deviations of individual data pieces any data which shows wild deviation has been deleted. This reduced our data count for each year. In total 6187 trading data was download which after cleaning for inconsistencies and outliers reduced to 5031. The data is from the month of July because previous data is not available. The data is of each month from July 16, 2007 onwards. Each month was divided into three parts of 10 day interval, a random day was selected from each 10 day interval, in this way I had three days of data for each month from July 16, 2007 to December 23, 2013. The reason behind choosing 3 day data was to make sure that data is diversified and clustering does not happen. Data for recent years are more in number as the trading has increased. The lowest data is for the year 2007 in which we have 146 number of trades and highest is for the year 2013 in which we have 1580 number of trades.

There has been no exclusion of any bonds based upon the characteristics such as convertibility, floating rate or fixed rate, call or put option Of the 4862 securities for which we have details, we see that the trading is concentrated in the securities which have a maturity period of five years or less than that. The percentage is around 57%. Out of 4862, 4059 are public sector bonds issued by PSUs, nationalized banks or institutions such as SIDBI, EXIM bank etc.

Chart 2: Maturity period of corporate bonds:

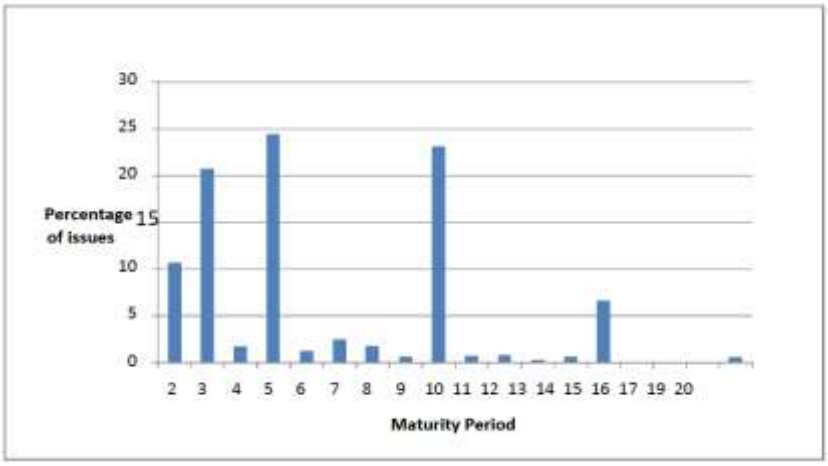
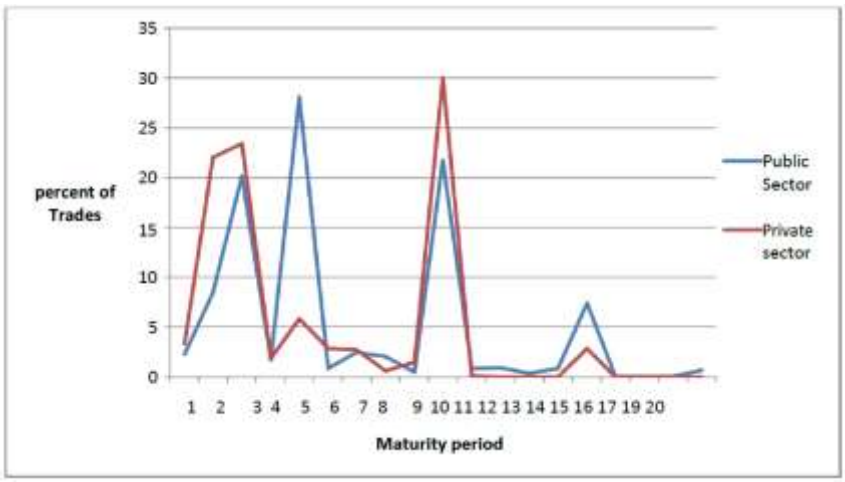


Chart 3: Comparison of maturity periods of Public sector and Private sector bonds:



The chart clearly shows the maturity pattern of corporate bonds traded in the last six months are inclined towards bonds with maturity period of fewer than 5 years.More than 55% of bonds traded were having maturity period of less than five years. We divided the bonds into two groups of public sector bonds and private sector in order to see if government backing is reflected in the maturity period. From what it appears from the chart, public sector companies do enjoy the less default risk perception as their maturity pattern is quite stretched in comparison to private sector bonds.

The corporate bonds deals are concentrated in few issuers. The bond market is also very narrowly focused on triple-A assets. The share of the top 10 securities increased to 44.4 percent in 2012–13, compared to 44.2 percent in 2011–12 (SEBI, 2013). Out of 7784 trades' data was obtained for 5100 trades out of which proper data was of only 4912 trades. This analysis is based from a sample of all the bond trades that were reported on the NSE platform. We can see that more than 90% of the trading is concentrated in AAA rated security. This is in contrasts to many other countries where securities below AA rating too are traded in significant number and value. Although there are very few cases of default, the investors are reluctant to give less creditworthy borrowers or risky projects a chance. This also paints a dismal picture of risk taking ability of Indian investors and this of course is a cause of concern because a growing country needs to spend on infrastructure sector which is often found to be risky due to involvement of large number of stakeholders with competing interests and long gestational period.

Table 1: Bond trades of different rating class

Rating	No. of trades
AAA	3821
AA	975
A	107
BBB	09
Total	4912

The table below shows the top ten trades of the last six months that were reported on the NSE platform. The surprise factor is that no private sector bond is there in top ten most traded bonds of 2014. However, one interesting thing is in the list of top ten companies with largest number of bonds outstanding there are four private companies and none of the bonds of these companies fall into the list of top ten companies with largest number of trades. There can be multiple reasons such as it may be that the trades are reported on other two platforms or they may be not traded at all, the dominance of private placement can be another reason, this area requires further research to come to a conclusion.

Table 2: Top 10 companies with largest number of trades

POWER FINANCE CORPORATION LIMITED
RURAL ELECTRIFICATION CORPORATION LIMITED
HOUSING DEVELOPMENT FINANCE CORPORATION LIMITED
LIC HOUSING FINANCE LIMITED
EXPORT IMPORT BANK OF INDIA
POWER GRID CORPORATION OF INDIA LIMITED
NATIONAL BANK OF AGRICULTURE & RURAL
DEVELOPMENT
IDFC LIMITED
INDIAN RAILWAY FINANCE CORPORATION
NUCLEAR POWER CORPORATION OF INDIA LIMITED
PNB HOUSING FINANCE LIMITED

Table 3: List of companies with largest number of outstanding bonds

POWER GRID CORPORATION OF INDIA LTD	280
IDFC LTD	203
NATIONAL THERMAL POWER CORPORATION LIMITED	189
TATA CAPITAL FINANCIAL SERVICES LIMITED	175
HOUSING DEVELOPMENT FINANCE CORPORATION LIMITED	168
POWER FINANCE CORPORATION LIMITED	145
LIC HOUSING FINANCE LTD.	137
DEWAN HOUSING FINANCE CORPORATION LIMITED	136
EXPORT IMPORT BANK OF INDIA	123
INDIAN RAILWAY FINANCE CORPORATION	116
SUNDARAM BNP PARIBAS HOME FINANCE LIMITED	114

4. CONCLUSION

India's corporate bond markets have not reached the critical stage so that it can back huge requirement of funds for building infrastructure and this is hurting the financial system. On one hand we are missing the benefits of a well developed bond market on the other hand we are stacking up the load on banks for long term lending by forcing banks to do the job of bond market. Underdevelopment of bond market is a big constraint. Majority of the trades are OTC trades and more than 90% are private placement. Data availability has always been a problem due to dominance of private placement and poor reporting, however things are changing with more and more data is made available online. Only six months data has been considered for maturity period analysis, ratings analysis and determining the largest number of trades. Trend analysis of turnover ratios, average daily turnover and negative turnover value and yield relationship. India does not perform well in terms of bond issuances and turnover. The relationship between bond trading and yield is negative. Most of the bond trading is concentrated A rated securities and short maturity bonds. Bond with maturity period of three, five and ten years are traded more and together these three account for around 70% of trades.(ISMR, 2013).

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