

Sovereign Debt to GDP and Sovereign Bond Yields: Evidence from India

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ABSTRACT

This paper investigates the impact of sovereign debt to GDP on the yields of sovereign bonds across different maturities of India from 2000 to 2017 comprising of 18 years of sample period. The empirical analysis was performed on the yearly data of debt to GDP and yields of sovereign bond across different maturities of India by applying regression analysis. It was found that debt to GDP is affecting yields of sovereign bond indices of medium term and long term however, it was noticed that there is no impact of debt to GDP on short-term bond yield of India. The results indicate that one point percentage increase in the stock of debt to GDP will lead to decrease of 33.8, 35.2, 37.3, 41.5 and 42.5 base points in 3-, 5-, 10-, 15- and 30-year bond yields of India.

1. Introduction

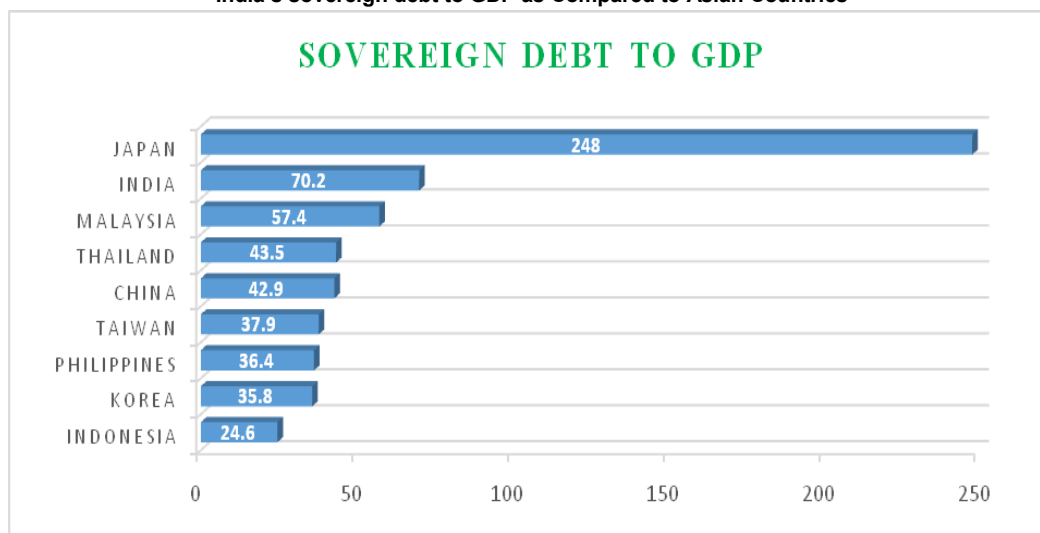
Gross sovereign debt at global level has increased during recent years and has reached to the stand at 82% of GDP in 2018. According to the IMF Japan has the highest gross sovereign debt of 236% of its GDP and Saudi Arabia is having least amount of government debt to GDP in the world. However, the average amount of public debt to GDP owed by most of the low-income countries is set to be 46% of their GDP. India sovereign debt to GDP from 2014 to 2017 is reported in the table 1. During 2017, India's sovereign debt to GDP was 70.2%. Since, 1991 to 2014 India's Sovereign debt to GDP almost averages 73.66%. Its all-time high and low sovereign debt to GDP was 84.30% in 2003 and 65.80% in 2013 respectively. In India, the Ministry of Finance, Government of India, reports the data and figures related to sovereign debt to GDP. India's sovereign debt to GDP is the highest among Asian nations except Japan that is reported in the graph 1. Debt to GDP is the one of the economic indicator of Indian economy that worries everyone from Governor of Reserve Bank of India to credit rating agencies. In November 2017, credit rating agency S&P report that it may increase India's sovereign ratings if the

level of sovereign debt to GDP falls below 60%. During same time Moody's has, reported that, government debt is a key constraint on India's ratings. Research report by Standard Chartered says, "Interest payment on outstanding government debt and increased market stabilization scheme bonds will put significant pressure on the fiscal deficit. Fiscal 2018 will be the first year since fiscal 2008 that the government's interest payment burden will be larger than its fiscal deficit".

Table 1
India National debt to GDP

2012	69.12%
2013	68.55%
2014	67.81%
2015	69.56%
2016	68.89%
2017	70.2%

Graph 1
India's sovereign debt to GDP as Compared to Asian Countries



Source: data obtained from IMF

The above graph reveals that India is the second largest country having highest sovereign debt to GDP after Japan among Asian countries. It reports that Indonesia is having least debt to GDP among Asian countries in 2018.

2. Review of literature

The impact of sovereign debt on sovereign bond yields has been enormously empirically researched in several developed countries. However, the global financial meltdown resulted the negligence related to fiscal positions in several countries that raised the concern about the effects of fiscal deficit or sovereign debt on sovereign bond yields and due the extension, formation of private capital and economic growth. The effect of sovereign debt on sovereign bond yields therefore, remains the focus of current and future analysis.

“Sovereign debt can influence the sovereign bond yields through different channels such as an increase in sovereign debt can encourage aggregate demand thus, leads to increase in sovereign bond yields. Secondly, sovereign debt can effect sovereign bond yields through the default risk premium. If investors panic that government could default, therefore, they may demand for compensating increase in bond yields (Ardagna et al., 2007; Gruber and Kamin, 2010; Poghosyan, 2014) Finally, the high burden of sovereign debt can compel government to raise bond yields to entice investors to keep this debt in their portfolios. All these channels discussed above indicates that there is positive nexus between sovereign debt and sovereign bond yields.

There is a voluminous empirical literature on the nexus between sovereign debt and bond yields, which can be categorized into two groups such as single country analysis and multi-country analysis. The former literature focused on the Treasury bond market of US and includes studies such as Engen, Hubbard (2004) and Thomas & Wu (2009) they found that there is significant impact of sovereign debt of bond yields. However, the results of latter literature provides mixed findings. Izak (2004) investigates the nexus between bond yield, government debt, fiscal deficit, inflation and growth of four transition economies such as Czech Republic, Hungary, Poland and Slovakia. The sample period spanned from 1994 to 2002.

He found that if there is one percentage increase in the primary balance that results decrease of 12 basis points in bond yields. Kinoshita (2006) investigates the nexus between long-term Treasury yields and the share of current financial liabilities of the general government in GDP and the share of government final consumption expenditure in GDP. He concluded that that a one percentage increase in the government debt to GDP ratio increases the Treasury bond yields by approximately 2–5 basis points.”

3. Data and Research Methodology

The data used in the analysis is secondary in nature and has been collected from Bloomberg database and Reserve Bank of India. The frequency of data is yearly and covers a sample period of 18 years from 2000- 17. Regression analysis has been applied to evaluate the impact of sovereign debt to GDP ratio on sovereign bond yields across different maturities of India.

3.1 Model Specification

The model used in this study is simple linear regression model. This attempted to look at the effects or the relationship between a responsive variable and independent variable with regard to this study, the dependent variable is sovereign bond yield of different maturities and the independent variable is sovereign debt to GDP ratio.

The model specified is therefore:

$Y = \beta_0 + \beta_1 X + e_{ij}$. Letting Sovereign bond yield = Y, sovereign debt to GDP = X. The model is re-specified as sovereign bond yield = $\beta_0 + \beta_1$ sovereign debt to GDP, where β_0 and β_1 are the regression coefficients which are estimated from the sample data. The e_{ij} is the random error term.”

4. Empirical Analysis and Discussions

Model formulation

To investigate the relationship between responsive variable (bond yields) and explanatory variables (sovereign debt to GDP) a linear Regression model was developed and its results are reported in the table 2.”

Table 2
Regression of debt to GDP and Sovereign bond yields of India

	1 year	2 year	3 year	5 year	10 year	15 year	30 year
R square	0.084	0.051	0.340**	0.276**	0.309**	0.066**	0.281**
Debt to GDP	-.190	-.133	-.338	-.352	-.373	-.415	-.425
F. statistics	0.342	0.369	.011**	0.025**	0.017**	0.012**	0.024**

***, **, * denotes significant @ 1 percentage, 5 percentage and 10 percentage respectively.

From the results of the table 2, it is evident that debt to GDP is negatively related with sovereign bond yields of India. It further reports that short term bond yields (1 year & 2 year) are not affected by debt to GDP however, it is having impact on the yields of medium term (3 year & 5 year) and long term (10-, 15- and 30 year) bond indices of India during entire study period. Debt to GDP explains or affects the -.338%, -.352%, -.373%, -.415% and -.425% yields of 3-, 5-, 10-, 15- and 30 year bond

indices of India. The results indicate that one point percentage increase in the stock of debt to GDP will lead to decrease of 33.8, 35.2, 37.3, 41.5 and 42.5 base points in 3-, 5-, 10-, 15- and 30-year bond yields of India. The F statistics is at 5 percentage across all maturities except short-term sovereign bond yields that indicates the model is good fitted across all maturities except short-term sovereign bond yields of India.

5. Conclusion

This study investigated the impact of debt to GDP on sovereign bond yields across different maturities of India. It was found that debt to GDP is affecting yields of sovereign bond indices of medium term and long term however, it was noticed that there is no impact of debt to GDP on short-term bond yield of India. The findings of the present study are consistent with the studies of Engen, Hubbard (2004), Laubach (2009) and

Thomas & Wu (2009); they also found that debt to GDP has significant impact on Treasury yields of US. The results indicate that one point percentage increase in the stock of debt to GDP will lead to decrease of 33.8, 35.2, 37.3, 41.5 and 42.5 base points in 3-, 5-, 10-, 15- and 30-year bond yields of India. Therefore, it can be claimed that debt to GDP is affecting sovereign bond yields across all maturities of India except the yields of short-term (1-, 2 year) bond indices of India.”

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