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GST Revenue and Regional Economic Development in India: Evidence from a State-Level Panel Data Analysis, 2020–2025

Dr. Navneet Shah

Asst.Prof., VJKM Arts, Sci, Commorce College, At.Vadu, Tal.Kadi, Dist. Mehsana

Abstract

This study investigates the relationship between Goods and Services Tax (GST) revenue mobilisation and regional economic development across 16 major Indian states. The analysis is based exclusively on official data published by the Government of India and the Reserve Bank of India (RBI). The empirical dataset comprises a balanced panel of 64 state-year observations covering FY 2020–21 to FY 2023–24. Gross state-level GST collections are obtained from Government of India records, while real per-capita Net State Domestic Product (NSDP) is drawn from the RBI's Handbook of Statistics on Indian Economy.

To minimise the influence of differences in population and economic size across states, GST revenue is converted into a per-capita measure. The principal empirical model is a log-log panel regression incorporating both state and year fixed effects. The preferred specification produces an estimated elasticity of approximately 0.141 between GST revenue per capita and real per-capita NSDP, with a p-value of approximately 0.059. This indicates a positive within-state association between GST mobilisation and regional economic development, although the estimate falls slightly outside the conventional 5 percent significance threshold. A separate growth-rate robustness specification does not identify a statistically significant contemporaneous relationship. The findings therefore suggest a positive association rather than a causal effect.

The analysis highlights the importance of distinguishing between aggregate tax collections, tax mobilisation per capita, economic scale, and tax intensity when assessing differences in fiscal performance across Indian states. The results also suggest that stronger revenue mobilisation should be considered alongside the effectiveness of public expenditure and broader structural characteristics of regional economies.

Keywords: Goods and Services Tax; GST revenue; regional development; state taxation; per-capita NSDP; panel data; fixed effects; India.

1. Introduction

The introduction of the Goods and Services Tax (GST) in July 2017 marked a major transformation of India's indirect tax framework. The reform was designed to establish a more integrated domestic market, reduce the cascading effects associated with multiple indirect taxes, strengthen tax compliance, and expand the formal tax base. These changes have important implications for state-level public finance and regional economic development because taxation influences the revenue available to governments, while

economic formalisation and market integration can simultaneously affect the size and composition of the tax base.

The relationship between GST revenue and regional development is particularly relevant in India because the country exhibits substantial differences among states in terms of population, industrial composition, income levels, urbanisation, formal-sector activity, and fiscal capacity. Consequently, a state generating a large amount of GST revenue in absolute terms may not necessarily have a stronger tax mobilisation performance when population and economic size are taken into account.

Existing empirical research generally points towards a positive relationship between taxation and economic performance, although the strength and nature of this relationship differ across studies and tax categories. Singhal et al. (2022), using panel data covering Indian states and union territories during 2017–2021, reported a positive association between GST and economic development. Krishna and Shacheendran (2024) also identified a positive relationship between GST revenue growth and national economic growth. Earlier research by Neog and Gaur (2020) demonstrated that the effect of taxation on state-level economic growth depends substantially on the structure and composition of the tax system.

The present study contributes to this literature by concentrating on the post-pandemic period and using a balanced panel of 16 major Indian states. Rather than relying solely on aggregate GST collections, the analysis gives particular attention to GST revenue per capita. This adjustment is important because comparisons based only on total collections can largely reflect differences in population and economic scale.

The central research question is: To what extent is GST revenue mobilisation associated with regional economic development across major Indian states during the study period?

The study pursues four specific objectives:

- To examine trends in GST revenue across selected Indian states.
- To compare the extent of GST revenue mobilisation among major states.
- To estimate the within-state relationship between GST revenue per capita and real per-capita NSDP.
- To identify policy implications for strengthening tax mobilisation and promoting balanced regional development.

The study does not attempt to establish that GST revenue causes economic development. Instead, it estimates the statistical association between the two variables after accounting for state-specific characteristics and common year effects.

2. Review of Literature

The relationship between taxation and economic development has been widely examined in the Indian context. The introduction of GST created a new institutional framework through which this relationship could be reassessed, particularly because GST was intended to simplify indirect taxation, improve compliance, and encourage formal economic activity.

Singhal et al. (2022) examined GST and economic development using panel data covering 31 Indian states and union territories for the period 2017–2021. Their findings indicated a positive relationship between GST and economic development. The study is closely related to the present analysis, although its observation period precedes the broader post-pandemic recovery.

Neog and Gaur (2020) investigated the relationship between tax structure and economic growth across selected Indian states over a substantially longer historical period. Their findings suggested that the growth implications of taxation vary according to the type of tax and the structure of the tax system.

Their work is relevant because it demonstrates that taxation should not be treated as a homogeneous factor when assessing economic performance.

At the national level, Krishna and Shacheendran (2024) analysed the relationship between GST revenue growth and economic growth using quarterly data. Their findings indicated a positive relationship between GST revenue growth and GDP growth. More recent state-level research has also focused on differences in GST buoyancy and the relationship between GST mobilisation and state economic performance.

An important limitation in some existing comparisons is the use of aggregate GST collections alongside aggregate measures of economic output. Such comparisons may be strongly influenced by the size of the state. Large states naturally tend to collect more tax revenue because they have larger populations and economic bases. A high correlation between total GST and total output may therefore partly reflect scale rather than differences in tax mobilisation.

The present study addresses this issue by constructing GST revenue on a per-capita basis and combining this measure with real per-capita NSDP. It further incorporates state and year fixed effects in the preferred specification. This framework provides a more informative assessment of changes within states over time than a simple cross-sectional comparison.

Nevertheless, fixed-effects estimation does not eliminate all sources of endogeneity. In particular, reverse causality remains possible because economically stronger states may naturally generate greater GST revenue, while stronger revenue mobilisation may also contribute to fiscal capacity. The empirical results should therefore be interpreted as associations rather than causal effects.

3. Data and Methodology

3.1 Data Sources and Sample

The principal GST dataset is based on official information from the Government of India, Ministry of Finance, Department of Revenue. Specifically, the study uses the state-wise GST figures reported in Rajya Sabha Unstarred Question No. 881, answered on 3 December 2024. The corresponding annexure reports gross GST collections for individual states from FY 2020–21 through FY 2023–24, together with FY 2024–25 figures available up to October 2024.

For the core regression analysis, only complete financial years from FY 2020–21 through FY 2023–24 are included. This produces a balanced panel consisting of 16 states and four years, resulting in 64 state-year observations.

The economic development indicators are obtained from the RBI's Handbook of Statistics on Indian Economy 2023–24. In particular, the study uses state-level constant-price NSDP and constant-price per-capita NSDP.

The 16 states included in the empirical analysis are:

- Andhra Pradesh
- Assam
- Bihar
- Chhattisgarh
- Haryana
- Jharkhand
- Karnataka
- Kerala

- Madhya Pradesh
- Maharashtra
- Odisha
- Punjab
- Rajasthan
- Tamil Nadu
- Uttar Pradesh
- West Bengal

The FY 2024–25 GST observations are not treated as complete annual observations because the official state-wise source available for this analysis covers that financial year only through October 2024. Treating these partial-year figures as full-year observations would create a measurement inconsistency. Accordingly, the inferential analysis is restricted to FY 2020–21 through FY 2023–24, while the broader 2020–2025 period is retained in the study title and scope.

3.2 Variable Construction

The principal dependent variable is real per-capita NSDP measured at constant prices using the 2011–12 base. The principal explanatory variable is gross GST revenue per capita.

To maintain internal consistency, population is derived from constant-price NSDP and constant-price per-capita NSDP using the following relationship:

Population = Constant-price NSDP / Per-capita NSDP

GST Revenue per Capita = Gross GST Revenue / Population

This approach avoids introducing an additional population dataset and ensures consistency between the population denominator and the NSDP measures used in the study.

3.3 Econometric Specification

The preferred model is a log-log panel specification with state and year fixed effects:

$$\ln(PCNSDP_{it}) = \alpha + \beta \ln(GSTPC_{it}) + \mu_i + \lambda_t + \varepsilon_{it}$$

where $PCNSDP_{it}$ represents real per-capita NSDP for state i in year t; $GSTPC_{it}$ represents GST revenue per capita; μ_i represents state fixed effects; λ_t represents year fixed effects; and ε_{it} represents the error term.

The coefficient β is interpreted as an elasticity. It measures the percentage change in real per-capita NSDP associated with a 1 percent change in GST revenue per capita, after controlling for time-invariant state characteristics and common year-specific shocks. Standard errors are clustered at the state level.

As a robustness exercise, the study also estimates a growth-form specification in which annual growth in real per-capita NSDP is related to log GST revenue per capita while retaining state and year fixed effects. This model is interpreted as a short-run association rather than a causal specification.

4. Descriptive Results

The balanced dataset contains 64 state-year observations. Across these observations, the average gross GST collection is approximately ₹59,129 crore, while average GST revenue per capita is approximately ₹9,486. The mean real per-capita NSDP is approximately ₹108,176.

The cross-sectional correlation between GST revenue per capita and real per-capita NSDP is approximately 0.787. By comparison, the correlation between total GST collections and real per-capita NSDP is substantially lower, at approximately 0.456. This difference demonstrates the importance of

scaling GST collections by population when comparing states with substantially different demographic and economic sizes.

Table 1. Selected State-Level GST and Real Per-Capita NSDP Indicators

State	GST 2020–21 (₹ crore)	GST 2023–24 (₹ crore)	GST CAGR (%)	Real PCNSDP CAGR (%)
Maharashtra	165,308	320,117	24.64	8.70
Karnataka	75,660	145,266	24.29	7.52
Tamil Nadu	69,121	121,329	20.63	7.21
Haryana	54,890	102,914	23.31	7.16
Uttar Pradesh	59,721	101,693	19.41	8.37
West Bengal	39,694	62,613	16.41	8.20
Odisha	29,844	54,748	22.42	10.26
Rajasthan	31,797	50,174	16.42	7.34
Andhra Pradesh	26,163	44,298	19.19	6.96
Madhya Pradesh	27,005	42,174	16.02	5.81

Maharashtra recorded the highest gross GST collection among the states in the sample in FY 2023–24, reaching approximately ₹3.20 lakh crore. Karnataka and Tamil Nadu followed with approximately ₹1.45 lakh crore and ₹1.21 lakh crore, respectively.

Haryana also demonstrated comparatively high GST mobilisation relative to its population. However, differences in absolute GST collections should not be interpreted independently of population and economic structure. A lower aggregate collection does not necessarily indicate weaker economic performance, particularly for states with large populations or different industrial compositions. Odisha provides an especially notable example because it recorded strong growth in both GST collections and real per-capita NSDP during the study period. Uttar Pradesh, in contrast, illustrates the importance of population scaling: despite having large aggregate GST collections, its GST revenue per capita is considerably lower than that of some smaller states.

5. Econometric Results

The empirical estimates provide further evidence that the relationship between GST revenue and regional development depends substantially on the treatment of state-level heterogeneity. The pooled model with year fixed effects produces a relatively large positive coefficient and high statistical precision. However, this estimate is predominantly influenced by cross-sectional differences between states. Once state fixed effects are introduced, the estimated coefficient declines considerably. This reduction is consistent with the presence of persistent differences among states in areas such as productivity, industrialisation, urbanisation, infrastructure, and human capital.

Table 2. Panel Regression Results

Specification	GST Variable Coefficient	Standard Error	p-value	R^2	N
Pooled OLS + Year FE	0.6176	0.0333	0.0000	0.7489	64
State + Year FE	0.1406	0.0746	0.0595	0.9990	64

Growth Robustness: State + Year FE	0.4879	18.4498	0.9789	0.2992	48

The preferred state- and year-fixed-effects specification produces an estimated elasticity of approximately 0.141, with a p-value of approximately 0.0595. In practical terms, the estimate suggests that a 10 percent increase in GST revenue per capita is associated with an approximately 1.4 percent increase in real per-capita NSDP, conditional on state and year effects.

The estimate is positive and close to the conventional 5 percent statistical significance threshold. However, because the p-value is slightly above 0.05, the result should be interpreted cautiously. More importantly, the fixed-effects design does not establish a causal relationship between GST mobilisation and economic development.

The growth-form robustness specification produces a coefficient of approximately 0.488, but its standard error is very large and its p-value is approximately 0.979. Consequently, there is no statistically significant evidence of a contemporaneous relationship between GST revenue per capita and annual growth in real per-capita NSDP within this specification.

Taken together, the results indicate that the relationship is more evident when the analysis considers the level of economic development rather than short-term annual growth.

6. Discussion

The empirical findings are broadly consistent with the proposition that tax mobilisation and economic development may reinforce one another. A larger and more formalised economy can generate a broader GST base, increasing the potential for revenue mobilisation. At the same time, stronger revenue mobilisation can improve the fiscal capacity of state governments and potentially support public services and development-oriented expenditure.

However, the direction of this relationship cannot be established using the present research design. Economic development itself may generate higher GST collections through increased consumption, formalisation, production, and taxable transactions. This possibility of reverse causality represents an important limitation.

The substantial heterogeneity among Indian states also deserves attention. Maharashtra, Karnataka, and Tamil Nadu record high aggregate GST collections partly because of their large and diversified economic bases. These states cannot be directly compared with smaller states using aggregate collections alone.

Odisha demonstrates a particularly strong combination of GST expansion and real per-capita NSDP growth during the study period. Uttar Pradesh provides another useful illustration of why population-adjusted measures are important. Its aggregate GST collections are substantial, but its large population means that GST revenue per capita provides a substantially different perspective on fiscal mobilisation.

These findings indicate that state-level fiscal performance should be evaluated using multiple indicators rather than a single aggregate revenue measure. GST per capita provides useful information about revenue mobilisation relative to population, while GST-to-output measures can provide additional insight into tax intensity and the relationship between taxation and economic capacity.

7. Policy Implications

7.1 Use Population-Adjusted Indicators

Comparisons of state GST performance should not rely exclusively on total GST collections. GST reve-

nue per capita and GST relative to economic output can provide more meaningful indicators of tax mobilisation because they account for differences in population and economic scale.

7.2 Link Revenue Mobilisation with Productive Expenditure

Higher tax revenue does not automatically translate into stronger development outcomes. Revenue mobilisation should therefore be accompanied by productive and efficient public expenditure. The developmental impact of additional fiscal resources depends substantially on how those resources are allocated.

7.3 Strengthen Compliance and Formalisation

States with relatively lower GST intensity may benefit from measures aimed at improving tax compliance, strengthening the use of compliance analytics, expanding formal economic activity, improving e-invoicing and e-way-bill enforcement, and enhancing taxpayer services.

7.4 Account for Structural Differences Among States

Intergovernmental fiscal assessments should recognise that states differ considerably in their tax bases, population structures, industrial composition, and economic capacity. Uniform comparisons based solely on absolute revenue can therefore provide an incomplete assessment of state fiscal performance.

7.5 Expand Future Empirical Research

Future research should incorporate lagged GST variables and investigate expenditure channels. Such extensions could help address simultaneity concerns and provide a better understanding of the mechanisms linking GST mobilisation with regional economic performance.

8. Limitations of the Study

Several limitations should be considered when interpreting the results.

First, the balanced regression panel covers only four complete financial years, from FY 2020–21 to FY 2023–24. The available FY 2024–25 state-wise GST information extends only through October 2024 and therefore cannot be treated as a comparable full-year observation.

Second, GST revenue per capita is used as the principal fiscal measure rather than a fully harmonised GST-to-GSDP ratio. The study therefore focuses on population-adjusted revenue mobilisation rather than a comprehensive measure of GST relative to state economic output.

Third, the short time dimension of the panel limits the statistical power available for more sophisticated dynamic panel techniques.

Fourth, fixed-effects estimation controls for time-invariant state characteristics but does not automatically resolve reverse causality or omitted time-varying factors. Economic growth may itself increase GST revenue, while other changing factors may influence both taxation and development. Finally, the estimated coefficient represents an association and should not be interpreted as evidence that GST revenue independently causes increases in regional economic development.

9. Conclusion

This study examines the relationship between GST revenue mobilisation and regional economic development across 16 major Indian states using official government and RBI data. The analysis documents substantial differences in GST mobilisation across states and demonstrates why population-adjusted measures are important for meaningful interstate comparisons.

The preferred fixed-effects model produces a positive estimated elasticity of approximately 0.141 between GST revenue per capita and real per-capita NSDP. The result indicates that, within the sample

and after accounting for state-specific and common year effects, higher GST revenue per capita is associated with higher levels of real per-capita NSDP. Nevertheless, the statistical evidence is marginal at the conventional 5 percent level, and the growth-based robustness specification does not identify a significant short-run relationship.

The findings should therefore be interpreted as evidence of association rather than causality. Stronger economic activity may increase GST revenue through a broader tax base and greater formalisation, while stronger revenue mobilisation may simultaneously enhance the fiscal capacity available for development-oriented spending.

The principal policy implication is that GST performance should not be judged solely by the absolute amount of revenue collected. Population, economic capacity, tax intensity, and the quality of public expenditure must also be considered when evaluating fiscal performance and regional development. A longer panel incorporating complete FY 2024–25 and FY 2025–26 state-level economic estimates would provide a stronger basis for examining dynamic relationships, lagged effects, and potential causal mechanisms between GST mobilisation and regional economic development.

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