# Determinants of Public Expenditure in Punjab and Haryana: A Comparative Analysis (1991-2016)

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**Abstract:**

*This study examines the determinants of public expenditure in the Indian states of Punjab and Haryana from 1991-92 to 2015-16, focusing on economic and demographic factors such as per capita income, population, and urbanization. Drawing on Wagner's Law and empirical data, the analysis employs a multivariate regression model to assess the impact of these variables on total state expenditure. Results indicate that urbanization significantly drives public expenditure in both states, while population growth has a negative effect, and per capita income shows no significant impact. Comparative analysis reveals Haryana's higher allocation to development expenditure, contributing to its faster economic growth compared to Punjab. The findings underscore the importance of prioritizing development expenditure and addressing non-economic factors like governance and institutional efficiency to optimize public spending.*

***Keywords:*** Public Expenditure, Fiscal Policy, Punjab, Haryana, Per Capita Income, Urbanization, Population Growth

## 1. Introduction

India's federal structure, as defined by Sir Robert Garran (1958), divides political power between the Union and state governments, with each operating independently within its sphere. The 73rd and 74th Constitutional Amendments further recognized local self-governments (Panchayats and Nagarpalikas) as a third tier, though resource allocation primarily occurs between the Union and states. Functions of national importance, such as defence and foreign trade, are assigned to the Union, while states handle local responsibilities like agriculture, public health, education, and infrastructure development. Public expenditure is a critical instrument for all government tiers to achieve growth, equity, and stability, particularly in a developing, mixed economy like India, where fiscal policy addresses economic disparities and fosters development (Seligman, 1951; Heller and Rao, 2006).

In this context, public expenditure plays a pivotal role in India's economic growth, especially post the 1991 economic reforms and the introduction of the Fiscal Responsibility and Budget Management (FRBM) Act in 2003. The Act aimed to curb fiscal deficits, which deteriorated significantly since the 1980s due to rising interest burdens and salary payments, particularly after the Fifth Pay Commission's implementation in 1997-98 (Reddy, 2008). States like Punjab and Haryana, formed after the 1966 re-organization of Punjab, exhibit distinct fiscal and growth trajectories. Haryana has outperformed Punjab, achieving a revenue surplus by 2005 and a higher Net State Domestic Product (NSDP) growth rate (9.07 per cent) as compared to the NSDP of Punjab (6.06 per cent).

This study investigates the determinants of public expenditure in Punjab and Haryana from 1991-92 to 2015-16, a period marked by significant fiscal reforms. Drawing on Wagner's Law, which posits that public expenditure grows with economic development, the analysis examines the roles of per capita income, population, and urbanization using time-series data and regression analysis. By analysing these states' expenditure trends and determinants, the study aims to provide policy insights for optimizing resource allocation and addressing fiscal challenges in India's federal framework.

## 2. Theoretical Framework

Wagner's Law (1883) suggests that public expenditure grows proportionately with national income as economies develop, driven by demands for public goods and services. Wagner categorized public expenditure into internal/external security and economic growth-related spending, including health, education, and infrastructure. Empirical studies, such as Asseery et al. (1999) and Magazzino (2012), support Wagner's Law in developing countries, while others, like Eberts and Gronberg (1992), refute it, highlighting the role of non-economic factors such as political and institutional environments. In the Indian context, studies like Bhat and Patnaik (1991) identify per capita income, population density, and urbanization as key drivers of state expenditure.

## 3 Data and Methodology

### 3.1 Study Design and Data Sources

This study adopts an exploratory research design to investigate the growth, pattern, and determinants of public expenditure in Punjab and Haryana from 1991-92 to 2015-16, a period marked by significant economic reforms, including the introduction of the Fiscal Responsibility and Budget Management (FRBM) Act in 2003. Secondary data were sourced from the Statistical Abstracts of Punjab and Haryana, Census of India, annual budgets, finance accounts, audit reports, Reserve Bank of India (RBI) Bulletins, and other government publications. These sources provided comprehensive data on total state expenditure, per capita income, population, urbanization, and fiscal variables such as states' own tax and non-tax revenue, central tax shares, and inter-state transfers.

### 3.2 Variables

The key variables analysed are:

- Total State Expenditure ($PE_t$): Total public expenditure, deflated to 1991-92 constant prices.
- Per Capita Income ($PCI_t$): Net State Domestic Product (NSDP) per capita, reflecting economic growth and demand for public services.
- Population ($P_t$): State population size, indicating demographic pressure.
- Urbanization ($U_t$): Proportion of urban population, capturing demand for civic amenities.

### 3.3 Data Processing

To ensure consistency, all monetary data (NSDP, public expenditure, and revenue) were converted from current to constant prices (base year: 1991-92) using the Wholesale Price Index (WPI) via the deflation method:

$$\text{Real Expenditure} = \frac{\text{Expenditure at current prices}}{\text{Price index}} \times 100$$

The splicing method was applied to maintain continuity in time-series data across different WPI base years.

### 3.4 Analytical Methods

The study employs both descriptive and econometric techniques:

- Descriptive Analysis: Average shares of development and non-development expenditure, as well as social and economic services, were calculated to compare expenditure patterns across the study periods.
- Compound Annual Growth Rate (CAGR): Calculated using the formula $Y = (ab)^n$ where a is the final value, b is the initial value, and n is the number of years, to assess growth trends in expenditure, population, urbanization, and per capita income.

Regression Analysis: A multivariate regression model was used to identify determinants of public expenditure:

$$PE_t = \alpha + \beta_1 PCI_t + \beta_2 U_t + \beta_3 P_t + \mu_t$$

where $\mu_t$ is the random disturbance term. The model was estimated using Ordinary Least Squares (OLS) with time-series data from 1991-92 to 2015-16.

The regression analysis tests the impact of per capita income, urbanization, and population on total state expenditure, building on Wagner's Law and prior studies. The model's robustness is assessed through $R^2$ and F-statistics.

### 4. Results and Discussion

### 4.1 Comparative Expenditure Patterns

The analysis reveals distinct expenditure patterns in Punjab and Haryana:

- Development vs. Non-Development Expenditure: Haryana consistently allocated a higher share of revenue expenditure to development purposes (e.g., 63.41 per cent from 1991-2015) compared to Punjab (50.08 per cent in 2011-16). Punjab's development expenditure declined from 51.08 per cent (1991-2001) to 40.90 per cent (2001-11) before recovering slightly.
- Social vs. Economic Services: Punjab prioritized social services (e.g., 53.32 per cent of development expenditure in 1991-2001) over economic services, while Haryana balanced both, with a slight edge in economic services (e.g., 46.62 per cent in 1991-2015).

- Non-Development Expenditure: Debt and interest payments dominated non-development expenditure in both states, with Punjab's share peaking at 44.54 per cent (1991-2001) and Haryana's at 42.43 per cent (2011-16). Punjab also allocated significant funds to pensions, reflecting higher non-productive spending.

Haryana's focus on development expenditure correlates with its higher economic growth rate, driven by investments in infrastructure and economic services. Punjab's higher non-development spending, particularly on pensions, suggests fiscal inefficiencies.

### 4.2 Determinants of Public Expenditure The regression results (See Appendices Tables 6.4 and 6.5) highlight the following:

- Urbanization: A significant positive driver in both states (Punjab: coefficient 3.408, p=0.044; Haryana: coefficient 5.582, p=0.002). Urban growth increases demand for amenities like water supply, sanitation, and transportation, necessitating higher public expenditure.
- Population: Negatively associated with expenditure in both states (Punjab: coefficient-2.588, p=0.095; Haryana: coefficient-3.608, p=0.002). This counterintuitive result may reflect constrained government resources, limiting expenditure growth despite population increases.
- Per Capita Income: Insignificant in both states (Punjab: p=0.483; Haryana: p=0.11), challenging Wagner's Law. This suggests that income growth alone does not drive public expenditure in these states, possibly due to fiscal constraints or competing priorities.

The models are robust, with high explanatory power ($R^2$ = 0.962 for Punjab, 0.903 for Haryana) and significant F-statistics, validating their fit.

### 4.3 Growth Rates of Determinants

Appendices Table 6.1 shows:

- Population Growth: Haryana (2.06 per cent) outpaced Punjab (1.48 per cent) from 1991-2016, reflecting higher demographic pressure.
- Urbanization Growth: Haryana's urban population grew faster (3.90 per cent vs. 2.60 per cent in Punjab), driven by migration from neighbouring states.
- Per Capita Income Growth: Haryana's per capita income grew at 6.87 per cent, significantly higher than Punjab's 4.51 per cent, indicating stronger economic progress.
- These trends align with Haryana's higher public expenditure growth (7.01 per cent CAGR) compared to Punjab (5.06 per cent CAGR), as shown in Tables 6.2 and 6.3.

### 5. Policy Implications

The findings suggest several policy recommendations:

1. Prioritize Development Expenditure: Haryana's growth model, emphasizing economic services, should guide Punjab to reallocate resources from non-development to development purposes.

2. Address Urbanization Pressures: Both states must invest in urban infrastructure to manage rapid urbanization, particularly in Haryana, where urban population growth is higher.

3. Reevaluate Non-Economic Factors: The insignificant impact of per capita income suggests that governance, corruption, and institutional efficiency play critical roles in expenditure efficiency, warranting further research.

4. Fiscal Discipline: Reducing non-development expenditure, especially on debt servicing and pensions, can free resources for productive investments.

## 6. Conclusion

This study confirms that urbanization is a significant driver of public expenditure in Punjab and Haryana, while population growth negatively impacts spending due to resource constraints. Per capita income, contrary to Wagner's Law, does not significantly influence expenditure, highlighting the role of non-economic factors. Haryana's higher development expenditure underpins its faster economic growth compared to Punjab, which is burdened by non-productive spending. Policymakers should focus on optimizing resource allocation, enhancing urban infrastructure, and addressing governance challenges to ensure sustainable fiscal policies.

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**Appendices Tables:**

**Table 6.1:** Determinants of Public Expenditure and Its Growth Rate in Punjab and Haryana

| Year | Punjab | | | Haryana | | |
|---|---|---|---|---|---|---|
| | Population | Urban-Population | Per-Capita-Income | Population | Urban-Population | Per-Capita-Income |
| 1991-92 to 2000-01 | 1.85 | 3.19 | 4.84 | 2.53 | 4.19 | 5.68 |
| 2001-02 to 2010-11 | 1.31 | 2.32 | 5.65 | 1.83 | 3.76 | 8.53 |
| 2011-12 to 2015-16 | 1.31 | 2.32 | 3.92 | 1.83 | 3.76 | 4.49 |
| 1991-92 to 2015-16 | 1.48 | 2.60 | 4.51 | 2.06 | 3.90 | 6.87 |

*Source: Reserve Bank of India Statistical Reports and Statistical Abstract of Haryana, various issues.*

*Note*: To calculate Compound Annual Growth Rates at constant prices, the data has been deflated to 1991-92 as the base year.

**Table 6.2:** Total State Expenditure and Its Determinants in Punjab

(Rs. in crore)

| Year | Total State Expenditure | State Population | Urban Population | Per Capita State Income |
|---|---|---|---|---|
| 1991-92 | 4907.69 | 2.07 | 0.62 (30.17) | 9800.48 |
| 1992-93 | 3708.75 | 2.10 | 0.64 (3.56) | 10050.07 |
| 1993-94 | 4052.87 | 2.14 | 0.66 (30.96) | 10588.04 |
| 1994-95 | 5307.09 | 2.18 | 0.68 (31.37) | 10407.46 |
| 1995-96 | 4550.79 | 2.22 | 0.71 (31.78) | 10608.88 |
| 1996-97 | 4687.40 | 2.26 | 0.73 (32.20) | 11380.60 |
| 1997-98 | 5630.12 | 2.31 | 0.75 (32.63) | 11792.35 |
| 1998-99 | 5742.85 | 2.35 | 0.78 (33.06) | 12581.66 |
| 1999-00 | 6211.79 | 2.39 | 0.80 (33.49) | 14740.47 |
| 2000-01 | 7216.10 | 2.44 | 0.83 (33.92) | 14975.86 |
| Average | 5201.54 | 2.25 | 0.72 (32.01) | 11692.59 |
| **CAGR** | **5.62** | **1.85** | **3.19** | **4.84** |
| 2001-02 | 7667.49 | 2.47 | 0.85 (34.26) | 15000.36 |
| 2002-03 | 7826.77 | 2.50 | 0.87 (34.60) | 14771.91 |
| 2003-04 | 8158.50 | 2.53 | 0.89 (34.94) | 15017.32 |
| 2004-05 | 8043.38 | 2.57 | 0.91 (35.29) | 15014.05 |
| 2005-06 | 8465.64 | 2.60 | 0.93 (35.64) | 15805.40 |
| 2006-07 | 8766.60 | 2.63 | 0.96 (36.00) | 17435.82 |
| 2007-08 | 9824.12 | 2.67 | 0.98 (36.36) | 19759.06 |

| | | | | |
|---|---|---|---|---|
| 2008-09 | 9846.64 | 2.70 | 1.00 (36.72) | 20521.52 |
| 2009-10 | 10211.53 | 2.74 | 1.02 (37.09) | 22191.89 |
| 2010-11 | 11036.43 | 2.77 | 1.04 (37.44) | 22734.71 |
| Average | 8984.71 | 2.62 | 0.94 (35.83) | 17825.20 |
| **CAGR** | **4.15** | **1.31** | **2.32** | **5.65** |
| 2011-12 | 9979.95 | 2.81 | 1.06 (37.81) | 23187.50 |
| 2012-13 | 11097.51 | 2.85 | 1.09 (38.19) | 23607.24 |
| 2013-14 | 11087.54 | 2.88 | 1.11 (38.57) | 24476.89 |
| 2014-15 | 12346.22 | 2.92 | 1.14 (38.96) | 26002.33 |
| 2015-16 | 14626.12 | 2.96 | 1.16 (39.35) | 26782.58 |
| Average | 11827.47 | 2.89 | 1.11 (38.58) | 24811.31 |
| **CAGR** | **9.10** | **1.31** | **2.32** | **3.92** |
| Overall average | 8040.00 | 2.52 | 0.89 | 16769.38 |
| **Overall CAGR** | **5.06** | **1.48** | **2.60** | **4.51** |

*Source: Reserve Bank of India Statistical Reports and Statistical Abstract of Punjab, various issues.*

*Note*: Total State Expenditure and Per Capita State Income has been deflated to 1991-92 as the base year. RE=Revised Estimate.

**Table 6.3:** Total State Expenditure and Its Determinants in Haryana

(Rs. in crore)

| Year | Total State Expenditure | State Population | Urban Population | Per Capita State Income |
|---|---|---|---|---|
| 1991-92 | 2647.04 | 1.69 | 0.42 (25.03) | 8672.28 |
| 1992-93 | 2591.00 | 1.73 | 0.44 (25.43) | 8090.33 |
| 1993-94 | 3347.26 | 1.77 | 0.46 (25.84) | 9174.12 |
| 1994-95 | 5071.65 | 1.82 | 0.48 (26.26) | 9461.60 |
| 1995-96 | 4155.41 | 1.87 | 0.50 (26.69) | 9666.79 |
| 1996-97 | 5012.03 | 1.91 | 0.52 (27.12) | 10796.06 |
| 1997-98 | 4761.94 | 1.96 | 0.54 (27.56) | 10909.58 |
| 1998-99 | 4927.00 | 2.01 | 0.56 (28.01) | 11362.32 |
| 1999-00 | 4689.99 | 2.06 | 0.59 (28.46) | 13240.27 |
| 2000-01 | 4794.73 | 2.11 | 0.61 (28.92) | 13622.35 |
| Average | 4199.80 | 1.89 | 0.51 (26.93) | 10499.57 |
| **CAGR** | **7.17** | **2.53** | **4.19** | **5.68** |
| 2001-02 | 5415.48 | 2.15 | 0.63 (29.47) | 14513.50 |
| 2002-03 | 5142.91 | 2.19 | 0.66 (30.03) | 15231.21 |
| 2003-04 | 6161.11 | 2.23 | 0.68 (30.60) | 16199.59 |
| 2004-05 | 5598.25 | 2.27 | 0.71 (31.18) | 16968.38 |
| 2005-06 | 6182.04 | 2.32 | 0.74 (31.77) | 18118.34 |
| 2006-07 | 7710.07 | 2.36 | 0.76 (32.37) | 20011.55 |
| 2007-08 | 8251.17 | 2.40 | 0.79 (32.98) | 22103.55 |

| 2008-09 | 9089.47 | 2.44 | 0.82 (33.61) | 24130.21 |
|---|---|---|---|---|
| 2009-10 | 10798.74 | 2.49 | 0.85 (34.25) | 28248.32 |
| 2010-11 | 10322.56 | 2.54 | 0.88 (34.88) | 29204.06 |
| Average | 7467.18 | 2.34 | 0.75 (32.11) | 20472.87 |
| **CAGR** | **9.07** | **1.83** | **3.76** | **8.53** |
| 2011-12 | 10895.47 | 2.58 | 0.92 (35.54) | 30318.31 |
| 2012-13 | 11840.78 | 2.63 | 0.95 (36.21) | 31757.91 |
| 2013-14 | 11740.31 | 2.68 | 0.99 (36.90) | 33289.96 |
| 2014-15 | 13253.40 | 2.73 | 1.02 (37.60) | 35857.56 |
| 2015-16 | 21457.81 | 2.78 | 1.06 (38.31) | 35531.68 |
| Average | 13837.56 | 2.68 | 0.99 (36.91) | 33351.09 |
| **CAGR** | **15.81** | **1.83** | **3.76** | **4.49** |
| Overall average | 7434.30 | 2.23 | 0.70 | 19059.19 |
| **Overall CAGR** | **7.01** | **2.06** | **3.90** | **6.87** |

*Source: Reserve Bank of India Statistical Reports and Statistical Abstract of Haryana, various issues.*

*Note*:  Total State Expenditure and Per Capita State Income has been deflated to 1991-92 as the base year.

**Table: 6.4:** Determinants of Public Expenditure in Punjab: A Regression Analysis

Dep. Variable: Total State Expenditure

| Variables | Coefficient | Significance |
|---|---|---|
| Constant | 1.436 (1.436) | 0.166 |
| Population | -2.588 (-1.746) | 0.095 |
| Urbanisation | 3.408* (2.140) | 0.044 |
| PCI | 0.158 (0.714) | 0.483 |
| $R^2$ F | 0.962 177.248 | 0.000 |
| N | 25 | |

*Note*: (*) = Significant values, N= Number of observations,
Figures in parentheses are t-value.

**Table: 6.5:** Determinants of Public Expenditure in Haryana: A regression Analysis

Dep. Variable: Total State Expenditure

| Variables | Coefficient | Significance |
|---|---|---|

| | | |
|---|---|---|
| Constant | 3.233*<br>(3.233) | 0.004 |
| Population | -3.608*<br>(-3.550) | 0.002 |
| Urbanization | 5.582*<br>(3.563) | 0.002 |
| PCI | -1.097<br>(-1.671) | 0.11 |
| $R^2$<br>F | 0.903<br>65.02 | <br>0.000 |
| N | 25 | |

*Note*: (*) = Significant Values, Figures in parentheses are t-value.