Impact of Government Bond Yeild On The GDP of India in The Recent Years: An Empirical Study

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Abstract: The Gross Domestic Product or GDP of the country is the indicator of the level of economic growth in a country. There are several factors that affect the GDP of the country and in turn the economic growth. The earlier studies by the eminent research scholars have portrayed important conclusions about the several factors that have an impact on the economic growth and stability. However, no evidence from earlier studies have been obtained which examines the impact, if any, that the government bond yields have on the GDP of India. This study intends to fill this research gap by analysing the same.

Key Words: Gross Domestic Product or GDP, one-year government bond yield, impact, trend, linear relationship.

1. INTRODUCTION:

Domestic product is defined as the value of all final goods and services produced by all the enterprises located within the domestic territory of the country during a year. The Gross Domestic Product or GDP of the country is the indicator of the level of economic growth in a country. There are several factors that affect the GDP of the country and in turn the economic growth. Several earlier studies have showed how and what impact does these factors have on GDP. With an urge to find out what other factors affect the economic growth (in terms of GDP, in this case), the economists and the policy makers continuously monitors several economic indicators. Such recent observations by the economists, policy makers and others have thrown light on the fact that the government bond yield also gives signals about the direction in which the economy is moving. Simply, the government bond yield is the return that the investors receive by investing their funds in such bonds. Such yields from government bonds may not have a direct impact on an individual's personal finance, however it may provide significant information about the economy.

The government bonds, like any other bonds, are debt instruments by which the government raises funds for the several government expenditures, and in turn the investors are assured of fixed return for the period that takes for the bond to mature. There are interest payments also on the sum borrowed and the final repayment is done at the time of maturity. It can be stated here that the bond yields are inversely proportional to the current market value of the bonds.

Besides the usual economic indicators, the bond yields also have the potential to show the course in which the economy is moving. There are several factors such as inflation, recession etc, which have an impact on the government bond yield. In case of developing countries like India the relationship between the government bond yield and the economic activity becomes complex. In this backdrop, the present study intends to analyse the impact that the government bond yield have on the GDP of India. For the purpose of this study the impact that the one-year government bond yield on the GDP of India is studied, with the aim to get useful information in this regard.

2. LITERATURE REVIEW:

In this segment the previous studies are carefully analysed and summarized as follows :
Abbas and Christensen (2010), in their study have analysed with the assistance of Granger-causality multivariate analysis the impact of the domestic debt on the economic process. For this purpose the researcher had evaluate the domestic debt data of 93 low income countries and therefore the period which is taken into account within the study is 1975-2004. The authors have reached meaningful conclusion that the expansion in contribution of those domestic debt, if it is marketable is kind of high.
Rangarajan and Sr

ivastava **(2005)**, have studied how the economic indicators of fiscal deficit and government debt impact the expansion and stabilization within the economy. In their study as well the GDP is taken as a measure to mirror the economic process. Significant conclusions are found during this respect. Referencing this study, since government debt shows an effect on the expansion of the economy, it becomes relevant to look at whether the bond yields hold any impact on the GDP.

Mehrotra et al (2012) portrayed that the development of the government bond market has an impact of the financial stability in the economy. It is further evident from the study that a developed government bond market makes the financial system and the economy at large more resilient to the shocks. Furthermore the development of the government bond market has an implication in formulating the monetary policy of a country.

Panigrahi et al (2022) aimed to examine the relationship that different global and macroeconomic components holds with the government bond yields in India by using the SVAR and the ARDL models. Their empirical results showed that while some of the factors have shown a positive relationship while in some other parts the relationship was not strong enough.

3. RESEARCH GAP:
All the previous studies by the eminent research scholars and experts have provided valuable information about the government bond yields and the economic stability and growth. Studies have been conducted to find the factors affecting the government bond yields as well. However, there are no such studies which examines whether there is any relation between the one-year government bond yield and the GDP of India. There have been several factors influencing GDP of the country. The impact, if any, that the government bond yield has on GDP of India, have not been studied earlier, and this study aims to examine the same.

4. OBJECTIVES OF THE STUDY:
The study deals with the objective of exploring the impact that one-year government bond yield has on the GDP of India.

5. RESEARCH METHODOLOGY:
In this part the tactic, approach, kind of data analysis and therefore the limitation of the study is made public. For the aim of this paper the information collected is secondary data. Secondary data is the data that has already been collected by the first sources and made readily available. Existing data is summarized and collated to extend the general effectiveness of the study. The research methodology is based on statistical analysis which in this paper is linear regression analysis. The regression analysis describes the relationship between a dependent variable and independent variable. In this study the dependent variable is the GDP of India and the independent variable is the one year government bond yields. The limitation of the study are: (1) Since the information employed in this study is secondary data the amount considered as the provision of the published data (2) only one-year government bond yield is considered for the purpose of this study and the impact of five year and ten year government bond yield is not considered (3) the period considered in the present study ten years (4) The Goss Domestic Product (GDP) for the purpose of this study is taken as Goss Domestic Product (GDP) at current price, and the impact on Goss Domestic Product (GDP) at constant price is ignored in this study.

6. DATA PRESENTATION AND ANALYSIS:
The main purpose of this study is analysing the extent to which the GDP of India influenced by one-year government bond yield and to understand the dependence of the GDP of India on one-year government bond yield. All the calculations are done using MS Excel -2007. The tables below provides us the data needed to perform the required analysis, that is Table 1 shows the Gross Domestic Product at Current Price of last 10 years and Table 2 shows one-year government bond yield for 10 years.

Table 1: Gross Domestic Product at Current Price of last 10 years

Year	GDP (` in crore)	Year	GDP (` in crore)
2012-13	9944013	2017-18	17090042
2013-14	11233522	2018-19	18886957
2014-15	12467960	2019-20	20351013
2015-16	13771874	2020-21	19745670
2016-17	15391669	2021-22	23214703

Source: https://www.indiabudget.gov.in/economicsurvey/

The Gross Domestic Product at Current Price of last 10 years as presented in Table 1 is graphically presented in Figure 1 below

Figure 1
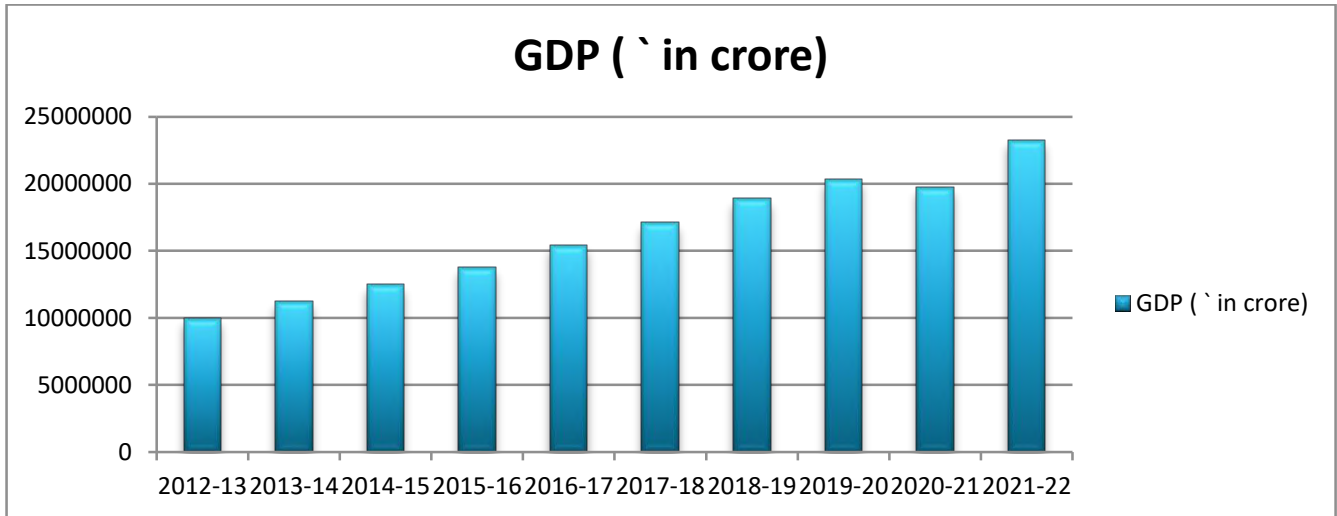
Table 2: One-Year Government Bond Yield of 10 years

Year	One-Year Government Bond Yield	Year	One-Year Government Bond Yield
2012-13	7.85	2017-18	6.53
2013-14	8.50	2018-19	6.42
2014-15	7.91	2019-20	4.82
2015-16	7.23	2020-21	3.71
2016-17	6.25	2021-22	4.42

Source: https://www.indiabudget.gov.in/economicsurvey/

The graphical representation of table 2 have been shown in figure 2 below

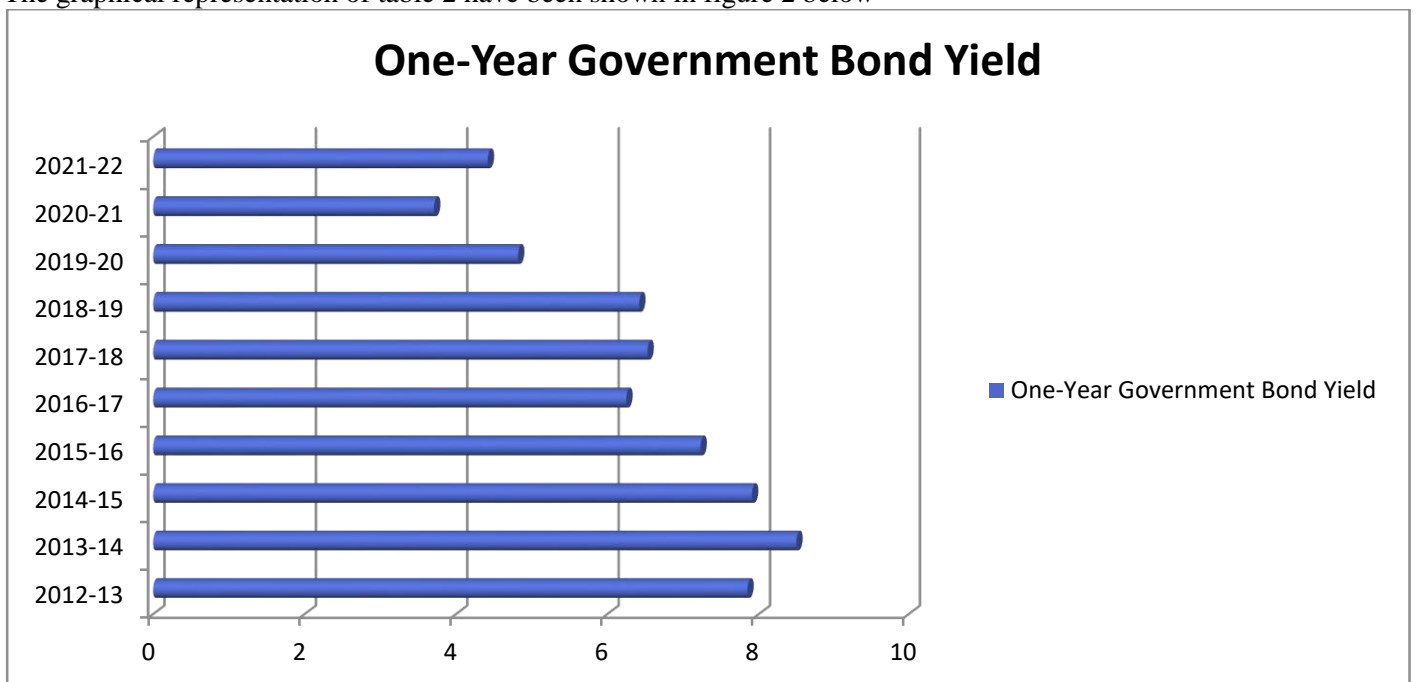**Figure 2**

To analyse the impact of one-year government bond yield on the GDP of India the following results of regression analysis have come up:

Table 3: Model Summary

Regression Statistics	
Multiple R	0.90243526
R Square	0.814389398
Adjusted R Square	0.791188073
Standard Error	1993588.22
Observations	10

Source: Author's computation

Table 4: Variation Analysis - ANOVA

	df	SS	MS	F	Significant F
Regression	1	139505149001920.00	139505149001920.00	35.10098631	0.000351864
Residual	8	31795151916568.40	3974393989571.05		
Total	9	171300300918488.00			

Source: Author's computation

Table 5: Regression Coefficients

	Coefficients	Standard Error	T Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	31828424.43	2710570.738	11.74233308	0.00000252907965 54596	25577837.1	38079011.75	25577837.1	38079011.75
one-year government bond yield	-2454224.093	414242.4057	-5.924608536	0.00035186369642 7908	-3409468.793	-1498979.393	-3409468.793	-1498979.393

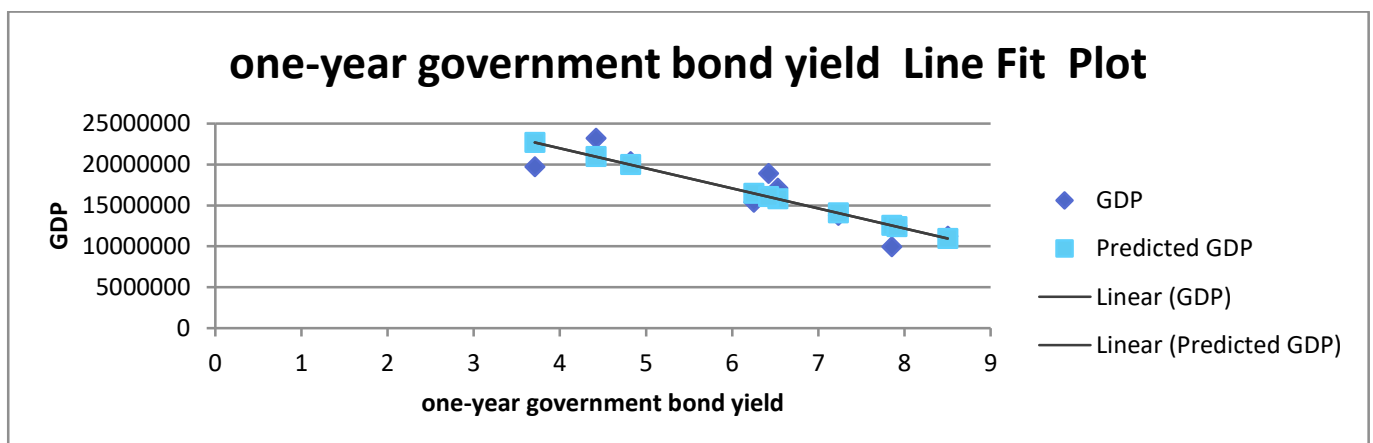Source: Author's computation

Figure 3

The Figure 3 above shows the line fit plot, where the blue dots indicate the how much have been the bond yield in the individual year and the corresponding GDP. The red dots which are on a line, is considered as the trend line, also termed as regression line. It shows the direction and nature of the relationship between one-year government bond yield and the GDP of India. It can be observed in Figure 3 that there is a linear relationship between one-year government bond yield and the GDP of India, but as the one-year government bond yield increases, the GDP decreases and vice versa.

In the above analysis the dependent variable is the GDP of India and the independent variable is the one-year government bond yield. So there is one dependent and one independent variable. Now based on the data of Table 5 the following equation can be obtained:

$y = 31828424.43 - 2454224.093 \, x_1$

where x_1 is one-year government bond yield and y is the GDP of India

The model summary in the Table 3 shows the value of Multiple R, which denotes the correlation coefficient which is 0.90243526. The value of R^2 denotes the coefficient of determination which is 0.814 or 81.4%. This indicates that the independent variable can explain 81.4% of the variation in the dependent variable, which is quite impressive. The adjusted R^2 value is 0.7912 that is 79.12%, which is also quite impressive. In order to test the validity of the regression equation a test is used. The regression coefficient of the sample have as correspondent the regression coefficients $ß_1$. If the predictor value is zero then it is possible that there is no relationship between one-year government bond yield and the GDP of India The alternative and null hypotheses are formulated as follows:

$H_0 = ß_1 = 0$

$H_1 = ß_1$ coefficient is not equal to 0

In order to test the null hypothesis at first the significance level is evaluated to understand whether or not the predictor makes any contribution in the entire model. In the Table 4 the ANOVA table is shown, where it can be observed that the p value of 0.000 which is lower than 0.1. Thus the null hypothesis of the slope coefficient being simultaneously insignificant is rejected and the alternative hypothesis of the model that is atleast one slope coefficient is significant, is accepted. So, it may be concluded that the model is significant on an overall basis. Further the coefficient table shows that the constant term and the predictor variable have a p value less than 0.01 and hence they are significant at 1% level of significance. The existence of constant term signifies that irrespective of the value of one-year government bond yield an amount of Rs. 31828424.43 crore of GDP is expected.

7. CONCLUSION:

The purpose of the study is estimating the effect of one-year government bond yield on the GDP of India. From the data presented and analysed above it can be concluded that there is a linear relationship between the dependent and the independent variable, but with an increase in one-year government bond yield the GDP of India, shows a decreasing trend. Further the presence of the constant term ensures that a minimum value of GDP of India will always be present irrespective of the one-year government bond yield. The present study is only concerned with the relationship between one-year government bond yield on the GDP of India, there is scope for further study to analyse the impact of five year and ten year government bond yield on the GDP of India.

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