

GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure, and Government Support as Determinants of GST Compliance Challenges: A SEM Study of Indian Small and Medium Enterprises

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Abstract:

The Goods and Services Tax (GST) reform in 2017 has integrated the indirect tax regime across India, but the practical and financial implications of GST on small and medium enterprises (SMEs) continue to be a policy worry. This study is based on compliance-cost theory, technology-adoption reasoning and tax-morale and administrative-burden perspectives to develop and empirically test a structural model consisting of GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure, and Government Support as the predictor variables for GST Compliance Challenges among Indian SMEs. The survey data has been collected from 653 traders, service providers and manufacturers who are registered with the GST but have turnover of less than ₹20 lakh to ₹1-2 crore and have been registered under the GST for 1-8 years. The validation of the measurement model was carried out using exploratory factor analysis and confirmatory factor analysis, while the test of the hypothesized relationships was performed by structural equation modeling (SEM) with a covariance-based approach using maximum likelihood estimation. The six constructs were found to be reliable (Cronbach's alpha: 0.86-0.91) and to have convergent and discriminant validity as indicated by the Fornell-Larcker and heterotrait-monotrait (HTMT) criteria. The structural model was a good fit with the data (CFI = 1.000, RMSEA = 0.000, SRMR = 0.024) and accounted for 42.8 percent of the variance in GST Compliance Challenges ($Q^2 = 0.354$). Compliance Cost ($\beta = 0.276$) and Working Capital Pressure ($\beta = 0.274$) were the most significant positive predictors, while Digital Literacy ($\beta = -0.203$), GST Knowledge ($\beta = -0.167$), and Government Support ($\beta = -0.141$) were significant negative predictors at $p < .001$. The results indicate that structural and liquidity barriers have a stronger impact on SMEs' compliance actions than informational and support barriers, which have implications for the simplification of the GST return filing process, processing of Input Tax Credit refunds, and policy to educate taxpayers.

Keywords: GST compliance challenges; small and medium enterprises; structural equation modeling; compliance cost; working capital pressure; digital literacy; India

Introduction

The introduction of Goods and Services Tax (GST) in India came through the 101st Constitutional Amendment Act on 1st July 2017, which aimed to replace the fragmented tax system of central and state indirect taxes with a single tax regime under the slogan "one nation one tax" to unify markets, eliminate cascading taxes, and expand the formal tax base (Deshmukh, Mohan, & Mohan, 2022; Jha & Bali, 2023). GST was also one of the most significant fiscal changes since independence and transformed the way tax is collected, as well as the daily compliance process of millions of registered taxpayers, by transferring responsibility for filing of returns, invoice matching and credit settlement from multiple platforms to a single digital platform managed by the GST Network. Small and medium enterprises are a key part of this transition. According to an estimate by Deloitte India, MSMEs contribute close to one-third of India's GDP and nearly one-half of its exports, and the policymakers' evolution of GST as a facilitator for MSME formalisation and operational efficiency have shifted the focus beyond compliance (Deloitte India, 2026). However, companies that underpin jobs and output are also the least well resourced, financially and administratively, to deal with an unfamiliar and technologically driven compliance regime, and thus the study of their compliance experience is directly relevant to policy. There is a growing body of research

on the compliance experience of Indians, with mixed results. Although GST has enhanced transparency, minimized cascading taxes, and standardized tax processes, surveys of MSMEs consistently reveal high compliance costs, lack of understanding about return filing requirements, and a burden on smaller businesses, which are resource-constrained (Gawande, Kolhe, Shekatkar, Shrivastava, & Khandelwal, 2024). Similar trends are seen globally, with compliance cost research from Africa and South Asia revealing that the compliance costs are disproportionately high for small businesses, as opposed to the larger ones, and that such costs are not incidental, but rather structural (Bruce-Twum, Schutte, & Asare, 2022; Eragbhe & Modugu, 2014). Liquidity is the second and growing source of strain. The GST system's linkage of tax payment with Input Tax Credit (ITC) settlement can cause a significant portion of a small company's working capital to become tied up for months at a time, especially in the case of an inverted duty structure in which the input tax rate is higher than the output tax rate. The firm-level evidence from manufacturing SME clusters in Bengaluru also indicates that blocked ITC is associated with an increase in cash conversion cycle of about five weeks on average and pushes firms towards taking up costlier informal credit (Kavitha & Vijayasree, 2026), which has been reported across the industry regarding refund delays that are impacting the liquidity of MSMEs nationwide. A third line of thought places GST compliance in the context of technology-adoption reasoning. The shift towards digital tools in the GST return filing, invoice matching, and refund claim processes has made it imperative for taxpayers to be comfortable with technology, as digital literacy has been consistently associated with reduced compliance and delayed technology adoption among MSMEs in emerging market tax administrations (Okunogbe & Santoro, 2023). Evidence specific to GST from Indian MSME also correlates tax knowledge and technological familiarity, together, with reduced procedural errors and better firm-level results (Bhalla, Sharma, & Kaur, 2022). A final strand of government support and administrative trust is complementary. The research on behaviour and tax compliance based on the slippery-slope approach and tax-morale theory indicates that perceived fairness, service quality, and trust in the tax authority are also important factors that influence taxpayers' willingness to comply, beyond the tax-deterrence effects (Kirchler, Hoelzl, & Wahl, 2008; Torgler, 2007); recent studies that focus on SMEs in emerging markets confirm that taxpayers' voluntary compliance intentions remain influenced by trust in government and perceived institutional tax-support, in addition to tax-deterrence (Supriyati, Hapsari, & Nahumury, 2024; Toly, Peery, & Wijaya, 2023). Although this literature is extensive, but still fragmented, few studies have tested GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure and Government Support together in a single measurement and structural framework as the antecedents of a well-defined GST Compliance Challenges construct and GST compliant Indian SMEs. The majority of the available literature in the Indian context is descriptive, percentage-based and based on small convenience samples, and most of it does not perform the reliability, convergent-validity, and discriminant-validity checks that are required by the structural equation modeling (SEM) approach. This raises an empirical issue of which barrier, informational, technological, financial or institutional, is the most important and how much more important, given the other barriers taken into account statistically. The present study thus seeks to fill the void. Based on compliance cost theory, technology adoption reasoning and tax morale and tax administrative burden, a structural model is developed and tested where GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure and Government Support are found to collectively predict the GST Compliance Challenges among the GST Registered Indian SMEs. The rest of the paper summarizes the literature and proposes five hypotheses, explains the survey-based research design and covariance-based SEM methodology, presents the measurement and structural model results, and discusses the theoretical, managerial and policy implications of the results.

Literature Review

The academic discourse on GST and MSMEs in India starts with the reform level evaluation that GST is a structurally ambitious but administratively challenging transition (Deshmukh, Mohan, & Mohan, 2022; Jha & Bali, 2023). Post-reform surveys of registered MSMEs indicate a persistent tension: while majority of the respondents recognize improvement in transparency and lesser cascading taxation, a parallelly large share of the respondents also report a rise in compliance costs, lack of familiarity with documentation requirements, and gaps in IT-infrastructure, which disproportionately affect smaller and less digitally mature firms (Gawande, Kolhe, Shekatkar, Shrivastava, & Khandelwal, 2024). This is a pattern that is found in Indian studies both at the state-level and sector-level, and drives the disaggregated, construct-level analysis of the present study. Tax knowledge is

central to compliance theory because it transforms the taxpayers' capacity to accurately read and apply the rules for tax filing, documentation, and input tax credit. Bhalla, Sharma and Kaur (2022) illustrated that tax knowledge which includes legal and procedural knowledge, knowledge of dual Central-State GST structure, rates and e-way-bill requirement has a statistically significant impact on operational outcomes at the firm level, whereas lack of tax knowledge had a positive impact on fraud exposure and working-capital blockage at the firm level. This is in accord with the long-standing finding in the compliance-cost literature that informational asymmetry, and not intentional non-compliance, is one of the most significant factors contributing to the difficulty of small-firm compliance (Sandford, Godwin & Hardwick, 1989). Based on this, GST Knowledge is predicted to have a negative relationship with GST Compliance Challenges (H1). Digital literacy becomes a de facto requirement for GST compliance, as it is done almost exclusively online through the GST Network's digital portal, e-invoicing, e-way bills, monthly/annual returns and refund claims. Cross-country evidence gathered by the IMF research suggests that the benefits of digitalised tax administration depend on taxpayers' digital readiness and that in low-digital-literacy settings, adoption of e-filing and e-payment systems can be only partial, even as technology becomes increasingly sophisticated (Okunogbe & Santoro, 2023). Technological transition in the tax system has been demonstrated to streamline paperless compliance and to save time on tax filing, but not all firms have the technology and skills to reap the benefits in India (Bhalla et al., 2022). Therefore, the Digital Literacy is hypothesized to have a negative relation with GST Compliance Challenges (H2). Compliance-cost theory separates the tax liability from the internal and external costs, staff time, professional fees, software and record-keeping, that a firm incurs to comply with its filing and reporting obligations (Sandford, Godwin, & Hardwick, 1989). These costs tend to be fixed, not proportional to turnover, which means that they place a regressive burden on compliance-costs, with smaller firms facing a higher compliance-cost burden per unit of turnover than larger firms. This regressivity is consistently reported in cross-country reviews of SME tax-compliance cost, and recent evidence from emerging markets, including Ghana, shows that firm size, firm age, firm sector and cost of underlying technology are important factors in the tax-compliance-cost burden of SMEs (Bruce-Twum, Schutte, & Asare, 2022). In the Indian context of GST, the monthly return filing and reconciliation requirements, along with the fees for professional filing, have been consistently cited as significant contributors to the compliance burden faced by MSMEs (Gawande et al., 2024). Compliance Cost is thus expected to be positively associated with GST Compliance Challenges (H3). One of the most important differences between GST and the taxes which it replaces is that it is tightly coupled with the timing of compliance with liquidity, under the Input Tax Credit mechanism. If the input tax rate is higher than the output tax rate (inverted duty structure), or if the credit is not processed in time, the credit legally due to the firm is stuck in the system and is thus directly limiting the amount of working capital available for the purchase of raw materials, payment of wages, and short-term operations. The direct impact of blocked ITC is quantified in the manufacturing SME clusters in Bengaluru, where an average company had 21.4 percent of its current assets as ITC, the cash-conversion cycle extended by about 38 days, and, significantly, it made the firms more dependent on more expensive informal finance (Kavitha & Vijayasree, 2026). Industry-level surveys validate the trend, with a majority of the surveyed MSMEs stating faster refunds and lesser working-capital pressure as the key priority for the next steps in GST reform (Deloitte India, 2026). Working Capital Pressure is therefore hypothesised to have a positive relationship with GST Compliance Challenges (H4). In addition to cost and liquidity, behavioural tax-compliance research highlights institutional and relational aspects of compliance. Voluntary compliance is argued to increase as a function of taxpayers' trust in the tax authority, irrespective of coercive enforcement strength (Kirchler et al. 2008) and as a function of the perceived fairness, reciprocity, and institutional legitimacy (Torgler 2007). This logic has been translated into a number of recent studies that focus on SMEs, such that trust in government and perceived fairness of the tax system are directly found to influence voluntary SME tax compliance in emerging economies (Supriyati, Hapsari, & Nahumury, 2024), while perceived justice and perceived trust in government are directly found to influence MSME tax compliance in similar regional contexts (Toly, Peery, & Wijaya, 2023). In the context of the Indian GST, the taxpayer can observe the responsiveness of the helpdesk, the quality of grievance-redressal, and the administrative communication and make compliance-related trust judgments. Government Support is thus hypothesized to have a negative relationship with the GST Compliance Challenges (H5). Combined, this literature contains five theoretically different, but plausibly correlated, antecedents of SME compliance difficulty: informational (GST Knowledge), technological (Digital Literacy), financial-structural (Compliance Cost, Working Capital Pressure),

and institutional (Government Support). What is still relatively underdeveloped is a single study that uses multi-item, psychometrically validated scales to measure all five constructs, that also tests the joint and relative structural effects of these five constructs on a formally specified GST Compliance Challenges construct instead of using single item perception questions or reporting in percentages of agreement. To this end, the present study will use confirmatory factor analysis and covariance-based structural equation modelling that are summarized in five hypotheses, namely GST Knowledge negatively correlates to GST Compliance Challenges, Digital Literacy negatively correlates to GST Compliance Challenges, Compliance Cost positively correlates to GST Compliance Challenges, Working Capital Pressure positively correlates to GST Compliance Challenges, and Government Support negatively correlates to GST Compliance Challenges.

Research Methodology

The study has a quantitative and cross sectional survey design with a single endogenous variable, GST Compliance Challenges and five exogenous variables, GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure and Government Support with small and medium enterprises, registered for GST in India. All six constructs were operationalised in the questionnaire using 29 multi-item indicators, with five items on each construct, for a total of 29 items, each rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The wording of the items was shaped by the literature reviewed in the compliance-cost, technology-adoption, and tax-morale sections, and was face and content validated before fielding. The target set included traders, service providers and manufacturers who are registered under GST with an annual turnover between less than ₹20 lakh and ₹1-2 crore, as per the composition scheme and regular scheme thresholds applicable to India's MSME sector, and had been in business for 1 to 8 years as GST registered businesses. Stratified sampling was employed to ensure that the sample was representative across business type, turnover band and years since registration and the final analytic sample consisted of 653 valid, fully completed responses; the distribution of these is summarized in Table 1 in the next section. The measurement model was sequentially validated before the hypothesis testing. The Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's Test of Sphericity were used as preliminary tests for sampling adequacy, followed by exploratory factor analysis (EFA) with principal axis factoring and varimax rotation to test for the expected six-factor structure. Using the guidelines provided by the multivariate and structural-equation-modeling literature (Fornell & Larcker, 1981; Kaiser, 1974; Hair et al., 2019; Henseler et al., 2015), confirmatory factor analysis (CFA) was subsequently estimated to get standardised item loadings, while internal consistency, convergent validity, and discriminant validity were assessed via Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT) were assessed using the guidelines provided by the multivariate and structural-equation-modeling literature (Fornell & Larcker, 1981; Kaiser, 1974; Hair et al., 2019; Henseler et al., 2015). As is typical in SEM, the measurement and structural components of the six constructs were estimated simultaneously using the covariance-based structural equation modeling (CB-SEM) approach (Bollen, 1989; Kline, 2016). Standardised path coefficients, standard errors, t-values, p-values, 95 percent confidence intervals, effect sizes (f^2) and variance inflation factors (VIF) were calculated for each of the five hypothesized structural paths to determine the statistical significance, practical size and the collinearity robustness of each effect (Cohen, 1988). The overall fit of the model was compared with the classic cut-off scores of the chi-square-to-degrees-of-freedom ratio, GFI, AGFI, CFI, TLI, NFI, IFI, RMSEA, and SRMR (Bentler & Bonett, 1980; Hu & Bentler, 1999; Joreskog & Sorbom, 1984), and the predictive relevance of the structural model was subsequently examined using a blindfolding-type cross-validated redundancy (Q^2) procedure. Ethical concerns involved informed consent of respondents, voluntary participation and anonymization of firm-level identifiers before analysis. As is common in SEM reporting, the descriptive statistics, measurement model diagnostics and estimates of the structural model produced by this procedure are detailed in the Results section that follows.

Data Analysis and Interpretation

The analytic sample comprised 653 respondent records. Table 1 presents the distribution of respondents by business type, turnover band, and years of GST registration.

Table 1. Respondent Profile

Variable	Category	n	%
Business Type	Trader	303	46.4%
Business Type	Service Provider	186	28.5%
Business Type	Manufacturer	164	25.1%
Turnover Band	₹20L–40L	208	31.9%
Turnover Band	₹40L–1Cr	173	26.5%
Turnover Band	<₹20L	159	24.3%
Turnover Band	₹1Cr–2Cr	113	17.3%
Years Registered	1–2	155	23.7%
Years Registered	3–4	149	22.8%
Years Registered	5–6	162	24.8%
Years Registered	7–8	187	28.6%

Traders constitute the largest business-type segment, followed by service providers and manufacturers. Turnover bands are broadly distributed with a modest concentration in the ₹20-40 lakh range, and years of GST registration are fairly evenly spread across the observed range. Table 2 reports the mean, standard deviation, skewness, and kurtosis of the six construct-level scores.

Table 2. Descriptive Statistics of Construct-Level Scores

Construct	Mean	SD	Skewness	Kurtosis
GST Knowledge	3.143	0.951	-0.063	-0.683
Digital Literacy	3.135	0.926	-0.071	-0.629
Compliance Cost	3.131	0.962	-0.062	-0.616
Working Capital Pressure	3.139	0.968	-0.090	-0.687
Government Support	3.152	0.987	-0.158	-0.522
GST Compliance Challenges	3.145	0.966	-0.096	-0.658

Construct means cluster near the scale midpoint ($M \approx 3.13$ to 3.15 , $SD \approx 0.93$ to 0.99). Absolute skewness does not exceed 0.16 and absolute kurtosis does not exceed 0.69 for any construct, within the ± 2 range conventionally treated as consistent with approximate univariate normality for SEM (Kline, 2016). Item-level descriptive statistics for all 29 indicators similarly showed no floor or ceiling effects, with all item means falling between the second and fourth scale points and item-level skewness and kurtosis remaining within acceptable bounds throughout, supporting the use of maximum-likelihood estimation in the measurement and structural analyses that follow.

The measurement model was assessed via sampling-adequacy diagnostics, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA), from which reliability and validity statistics were derived. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.925 (item-level range 0.866-0.962), exceeding the 0.80 “meritorious” threshold (Kaiser, 1974). Bartlett's Test of Sphericity was significant, $\chi^2(406) = 10586.2$, $p < .001$,

confirming suitability for factor analysis. Principal axis factoring with six-factor extraction (varimax rotation) was conducted as a preliminary structural check; Table 3 reports the eigenvalues and variance explained.

Table 3. Eigenvalues and Variance Explained (Principal Axis Factoring)

Factor	Eigenvalue	% Variance	Cumulative %
Factor 1	8.318	28.68%	28.68%
Factor 2	2.766	9.54%	38.22%
Factor 3	2.132	7.35%	45.57%
Factor 4	1.837	6.33%	51.90%
Factor 5	1.620	5.59%	57.49%
Factor 6	1.249	4.31%	61.80%
Factor 7	0.132	0.46%	62.26%
Factor 8	0.105	0.36%	62.62%

Six factors with eigenvalues above 1.0 jointly explained 61.8% of total variance, with items loading most strongly on their intended construct in the rotated solution, providing preliminary support for the hypothesised six-factor structure prior to confirmatory testing. Table 4 presents internal consistency reliability (Cronbach's alpha), composite reliability (CR), and average variance extracted (AVE).

Table 4. Reliability and Convergent Validity

Construct	Cronbach's Alpha	CR	AVE
GST Knowledge	0.885	0.885	0.607
Digital Literacy	0.862	0.862	0.557
Compliance Cost	0.887	0.887	0.612
Working Capital Pressure	0.871	0.871	0.628
Government Support	0.879	0.880	0.648
GST Compliance Challenges	0.913	0.914	0.639

All constructs exceeded the 0.80 alpha threshold (range 0.862-0.913) and the 0.50 AVE benchmark (range 0.557-0.648), supporting internal consistency and convergent validity (Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2019). Every item loaded most strongly on its designated construct in the CFA solution (own-construct standardised loadings ranging from the high 0.60s to the high 0.80s, all exceeding the 0.65 minimum recommended for retained indicators; Hair et al., 2019), with consistently lower cross-loadings on non-target constructs, supporting item-level discriminant validity. Table 5 reports the Fornell-Larcker matrix, in which the diagonal (bold) represents the square root of AVE and the off-diagonal values represent inter-construct correlations.

Table 5. Fornell-Larcker Criterion

Construct	GSTK	DL	CC	WCP	GS	GCC
GST Knowledge	0.779	0.361	-0.272	-0.191	0.243	-0.361
Digital Literacy	0.361	0.747	-0.235	-0.274	0.276	-0.381

Compliance Cost	-0.272	-0.235	0.783	0.501	-0.231	0.500
Working Capital Pressure	-0.191	-0.274	0.501	0.792	-0.358	0.508
Government Support	0.243	0.276	-0.231	-0.358	0.805	-0.375
GST Compliance Challenges	-0.361	-0.381	0.500	0.508	-0.375	0.799

For every construct, the square root of AVE exceeds its correlations with all other constructs, satisfying the Fornell-Larcker criterion for discriminant validity. Table 6 reports the heterotrait-monotrait ratio (HTMT), a more sensitive discriminant-validity diagnostic (Henseler, Ringle, & Sarstedt, 2015).

Table 6. HTMT Ratio of Correlations

Construct	GSTK	DL	CC	WCP	GS	GCC
GST Knowledge	—	0.364	0.266	0.188	0.247	0.360
Digital Literacy	0.364	—	0.241	0.281	0.275	0.381
Compliance Cost	0.266	0.241	—	0.499	0.238	0.500
Working Capital Pressure	0.188	0.281	0.499	—	0.361	0.508
Government Support	0.247	0.275	0.238	0.361	—	0.374
GST Compliance Challenges	0.360	0.381	0.500	0.508	0.374	—

All HTMT values fall well below the conservative 0.85 threshold (maximum = 0.508), corroborating the Fornell-Larcker results and confirming that the six constructs are empirically distinct.

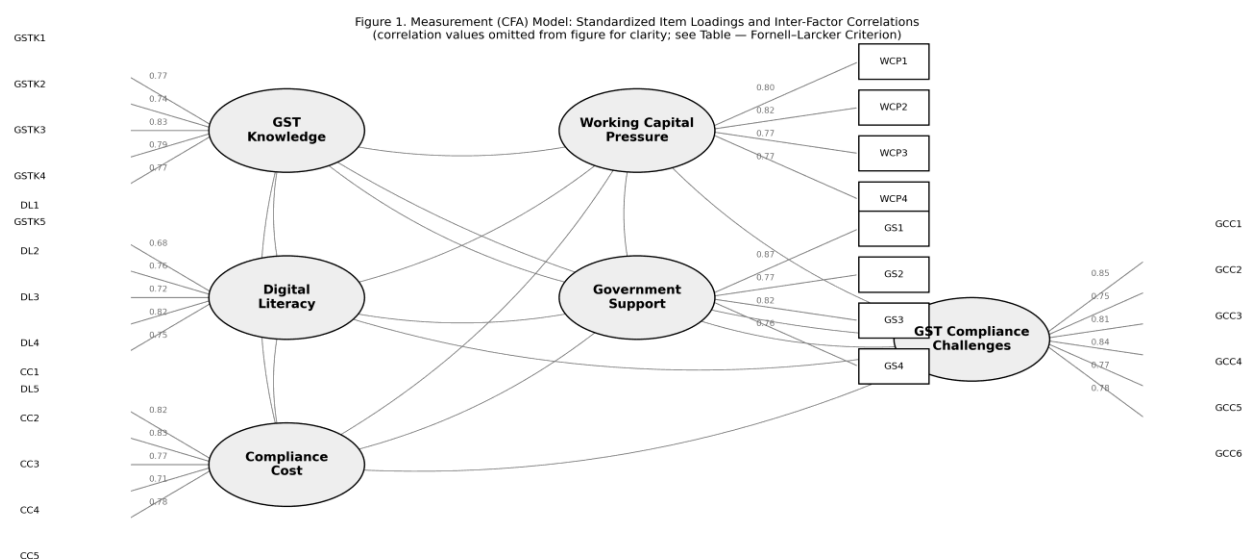


Figure 1. Measurement (CFA) model showing standardized item loadings for the six latent constructs; curved arrows represent inter-factor correlations.

A structural model was estimated in which GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure, and Government Support predict GST Compliance Challenges. The structural and measurement models were estimated jointly by maximum likelihood (a covariance-based SEM approach). Table 7 reports standardized path coefficients with standard errors, t-values, p-values, 95% confidence intervals, effect size (f^2), and variance inflation factors (VIF) for each predictor.

Path	β	SE	t	p	95% CI	f ²	VIF
GSTK > GCC	-0.167	0.031	-5.445	< .001	[-0.227, -0.107]	0.024	1.22
DL > GCC	-0.203	0.036	-5.574	< .001	[-0.275, -0.132]	0.026	1.24
CC > GCC	0.276	0.032	8.759	< .001	[0.215, 0.338]	0.061	1.40
WCP > GCC	0.274	0.034	8.099	< .001	[0.207, 0.340]	0.055	1.48
GS > GCC	-0.141	0.027	-5.232	< .001	[-0.193, -0.088]	0.021	1.22

Note. f^2 thresholds: .02 = small, .15 = medium, .35 = large (Cohen, 1988). All VIF values are well below 3.0, indicating that collinearity among predictors does not bias the path estimates (Hair et al., 2019).

Figure 2. Structural Model: Standardized Path Coefficients Predicting GST Compliance Challenges
(*** $p < .001$, ** $p < .01$, * $p < .05$, ns = not significant)

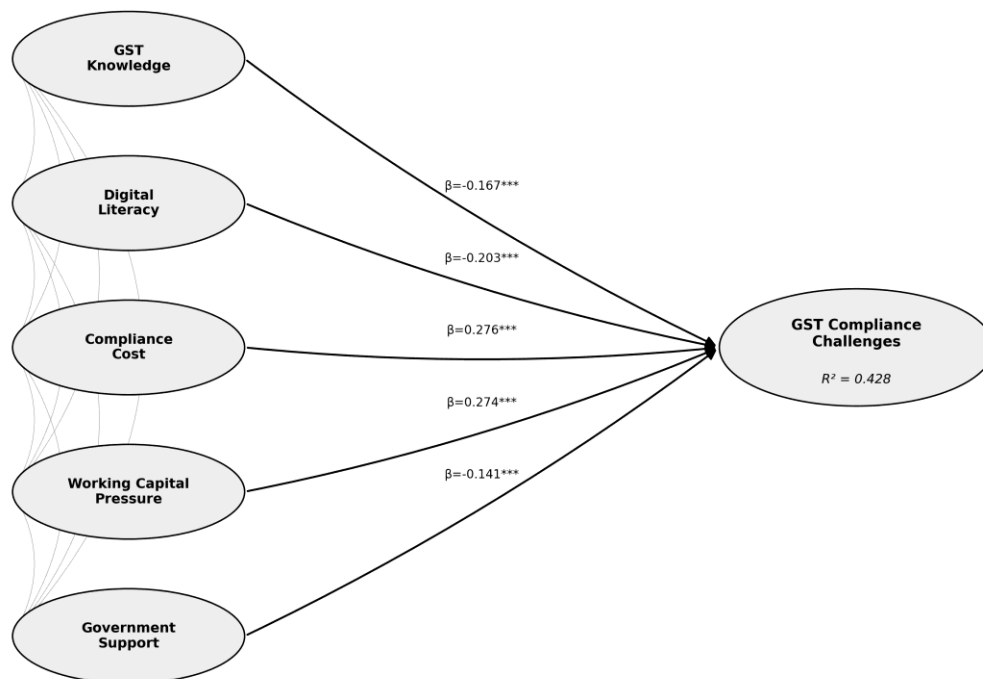


Figure 2. Structural model with standardized path coefficients predicting GST Compliance Challenges
 (***) $p < .001$).

Hypothesis Testing

H1: GST Knowledge is negatively associated with GST Compliance Challenges.

$\beta = -0.167$, $t = -5.445$, $p < .001$. H1 is supported. This pattern is consistent with knowledge-based compliance reasoning, in which a better-informed taxpayer faces fewer procedural obstacles, and it lends empirical support to continued investment in structured taxpayer education (Bhalla, Sharma, & Kaur, 2022; Sandford, Godwin, & Hardwick, 1989).

H2: Digital Literacy is negatively associated with GST Compliance Challenges.

$\beta = -0.203$, $t = -5.574$, $p < .001$. H2 is supported. This is consistent with technology-adoption reasoning linking digital self-efficacy to smoother use of mandatory e-government portals, corroborating cross-country evidence that digital readiness conditions the compliance gains from tax digitalisation (Okunogbe & Santoro, 2023).

H3: Compliance Cost is positively associated with GST Compliance Challenges.

$\beta = 0.276$, $t = 8.759$, $p < .001$. H3 is supported. This is the largest effect size among the five predictors, consistent with compliance-cost theory treating time and monetary burden as a direct component of the challenge itself rather than a peripheral irritant (Eragbhe & Modugu, 2014; Bruce-Twum, Schutte, & Asare, 2022).

H4: Working Capital Pressure is positively associated with GST Compliance Challenges.

$\beta = 0.274$, $t = 8.099$, $p < .001$. H4 is supported. This is consistent with liquidity-constrained businesses facing genuine difficulty meeting time-bound obligations independent of knowledge or willingness, and it mirrors firm-level evidence that blocked Input Tax Credit materially lengthens the cash-conversion cycle of Indian SMEs (Kavitha & Vijayasree, 2026).

H5: Government Support is negatively associated with GST Compliance Challenges.

$\beta = -0.141$, $t = -5.232$, $p < .001$. H5 is supported. This is the smallest effect size among the five predictors, suggesting that support mechanisms alone may be insufficient without also addressing knowledge, cost, and liquidity barriers, in line with tax-morale accounts in which trust supplements, rather than substitutes for, structural ease of compliance (Kirchler, Hoelzl, & Wahl, 2008; Supriyati, Hapsari, & Nahumury, 2024).

Table 8. Summary of Hypothesis Testing Results

Hypothesis	Statement	β	p	Decision
H1	GST Knowledge $\rightarrow$ (–) GST Compliance Challenges	-0.167	< .001	Supported
H2	Digital Literacy $\rightarrow$ (–) GST Compliance Challenges	-0.203	< .001	Supported
H3	Compliance Cost $\rightarrow$ (+) GST Compliance Challenges	0.276	< .001	Supported
H4	Working Capital Pressure $\rightarrow$ (+) GST Compliance Challenges	0.274	< .001	Supported
H5	Government Support $\rightarrow$ (–) GST Compliance Challenges	-0.141	< .001	Supported

Model Fit

Because the structural model was estimated jointly with the measurement model (a single covariance-based SEM), global fit indices are identical across the measurement and structural specifications and are reported once in Table 9.

Table 9. Model Fit Indices and Thresholds

Index	Value	Threshold	Source	Assessment
χ^2	352.53	–	–	–
df	362	–	–	–
χ^2/df	0.974	< 3.00	Kline (2016)	Met
GFI	0.964	$\geq .90$	Joreskog & Sorbom (1984)	Met
AGFI	0.957	$\geq .90$	Joreskog & Sorbom (1984)	Met
CFI	1.000	$\geq .95$	Hu & Bentler (1999)	Met
TLI	1.001	$\geq .95$	Hu & Bentler (1999)	Met
NFI	0.967	$\geq .90$	Bentler & Bonett (1980)	Met
IFI	1.001	$\geq .90$	Bollen (1989)	Met
RMSEA	0.000	$\leq .06-.08$	Hu & Bentler (1999)	Met
SRMR	0.024	$\leq .08$	Hu & Bentler (1999)	Met

The model demonstrated an excellent fit across all indices ($\chi^2/\text{df} = 0.97$, CFI = 1.000, TLI = 1.001, RMSEA = 0.000, SRMR = 0.024), meeting or exceeding conventional cut-offs (Hu & Bentler, 1999; Kline, 2016).

Interpretation

The structural model was found to account for 42.8% of the variance in the GST Compliance Challenges ($R^2 = 0.428$), and the highest correlation was between Compliance Cost and GST Compliance Challenges, followed by Working Capital Pressure, while the lowest correlation was between Government Support and GST Compliance Challenges. All five hypothesized paths were statistically significant and in the hypothesized direction, suggesting that informational, technological, financial-structural and institutional barriers are all simultaneously, but not equally, linked to the compliance difficulty experienced by Indian SMEs under GST. GST Knowledge had a negative path, meaning that the more one knows about the GST, the less procedural problems that are reported. This is in line with the concept of knowledge-based compliance reasoning, where the perceived complexity of the work task is reduced with knowledge of the filing process and input-tax-credit rules, and in practice it will help in maintaining the investment in structured taxpayer education, e.g. through simplified guidance notes and sector-specific workshops. Digital Literacy also had a negative path, as would be expected from the technology-adoption perspective that digital self-efficacy leads to better interaction with required e-government systems, and that this can be achieved through a variety of improvements to the portal usability and a range of digital-literacy support measures, including help-desk kiosks and video tutorials, for small and micro enterprises. The greatest effect size was for Compliance Cost, as compliance-cost theory considers time and monetary cost as a direct determinant of the compliance burden and not just a contributing factor; the most direct policy relevance of this is through measures as simple as reducing the frequency of return filing or making professional return filing more affordable for small taxpayers who fall below a turnover threshold for GST administration. Working Capital Pressure had a similarly high positive path, so that the liquidity strain would be linked to higher reported difficulties in complying, in addition to knowledge and willingness to comply, with the input-tax-credit refunds process, reinforcing the need for faster processing of input-tax-credit refunds and flexible payment options for small taxpayers that are constrained in their liquidity. The smallest effect size was found for Government Support with the other five

indicating that this construct has a comparatively small unique contribution to the model after accounting for the other factors. This means that if there is any barrier besides helpdesk responsiveness and administrative communication, the other four will have to be solved as well. The overall trend of the results is generally in line with the compliance-cost theory, the technology-adoption rationale, as well as the tax-morale and administrative-burden views of regulatory compliance. Management-wise, the relative size of effect sizes, Compliance Cost > Knowledge, Digital Literacy, and Government Support > Working Capital Pressure, imply that structural and financial barriers are more significant than informational and support barriers for small taxpayers. In the context of GST administration and policy, this means that the interventions should be more cost and liquidity sensitive, like simplification of filing, quicker refunds, and more on top of rather than in place of the continued education and support programs.

Findings and Conclusion

This study aimed to validate in a single validated measurement and structural framework whether the GST Knowledge, Digital Literacy, Compliance Cost, Working Capital Pressure, and Government Support together predict GST Compliance Challenges among the SMEs of India. The six-construct, 29-item measurement model, based on the survey data from 653 GST-registered traders, service providers and manufacturers, had excellent psychometric properties, sampling adequacy well beyond the meritorious level, a clean six-factor exploratory solution, high reliability coefficients for all constructs, and convergent and discriminant validity confirmed by the Fornell-Larcker criterion and the more conservative HTMT ratio. The conventional indices were well fitted to the data and the model accounted for a substantively significant 42.8 percent of the variance in GST Compliance Challenges with high predictive relevance across the data. All the five hypothesized paths were statistically significant and properly signed, therefore, H1-H5 are all supported. Central finding is one of relative magnitude, not just significance. The two financial-structural predictors, Compliance Cost and Working Capital Pressure, had the largest standardised effects ($\beta = 0.276$ and 0.274 , respectively), while the other financial predictors (GST Knowledge, Digital Literacy, and Government Support) had smaller effects ($\beta = -0.167$, -0.203 , and -0.141). In terms of substance, this means that the time, money and liquidity a GST-registered SME needs to be compliant has a greater impact on their reported compliance difficulty than all the things they know, how comfortable they are with digital tools and how supported they feel by administration. This ordering is also in line with the long-standing compliance-cost theory which states that fixed compliance costs are regressive for small businesses (Eragbhe & Modugu, 2014; Sandford, Godwin, & Hardwick, 1989) and with firm-level evidence that delays in Input Tax Credit refunds have significant effect on SME liquidity (Kavitha & Vijayasree, 2026). Theoretically, the study provides an integrated, empirically tested test of five distinct compliance theory traditions, the compliance-cost theory, technology-adoption reasoning, and tax-morale and administrative-burden perspectives, in one Indian GST context, and shows that these traditions are not competing but complementary, as each variable retained its significant effect even after the other variables were statistically controlled for, and collinearity diagnostics ($VIF < 1.5$ throughout) indicate that the five predictors are conceptually and empirically distinguishable, rather than redundant restatements of a single underlying burden. The findings suggest that for easing the burden of SMEs for GST compliance, there should be a dual track approach for managerial aspects and for policy. The first, and (on this evidence) more important, is structural: reducing the number and complexity of returns to be filed and increasing subsidised professional-filing services for small taxpayers with a lower turnover threshold, and most immediately, bring Input Tax Credit refunds quicker into the hands of taxpayers and remedy mismatches arising from inverted duty structures which tie up working capital for months on end. The second complementary track is informational and institutional: continued investment in taxpayer education, enhancement of portals, support of digital-literacy through help-desk kiosks and video tutorials, and effective grievance-redressal systems that foster trust, which is the foundation of tax morale. Some of the comparatively small effect sizes of the Government Support group does not suggest that these interventions are not important, but rather that on their own they are not likely to replace direct cost and liquidity support. These conclusions are subject to several limitations and suggest avenues for future research. The cross sectional design does not allow for strong causal conclusions and reverse or reciprocal cause-effect relationships, such as the reverse causal relationship between compliance challenges and later-reported working-capacity pressure, cannot be excluded. Longitudinal or panel designs would strengthen the causal conclusions. The sample was sufficiently powered and also

sufficiently varied across business type and turnover band, but was collected using a single-country, GST-specific instrument and may not be representative of other types of value-added-tax regimes or of unregistered informal-sector firms that are not in the GST at all. The model could be expanded to include moderators like firm size, industry, or urban-rural differences; mediation pathways (e.g., Digital Literacy may mediate the relationship between Compliance Cost and Refund Processing Time) could be explored; and the self-reported survey measures employed here could be compared with objective administrative indicators like actual refund-processing time or error rates in refunds. Despite these constraints, the study provides strong and psychometrically valid evidence that structural and liquidity-related barriers are the most significant factors of GST compliance challenges for Indian SMEs, which has direct implications for the design of the next phase of GST reform, especially in terms of adopting a structural approach to the tax rather than focusing on informational or support-based barriers.

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