The Macro-economic Determinants of Corporate Bond Market in India

Ajeet Kumar Maurya

Senior Research Fellow
Faculty of Management Studies
Banaras Hindu University
Varanasi

Onkar Nath Mishra

Senior Research Fellow
Faculty of Management Studies
Banaras Hindu University
Varanasi

Abstract

The aim of this study is to examine the influence of macro-economic variables on the corporate bond market in India covering the period of 23 years i.e. from 1990-91 to 2012-13. Macro-economic indicators reflect the state of economy and influence the issuance of fixed income securities by the corporate. The study provides the evidence that issuance in corporate bond market is significantly correlated with the foreign exchange reserves. Using multiple regression analysis, we arrive at the conclusion that all the selected variables but GDP and Trade openness, significantly explain the volumes of corporate bonds.

Keywords: Capital Market, Corporate Bond Market, Government Bond, Macroeconomic Variables, Unit Root Test, Regression Analysis

**JEL Classification:** G10, G12, G21, G28

Introduction

For a developing economy like India, a well developed bond market is a critical source of funds for the corporate sector. The corporate sector requires funds for both short and long term. While short term requirements are mainly fulfilled by borrowings from the banking sector and money markets, the long term funding requirements requires that they approach the general investors who invest in their securities either as debt or equity capital. Multiple routes of financing such as equity, debt and bank borrowings also lessen the adverse effect of financial crises. In order to that, the debt market is a good alternative source of financing the long term requirements of funds after stock market. It enables the corporate to raise funds at low cost, facilitates infrastructure financing and acts as safeguard for financial stability. Furthermore, it reduces the reliance on bank financing.

Indian bond market still has not matured and is small relative to other large economies. According to the data provided by World Economic Indicators of World Bank (2012), it is reported that total Indian domestic bond market stood at 49.67% of GDP which is very low as compared to other developed and developing countries. Japan has the highest outstanding domestic debt, 195.78% of GDP which is followed by Singapore, UK, US, Austria, Sri Lanka and Australia respectively (graph 1).

Another important feature of Indian bond market is that it is predominantly government bond market. Governments both central

and states are the largest fund raisers and despite two and half decades of economic reforms, corporate bond market is

small in size, though growing.
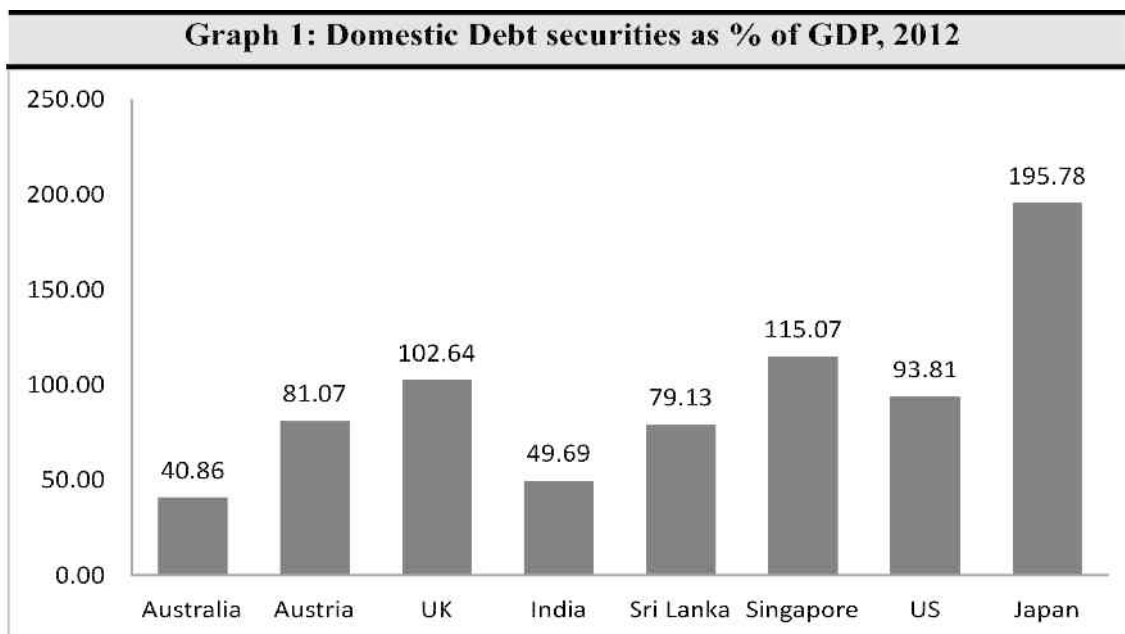
Graph 1: Domestic Debt securities as % of GDP, 2012

The aim of this paper is to examine the inter-relationship between the volume of corporate bond market and macro economic variables. The study includes the data for a period of 23 years i.e. from 1990-91 to 2012-13. What is the nature and direction of the relationship between corporate bond market and important macro economic variables? What are the macro-economic indicators affecting the inflows in the corporate bond market? These two research questions motivated the researcher to undertake this study.

The rest of the paper proceeds with different sections. Section 2 gives the description about the corporate bond market along with its role in development. Section 3 provides a brief review of related literature. Section 4 deals with the data and methodology part of the study. Section 5 discusses the regression model and empirical results. The last section summarises the findings and concludes.

Corporate Bond Market in India

The debt-market comprises of two segments: government securities market and corporate debt market. The corporate debt market in most of the developed countries is more

developed than the government bond markets. US bond market is the largest securities market in the world and it is more than USD 35 trillion in size with a turnover exceeding 500 billion daily (SOURCE). But in India, corporate debt market is less developed as compared to government securities market. The market share of corporate bond market is very small about 24 percent of the total debt market (graph 1). This reflects the underdeveloped state of corporate debt market in comparison to government bond market in India.

A significant feature of Indian debt market is that there are a small number of big investors trading in Indian debt market who make it a wholesale debt market (WDM). The wholesale debt market segment of NSE is the only leading body in India that deals in trading of debt securities. The growth of WDM segment of NSE is presented in graph 3 from the period of 1994-95 to 2013-14. Market capitalisation of WDM segment has made a continuous development during the mentioned period which indicates the development of Indian debt market.
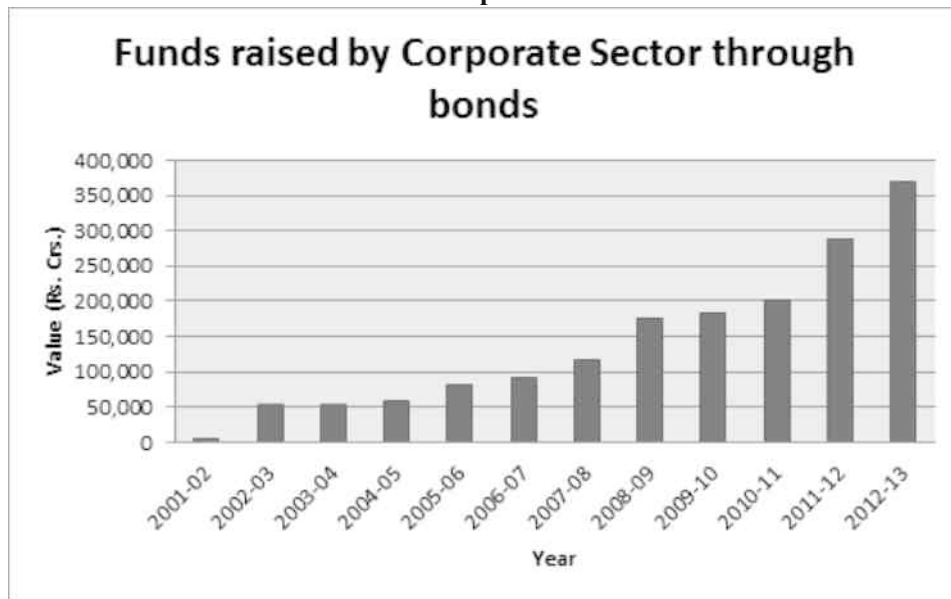
Graph: 3
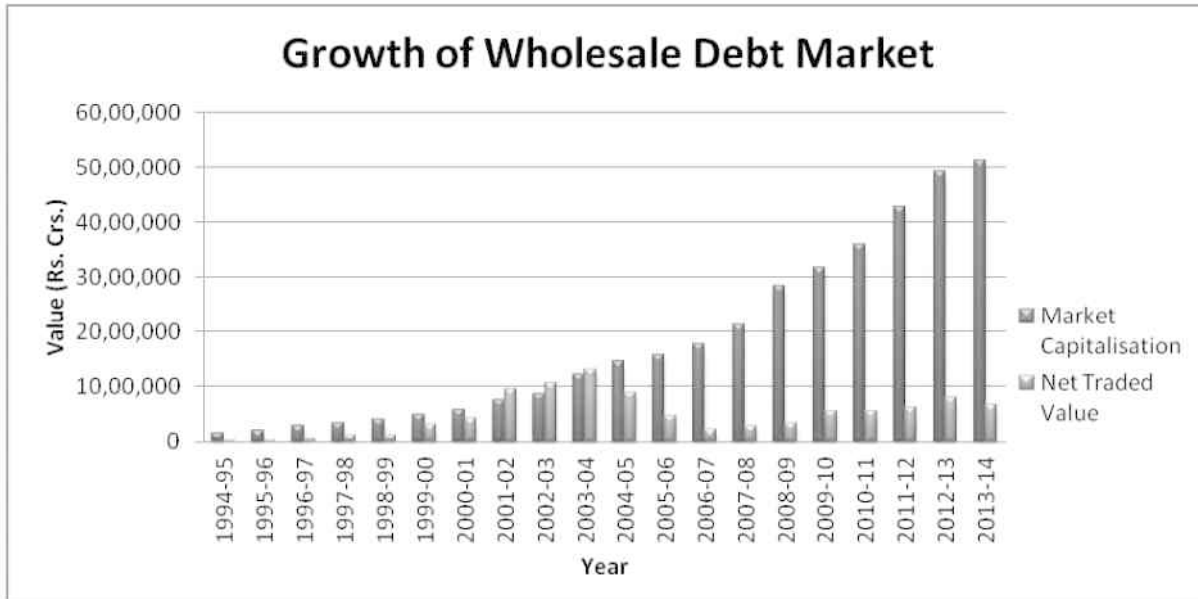
Source: NSE Datazone

The mobilisation of funds through corporate bonds has also made a significant progress during the period of last thirteen years which is evident from graph 4. Total funds raised through corporate bonds were Rs. 3,68,800 crores during the year 2012-13 which was 21.85% more than that of previous year. It is also noticed that mobilisation of funds in primary corporate bond market has not been affected by the global recession during 2007 to 2009. The primary market made growth of 20.56% in 2007-08 over its previous year and 33.87% growth in 2008-09 over 2007-08.
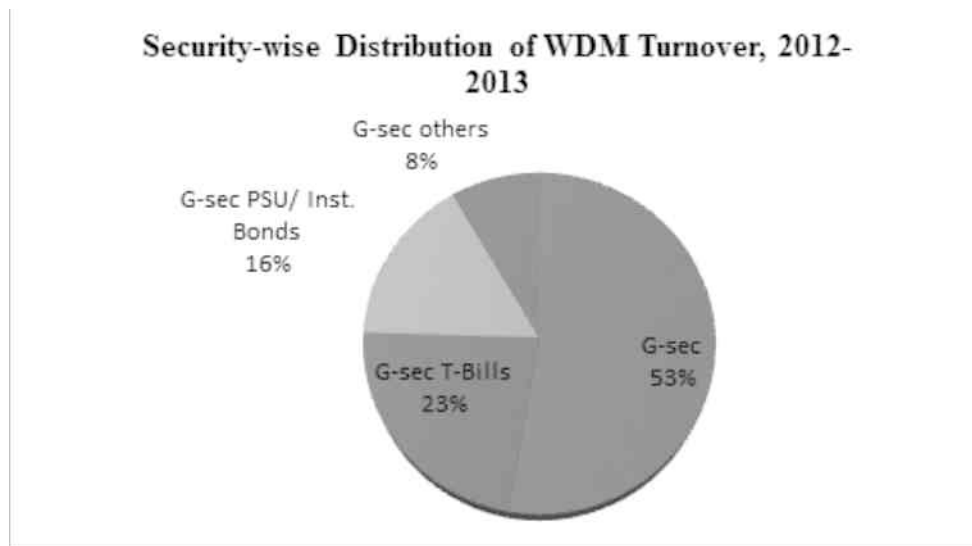
Graph: 4

Source: NSE (ISMR)

Similarly, the security wise distribution of WDM turnover indicates that 53% of turnover was in the G-sec securities

followed by T bills, PSUs and other categories (graph).

Security-wise Distribution of WDM Turnover, 2012-2013

Literature Review

The study of bond market development is very popular among researchers. However, there is not much literature available regarding to the corporate bond market particularly in the case of emerging economies. The reason might be attributed to the fact that corporate bond market is not quite well developed in these economies. In this section we present a brief review of representative studies.

Kunt and Levine (1996) examine the relationship between economic development and financial structure. They find that overall financial development matters for economic growth. They also suggests that policymakers may achieve greater returns by focusing less on the extent to which their country is bank-based or market based and more on legal, regulatory, and policy reforms that boost the functioning of markets and banks.

Fink and et al. (2003) examined the relationship between the development of the aggregate bond markets and real GDP in 13 highly developed economies using a panel data over the 1950 to 2000 period. They used Granger causality tests, correlation analysis, Ordinary list Square method (OLS) techniques to check stationarity, co-integration, and causality features of the variables and Vector Error Correction Model (VECM) to validate the model. The study found the evidence on the relationship between bond markets and real economic growth in the EU15, USA, Japan, Switzerland and Norway. While in the cases of Japan, Finland and Italy they found the evidence of interdependence between bond market capitalization growth and real output growth.

Liang and Teng (2006) investigated the relationship

between financial development and economic growth for the case of China over the period 1952–2001. After considering the time series characteristics of dataset and several confirmed sources-of-China's-growth such as capital stock and international trade, a theoretically based multivariate VAR framework is used as an appropriate specification and whether proxy measurement of financial development is associated with long-run economic growth is identified in a co-integrating framework through tests of over-identifying restrictions. They concluded that there exists a unidirectional causality from economic growth to financial development in China over the period 1952– 2001 which is separated distinctly from the existing literature.

Kolapo and Adaramola (2012) examined the impact of the Nigerian capital market on its economic growth using GDP as a proxy for economic growth while Market Capitalization (MCAP), Total New Issues (TNI), Value of Transactions (VLT), and Total Listed Equities and Government Stocks (LEGS) as variables for capital market. To check whether a long run relationship exists between capital market and economic growth in Nigeria, Johansen co-integration and Granger causality tests were applied. It was concluded that there exists a long run relationship between capital market and economic growth. The capital market impacts positively on the economic growth of the country.

Murthy and Kalsie (2013) tried to measure the international currency crisis of 1997 using a panel data of five Asian counties i.e. Thailand, Philippines, Korea, Indonesia, and Malaysia. They adopted continuous and discrete approaches for defining and measuring crises and used India as a 'control' which enables international and inter-temporal comparisons during crisis. They used Granger causality

tests, correlation analysis, principal component analysis (PCA) and regression analysis techniques to fulfil the objectives of the study. It was found that the index of crises consists of exports, exchange rate, and interest rate. The financial index contains risk rating, domestic financing, and stock traded. The index of macro variables is based on GDP, capital formation, and budget balance. Macro index negatively influences crisis and financial index influences crisis positively. The stock traded and domestic financing (the financial variables) were the most important causes of crisis while amongst the macro variables, GDP growth was the major influencing variable.

Ayadi and Arbak (2013) tried to explore the relationship between financial sector development and economic growth, using a sample of northern and southern Mediterranean countries for the years 1985-2009. They concluded that credit to the private sector and bank deposits are in many specifications negatively associated with economic growth while stock market size, liquidity and investment, whether domestic or in the form of FDI, contributed a significant role in economic growth in selected economies.

Huang and Lu (2009) investigated the impact of macroeconomic variables on the volatility of government-bond returns. They extracted the "real" and "monetary" factors from the real activities and monetary variables respectively. Then they examined the two factors' impact on the daily volatility of the 1-, 5-, 10- and 30-year U.S. Treasury bonds. Finally they concluded that both "real" and "monetary" factors significantly affected the bond return volatility. In particular, the "real" factor affected the volatility across all maturities, while the monetary variables were significantly related to the volatility of short-term bonds and weakly related to the volatility of medium-term bonds.

Li (2002) studied the correlation between stock returns and long-term government bond returns, and tried to explain the economic driving forces behind this relationship using the data of G7 countries from the past 40 years. He concluded that uncertainty about long-term expected inflation plays an important role in determining the major trends of stock-bond correlations. He also stated that uncertainty about other macroeconomic factors, such as the real interest rate and unexpected inflation, also a ected the co-movement of stock-bond returns to a lesser degree. Finally he came to result that investors' asset allocation decisions got improved through forecasting stock-bond correlations based on macroeconomic factors.

Huang and Kong (2005) investigated the impact of scheduled macroeconomic (11variables) news announcements on the corporate bond market using daily credit spreads from January 1997 through June 2003. In case of examining the importance of individual macroeconomic announcements, they found that only three announcements (advance retail sales, changes in nonfarm payroll, and the consumer confidence index) had a consistent and significant (0.005 level) effect on corporate bond credit spreads while the employment report also had a significant impact on corporate bond credit spreads. But when they explored the impact of macroeconomic announcements on the conditional volatility of credit spreads in corporate bonds, it was found that only retail sales announcements out of above three significant variables, showed some significant conditional volatility impact.

Arnold and Vrugt (2010) explored fundamental determinants of volatility in the U.S. Treasury bond market using quarterly data for the period 1970–2005. They found that there was a significant relation between bond volatility and dispersion based uncertainty about the monetary policy rate, inflation, and measures of real activity. The dispersion in monetary policy rate forecasts captured almost all macroeconomic uncertainty in the data set. Finally they concluded that the link between Treasury bond volatility and uncertainty about macroeconomic variables is much stronger than for the more traditional time series measures of macroeconomic volatility and monetary policy uncertainty caused to Treasury bond volatility.

Liebermann (2011) analysed the daily response of T-Bond yields to the news in a large set of macroeconomic releases over the sample running from January 1997 to September 2010. After analysing the sample evidences, he found that the bond market reacts mainly to the soft data which have very short publication lags and the most timely hard data. Further looking at sub-samples over the pre-Great Recession period revealed that parameter instability in terms of absolute and relative size of yields response to news, as well as significance, is present.

Nair and Thenmozhi (2012) investigated the effect of macroeconomic factors on the conditional volatility of developed and emerging bond markets using ARMA-GARCH model and examines the effect of macroeconomic factors. The samples were India, Brazil among the emerging bond markets and USA, UK, Germany and Japan among the developed bond markets. The data constituted monthly data and the sample period of the study spans from 2004 to 2010 for India, 2002 to 2010 for Brazil, and 2000 to 2010 for USA, UK, Germany and Japan. They concluded that there is high degree of significant inter-correlation between short-term and long-term interest rates in all the countries. The findings also showed that the macroeconomic factors exhibit a significant relationship with volatility in all the bond markets, more specifically in the emerging bond markets.

Mihaljek and et. al (2002) reviews recent trends in the

development of debt markets in the emerging economies on two aspect: first the analysis of the size and growth of debt markets and the macroeconomic aspects of their development and the second focus nexus on the main microeconomic and institutional characteristics of emerging debt markets. They conclude that despite considerable growth, domestic debt markets in the emerging economies remain small compared to industrial countries. The emerging economies have been success to develop government bond markets but much less success in developing corporate bond markets. It is also concluded that fiscal deficits, real economic growth and private capital flow have a positive relationship with debt market whereas there are weak relationship between inflation and the debt market.

ICMA (2013) studied the importance of corporate bond markets for economic growth as well as for investors, for companies, and for governments. And it found that the corporate bond markets have an important role in economic growth of the country. They bring substantial economic benefit by taking the strain off public sources of funding, easing pressure on bank lending etc.

USAID (2009) tried to study the technical understanding of corporate bond issuances and approaches to developing a sustainable corporate bonds market in emerging economies. It was found by it that the amount of outstanding private debt securities as a percentage of GDP in emerging market economies is significantly less than that in developed economies and it suggested that by developing corporate bond markets in emerging market economies could be accelerated sustainable rates of economic growth.

Thumrongvit et. al. (2013) studied the bond markets as a third key component of the financial system. They used a panel data set of 38 countries for conducting the study. They concluded that stock market development is positively related to economic growth and government bonds are positively related to economic growth, while the effects of corporate bonds change from negative to positive, as domestic financial structures expand in size and diversity.

After evaluating the above literature, we come to the idea that the external corporate financing pattern is also influenced by macroeconomic factors like the phase of business cycle, inflation rate, interest rate structure etc. (Choe, Masulis, & Nanda, 1993; Bondt, 2005; Korajczyk & Levy, 2003; Park & Shenoy, 2002). However, such studies are scanty in context of India.

Methodology

Data and Variables

The data used in the study are secondary in nature. In the study corporate bond market and some selected macro economic variables have been used. The data has been obtained from Reserve Bank of India (RBI), Planning Commission of India, Ministry of Finance, Bombay Stock Exchange (BSE), National Stock Exchange (NSE), Securities and Exchange Board of India (SEBI) and World Development Indicators (WDI) etc. for the period from 1990 to 2013. The researchers have defined the all the selected variables on the base of literature and their own context of the study. The definition of the variables and sources of data are described in Table 1.

Table 1

Variables	Definition	Source
Government Expenditure (G_EXP)	Total govt expenditure in India as a percentage of GDP	Planning commission of India
Interest Rate on Government Bonds (INT)	Interest rates on central and state government dated securities (Average %)	Planning commission of India
Fiscal Deficit (FD)	Net fiscal Deficit as a percentage of GDP at current market price	Planning commission of India
Government Plan Expenditure	Total govt. Plan expenditure as percentage of GDP	Planning commission of India
Government Debt (GD)	Total govt. Debt (Central and state) as a percentage of GDP	Calculated with the data from RBI
Gross Domestic Product (GDP)	GDP (at Factor cost) growth rate as a percentage change over previous year	Calculated with the data from RBI
Government Consumption (CONS)	Government final consumption expenditure as a percentage change over previous year	Calculated with the data from RBI

India's External Debt (EXD)	Indian External Debt Stock - GDP Ratio	RBI
Foreign exchange reserve (FOREX)	Net Foreign exchange reserve growth rate over previous year (%)	Calculated with the data from RBI
Exchange rate (EXR)	Exchange rate on $ (% change over previous year)	Calculated with the data from RBI
Indices Return (IR)	BSE Sensex Indices Return over previous year (%)	Calculated with the data from SEBI
Inflation rate (INF)	The annual percentage change in CPI	World Development Indicator (WDI)
Total value traded (TVT)	The total value of shares traded at BSE Indices during the period as % of GDP	Calculated with the data from RBI
Turnover ratio (TR)	The ratio of total value traded to market capitalisation of BSE	Calculated with the data from RBI
GDP per capita (GDP_PC)	GDP per capita growth (Annual percent change)	Calculated with the data from RBI
Trade Openness (TO)	Sum of Import and Export of goods & services (Percentage of GDP)	Calculated with the data from RBI
Current Account Balance (CAB)	Total Current Account Balance (Percentage of GDP)	Calculated with the data from RBI
Gross Domestic Saving (GDS)	The ratio of Gross Domestic Saving to GDP (%)	Data from Economic Survey of India
Gross Capital Formation (GCF)	Gross Capital Formation (Percentage of GDP)	Data from Economic Survey of India
Corporate Bond market (CBM)	Sum of Bonds issued by PSUs and Internal market borrowing by RBI for financing the gross fiscal deficits (Annual percentage change over previous year)	Calculated with the data from SEBI and RBI

Descriptive Statistics and Preliminary Findings

The descriptive statistics of all the selected macro economic variables including corporate bond market are presented in Annexure 1. The mean value of government debts (GD) is 72.06 % which is the highest average value among all other variables whereas corporate bond market (CBM) stands at second number. The current account balance (CAB) has the lowest mean value i.e. -1.58%. The corporate bond market has the highest standard deviation (134.73%) which indicates that corporate bond market has the greatest deviation from its mean value as compared to other variables. In case of government plan expenditure (P_EXP) has the lowest Std. Deviation which shows soundness in deviation of its value. When we examine the skewness of variables, we find that current account balance (CAB), government consumptions (CONS), fiscal deficits (FD), gross domestic products (GDP) and GDP per capita (GDP_PC) are negatively skewed while all other variables are positively skewed which indicates asymmetry in data.

When the normality assumption of variables is analysed, it is found that corporate bond market, current account balance, exchange rate, foreign exchange reserves and turnover ratio have their corresponding p-value less than 5% which suggests that these variables do not have normal distribution. But more that 50% of variables included in the study are normally distributed so we can proceed for further analysis.

Annexure 2 presents the correlation analysis of all variables. It is found that corporate bond market is positively and significantly correlated with foreign exchange reserves whereas it does not have any significant correlation with any other variable. It is only negatively or positively correlated with other variables. The gross domestic product (GDP) is highly correlated with government consumption (CONS). It is also noted that gross domestic saving (GDS) has highly negative correlation with external debts (EXD) and highly

positive correlation with gross capital formation. The GDP per capita (GDP_PC) is significantly positive correlated with government consumptions and GDP. In case of interest rate, we find that it has significantly positive correlation with external debts and significant negative correlation with gross capital formation (GCF), government debt (GD) and gross domestic saving (GDS). But as per our opinion, there should be positive correlation between interest rate of long term government securities and total long term debt. When the level of total long term government debt increases, the interest rate will also increase because the bigger the size of government debt tends to induce bigger risk perception among investors. When we analyse the trade openness (TO), we find that it is significantly correlated with current account balance (CAB), Government consumptions, external debts, gross capital formation, gross domestic savings and interest rates.

Empirical analysis and results

a.   Unit Root Test

Before moving further in analysis of data, it is necessary to check whether the data are stationary or not because any econometric model asks for a stationary time series data. The results of regression may be spurious if we analyse it without checking the stationarity of data. Therefore unit root test is used to check the stationary of data. For conducting this test, Augmented Dickey Fuller Test (ADF test) is employed. The stationarity of time series data is analysed using intercept and trend base. The results of unit root of all the variables are presented in table 4. It was found that corporate bond market (CBM), foreign exchange reserve (FOREX) and government expenditures (G_EXP) do not have unit root. It means that they are stationary time series data at level. While government consumption (CONS), external debt (EXD), exchange rate (EXR), fiscal deficits (FD), gross capital formation (GCF), gross domestic products (GDP), GDP per capita (GDP_PC), gross domestic saving (GDS), inflation (INF), indices returns (IR), total value traded (TVT), turnover ratio (TR) and trade openness (TO) report the existence of unit root at level and stationarity in first difference form. While government debt (GD), interest rate on government bonds (INT) and government plan expenditures (P_EXP) contain unit root at level as well as in first difference form and they become stationary in second difference form. Therefore, before applying the regression analysis, the series data have been made stationary through conversion of data as the unit root test suggests.

Regression Analysis

Linear multiple regression model has been used to analyse the effect of all selected macro economic variables on the resource mobilisation in India's corporate bond market.

The basic least squares equation is:

$$Yt = \alpha + \beta xt + ut \quad .... (0)$$

Where, Yt is a dependent variable, α is a constant, βxt is a vector of independent variables,

ut is a disturbance term and t indexes is for time (in years).

The models used in the research have model specifications in two- folds. The first method is Enter Method which is specified in Annexure 4 for Model 1 and the second method is Stepwise method for knowing the best fit model to determine the flow in corporate bond market that is presented in Annexure 5 and Annexure 6 for Model 2 and Model 3.

Analysis of regression Model one

In regression regression Model one, corporate bond market is dependent variable while all other selected macro economic variables are independent variables and the equation is presented in model one as below:

$$Corporate\ Bond\ Market\ (CBM) = \alpha i + \beta 1*CAB + \beta 2*CONS + \beta 3*EXD + \beta 4*EXR + \beta 5*FD + \beta 6*FOREX + \beta 7*G\_EXP + \beta 8*GCF + \beta 9*GD + \beta 10*GDP + \beta 11*GDP\_PC + \beta 12*GDS + \beta 13*INF + \beta 14*INT + \beta 15*IR + \beta 16*P\_EXP + \beta 17*TVT + \beta 18*TR + \beta 19*TO + ut \quad .... (1)$$

The result of model one is reported in Annexure 4. It shows that 99.97% variation in corporate bond market is explained by all the independent variables included in the model. But it is also clear that all the explanatory variables except fiscal deficits are not found statistically significant at 5% level. Durbin Watson test shows the fitness of model but F test is not significant at 5% level. It, therefore, is concluded that this model is not best fit model.

Analysis of regression Model two

It is clear that model one is not best fit model, so we move further on step wise method through our own logics to find the best fit model. As we analysed in correlation analysis, we found that gross domestic product (GDP) is highly correlated with government consumptions (CONS) and also with GDP per capita and gross domestic saving. Therefore, this variable is dropped from model two in order to find best fit model. The second regression equation is presented as below:

$$Corporate\ Bond\ Market\ (CBM) = \alpha i + \beta 1*CAB + \beta 2*CONS + \beta 3*EXD + \beta 4*EXR + \beta 5*FD + \beta 6*FOREX + \beta 7*G\_EXP + \beta 8*GCF + \beta 9*GD + \beta 10*GDP\_PC + \beta 11*GDS + \beta 13*INF + \beta 14*INT + \beta 15*IR + \beta 16*P\_EXP + \beta 17*TVT + \beta 18*TR + \beta 19*TO\ ut \quad .... (2)$$

The Annexure 5 shows the results of model two. The inflows in corporate bond market is explained by all explanatory variables is 99.29 %, but only fiscal deficit is once again statistically significant and F-stat is also not significant at

5% level. Therefore, this model is also not a good fit model.

Analysis of regression Model three

We further move to model 3. The result of correlation also reports that trade openness (TO) is significantly correlated with current account balance (CAB), external debts (EXD), government expenditure (G_EXP), gross capital formation (GCF), gross domestic savings (GDS) and interest rates (INT). So to remove the effect of trade openness on these variables, it is dropped out from model 3. The new regression model 3 is as follows:

Insert

Annexure 6 shows the results of regression equation 3. It explains that F-stat is significant at 5% level and Durbin Watson test also proves the fitness of model. R-square value is 99.24 % which states that variables included in model 3 explain about 99 % of the variations in inflows in corporate bond market. After reviewing all three models, it can be concluded that model three is the best fit model.

Conclusion

In this paper, we have examined the effects of some selected macro economic variables on the inflows of corporate debt market in India which has been ignored in previous studies. Due to unavailability of data on corporate bond market prior to 1994 through NSE, only bonds issued by public sector undertaking have been included for the consideration of inflows in corporate debt market. This is from the study that turnover in corporate bond market is significantly correlated with foreign exchange reserves while with other variables it is only correlated positively or negatively but not significantly.

We can infer from this result that foreign exchange reserve is the only variable among the selected macro economic variables which significantly affects the primary market of corporate bond market. But when we analyse the effect of all selected macroeconomic variables on corporate bond market, we find that all the selected variables significantly explain the determination of inflows of corporate bonds except GDP and Trade openness.

Limitation and scope for future research

The limitation of our study is that it covers a small time period whereas to examine the long run linear relationship, at least the data should be for 30 years. The data on corporate bond market should include more segments such as bonds issued by private sector enterprises, financial institutions, banks etc. Further, some variables like tax rate, foreign direct investments, legal perspectives and corruptions can be included in the study to bring out more clarity.

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Annexure 1: Descriptive Statistics

	CBM	CAB	CONS	EXD	EXR	FD	FOREX	G_EXP	GCF	GD	GDP	GDP_PC	GDS	INF	INT	IR	P_EXP	TO	TR	TVT
Mean	44.4790	-1.585121	5.792529	23.48696	5.707699	5.359130	29.95594	15.52217	28.82609	72.06391	6.566522	12.20044	27.52174	7.881870	9.820870	18.24487	4.347826	28.52538	37.43038	16.70241
Median	15.0874	-0.905098	5.416390	21.20000	4.394279	5.560000	26.31695	15.50000	26.00000	71.44000	6.680000	13.09148	25.70000	8.351816	9.440000	19.37715	4.40000	18.54399	27.00273	12.83030
Max.	628.371	2.303359	9.391006	38.70000	36.39844	7.850000	108.9173	18.52000	38.10000	83.23000	9.570000	17.35300	36.80000	13.87025	13.75000	79.08111	5.08000	78.25671	174.9674	42.68579
Min.	-64.15875	-8.711388	1.797012	16.80000	-11.13815	2.54000	-6.76360	13.58000	21.80000	64.37000	1.43000	5.765086	21.30000	3.684807	5.71000	-25.36887	3.81000	6.721368	8.590853	2.671659
Std. Dev.	134.7302	2.495849	2.236685	6.436494	10.02419	1.192579	29.42604	1.223501	5.657515	5.753720	2.089279	3.023049	5.099105	3.248169	2.508292	28.09240	0.432739	21.28756	34.20334	11.97424
Skew.	3.719886	-1.437366	-0.148517	1.121740	1.370843	-0.375656	1.441956	0.376752	0.392836	0.642771	-0.407506	-0.844199	0.335437	0.203618	0.014504	0.183636	0.211297	1.010141	2.983851	0.665913
Kurt.	16.81111	4.933805	1.800776	3.202633	5.436059	3.281775	4.468111	2.885417	1.446158	2.374564	2.792431	2.937302	1.563851	1.843404	1.595190	2.129052	1.516975	2.892068	12.58914	2.443992
Jarque-Bera	235.8429	11.50354	1.462769	4.862832	12.89076	0.617039	10.03595	0.566695	2.905366	1.958630	0.677857	2.735674	2.407947	1.440906	1.892068	0.856212	2.278867	3.922642	122.2498	1.996120
Prob.	0.000000	0.003177	0.481242	0.087912	0.001588	0.734534	0.006618	0.757034	0.233939	0.375568	0.712533	0.254657	0.300076	0.486532	0.388278	0.651742	0.320000	0.140672	0.000000	0.368594

Annexure 2: Correlation analysis

	CBM	CAB	CONS	EXD	EXR	FD	FOREX	G_EXP	GCF	GD	GDP	GDP_PC	GDS	INF	INT	IR	P_EXP	TO	TR	TVT
CBM	1.000																			
CAB	0.052	1.000																		
CONS	0.032	-0.316	1.000																	
EXD	0.227	0.231	-0.638	1.000																
EXR	-0.080	-0.086	-0.512	0.698	1.000															
FD	0.362	0.023	-0.371	0.448	0.365	1.000														
FOREX	0.369	0.416	-0.490	0.623	0.302	0.277	1.000													
G_EXP	0.121	0.506	-0.583	0.532	0.328	0.681	0.610	1.000												
GCF	-0.166	-0.633	0.681	-0.722	-0.425	-0.524	-0.489	-0.638	1.000											
GD	-0.035	0.601	-0.237	-0.229	-0.225	-0.235	0.170	0.254	-0.057	1.000										
GDP	-0.052	-0.119	0.867	-0.621	-0.661	-0.527	-0.489	-0.553	0.625	-0.026	1.000									
GDP_PC	0.102	-0.384	0.487	0.118	0.026	-0.146	0.008	-0.224	0.385	-0.514	0.471	1.000								
GDS	-0.173	-0.453	0.660	-0.796	-0.519	-0.623	-0.456	-0.611	0.969	0.152	0.655	0.270	1.000							
INF	-0.080	-0.369	-0.017	0.502	0.600	0.282	0.058	0.104	-0.072	-0.669	-0.162	0.628	-0.227	1.000						
INT	0.203	0.175	-0.299	0.744	0.433	0.419	0.276	0.214	-0.714	-0.568	-0.353	0.088	-0.821	0.412	1.000					
IR	-0.278	0.184	-0.139	0.281	0.166	-0.307	0.432	0.137	0.039	0.173	0.070	0.246	0.063	0.139	-0.063	1.000				
P_EXP	0.275	-0.068	-0.256	0.441	0.257	0.508	0.459	0.568	-0.089	0.011	-0.266	-0.288	-0.143	0.329	-0.033	0.138	1.000			
TO	-0.116	-0.840	0.487	-0.620	-0.214	-0.313	-0.516	-0.597	0.866	-0.195	0.341	0.254	0.798	0.032	-0.633	-0.212	0.004	1.000		
TR	-0.055	0.340	-0.246	-0.111	-0.055	0.145	-0.025	0.165	-0.298	0.224	-0.239	-0.675	-0.235	-0.422	0.078	-0.206	-0.301	-0.276	1.000	
TVT	-0.102	-0.066	0.490	-0.648	-0.438	-0.432	-0.354	-0.405	0.554	0.192	0.453	-0.177	0.624	-0.403	-0.487	-0.016	-0.337	0.367	0.529	1.000

Annexure 3: UNIT ROOT TEST

Variables	ADF Test			
	At level		First Difference	
	T- stat	P-Value	T- stat	P-Value
CBM	-5.937988	0.0004		
CAB	0.167283	0.9959	-4.416425	0.0111
CONS	-3.148617	0.1202	-7.195436	0.0000
EXD	-1.583478	0.7664	-8.961435	0.0000
EXR	-3.487686	0.0656	-6.182244	0.0004
FD	-3.410826	0.0756	-5.111969	0.0027
FOREX	-3.678902	0.0469		
G_EXP	-3.732434	0.0424		
GCF	-2.750885	0.2279	-5.474734	0.0013
GD	-2.081078	0.5260	-2.448888 (-5.029326)	0.3468 (0.0035)
GDP	-3.365650	0.0821	-7.445011	0.0000
GDP_PC	-2.032749	0.5524	-5.202175	0.0023
GDS	-2.075949	0.5300	-5.353472	0.0017
INF	-2.390787	0.3736	-6.674616	0.0001
INT	-2.231441	0.4496	-3.217335 (-4.226786)	0.1092 (0.0201)
IR	-3.579772	0.0553	-5.102821	0.0030
P_EXP	-2.780621	0.2192	-3.314999 (-5.912564)	0.0911 (0.0006)
TVT	-2.092829	0.5213	-4.943205	0.0038
TR	-2.623504	0.2742	-6.432808	0.0002
TO	1.532684	0.9999	-4.437835	0.0113

Annexure 4: Regression Model 1

Variable	Coefficient	Std. Error	t-Statistic	P. Value
C	1027.090	96.36696	10.65812	0.0596
CAB	-21.77079	9.695926	-2.245354	0.2667
CONS	-12.01070	3.646243	-3.293992	0.1876
EXD	-33.33861	3.820276	-8.726755	0.0726
EXR	-2.619982	0.570889	-4.589300	0.1366
FD	116.1902	5.524487	21.03185	0.0302
FOREX	3.850961	0.363318	10.59942	0.0599
G_EXP	-73.23705	6.131661	-11.94408	0.0532
GCF	-63.13436	11.35227	-5.561385	0.1133
GD	13.16978	3.749794	3.512135	0.1766
GDP	25.17053	4.964149	5.070462	0.1240
GDP_PC	9.868918	4.989836	1.977804	0.2980

GDS	79.43635	14.02713	5.663052	0.1113
INF	-4.382960	2.999424	-1.461267	0.3821
INT	38.56682	8.039337	4.797263	0.1308
IR	0.124234	0.209459	0.593116	0.6592
P_EXP	-120.1193	18.08240	-6.642881	0.0951
TVT	-6.216815	1.720845	-3.612651	0.1719
TR	2.336615	0.497953	4.692443	0.1337
TO	5.283422	2.214793	2.385515	0.2527

R-squared	0.999736	**Durbin-Watson**	2.048638
Adj. R-squared	0.994728	**F-stat**	199.6084
		Prob(F-stat)	0.055687

Annexure 5: Regression Model 2

Variable	Coefficient	Std. Error	t-Statistic	P. Value
C	847.3557	327.4751	2.587542	0.1225
CAB	-39.48769	33.05221	-1.194707	0.3547
CONS	-5.870092	12.56847	-0.467049	0.6864
EXD	-33.22674	13.96066	-2.380025	0.1403
EXR	-2.143423	2.057802	-1.041608	0.4070
FD	113.3003	20.08107	5.642143	0.0300
FOREX	3.532823	1.307769	2.701412	0.1141
G_EXP	-60.38438	20.40332	-2.959537	0.0977
GCF	-80.14757	39.63247	-2.022270	0.1805
GD	0.011479	9.891583	0.001160	0.9992
GDP_PC	11.20048	18.20969	0.615083	0.6012
GDS	84.81707	51.11413	1.659366	0.2389
INF	-7.862311	10.67046	-0.736830	0.5379
INT	42.55378	29.23826	1.455414	0.2828
IR	0.279139	0.757267	0.368614	0.7478
P_EXP	-90.40759	62.51481	-1.446179	0.2850
TVT	-1.883174	5.458224	-0.345016	0.7630
TR	0.989651	1.539147	0.642987	0.5861
TO	2.967559	7.919815	0.374701	0.7439

R-squared	0.992959	**Durbin-Watson**	1.651167
Adj. R-squared	0.929592	**F-stat**	15.66998
		Prob(F-stat)	0.061611

Annexure 6: Regression Model 3

Variable	Coefficient	Std. Error	t-Statistic	P. Value
C	917.9844	226.1917	4.058435	0.0270
CAB	-34.99246	26.01424	-1.345127	0.2712
CONS	-5.616613	10.60081	-0.529829	0.6329
EXD	-29.27053	7.714857	-3.794047	0.0321
EXR	-2.029209	1.718988	-1.180467	0.3229
FD	108.9974	13.91473	7.833237	0.0043
FOREX	3.607886	1.091596	3.305148	0.0456
G_EXP	-64.11927	15.03751	-4.263954	0.0237
GCF	-70.25333	24.96382	-2.814206	0.0671
GD	2.034864	7.000235	0.290685	0.7902
GDP_PC	16.00323	10.92543	1.464770	0.2392
GDS	71.96062	32.00162	2.248655	0.1101
INF	-10.74546	6.244423	-1.720809	0.1838
INT	40.47929	24.24988	1.669258	0.1937
IR	0.289505	0.639213	0.452908	0.6814
P_EXP	-105.8292	39.74611	-2.662630	0.0762
TVT	-2.590003	4.326306	-0.598664	0.5916
TR	1.133588	1.258929	0.900438	0.4343
R-squared	0.992465	Durbin–Watson	1.909064	
Adj. R-squared	0.949766	F-stat	23.24353	
		Prob(F-stat)	0.012298	