

Studying the Impact of GST Adoption on Performance of Small-Scale Businesses in India: An Empirical Analysis Using Partial Least Squares Structural Equation Modeling

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Abstract

One of the most important aspects of India's tax system is the Goods and Services Tax (GST), which is a comprehensive tax on goods and services that has the potential to revolutionize tax procedures and promote economic growth. This study investigates the impact of Goods and Services Tax (GST) adoption on the performance of small-scale businesses in India, utilizing the Innovation Diffusion Theory (IDT) and incorporating employee trust as a moderating variable. Employing Partial Least Squares Structural Equation Modeling (PLS-SEM), the analysis draws on 330 valid responses from an initial 500 surveyed participants. The structural model results indicate that relative advantage ($\beta = 0.392$, $p < 0.000$), complexity ($\beta = 0.332$, $p < 0.000$), and compatibility ($\beta = 0.170$, $p < 0.002$) significantly influence GST adoption (GA), whereas observability ($\beta = 0.093$, $p < 0.096$) does not. Furthermore, GST adoption positively impacts financial performance (FP) ($\beta = 0.290$, $p < 0.000$), and employee trust (ET) significantly moderates this relationship ($\beta = 0.461$, $p < 0.000$). This research provides valuable insights into the dynamics of GST adoption, emphasizing the critical role of employee trust in enhancing organizational performance. Policymakers and business leaders can leverage these findings to foster a supportive environment for GST implementation, ultimately driving business growth and compliance in the small-scale sector.

Keywords: Firm Performance, GST, IDT, Adoption, PLS-SEM

1. Introduction

The Goods and Services Tax (GST) stands as a monumental fiscal reform, both in India and globally, aiming to streamline the taxation system and foster economic growth (Nayyar & Singh, 2018). Introduced in India on July 1, 2017, GST replaced a plethora of indirect taxes levied by the central and state governments, unifying the taxation structure under a single regime (Majumder et al., 2021). This move towards a uniform tax framework mirrors global trends, where several countries have adopted similar reforms to enhance efficiency, transparency, and ease of doing business. GST operates as a value-added tax levied on the consumption of goods and services, characterized by its multi-stage and destination-based nature (Lee et al., 2013). It taxes value addition at each stage of the supply chain, ensuring that the end consumer bears the tax burden. This approach aims to eliminate the cascading effect of taxes, promote compliance, and mitigate evasion, ultimately contributing to a more robust and equitable tax system (Li & Whalley, 2017).

In the Indian context, GST's implementation marks a significant milestone in the country's economic landscape, promising to revolutionize the taxation regime and spur economic growth (Nath, 2017). With its potential to simplify tax compliance, reduce tax cascading, and create a unified national market, GST holds immense relevance for businesses operating in India (Nayyar & Singh, 2018). The introduction of GST has had far-reaching implications for businesses, consumers, and the economy as a whole. It has simplified the tax compliance process by replacing multiple taxes with a single system, facilitated seamless movement of goods across state borders, and led to efficiency gains in logistics and supply chain management (Mawuli et al., 2014). Moreover, GST has increased tax revenue for both central and state governments, enabling investments in infrastructure, social welfare programs, and other public services. However, the implementation has also posed challenges, including initial teething problems, compliance issues, and adjustment difficulties for businesses (Gupta, 2014).

Understanding the adoption and effective utilization of GST by businesses is crucial for harnessing its full potential. This adoption hinges on various factors, including relative advantage, complexity, compatibility, and observability, which offer

a comprehensive framework for examining technology adoption behavior (Rogers, 1995). Additionally, employee trust serves as a critical moderating variable, influencing how these factors impact firm performance post-GST adoption. This research explores the impact of GST adoption on small-scale businesses in India, using “Partial Least Squares Structural Equation Modeling (PLS-SEM)” to analyze the data. By examining variables from the Innovation Diffusion Theory and incorporating employee trust as a moderator, this study provides valuable insights into the factors influencing GST adoption and its subsequent effect on firm performance. The focus on small-scale businesses is particularly pertinent, given their significant role in the Indian economy and their unique challenges in adapting to new regulatory frameworks.

The practical implications of this research are multifaceted. Policymakers can use the insights to design more effective GST implementation strategies, addressing businesses' concerns and enhancing their satisfaction with the GST regime. Small-scale businesses can leverage the findings to tailor their GST compliance processes, improving operational efficiency and compliance rates. Moreover, this study contributes to the broader discourse on technology adoption in regulatory contexts, offering a foundation for future research to explore additional determinants of GST adoption and their implications for businesses. In summary, this research endeavours to bridge the gap between theoretical frameworks and practical applications, comprehensively analyzing GST adoption behavior among small-scale businesses in India. Through empirical analysis using PLS-SEM, the study aims to offer actionable insights to guide policymakers, businesses, and researchers in navigating the evolving taxation landscape.

2. Literature Review

Previous research has established the foundation for comprehending the behaviors associated with GST adoption. Table 1 illustrates crucial literature that contextualizes our study.

2.1 Goods and Services Tax (GST)

One of the most comprehensive indirect taxes imposed on the supply of goods and services is the “Goods and Services Tax (GST)”. “It is a destination-based tax system, with the tax being collected at the site of consumption rather than at the point of origin” (Ojha & Vrat, 2019). On July 1, 2017, the GST regime was implemented in India, supplanting various indirect taxes, including central excise duty, service tax, and value-added tax (VAT). The objectives of the GST implementation in India were to eliminate cascading taxes, simplify the tax structure, facilitate business operations, and establish a unified national market. ‘Goods and services are classified into various tax categories under the GST regime, such as “0%, 5%, 12%, 18%, and 28%,” based on their nature and significance (Agrawal & Fox, 2017). Furthermore, in order to guarantee affordability and equity, specific products and services are either exempt from GST or taxed at a reduced rate. The GST in India is a dual model, with the central and state administrations possessing the authority to levy and collect GST (Narayanan & Latiff, 2024). The central government imposes the central GST (CGST), while the state administrations impose the state GST (SGST). The central government collects Integrated GST (IGST) on interstate transactions.

Table 1: Review of the Literature on the Adoption of Goods and Services Tax

Authors	Country/ Region	Journal	Analysis Technique	Area of Research	Findings
Qi et al. (2023)	China	Journal of Environmental Economics and Management	Panel Data Estimation	Environmental Economics	“This paper reveals the micro-mechanisms of how the tax policies incentivize firms to choose emission reduction strategies and highlights the importance of the interaction effects between environmental and non-environmental policies, thus providing implications for the policy mix of environmental regulation and tax-cut incentives to promote pollution reduction and improve business performance.”

Lu et al. (2023)	China	Energy Economics	Difference-in-Differences Strategy	Environmental Economics	“Empirical analysis reveals that the export rebate reduction policy increases firms’ pollution emission intensities and decreases their total outputs, leading to a negative but less significant effect on total pollution emissions. Tests to explore the mechanism reveal that firms’ financial constraints become tighter if affected by the export VAT rebate reduction, as evidenced by reduced revenues, profits, and total factor productivity.”
Guo et al. (2023)	Least Developing Nations (LDCs)	IEEE Transactions on Engineering Management	Stackelberg supply chain gaming model	Industrial Management	“It is concluded that the uncertain LDC market, imposing a high import tariff or a high value-added tax (VAT) on the imported second-hand product may not help local manufacturing. Instead, implementing a carrot-and-sticks (CaS) scheme, which includes an import tariff, a VAT, and an extra incentive, can help. The LDC governments are suggested to adjust the CaS scheme’s structure based on factors like risk attitudes of supply chain members, the unit product supply costs, social health risk, and consumer acceptance level of the second-hand product.”
Wang & Anwar (2022)	China	Emerging Markets Finance and Trade	Provincial-Level Panel Data And Propensity Score Matching (PSM) Technique	Business Economics	“Our empirical findings based on the panel data confirm that VAT rebates had a significantly negative effect on China’s mechanical goods exports. In particular, on average, a one-percentage-point increase in the VAT rebate rate decreases exports by 2.07%. Our results are robust to alternative bandwidths.”
Cho et al. (2021)	China	Journal of Management Information Systems	Game Model	Information Systems	“This study concludes that decision to adopt blockchain depends on considerations such as adoption costs, the vendors’ VAT reporting behavior, the retailer’s profit margins, and inter-vendor competition.”

Ali et al. (2021)	Ethiopia	National Tax Journal	Regression Analysis	Finance	“It is found that ESRM use resulted in a large and significant increase in tax payments. Moreover, this effect is driven by firms that were more likely to evade taxes prior to ESRM use. The results highlight the potential role that information technology may play in strengthening state fiscal capacity in developing countries.”
Peng et al. (2021)	China	Environmental & Resource Economics	Difference- in- Differences Strategy	Environmental Economics	“It is revealed that fiscal squeeze has a negative effect on pollution abatement expenditures. Moreover, private firms in eastern regions are less responsive to this shock than those in the rest of China due to having better regulated local governments. We also find that this effect is smaller in magnitude if the firm owner is younger, more educated or has industrial and political connections compared to her respective counterparts.”
Majumder et al. (2021)	India	Journal of Policy Modeling	Optimal Commodity Tax Framework	Business Economics	“The study provides evidence on the redistributive potential of indirect taxation by showing the progressive nature of the optimal commodity taxes. The latter result is of particular significance in developing countries where indirect taxes raise the greater share of revenue and provide an important policy tool for tackling increasing inequality.”
Fan et al. (2020)	China	Journal Of International Economics	Regression Analysis	Business Economics	“The study finds that after the adoption of the technology, firms located further away from local tax agencies face higher effective VAT rates (the enforcement effect) and export more (the elusion effect) than they did before the adoption.”

Ojha & Vrat (2019)	India	Systems Research And Behavioral Science	SD Tools— Causal Loop Diagram (CLD) And Stock And Flow Diagram (SFD)	Business Economics	“The GST is expected to trigger its impact on the following eight elements: warehouse efficiency, interstate check-post operations, informal to formal business transition, interstate business expansion by micro, small, and medium enterprises, simplicity and transparency in tax collection process, logistics cost reductions, ease of doing business in India, and working capital cost realignment, which in turn may accelerate the manufacturing growth in Indian economy.”
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Source: Author's Own Creation

3. Hypothesis Development and Research Model

3.1 Hypothesis Development

The Innovation Diffusion Theory (IDT) proposed by Rogers (1962) was employed in investigating the effects of the goods and services tax (GST) on firm performance. The study model illustrated the interrelationship among the identified factors in Figure 1.

3.1.1 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) posits that several factors influence the adoption of new technologies (Rogers, 1962). In the context of GST adoption among small-scale businesses, the key IDT factors include relative advantage, compatibility, complexity, and observability. “Relative advantage refers to the perceived benefits of adopting an innovation over existing practices” (Rogers, 1995). If small-scale businesses perceive GST as offering significant benefits, such as streamlined tax processes and reduced tax burden, they are more likely to adopt it. “Compatibility is the degree to which an innovation aligns with the existing values, past experiences, and needs of potential adopters” (Rogers, 1961). If GST is perceived as compatible with the current business practices of small-scale businesses, the adoption rate is likely to be higher. “Complexity refers to the perceived difficulty of understanding and using an innovation” (Rogers, 1962). Innovations perceived as less complex are more likely to be adopted. If GST procedures are perceived as too complicated, small-scale businesses may be reluctant to adopt them. “Observability is the extent to which the results of an innovation are visible to others” (Rogers, 1995). If the benefits of GST adoption are observable in other similar businesses, it may influence others to adopt GST as well. Thus, we pose these hypotheses.

H1: Relative advantage positively impacts GST adoption.

H2: Compatibility positively impacts GST adoption.

H3: Complexity negatively impacts GST adoption.

H4: Observability positively impacts GST adoption.

3.1.2 GST Adoption and Firm Performance

The adoption of GST is expected to have a significant impact on the performance of small-scale businesses. Firm performance in relation to GST adoption reflects the operational and financial improvements small-scale businesses experience (Ojha & Vrat, 2019). GST aims to simplify tax compliance, reduce the overall tax burden, and improve the ease of doing business, which can lead to better firm performance. Thus, it is hypothesised that:

H5: GST adoption positively impacts firm performance.

3.1.3 Employee Trust

Employee trust is crucial in the successful implementation of new systems and processes within an organization (Keeling et al., 2010). Trust in the benefits and fairness of GST can enhance the positive impact of GST adoption on firm performance. Employee trust moderates the relationship (Innocenti, 2010) between GST adoption and firm performance, such that higher employee trust strengthens the positive impact of GST adoption on firm performance. Thus, it is hypothesised that:

H6: Employee trust moderates the relationship between GST adoption and firm performance.

3.2 Research Model

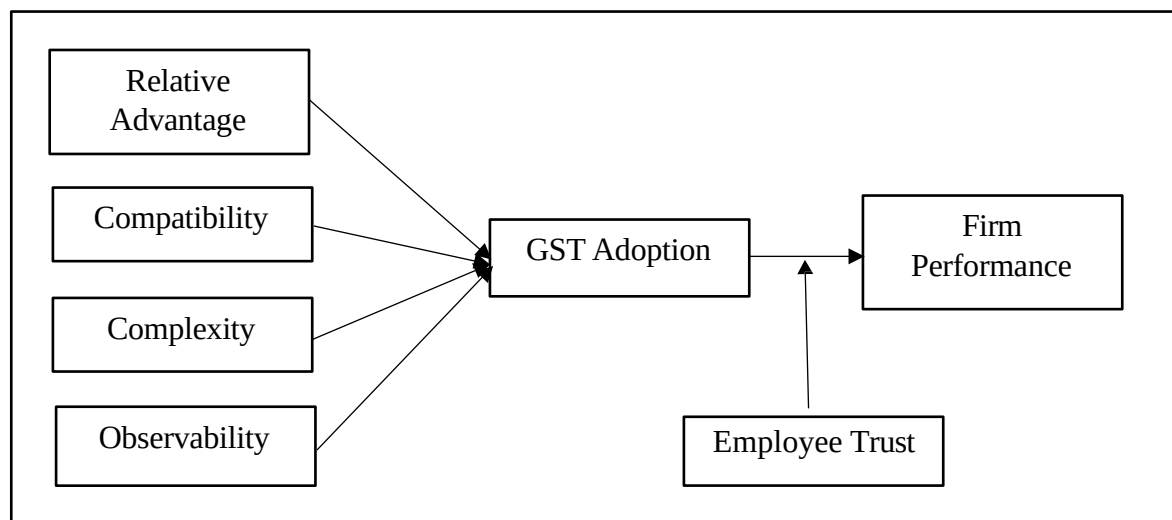


Figure 1: Research Model (Author's Own Creation)

4. Methodology

This study implemented a quantitative methodology to comprehensively examine the firm's performance in adopting GST in small-scale businesses. The questionnaire was created by changing the modified scales, and experts assisted in confirming its face validity. The pilot study was conducted to evaluate the questionnaire's reliability and validity, and all of the recommended modifications have been implemented. Ultimately, a survey was used to gather information from small firms, and Smart PLS-4's Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was used to analyze the results. PLS-SEM is a powerful tool for deciphering intricate correlations between numerous factors (Sarstedt & Cheah, 2019). A five-point Likert scale was used to evaluate the responses from the respondents. The sample size for the study is 240, which is calculated by multiplying the total item count by 10 (Chuah & Cham, 2020). The purposive sampling technique was employed in the survey, which involved the participation of 500 respondents. 330 valid responses were meticulously selected for analysis from this pool, following stringent screening and quality control procedures. The survey is composed of two sections: the first collects information about the demographics of the participants, as indicated in Table 2, and the second section gathers information about six constructs, a total of 24 items, as shown in Table 3. The conceptual model was subjected to thorough statistical testing using PLS-SEM, providing a solid basis for investigating the variables impacting firm performance in the context of GST implementation.

Table 2: Demographics

"Characteristics"	"Categories"	"No. of Respondents"	"Percentage" (%)
Business Sector	Agriculture	46	13.95
	Manufacturing	124	37.55
	Service	160	48.50

Years of Operation	Less than 1 Year	15	4.54
	1 Year - 5 Year	63	19.09
	5 Year - 10 Year	156	47.28
	10 Year and above	96	29.09
Ownership Structure	Sole Proprietorship	156	47.27
	Partnership	52	15.76
	Cooperative Society	34	10.30
	Limited Liability Partnership	40	12.12
	Company	48	14.55
Level of Business Operation	Local	144	43.64
	State	112	33.94
	National	56	16.97
	International	18	5.45

Source: Author's Own Creation

5. Findings

The research results obtained through “Partial Least Squares Structural Equation Modelling (PLS-SEM) in Smart PLS-4” showed a robust measurement model that verified the reliability and accuracy of the variables (Hair et al., 2017). The structural model has provided valuable insights into the factors influencing firm performance by examining the connections between these variables. The study is free from common method bias, as all VIF values fall within the range of 1.792 - 1.931, which is less than the threshold value of 3.33 (Kock, 2015).

5.1 Measurement Model

The primary objective of this study was to evaluate the reliability and validity of the latent constructs by examining the measurement model in PLS-SEM. A high level of item reliability was indicated by the fact that each result exceeded the required threshold of 0.7 after a comprehensive analysis of the factor loadings (Hair Jr et al., 2022). Moreover, the robust degree of internal consistency is ensured by the reliability coefficients, rho-a, and rho-c, which are above the acceptable threshold of 0.7 (Fornell & Larcker, 1981). The AVE values have surpassed the minimum criterion of 0.5, thereby demonstrating the presence of convergent validity. In order to ascertain whether there was evidence of discriminant validity, the study evaluated the Heterotrait-Monotrait Ratio (HTMT) values. The findings strengthened the overall dependability of the measurement model by confirming the distinctiveness of the underlying constructs (Hair et al., 2019). This study's findings validate the measurement model's precision and reliability, establishing a solid basis for further investigation into the structural model. Tables 3 and 4 of the study are presented to show the results.

Table 3: Construct Reliability and Validity

Constructs	Factor Loadings	CR (rho_a)	CR (rho_c)	AVE
Relative Advantage (RA)		.880	.913	.724
RA1	.858			
RA2	.870			
RA3	.872			
RA4	.802			
Compatibility (CP)		.894	.926	.758
CP1	.861			
CP2	.888			
CP3	.863			
CP4	.871			
Complexity (CM)		.902	.913	.723
CM1	.896			
CM2	.845			

CM3	.774			
CM4	.882			
Observability (OB)		.845	.886	.660
OB1	.808			
OB2	.803			
OB3	.830			
OB4	.808			
GST Adoption (GA)		.867	.907	.710
GA1	.795			
GA2	.894			
GA3	.843			
GA4	.836			
Firm Performance (FP)		.858	.903	.699
FP1	.800			
FP2	.824			
FP3	.871			
FP4	.848			
Employee Trust (ET)		.846	.894	.678
ET1	.816			
ET2	.821			
ET3	.850			
ET4	.806			

Source: Author's Own Creation

Table 4: Discriminant Validity

	CM	CP	FP	GA	ET	OB	RA
CM							
CP	0.329						
FP	0.517	0.576					
GA	0.523	0.720	0.718				
ET	0.460	0.584	0.800	0.764			
OB	0.754	0.439	0.502	0.529	0.522		
RA	0.397	0.614	0.752	0.760	0.731	0.381	

Source: Author's Own Creations

5.2 Structural Model

To assess the stability and significance of the factors, a thorough examination of several critical criteria was carried out as part of the PLS-SEM structural model analysis. The statistical significance of the postulated pathways was assessed using the p-values and t-tests associated with the path coefficients, as presented in Table 5. The model's predictive relevance was evaluated using Q² values (Hair et al., 2019), which are 0.578 for GA and 0.541 for FP, suggesting a high level of predictive power for the proposed model, shown in Table 6. The extent of the repercussions was assessed using f² values, which offered a gauge of the links' practical significance (Hair Jr et al., 2022). The three most crucial constructs to evaluate the effectiveness of a company implementing the GST structure are employee trust, relative advantage, and compatibility. The explanatory power of the model was assessed by the R² values (Hair et al., 2019), which are 58.7% for GA and 51.6% for FP. The study demonstrated the moderating effect of employee trust on the association between GA and FP, as evidenced by an increase in FP's coefficient of determination from 38.3% to 51.6% and support for hypothesis 6 (H6). Further evaluation of the goodness of fit model was conducted by calculating the "standardized root mean square residual" (SRMR), which produced a result of 0.072, below the 0.08 threshold limit (Hair et al., 2017). The robustness and significance of the study framework's connections were emphasized through an examination of these attributes in the structural model.

Table 5: Structural Model Results

Hypothesis	Inner VIFs	Beta (b)	T statistics	p values	f ²	Supported
H1: RA->GA	1.503	0.392	7.500	0.000	0.251	Yes
H2: CP->GA	1.523	0.332	6.505	0.000	0.179	Yes
H3: CM->GA	1.792	0.170	3.114	0.002	0.039	Yes
H4: OB->GA	1.860	0.093	1.667	0.096	0.011	No
H5: GA->FP	1.809	0.290	5.075	0.000	0.096	Yes
H6: ET->FP	1.931	.461	7.149	0.000	0.231	Yes

Source: Author's Own Creation

Table 6: R² Q² and SRMR

“Constructs”	“Q ² Value”	“R ² (Without Moderation)”	“R ² (With Moderation)”	“SRMR”
GA	0.578	0.587	0.587	0.072
FP	0.541	0.383	0.516	

Source: Author's Own Creation

6. Discussion and Conclusion

The study provides a comprehensive analysis of the impact of GST adoption on small-scale businesses in India, utilizing the Innovation Diffusion Theory (IDT) (Rogers, 1962) and considering employee trust as a moderating variable. The structural model results offer significant insights into how various factors influence GST adoption and firm performance. The positive and significant relationship between relative advantage and GST adoption ($\beta=0.392$, $p<0.000$) indicates that businesses perceive substantial benefits from adopting GST, such as improved efficiency and streamlined operations. This supports the notion that when businesses recognize clear advantages in new technology, they are more likely to adopt it (Ntemana & Olatokun, 2012). Compatibility also showed a significant positive influence on GST adoption ($\beta=0.332$, $p<0.000$). This suggests that the more GST aligns with existing business processes and values, the higher the likelihood of its adoption. This finding aligns with the IDT framework, which emphasizes the importance of compatibility in the adoption of innovations (Almaiah et al., 2022).

The negative relationship between complexity and GST adoption ($\beta=0.170$, $p<0.002$) further reinforces that businesses prefer simpler and less complex systems. This indicates that the easier and more user-friendly the GST system is perceived to be, the more likely businesses are to adopt it. While observability was expected to influence GST adoption positively, the results were not significant ($\beta=0.093$, $p<0.096$). This might be due to businesses not fully understanding or valuing the visibility of GST benefits in the initial stages of adoption. GST adoption positively impacts firm performance ($\beta=0.290$, $p<0.000$), supporting the hypothesis that the adoption of GST leads to improved business outcomes (Ntemana & Olatokun, 2012). This relationship highlights that GST adoption can streamline operations, reduce costs, and potentially increase

profitability for small-scale businesses. Employee trust significantly moderates the relationship between GST adoption and firm performance ($\beta=0.461$, $p<0.000$). This underscores the critical role of employee trust in ensuring successful implementation and utilization of GST. When employees trust the system and believe in its benefits, they are more likely to engage positively (Hassanein & Head, 2004; Innocenti, 2010), thereby enhancing overall firm performance. The R^2 and Q^2 values indicate the model's predictive relevance and explanatory power, with a strong effect on GST adoption and firm performance. The inclusion of employee trust significantly improves the explanatory power for firm performance, as evidenced by the increase in R^2 from 0.383 to 0.516.

The empirical analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) reveals that factors such as relative advantage, compatibility, and complexity significantly influence GST adoption among small-scale businesses in India. Furthermore, the adoption of GST positively impacts firm performance, with employee trust playing a crucial moderating role. These findings provide valuable insights for policymakers and business practitioners aiming to enhance GST compliance and leverage its benefits. The study highlights the importance of designing GST systems that align with existing business processes and are easy to use, to encourage widespread adoption. Additionally, fostering employee trust in the GST system can further amplify its positive impact on business performance. Future research could explore additional moderating variables and extend the study to different business contexts to enhance the generalizability of these findings.

7. Implications

The implications of this research are multifaceted and significant for various stakeholders involved in GST implementation and compliance. Firstly, the study highlights the critical role of innovation diffusion theory constructs, such as perceived compatibility, observability, relative advantage, and complexity, in shaping firm performance post-GST adoption. Policymakers can leverage these insights to design GST policies that are more aligned with small-scale businesses' operational realities and innovation capacities, thus facilitating smoother transitions and higher compliance rates. Additionally, the moderating role of employee trust emphasizes the need for building and maintaining trust within organizations to enhance the positive impact of GST adoption on performance. Businesses can use these findings to foster a culture of trust and innovation, optimizing their GST compliance processes and boosting overall efficiency. Practitioners can also tailor their GST-related training and support programs to address these key factors, ensuring that employees are well-informed and confident in the new system. Finally, researchers can build upon this study's framework to explore further dimensions of GST adoption and performance, potentially uncovering additional moderating variables and contextual factors. The research provides valuable insights that can inform policy, practice, and future academic endeavours, contributing to a more comprehensive understanding of GST adoption dynamics in small-scale businesses.

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