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**Poonam Arora**
Department of Commerce, Mata Sundri College for Women, University of Delhi, New Delhi, India

**Corresponding Author:**
**Poonam Arora**
Department of Commerce, Mata Sundri College for Women, University of Delhi, New Delhi, India

# Trends and composition of India's external debt

## Poonam Arora

**Abstract**
External debt is the major source of international capital flow, that help in overall growth and development of any nation. The importance gets increased in the case of developing country where there is always a saving investment gap. In developing country savings are always less to finance investment opportunity where international capital flow from external debt play a vital role. In the present paper we have discussed the basic concept of external debt together with its sources. We have taken the data from official website of RBI for the period of eighteen years started from 2001-02 to 2019-20. The paper focused on studying the trends and composition of India's external debt. To study the composition, we have taken the average of % of share of various sources in total external debt over a period of eighteen years. We found that during the last eighteen year, the maximum debt came from commercial borrowings, followed by NRI deposits and short-term deposits. To study the trends, we have calculated the growth indices taking 2001-02 as a base. With the help of growth indices, we concluded that all sources of debt be it a long term or short term have shown increasing trends, except the rupee debt. Thereafter we have applied the semi log regression model to calculate annual compounding growth rate. We found that for all the sources the growth rate is positive and also statistically significant at 1 percent level of significant except rupee debt where the growth rate is negative and debt to GDP ratio where growth rate was not found to be statistically significant. From data analysis, we concluded that India's external debt is rising but India is able to manage it efficiently.

**Keywords:** External Debt, IMF, Rupee Debt, External Commercial Borrowings, GDP, Trade credits.

## Introduction

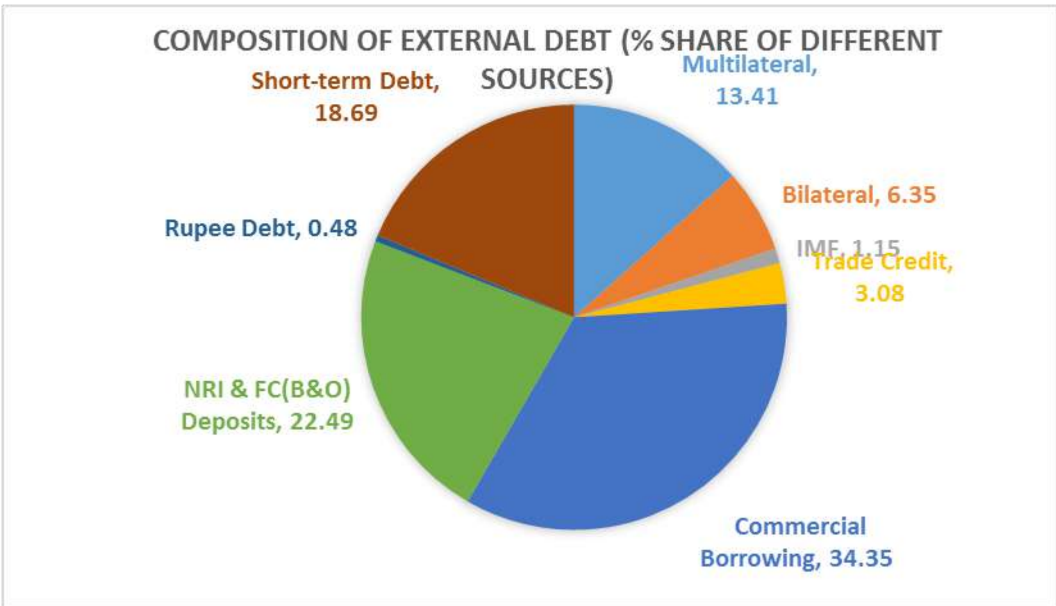
External debt plays a very important role in overall growth and development of any economy. It helps in shaping the economic activities of a country. According to India's External Debt, A status report 2019-20, issued by Ministry of finance, Govt of India, India's external debt stock rose 2.8% as at end March 2020 from a year ago. But salient debt indicators such as external debt to GDP ratio at 20.6 percent, debt service ratio at 6.5 percent and foreign exchange reserve to external debt ratio at 85.5 percent continue to be in comfort zone.

**Table 1:** Debt indicators of the financial years (2001-02 to 2019-20)

| Financial Year | Concessional Debt as % of Total Debt | Short-term Debt as % of Total Debt | Debt Stock- GDP Ratio (%) | Debt Service Ratio (%) |
|---|---|---|---|---|
| 2002 | 35.9 | 2.8 | 20.8 | 13.7 |
| 2003 | 36.8 | 4.5 | 20.0 | 16.0 |
| 2004 | 35.8 | 3.9 | 17.7 | 16.1 |
| 2005 | 30.7 | 13.2 | 18.4 | 5.9 |
| 2006 | 28.4 | 14.0 | 17.1 | 10.1 |
| 2007 | 23.0 | 16.3 | 17.7 | 4.7 |
| 2008 | 19.7 | 20.4 | 18.3 | 4.8 |
| 2009 | 18.7 | 19.3 | 20.7 | 4.4 |
| 2010 | 16.8 | 20.1 | 18.5 | 5.8 |
| 2011 | 14.9 | 20.4 | 18.6 | 4.4 |
| 2012 | 13.3 | 21.7 | 21.1 | 6.0 |
| 2013 | 11.1 | 23.6 | 22.4 | 5.9 |
| 2014 | 10.4 | 20.5 | 23.9 | 5.9 |
| 2015 | 8.8 | 18.0 | 23.8 | 7.6 |
| 2016 | 9.0 | 17.2 | 23.4 | 8.8 |
| 2017 | 9.4 | 18.7 | 19.8 | 8.3 |
| 2018 | 9.1 | 19.3 | 20.1 | 7.5 |
| 2019 | 8.7 | 20.0 | 19.8 | 6.4 |
| 2020 | 8.6 | 19.1 | 20.6 | 6.5 |

Table 1 shows various debt indicators which showed that India is managing its external debt very efficiently. By looking at that table 1, we can observe that proportion of concessional debt in overall debt composition has declined over a period of time, whereas the proportion of short-term debt has increased from 2.8 percent in 2001-02 to 19.1 in 2019-20, which is a good sign for an economy. By looking at the debt to GDP ratio we can observe that for the year 2019-20 it was 20.6 which is more than a year ago. The higher the debt to GDP ratio, higher will be the risk of default. A study by world bank found that if debt to GDP ratio of a country exceeds 77 percent for prolonged periods, it slows economic growth. When we compare the India's external debt to GDP ratio, it is quiet low. Debt service ratio (principal and interest to country's export earnings) has also declined from 13.7 percent in the year 2001-02to just 6.5 percent in the year 2019-20. Lesser the debt service ratio is, healthier the country's international finance. All these indicators show that India's external debt is in the comfortable zone, which is also stated by the status report of 2019-20.

**Composition of External debt**




**Pie chart 1:** Composition of external debt

Chart 1 shows the proportion of different sources of external debt. Proportionate share is taken as the average of proportion over eighteen year starting from 2001-02 to 2019-20. It can be clearly seen from the chart, that maximum debt comes from external commercial borrowings, followed by NRI Deposits and short-term debt. Whereas the least amount of debt has came from rupee debt and IMF loans.

**Concept of External Debt**

In this section, paper acquaint the reader with the basic definition of external debt and its components.

External debt can be termed as that portion of country's debt which is borrowed from foreign lenders, that include commercial banks, international financial institution like IMF, World, ADB etc and from the government of foreign nations. External debt is a loan given by one nation to other nation. The term is associated with international lending. Whenever one nation give loan to the other nation, then the second nation's external debt increase. A nation gives loan to other nation on certain terms and condition regarding interest payment and repayment of amortized amount. Many developing or less developed countries have received extensive capital inflows from abroad and therefore now carry substantial debt to the foreigners. As per IMF definition, "Gross external debt, at any given time, is the outstanding amount of those actual current and not contingent liabilities that require payment(s) of principal and interest or both by debtor at some point(s) in the future and that are owned to non-residents by residents of an economy"

**According to this definition given by IMF, the key elements are as follows:**

1. Outstanding and Actual current liabilities – It include outstanding and actual current liabilities in respect to both principal and interest.
2. Principal and interest – Principal and interest, both payable in any time in future.
3. Residence – To qualified as external debt, the debt liabilities must be payable by residents of a nation to non-residents. Residence in determined by their centres of economic interest i.e., where they are located and not by their nationality.
4. Current and not contingent – contingent liabilities are excluded from the definition of external debt because their existence is dependent on happening on another events.

Generally external debt is classified into four heads namely (a) public and publicly guaranteed debt, (b) private non-guaranteed credit, (c) central bank deposits, and (d) loans due to IMF (International Monetary Fund). But this classification varies from country to country.

**In India external debt is classified in seven heads which are:**

1. Multilateral debt – Multilateral debt refers to loans taken by various multilateral agencies like Asian

Development bank (ADB), International Bank for Reconstruction & Development (IBRD), Organisation of Petroleum Exporting Countries (OPEC), and International Development Association (IDA) etc.
2. Bilateral debt – It refers to the debt owed by developing countries to the government of various countries.
3. IMF loans – IMF debt represents the debt owed to the International Monetary Fund, it provides debt capital in the situation when countries become unable to repay the interest or principal amortized as per schedule.
4. Trade credit – It refers to the credit extended for imports directly by the overseas suppliers, banks and financial institutions for maturity period of one to three years, whereas those with the maturity of less than a year fall under the category of short-term credits.
5. External commercial borrowings (ECBs) – ECBs are loans taken by Indian residents from non-residents lenders. It refers to commercial loans with a minimum maturity of three years, raised from internationally recognized non- resident lenders such as international banks, export credit agencies, international capital markets etc.
6. NRI & FC deposits – NRI deposits are deposits in foreign currency that are made by non-resident Indian in an Indian bank. It is a kind of Fixed Deposit account which allows Indians living abroad to invest through their NRO accounts.
7. Rupee debt – It refers to debt denominated in Indian Rupee and that is payable through export of goods.

Above mentioned all the heads are having long term maturity i.e., more than a year. So collectively they can be termed as long-term debt. Beside that there is one more category named short term debt, having a maturity period of one year or less. It mainly consists trade credit and NRI deposits with less than one year maturity. Since India's external debt is classified according to this format therefore, it can be termed as "standard format".

**Review of literature**

Oded (1984) [8] proposed a comprehensive indicator for estimating the debt burden. He defines an indicator of debt burden as the ratio of debt servicing to debt repayment capacity of any year. He classified the existing indicators into two broad categories as simple and naïve indicators and concludes that the application of these naïve indicators to the data of debtor countries has proved inadequate to predict debt default.

Bajpai (1994) [12] in his paper stated that India is one of the largest debtors among the developing countries, if ranked by outstanding external debt stock. However, its ranking is much lower by debt service because large portion of its debt is still on concessional terms.

Ramakrishna (2004) [9], in his paper tried to study the debt scenario of India and verify whether it needs any debt relief. He had written in his paper that India is not considered to be debt ridden economy according to world Bank's definition. He further added that in previous year the external debt's growth rate and debt service ratio have come down, although in absolute term their magnitudes have risen but still, he concluded that there exist a debt overhang and crowding out of growth in Indian

Singh (2007) [11] finds the causes of Indian corporate seeking overseas funding. He pointed out that domestic demand, interest rate differentials and credits conditions primarily influence the demand for ECB by Indian corportaes.

Raghavender Raju etc. (2011) [5] said that external debt acts as regulator in the economy who are facing capital problem. They studied the determinants of external debt and found that it has a positive relationship with GDP, similarly ECBs and NRI deposits, that are components of external debt are also positively related with interest rate differential.

Singh (2013) [2], said that external borrowings help the countries to achieve high level of growth rates but excessive borrowing in past has shown debt crisis faced by many countries. Therefore, countries should try to maintain their external debt burden up to a manageable limit. Even in India major policy reforms initiated in 1991, showed an increase in non-debt creating flows due to which debt sustainability indicators has improved. All these prudent policies adopted by government helped in maintaining a comfortable position of external debt.

Sanhita (2014) [3] adding to it stated that, the main cause of economies facing debt crisis is poorly structured debt. Further supporting same Saxena (2014) [4], said that the if country's external debt is under sustainable limits, it will be considered as properly managed. According to her since 1991, Indian economy has shown imbalances in its debt position, but the policies adopted by GOI in the light of external debt has shown a drastic improvement. She further examines the debt situation in term of Review of policy and sustainability assessment of external debt.

Kishore (2015) [7], also support the view that excessive borrowings from other countries has led India into debt crisis situation during early 1990s. But number of measures taken by Indian government in 1991, ease the situation. He concluded that till 1980s, external debt was not a major problem, but during 1980-1990 it become a major issue because of shift from official sources of debt to ECBs. Until 1980, government used to borrow mainly from concessional sources but, it was 80s when government started borrowed from private sources which led to a sharp rise in external debt. Due to this decline in concessional sources, government mainly relied upon the private sources which were definitely costly.

Ray *et al*. (2017) [10] in their working paper series, study trends, composition and determinants of ECB. They found that domestic factors dominate the global factors in influencing the ECB flows to India. They also found that the growth differential between India and the international economy will be a key driver influencing ECB flows to India.

RBI Bulletein (2020) [6] also stated that since the external debt as % of GDP remained lower in recent years, this may be attributed to higher growth rate of Indian economy than its external debt. All these is possible due to prudent external management policies.

**Objectives of paper**

The paper strives to acquaints the reader with the followings: -

1. Concept of External Debt
2. Component of India's external debt
3. Overall trends of external debt and its various sources
4. Annual compound growth rate of Gross external debt and its sources
5. Whether India is utilised the debt capital efficiently or not

**Data source and research methodology**

After reviewing the different sources, the data has been collected from the Handbook of Indian Statistics published by Reserve Bank of India. So, the data has been collected from official website of RBI. We have taken the data of eighteen long year, to study the trends and composition of external debt of India.

In India, external debt is divided into two main heads namely long term and short-term debt. The long-term debt is further divided into seven heads. So, first we have analysed the trends in various heads and subheads with the help of overall growth indices.

We have calculated overall growth indices with the help of following formula: -

$$GIt = Vt / Vb * 100$$

Where GIt = Growth index for the year "t"
Vt = Value of debt for the year "t"
Vb = Value of debt for the year "b"
t = 2001-02 to 2019-20
b = 2001-02

Overall growth indices help us to calculate the change (positive as well as negative) in the level of external debt in eighteen years under the consideration (2001-02 to 2019-20) because for the purpose of constructing the overall growth indices, we have taken 2001-02 as the base year. However, for IMF debt, we have taken year 2003-04 as the base because variable did not exist for the year 2001-02.

After calculating the growth indices, we have used semi log regression model to calculate the annual compound growth rate (ACGR). We have used semi log regression model because the growth is always exponential.

$$\text{Log } Y = \alpha + \beta t + \mu t \qquad (1)$$

Where Log Y = natural log of variable Y

$\alpha$ = intercept term
$\beta$ = slope of the regression equation,

which is annual compound growth rate

t = time (2001-02 to 2019-20))
$\mu t$ = error term

with the help of above written equation, we can find out the growth rate. The "β" give us the rate of growth that is annual compounding growth rate (ACGR). We have taken 0.01 as the level of significance.

**Data interpretation**

In this section we are going to analyse the results of each and every head and subheads of external debt one by one.

✓ **Multilateral debt**

It refers to the loan taken multilateral institutions such as the International Development Association (IDA), International Bank for Reconstruction and Development (IBRD), Asian Development bank (ADB), etc.

**Table 2:** Multilateral debt and Growth indices

| Financial Year | Multilateral Debt | Growth Indices |
|---|---|---|
| 2002 | 155633 | 100 |
| 2003 | 142683 | 91.67 |
| 2004 | 131105 | 84.23 |
| 2005 | 138897 | 89.24 |
| 2006 | 145503 | 93.49 |
| 2007 | 154053 | 98.98 |
| 2008 | 157901 | 101.45 |
| 2009 | 201425 | 129.42 |
| 2010 | 193436 | 124.28 |
| 2011 | 216672 | 139.21 |
| 2012 | 257088 | 165.18 |
| 2013 | 279310 | 179.46 |
| 2014 | 321560 | 206.61 |
| 2015 | 328148 | 210.84 |
| 2016 | 359490 | 230.98 |
| 2017 | 354118 | 227.53 |
| 2018 | 371781 | 238.88 |
| 2019 | 396131 | 254.52 |
| 2020 | 449066 | 288.54 |

Table 2 shows the actual level of multilateral debt and its corresponding growth indices. It can be observed from table that over a period of eighteen year, the multilateral debt has increased by 188.54 points as index increased from 100 in the year 2001-02 to 288.54 in the year 2019-20. From these indices, we can say that multilateral debt is showing increasing trend.

By applying regression analysis, we have got the regression equation as

Log of Multilateral debt ^ = -133.138 + 0.072345 (t)
(2E-11) (4.84E-12)

Values in brackets are p - values, which are less than 0.01. It shows that growth rate is significant.

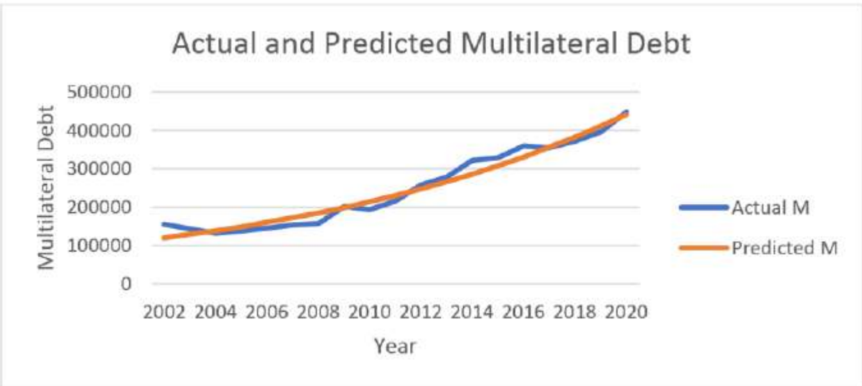



**Fig 1:** Actual and Predicted Multilateral debt

Predicted values are calculated after applying regression model. From the above figure and regression equation, we have concluded that over a period of time multilateral debt has shown an increasing trend and has increased an at annual growth rate of 7.23 percent.

### ✓ Bilateral debt

It refers to debt / money India owes to foreign governments.

**Table 3:** Bilateral Debt and Growth indices

| Financial Year | Bilateral Debt | Growth Indices |
|---|---|---|
| 2002 | 74762 | 100 |
| 2003 | 79921 | 107 |
| 2004 | 77084 | 103 |
| 2005 | 74530 | 100 |
| 2006 | 70302 | 94 |
| 2007 | 70034 | 94 |
| 2008 | 78802 | 105 |
| 2009 | 104997 | 140 |
| 2010 | 101976 | 136 |
| 2011 | 114905 | 154 |
| 2012 | 137086 | 183 |
| 2013 | 136329 | 182 |
| 2014 | 148813 | 199 |
| 2015 | 136060 | 182 |
| 2016 | 149378 | 200 |
| 2017 | 150808 | 202 |
| 2018 | 164788 | 220 |
| 2019 | 176660 | 236 |
| 2020 | 203440 | 272 |

Table 3 shows that bilateral debt has increased by 172 points over the period of eighteen years as index has rose from 100 to 272 for the 2001-02 to 2019-20 respectively. It means the bilateral debt is also showing increasing trends.
By applying regression model, we regression equation for bilateral debt as

Log of Bilateral debt ^ = -108.516 + 0.059741(t)
(1.445E-09) (3.022E-10)

For bilateral debt p values are less than 0.01, which means growth rate is significant.

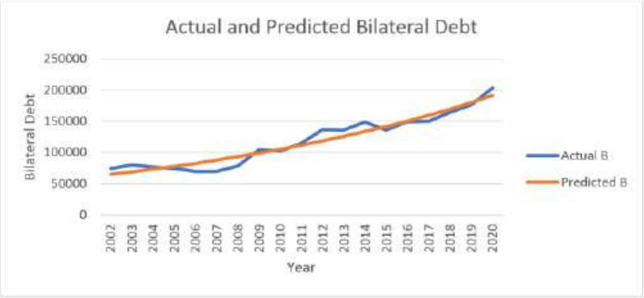



**Fig 2:** Actual and Predicted Bilateral debt

From fig 2, it can be seen that bilateral debt has also shown rising trends. Bilateral debt has increased at an annual growth rate of 5.97 percent. If we compare the growth rate of bilateral debt with multilateral debt, we can conclude that multilateral debt has increased at a higher rate of 7.23 percent as compared to bilateral debt. But both types of debt are showing an increasing trend.

### ✓ Debt from International Monetary Fund (IMF)

IMF provide loan to its member countries in the time of severe financial trouble i.e., when a country is unable to pay its international bills, has a balance of payment problem, unable to restore to sustainable economic growth. That is why IMF is also known as the lender of last resort.

**Table 4:** IMF Debt and Growth Indices

| Financial Year | International Monetary Fund Debt | Growth Indices |
|---|---|---|
| 2004 | 4381 | 100 |
| 2005 | 4503 | 103 |
| 2006 | 4378 | 100 |
| 2007 | 4484 | 102 |
| 2008 | 4479 | 102 |
| 2009 | 5188 | 118 |
| 2010 | 27264 | 622 |
| 2011 | 28163 | 643 |
| 2012 | 31528 | 720 |
| 2013 | 32439 | 740 |
| 2014 | 36910 | 843 |
| 2015 | 34350 | 784 |
| 2016 | 37177 | 849 |
| 2017 | 35129 | 802 |
| 2018 | 37716 | 861 |
| 2019 | 38202 | 872 |
| 2020 | 40931 | 934 |

Table 4 shows that loan from IMF has increased over a period of time because the index has increased from 100 in the base year 2001-02 to 934 in the year 2019-20. Major jump can be observed in the year 2009-10 because the index rose by 504 points touching the level of 622 as compare to 118 a year ago. In the year 2009-10 India was the largest recipient of world bank loans due to the collapse in commodity prices.
By applying semi log regression, we got regression equation as

Log of Debt from IMF^ = -340.104 + 0.173874(t)
(4.8E-06) (3.48E-06)

Annual compounding growth rate of IMF debt is 17.39 percent, which is significant as p values for both intercept as well as growth is less than the level of significance (0.01). so far debt from IMF shows the highest growth rate as compared to the growth rate of bilateral and multilateral debt.

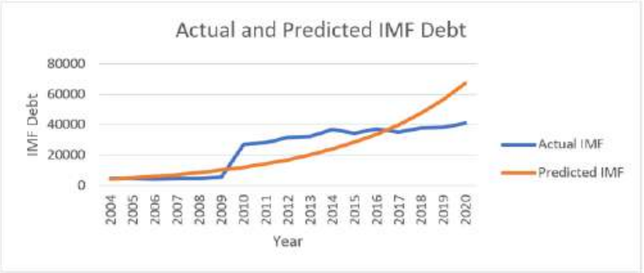



**Fig 3:** Actual and Predicted debt from IMF

Figure 3 shows that debt from IMF has shown increasing trend. There was a major change in the year 2009-10 due to subprime crisis which impacted the entire world. India has taken maximum assistance from IMF and world bank during that period.

### ✓ Trade credit

It is an important source of external debt. It is a type of commercial financing under which credit facility is extended by supplier to customers for purchasing goods and services. It provides long term as well as short term funding to businesses.

**Table 5:** Trade credit and Growth indices

| Financial Year | Trade Credit | Growth Indices |
|---|---|---|
| 2002 | 26110 | 100 |
| 2003 | 23750 | 91 |
| 2004 | 20553 | 79 |
| 2005 | 21976 | 84 |
| 2006 | 24175 | 93 |
| 2007 | 31237 | 120 |
| 2008 | 41296 | 158 |
| 2009 | 73772 | 283 |
| 2010 | 76011 | 291 |
| 2011 | 83112 | 318 |
| 2012 | 97117 | 372 |
| 2013 | 96556 | 370 |
| 2014 | 93275 | 357 |
| 2015 | 78915 | 302 |
| 2016 | 70001 | 268 |
| 2017 | 62426 | 239 |
| 2018 | 61676 | 236 |
| 2019 | 54899 | 210 |
| 2020 | 54119 | 207 |

Table 5 shows the growth indices for trade credit. From table, it can be observed that over a period of time trade credit has gone up because index increased from 100 points to 207 points corresponding to year 2001-02 to 2019-20. For the initial 4-5 years, though the index has declined and touched the level of 93 points and thereafter started showing rising trends.

By applying regression model, we got regression equation as

Log of Trade credit^ = - 128.425 + 0.069246(t)
(0.002) (8E-04)

Trade credit has gone up by growth rate of 6.92 percent and this growth rate is statistically significant as p values are less than 0.01.


**Fig 4:** Actual and Predicted trade credit

By plotting the actual and predicted values of trade credit on a graph (shown in figure 4), we got upward slopping curve. This reflects that trade credits are also showing the rising trends

### ✓ External Commercial Borrowings (ECBs)

External commercial borrowings are one of the important sources of external debt or international capital flow. It refers to loan taken by international lender, private sector etc having a maturity period of more than a year.

**Table 6:** ECBs and Growth indices

| Financial Year | Commercial Borrowing | Growth Indices |
|---|---|---|
| 2002 | 113908 | 100 |
| 2003 | 106843 | 94 |
| 2004 | 95611 | 84 |
| 2005 | 115533 | 101 |
| 2006 | 117991 | 104 |
| 2007 | 180669 | 159 |
| 2008 | 249243 | 219 |
| 2009 | 318209 | 279 |
| 2010 | 319221 | 280 |
| 2011 | 448448 | 394 |
| 2012 | 614623 | 540 |
| 2013 | 762128 | 669 |
| 2014 | 897744 | 788 |
| 2015 | 1128501 | 991 |
| 2016 | 1197176 | 1051 |
| 2017 | 1115514 | 979 |
| 2018 | 1312723 | 1152 |
| 2019 | 1428897 | 1254 |
| 2020 | 1660215 | 1458 |

Table 6 shows the growth indices of commercial borrowings and it is showing maximum increase. The index shot up by 1358 points and touched the level of 1458 points in the year 2019-20 as compared to 100 points in the base year 2001-02.

ECBs^ = -346.785 + 0.17888(t)
(3.7E-13) (2E-13)

ECBs has grown at a rate of 17.88 percent. Which is the maximum growth rate so far.

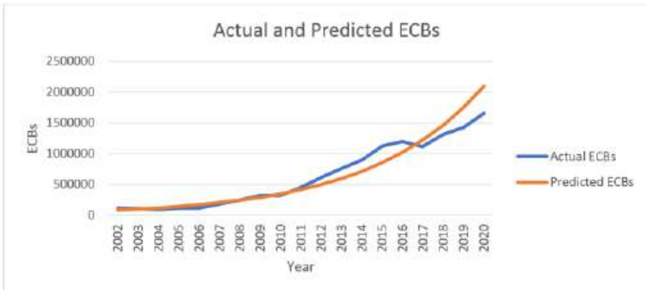



**Fig 5:** Actual and Predicted ECBs

By plotting the actual and predicted values of ECBs in Fig 5, we have got upward slopping curve. It means similar to all the sources discussed so far the ECBs are also showing an increasing trends.

### ✓ NRI & FC (B&O) Deposits

NRI fixed deposits is a great way to invest money for Indians who live overseas. FCNR is foreign currency denominated account. It is not a saving account rather a term deposit with a minimum tenure of 1 year and maximum of 5 years.

**Table 7:** NRI & FC(B&O) Deposits and growth indices

| Financial Year | NRI & FC(B&O) Deposits | Growth Indices |
|---|---|---|
| 2002 | 83712 | 100 |
| 2003 | 110022 | 131 |
| 2004 | 135618 | 162 |
| 2005 | 143267 | 171 |
| 2006 | 161834 | 193 |
| 2007 | 179786 | 215 |
| 2008 | 174623 | 209 |
| 2009 | 210118 | 251 |
| 2010 | 217062 | 259 |
| 2011 | 230812 | 276 |
| 2012 | 299840 | 358 |
| 2013 | 385202 | 460 |
| 2014 | 624101 | 746 |
| 2015 | 720997 | 861 |
| 2016 | 841956 | 1006 |
| 2017 | 757751 | 905 |
| 2018 | 820737 | 980 |
| 2019 | 902152 | 1078 |
| 2020 | 977309 | 1167 |

Table 7 is showing the growth indices of NRI deposits. NRI deposits has increased by 11 times in the year 2019-20 as compared to 2001-02. The index touched the 1167 points.

Log of NRI & FC (B&O) Deposits ^ = -272.0804 + 0.14158(t)
(9.16E-13) (4.37E-13)

By applying semi log regression model, we got the growth rate of 14.16 percent for NRI deposits. With the help of regression equation, we have calculated the predicted values of NRI & FC (B&O) Deposits, which are shown in figure 6.

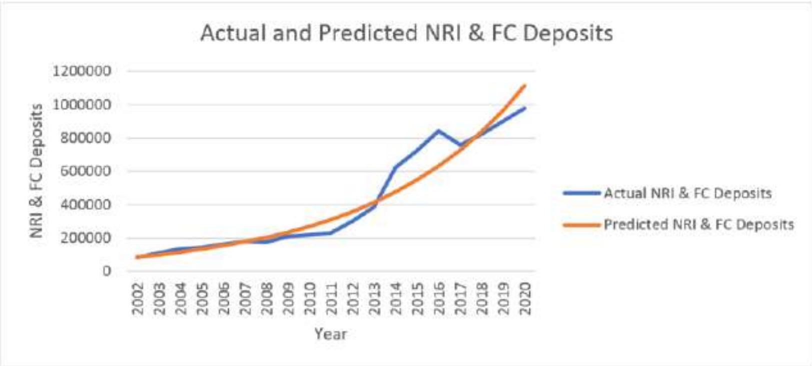



**Fig 6:** Actual and Predicted NRI & FC(B&O) Deposits

From the above figure, it can be seen clearly that over a period of time NRI deposits has also gone up as it is also showing an increasing trend.

- ✓ **Rupee debt**

It is that part of India's external debt which is denominated in domestic currency i.e., rupee. It represents the debt to be paid in rupee by the Indian residents to foreigners.

**Table 8:** Rupee Debt and Growth Indices

| Financial Year | Rupee Debt | Growth Indices |
|---|---|---|
| 2002 | 14807 | 100 |
| 2003 | 13405 | 91 |
| 2004 | 11856 | 80 |
| 2005 | 10071 | 68 |
| 2006 | 9184 | 62 |
| 2007 | 8508 | 57 |
| 2008 | 8065 | 54 |
| 2009 | 7760 | 52 |
| 2010 | 7480 | 51 |
| 2011 | 7147 | 48 |
| 2012 | 6922 | 47 |
| 2013 | 6839 | 46 |
| 2014 | 8826 | 60 |
| 2015 | 9426 | 64 |
| 2016 | 8479 | 57 |
| 2017 | 7962 | 54 |
| 2018 | 7886 | 53 |
| 2019 | 8007 | 54 |
| 2020 | 7704 | 52 |

Rupee debt is the only source of external debt, that is showing declining trends because the index has declined by 48 points. So, in the year 2019-20, rupee debt is almost half of the level of rupee debt in the 2001-02.

By applying regression model, we got regression equation as

Log of Rupee debt ^ = 59.585 - 0.02512(t)
(0.0005) (0.0021)

Which means rupee debt has declined at a rate of 2.51 percent because growth rate is negative.

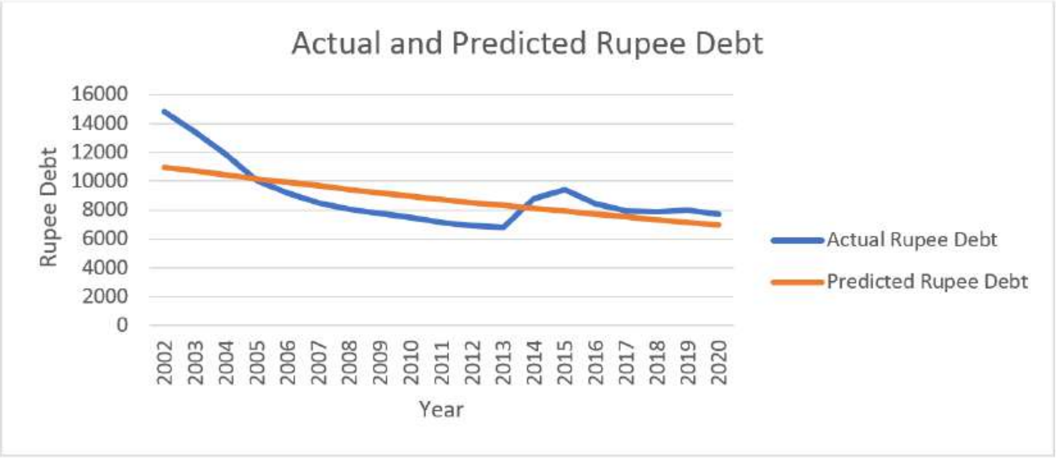



**Fig 7:** Actual and Predicted Rupee Debt

Above fig 7, shows the actual and predicted rupee debt where, predicted values are calculated with the help of semi log regression equation. Both predicted as well as actual rupee debt curves are downward slopping, it means over a period of time rupee debt has declined. Therefore, we can conclude that rupee debt is showing decreasing trends.

- ✓ **Total long-term debt**

The total long-term debt includes debt from various sources having a maturity period of more than a year. it includes multilateral debt, bilateral debt, debt from IMF, trade credits, commercial borrowings, NRI deposits as well as rupee debt.

**Table 9:** Total Long-term debt and Growth indices

| Financial Year | Total Long-term Debt | Growth Indices |
|---|---|---|
| 2002 | 468932 | 100 |
| 2003 | 476624 | 102 |
| 2004 | 476208 | 102 |
| 2005 | 508777 | 108 |
| 2006 | 533367 | 114 |
| 2007 | 628771 | 134 |
| 2008 | 714409 | 152 |
| 2009 | 921469 | 197 |
| 2010 | 942450 | 201 |
| 2011 | 1129258 | 241 |
| 2012 | 1444205 | 308 |
| 2013 | 1698803 | 362 |
| 2014 | 2131229 | 454 |
| 2015 | 2436397 | 520 |
| 2016 | 2663657 | 568 |
| 2017 | 2483708 | 530 |
| 2018 | 2777308 | 592 |
| 2019 | 3004948 | 641 |
| 2020 | 3392784 | 724 |

The total long-term debt has gone up by almost seven times as index reached the level of 724 points in the year 2019-20. For the first four year the increase was not substantial as index reached just 108 points. But after that, index shot up nearly by 50 points in almost all the years.

Log of Total long-term debt^ = -242.799 + 0.12769(t)
(5.3E-14) (2.1E-14)

From the semi log regression model, we got growth rate of 12.77 percent per annum.

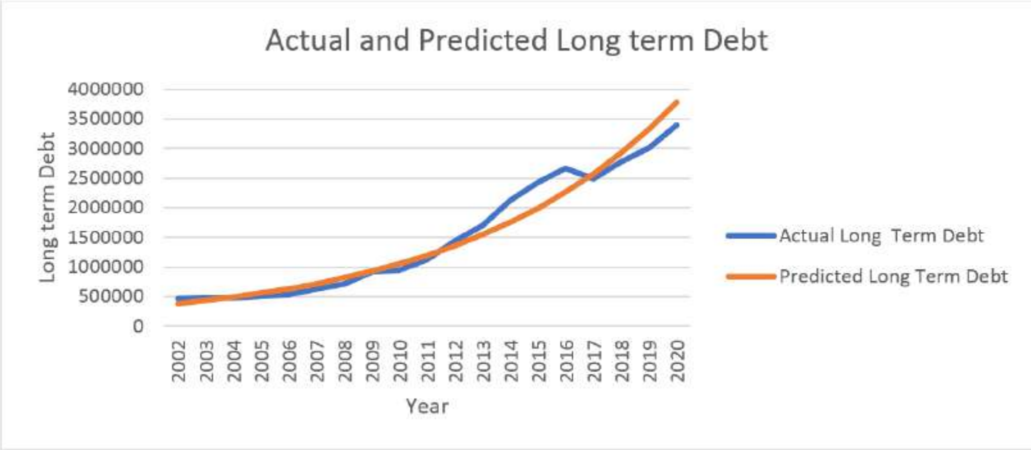



**Fig 8:** Actual and predicted Long term debt

After plotting the actual and predicted values of long-term debt on a graph, we got an upward slopping curve. This shows that over a period of eighteen year, the long-term debt has shown an increasing trend with the growth rate of 12.77 percent.

### ✓ Short term debt

It includes the external debt which are not covered so far having a maturity period of one year or less than a year.

**Table 10:** Short term Debt and Growth indices

| Financial Year | Short-term Debt | Growth Indices |
|---|---|---|
| 2002 | 13396 | 100 |
| 2003 | 22180 | 166 |
| 2004 | 19251 | 144 |
| 2005 | 77528 | 579 |
| 2006 | 87155 | 651 |
| 2007 | 122631 | 915 |
| 2008 | 182881 | 1365 |
| 2009 | 220656 | 1647 |
| 2010 | 236188 | 1763 |
| 2011 | 290149 | 2166 |
| 2012 | 399962 | 2986 |
| 2013 | 525931 | 3926 |
| 2014 | 550985 | 4113 |
| 2015 | 535144 | 3995 |
| 2016 | 553906 | 4135 |
| 2017 | 571387 | 4265 |
| 2018 | 664575 | 4961 |
| 2019 | 749924 | 5598 |
| 2020 | 805708 | 6015 |

Table 10 shows the short-term debt and its growth indices. The table shows that over a period of time the short-term debt has increased by 60 times, which is a drastic jump. The index rose to 6015 points in the year 2019-20, which means over a period of time the magnitude of external debt has gone up very high in absolute term. Maximum increase were in the year2012-13, where index has risen by almost 1000 points and touched the level of 3926 from 2986 a year ago and another major increase was in the year 2004-05, when index shot up by 435 points.

Log of Short-term debt^ = -420.036 + 0.214957(t)
(9.46E-09) (6.17E-09)

The short-term debt has increased at an alarming rate of 21.5 percent per annum. This growth rate is statically significant as well because the p values for both intercept as well as growth rate are less than the level of significance (0.01).

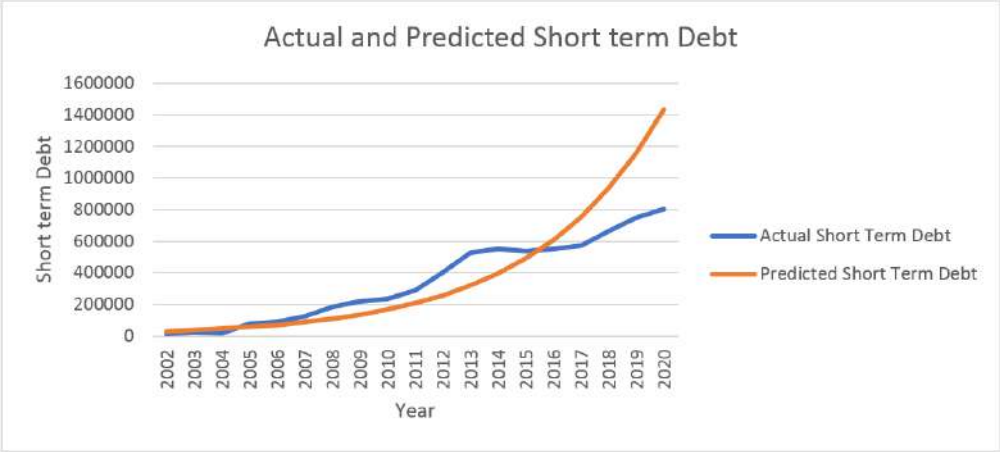



**Fig 9:** Actual and Predicted short term debt

Figure 9 shows the actual and predicted short term debt, where predicted values are calculated by applying regression model. From fig 9, it can be observed clearly that short term debt is also showing an increasing trend.

✓ **Gross debt**

It refers to total debt at any point of time, that include short term as well as long term debt.

**Table 11:** Gross debt and Growth Indices

| Financial Year | Gross Total Debt | Growth Indices |
|---|---|---|
| 2002 | 482328 | 100 |
| 2003 | 498804 | 103.41 |
| 2004 | 495459 | 102.72 |
| 2005 | 586305 | 121.55 |
| 2006 | 620522 | 128.65 |
| 2007 | 751402 | 155.78 |
| 2008 | 897290 | 186.03 |
| 2009 | 1142125 | 236.79 |
| 2010 | 1178638 | 244.36 |
| 2011 | 1419407 | 294.28 |
| 2012 | 1844167 | 382.34 |
| 2013 | 2224734 | 461.24 |
| 2014 | 2682214 | 556.09 |
| 2015 | 2971542 | 616.08 |
| 2016 | 3217563 | 667.09 |
| 2017 | 3055095 | 633.4 |
| 2018 | 3441883 | 713.59 |
| 2019 | 3754872 | 778.48 |
| 2020 | 4198492 | 870.46 |

Table 11 show the gross debt amount and its growth indices over eighteen years period. The gross debt has increased by more than 8 times in this period because the index has touched the level of 870.46 points.

By applying semi log regression model, we have got regression equation as

Log of Gross Debt^ = -260.626 + 0.13665(t)
(9.89E-15) (4.11E-15)

Which means the gross debt has increased by annual growth rate of 13.66 percent and this growth rate is statistically significant as p values for intercept and growth rate, are less than the level of significance (0.01).

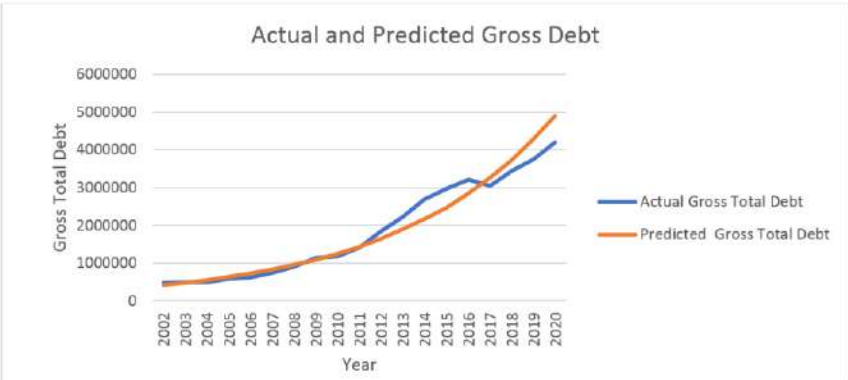



**Fig 10:** Actual and Predicted Gross Debt

By plotting the actual and predicted values of gross debt on graph, we are getting upward slopping curve. This reflects that over a period of time the gross debt has increased or it is showing increasing trend.

- ✓ **Gross Domestic Product (GDP)**

GDP can be defined as the total market value or monetary value of all the goods and services produced within a country in a specific time period. It refers to the value of goods and services produced in a nation. It functions as a scoreboard of country's economic health.

**Table 12:** GDP and Growth Indices

| Financial Year | Gross Domestic Product | Growth Indices |
|---|---|---|
| 2002 | 2318885 | 100 |
| 2003 | 2494020 | 107.55 |
| 2004 | 2799203 | 120.71 |
| 2005 | 3186440 | 137.41 |
| 2006 | 3628784 | 156.48 |
| 2007 | 4245209 | 183.07 |
| 2008 | 4903224 | 211.44 |
| 2009 | 5517512 | 237.93 |
| 2010 | 6371016 | 274.74 |
| 2011 | 7631220 | 329.09 |
| 2012 | 8740128 | 376.91 |
| 2013 | 9931848 | 428.3 |
| 2014 | 11222653 | 483.96 |
| 2015 | 12485471 | 538.42 |
| 2016 | 13750269 | 592.96 |
| 2017 | 15429773 | 665.39 |
| 2018 | 17123796 | 738.44 |
| 2019 | 18964000 | 817.8 |
| 2020 | 20381029 | 878.91 |

Table 12 shows the GDP and its growth indices, which shows over a period of eighteen year the GDP has also increased by almost more than 8 times because the index has touched 878.91 points. This is quite interesting to note that the increase in GDP is almost equal to the increases in Debt where the index touched the level of 870.46.

Log of GDP^ = -241.358 + 0.127868(t)
(5.98E-21) (2.05E-21)

From regression model, we have got the growth rate of GDP as 12.79 percent, which is slightly less than the growth rate of Debt that is 13.66 percent.

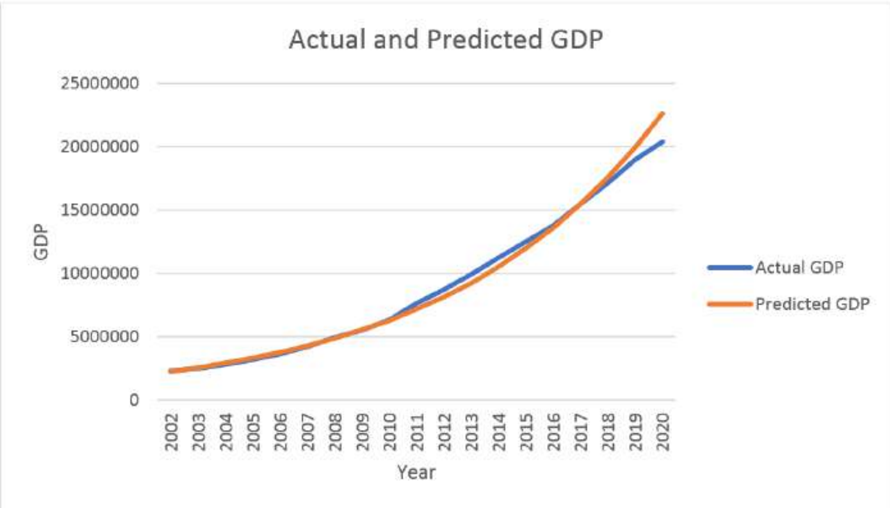



**Fig 11:** Actual and Predicted GDP

In the figure 11, GDP is also showing increasing trends, which is good for any economy. Since the growth rate of debt is slightly higher than the growth rate of GDP, therefore we have evaluated the growth rate of Debt to GDP ratio.

**Debt to GDP**

It can be termed as the ratio of country's public debt to its GDP. It is a useful tool for leaders, investors and economist. Though there is no ideal debt to GDP ratio, but a study in 2013 by the World Bank found that if debt to GDP ratio exceeds 77% for an extended period, then it slows economic growth.

**Table 13:** Debt to GDP ratio and Growth indices

| Financial Year | Debt Stock- GDP Ratio (%) | Growth Indices |
|---|---|---|
| 2002 | 20.8 | 100 |
| 2003 | 20.0 | 96.15 |
| 2004 | 17.7 | 85.09 |
| 2005 | 18.4 | 88.46 |
| 2006 | 17.1 | 82.21 |
| 2007 | 17.7 | 85.09 |
| 2008 | 18.3 | 87.98 |
| 2009 | 20.7 | 99.51 |
| 2010 | 18.5 | 88.94 |
| 2011 | 18.6 | 89.42 |
| 2012 | 21.1 | 101.44 |
| 2013 | 22.4 | 107.69 |
| 2014 | 23.9 | 114.9 |
| 2015 | 23.8 | 114.42 |
| 2016 | 23.4 | 112.5 |
| 2017 | 19.8 | 95.19 |
| 2018 | 20.1 | 96.63 |
| 2019 | 19.8 | 95.19 |
| 2020 | 20.6 | 99.03 |

In table 13, growth indices of debt to GDP ratio have been calculated, which is almost same in the last year as it was in the first year (2001-02). The table shows that India is able to maintain its debt to GDP ratio over eighteen-year period, moreover it is quite low as compared to the benchmark (77%) set by the World Bank in the year 2013. From this we can conclude that India's external debt is in the comfort zone and is efficiently managed.

Log of Debt to GDP^ = -14.6628 + 0.00878(t)
(0.07454) (0.035192)

By applying semi log regression model, we got the growth rate of 0.878 percent, which is very low. Moreover, this growth rate is statistically not significant as p values are more than the level of significance (0.01)

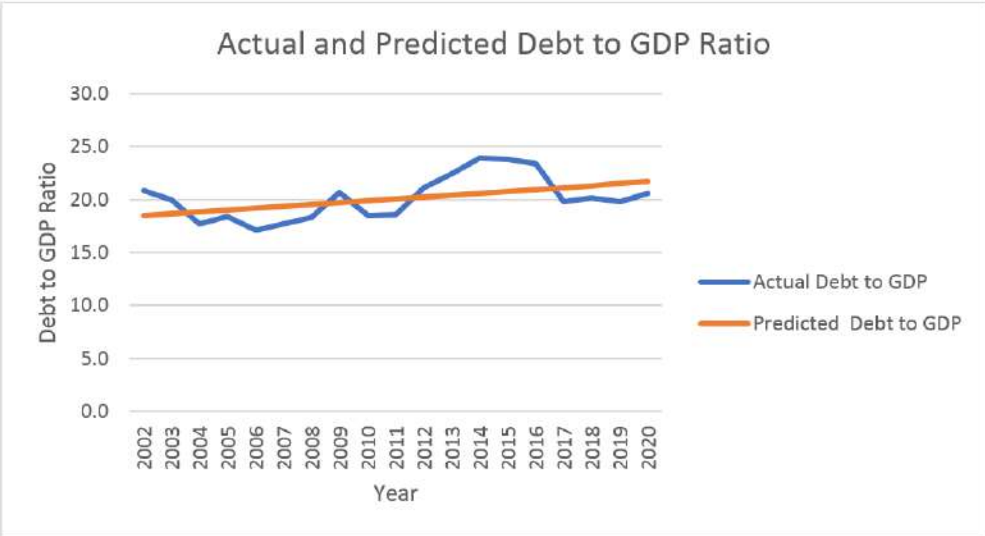



**Fig 12:** Actual and Predicted Debt to GDP Ratio

Figure 12 shows the trend line for debt to GDP ratio, which is almost parallel to x axis, which represent that debt to GDP ratio is almost constant over a period of time.

## Conclusion

From the analyses, we have found that Gross debt has shown an increasing trend which is also followed by GDP. As GDP has also increased at a rate which is almost equal to the rate of debt so, from this we can conclude that India has utilised its debt capital efficiently.

**We have applied the semi log regression model to calculate ACGR and found the growth rate of different sources as follows:**

| Source | ACGR (%) | P value |
|---|---|---|
| Multilateral Debt | 7.23 | 4.84E-12 |
| Bilateral Debt | 5.97 | 3.02E-10 |
| IMF loans | 17.39 | 3.48E-06 |
| Trade credit | 6.92 | 8E-04 |
| External Commercial Borrowings | 17.89 | 2.01E-13 |
| NRI deposits | 14.16 | 4.37E-13 |
| Rupee debt | (2.51) | 0.002 |
| Long term debt | 12.77 | 2.1E-14 |
| Short term debt | 21.5 | 6.17E-09 |
| Gross external debt | 13.67 | 4.11E-15 |
| GDP | 12.79 | 2.05E-21 |
| Debt to GDP | 0.878 | 0.035(NS) |

Moreover, since in our data analysis we have found that debt to GDP ratio is almost constant which is also good for an economy. Though the declining debt to GDP ratio is always preferable over the constant debt to GDP ratio because debt to GDP will decline only when the growth rate of GDP is more than the growth rate of debt. Beside rupee debt, all other sources of external debt have shown an increasing trend. India has taken maximum financial assistance from IMF in the year 2009-10. The growth rates of all the sources are positive except rupee debt. Although the growth rate of debt to GDP has a growth rate of 0.878 percent but this is not significant as p value is more than the level of significance. India got maximum debt from ECBs, which is followed by NRI deposits and short-term debt.

From the above analysis, we can conclude that although India is able to utilised its debt capital efficiently. But still there is a scope of improvement because debt to GDP ratio should decline over a period of time. So that India can be termed as "efficient economy".

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