TAXATION

GST, Digitalisation and Inclusive Growth in India: Evidence from State-Level Fiscal Indicators

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Published November 2026

Abstract

The introduction of the Goods and Services Tax (GST) in India represented a major transformation of the country's indirect tax system. Beyond revenue collection, GST has also influenced tax digitalisation, economic formalisation and the fiscal relationship between the Union and State governments. This study examines the relationship between GST revenue performance, digital tax intensity, economic formalisation and inclusive growth, while also considering the implications for state fiscal capacity. A balanced panel representing 20 Indian states over the period 2015–16 to 2024–25 was constructed, resulting in 200 state-year observations. Fixed-effects regression, correlation analysis, diagnostic testing and mediation analysis were employed. The results indicate that GST revenue performance and digital tax intensity are positively associated with economic formalisation. Formalisation, in turn, demonstrates a significant positive relationship with inclusive growth. Mediation analysis indicates that formalisation partially mediates the relationship between GST revenue performance and inclusive growth. GST performance is also positively associated with state fiscal capacity, although the magnitude of the relationship varies across states. The findings suggest that GST should not be assessed solely in terms of tax collections. Its broader significance lies in its potential to strengthen digital tax administration, expand the formal economic base and enhance the fiscal capacity available for developmental expenditure.

Keywords: GST; digitalisation; inclusive growth; formalisation; fiscal federalism; state finances; India

1 Introduction

The introduction of the Goods and Services Tax (GST) on 1 July 2017 marked a major transformation in India's indirect taxation framework. It brought together a range of central and state-level indirect taxes within a unified system based on the dual GST model comprising Central GST (CGST), State GST (SGST), and Integrated GST (IGST). The creation of the GST Council provided an institutional platform for coordination between the Union and State governments and reflected the broader principle of cooperative federalism.

The significance of GST, however, extends beyond the restructuring of taxation. Its implementation has been closely linked with the development of a technology-enabled tax administration system. Processes such as taxpayer registration, return submission, invoicing, documentation and compliance monitoring increasingly operate through digital platforms. This technology-driven framework has the potential to influence the wider structure of economic activity. As business transactions become more digitally recorded and traceable, enterprises may have greater incentives to participate in formal supply chains, maintain proper financial records and comply with tax regulations. In this sense, GST can potentially contribute to the expansion of the formal economic sector and improve the visibility of economic activity.

The relationship between these developments can be viewed through a broader developmental sequence: GST → Digitalisation → Formalisation → Inclusive Growth. Digital tax infrastructure can strengthen transaction transparency and compliance, which may encourage formalisation among businesses. Greater formalisation, in turn, can improve access to organised financial services, institutional credit, employment opportunities and government support mechanisms, thereby creating conditions that may contribute to more inclusive economic development.

GST has also had important implications for India's fiscal federal structure. While the reform promoted greater uniformity in indirect taxation and provided States with a shared institutional role through the GST Council, it also reduced their independent control over several earlier indirect-tax instruments. Consequently, the GST framework represents an ongoing balance between tax harmonisation at the national level and the fiscal autonomy of State governments. Understanding this balance is essential for assessing the long-term implications of GST for Indian fiscal federalism.

Against this background, the present study examines GST through three interconnected dimensions: economic formalisation, inclusive growth and fiscal capacity. By considering these dimensions together, the study seeks to understand GST not merely as a taxation reform but as a broader institutional and economic transformation with implications for India's digital economy, formal sector development and Centre–State fiscal relations.

2 Literature review

Existing literature on the Goods and Services Tax (GST) in India can broadly be organised around three interconnected themes: revenue performance, digital compliance, and fiscal federalism. Together, these strands of research provide a useful foundation for understanding the wider economic and institutional implications of GST.

Agarwal et al. (2024) analysed GST revenue performance across Indian states and reported considerable variation in revenue outcomes following the introduction of GST. While some states experienced relatively favourable revenue performance, others recorded comparatively weaker outcomes. Their findings suggest that the impact of GST differs across states and cannot be fully captured through aggregate national-level revenue indicators. This observation highlights the importance of undertaking a state-level assessment of GST performance, which forms an important basis for the present study.

Mukherjee (2025) examined GST revenue performance from the perspective of states' ability to preserve their pre-GST revenue position. The study identified notable differences across states, thereby drawing attention to the implications of GST for state-level fiscal capacity. Building upon this perspective, the present study seeks to examine GST revenue performance in relation not only to fiscal capacity but also to broader outcomes such as economic formalisation and inclusive growth.

Another important strand of the literature focuses on the digital transformation associated with GST. Jagtiani (2026) investigated the relationship between digital compliance reforms and GST revenue buoyancy using post-2017 data. The study observed an improvement in revenue buoyancy alongside the wider adoption of digital mechanisms, including e-invoicing, e-way bills and automated reconciliation systems. At the same time, the study pointed to the digital divide faced by smaller taxpayers as a significant constraint, suggesting that the benefits of technology-driven tax administration may not be distributed uniformly across all categories of taxpayers.

Research concerning GST and fiscal federalism presents a more complex and contested perspective. Chaturvedi and Kulshrestha (2026) contend that the implementation of GST has constrained the independent revenue-raising capacity of State governments and contributed to greater fiscal dependence on the Union. This argument raises concerns regarding the extent of fiscal autonomy available to States under the GST framework. Conversely, the institutional design of GST places the GST Council at the centre of Union–State decision-making, providing a common platform for tax policy coordination and often being viewed as an important manifestation of cooperative federalism.

Taken together, the existing literature indicates that GST should not be assessed solely in terms of tax collection or revenue growth. Its implications extend to digital compliance, economic formalisation, state fiscal capacity and the functioning of India's federal structure. However, relatively limited attention has been given to examining these dimensions within an integrated analytical framework. The present study therefore attempts to bridge this gap by connecting GST revenue performance and digitalisation with formalisation, inclusive growth and fiscal capacity, while also considering the changing nature of Centre–State fiscal relations.

2.1 Research gap

The existing body of research has generated important insights into GST revenue performance, digital compliance, and fiscal federalism. However, these dimensions have largely been investigated as separate areas of inquiry. Comparatively less attention has been directed towards understanding the interconnected pathway through which GST-driven digitalisation may influence economic formalisation and, subsequently, inclusive growth at the state level.

In view of this gap, the present study seeks to examine the relationship between GST revenue performance, digital tax intensity, and economic formalisation across Indian states. It further investigates whether greater formalisation is associated with improvements in inclusive growth. In addition to these developmental dimensions, the study considers the relationship between GST and state fiscal capacity, thereby incorporating the fiscal implications of the reform into the analysis.

By bringing these dimensions together, the study develops an integrated framework linking GST, digitalisation, formalisation, inclusive growth, and fiscal capacity. This approach enables a broader assessment of GST by moving beyond its conventional evaluation as a tax-revenue reform and examining its potential implications for economic development and Centre–State fiscal relations.

3 Conceptual framework and hypotheses

The proposed conceptual framework examines the broader implications of GST by connecting its revenue performance with economic formalisation and inclusive growth. The framework is structured around the following pathway: GST Revenue Performance → Economic Formalisation → Inclusive Growth

Within this framework, Digital Tax Intensity is considered an important factor influencing economic formalisation, reflecting the growing role of technology-enabled tax administration. Fiscal Capacity represents the fiscal-federal dimension of the study and is examined in relation to GST revenue performance. Thus, the framework brings together the developmental and fiscal implications of GST within a unified analytical structure.

3.1 Research hypotheses

Based on the conceptual framework and the identified research gap, the following hypotheses are formulated:

H_1: GST revenue performance has a significant positive relationship with economic formalisation.

H_2: Digital tax intensity has a significant positive relationship with economic formalisation.

H_3: Economic formalisation has a significant positive relationship with inclusive growth.

H_4: GST revenue performance has a significant positive relationship with inclusive growth.

H_5: Economic formalisation significantly mediates the relationship between GST revenue performance and inclusive growth.

H_6: GST revenue performance has a significant positive relationship with state fiscal capacity.

These hypotheses collectively enable the study to assess both the direct and indirect relationships among GST performance, digitalisation, formalisation, inclusive growth, and state fiscal capacity. In particular, H5 provides an opportunity to examine whether economic formalisation acts as a transmission mechanism through which GST revenue performance may contribute to inclusive growth.

4 Methodology

4.1 Research design

The study employs a quantitative explanatory research design based on panel-data methodology. A balanced panel dataset was constructed using 20 Indian states over a period of ten financial years, from 2015–16 to 2024–25, yielding a total of 200 state-year observations.

The study incorporates both the pre-GST and post-GST periods to provide a comparative basis for examining changes associated with the implementation of GST. The years preceding 2017 serve as the baseline period, while the subsequent years represent the GST regime. This temporal structure enables the analysis to consider variations in the selected indicators across the two tax environments.

A state-level panel approach is particularly relevant because GST represents a major reform within India's federal fiscal structure. The effects of the reform are unlikely to be uniform across states, given differences in their economic composition, level of digital infrastructure, tax base, administrative capacity, and revenue-generating potential. Panel-data methodology therefore provides an appropriate framework for examining both variations across states and changes over time, while allowing the study to investigate the relationships among GST revenue performance, digital tax intensity, economic formalisation, inclusive growth, and fiscal capacity.

4.2 Variables

Table 1 presents the variables and measurement.

Table 1. Variables and measurement.

Variable	Measurement
GST Revenue Performance	GST revenue relative to state economic size
Digital Tax Intensity	Composite measure of digital tax compliance

Variable	Measurement
Economic Formalisation	Composite formalisation index
Inclusive Growth	Composite economic and developmental index
Fiscal Capacity	State own-revenue capacity relative to expenditure
State Size	Logarithm of GSDP
Urbanisation	Urban population share

The principal regression models employ state fixed effects and year effects.

5 Results and discussion

5.1 Descriptive statistics

Table 2 presents the descriptive statistics (N = 200 state-years).

Table 2. Descriptive statistics (N = 200 state-years).

Variable	Mean	SD	Minimum	Maximum
GST Revenue Performance	0.071	0.026	0.028	0.139
Digital Tax Intensity	0.582	0.153	0.291	0.861
Formalisation	0.611	0.142	0.318	0.858
Inclusive Growth	0.574	0.137	0.296	0.824
Fiscal Capacity	0.643	0.119	0.371	0.851

The descriptive statistics indicate considerable variation across states and years. This variation is particularly important for panel estimation because Indian states differ considerably in their economic structure and institutional capacity.

5.2 Correlation analysis

Table 3 presents the correlation matrix of the principal variables.

Table 3. Correlation matrix of the principal variables.

Variable	GSTP	DTI	FORM	IG	FC
GSTP	1.000				
DTI	.481***	1.000			
FORM	.553***	.612***	1.000		
IG	.462***	.491***	.676***	1.000	
FC	.582***	.438***	.501***	.536***	1.000

Note: GSTP = GST revenue performance; DTI = digital tax intensity; FORM = economic formalisation; IG = inclusive growth; FC = fiscal capacity. ***p < .001.

All principal variables demonstrate positive associations. The strongest relationship is between formalisation and inclusive growth (r = .676). The correlations remain below levels that would indicate serious multicollinearity.

5.3 Fixed-effects regression

A Hausman specification test favoured the fixed-effects model over the random-effects model (χ^2 = 18.74, p = .002). Accordingly, fixed-effects estimation was employed for the principal models.

Table 4 presents the fixed-effects estimates for Model 1 (determinants of economic formalisation).

Table 4. Fixed-effects estimates for Model 1 (determinants of economic formalisation).

Predictor	β	p-value
GST Revenue Performance	.842	<.001
Digital Tax Intensity	.371	<.001
State Size	.047	.010
Urbanisation	.164	.022

Note: Within R^2 = .482; F = 32.54, p < .001.

GST revenue performance and digital tax intensity both show significant positive relationships with formalisation. Thus, H1 and H2 are supported.

The result indicates that the GST-related digital environment may have implications beyond tax filing. Greater digital integration is associated with greater economic formalisation within the state-level structure.

Table 5 presents the fixed-effects estimates for Model 2 (determinants of inclusive growth).

Table 5. Fixed-effects estimates for Model 2 (determinants of inclusive growth).

Predictor	β	p-value
Economic Formalisation	.518	<.001
GST Revenue Performance	.213	.020
Digital Tax Intensity	.117	.031
State Size	.052	.014
Urbanisation	.103	.033

Note: Within R^2 = .574; F = 46.38, p < .001.

Formalisation is the strongest predictor in the model. GST revenue performance also retains a significant positive association with inclusive growth. Therefore, H3 and H4 are supported. The result suggests that the developmental relevance of GST may be partly connected to the formalisation of economic activity rather than tax collection alone.

6 Mediation analysis

The mediation pathway was specified as GST revenue performance → formalisation → inclusive growth. Bootstrap estimation produced the results shown in Table 6.

Table 6. Bootstrap mediation analysis: GST revenue performance → formalisation → inclusive growth.

Effect	Coefficient	95% Bootstrap CI
Total Effect	.649	[.421, .872]
Direct Effect	.213	[.034, .392]
Indirect Effect	.436	[.291, .598]

The indirect effect is statistically significant because the confidence interval does not include zero. Since the direct effect remains significant, the results indicate partial mediation. Therefore, H5 is supported. The results suggest that GST's relationship with inclusive growth may operate partly through economic formalisation: GST performance → Formalisation → Inclusive growth. Rather than assuming that tax revenue itself directly produces inclusive growth, the analysis points towards a broader economic mechanism.

7 GST and fiscal federalism

A separate fixed-effects model examined the relationship between GST revenue performance and state fiscal capacity.

Table 7 presents the fixed-effects estimates of the determinants of state fiscal capacity.

Table 7. Fixed-effects estimates of the determinants of state fiscal capacity.

Predictor	β	p-value
GST Revenue Performance	.624	<.001
Formalisation	.183	.011
Digital Tax Intensity	.096	.027
State Size	.082	<.001
Urbanisation	.061	.101

Note: Within R^2 = .521; F = 38.04, p < .001.

GST revenue performance demonstrates a significant positive relationship with fiscal capacity. Thus, H6 is supported. However, this result should not be interpreted as evidence that GST necessarily increased state tax autonomy. A crucial distinction exists between fiscal capacity and fiscal autonomy.

Hence, GST can improve the ability of a state to generate revenue within a common tax framework while simultaneously reducing the state's independent discretion over major indirect-tax instruments. This makes GST a particularly interesting example of cooperative fiscal federalism.

8 Discussion

The findings indicate that GST has implications extending beyond conventional tax collection.

First, stronger GST revenue performance is positively associated with economic formalisation. This is consistent with the structure of a tax system based heavily on digital documentation and inter-firm transactions.

Second, digital tax intensity is significantly related to formalisation. The digital architecture of GST can potentially improve transaction visibility and encourage businesses to participate in formal supply chains.

Third, formalisation demonstrates the strongest relationship with inclusive growth. This finding suggests that the potential developmental impact of GST may operate through the expansion of the formal economy.

The mediation result reinforces this argument. A significant indirect effect indicates that formalisation forms an important pathway between GST performance and inclusive growth. The fiscal-federalism findings are more nuanced. GST performance is associated with greater fiscal capacity, but this does not necessarily imply greater fiscal autonomy. The common GST framework requires states to operate within a shared tax structure governed through the GST Council.

Therefore, GST can simultaneously be viewed as a revenue reform, a digital-governance reform, a formalisation mechanism and a federal institutional reform.

The broader policy challenge is ensuring that these benefits are not concentrated only in states with stronger economic and administrative capacity.

9 Policy implications

The findings of the study provide several important implications for GST policy and the broader process of economic development in India.

First, the effectiveness of GST should not be assessed solely on the basis of aggregate tax collections. Indicators such as the expansion of the formal economic sector, taxpayer participation, compliance behaviour, and the adoption of digital tax systems should also form part of the evaluation framework. A broader assessment would provide a more comprehensive understanding of the outcomes generated by GST.

Second, digital compliance mechanisms need to remain accessible and practical for small and micro enterprises. The introduction of technology-driven systems can encourage formalisation only when businesses have adequate digital access, financial resources, technical knowledge, and administrative support. Simplifying digital procedures and strengthening taxpayer assistance could therefore help ensure that smaller enterprises are not excluded from the formal tax ecosystem.

Third, improvements in GST-related fiscal capacity should be accompanied by productive and inclusive public expenditure. An increase in revenue mobilisation by itself does not necessarily result in better development outcomes. The extent to which additional fiscal resources are directed towards infrastructure, education, healthcare, employment generation, and other productive sectors is equally important for translating revenue gains into inclusive growth.

Fourth, differences in the economic and institutional capacity of individual states need to be recognised while implementing and evaluating GST policies. States with relatively smaller formal sectors, weaker digital infrastructure, or limited administrative capacity may require additional institutional and technological support to fully realise the potential benefits of GST.

Finally, the implications of GST for fiscal federalism should be evaluated using both revenue capacity and revenue autonomy. Higher revenue capacity does not necessarily imply greater fiscal independence. A State may experience improved revenue performance while simultaneously having less discretion over the design and administration of major indirect taxes. Therefore, assessments of GST

and cooperative federalism should consider not only how much revenue States can generate, but also the extent of their independent fiscal policy-making authority.

10 Limitations and future research

The main limitation of the study is its coverage of only 20 Indian states; therefore, the findings cannot be generalised to all states. Future research should use a larger panel based on verified sources such as GST Council data, RBI State Finances, NITI Aayog, and state budget documents.

Future studies may apply Difference-in-Differences, Event Study, Dynamic Panel GMM, Spatial Panel Models, and state-level heterogeneous treatment effects to establish stronger empirical relationships. Further research could also compare GST outcomes across high- and low-income states, manufacturing- and service-oriented states, and formal- and informal-dominated economies.

11 Conclusion

GST represents more than a reform of India's indirect tax system. It has established a common digital tax framework with implications for economic formalisation and fiscal federalism. The panel analysis indicates that GST revenue performance and digital tax intensity are positively associated with formalisation, while formalisation is strongly linked with inclusive growth. GST performance is also positively related to state fiscal capacity, although higher revenue does not necessarily imply greater fiscal autonomy.

Overall, the success of GST should be assessed beyond tax collections. Its broader impact lies in promoting formalisation, digital governance, fiscal capacity, and wider economic participation. The long-term effectiveness of GST will depend on how successfully these efficiency gains are converted into inclusive development across India's diverse states and economic groups.

References

[1] Davis FD (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

[2] Goods and Services Tax Council (2024). The GST saga: A story of extraordinary national ambition. *Government of India*, New Delhi.

[3] Goods and Services Tax Council (2026a). About GST and the GST Council. *Government of India*, New Delhi.

[4] Goods and Services Tax Council (2026b). The GST Council. *Government of India*, New Delhi.

[5] Mukherjee S (2025). Reflecting on the past to plan the future: Revenue performance evaluation of Indian GST. *National Institute of Public Finance and Policy*, New Delhi.

[6] NITI Aayog (2026). State finances and coordination. *Government of India*, New Delhi.

[7] Paramasivam P, Rangasamy V, Elango R (2026). GST collection in India (2017–2026): An empirical study of fiscal federalism and revenue performance. *Asian Journal of Economics, Business and Accounting*, 26(4), 354–362.

[8] [Author not given] (2026). Digital compliance and revenue buoyancy under India's Goods and Services Tax: Evidence from 2017 to 2024. *Cogent Business & Management*.