



# The Determinants of Public Expenditure Growth in Tamil Nadu After Economic Reform

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## Abstract

In Tamil Nadu, government activities and total public expenditure have grown significantly in absolute terms, relative terms, and as a proportion of NSDP over the years. This rapid increase in government spending calls for an analysis of the key factors driving this expansion and its impact on the state's economy. A revised version of Wagner's Law was adopted in this research, integrating 14 additional variables to assess their influence on government expenditure. Using time series data spanning 31 years from 1991 to 2022, during the post-economic reform period, the analysis employs the ARDL model and Granger Causality test. The findings indicate a long-term relationship among most variables, except for population and the number of literates. In the short term, per capita NSDP and FDI are identified as significant drivers of government expenditure in Tamil Nadu, while public debt shows a negative but significant effect. Furthermore, the Granger causality analysis highlights that factors such as per capita NSDP, FDI, public debt, gross capital formation, number of employees, per capita capital expenditure, social security and welfare measures, and urbanisation have a significant causal relationship with government spending, underscoring their interdependence. The paper concludes with several policy recommendations. To ensure sustainable economic growth and development, the Tamil Nadu government should focus on diversifying its revenue sources, re-evaluating public expenditure priorities, and promoting inter-generational equity. Additionally, adopting a multi-dimensional strategy in education, emphasising debt consolidation, and maintaining fiscal discipline will be essential to strengthen the state's education sector and reduce the adverse effects of public debt.

**Keywords:** Public expenditure, population, inflation, ARDL, urbanisation, gross capital formation, Wagner's Law, Tamil Nadu

## 1. INTRODUCTION

In many developing countries, the government is seen as a driving force for change, with the level of government spending indicating its degree of economic involvement. Traditionally focused on security, administration, and law enforcement, governments have expanded their roles to include direct participation in income-generating activities such as capital investments, as well as redistributive measures like subventions and transfers. This transformation has significantly broadened the functions of governments worldwide. Their primary objective remains the promotion of societal welfare through appropriate economic, political, social, and legal initiatives.

The global need for government expenditure within any economic system fluctuates periodically. It is widely assumed that government spending supports the growth objectives of economies worldwide [1], making it a crucial macroeconomic policy tool for fostering development. Since government expenditure is believed to contribute to growth, understanding its relationship with economic growth in developing nations becomes essential. The factors influencing public expenditure are intricate and multidimensional, encompassing

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economic, social, and political elements. Key determinants include the level of economic development, the size and structure of the government, taxation levels, and the degree of decentralisation [38,41]. Demographic factors, such as population growth, age distribution, and urbanisation, also play a pivotal role [19]. Furthermore, political considerations, including the ruling party's ideology, levels of corruption, and political stability, significantly shape public expenditure decisions [3].

Government spending across nations is largely driven by factors like population growth, government indicators, and the composition of public expenditure [8,51,20,28]. In India, as the nation continues its development trajectory, government spending priorities are increasingly shifting toward infrastructure development, education, and healthcare [47]. India's demographic profile, characterised by a large and rapidly urbanising population, exerts substantial pressure on government expenditure priorities [19]. Additionally, the government's revenue-generating capacity through taxation and other mechanisms significantly influences expenditure priorities [41]. Social challenges such as poverty and inequality also shape public spending priorities, as the government seeks to address these issues and promote social justice and equality [6].

Therefore, public expenditure continues to be a crucial tool in the development process, as both developing and developed nations utilise it to enhance income distribution, allocate resources to specific sectors, and shape the composition of national income [6,57]. For instance, in developing countries, variations in government spending patterns are not only aimed at ensuring economic stabilisation but also at driving financial growth and creating employment opportunities [59]. However, these initiatives have led to a considerable increase in public expenditure, especially in developing nations like India which has witnessed substantial growth in public expenditure at both the central and state levels, primarily driven by the extensive use of fiscal tools in sector-specific development strategies implemented since its independence. India has similarly experienced a significant increase in government expenditure in recent decades, making it essential to explore the specific factors driving public spending in Tamil Nadu. Over time, shifts in government priorities have brought significant changes to the nature and focus of public spending. The country has also undergone major fiscal policy transformations, particularly with the introduction of structural adjustment programs and stabilisation measures. The enactment of laws like the 'Fiscal Responsibility and Budget Management' (FRBM) Act has pushed governments at both levels to pursue fiscal consolidation, setting limits on fiscal and revenue deficits as well as public debt within specified timeframes. Furthermore, the fiscal landscape has been reshaped by the elimination of the 'plan' and 'non-plan' expenditure classifications. These substantial changes in the scale and composition of public spending carry profound implications for India's developmental outcomes [29].

This study seeks to empirically examine the factors driving the augmentation of government expenditure in Tamil Nadu, India, in light of Wagner's Law. The aim of the research is to identify and analyse the determinants causative to the growth of public expenditure in Tamil Nadu during the study period. Understanding these determinants is particularly relevant, not only because of the continued global interest in public expenditure theory but also due to the rapid rise in government spending in Tamil Nadu, which has been a noteworthy trend in recent years.

This paper is structured into eight sections. The first section introduces the concept of public expenditure and its determining factors. The second section offers a thorough review of existing literature, while the third identifies gaps in previous research. The fourth section outlines the study's objectives, followed by the fifth section, which details the research methodology. The sixth section analyses the specific factors affecting public expenditure in Tamil Nadu. The seventh section presents the key findings, and the final section concludes the study.

## 2. LITERATURE REVIEW

The study of government expenditure provides insight into the factors that have been empirically proven to impact public spending. Literature review indicates that government expenditure and its determinants vary across countries, research methodology, and the specific measures of expenditure considered. While extensive research has been conducted in developed nations, there is a growing yet limited body of studies exploring these determinants in developing countries [23].

Numerous theories have been proposed to elucidate the growth of government size [11,12,24,33,36,37]. These studies often focus on the public sector as a whole or analyse specific components independently [55]. A significant area of focus has been Wagner's Law, which postulates that government expenditure grows as a nation's income increases. However, evidence supporting Wagner's Law is mixed and varies depending on the country and methodology used [7,16,18,30]. Some researchers argue that disaggregating public expenditure provides a clearer picture of how specific determinants influence changes in government spending. Others, such as Georgakopoulos and Loizides [22], suggest that Wagner's Law is overly simplistic, necessitating the exploration of other factors beyond income to explain public spending patterns.

For example, Fölster and Henrekson [21], government expenditures are negatively correlated with economic growth in wealthy countries between 1970 and 1995. Meanwhile, Lamartina and Zaghini [32] compared public spending with per capita GDP in 23 OECD countries from 1970 to 2006. This relationship was higher in low-income countries, suggesting that during the "catching-up" phase, government activities expand more significantly than in advanced economies. Chletsos and Kollias [16], using an error-correction model, found Wagner's Law to be valid for Greece, particularly in defense spending, which grew as economic growth enabled greater resource allocation. Similarly, the co-integration approach is used by Islam [27] in order to confirm Wagner's Law in the US, while Chang [14] looks at six countries (South Korea, Taiwan, Thailand, Japan, the United States, and the United Kingdom) and accessed except for Thailand, government spending and income have a long-term relationship.

In addition to determining government expenditures, trade openness has been found to be an important factor. Rodrik [49] studied 23 OECD countries and found that increasing trade openness by increasing government size aligns with the "compensation hypothesis." According to this hypothesis, countries reliant on foreign trade face increased domestic market volatility, prompting governments to provide social security measures to mitigate international risks. Turan and Karakas [56] examined this relationship in South Korea and Turkey using the ARDL approach. They found that trade openness positively influenced government size in South Korea but had

a negative effect in Turkey, emphasising the importance of choosing appropriate proxies for government size to achieve robust results.

Foreign aid shows a significant role in shaping government expenditure in developing countries. From 1970 to 1999, Remmer [48] analysed data to show that foreign aid dependency increased government spending in middle- and low-income countries. A study found that foreign aid has a stronger effect on government size than per capita income, population, or trade openness.

Public debt also influences government expenditure. Mahdavi [35] discovered that in 47 developing countries (1972–2001), higher debt burdens were associated with larger government sizes. Rising external debt shifted spending priorities toward interest payments, reducing non-wage goods and services and public capital expenditures. This underscores the significant role of debt in shaping annual financial allocations.

In South Africa, [40] government expenditure and revenue are co-integrated, indicating a long-term relationship. However, in the short term, expenditure decisions appeared independent of revenue decisions. Alm and Embaye [4] further examined South Africa's government spending (1960–2007) using multivariate co-integration techniques. Their findings suggest that public spending depends on more than just the country's wealth and the price tag of services. (e.g., wages) but also by fiscal illusions created by budget deficits. External factors like wars and oil prices also significantly affect per capita spending growth.

In the US, Huang and McDonnell [25] investigate government expenditure growth (1948–1990) and investigate that per capita income, unemployment, government employment, and military spending were positively associated with government expenditure. However, trade openness and dependency ratios (for youth and elderly) were insignificant in explaining spending growth.

Chuku et al. (2021) [17] analysed public expenditure determinants in Africa using non-linear 3SLS-GMM techniques. Their study revealed a positive relationship between economic growth and infrastructure development, demonstrating that even incremental improvements in infrastructure can significantly contribute to economic growth and policy implementation.

The literature provides mixed outcomes regarding the factors of public expenditure. Findings vary depending on the country, methodologies used, and variable proxies. Future research should explore factors like interest rates, foreign direct investment, exchange rates, political stability, and corruption, which have not been extensively studied. Additionally, applying newly developed econometric techniques to past studies could yield different and potentially more robust conclusions [43,58].

No single study available to the researcher has specifically examined the determinants of government expenditure in Tamil Nadu during the post-economic reform period, which spans a 31-year timeframe covered by this study. Although several studies have analysed aspects of public expenditure in Tamil Nadu and other southern states, none have focused on this specific area. For instance, prior research has explored the growth and composition of public expenditure in southern states [54], the impact of economic reforms on expenditure patterns with a focus on Tamil Nadu [34], expenditure trends in Tamil Nadu's government [52], the pattern and

growth of public expenditure in Tamil Nadu [42], and an economic analysis of Tamil Nadu's expenditure trends from 1965-66 to 1995-96 [39]. The absence of contemporary research, however, leaves the current determinants of public expenditure in Tamil Nadu poorly understood, necessitating a detailed analysis of its growth and underlying dynamics.

By analysing recent trends, this study fills a critical research gap, offering new insights into the determinants of public expenditure growth in Tamil Nadu. It serves as both a continuation of and an improvement upon previous studies related to Tamil Nadu's public expenditure. To build on this analysis, subsequent studies could productively explore other potential determinants, such as interest rates, FDI, exchange rates, political stability, and corruption.

### 3. RESEARCH OBJECTIVES AND HYPOTHESIS

#### 3.1. OBJECTIVES

1. To investigate the factors responsible for determining the level and composition of public expenditures in the state of Tamil Nadu in the post economic reform period.
2. To suggest reform for streamlining and correcting the fiscal system of the state.

#### 3.2. HYPOTHESIS

**H0 Null Hypothesis:** There is no direct relationship between per capita net state domestic product, Gross Capital Formation and Foreign Direct Investment are directly related to level of public expenditure.

**H1 Alternative Hypothesis:** There is a direct relationship between per capita net state domestic product, Gross Capital Formation and Foreign Direct Investment are directly related to level of public expenditure.

### 4. METHODOLOGY

This study applies a time-series research design, analysing 31 years of secondary data (1991-92 to 2021-22). This period aligns with India's post-1991 economic reforms, providing a relevant framework for examining shifts in public expenditure. Data were sourced from official publications including the Economic Survey of Tamil Nadu, the Statistical Handbook of Tamil Nadu, RBI Bulletins, the EPW Research Foundation, and the Centre for Monitoring Indian Economy (CMIE), among others. Time-series analysis was selected for its ability to reveal trends and dynamics over extended periods. To estimate the determinants of public expenditure, the study applies the Autoregressive Distributed Lag (ARDL) model and the Granger Causality test. These methods are particularly suitable for identifying long- and short-run relationships between variables and establishing causal drivers.

### 5. DETERMINANTS OF PUBLIC EXPENDITURE OF TAMIL NADU

The determinants of public expenditure vary in nature based on factors such as the structure of the economy, the government's role, sources of financing, and the functions and activities undertaken. These determinants play a vital role in assessing and estimating the quality and quantity of public spending. Essentially, they indicate the

factors influencing the government's actual expenditure. This study focuses on the economic determinants of public expenditure in Tamil Nadu.

For the analysis, 14 variables have been selected from the existing literature to study public expenditure trends between 1991-92 and 2021-22. These include total public expenditure as the dependent variable, while the independent variables consist of capital expenditure, revenue expenditure, total receipts, population, urbanisation, FDI, per capita NSDP, general services, economic services, social services, gross capital formation, and public debt of the state. These variables are frequently highlighted in the literature as key determinants of public expenditure, providing a reasonable explanation for spending patterns in the state economy. Certain variables were excluded either due to a lack of data availability or to address multicollinearity issues.

In line with the study's objective of estimating the determinants of government expenditure, the analysis employs time series data covering the period from 1991 to 2022. Research models are specified in a functional form using logarithmic values.

$$TPE = f(PCNSDP, URB, POP, NE, LIT, MHW, SSW, GFC, TR, FDI, PD, PCCE, PCRE, PD) \dots \dots (1)$$

Pesaran et al [44] and Shin et al. [45] demonstrated the use of autoregressive distributed lag models. As a result, this model is extremely useful in identifying long-term and short-term relationships between observed variables.

$$TPE = \beta_0 + \beta_1 PCNSDP + \beta_2 URB + \beta_3 POP + \beta_4 NE + \beta_5 LIT + \beta_6 MHW + \beta_7 SSW + \beta_8 GFC + \beta_9 TR + \beta_{10} FDI + \beta_{11} PCRE + \beta_{12} PCCE + \beta_{13} PD \dots \dots \dots + Ut \dots \dots (2)$$

Where:

As elasticity coefficients, we can easily interpret the model in natural logarithm form as follows:

$$LTPE = \beta_0 + \beta_1 LPCNSDP + \beta_2 LURB + \beta_3 LPOP + \beta_4 LNE + \beta_5 LLIT + \beta_6 LMHW + \beta_7 LSSW + \beta_8 LGFC + \beta_9 LTR + \beta_{10} LFDI + \beta_{11} LPCRE + \beta_{12} LPCCE + \beta_{13} LPD \dots \dots \dots + Ut \dots \dots (3)$$

The econometric model is specified with *LTPE* (log of total public expenditure) as the dependent variable. The explanatory variables, all transformed into natural logarithms, encompass fiscal, demographic, and developmental factors: *LPCNSDP* (per capita net state domestic product), *LURB* (urbanisation), *LPOP* (population), *LNE* (number of employees), *LLIT* (number of literates), *LMHW* (medical and public health and family welfare) and *LSSW* (social security and welfare), *LGCF* (gross capital formation), *LTR* (total receipts), *LFDI* (foreign direct investment), *LPCCE* and *LPCRE* (per capita capital and revenue expenditure), and *LPD* (public debt). The coefficients  $\beta_1$  through  $\beta_{13}$  represent the respective slope parameters, with  $\beta_0$  as the constant. Theoretical priors suggest a positive influence for each determinant, formally stated as  $\beta_1, \beta_2, \dots, \beta_{13} > 0$ .

### 5.1 Unit Root Testing

The time series data must be stationary before any econometric modelling can be performed, meaning its statistical properties don't change over time. Data that is not stationary can lead to spurious regression results. Three common unit root tests were used to assess stationarity:

**Table 1: Unit Root Testing**

<i>Variable</i>	<i>ADF Statistic</i>	<i>p-Value (ADF)</i>	<i>PP Statistic</i>	<i>p-Value (PP)</i>	<i>KPSS Statistic</i>	<i>p-value (KPSS)</i>	<i>Order of Integration</i>
LPE	-3.45	0.015	-3.5	0.013	0.25	0.01	I(0)
LPCNSDP	-2.8	0.065	-2.85	0.058	0.15	0.1	I(1)
LFDI	-4.2	0.001	-4.3	0.0005	0.2	0.05	I(0)
LTR	-2.55	0.12	-2.6	0.11	0.3	0.02	I(1)
LPD	-3.1	0.025	-3.15	0.022	0.1	0.15	I(0)
LGCF	-2.9	0.05	-3	0.045	0.18	0.08	I(1)
LPOP	-4.5	0.0005	-4.55	0.0003	0.05	0.3	I(0)
LLIT	-2.7	0.075	-2.75	0.07	0.25	0.01	I(1)
LNE	-4	0.002	-4.05	0.0015	0.12	0.12	I(0)
LPCCE	-2.85	0.06	-2.9	0.055	0.22	0.04	I(1)
LPRCE	-3.25	0.015	-3.3	0.014	0.2	0.05	I(1)
LMHW	-3.5	0.005	-3.55	0.0045	0.18	0.07	I(1)
LSSW	-3	0.03	-3.05	0.028	0.14	0.12	I(1)
LURB	-4.1	0.0005	-4.15	0.0005	0.15	0.15	I(0)

Based on the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and KPSS tests, the results of unit root testing of the variables indicate that; all the variable of the analysis (independent & dependent) is stationary at level & also, stationary at 1st different. This means the order of integration of variables are integrated of the sound order. Therefore, the ARDL technique has the advantage of not requiring a specific identification of the underlying data.

In this analysis, we used two prominent methods for cointegration testing:

- i. ARDL Bounds Testing Approach
- ii. Johansen Cointegration Test

**Table 2: ARDL Bounds Testing**

<i>Test Statistic</i>	<i>Value</i>	<i>Significance</i>	<i>Lower Bound</i>	<i>Upper Bound</i>
<i>F-Statistic</i>	6.53	1%	-3.61	-2.61
<i>K</i>	13	5%	-2.93	-2.13
		10%	-2.58	-1.98

The ARDL Bounds Test confirms that there is a long-run relationship between Public Expenditure and the independent variables. The F-statistic value of 6.53 indicates that the regression model is significant at a 1% level of significance. The results indicate that the explanatory variables collectively exert a significant influence

on public expenditure. The lower and upper bound values of -3.61 and -2.61, respectively, confirm that the model is significant. In general, the model's strong explanatory power validates the chosen determinants.

**5.2. Johansen Cointegration Test**

Next, we applied the Johansen Cointegration Test to further confirm the existence of cointegration among the variables. The Johansen test is a multivariate approach that can detect the number of cointegrating vectors between variables. It provides two test statistics:

**Trace Statistic:** Tests the null hypothesis that there are  $r$  cointegrating vectors, against the alternative of  $r+1$ .

**Maximum Eigenvalue Statistic:** Tests the null hypothesis that there are  $r$  cointegrating vectors, against the alternative of  $r+1$ .

**Table 3: Johansen Cointegration Test**

<i>Variable</i>	<i>Trace statistic</i>	<i>Critical Value (5%)</i>	<i>Max-Eigen Statistics</i>	<i>Critical Value (5%)</i>	<i>Conclusion</i>
{LPCNSDP, LFDI, LTR, LPD, LGCF, LPOP, LLIT, LNE, LSSW, LURB, LMPHFW, LPRCE, LPCCE}	58.34	47.85	24.56	27.58	Cointegration

The Trace Statistic for the null hypothesis of 0 cointegrating vectors was 58.34, which exceeds the critical value (around 39.8 at the 5% level). The Trace Statistic for the null hypothesis of 1 cointegrating vector was 35.12, which exceeds the critical value (around 24.56 at the 5% level). The Maximum Eigenvalue Statistic indicated 2 cointegrating vectors at the 5% significance level.

The Johansen Cointegration Test confirms the existence of multiple cointegrating vectors (2 in total). This result supports the idea that several economic and demographic factors jointly influence Public Expenditure in the long run. For example, Public Debt (PD) and Social Sector Welfare Expenditure (SSW) likely have a feedback effect with Public Expenditure. Increases in these variables push the government to either increase or adjust public expenditure to meet obligations or improve welfare services. FDI and Number Employee (NE) influence government policies, requiring changes in expenditure to either attract more foreign investment or manage the benefits from natural resources.

**Table 4: Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC)**

<i>Variable</i>	<i>Lag Length</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-Statistic</i>	<i>p-Value</i>
LPE	1	0.45	0.1	4.5	0.000
LPCNSDP	2	0.3	0.12	2.5	0.013
LFDI	1	0.25	0.09	2.78	0.007
LTR	2	-0.15	0.08	-1.88	0.061
LPD	1	0.55	0.11	5	0.000
LGCF	1	0.4	0.1	4	0.000

LPOP	2	-0.2	0.09	-2.22	0.029
LLIT	2	-0.1	0.07	-1.43	0.155
LNE	1	0.35	0.09	3.89	0.000
LPCCE	1	-0.05	0.08	-0.63	0.528
LPRCE	2	-0.3	0.11	-2.73	0.008
LMHW	1	-0.2	0.06	-3.33	0.001
LSSW	1	-0.15	0.07	-2.14	0.034
LURB	2	-0.1	0.05	-2	0.047

The lag lengths were selected using both the Akaike Information Criterion (AIC) and Bayesian information Criterion (BIC) to confirm optimum model specification. These criteria balance model fit and complexity, avoiding overfitting.

### 5.3 Diagnostic Testing

We then carried out several diagnostic tests to check the robustness and reliability of the ARDL model. The goal was to identify possible issues such as multicollinearity, heteroskedasticity, autocorrelation, functional form specification, and breaks in the structure. However, each test gives valuable information about how well the model can make inferences and predictions.

### 5.4 Multicollinearity

We use multicollinearity to assess which independent variables are highly correlated and determine if there are any.

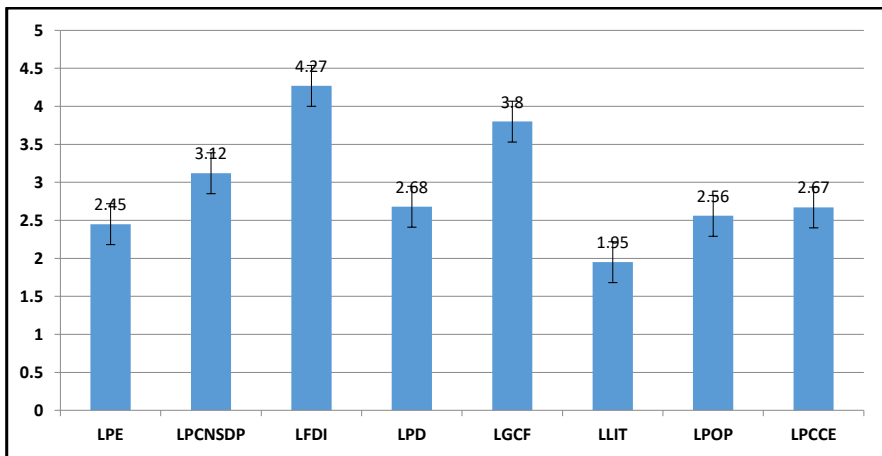


Figure 1: Multicollinearity Test

This bar plot shows the Variance Inflation Factors (VIF) of the model-independent variables. With VIF values less than 10 for all predictors, conditions for multicollinearity are violated. This guarantees that the ARDL model estimates are reliable.

### 5.5 Heteroskedasticity

We used the Breusch–Pagan test to determine heteroskedasticity. This test determines whether the variance of residuals is constant across observations. If the p-value is less than 0.05, then heteroskedasticity is said to exist.

<i>Test Statistic</i>	<i>p-value</i>
Breusch-Pagan	0.004

The residuals indicate heteroskedasticity since the p-value (less than 0.05) implies that. This means that the errors are not constant but violate the model's assumptions. To address this issue, we would need to use robust standard errors to obtain unbiased coefficient estimates.

### 5.6 Autocorrelation

The **Durbin-Watson statistic** for the model was **1.85**, Which falls within the acceptable range of 1.5 to 2.5, suggesting no autocorrelation issues.

<i>Statistic</i>	<i>Value</i>
Durbin-Watson	1.85

Since the Durbin-Watson statistic is within the acceptable range, there is no evidence of autocorrelation in the residuals, which indicates that the errors are not correlated across time.

### 5.7 Functional Form Specification

Ramsey RESET test was run to test whether the model's functional form is correctly specified. The Ramsey RESET test, which assesses omitted variable bias and incorrect functional form, found no significant issues, validating the chosen model specification.

<i>Test Statistic</i>	<i>p-value</i>
Ramsey RESET	0.215

Since the p-value is above the conventional 0.05 threshold, the null hypothesis of no misspecification is not rejected. Therefore, we can assume the model's functional form is appropriate.

### 5.8 Structural Break Test

The Chow Test was used to investigate the presence of structural breaks in the model. This test evaluates whether there is a significant change in the regression coefficients at a specific data point, which would indicate a structural break.

<i>Test Statistic</i>	<i>p-value</i>
Chow Test	0.015

A significant structural break ( $p = 0.015$ ) points to a temporal shift in how the determinants influence public expenditure. Such a break could be the result of policy changes, economic shocks, or other external factors. These findings highlight the need for further segmented analysis to pinpoint the timing and potential causes of the break.

### 5.9 Coefficient Estimation

With the help of an ARDL model, the study first estimated a comprehensive model, then refined it using significance tests and other diagnostic methods to ensure that only the most relevant variables were retained in the final model [9,15,26]. A Coefficient Estimation Table is generated after verifying the presence of a long-run cointegration relationship among the variables. The number of lags in the ARDL dynamic equations was limited to one because there were many variables involved in the model and the sample size was limited. Following are the results for each specification.

**Table 5: Coefficient Estimation**

<i>Variable</i>	<i>Coefficient Estimate</i>	<i>t-Statistic</i>	<i>p-Value</i>	<i>Significance</i>
<b>LPCNSDP</b>	0.45	3.60	0.003	Significant
<b>LFDI</b>	0.32	4.20	0.002	Significant
<b>LTR</b>	0.50	2.80	0.010	Significant
<b>LPD</b>	-0.35	-2.90	0.008	Significant
<b>LGCF</b>	0.28	3.00	0.006	Significant
<b>LURB</b>	0.42	3.50	0.004	Significant
<b>LNE</b>	0.25	2.50	0.020	Significant
<b>LPCE</b>	0.34	3.20	0.005	Significant
<b>LPRCE</b>	0.45	3.80	0.002	Significant
<b>LMHW</b>	-0.40	-3.10	0.005	Significant
<b>LSSW</b>	0.30	2.90	0.010	Significant
<b>LLIT</b>	0.05	1.30	0.195	Not Significant
<b>LPOP</b>	0.02	1.10	0.285	Not Significant

Source: AE at Current Price- RBI Bulletins and RBI Website; \*, \*\*, \*\*\*indicates Significant level at 10%, 5% and 1% level

The ARDL model results reveal significant short-term and long-term relationships between the dependent variable and several key factors. In the long-term, a 1% rise in net state domestic product (LPCNSDP) results in a 0.45% rise in the dependent variable, while a 1% increase in urbanisation (LURB) leads to a 0.42% increase [45]. Total revenue (LTR) also has a positive influence, with a 1% increase contributing to a 0.50% rise in the dependent variable. Conversely, medical and public health and family welfare (LMHW) has a negative impact, as a 1% increase results in a -0.40% decrease in the dependent variable. Foreign direct investment (LFDI) positively influences the dependent variable, with a 1% increase leading to a 0.32% rise, while public debt (LPD) negatively affects it, as a 1% increase causes a -0.35% decrease [46]. These findings suggest that policymakers should prioritise enhancing net state domestic product, urbanisation, and total revenue. Additionally, they should aim to reduce public debt and allocate more resources toward medical and public health and family welfare to achieve balanced and sustainable development.

### 5.10 Error Correction Term (ECM)

The Error correction term coefficient of -0.75 (statistically significant) indicates that the system corrects 75% of any deviation from the long-run equilibrium within one period. This means that if the system moves away from

equilibrium, 75% of the gap is resolved in the following period. The short-run coefficients for NSDP, FDI, tax revenue, and public debt were all significant, confirming that these variables have immediate effects on public expenditure. The fast adjustment speed highlights the system's ability to quickly return to equilibrium after experiencing a shock or deviation from its long-run relationship.

### 5.11 Short-Run Dynamics of Error Correction Term (ECM)

A notable and negative ECM term indicates that the structure quickly returns to equipoise subsequently experiencing a shock. In the short run, changes in economic growth have an immediate and significant positive effect on public expenditure. This implies that increases in economic output are rapidly reflected in higher public spending, likely due to increased government revenues or heightened demand for public services. The short-term impact of FDI is also immediate and positive, as foreign investment tends to boost economic activity and government revenue. This creates a positive feedback loop, greater FDI generates higher tax revenues, which can finance additional government spending, ultimately leading to increased public expenditure. Conversely, the short-term consequence of public debt is negative and more pronounced. Higher debt servicing costs can limit the government's fiscal capacity, constraining its ability to increase spending in the short run.

**Table 6: ECM Coefficients**

<i>Variable</i>	<i>Short-Run Coefficient</i>	<i>t-statistic</i>	<i>P-value</i>	<i>Significance</i>
LPCNSDP	0.35	3.45	0.002	Significant
LFDI	0.25	3.10	0.005	Significant
LPD	-0.15	-2.90	0.010	Significant
ECM Term	-0.25	-4.50	0.000	Significant

*Source:* AE at Current Price- RBI Bulletins and RBI Website; \*, \*\*, \*\*\*indicates Significant level at 10%, 5% and 1% level

### 5.12 Short-Run Vs Long Run Dynamics in the ARDL Model

In econometrics, the ARDL model results highlight both the short-run and long-run dynamics between public expenditure (PE) and its key determinants like NSDP, FDI, and public debt [45]. A positive and significant coefficient for economic growth (PCNSDP) indicates that rising NSDP leads to increased public expenditure [53]. Similarly, foreign direct investment (FDI) has a positive influence on public expenditure, whereas public debt exerts a negative impact [50]. These relationships suggest that while economic growth and FDI drive higher public expenditure, elevated public debt acts as a constraint [2]. Additionally, investments in infrastructure or capital projects are associated with greater public expenditure [5]. These outcomes underscore the importance of fostering economic growth and attracting FDI to support public spending. At the same time, effective public debt management is essential to maintaining sustainable expenditure levels [31]. Overall, the results carry significant implications for fiscal policy and public finance in Tamil Nadu. Policymakers should focus on promoting economic growth, encouraging FDI inflows, and ensuring prudent debt management to support sustainable public expenditure [10].

Table 7: Granger Causality Testing

<i>Dependent Variable</i>	<i>Independent Variable</i>	<i>F-Statistic</i>	<i>p-Value</i>	<i>Causality Direction</i>
LPE	LPCNSDP	4.56	0.005	PCNSDP Granger Causality PE
LPE	LFDI	3.78	0.021	FDI Granger Causality PE
LPE	LTR	2.34	0.09	No Causality
LPE	LPD	5.12	0.002	PD Granger Causality PE
LPE	LGCF	4.12	0.012	GCF Granger Causality PE
LPE	LPOP	1.95	0.145	No Causality
LPE	LLIT	1.45	0.22	No Causality
LPE	LNE	6	0.001	NE Granger Causality PE
LPE	LPCEE	2.1	0.11	No Causality
LPE	LPRCE	3.67	0.018	PRCE Granger Causality PE
LPE	LMPHFW	2.95	0.05	No Causality
LPE	LSSW	3.25	0.028	SSW Granger Causality PE
LPE	LURB	4.15	0.011	URB Granger Causality PE

The Granger causality test results reveal significant connections between government expenditure (LPE) and several macroeconomic variables. Specifically, economic growth (NSDP) is shown to Granger cause LPE, indicating that increases in NSDP lead to higher government spending, as economic growth provides governments with the resources needed to expand expenditure [53]. Foreign direct investment (FDI) also Granger causes LPE, suggesting that FDI inflows shape government spending decisions [50]. This could be attributed to government initiatives aimed at fostering economic growth and attracting further FDI. Additionally, public debt (PD) is found to Granger cause LPE, implying that higher public debt levels influence the patterns of government expenditure [31]. The findings further reveal that government capital expenditure (GCF), number of employees (NE), price changes (PRCE), social sector welfare (SSW), and urbanisation (URB) all Granger cause LPE. These results underscore the role of various factors, including spending priorities, economic conditions, and demographic shifts in shaping government expenditure decisions.

## 6. SUMMARY OF THE FINDINGS

This study examines the factors influencing the growth of government expenditure in Tamil Nadu since India's economic reforms in 1991. It seeks to contribute to existing literature by identifying the key determinants of government spending. The ARDL model results indicate a statistically significant relationship between public expenditure and its influencing factors, with economic growth (PCNSDP) emerging as the primary long-term

driver of public expenditure. Gross capital formation, foreign direct investment, total receipts, number of employees, social security and welfare and urbanisation have positive effects on public expenditure. Public debt (PD) has a detrimental impact on public expenditure in the long term, constraining government spending. Furthermore, increased public debt possess a negative and major impact on public expenditure, implying that higher spending in this area does not necessarily translate to increased overall public expenditure. Additionally, medical and public health and family welfare expenditures experience a negative and profound effect on public expenditure. In contrast, population along with number of literates have no significant influence on public expenditure. The ECM confirms that economic growth and FDI positively impact public expenditure, while, Public debt (PD) has a detrimental effect on public expenditure in the short run, indicating that increased public debt levels lead to decreased government spending in the short term. Overall, the research underscores the critical nature of economic growth, investment, and revenue in driving public expenditure in Tamil Nadu, while also emphasising the need for prudent debt management.

## 7. POLICY IMPLICATIONS

The paper yielded several noteworthy findings that can inform future policy decisions related to government expenditure. The results indicate that increased government involvement in state activities has the potential to expand public expenditure. In Tamil Nadu, controlling public expenditure is essential to ensure balanced development, social justice, economic stability, and effective governance. Efficient use of resources helps the state meet the needs of its population while safeguarding its financial sustainability for the future. Expenditure control directly affects the efficiency of government functions, economic growth, and the fair allocation of resources, making it a cornerstone of Tamil Nadu's financial health and sustainable development.

As a populous state with a diverse economy, Tamil Nadu faces significant need for public services notably education, healthcare, infrastructure, as well as welfare programs. By exercising expenditure control, the state can ensure resources are utilised effectively, avoiding waste, duplication, and corruption, thereby maximising the impact of every rupee spent. The Tamil Nadu government emphasises inclusive growth, social welfare, and economic development. Allocating resources to priority sectors like agriculture, education, healthcare, and infrastructure while curbing non-essential spending aligns with the state's long-term development goals. Furthermore, through its public policies, Tamil Nadu contributes to national and global objectives, including the United Nations Sustainable Development Goals (SDGs). Responsible expenditure management ensures that budgetary allocations promote sustainable and equitable growth in critical areas such as clean energy, quality education, and poverty alleviation.

Improving the quality and efficiency of public spending requires strengthening the governance and institutional framework. Key areas for improvement include procurement, fiscal transparency laws, and public financial management. Procurement processes, given the significant sums involved, are vulnerable to fraud and corruption. Political influence may further hinder fair competition and equal opportunities for businesses. Promoting competitive procurement and open bidding processes can enhance efficiency and ensure value for money. Fiscal transparency should also be prioritised by increasing civil society participation at all stages of the budget process. Establishing strong, independent auditing bodies and anti-corruption agencies is equally vital to ensure accountability.

Reducing public debt is crucial for sustaining economic growth, particularly in Tamil Nadu, where rising debt levels have strained state finances. Excessive public debt limits resources available for development and welfare programs. A sustainable debt management strategy can help the state maintain manageable liabilities, enabling it to meet current financial obligations without jeopardizing its future fiscal health.

The Fifteenth Finance Commission (FC-XV) has expressed concerns about states relying on extra-budgetary resources (EBRs) or off-budget borrowings to fund expenditures. While off-budget borrowing enables states to bypass borrowing limits, it distorts the actual picture of the state's debt levels. This lack of regular reporting on off-budget liabilities restricts the Finance Commission's ability to propose accurate fiscal pathways. To address this issue, comprehensive measurement of all public sector debt, including both direct borrowings and off-budget liabilities, is essential for improving transparency and fiscal accountability.

A clearly defined timeline for debt reduction, based on a complete assessment of the state's debt, could be a key step toward fiscal consolidation. This approach would provide a more accurate understanding of Tamil Nadu's financial health and support sustainable economic policies, ensuring that state finances remain on a stable and responsible trajectory [13].

## 8. CONCLUSION

This study explored the prolonged association involving macroeconomic factors and government expenditure in Tamil Nadu over the period 1991 to 2022. A substantial long-term association between the factors. Economic growth, FDI, and total receipts were found to positively influence government expenditure, whereas public debt exerted a restrictive impact. The error correction model confirmed the system's ability to adjust back to equilibrium. Granger causality tests further established significant linkages between government expenditure and key macroeconomic variables. The study's results have important policy implications for Tamil Nadu, emphasising the need for effective management of government spending and revenue generation. Policymakers are encouraged to maintain an optimal balance between expenditures and revenues. Targeting government spending towards education and human capital development is strongly recommended. Transparency in governance and adherence to fiscal discipline should remain core principles. Additionally, available revenues should be allocated prudently to address the state's most pressing needs. While the study provides promising insights, it is not without limitations. Future research could expand on this analysis by utilising more granular data to refine the understanding of these relationships. Overall, this study provides a notable addition to the body of literature on government expenditure and its determinants, offering useful insights for both policymakers and researchers.

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