

Does Public Debt affect Economic Growth? Evidence from Andhra Pradesh and Tamil Nadu

Ganga. S¹, Dr. S. Nehru²

¹*Research Scholar, The Department of Economics, The Gandhigram Rural Institute (Deemed to be University), Gandhigram Dindigul District, Tamil Nadu*

²*Senior Professor, The Department of Economics, The Gandhigram Rural Institute (Deemed to be University), Gandhigram Dindigul District, Tamil Nadu*

Abstract—This study examines the long run relationship between public debt and economic growth in Andhra Pradesh and Tamil Nadu using annual time series data from 1991-2022. Per capital Net state domestic product (constant prices) is taken as proxy for Economic growth while Ratio of outstanding liabilities to Gross state domestic product is taken as proxy variable for public debt. Debt servicing and investments are taken as explanatory variables. The study employs Augmented Dickey Fuller (ADF) Test and Philips Peron Unit root test to examine the stationarity of the data followed by Johansen Cointegration test and Vector Error Correction model to analyze long run and short run dynamics. The result indicates that there exists a long run relationship among the variables. The normalized cointegration result indicates that public debt negatively affects economic growth in Andhra Pradesh and Tamil Nadu while Investment and Debt servicing positively affects economic growth. The study concludes that sustainable debt management and productive utilization of borrowed funds are essential for maintaining long-term economic growth and fiscal sustainability.

I. INTRODUCTION

Public debt has become one of the most important policy instruments used by governments to finance developmental activities, stabilize economic fluctuations and bridge the gap between public expenditure and government revenue. In both developed and developing economies borrowing has emerged as an indispensable source of financing infrastructure, social welfare programs, health, education and capital formation. However, the rapid increase in public debt following the global financial crisis of 2008 and the COVID-19 Pandemic has intensified the debate regarding its implications for

long-term growth and fiscal sustainability. According to the International Monetary Fund, Public debt refers to the total outstanding liabilities of the government including both domestic and external obligations. Similarly, the World Bank defines public debt as government liabilities that require future repayment of principal and interest and are incurred to finance fiscal deficits and development expenditure. Public borrowing enables government to mobilize resources without immediately increasing tax burdens, but persistent accumulation of debt may impose substantial fiscal costs through rising interest payments and reduced fiscal flexibility.

As noted by public debt is the receipt from the sale of financial instruments by the governments to individuals or firms in the private sector to induce the private sector to release manpower and real resources. This definition highlights the role of government borrowing as a mechanism for mobilizing resources for public investment and economic development. Nevertheless, the effectiveness of public debt largely depends on the productive utilization of borrowed funds and the government's capacity to service debt without compromising macroeconomic stability.

The influential study by renewed global interest in the debt growth debate by arguing that economic growth tends to decline sharply when the public debt to GDP ratio exceeds approximately 90 percent. Their findings stimulated extensive empirical research examining whether public debt exerts a causal influence on economic growth or merely reflects weak economic performance. Subsequent studies have produced mixed evidence. (Checherita et.al 2012) reported a non-linear relationship between government debt and economic growth in Eurozone countries. found little

evidence of a causal relationship between debt and growth. These contrasting findings indicate that the impact of public debt depends on factors such as debt composition, institutional quality, fiscal governance and efficiency of public expenditure.

In developing economies such as India public debt has played a significant role in financing economic development since Independence. Planned economic development, infrastructure expansion, social sector expenditure and poverty alleviation programs have relied substantially on public borrowing. Although fiscal reforms such as the Fiscal Responsibility and Budget Management (FRBM) framework have attempted to improve debt sustainability, public debt continues to remain an important concern because of rising fiscal deficits, increasing interest payments and expanding welfare commitments.

The Reserve Bank of India has consistently emphasized that prudent debt management is essential for maintaining macroeconomic stability while ensuring adequate fiscal space for developmental expenditure. Similarly, the International Monetary Fund (2023) argues that sustainable public debt is fundamental for achieving long-term economic growth because excessive indebtedness limits government's ability to respond effectively to future economic shocks.

Against this background the present study investigates the impact of public debt on economic growth in Andhra Pradesh and Tamil Nadu using annual time-series data for the period 1991-2022. Andhra Pradesh and Tamil Nadu were selected for the present study because they represent two economically significant South Indian states with distinct fiscal and economic characteristics. To examine the existence of a long-run equilibrium relationship between public debt and economic growth in Andhrapradesh and Tamil Nadu, the study employs the Johansen Cointegration Test. The Johansen methodology based on the Vector Autoregressive (VAR) framework is particularly suitable for analysing multiple non stationary time series variables and identifying the number of cointegrating relationships among them. The findings of the study are expected to contribute to the existing literature on public debt and economic growth and provide policy insights for promoting fiscal sustainability and effective debt management at the state level.

II. RELATED EMPIRICAL STUDIES

examined data from 44 countries and found that the public debt-to-GDP ratio exceeds approximately 90 percent economic growth declines significantly and their study revived the debate on debt thresholds and fiscal sustainability.

examined Kenya using multiple regression analysis and found that public debt significantly influenced economic growth. employed the Engle-Granger Cointegration technique for Tunisia and observed that higher external public debt adversely affected long run GDP perceptual supporting the debt overhang hypothesis.

examined eight emerging economies using panel data techniques and reported a positive association between public debt and economic growth. They found that investment and population growth positively affected growth whereas inflation and trade balance are statistically insignificant.

examined 24 European Union Countries using OLS and autoregressive models and reported that increase in public debt significantly reduces GDP growth. (Pegkas et.al 2020) using Fully Modified Ordinary Least Squares (FMOLS) for 12 Eurozone countries found that Public debt negatively affected longrun economic growth. Similarly employed the Mundlak approach for OECD countries and reported that public debt exerted a negative permanent effect but a positive transitory effect on economic growth.

argued that debt and economic growth were unrelated in India and questioned the applicability of Keynesian pump-priming theory due to limited excess productive capacity. employed Cointegration and Granger Causality techniques using Indian data from 1959-1995 and found no causal relationship between domestic debt and economic growth. examined fiscal sustainability using the intertemporal budget constraint and fiscal reaction function and concluded that India's debt remained sustainable while exhibiting a non-linear relationship with economic growth.

employed ARDL and Malmquist productivity analysis and observed a long-run equilibrium relationship between public debt and economic growth. Their subsequent study using non linear ARDL and Two-stage Least Squares found that public debt positively affects economic growth in shortrun but negatively affected economic growth over longrun through macroeconomic transmission channels.

using Cointegration and Vector Error Correction Models (VECM) observed that increasing debt and interest payment burdens negatively affected long-run economic growth in Uttar Pradesh. examined spatial and temporal patterns of state debt across India and found significant interstate disparities in debt accumulation and fiscal performance.

Although a substantial body of literature has examined the relationship between Public debt and economic growth at international and national levels, empirical evidence at the Indian state level remains limited. Existing studies have primarily examined public debt and economic growth at the national level or across countries. Comparative evidence for South Indian states remains limited particularly after the bifurcation of Andhra Pradesh and the post-FRBM fiscal period. This study addresses this gap by providing a comparative time series analysis of Andhra Pradesh and TamilNadu from 1991-2022 to provide a deeper understanding of the long-run effect of public debt on economic growth and to generate state specific policy implications for sustainable debt management.

III. RATIONALE FOR SELECTING ANDHRA PRADESH AND TAMIL NADU

The selection of Andhra Pradesh and Tamil Nadu is based on their distinct fiscal and economic characteristics which provide a meaningful basis for comparative analysis. Tamil Nadu is one of India's most industrialized and economically advanced states characterized by a diversified economic structure relatively stable economic growth and well-developed manufacturing and service sectors. In contrast, Andhra Pradesh has undergone significant fiscal and structural changes particularly after the bifurcation of the state in 2014 resulting in increased public borrowing to finance infrastructure development, welfare programmes and capital expenditure. The two states differ considerably in terms of debt levels, fiscal management practices, economic structure and growth performance. These differences make them suitable case studies for examining how varying levels of public debt influence long-run economic growth. A Comparative analysis of these states also provides valuable insights into the state-level debt sustainability and contributes to the formulation of more effective fiscal policy recommendations.

IV. OBJECTIVE OF THE STUDY

The primary objective of the study is to examine the impact of public debt on economic growth in Andhra Pradesh and Tamil Nadu during 1991-2022. Specifically, the study investigates whether a long-run equilibrium relationship exist between public debt, economic growth, debt servicing and investment by using Johansen cointegration technique. The study also aims to provide empirical evidence on the role of public debt in influencing economic growth and to offer policy insights for promoting fiscal sustainability and effective debt management at state level.

V. DATA AND METHODOLOGY

Data

This study is conducted purely based on the secondary data of two states viz. Andhra Pradesh and Tamil Nadu. The empirical investigation has been conducted using the annual data are collected during the period 1991-2022. The per capita net state domestic product at current prices is defined as the indicator of economic growth, and the ratio of total outstanding liabilities to gross state domestic product is taken as a stock variable for public debt, the ratio of interest payments to revenue receipts is used as a flow variable for debt servicing and the gross capital formation as a ratio of nominal GSDP is used as a proxy for investment. All these data are collected from the RBI Handbook of Statistics on Indian States and State Finance: Study of Budgets

Methodology

The estimation process starts with examining the stationary properties of the time series data by using Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. The present study estimates the following growth function

$$\ln Y_t = \beta_0 + \beta_1 \ln PD_t + \beta_2 DS_t + \beta_3 K_t + u_t$$

Where Y_t is Economic Growth, PD_t is Public Debt, DS_t is Debt Servicing and K_t Investment

Variables	Description	Expected Sign
EG (Proxy for Economic Growth)	Per Capita Net State Domestic Product at Constant Prices	Dependent Variable

PD (Public Debt)	Outstanding Liabilities as a Percentage of GSDP	Negative (-)
DS (Debt Servicing)	Interest Payments as a Percentage of Revenue Receipts	±
INV (Investment)	Gross Capital Formation as a Percentage of GSDP	Positive (+)

The model is derived from endogenous growth, where economic growth is influenced by capital formation and fiscal variables. Public debt is incorporated to examine whether government borrowing supports or constraints long-run economic growth. Investment captures capital formation while debt servicing reflects the fiscal burden associated with public borrowing. Together, these variables provide a comprehensive framework for analyzing the relationship between public debt and economic growth at the state level

Explanation of the Variables

- Public Debt is measured as the ratio of total outstanding liabilities to Gross State Domestic Product. According to the debt overhang hypothesis, excessive public debt discourages investment increases interest obligations and reduces long-run economic growth. Therefore, the expected coefficient of public debt is negative.
- Debt Servicing is measured by the ratio of interest payments to revenue receipts. A high debt

servicing burden may reduce fiscal space available for productive expenditure implying a negative effect on growth. However, efficient debt servicing may also reflect prudent fiscal management and enhance investor confidence. Therefore, the expected sign is ambiguous and must be determined empirically.

- Investment is proxied by Gross Capital Formation as a percentage of GSDP. Higher investment expands productive capacity, creates employment and increases income and thereby promoting economic growth. Hence the coefficient of investment is expected to be positive.

Empirical Analysis and Interpretation

The relationship between public debt and the economic growth of Andhra Pradesh and Tamil Nadu has been tested using appropriate econometric models and the results are reported in the following sections.

Test for Stationarity

To avoid spurious regressions problem, as a first step of the estimation process the stationary properties of the all variables are verified by using the augmented Dickey–Fuller (1979), and Phillips and Perron (1988) tests and are estimated and the results are reported if following tables.

Table 1: Unit Root Test Results of Andhra Pradesh

Variables	ADF Test		PP Test	
	Level	Difference	Level	Difference
Economic growth	-0.686 (0.83)	-5.740(0.01) *	-0.764(0.81)	-5.740(0.01) *
Public Debt	-0.824(0.35)	-6.339(0.00) *	-0.824(0.350)	-6.339(0.00) *
Investment	-2.26(.1899)	-7.77 (0.00) *	-2.33(0.168)	-7.50(0.00) *
Debt Service	-0.347 (0.55)	-2.613(0.01) *	-0.577 (0.45)	-3.58 (0.00) *

Note: ‘*’ indicates significance at the 1% level of significance. The figures in parenthesis are p values

To check the presence of unit roots, augmented Dickey Fuller test and Phillip Perron tests are employed and estimate results in Table 1. The test results show that for Andhra Pradesh, the estimated probability values were good enough to reject the null hypothesis of no unit root at the levels whereas in the first differences, the estimated values are accepting the null of no unit root. The Phillip-Perron test results also show the same results. Thus, based on these two tests it is confirmed that in Andhra Pradesh, all the four variables, economic growth, public debt, investment, and debt service are non-stationary at level and a variable of I (1) process and become stationary only in the first order at the conventional level of significance.

Table 2: Unit Root Test Results of Tamil Nadu

Variables	ADF Test		PP Test	
	Level	Difference	Level	Difference
Economic growth	-1.121 (0.69)	-3.06(0.04) *	-1.54(0.499)	-2.89(0.05) *
Public Debt	-2.985(0.047)	-5.747(0.00) *	-3.00(0.045)	-5.75(0.00) *
Investment	-1.87 (0.33)	-6.81(0.00) *	-1.929 (0.31)	-6.81(0.00) *
Debt Service	-2.45 (0.13)	-3.97(0.004) *	-2.04(0.266)	-3.97(0.004) *

Note: ‘*’ indicates significance at the 1% level of significance. The figures in parenthesis are p values

The unit root test of results of the variables used to check the relationship between public debt and economic growth of Tamil Nadu is reported in above Table 2 and the results indicates that the unit root tests are not rejecting the null hypothesis of a unit root at 1% level of significance at the level and both the test results rejects the null hypothesis of unit root at the first difference. Thus, all the tests confirm that the variables used for estimation are following a stationary process only in the first order.

It is understood from the results of the unit root models reported in Table 1 and 2, it was found that all the variables are stationary only at first differences and so the Cointegration models are the appropriate one for examining the relationships between these variables. So, to verify the existing relationship between the variables, the present study, uses Johansen-Juselius multivariate cointegration technique. It is well known that the results of Johansen-Juselius procedures are sensitive to lag length for VAR model and the orders of integration of the variables entering each of the VAR models. Prior to testing for cointegration, the optimal lag length on each variable in the VECM model was tested through five lag selection criteria namely, Akaike Information Criteria (AIC), Schwarz Information Criteria (SIC), Likelihood Ratio Tests (LR), Final Prediction Error (FPE) and Hannan-Quinn Information Criteria (HQ). For all the countries 2 lags have been chosen as the optimum lag length suggested by AIC and SIC criteria.

Table 3: Johansen Cointegration Test (Andhra Pradesh)

Null Hypothesis	Alternative Hypothesis	λ Trace Statistics	Critical Values
$r=0^*$	$r>0$	89.65	47.85 (0.00)
$r\leq 1^*$	$r>1$	32.22	29.79 (0.06)
$r\leq 2$	$r>2$	12.72	15.49 (0.15)
$r\leq 3$	$r>3$	1.059	3.84 (0.27)

Null Hypothesis	Alternate Hypothesis	λ Max Statistics	Critical Values
$r=0^*$	$r=1$	57.38	27.58 (0.05)
$r=1$	$r=2$	19.54	21.13 (0.18)
$r=2$	$r=3$	11.66	14.26 (0.15)
$r=3$	$r=4$	1.059	3.84 (0.27)

Notes: ‘*’ indicates significance at the 5% level of significance. The figures in parenthesis are p values

The Johansen method suggests two statistics to determine the number of cointegrating vectors: the trace statistics and maximum Eigen value statistics. The appropriate critical values for the tests are provided in Osterwald-Lenum Eigen values.

The reported results of Johansen cointegration test for the Andhra Pradesh in Table 4 shows that both the trace statistics rejects the null hypothesis of zero Cointegrating vector($r=0$) against the alternative of one or more Cointegrating vectors($r>0$) at 5% significance level. The null hypothesis of less than one cointegration ($r\leq 1$), against the alternative of two or more Cointegrating vectors($r>1$) is also rejected because the estimated trace statistics is greater than the critical values and the other null hypothesis are not rejected. So, the trace statistics confirm the presence of two cointegrating vectors among these variables. But the critical values of max Eigen value statistics rejects only the null hypothesis of no cointegration ($r=0$) and show only show a presence of only one Cointegration vector.

Table 4 reports the results of Johansen cointegration test for Tamil Nadu and estimated trace statistics confirm the presence of one Cointegrating vectors at 5% significance level and the maximum Eigen Value test also indicates the presence of one Cointegrating vectors at 5% level of significance and confirm the presence of long run relationship among these variables.

Table 4: Johansen Cointegration Test (Tamil Nadu)

Null Hypothesis	Alternative Hypothesis	λ Trace Statistics	Critical Values
$r=0^*$	$r>0$	77.05	47.85 (0.00)
$r\leq 1$	$r>1$	22.96	29.79 (0.24)
$r\leq 2$	$r>2$	9.736	15.49 (0.30)
$r\leq 3$	$r>3$	0.076	3.84 (0.78)
Null Hypothesis	Alternate Hypothesis	λ Max Statistics	Critical Values
$r=0^*$	$r=1$	54.08	27.58 (0.00)
$r=1$	$r=2$	13.23	21.13 (0.43)
$r=2$	$r=3$	9.65	14.26 (0.23)
$r=3$	$r=4$	0.07	3.84 (0.78)

Notes: ‘*’ indicates significance at the 5% level of significance. The figures in parenthesis are p values

Since the variables are cointegrated, an econometric interpretation of the results can be obtained by normalizing the cointegrated vector on economic growth. The Cointegrating vector is normalized with respect to the economic growth for each state in order to give economic meanings to the estimated vectors. So, Table 5 reports the normalized estimates of the cointegration vectors for both the states.

Table 5: Normalizing Cointegrating Coefficients

State	Ln (EG)	Ln (DS)	Ln (INV)	Ln (PD)
Andhra Pradesh	1.00	4.153 (15.79)	2.02 (10.15)	-3.77 (-11.26)
Tamil Nadu	1.00	13.67 (8.45)	1.553 (4.78)	-10.54 (-5.34)

Notes: The figures in parenthesis are standard errors

When the economic growth is normalized, results shows that in Andhra Pradesh, the coefficients of debt service and investment, have a positive sign and also statistically significant at 1% level and public debt, have a negative impact on the economic growth. This shows that an increase in investment and debt service will stimulate the economic growth in the long run, and increase in public debt will affect the growth in negative way which means, the increase in debt will reduce the long-rung growth. The estimated results are very much similar for Tamil Nadu also where debt service and investment are influencing the economic growth in a positive and significant way and public debt has an adverse effect on the economic growth.

The long-run relationship between the public debt and economic growth has been established in the above tables and so the error correction model has to be estimated. The error correction term shows how the system converges to the long-run equilibrium implied by the cointegrating regression.

Table 6: Vector Error Correction Model for Andhra Pradesh

Lags	EC	C	EG	PD	INV	DS
1	-0.4624 [-2.633]	0.06268 [4.648]	-0.041 [-0.252]	-0.88 [-0.8916]	3.36 [1.3814]	-0.703 [-1.307]
2			-0.200 [-2.92]	0.227 [0.15]	0.608 [1.06]	1.727 [2.35]

Notes: The figures in parenthesis aren’t’ statistics values

Table 7: Vector Error Correction Model for Tamil Nadu

Lags	EC	C	EG	PD	INV	DS
1	-0.0143 [-2.311]	0.048 [2.839]	0.466 [1.634]	-0.95127 [-0.780]	-0.7154 [-0.163]	-1.16240 [-1.523]
2			-0.32713 [-1.234]	-0.4981 [-0.440]	-7.0935 [-1.745]	-0.4985 [-0.443]

Notes: The figures in parenthesis aren’t’ statistics values

Results shows that cointegration relationship exist among the variables in both states and so the two error correction model have to be estimated. The error correction equation shows the short-term dynamics of the relationship between the variables. The basic idea behind ECM is to model the adjustment process towards the long-term equilibrium with short term deviations occur. The model includes an error correction term, which represents the speed at which

the system corrects itself in response to any deviations from the cointegrating relationship. The estimated coefficients from the error correction models are presented in below table 4.6 and table 7. The estimated EC coefficient in Andhra Pradesh is negative (-0.045) and statistically significant (-2.63), which indicates that every year disequilibrium among the variables got adjusted by -0.045 times. Similarly, for Tamil Nadu also the EC coefficient is (-0.014) is negative and

statistically significant (-2.311) and confirms the presence of significant adjustments in the disequilibrium

The negative and statistically significant error correction coefficients in both states indicate that there are significant adjustments in the short term to bring the variables back to their long-term equilibrium. These findings provide valuable insights into the relationships and dynamics of the studied variables in the context of the two states.

VI. FINDINGS, SUGGESTIONS AND CONCLUSIONS

Major findings of the study

- The Johansen cointegration test confirms the existence of a long-run equilibrium relationship between economic growth, public debt, investment and debt servicing in Andhra Pradesh and Tamil Nadu
- Public debt has negative impact on economic growth in Andhra Pradesh and Tamil Nadu
- Investment and debt servicing has positive impact on economic growth in Andhra Pradesh and Tamil Nadu. Effective debt servicing implies there exist fiscal discipline in both states.
- The Vector Error Correction Mechanism (VECM) results indicate that there are negative error correction terms for both states confirming adjustment from short run disequilibrium towards long-run equilibrium
- Andhra Pradesh exhibits a relatively faster speed of adjustment compared to Tamil Nadu
- The result indicates that excessive accumulation of public debt without productive investment may reduce long-term economic growth.

Suggestions

- Government should ensure that borrowed funds are utilized mainly for productive capital investments rather than revenue expenditure
- Fiscal discipline should be strengthened through effective implementation of fiscal responsibility measures
- Public debt should be maintained within sustainable limits to avoid excessive interest payments burden
- Investments in infrastructure, education,

healthcare and productive sectors should be prioritized to enhance economic growth.

- State government should strengthen revenue mobilization through tax reforms and efficient tax administration.
- Regular monitoring of debt sustainability indicators should be undertaken to maintain fiscal sustainability.

Conclusion

Public debt has a complex relationship with economic growth. While low levels of debt can support economic activity, excessive debt beyond a threshold can have negative consequences. It can crowd out private investment, increase borrowing costs, and hinder long-term growth prospects. Sustainable debt levels, efficient public spending, fiscal discipline, and structural reforms are necessary to mitigate the adverse effects of public debt on economic growth. Each country's specific circumstances and institutional factors should be taken into account when formulating debt management and growth strategies .

REFERENCES

- [1] A. B. Abubakar and S. O. Mamman, "Permanent and transitory effect of public debt on economic growth," *Journal of Economic Studies*, vol. 48, no. 5, pp. 1064–1083, 2021.
- [2] M. K. Agarwal and S. Ansari, "Impact of public debt on the economic growth of subnational economies in India," *Economic and Political Weekly*, vol. 57, no. 21, p. 49, 2021.
- [3] D. P. Bal and B. N. Rath, "Do macroeconomic channels matter for examining relationship between public debt and economic growth in India?," *Journal of Quantitative Economics*, vol. 16, Suppl. 1, pp. 121–142, 2018.
- [4] D. P. Bal and B. N. Rath, "Public debt and economic growth in India: A reassessment," *Economic Analysis and Policy*, vol. 44, no. 3, pp. 292–300, 2014.
- [5] C. Checherita-Westphal and P. Rother, "The impact of high government debt on economic growth and its channels: An empirical investigation for the Euro Area," *European Economic Review*, vol. 56, no. 7, pp. 1392–1405, 2012.

- [6] B. Fincke and A. Greiner, "Public debt and economic growth in emerging market economies," *South African Journal of Economics*, vol. 83, no. 3, pp. 357–370, 2015.
- [7] S. Johansen, "Statistical analysis of cointegration vectors," *Journal of Economic Dynamics and Control*, vol. 12, nos. 2–3, pp. 231–254, 1988.
- [8] B. Kaur and A. Mukherjee, "Threshold level of debt and public debt sustainability: The Indian experience," *Reserve Bank of India Occasional Papers*, vol. 33, no. 1, pp. 1–37, 2013.
- [9] C. Matiti, "The relationship between public debt and economic growth in Kenya," *International Journal of Social Sciences and Project Planning Management*, vol. 1, no. 1, pp. 65–86, 2013.
- [10] B. S. Minhas, "The planning process and the annual budget: Some reflections on Indian experience," *Indian Economic Review*, pp. 115–149, 1987.
- [11] B. M. Mohamed, "Assessing the short- and long-run real effects of public external debt: The case of Tunisia," *African Development Review*, vol. 25, no. 4, pp. 587–606, 2013.
- [12] U. Panizza and A. Presbitero, "Public debt and economic growth: Is there a causal effect?," *Journal of Macroeconomics*, vol. 41, pp. 21–41, 2014.
- [13] P. Pegkas, C. Staikouras, and C. Tsamadias, "On the determinants of economic growth: Empirical evidence from the Eurozone countries," *International Area Studies Review*, vol. 23, no. 2, pp. 210–229, 2020.
- [14] C. M. Reinhart and K. S. Rogoff, "Growth in a time of debt," *American Economic Review*, vol. 100, no. 2, pp. 573–578, 2010.
- [15] C. S. Shoup, *Public Finance*. New Brunswick, NJ: Transaction Publishers, 2006.
- [16] C. Singh, "Domestic debt and economic growth in India," *Economic and Political Weekly*, pp. 1445–1453, 1999.
- [17] V. Snieska and D. Burškaitienė, "Panel data analysis of public and private debt and house price influence on GDP in the European Union countries," *Inžinerinė Ekonomika*, vol. 29, no. 2, pp. 197–204, 2018.
- [18] S. Thakur, "Public debt and regional inequality in India: Patterns, determinants and implications," *GeoJournal*, vol. 88, no. 1, pp. 225–245, 2022.