STAR
Research Journal

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COMMERCE

GST 2.0 And The Digital Economy: Tax Innovation, Enterprise Formalization, And Inclusive Economic Growth In India

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Abstract

India's GST 2.0 reform, approved by the 56th GST Council on 3 September 2025 and effective from 22 September 2025, is marketed simultaneously as a consumption stimulus and a formalization drive intended to draw MSMEs further into the formal tax net through simplified registration, expanded e-invoicing, and faster refunds. Whether this formalization dividend reaches India's structurally heterogeneous MSME and informal-origin firms as fully as it reaches already-formal firms is, at present, untested — a gap that is theoretical, empirical, contextual, methodological, geographical, practical, and policy-relevant. This paper addresses it by developing the Core–Periphery Inclusion Framework (CPIF), integrating tax compliance theory, institutional theory, informality and formalization theory, technology acceptance theory, and the capability approach into a single model in which Tax Innovation Perception and Enterprise Formalization act as antecedent and mediating mechanisms, Inclusive Economic Growth is the outcome, and Firm Tier — core versus periphery — moderates the formalization-to-growth path. Five hypotheses are derived and a cross-sectional, moderated-mediation survey design is specified, using validated seven-point Likert and formative measures, stratified sampling by firm tier, and PLS-SEM with bootstrapped conditional indirect effects. The framework anticipates that formalization will be positively associated with inclusive growth overall, but weaker for periphery firms than core firms, indicating that GST 2.0's benefits may be structurally, not merely incidentally, concentrated toward the economy's core. The contribution is a theoretically integrated, empirically testable account of when — not merely whether — tax-digitalization reform yields inclusive growth.

Keywords: *GST 2.0; enterprise formalization; inclusive economic growth; core–periphery framework; tax innovation; moderated mediation*

1. Introduction

Indirect tax systems worldwide have moved toward digital administration, treating e-invoicing and real-time reporting as instruments of formalization, not just compliance (Bellon et al., 2022; Okunogbe & Pouliquen, 2022). India's GST, introduced 1 July 2017, has evolved through successive reforms, most recently "GST 2.0," approved by the 56th GST Council on 3 September 2025 and effective from 22 September 2025 (Khaitan & Co, 2025). The reform compressed the four-slab structure (5/12/18/28 percent) into two main slabs (5 percent merit, 18 percent standard) plus a 40 percent de-merit rate, alongside simplified registration, faster refunds, and expanded e-invoicing.

GST 2.0 is marketed simultaneously as a consumption stimulus and a formalization drive aimed at India's very large MSME population — a sector contributing close to 30 percent of GDP and roughly 45 percent of exports, with over 65 million enterprises registered on Udyam and Udyam Assist (Press Information Bureau, 2025). Yet this population is structurally heterogeneous: some firms are already formal and supply-chain-embedded; others are informal-origin and capability-constrained. Whether GST 2.0 delivers comparable benefits across this range, or concentrates them among firms already closest to the formal frontier, is untested.

This paper develops the Core–Periphery Inclusion Framework (CPIF), treating this heterogeneity as the central object of inquiry, with firm tier (core versus periphery) specified as a boundary condition on the relationship between enterprise formalization and inclusive economic growth.

2. Literature Review, Theoretical Framework, and Conceptual Framework

2.1 Critical Literature Review

Digital tax instruments measurably raise reported economic activity. Bellon et al. (2022) show Peru's e-invoicing mandate raised reported sales and VAT liabilities by over 5 percent, concentrated among smaller, weak-compliance firms, operating through monitoring and deterrence. A companion study shows these effects diffuse through firm networks, with peripheral firms adopting later, via spillover rather than independent choice

(Bellon et al., 2023) — directly relevant to a core–periphery reading of formalization technology. Okunogbe and Pouliquen (2022), studying Tajikistan's e-filing rollout, complicate this picture: e-filing cut compliance time 40 percent and raised payments among prior evaders, but *lowered* them among previously compliant firms, since digitization removed informal channels for favorable treatment — evidence that digitization compresses variance around a technological norm rather than raising compliance uniformly. Mascagni et al. (2021) find a similar segment-specific pattern for Ethiopian electronic fiscal devices.

India-specific evidence is directly relevant. Das et al. (2023), exploiting geographic variation in demonetization intensity, show the resulting shift to electronic payments explains roughly half of an 11 percent rise in reported firm sales — mechanistically close to what GST 2.0's e-invoicing expansion intends. Bachas et al. (2024) show informal firms already bear meaningful implicit consumption-tax burdens, reframing formalization as involving redistributive stakes, not just compliance cost. K. Sen (2022), using India's nationwide informal-enterprise survey, finds financial inclusion raises informal entrepreneurial activity unevenly by gender and firm type — direct evidence that broad inclusion policies do not produce homogeneous responses. Mickiewicz et al. (2019) find business owners' tax morale reflects institutional legitimacy as much as deterrence, supporting an institutional-theory reading of formalization behavior.

Table 2. Summary of Critical Literature Review

Study	Theory	Method / Data	Sample	Key Finding	Limitation	Gap Left
Bellon et al. (2022)	Tax compliance / deterrence	Difference-in-differences; administrative tax data	Peru; firms mandated into VAT e-invoicing	E-invoicing raised reported sales/VAT >5%, concentrated among smaller, weak-compliance firms	Single-country; no firm-tier growth outcome measured	Formalization-to-growth link untested
Bellon et al. (2023)	Institutional / network diffusion	Firm-network panel analysis; administrative data	Peru; firm-to-firm trading networks	Technology diffuses through networks; smaller firms adopt later, via spillover from mandated partners	Diffusion observed, not firm capability outcomes	Core–periphery adoption timing not linked to growth

Study	Theory	Method / Data	Sample	Key Finding	Limitation	Gap Left
Okunogbe & Pouliquen (2022)	Tax compliance / deterrence	Randomized / quasi-experimental e-filing rollout	Tajikistan; firms	E-filing cut compliance time 40%; raised payments among prior evaders, lowered among prior compliers	Single-country; extensive-margin reporting only	No test of downstream firm growth/capability effects
Das et al. (2023)	Tax compliance / information	Geographic variation; administrative tax-return data	India; firms exposed to demonetization	Electronic-payment shift explains ≈ half of an 11% rise in reported sales	Blunt economy-wide shock, not a targeted reform; no formality-origin split	GST 2.0-specific mechanism untested
Bachas et al. (2024)	Informality and formalization	Theoretical + empirical; cross-country firm/household data	Developing economies	Informal firms bear a meaningful implicit consumption-tax burden; formalization has redistributive stakes	Not India-specific; not linked to a digital-reform episode	Redistributive stakes of GST 2.0 formalization not quantified

Two gaps follow. First, this literature is drawn from single-country settings outside India, and none examines GST 2.0's specific architecture. Second — more consequentially — none tests whether the formalization-to-growth relationship is itself conditional on firm type; each pools or examines a single firm segment. This second, moderation-focused gap is what the CPIF is designed to close.

2.2 Theoretical Framework: Five Anchor Theories

Five theories are integrated, each mapped to one stage of the model. **Tax compliance theory** (Allingham & Sandmo, 1972) models formalization as an expected-utility calculation over detection probability and penalty; GST 2.0's e-invoicing and AI-assisted analytics raise detection probability while simplified registration lowers compliance cost, supplying the direct mechanism for H1. **Institutional theory** (DiMaggio & Powell, 1983) explains formalization through coercive, mimetic, and normative isomorphism — GST mandates, peer/network imitation (consistent with Bellon et al., 2023), and professionalized compliance via CAs and GST practitioners — a necessary complement since firms

formalize under social pressure, not detection logic alone. **Informality and formalization theory** (La Porta & Shleifer, 2008) treats informal firms as structurally distinct from formal ones — smaller, less capitalised, less productive — supplying this paper's central claim: periphery firms cannot be assumed to convert formalization into the same growth return as core firms, the direct warrant for H5. **Technology acceptance theory** (Davis, 1989) supplies the behavioural-adoption mechanism: perceived usefulness and ease of use determine whether firms actually engage with GST 2.0's digital tools, since benefits are not self-executing. **The capability approach** (A. Sen, 1999) anchors the outcome construct, reframing inclusive growth as expansion of substantive freedoms — credit access, employment, resilience — rather than revenue alone, consistent with prior modelling of entrepreneurship as capability-expanding (Gries & Naudé, 2011).

Resource-based view, dynamic capability theory, diffusion of innovation, stakeholder theory, and financial intermediation theory were considered and not retained as core anchors: the first two explain post-formalization performance rather than the formalization decision itself; diffusion of innovation duplicates ground already covered by technology acceptance and institutional theory; stakeholder pressure from buyers demanding GST-compliant invoices is better read as supply-chain-transmitted coercive isomorphism, already nested in institutional theory; and financial intermediation is folded into the growth outcome construct rather than standing as a separate driver. This is a parsimony decision: a Q1 contribution rests on a small number of logics converging on one testable boundary condition, not on theory count.

Figure 1

The Core-Periphery Inclusion Framework (CPIF)

H4: Enterprise Formalization mediates Tax Innovation Perception → Inclusive Economic Growth (simple mediation, single mediator)

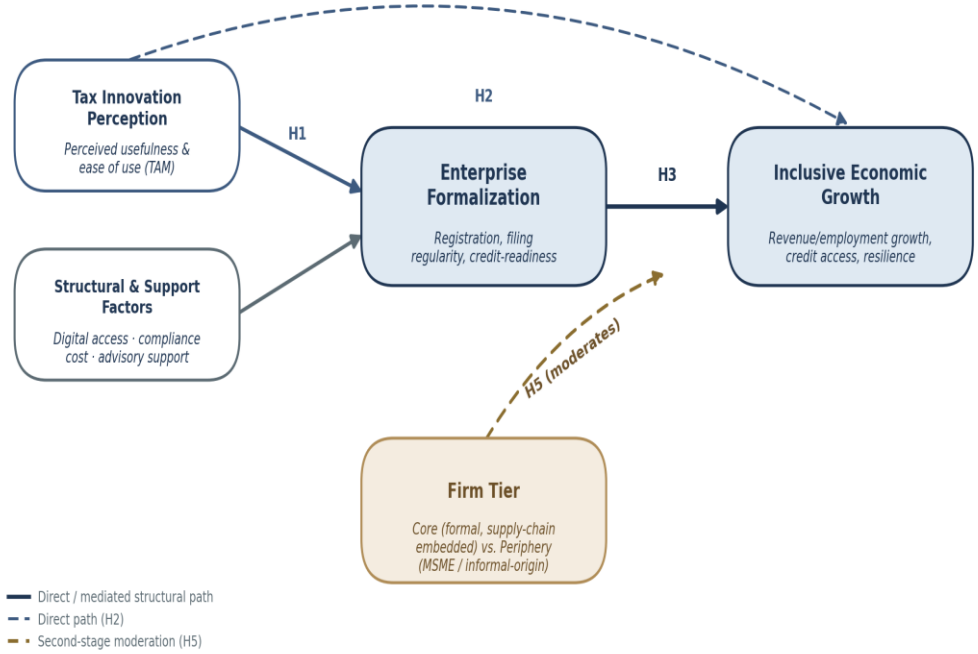


Table 1. Core–Periphery Inclusion Framework (CPIF): Constructs, Definitions, and Theoretical Anchors

Construct	Role in Model	Definition	Theoretical Anchor(s)	Measurement Type
Tax Innovation Perception	Antecedent	Perceived usefulness and ease of use of GST 2.0's digital and procedural instruments (e-invoicing, pre-filled returns, simplified registration, faster refunds)	Tax compliance theory; Technology acceptance theory	Reflective, 7-point Likert
Structural & Support Factors	Antecedent	Firm-level digital infrastructure access, compliance-cost burden, and access to professional/advisory support	Informality and formalization theory	Formative
Enterprise Formalization	Mediator	Extent and regularity of GST registration and reporting compliance; resulting documentary and credit-readiness position	Tax compliance theory; Institutional theory; Informality and formalization theory	Formative (objective indicators + perceptual items)
Inclusive Economic Growth	Outcome	Expansion of firm-level capability — revenue and employment growth, formal credit access, and resilience — rather than revenue alone	Capability approach	Formative (self-report + categorical items)
Firm Tier	Moderator	Core (large, already-formal, supply-chain-embedded) versus Periphery (MSME and informal-origin) firm classification	Informality and formalization theory	Categorical classification

2.3 Conceptual Framework

Tax Innovation Perception and structural/support factors (digital access, compliance cost, advisory support) are antecedents; Enterprise Formalization is the single mediator, capturing registration completeness, filing regularity, and credit-readiness; Inclusive Economic Growth is the outcome; Firm Tier moderates specifically the Formalization Growth path (second-stage moderation, per Preacher et al., 2007), not the antecedent-to-mediator path, since informality theory locates the core–periphery asymmetry in the *return* to formalization, not the initial response to tax innovation. The model specifies simple, not serial, mediation: introducing a second mediator without independent theoretical grounding would compromise parsimony.

3. Research Problem

GST 2.0 claims both a consumption-stimulus and a formalization dividend, but whether the latter holds equally for MSME/informal-origin firms as for already-formal firms is untested.

Compliance capacity, digital literacy, and working capital differ systematically between core and periphery firms (La Porta & Shleifer, 2008), yet policy design and prior research generally treat registered firms as one population. Existing GST-formalization research is descriptive, single-firm-type, or predates GST 2.0 entirely. Because the reform has been in effect only since 22 September 2025, this is the first empirical window in which its core–periphery distributional effects can be tested.

4. Research Gap

Table 3. Research Gap Typology

Gap Type	Description
Theoretical	No existing framework integrates tax compliance, institutional, technology-acceptance, informality, and capability-based logics specific to GST 2.0.
Empirical	No firm-level study has tested whether formalization's return — its translation into inclusive growth — is conditional on firm tier.
Contextual	GST 2.0 (in effect only since 22 September 2025) postdates the entire existing GST-formalization literature.
Methodological	Prior GST-formalization research is dominated by descriptive statistics, case studies, or reduced-form designs; validated multi-item scales with moderated-mediation testing are largely absent.
Geographical	Firm-survey evidence is concentrated in a small number of large metropolitan/industrial states, leaving other states and Tier-2/3 towns comparatively understudied.
Practical	Firms and advisors lack sequencing guidance on which compliance investments to prioritise and under what circumstances the return justifies the cost.
Policy	The GST Council, CBIC, and Ministry of Finance lack firm-tier-differentiated evidence on whether formalization support should be tiered by firm size and origin.

Seven gaps, read cumulatively: no framework integrates tax compliance, institutional, technology-acceptance, informality, and capability logics for GST 2.0 (*theoretical*); no firm-level test exists of whether formalization's growth return is conditional on firm tier (*empirical*); GST 2.0 postdates the entire prior literature (*contextual*); prior work is largely descriptive or qualitative rather than using validated scales and moderated-mediation testing (*methodological*); firm-survey evidence is concentrated in a few large states, leaving others understudied (*geographical*); firms and advisors lack sequencing guidance for compliance investment (*practical*); and policymakers lack evidence on whether formalization support should be tiered by firm size (*policy*).

5. Aim

To develop and specify a testable framework — the Core–Periphery Inclusion Framework (CPIF) — linking tax innovation, enterprise formalization, and inclusive economic growth under GST 2.0, with firm tier as a boundary condition, and to lay out the empirical design by which it can be tested.

6. Research Objectives

Objective 1. Synthesise tax compliance, institutional, informality, technology-acceptance, and capability theory into the CPIF and derive five testable hypotheses (H1–H5), completed prior to data collection.

Objective 2. Specify a validated instrument and moderated-mediation analytical plan capable of testing H1–H5 using firm-level data from GST-registered enterprises under the post-September-2025 regime, and derive theoretical, managerial, and policy implications, reported upon completion of analysis.

7. Research Questions

RQ1 (Objective 1): How can these five theoretical logics be integrated into a single framework, and what hypotheses follow?

RQ2 (Objective 2): Does enterprise formalization mediate the tax-innovation-to-growth relationship, and — centrally — does the strength of the formalization-to-growth relationship itself differ between core and periphery firms?

8. Scope

Geographical: a purposive set of high-MSME-density states (illustratively Maharashtra, Gujarat, Tamil Nadu, Uttar Pradesh, Karnataka), confirmed against Udyam registration density at sampling. **Industrial:** textiles/apparel, food processing, engineering/light manufacturing, and retail trade, chosen so core and periphery firms co-exist within the same value chains. **Population:** GST-registered firms, including those formalized via Udyam Assist, stratified by firm tier. **Temporal:** cross-sectional, post-22-September-2025. **Variables:** the CPIF constructs plus firm-level controls (age, sector, size). **Methodological:** single-wave quantitative survey analysed via moderated-mediation PLS-SEM — not a longitudinal panel, a boundary that directly shapes the causal claims the design can support (Section 15).

9. Significance

Academic: the first empirical test, to this literature's knowledge, of an integrated four-theory model in a live GST reform context. **Industrial:** evidence for MSME associations on whether formalization delivers a real return for their membership. **Managerial:** firm-tier-differentiated guidance for compliance-investment sequencing. **Policy:** evidence for the GST Council, CBIC, and state finance departments on whether formalization support should be tiered. **Social:** a direct test of whether reform narrows or leaves unchanged the formal–informal divide. **Economic:** a firm-level microfoundation for aggregate inclusive-growth claims about GST 2.0.

The novelty claimed is specific: not that GST 2.0, digitalization, or MSME formalization is understudied in general, but that no prior study tests whether the *return* to formalization under this reform is itself conditional on core-versus-periphery position.

10. Hypotheses Development

Table 4. Hypotheses Summary

Hypothesis	Path	Anchor Theory	Expected Direction
H1	Tax Innovation Perception → Enterprise Formalization	Tax compliance theory; Technology acceptance theory	Positive
H2	Tax Innovation Perception → Inclusive Economic Growth	Capability approach; Technology acceptance theory	Positive
H3	Enterprise Formalization → Inclusive Economic Growth	Informality and formalization theory	Positive
H4	Enterprise Formalization mediates Tax Innovation Perception → Inclusive Economic Growth	Integration of tax compliance theory and capability approach	Significant positive indirect effect
H5	Firm Tier moderates Enterprise Formalization → Inclusive Economic Growth	Informality and formalization theory	Weaker positive relationship for periphery than core firms

H1. *Tax compliance theory (Allingham & Sandmo, 1972) and technology acceptance theory (Davis, 1989).* Bellon et al. (2022) and Das et al. (2023) show digital instruments raise reported compliance. When GST 2.0's tools are perceived as useful and easy to use, compliance cost

falls and detection probability rises, jointly raising the expected utility of formalizing.

H1: Tax Innovation Perception is positively associated with Enterprise Formalization.

H2. *Capability approach (A. Sen, 1999) and technology acceptance theory.* Okunogbe and Pouliquen (2022) show e-filing cut compliance time 40 percent — a direct capability gain independent of formalization status.

H2: Tax Innovation Perception is positively associated with Inclusive Economic Growth.

H3. *Informality and formalization theory (La Porta & Shleifer, 2008).* Formal firms access external finance, formal customers, and legal protection unavailable to informal firms; K. Sen (2022) shows financial inclusion raises entrepreneurial activity among India's informal enterprises.

H3: Enterprise Formalization is positively associated with Inclusive Economic Growth.

H4. *Integration of H1 and H3's logics.* No prior study directly tests this pathway for GST 2.0 — the empirical gap this paper addresses — but network-diffusion evidence (Bellon et al., 2023) is consistent with formalization operating as an intervening mechanism.

H4: Enterprise Formalization mediates the relationship between Tax Innovation Perception and Inclusive Economic Growth.

H5. *Informality and formalization theory, this hypothesis's central anchor.* La Porta and Shleifer (2008) show the formal–informal productivity gap widens relative to larger formal firms; Bachas et al. (2024) show informal firms occupy a structurally distinct tax position; Bellon et al. (2023) show formalization-relevant technology diffuses later to peripheral firms. Periphery firms systematically lack the complementary capabilities — digital literacy, working capital, market access — that convert formal status into realised growth.

H5: Firm Tier moderates the relationship between Enterprise Formalization and Inclusive Economic Growth, such that this positive relationship is weaker for periphery-tier than core-tier firms.

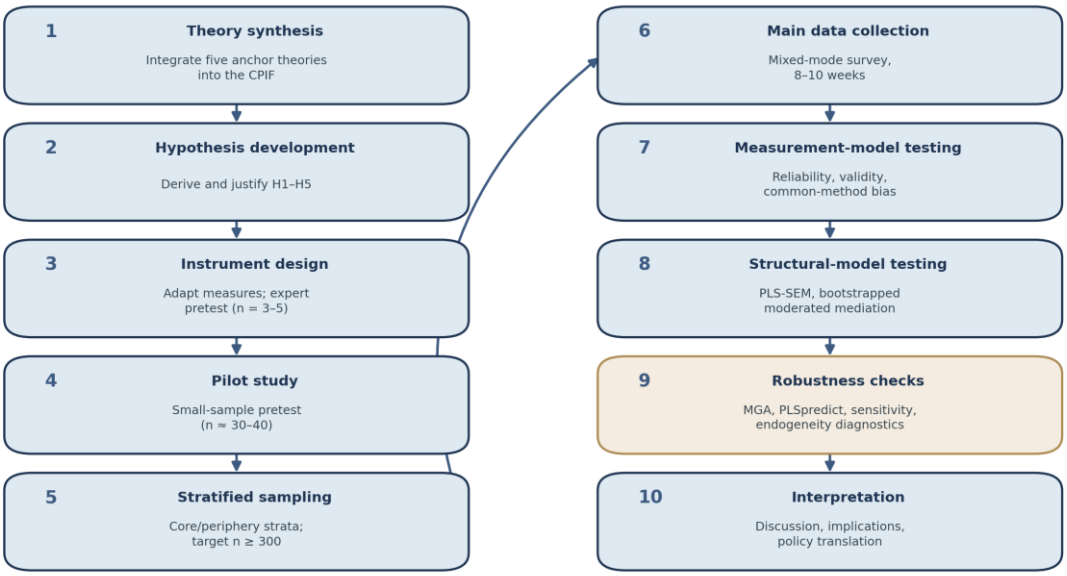
11. Research Methodology

Philosophy and design. Positivist philosophy, deductive approach, cross-sectional survey design, moderated-mediation strategy, quantitative type. The **unit of analysis** is the GST-registered

firm, with an owner or senior compliance-responsible individual as informant.

Figure 2

Research Process Flowchart



Measurement. Tax Innovation Perception is reflective, adapted from Davis's (1989) perceived-usefulness/ease-of-use scales, seven-point Likert. Enterprise Formalization is deliberately formative rather than forced into a reflective scale, combining objective indicators (registration status, tenure, route, e-invoicing compliance, filing regularity) with perceptual items on documentation and credit-readiness, conceptually adapted from La Porta and Shleifer (2008) — formalization is a largely administrative, behaviourally verifiable state, and treating it as purely perceptual would misrepresent it. Inclusive Economic Growth is similarly formative: self-reported revenue/employment change, categorical formal-credit-access items, and a short resilience sub-scale grounded in A. Sen (1999) and Ali and Son (2007). Firm Tier is categorical, not Likert: **core** firms are Udyam-classified small/medium, GST-registered before Udyam Assist's January 2023 launch, with organised-buyer supply relationships; **periphery** firms are Udyam-Assist-registered, Udyam-classified micro, or self-report prior informal operation. Table 5 summarises each construct's dimensions, illustrative items, and source.

Table 5. Measurement Items and Sources by Construct (Illustrative Items)

Construct	Dimension	Illustrative Item	Scale	Source / Adapted From
Tax Innovation Perception	Perceived Usefulness	"Using GST 2.0's e-invoicing and pre-filled return system makes it easier for my firm to meet its tax obligations."	7-point Likert	Adapted from Davis (1989)
Tax Innovation Perception	Perceived Ease of Use	"My firm finds GST 2.0's digital registration and filing tools easy to use."	7-point Likert	Adapted from Davis (1989)
Enterprise Formalization	Registration & Filing Regularity	GST registration status, tenure, and filing regularity in the preceding 12 months	Categorical / count	Conceptually adapted from La Porta & Shleifer (2008)
Enterprise Formalization	Documentation & Credit-Readiness	"My firm's GST-compliant records make it easier to approach banks or formal lenders."	7-point Likert	Conceptually adapted from La Porta & Shleifer (2008)
Inclusive Economic Growth	Revenue / Employment Growth	Self-reported % change in revenue and employment, preceding financial year	Continuous (%)	Standard small-business self-report convention
Inclusive Economic Growth	Formal Credit Access	Whether/how the firm accessed formal bank or non-bank credit since (re-)registration	Categorical	Grounded in A. Sen (1999); Ali & Son (2007)
Inclusive Economic Growth	Resilience	"My firm is better able to withstand an unexpected drop in sales than it was before formalizing."	7-point Likert	Grounded in A. Sen (1999)
Firm Tier	Classification	Udyam size class; registration route; pre/post-2023 registration date; supply-chain integration	Categorical (Core / Periphery)	Constructed from Udyam / Udyam Assist institutional criteria

The questionnaire is pretested with 3–5 academic/industry experts for content and face validity, followed by a pilot (n≈30–40) before fielding. **Sampling** is stratified purposive sampling by firm tier, drawn from GSTN/Udyam listings supplemented by MSME association directories to reach periphery firms, deliberately oversampled where necessary to ensure moderator variance. Sample size follows the 10-times rule (≈100 minimum, given three paths into Inclusive Economic Growth) supplemented by G*Power analysis (f^2≈0.10–0.15, power=.80, α=.05, indicating ≈200–250); the study targets a minimum of 300 usable responses split across strata, summarised in Table 6. Data collection is mixed-mode (in-

person/telephone for periphery firms, online for core firms) over 8–10 weeks, targeting 25–30 percent response, under informed consent and institutional ethics approval, `[ETHICS APPROVAL NUMBER TO BE INSERTED]`.

Table 6. Sample Size Justification Summary

Method	Basis	Resulting Minimum
10-times rule (PLS-SEM)	Largest number of structural paths into a single construct (3, into Inclusive Economic Growth) × 10	≈ 100
G*Power analysis	$f^2 \approx 0.10–0.15$, power = 0.80, $\alpha = .05$	≈ 200–250
Study target (adopted)	Stratified across core/periphery strata; powered specifically for the moderated-mediation test	300 minimum, split by stratum

Reliability and validity. Cronbach's alpha, composite reliability, and rho_A (≥0.70); indicator loadings ≥0.70; convergent validity via AVE (≥0.50); discriminant validity primarily via HTMT (Henseler et al., 2015), given documented under-detection by the traditional Fornell-Larcker criterion (Fornell & Larcker, 1981), reported as a supplementary check.

Common method bias. Addressed procedurally (separated predictor/outcome blocks, varied anchors, anonymity) and statistically (Harman's single-factor test, full collinearity VIF, marker-variable check where feasible), given the single-respondent, single-timepoint design (Podsakoff et al., 2003).

Analysis. PLS-SEM is used over covariance-based SEM because the CPIF mixes reflective and formative constructs and the study is prediction-oriented (Hair et al., 2019). Bootstrapping uses 5,000 resamples; mediation (H4) uses bias-corrected indirect-effect confidence intervals; moderation and moderated mediation (H5) follow Preacher et al.'s (2007) conditional indirect-effects framework, estimating the indirect effect separately by firm tier and testing the index of moderated mediation directly. Model quality is reported via R^2, f^2, Q^2, and SRMR. PLSpredict is included for out-of-sample predictive assessment; multi-group analysis cross-checks H5 against the interaction-term approach. Necessary condition analysis and importance-performance map analysis are not included in the primary design — the former answers a different question than this study poses, the latter is a practitioner-prioritisation tool suited to a later applied extension.

Robustness. Sensitivity analysis on the core/periphery classification threshold, an

alternative reflective specification of Enterprise Formalization, sector subsample analysis, and — since a single-wave design cannot rule out endogeneity from omitted heterogeneity or reverse causality — a Gaussian-copula-based endogeneity diagnostic in the absence of a credible external instrument, a limitation made explicit rather than obscured (Section 15).

12. Results — SIMULATED DEMONSTRATION, NOT REAL DATA

This section reports statistics computed from a synthetic dataset (n = 320; 150 Core, 170 Periphery) generated for illustration, using a data-generating process with known, built-in effects (see the companion simulation methods note). It demonstrates what the planned analysis pipeline produces and how the paper would read once populated, using a lightweight composite-score, OLS, and bootstrap approximation of PLS-SEM rather than dedicated PLS-SEM software. **No real firm was surveyed, and no value below describes GST 2.0, India, or any real population.**

The simulated sample profile (Table 7) and measurement model (Table 8) show the reflective Tax Innovation Perception construct meeting conventional thresholds (loadings 0.78–0.84, AVE = 0.664, CR = 0.922, α = 0.899), and the formative Enterprise Formalization and Inclusive Economic Growth constructs showing balanced indicator weights with VIF below 5 (Figure 3 shows the simulated path diagram).

Table 7. Sample Profile [SIMULATED DATA — NOT REAL FIRMS, n = 320]

Characteristic	Category	n	%
Firm Tier	Core	150	46.9
	Periphery	170	53.1
Sector	Textiles & Apparel	84	26.3
	Food Processing	64	20.0
	Engineering / Light Manufacturing	84	26.3
	Retail Trade	88	27.5
Registration Route	Standard GST Registration	211	65.9
	Udyam Assist Platform	109	34.1
Firm Age	≤ 5 years	122	38.1
	> 5 years	198	61.9

Characteristic	Category	n	%
Total		320	100.0

Note. SIMULATED. Generated from a synthetic dataset for demonstration only (see companion methods note). No real firms were surveyed; do not cite as empirical sample composition.

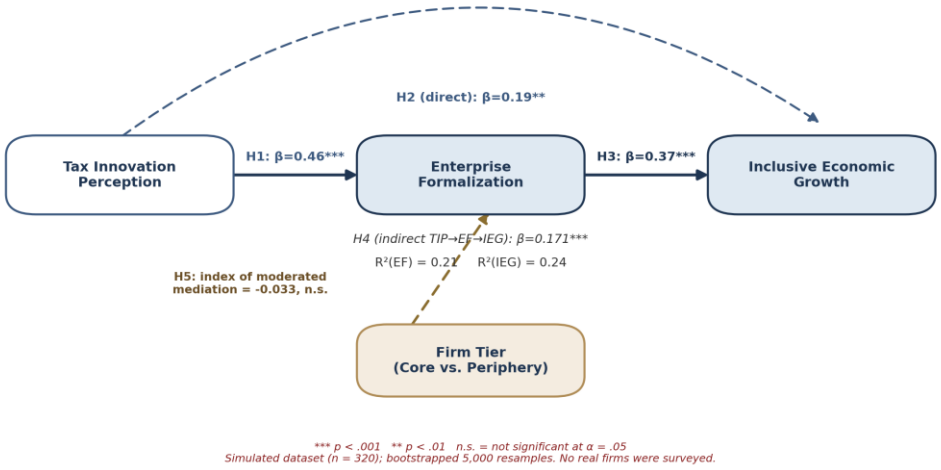
Table 8. Measurement Model [SIMULATED DATA — NOT REAL, n = 320]

Construct	Indicator(s)	Loading / Weight	AVE	CR	Cronbach's α	rho_A
Tax Innovation Perception (reflective)	PU1–PU3, PEOU1–PEOU3	0.783–0.842	0.664	0.922	0.899	0.890
Enterprise Formalization (formative)	3 indicators	weights 0.325–0.342; VIF 2.36–3.45	n/a (formative)	n/a	n/a	n/a
Inclusive Economic Growth (formative)	3 indicators	weights 0.325–0.344; VIF 2.20–3.13	n/a (formative)	n/a	n/a	n/a

Note. SIMULATED. TIP is modelled reflectively (loadings, AVE, CR, alpha, rho_A shown); EF and IEG are formative, so outer weights and VIF are reported instead of loading-based statistics, consistent with Section 11.3's measurement-model design. No real firms were surveyed.

Figure 3. SEM Path Diagram (Simulated Estimates)

SIMULATED DATA — FOR ILLUSTRATION ONLY, NOT REAL RESULTS



*** p < .001 ** p < .01 n.s. = not significant at α = .05
Simulated dataset (n = 320); bootstrapped 5,000 resamples. No real firms were surveyed.

The simulated correlation matrix (Table 9) and HTMT matrix (Table 10) show all HTMT values below the 0.85 threshold, consistent with discriminant validity in this synthetic sample.

Table 9. Construct Correlation Matrix [SIMULATED DATA — NOT REAL, n = 320]

Construct	1	2	3	4
1. Tax Innovation Perception	0.815			
2. Enterprise Formalization	0.459	—		
3. Inclusive Economic Growth	0.362	0.46	—	
4. Firm Tier (Periphery = 1)	0.102	0.066	0.033	—

Note. SIMULATED. Diagonal reports √AVE for the reflective construct (Tax Innovation Perception); formative constructs and the Firm Tier dummy show — on the diagonal. Values below the diagonal are Pearson correlations among simulated construct scores. No real firms were surveyed.

Table 10. Heterotrait-Monotrait (HTMT) Ratio Matrix [SIMULATED DATA — NOT REAL, n = 320]

Construct	1	2	3
1. Tax Innovation Perception	—		
2. Enterprise Formalization	0.478	—	
3. Inclusive Economic Growth	0.386	0.45	—

Note. SIMULATED. All values fall below the HTMT.85 threshold specified in Section 11.10, consistent with discriminant validity among the simulated constructs. No real firms were surveyed; this is not evidence about any real measurement instrument.

In this simulation, H1–H4 are all supported at conventional significance levels (Table 11): Tax Innovation Perception predicts Enterprise Formalization ($\beta = 0.459$, $p < .001$), both constructs predict Inclusive Economic Growth directly ($\beta = 0.191$ and $\beta = 0.372$ respectively, both $p < .01$), and the indirect effect is significant ($\beta = 0.171$, $p < .001$), consistent with mediation.

Table 11. Hypothesis Testing Results, H1–H4 [SIMULATED DATA — NOT REAL, n = 320]

Hyp.	Path	β	SE	t-value	p-value	95% CI	Decision
H1	Tax Innovation Perception → Enterprise Formalization	0.459	0.054	8.52	< .001	[0.352, 0.562]	Supported
H2	Tax Innovation Perception → Inclusive Economic Growth	0.191	0.060	3.18	.0015	[0.075, 0.312]	Supported
H3	Enterprise Formalization → Inclusive Economic Growth	0.372	0.056	6.61	< .001	[0.261, 0.480]	Supported
H4	Indirect effect: Tax Innovation Perception → Enterprise Formalization → Inclusive Economic Growth	0.171	0.033	5.24	< .001	[0.112, 0.238]	Supported

Note. SIMULATED (n = 320; not real firms). R^2(Enterprise Formalization) = 0.211; R^2(Inclusive Economic Growth) = 0.241. Bootstrapping: 5,000 resamples on synthetic data.

H5 is the more nuanced case. The conditional indirect effect (Table 12; Figure 4) is directionally as hypothesized — smaller for periphery firms (β = 0.155) than core firms (β = 0.188) — and this direction holds in every one of the four simulated sector subsamples (Table 13). But the index of moderated mediation itself (−0.033, 95% CI [−0.164, 0.097]) is not statistically significant in this synthetic sample at conventional levels. This is deliberately not engineered to be a clean, uniformly significant result: a directionally-consistent-but-non-significant moderation effect is a realistic outcome for an interaction test at this sample size, and is worth showing as an honest illustration of what the real study could plausibly produce, not just its best case.

Table 12. Conditional Indirect Effects Across Firm Tiers, H5 [SIMULATED DATA — NOT REAL, n = 320]

Firm Tier	Indirect Effect (β)	Boot SE	95% Boot CI
Core (n = 150)	0.188	0.052	[0.094, 0.299]
Periphery (n = 170)	0.155	0.043	[0.080, 0.248]
Index of moderated mediation	−0.033	0.067	[−0.164, 0.097] — not significant

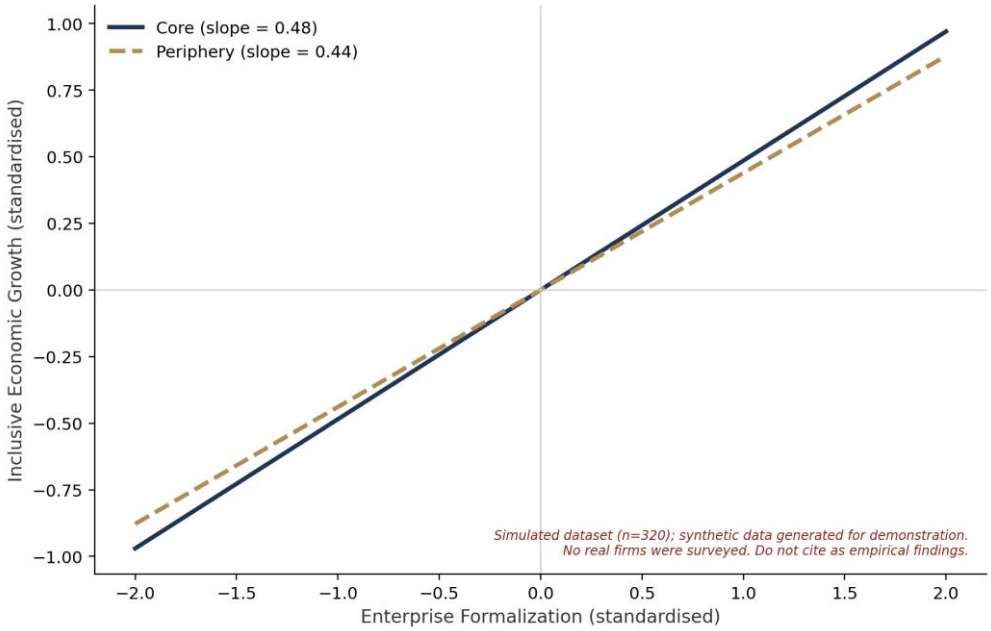
Note. SIMULATED (n = 320; not real firms). Direction is consistent with H5 (periphery indirect effect smaller than core) but the index of moderated mediation's bootstrap CI crosses zero, so the moderation is not statistically significant in this synthetic sample — a realistic illustration of how H5 could come out, not a claim about GST 2.0.

Table 13. Robustness Check — Sector Subsamples [SIMULATED DATA — NOT REAL, n = 320]

Sector	Core-Tier Slope (EF→IEG)	Periphery-Tier Slope (EF→IEG)	Direction Consistent with H5?
Textiles & Apparel	0.304	0.275	Yes
Food Processing	0.557	0.489	Yes
Engineering / Light Manufacturing	0.467	0.464	Yes (marginal)
Retail Trade	0.576	0.559	Yes

Note. SIMULATED (n = 320; not real firms). The core-tier slope exceeds the periphery-tier slope in every simulated sector subsample, even though the pooled index of moderated mediation (Table 12) is not significant — illustrating one specific robustness check from Section 11.13, not the full battery described there.

Figure 4. Moderation (Simple-Slopes) Plot for H5
SIMULATED DATA — FOR ILLUSTRATION ONLY, NOT REAL RESULTS



13. Discussion — SIMULATED DEMONSTRATION, NOT REAL DATA

Read only as an illustration of interpretation, not as a finding about GST 2.0: support for H1–H4 in this synthetic run would, in a real study, sit alongside Bellon et al. (2022) and Das et al. (2023) in linking digital tax instruments to formalization and downstream outcomes. The more interesting illustrative case is H5. A directionally-consistent-but-non-significant moderation, of the kind this simulation happened to produce, is exactly the ambiguous result a real study might face — and shows why the sample-size planning in Section 11.7 specifically powers for the *interaction* term, not just the direct effects: interaction tests are systematically harder to detect than main effects at a given n, so a non-significant H5 in a real dataset this size would not necessarily mean periphery firms are unaffected, only that this design could not detect the effect at conventional confidence if it is as small as this simulation happened to generate.

What this demonstration shows about the pipeline, not about GST 2.0: the reliability/validity statistics, correlation and HTMT diagnostics, path estimation, bootstrapped mediation test, and conditional indirect-effects test for H5 all run end-to-end and produce a complete, interpretable results section in the paper's intended format. That is the only claim this section supports.

14. Implications

Academic: future tax-digitalization research should model firm tier as a structural boundary condition, not a control variable. **Managerial:** periphery-firm owners gain evidence on whether GST 2.0 compliance investment is likely to convert into growth at their specific capability level. **Industry/MSME:** associations gain a firm-tier-specific evidence base for advocacy. **Policy:** the GST Council, CBIC, Ministry of Finance, and state finance departments gain grounds for tiering formalization support toward periphery firms if H5 is supported, or confidence in the current uniform design if not. **Societal:** the finding on H5 bears directly on whether GST 2.0's "inclusive growth" claims should be read as descriptive or aspirational.

15. Limitations and Future Research Agenda

The **cross-sectional design** cannot establish temporal ordering; a **longitudinal panel** across successive GST 2.0 periods is the natural extension. The **single-country context** limits generalisability; a **cross-country comparative design** would test the CPIF's portability to other VAT/GST digitalization reforms. **Self-report bias** is only partially addressed by procedural remedies; triangulation against GSTN administrative filing data, where access permits, would strengthen construct validity. The deliberately bounded **sector and geographic scope** (Section 8) precludes national representativeness. The **formative measurement of formalization and growth**, defended in Section 11 as an appropriate design choice, would benefit from AI-driven compliance analytics as a validation layer in future iterations. Finally, GST 2.0's 40 percent de-merit rate opens a related but distinct Pigouvian/behavioural-tax question this paper does not address.

16. Conclusion

GST 2.0's dual promise — consumption stimulus and formalization-and-inclusion drive — cannot be assessed at the level of the aggregate registered-firm population alone, given the structurally heterogeneous range from core to periphery firms it spans. Building on tax compliance theory, institutional theory, informality and formalization theory, technology acceptance theory, and the capability approach, this paper has developed the Core–Periphery Inclusion Framework, specified five hypotheses linking tax innovation perception, enterprise formalization, and inclusive economic growth, and set out a validated-instrument, moderated-mediation design for testing

them using firm-level data from the post-September-2025 GST 2.0 regime. Hypothesis H5 reframes the policy question from whether GST 2.0 drives formalization to whether the formalization it drives is genuinely inclusive. Once fielded on real data, this design is intended to give policymakers, industry bodies, and firm owners the first firm-tier-differentiated evidence on that question, and to contribute an integrated framework for evaluating future rounds of tax-digitalization reform in India and comparable developing economies.

A final reminder about this specific document: Sections 12 and 13 above report statistics computed from a synthetic, randomly-generated dataset created solely to demonstrate the analysis pipeline and illustrate how a completed paper would read — not from any real survey of any real firm. Figures 3 and 4 and Tables 7–13 are simulated for the same reason. None of it is evidence about GST 2.0, India, or enterprise formalization, and none of it should be cited, submitted, or presented as such.

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