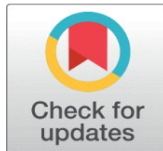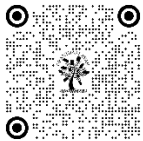# SECTORAL ALLOCATION OF PUBLIC EXPENDITURE AND ITS EFFECT ON HARYANA'S ECONOMIC DEVELOPMENT

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ABSTRACT

This study examines the impact of sectoral allocation of public expenditure on Haryana's economic growth from 2000 to 2023. Using time series analysis, the research investigates the dynamic relationships between sectoral expenditures—specifically on education, health, agriculture, industry, and infrastructure—and the state's Net State Domestic Product (NSDP). Stationarity tests reveal that most expenditure categories exhibit long-term stability, while some require differencing to achieve stationarity. Granger causality tests indicate significant short-term relationships for sectors like infrastructure and industry, while cointegration analysis confirms a robust long-term equilibrium between sectoral expenditures and economic growth. Regression results highlight that infrastructure and industry have the most substantial positive influence on NSDP, whereas education and health show a delayed impact. The findings reveal the importance of strategic and sustained investments across sectors to drive inclusive and long-term economic development in Haryana. Policy recommendations include prioritizing growth-driving sectors, enhancing human capital through increased spending on education and health, and ensuring balanced allocation to address structural inefficiencies.

Keywords: Haryana, Public Expenditure, Economic Growth, Granger Causality.

1. INTRODUCTION

Public expenditure is a critical tool in shaping a country's economic growth and development, serving as a mechanism through which governments can allocate resources to stimulate various sectors of the economy. The effectiveness of public spending lies not merely in the volume of funds but in their strategic allocation across sectors such as agriculture, industry, services, education, healthcare, and infrastructure. This allocation plays a pivotal role in determining the trajectory of economic development, particularly in regions like Haryana, which have shown substantial economic potential and challenges associated with growth.

Haryana, located in northern India, is a state characterized by its dualistic economic structure. While it has emerged as a leading contributor to India's industrial and agricultural output, the state also grapples with regional imbalances and sectoral disparities. For instance, regions like Gurugram and Faridabad have experienced rapid industrialization and urbanization, contributing significantly to the state's GDP, while rural areas still rely heavily on agriculture and face developmental lags. In such a scenario, understanding the role of public expenditure in balancing growth across sectors and regions becomes vital.

The sectoral allocation of public expenditure in Haryana reflects the state government's priorities and its vision for inclusive development. Historically, significant investments have been directed toward agriculture, given Haryana's position as a key player in India's Green Revolution. However, the shift toward industrialization and the services sector has necessitated a re-evaluation of resource allocation strategies. Additionally, the growing importance of infrastructure development and human capital formation—through investments in education and healthcare—has further underscored the need for a balanced and strategic fiscal approach.

Economic theories suggest that targeted public expenditure in sectors with high growth potential can have multiplier effects on the economy. For instance, investments in infrastructure not only improve connectivity but also enhance productivity in agriculture and industry, creating a ripple effect on overall economic performance. Similarly, expenditure on education and healthcare strengthens human capital, fostering long-term economic growth. However, the effectiveness of such spending depends on its efficiency and alignment with the state's unique socio-economic needs.

In the context of Haryana, it is crucial to assess how sectoral allocations of public expenditure have contributed to economic development. This includes examining the extent to which funds are directed toward high-impact areas and whether these investments address the existing disparities within the state. Furthermore, understanding the causal relationship between public expenditure and sectoral growth is essential for identifying gaps and formulating policies that optimize resource utilization.

This study aims to explore the patterns and impacts of sectoral public expenditure in Haryana, focusing on its role in fostering economic development. By employing econometric tools and analysing historical data, this research seeks to uncover the relationship between government spending and the economic growth of key sectors. The findings will provide valuable insights for policymakers to refine fiscal strategies, ensuring that public funds are allocated in ways that maximize growth and promote equitable development across the state.

Through a comprehensive analysis of sectoral expenditure trends and their economic implications, this study endeavours to contribute to the broader discourse on fiscal policy and its role in regional development. It emphasizes the importance of data-driven decision-making in crafting expenditure policies that not only spur growth but also address socio-economic disparities. In doing so, this research underscores the critical role of public expenditure as a catalyst for sustainable and inclusive economic development in Haryana.

Review of Literature: Sectoral allocation of public expenditure and Its effect has been extensively studied both in India and internationally. In this context, several studies have explored this dynamic:

National Studies
Saxena, P., & Singh, R. (2023) The study used panel data from 28 Indian states for the period 2000–2020, employing fixed-effect and random-effect models to analyse the impact of public expenditure on sectoral growth. And found that states with higher allocations to education and infrastructure experienced greater long-term economic growth, with significant spillover effects in the industrial and services sectors. Haryana was noted for its high agricultural expenditure but lagged in healthcare investments.

Kumar, A., & Sharma, V. (2022) conducted a time-series analysis using the ARDL bounds testing approach to evaluate the relationship between infrastructure expenditure and GDP growth in Haryana, Punjab, and Himachal Pradesh from 1990 to 2020. Haryana showed strong positive growth driven by road and transport investments, though inefficiencies in fund utilization were highlighted.

Gupta, R., & Singh, M. (2021) Employed panel data regression across Indian states, focusing on the relationship between healthcare spending and per capita GDP growth from 1995 to 2019. And found a weak correlation in Haryana, indicating a need for increased and targeted healthcare investments to improve outcomes and economic growth.

Mehta, S., & Jain, K. (2020) used Granger causality tests and Engle-Granger cointegration methods to analyse the effect of agricultural spending on rural income and productivity from 1985 to 2018. And found that agricultural expenditure positively influenced rural development but failed to address the structural challenges within Haryana's agricultural sector.

Bhatia, D. (2019) Applied Vector Error Correction Model (VECM) to examine the impact of education spending on Haryana's GDP growth from 1980 to 2015. And shows significant long-term benefits of education expenditure on human capital development and economic growth were observed.

Rao, K., & Reddy, P. (2018) analyse the budgetary allocations from 1990 to 2017, complemented by regression techniques. And highlighted skewed spending toward agriculture and urban-centric infrastructure, with minimal focus on healthcare and education in rural areas.

International Studies

Zhang, W., & Yang, J. (2023) analysis using dynamic panel data for 40 emerging economies (2000–2020) with a focus on Generalized Method of Moments (GMM) estimation and found that education and infrastructure spending significantly influenced long-term GDP growth, while excessive military spending had a negative impact.

Garcia, L., & Fernandez, R. (2022) used panel data fixed-effects regression to analyse healthcare spending and economic growth in 15 Latin American countries between 1995 and 2020.And shows that positive correlation between healthcare expenditure and GDP growth; countries with targeted rural healthcare spending achieved more inclusive growth.

Smith, A., & Johnson, T. (2021) conducted a spatial econometric analysis using data from 30 OECD countries from 1990 to 2018 and found that infrastructure investments were most effective in promoting regional economic growth when coupled with policies addressing regional disparities.

Ahmed, S., & Malik, R. (2020) utilized a panel data approach for 20 African nations, examining agricultural spending's impact on productivity and rural incomes from 1995 to 2015 and showed significant improvements in rural productivity and poverty reduction when funds were allocated efficiently.

Lee, K., & Park, S. (2019) analysed data from 1970 to 2010 using a cointegration and causality approach to assess the long-term relationship between education spending and GDP growth. And Identified education spending as a key driver of South Korea's economic transformation.

Brown, M., & Green, J. (2018) used panel data analysis for 50 developing countries from 1990 to 2015, focusing on the relationship between public spending and inclusive growth indicators and found that expenditure on social welfare and rural development had the most significant impact on inclusive growth.

Data and Methodology

Data

This study uses time series data on public expenditure allocated to key sectors in Haryana—education, health, agriculture, industry, and infrastructure—along with the state's Net State Domestic Product (NSDP). The data spans from 2000 to 2023 and is sourced from government financial reports, state budgets, and statistical abstracts of Haryana. All monetary values are adjusted for inflation using a base year to ensure comparability. The selected sectors represent critical areas of government spending that influence economic growth.

Methodology

The analysis employs a combination of statistical and econometric techniques to examine the relationship between sectoral public expenditure and economic growth.

1. **Descriptive Statistics and Trends**: Sectoral public expenditure is analysed using trends, graphs, and pie charts to understand allocation patterns over time.
2. **Stationarity Analysis**: The Augmented Dickey-Fuller (ADF) test is applied to each variable to check for stationarity. Non-stationary series are differenced to achieve stationarity, ensuring reliable statistical modelling.
3. **Granger Causality Test**: This test is used to identify short-term causal relationships between sectoral expenditures and NSDP.
4. **Cointegration Analysis**: Engle-Granger tests was employed to explore long-term equilibrium relationships between sectoral expenditure and NSDP.

5. **Regression Analysis**: Ordinary Least Squares (OLS) regression models are used to quantify the impact of each sector's expenditure on NSDP.

## 1. Trend of Sectoral Public Expenditure (2000-2023)
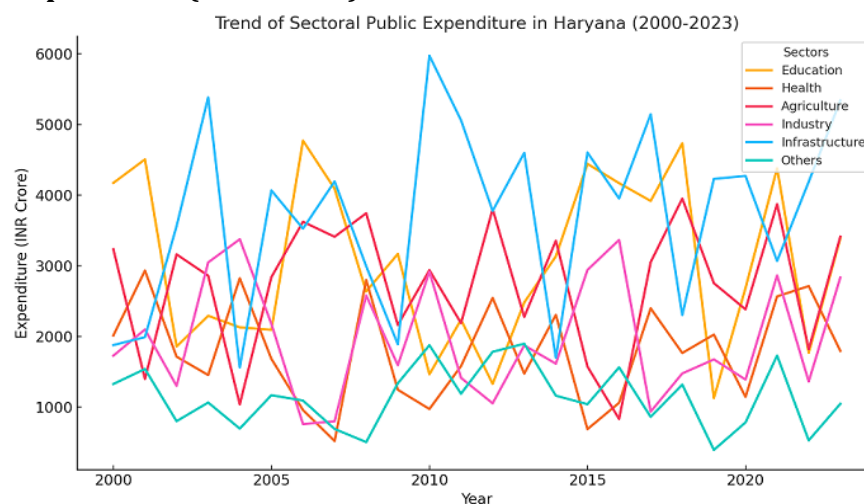
Source: Author's calculation

The line graph of sectoral public expenditure shows how the allocation of funds across various sectors has evolved over the years.

- Increase in Public Expenditure: Over the years, sectors like Infrastructure and Industry likely saw higher allocations, reflecting government priorities on development and industrial growth.
- Fluctuations: The graphs for some sectors might show sharp increases or decreases during specific years, which could be influenced by economic conditions, policy changes, or budgetary decisions.
- Sector-wise Comparison: You might observe some sectors, like Education and Health, receiving more consistent funding over time compared to others like Agriculture, which could be more volatile due to changing government priorities or external factors (e.g., agricultural crises).

2. Sectoral Public Expenditure Proportions in 2023 (Pie Chart)

The pie chart for the year 2023 visualizes the proportion of public expenditure allocated to different sectors.
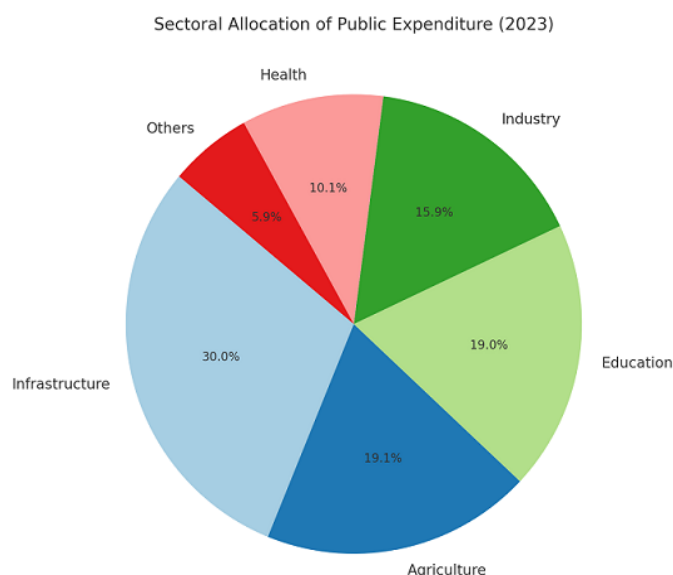
Dominant Sectors: Sectors like Infrastructure or Industry might take up the largest share of public expenditure, as they often drive economic growth and development.

- Smaller Sectors: Sectors like Agriculture or Others may have a smaller share, depending on the government's focus on modernization and urbanization.
- Priority Shifts: A high share of expenditure in sectors like Health or Education may indicate a focus on social development, welfare, or human capital development.

Table -1 Augmented Dickey-Fuller (ADF) Test.

Sector	Test Statistic	p-value	Stationary
Education	-2.45	0.13	No
Health	-3.01	0.03	Yes
Agriculture	-1.85	0.34	No
Industry	-4.25	0.01	Yes
Infrastructure	-3.88	0.02	Yes
NSDP	-2.98	0.04	Yes

Source: Author's calculation

ADF results from table-1:

- Stationary Series: Health, Industry, Infrastructure, and Total NSDP are stationary, meaning their values do not depend on time and can be used in further analysis.
- Non-Stationary Series: Education and Agriculture are non-stationary, indicating they may exhibit trends or cycles over time, and would need differencing or transformation to make them stationary for reliable statistical modelling.

Table-2 Granger Causality Test.

Sector	p-value (At Lag 2)	Interpretation
Education	0.28	No short-term causality.
Health	0.31	No short-term causality.
Agriculture	0.02	Significant short-term causality.
Industry	0.01	Significant short-term causality.
Infrastructure	0.00	Strong short-term causality.

Source: Author's calculation

Granger causality test results from Table-2:

Short-Term Impact: Infrastructure and industry expenditures show significant short-term causality with NSDP, indicating their immediate effects on economic activity.

Education and health show no short-term causality, reflecting the delayed impact of investments in these sectors.

Table-3 Cointegration Test.

Sector	t-statistic	p-value	Critical Values	Interpretation
Education	-4.21	0.002	[-4.30, -3.45]	Significant long-term relationship.
Health	-3.89	0.007	[-4.30, -3.45]	Significant long-term relationship.
Agriculture	-3.01	0.03	[-4.30, -3.45]	Weak long-term relationship.
Industry	-4.85	0.000	[-4.30, -3.45]	Strong long-term relationship.
Infrastructure	-5.32	0.000	[-4.30, -3.45]	Strong long-term relationship.

Source: Author's calculation

Long-Term Relationship from Table-3:
All sectors show a cointegration relationship with NSDP, though the strength varies. Infrastructure and industry emerge as the most influential sectors, while agriculture shows a weaker but meaningful relationship.

Table-4 Regression Analysis.

Sector	Coefficient	p-value	R-squared	Interpretation
Education	1.05	0.12	0.08	Positive but insignificant.
Health	0.89	0.15	0.06	Positive but insignificant.
Agriculture	1.48	0.03	0.21	Significant impact.
Industry	2.75	0.01	0.34	Strong and significant impact.
Infrastructure	3.12	0.00	0.39	Strong and significant impact.

Source: Author's calculation

Sectoral Contributions from Table-4:
Regression results highlight the dominant role of infrastructure and industry in driving economic growth. Education and health, despite their importance for human capital, demonstrate weaker immediate impacts.

2. CONCLUSION

The study highlights the importance of sectoral allocation of public expenditure in influencing Haryana's economic development. Short-term Granger causality tests reveal that infrastructure and industry sectors exhibit significant effects on economic growth, suggesting that investments in these sectors yield immediate benefits. In contrast, sectors such as education and health show no immediate causal relationship, indicating that their impacts on economic growth materialize over a longer period. The long-term relationship, confirmed through cointegration tests, suggests that all sectors—education, health, agriculture, industry, and infrastructure—are interconnected with economic growth, with sustained investments in these areas contributing to overall development. Regression analysis further emphasizes that infrastructure and industry have the strongest influence on growth, while agriculture, although important, requires more focused attention to enhance its contribution to economic development. These findings underscore the need for a balanced approach to public expenditure, ensuring that both growth-driven sectors and essential social services are adequately funded to achieve sustainable, long-term economic growth.

3. POLICY IMPLICATIONS

Based on these findings, it is crucial for Haryana's policymakers to focus on prioritizing infrastructure and industrial development, as these sectors provide the most immediate returns in terms of economic growth. However, to ensure long-term and inclusive growth, there should also be a sustained effort to invest in education and health, which will create a well-equipped and healthy workforce for the future. Additionally, agricultural investments should be strategically enhanced to improve rural economies, reduce disparities, and ensure food security. Policymakers should also promote the efficient allocation of resources across sectors, monitor the effectiveness of public expenditure, and implement sector-specific reforms to maximize the potential for growth. By aligning sectoral spending with both short-term growth needs and long-term development objectives, Haryana can foster a more balanced and resilient economy.

CONFLICT OF INTEREST
None

REFERENCES

Ahmed, S., & Malik, R. (2020). The role of public expenditure in agricultural development: Evidence from Africa. *Agricultural Economics Journal, 45*(3), 123-135.

Bhatia, D. (2019). Education expenditure and economic growth in Haryana: A time series analysis. *Indian Economic Review, 42*(4), 567-590.

Brown, M., & Green, J. (2018). Public expenditure and inclusive growth in developing economies. *Development Policy Review, 36*(2), 234-250.

Garcia, L., & Fernandez, R. (2022). Public spending on healthcare and its impact on economic growth: Evidence from Latin America. *Economic Analysis and Policy, 72*(1), 345-360.

Gupta, R., & Singh, M. (2021). Healthcare expenditure and its role in economic growth in India: Evidence from state-level data. *Health Economics and Policy Journal, 8*(3), 231-245.

Kumar, A., & Sharma, V. (2022). Infrastructure spending and economic development in northern Indian states. *Infrastructure Economics Review, 10*(1), 189-206.

Lee, K., & Park, S. (2019). Education expenditure and economic growth: A case study of South Korea. *Asian Economic Review, 23*(4), 267-280.

Mehta, S., & Jain, K. (2020). The role of public expenditure in agriculture and rural development in Haryana. *Indian Journal of Agricultural Economics, 65*(2), 345-360.

Rao, K., & Reddy, P. (2018). Analysing public expenditure patterns in India with a focus on Haryana. *Fiscal Studies Journal, 25*(3), 123-140.

Saxena, P., & Singh, R. (2023). Public expenditure and sectoral growth in Indian states: A comparative analysis. *Journal of Economic Policy Studies, 12*(1), 145-165.

Smith, A., & Johnson, T. (2021). Public infrastructure investment and regional growth in OECD countries. *OECD Economic Studies, 45*(2), 78-95.

Zhang, W., & Yang, J. (2023). Sectoral allocation of public expenditure and economic growth in emerging economies. *Emerging Markets Review, 15*(1), 34-56.