

Financial Burden of Public Debt through Debt Sustainability Indicators in Andhra Pradesh and Telangana States

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Abstract

The present paper explains the growth of financial burden of public debt through debt sustainability indicators in Andhra Pradesh and Telangana states. The debt sustainability is critical aspect of examining the financial burden of public debt. This debt sustainability analysis involves the assessment of the ability of the state government to repay its maturing public debt over time with some indicators such as debt to GSDP ratio, debt to revenue ratio, debt services ratio, interest payments to revenue receipts ratio, interest payments to revenue expenditure ratio and the difference between the growth of public debt and growth of revenue receipts. The analysis on outstanding public debt to GSDP ratio of Andhra Pradesh and Telangana states, it is observed that debt to GSDP ratio of AP has been fluctuated between 28.33% and 35.82% during the period of study and outstanding public debt to GSDP ratio of Telangana fluctuated between 16.11% and 25.92% during the period of study. Therefore, it is concluded that the outstanding public debt ratio to GSDP of Andhra Pradesh state is higher than Telangana state by about ten percentage points in all the years study period. The debt to revenue ratio is greater than 100 both for Telangana and Andhra Pradesh states. In the case of Andhra Pradesh the debt to revenue ratio infuses between 164.05 to 299.27 during the period of study and in the case of Telangana state the debt to revenue ratio as between infuses between 122.30 and 241.88 during the period of study there from it is inferred that financial burden of outstanding public debt in Andhra Pradesh is higher than the financial burden of outstanding public debt in Telangana.

The debt services ratio of Andhra Pradesh has been fluctuated between 11.39% and 21.65% with an increasing trend. Similarly to debt serving ratio of Telangana state has been fluctuated between 11.39 and 21.65 with an increasing trend. Further it is observed that the public debt services ratio of Andhra Pradesh is greater than the of Telangana state in the all the years of study periods therefore the financial burden of Andhra Pradesh state is higher than Telangana state during the period of study which indicates that the financial burden of public debt is greater than the Telangana specially during the COVID period. In the case of Andhra Pradesh interest payments of revenue receipts ratio as inflected between 8.73% and 17.09% with an increasing trend in the case of Telangana, interest payments to revenue receipts ratio has been inflection between 9.93% and 16.69% with a increasing trend. the differences between interest payments to revenue receipt ratio of Andhra Pradesh is greater than interest payment to revenue receipts of Telangana during the period of study excluding the year 2014-15 and 2021-22, this indicates that the financial budget of public debt in terms of interest payments is greater for Andhra Pradesh and Telangana. The differences between growth rate of outstanding public debt and total revenue Andhra Pradesh is positive up to 2020-21 and after that it is negative. In other words Andhra Pradesh state has increasing financial burden after 2020-21. In the case of Telangana state the financial burden in term of the differences between growth rate of outstanding public debt and growth rate of total revenue has no specific trend but it has fluctuation between both negative and positive direction.

Keywords: Financial Burden, Sustainability, Revenue, debt services, Interest Payments, Expenditure.

1. Introduction:

The present paper explains the growth of financial burden of public debt through debt sustainability indicators. The debt sustainability is critical aspect of examining the financial burden of public debt. This debt sustainability analysis involves the assessment of the ability of the state government to repay its maturing public debt over time with some indicators such as debt to GSDP ratio, debt to revenue ratio, debt services ratio, interest payments to revenue receipts ratio, interest payments to revenue expenditure ratio and the difference between the growth of public debt and growth of revenue receipts.

2. Review of Literature:

Many Economists have studied the financial burden of public Debt at International, National and States levels.

Evsey Domar (1957) in his study entitled examined the financial burden of the Public Debt and its effect on saving and investment at macro level for selected countries of the world. According to him the financial burden indicates the required amount of financial allocation in the budget of the National Governments as percent of revenue receipts and revenue expenditure. Raja Raman I, BHIDE, S. and PATTNAYAK, R.K (2005) in their study entitled “A study of debt sustainability at state level in India” published by Reserve Bank of India examined the issue of debt sustainability at the state level during the time period 1992-2003. This study drew of attention to a rise in debt of major states during the unique minimum 1997- 2002 over the average unique minimum 1992-1997 and they have highlighted the need for fiscal correction to stabilize debt as percent of Gross State Domestic Product (GSDP) because the interest rate on public debt exceeded the nominal growth rate of Gross State Domestic Product (GSDP) during 1997-2002. This study identified that states in needs of expenditure compression and improvement in own revenue collection efforts and suggested several institutional reforms such as establishment of consolidated rising fund, guarantee redemption fund and introduction of Andhra Pradesh on Guarantees and Fiscal Responsibility Legislature (FRLs). According to IMF Policy Paper (2011), the debt sustainability is given as long as debt is not accumulate at a rate considerably exceeding the government’s capacity to service it in the absence of policy adjustment, negotiating or defaulting. According to P.S. Renjith and K. R. Shanmugam (2018), although the debt is not sustainable in eight Indian States namely Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal, they meet the condition that the rate of growth of public debt is lower than the GSDP growth rate. In this context, the present paper tries to examine the financial burden of public debt of Andhra Pradesh and Telangana states during the post-bifurcation period of Andhra Pradesh.

3. Objective:

The basic objective of the paper is to examine the financial burden of public debt through debt sustainability indicators of Andhra Pradesh and Telangana states during the post-bifurcation period, i.e., from 2014-15 to 2023-24.

4. Hypotheses:

The hypotheses formulated for the paper are as follows:

Null Hypothesis – 1: There is no significant change in the proportion of outstanding public debt to the GSDP of Andhra Pradesh and Telangana states;

Null Hypothesis – 2: There is no significant change in the public debt to revenue receipts ratio of Andhra Pradesh and Telangana states;

Null Hypothesis – 3: There is no significant change in the Public Debt Service Ratio of Andhra Pradesh and Telangana;

Null Hypothesis – 4: There is no significant change in the Interest Payments to Revenue Receipts Ratio of Andhra Pradesh and Telangana States; and

Null Hypothesis – 5: There is no significant Difference between the growth rate of Total Revenue Receipts and the growth rate of Outstanding Public Debt of Andhra Pradesh and Telangana States.

5. Methodology:

The methodology of the paper covers the sources of data, period of study and the statistical tools used for data analysis, which are detailed in the following paragraphs.

5.1. Sources of Data: This paper is based secondary data collected from the Budget Documents of Andhra Pradesh and Telangana, Socio-Economic Survey of Andhra Pradesh, Socio-Economic Outlook of Telangana, State Finances – A Study of Budgets published annually by the Reserve Bank of India and published research papers in various International and National Journals.

5.2. Period of Study: The study covers the period of 10 years from 2014-15 to 2023-24. The justification for the starting year is the notification of Andhra Pradesh State bifurcation into Telangana and Andhra Pradesh on 2nd June 2014 and the justification for the terminal year is the availability of the latest comparable data.

5.3. Statistical Tools Used: The data analysis in the paper uses the statistical tools such as Ratios and Trend Lines of growth with linear equations for testing the hypotheses.

6. Public Debt to GSDP Ratio:

The present study estimated the proportion of outstanding public debt of the state government to the GSDP of state. A raise in the public debt to GSDP ratio suggests an increase in the financial burden and a fall in the public debt to GSDP ratio suggests a decrease in the financial burden. The trends in the public debt to GSDP ratio of AP and TS has been provided in the table-1 and in the chart-1.

Table – 1: Trends in the Ratio of Outstanding Public Debt to GSDP of Andhra Pradesh and Telangana States

Year	Ratio of Outstanding Public Debt to GSDP of Andhra Pradesh	Ratio of Outstanding Public Debt to GSDP of Telangana
2014-15	28.33	16.58
2015-16	28.77	16.11
2016-17	28.47	19.42
2017-18	28.46	17.27
2018-19	29.47	20.44
2019-20	32.60	21.67
2020-21	35.82	25.92
2021-22	32.92	25.48
2022-23 RE	32.70	24.97
2023-24 BE	33.55	24.63

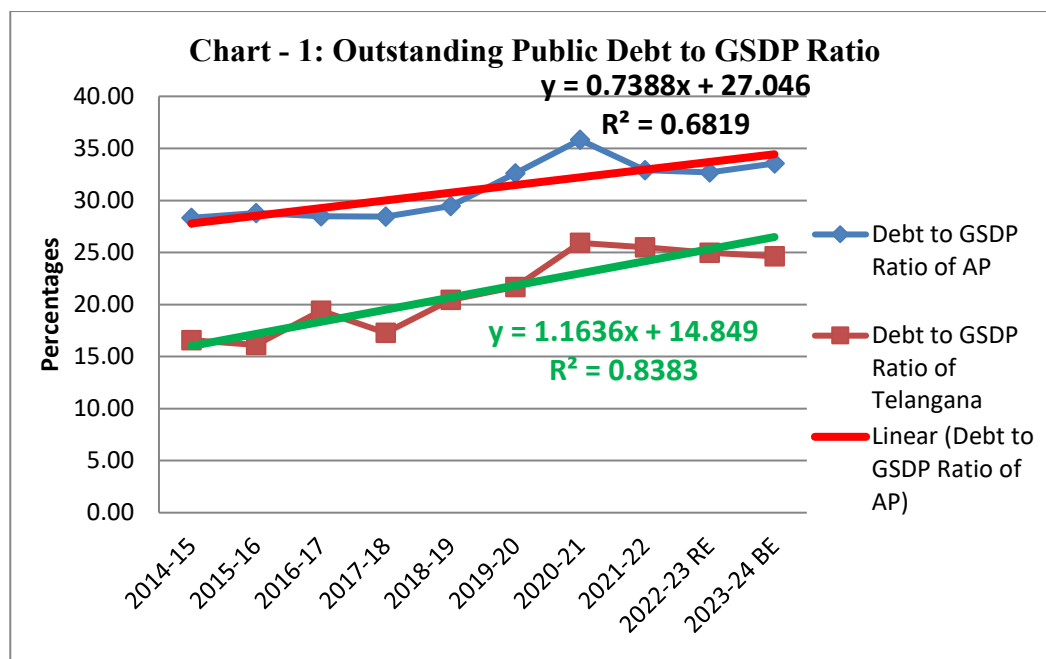
Sources: 1. Government of Andhra Pradesh: Budget Documents for various years

2. Government of Telangana: Budget Documents for various years

The analysis on outstanding public debt to GSDP ratio of Andhra Pradesh and Telangana states, it is observed that debt to GSDP ratio of AP has been fluctuated between 28.33% and 35.82% during the period of study and outstanding public debt to GSDP ratio of Telangana fluctuated between 16.11% and 25.92% during the period of study. Therefore, it is concluded that the outstanding public debt ratio to GSDP of Andhra Pradesh state is higher than Telangana state by about ten percentage points in all the years study period.

It is observed from the chart-1 that trends in the outstanding public debt to GSDP ratio of Andhra Pradesh and Telangana have been shown with an increasing trend. In addition to the chart of the trend line it is also observed that the trend equation If Andhra Pradesh and Telangana exhibits a positive trend it is slope of 1.163 for Telangana and 0.738 for Andhra Pradesh states. In other words the growth rate of outstanding public debt is higher than the growth rate of outstanding public debt in Andhra Pradesh.

The outstanding public debt to GSDP ratio indicates that both Andhra Pradesh and Telangana states have crossed the FRBM limit fixed by the government of India for Indian states. The government of India has allowed the state governments to borrow up to the level of 25% during the COVID pandemic period of 2020-21 and 2021-22 but both states have crossed the limit of FRBM Act and they are in a dangerous financial situation due to severe financial burden which is very high for Andhra Pradesh state than Telangana state.



7. Outstanding Public Debt to Total Revenue Ratio:

The Outstanding public debt to total revenue ratio indicates that how much of the state's total revenue is required to pay off the matured public debt. If debt payments exceed the total revenue of the state, the state may face severe financial burden and difficulties in meeting its obligations. The trends in the public debt to revenue receipts ratio of Andhra Pradesh and Telangana states have been given in the table-2 and chart-2.

Table-2: Outstanding Public Debt to Total Revenue Ratio of Andhra Pradesh and Telangana States

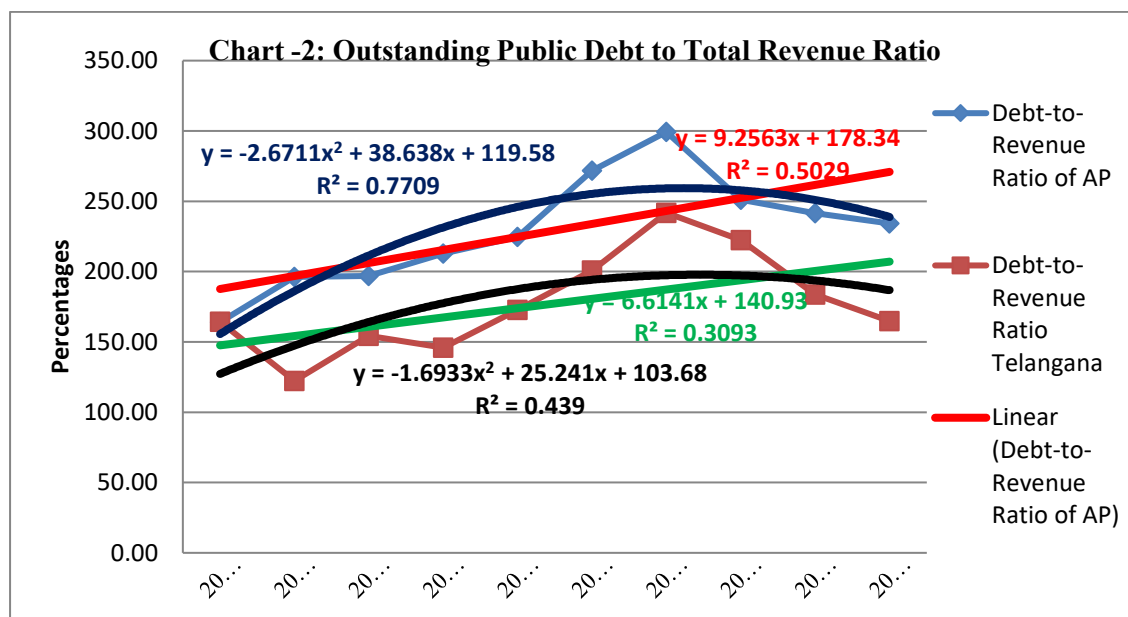
Year	Outstanding Public Debt to Total Revenue Ratio of Andhra Pradesh	Outstanding Public Debt to Total Revenue Ratio of Telangana
2014-15	164.05	164.27
2015-16	196.12	122.30
2016-17	196.86	154.35
2017-18	212.93	145.83
2018-19	224.56	172.83
2019-20	271.81	200.75
2020-21	299.27	241.81
2021-22	251.13	222.37
2022-23 RE	241.56	183.73
2023-24 BE	234.22	164.87

Sources: 1. Government of Andhra Pradesh: Budget Documents for various years
2. Government of Andhra Pradesh: Budget Documents for various years

Outstanding public debt to total revenue indicates the percentage of outstanding public debt in total revenue of Andhra Pradesh and Telangana states. It is also an index number considering total revenue equal to 100. If the ratio is greater than 100 it is consideration as financial burden to the state and if it is increasing it consider as increasing financial burden from table-2 it is observed that the debt to revenue ratio is greater than 100 both for Telangana and Andhra Pradesh states. In the case of Andhra Pradesh the debt to revenue ratio infuses between 164.05 to 299.27 during the period of study and in the case of Telangana state the debt to revenue ratio as between

infuses between 122.30 and 241.88 during the period of study there from it is inferred that financial burden of outstanding public debt in Andhra Pradesh is higher than the financial burden of outstanding public debt in Telangana.

It is clear from the chart-2 that debt to revenue ratio of Andhra Pradesh state is higher than the Telangana state in all the year of the study excluding the beginning year 2014-15 both states have faces severe financial burden, during year 2020-21 due to COVID pandemic condition. It is also observed from chart-2 that both states have lower R2 values for linear trend lines than their corresponding quadratic trend lines, which indicate that the financial budget has an increasing trend. Up to 2020-21 and it has declining trend in the case of both Andhra Pradesh and Telangana state in terms of outstanding public debt to total revenue ratio of Andhra Pradesh and Telangana.



8. Debt Services Ratio:

The public debt services ratio is the proportion of public debt service obligations, which includes interest payments and repayment of public debt, to the total revenue receipts of the state. If debt services ratio increases, it indicates a greater financial burden on the state GOVT if debt services ratio declining, it indicates a lower financial burden on the state budget. The trends in the debt service ratio of AP and TS have been depicted in the table-3 and chart-3.

Table-3: Public Debt Service Ratio of Andhra Pradesh and Telangana

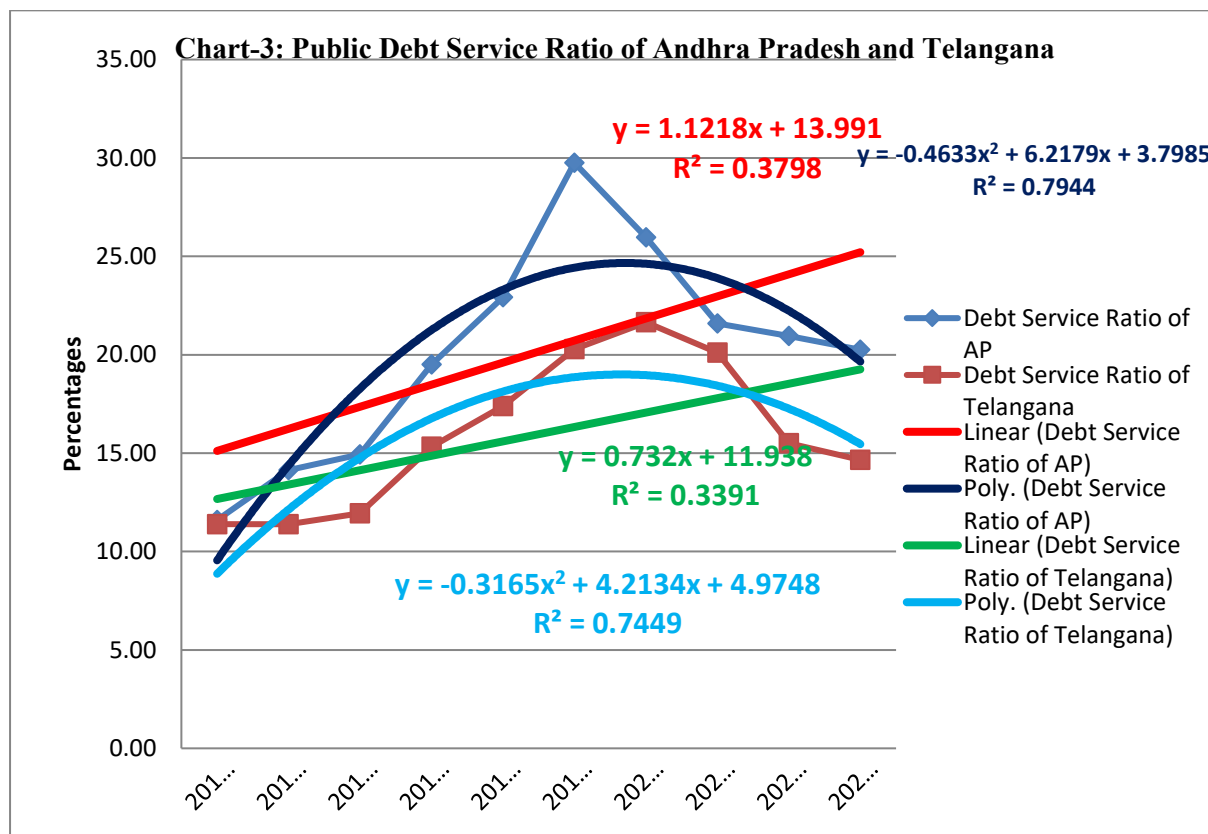
Year	Public Debt Service Ratio of Andhra Pradesh	Public Debt Service Ratio of Telangana
2014-15	11.60	11.39
2015-16	14.14	11.40
2016-17	14.93	11.94
2017-18	19.51	15.32
2018-19	22.91	17.40
2019-20	29.75	20.28
2020-21	25.97	21.65
2021-22	21.59	20.10
2022-23 RE	20.95	15.50
2023-24 BE	20.25	14.66

Sources: 1. Government of Andhra Pradesh: Budget Documents for various years

2. Government of Andhra Pradesh: Budget Documents for various years

Servicing of public debt includes payment of interest on the outstanding public debt and repayment of matured public debt. The debt service ratio is the ratio between servicing of public debt to total revenue of the state. It indicates that how much percentage state revenue is devoted to the serving of public debt the analysis on the table-3 and chart-3 it is clear that the debt services ratio of Andhra Pradesh has been fluctuated between 11.39% and 21.65% with an increasing trend. Similarly to debt serving ratio of Telangana state has been fluctuated between 11.39 and 21.65 with an increasing trend. Further it is observed that the public debt services ratio of Andhra Pradesh is greater than the of Telangana state in the all the years of study periods therefore the financial burden of Andhra Pradesh state is higher than Telangana state during the period of study which indicates that the financial burden of public debt is greater than the Telangana specially during the COVID period.

It is observed from the chart-3 that debt services ratio of Andhra Pradesh and Telangana have increasing trends between 2014-15 up to 2020-21 and declining trend during post COVID period, which indicates that the public debt services ratio has increased to its peak level due to continuous increase in debt payments or servicing charges and fall in the revenue receipts of states governments due to lock-down conditions both in Telangana and Andhra Pradesh. It is also observed from the chart that the co-efficient of determination for the linear trend lines and polynomial or pandemic trend lines in the graph the linear trend lines have very to R² values at 0.339 for Andhra Pradesh and 0.379 for Telangana which indicate that they are not best fit trend lines. On the other hand the R² values of quadratic trend lines are 0.744 for Telangana and 0.794 for Andhra Pradesh. Therefore it is concluded that the financial burden Andhra Pradesh state is higher than the financial burden of Telangana state in terms of debt services ratio.



9. Interest Payments to Revenue Receipts Ratio:

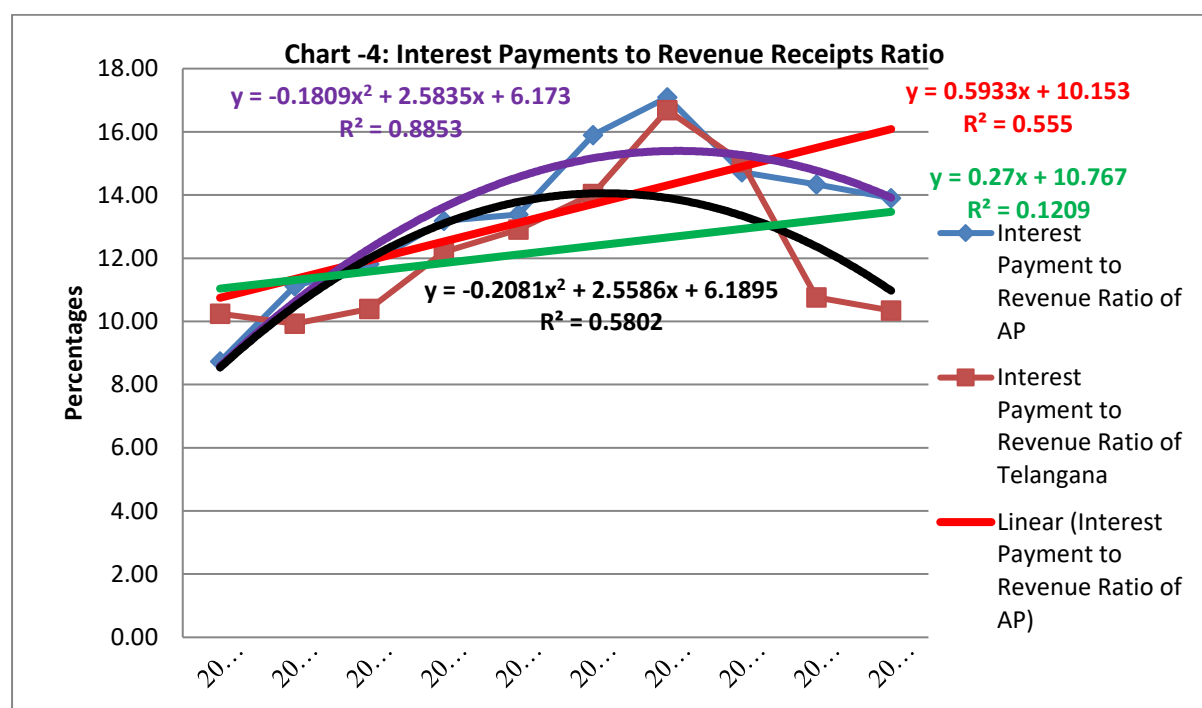
The ratio of interest payment to total revenue receipts indicates the percentage of the total revenue receipts of the state used to pay the interest on the outstanding public debt. If the value of interest payment to revenue receipts ratio increases the financial burden on the state budget increases and if the interest payment revenue receipts ratio decline, the financial burden on the state budget decline. The trends in the interest payment to revenue receipts ratio is provided in table-4 and chart-4.

Table-4: Trends in the Interest Payments to Revenue Receipts Ratio of Andhra Pradesh and Telangana States

Year	Interest Payments to Revenue Receipts Ratio of AP	Interest Payments to Revenue Receipts Ratio of Telangana
2014-15	8.73	10.24
2015-16	11.11	9.93
2016-17	11.82	10.40
2017-18	13.18	12.20
2018-19	13.38	12.90
2019-20	15.90	14.03
2020-21	17.09	16.69
2021-22	14.72	15.03
2022-23 RE	14.33	10.76
2023-24 BE	13.90	10.35

Sources: 1. Government of Andhra Pradesh: Budget Documents for various years

2. Government of Andhra Pradesh: Budget Documents for various years



Interest payments to revenue receipt used for payment of interest on the outstanding public debt the trends in the interest in payments in revenue receipt ratio of Andhra Pradesh and Telangana state has been given in table-4 and depicted in chart-4. In the case of Andhra Pradesh interest payments of revenue receipts ratio as inflected between 8.73% and 17.09% with an increasing trend in the case of Telangana, interest payments to revenue receipts ratio has been inflection between 9.93% and 16.69% with a increasing trend. the differences between interest payments to revenue receipt ratio of Andhra Pradesh is greater than interest payment to revenue receipts of Telangana during the period of study excluding the year 2014-15 and 2021-22, this indicates that the financial budget of public debt in terms of interest payments is greater for Andhra Pradesh and Telangana.

It is clear from the chart-4 that both Andhra Pradesh and Telangana have an increasing trend in the interest payment to revenue receipts ratio up to the year 2020-21 and after that they have decline trends and it is indicates that the financial burden of public debt in terms of interest payment on outstanding public debt has increased during the pre-COVID period and decline during the post-COVID period. Further, the financial burden of public debt in terms of interest payments to revenue receipts ratio it is greater for Andhra Pradesh than for Telangana. It

is also observed from the chart-4 that the quadratic trend lines of Andhra Pradesh and Telangana for interest payments to revenue receipts ratio have higher R2values than there R2values of linear trend lines of interest payments to revenue receipts ratio.

10. Difference between growth rate of public debt and growth rate of revenue receipts:

The differences between growth rate of public debt and growth rate of revenue receipts indicates the financial burden of the state. If the growth rate of public debt is higher than the growth rate of revenue receipts, the financial burden is positive and it's become unsustainable and if the growth rate of public debt is lower than the growth rate of revenue receipts, the financial burden is within the limits and it becomes sustainable.

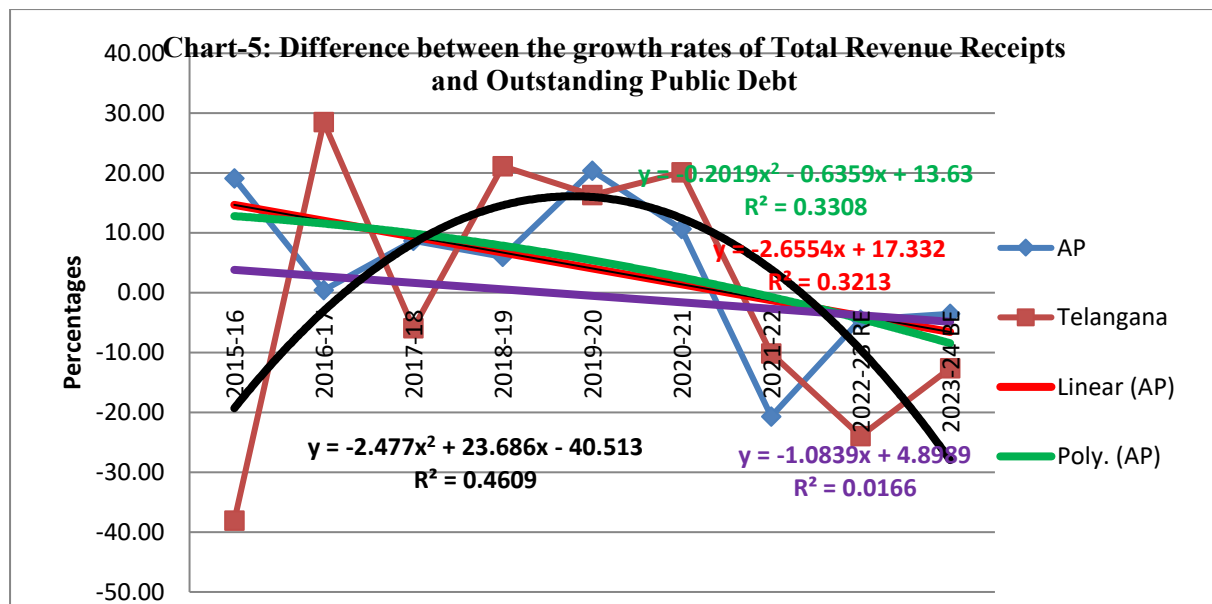
Table-5: Difference between the growth rate of Total Revenue Receipts and the growth rate of Outstanding Public Debt of Andhra Pradesh and Telangana States

Year	AP	Telangana
2015-16	19.11	-38.10
2016-17	0.42	28.50
2017-18	8.66	-5.92
2018-19	5.97	21.14
2019-20	20.37	16.34
2020-21	10.66	20.13
2021-22	-20.67	-10.15
2022-23 RE	-4.47	-23.97
2023-24 BE	-3.55	-12.64

Sources: 1. Government of Andhra Pradesh: Budget Documents for various years

2. Government of Andhra Pradesh: Budget Documents for various years

The differences between the growth rate of outstanding public debt and the growth rate of total revenue of the state indicates the financial burden of the public debt. The trends in the differences between the growth rates of outstanding public debt and revenue receipts of Andhra Pradesh and Telangana states have been presented in the table-5 and chart-5. It is clear from the table that the differences between growth rate of outstanding public debt and total revenue Andhra Pradesh is positive up to 2020-21 and after that it is negative. In other words Andhra Pradesh state has increasing financial burden after 2020-21. In the case of Telangana state the financial burden in term of the differences between growth rate of outstanding public debt and growth rate of total revenue has no specific trend but it has fluctuation between both negative and positive direction. Therefore it is concluded that there is an identified trends before and after 2020-21 in the case of Andhra Pradesh and there is no specific in case of Telangana.



It is observed from chart-5 the financial burden in terms of differences between outstanding public debt and revenue receipts have no specific trend in the case of Telangana but the trend is positive up to the year 2020-21 and it became negative after 2020-21 in the case of Andhra Pradesh. It is observed from the chart-5. The both linear trend lines and quadratic trend lines have very low R2 values both for Andhra Pradesh and Telangana. Therefore the financial burden in term of the differences between the growth rates of outstanding public debt and revenue receipts of Andhra Pradesh and Telangana have no specific trends identified during the period study.

11. Conclusion:

The analysis on outstanding public debt to GSDP ratio of Andhra Pradesh and Telangana states, it is observed that debt to GSDP ratio of AP has been fluctuated between 28.33% and 35.82% during the period of study and outstanding public debt to GSDP ratio of Telangana fluctuated between 16.11% and 25.92% during the period of study. Therefore, it is concluded that the outstanding public debt ratio to GSDP of Andhra Pradesh state is higher than Telangana state by about ten percentage points in all the years study period. The debt to revenue ratio is greater than 100 both for Telangana and Andhra Pradesh states. In the case of Andhra Pradesh the debt to revenue ratio infuses between 164.05 to 299.27 during the period of study and in the case of Telangana state the debt to revenue ratio as between infuses between 122.30 and 241.88 during the period of study there from it is inferred that financial burden of outstanding public debt in Andhra Pradesh is higher than the financial burden of outstanding public debt in Telangana. The debt services ratio of Andhra Pradesh has been fluctuated between 11.39% and 21.65% with an increasing trend. Similarly to debt serving ratio of Telangana state has been fluctuated between 11.39 and 21.65 with an increasing trend. Further it is observed that the public debt services ratio of Andhra Pradesh is greater than the of Telangana state in the all the years of study periods therefore the financial burden of Andhra Pradesh state is higher than Telangana state during the period of study which indicates that the financial burden of public debt is greater than the Telangana specially during the COVID period. In the case of Andhra Pradesh interest payments of revenue receipts ratio as inflected between 8.73% and 17.09% with an increasing trend in the case of Telangana, interest payments to revenue receipts ratio has been inflection between 9.93% and 16.69% with a increasing trend. the differences between interest payments to revenue receipt ratio of Andhra Pradesh is greater than interest payment to revenue receipts of Telangana during the period of study excluding the year 2014-15 and 2021-22, this indicates that the financial budget of public debt in terms of interest payments is greater for Andhra Pradesh and Telangana. The differences between growth rate of outstanding public debt and total revenue Andhra Pradesh is positive up to 2020-21 and after that it is negative. In other words Andhra Pradesh state has increasing financial burden after 2020-21. In the case of Telangana state the financial burden in term of the differences between growth rate of outstanding public debt and growth rate of total revenue has no specific trend but it has fluctuation between both negative and positive direction.

References:

1. Evsey Domar (1957), “Burden of Debt and National Income”, published in *Essay in the Theory of Economic Growth*, Oxford University Press.
2. International Monetary Fund (2011), *Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis*, Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis; IMF Policy Paper; August 5, 2011
3. Raja Raman I, Bhide, S. and Pattnayak, R.K (2005), “A study of debt sustainability at state level in India”, published by Reserve Bank of India.
4. P.S. Renjith and K. R. Shanmugam (2018), “Sustainable Debt Policies of Indian State Governments”, *Margin: The Journal of Applied Economic Research*, Volume 12, Issue 2. <https://journals.sagepub.com/home/MAR>
5. Reserve Bank of India, *State Finances – A Study of Budgets* for various years.
6. Government of Andhra Pradesh, *Andhra Pradesh Fiscal Responsibility and Budget Management (APFRBM) Act, 2005*.
7. Government of Andhra Pradesh, *Budget Documents*, for various years.
8. Government of Telangana, *Budget Documents*, for various years.