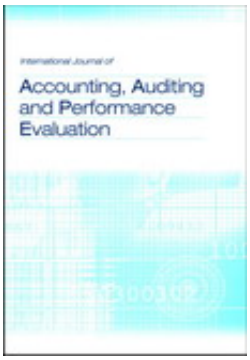

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Investigating the effect of goods and service tax on operational performance, cost efficiency and profit margins of MSMEs

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Investigating the effect of goods and service tax on operational performance, cost efficiency and profit margins of MSMEs

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Abstract: Tax and economy go hand in hand, and whenever any overhaul in tax structure takes place, it becomes vital to examine the effect on micro units of economy and its businesses. The present study evaluates the impact of goods and service tax (GST) on the performance of Indian micro, small, and medium enterprises (MSMEs) after the tax system changes in India. The empirical findings from ordinal regression results state that tax system restructuring has reduced the overall cost of the firms and improved operative performance. Moreover, the technological shift by the GST Network led to paperless compliances, which saved the productive time of MSMEs. Further, the results stated that the micro-units have shown a pronounced significant and positive impact amongst all the enterprises. The results may aid other countries in understanding the after-effect of tax reform on MSMEs' performance.

Keywords: tax reform; GST; goods and service tax; ordinal regression; business performance; MSME; micro; small and medium enterprises.

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1 Introduction

The micro, small and medium enterprises (MSME) sector plays a vital role in an economy's progress and growth. The MSME sector in developed and developing economies constitutes 90% of the businesses and contributes around 40% of the country's national income (World Bank Report, 2021). Therefore, the government brings reforms to boost the MSME sector and its businesses, especially tax reforms, as tax and economy go hand in hand (Nguyen, 2019; Xing and Whalley, 2014; Ahmad and Stern, 1991). Moreover, MSMEs are the most responsive to national tax reform because of their economies of scale (Ocheni, 2015). Multiple implications were observed on MSMEs after tax reform in countries. For example, after GST implementation in Canada, a rise in the firms' revenue and turnover was observed (Zu, 2018). Likewise, Australian micro-firms have experienced an increase in trade and cash flow benefits after GST (Isle et al., 2014). On the other hand, Malaysian firms' businesses underwent serious withering due to arduous record-keeping systems (Ramli et al., 2015; Buchan et al., 2012). However, each economy has its own specific characteristics, ways of doing business, and different reactions toward tax reform.

To conduct the present research, we have examined the impact on Indian MSMEs as India in July 2017 revamped its entire indirect tax system by implementing goods and service tax (GST). MSMEs is one of the important sector of India as it contributes around

30% in its Gross Domestic Product, 95% to its industrial enterprises and 45% to it total production. The vital role of MSME in the Indian economy and the new tax reform in India makes it essential to examine its impact on them. In order to achieve the objectives of the study, we have used different theoretical optics to identify the key elements of GST implementation that directly influence business performance. Theories provided a base for research by identifying the crucial factors that impact performance. One of the key variables is change in tax system, which is acknowledged through Fischer's Model of Tax Compliance (Fischer et al., 1992). Technological advancement in the tax system is inspired by Technology Acceptance Model (Davis, 1989; Venkatesh and Bala, 2008). Tax knowledge and awareness are linked to the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980). The tax compliance system is inspired by the Economic Deterrence Theory of Tax compliance (Yong, 2006). It was synthesised that multiple theoretical bases in a single study help to achieve the paper's motive comprehensively. These variables are the most relevant and grounded in the theories. They are explained in the literature review in detail and least explored in the context of business performance after GST incorporation.

The comprehensive analysis is unique in its own way and may aid other countries in understanding the key tax determinants that strongly impact MSMEs' performance. Further, institutional investors, particularly foreign institutional investors (FII), and credit rating agencies remain interested in making investments in the MSME sector. They must understand the effect of such tax policy changes on their businesses. As in India only, a rise has been observed of 19% in foreign direct investment in 2020–2021 (USD 59.64 billion) compared to 2019–2020 (USD 49.98 billion) due to policy reforms incorporated by the Indian government (Ministry of Commerce and Industry, 2020–2021). The current research' result may help emerging economies in the practical formulation and implementation of tax policies to boost small firms.

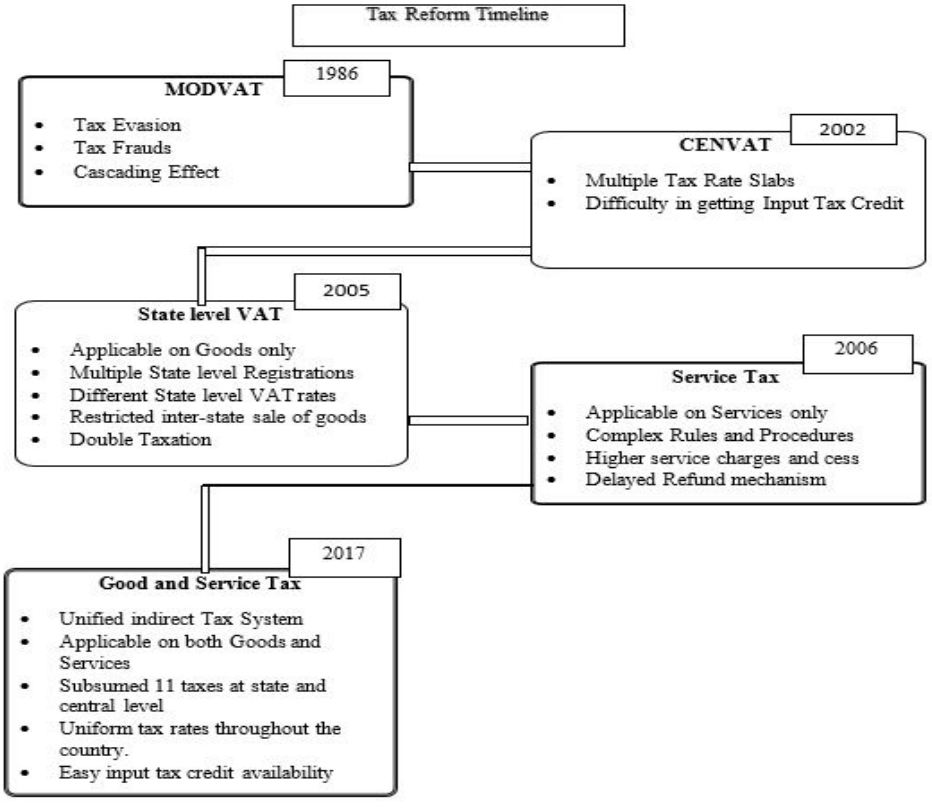
This paper is organised as follows: firstly, Section 2 provides insight on the tax reform timeline in India. Then, Section 3 narrates the theoretical framework and Section 4 states the literature review of the predictor variables (GST determinants), control variables (firm size and turnover) and business performance (BP), to form the hypothesis. Next, Section 5 gives insight regarding population, sample, scale, size of MSMEs and research methodology adopted. Then, in Section 6, the ordinal regression model's empirical findings are demonstrated. Section 7 stated the conclusion and practical implications of the study.

2 Indirect tax reforms in India

In India, the tax reform wave started in 1986 by introducing the modified value added tax (MODVAT). MODVAT system was prone to tax evasion and cascading of taxes, which hampered the country's business and trade. Later, the government introduced the Central Value Added Tax (CENVAT) in 2002–2003 to wipe out the limitations of the MODVAT (Shome et al., 1996; Sinha, 1987). However, under CENVAT, there was difficulty getting an input tax credit, which increased the cost of production and gave Indian MSMEs a competitive disadvantage in the international market (Govind, 2011; Vasanthagopal, 2011). Even state-level VAT implemented after CENVAT in 2005 was incomplete as double taxation on products prevailed, and there were many restrictions on the movement of goods interstate (Sree Kantaradhya, 2000). Moreover, the Service Tax system came

with too complex rules and procedures, which made the indirect tax system more cumbersome. Ultimately the MSMEs' businesses suffered. Therefore, the central government under the Kelkar Committee (13th Finance Commission) came up with a unified tax system in tune with the other developed countries-GST in India. To fetch transparency in the tax system and to meet the prospects of MSMEs' business growth (Khoja and Khan, 2020; Sury, 2017; Govind, 2011; Vasanthagopal, 2011). The timeline and limitations of each indirect tax reform is represented in Figure 1.

Figure 1 Indirect tax reform timeline and its limitations



Source: Authors' Compilation

3 Theoretical framework

This section demonstrates the specific channels that identify the key variables related to GST and firm performance, which include Fischer's Model of Tax Compliance, Economic Deterrence Theory of Tax Compliance, Technology Acceptance Model and TRAs. We demonstrate that after the tax reform, the key determinants identified from these base theories must be given due importance so that firms' can avail benefits to enhance their performance.

a *Fischer's model of tax compliance*

Jackson and Milliron (1986) observed in their comprehensive research that 14 factors directly impact the tax conformity by the taxpayers, which are further characterised in 4 categories, namely,

i demographic

ii non-compliance opportunity

iii attitude and perception

iv tax system.

According to the model, demographic variables such as age, gender and education has the indirect impact on the compliance behaviour. Whereas, non-compliance opportunity (income level, income source and occupation); attitude and perception (peer influence and fairness) and tax system directly impacts the tax compliance behaviour of a taxpayer. Out of which tax system/structure is considered the most crucial variables. The model emphasised that complexity in the system, probability of detection, tax rates not only influences the tax compliance behaviour but impacts the business performance. Slemrod (1990) in his study (inspired by the Fischer's Model) stated that the alteration in the tax system is employed with the motive to reduce its inefficiency and boost businesses. Therefore, considering the critical factor identified by Fischer's Model of Tax Compliance, we opted for the tax system as one of the key variables of the present research.

b *Economic deterrence theory of tax compliance*

The economic deterrence theory highlights that taxpayers rely on the compulsory enforcement of the system. Further, it analyses that the compliance by any taxpayer is based on the cost and benefits involved as non-compliance leads to penalties and harms profitability of any firm. Moreover, the model attempts to explain the impact of tax compliance rather than the level of compliance. It states that how the tax compliance and its system can affect the taxpayer. Motivated by the theory, we opted for the tax compliance system as one of the variables to examine how the change in compliance procedures after GST impact business performance.

c *Technology acceptance model*

The success of technological tax transition in an economy depends on businesses' quick adaption. Technology acceptance model (TAM) motivated the users to adapt to the new business working styles after the transition in tax-related affairs. TAM works on the two major determinants

i perceived usefulness

ii perceived ease of use (Venkatesh and Bala, 2008; Davis, 1989).

This model aided managerial staff with the required capabilities, provided insight into the role of information technology (IT) usage in MSMEs, and helped them flourish at the international level (Dahnil et al., 2014). As in the past, MSMEs have shown a slow adoption rate which led to unsuccessful IT implementation due to limited IT skill,

strategy and lack of access to capital resources, and high installation cost of the new system (Rahayu and Day, 2015; Nguyen, 2019; Sugiharto et al., 2010). TAM inspired the authors to study the effect of technological transition on performance levels after tax reform.

d *Theory of reasoned action*

For a successful implementation of tax reform in the country, the taxpayers must have proper awareness and knowledge. Based on the TRA, tax knowledge is the fundamental reason all taxpayers (individuals, companies, associations etc.) comply with taxation rules. It leads to lawful compliance and implementation of taxation policies in their business as they know the consequence of their action, that is, after-effects in the form of penalties and fines that obstruct the firm's productivity and reputation (Rahmayanti and Prihatiningtias, 2020)**.**

4 Review of literature and hypotheses development

The current paper explores the tax reform (GST) variables that impact MSMEs' business performance. Independent factors such as a change in the tax system, tax compliance mechanism and technological tax transition (Goods and Service Network) are discussed below concerning their impact on business performance (Section 4.1). Furthermore, studies related to firm sizes and turnover in relation to firm performance are also observed (Section 4.2). Finally, the studies related to business performance parameters are explained in Section 4.3.

4.1 GST factors

a *Tax system*

The tax system and its reform are high on the agenda of developing countries governments (World Bank Report, 2011). This is because they require revenues, and the tax system in developing countries is severe and distorted (Somaya, 2012). The maximum burden of which is born by businesses in developing or low-income economies, the tax cost and administrative load are high due to their limited sources (World Bank Report, 2006). Therefore, to lower the burden and improve revenue generation, government reforms its tax system, which has multiple implications. It was observed that after the tax reform, the tax system change helps reduce tax fraud through the robust matching concept of invoices, which proved beneficial to MSMEs' businesses (Bhalla et al., 2022a, 2023). Further, the pooling of central and state indirect taxes into GST in India has strengthened the financial system as well the provided the businesses to expand without restriction inter-, or intra-state (Sharma, 2022). As a result, the overall tax burden on goods has dropped by 25–30% as empirically verified by Dey and Jena (2018) in their study, which gives Indian products a competitive edge in domestic and international markets.

Therefore, we can hypothesise that:

Hypothesis 1: Tax system restructuring enhances the performance of MSMEs.

b *Technological advancement*

Technology is essential in expanding MSMEs' business globally in terms of customers (Neirotti et al., 2018). In the tax system, as well, technological advancement has proved as a boon to the industries by resolving major business issues like corruption, transparency, and privacy (Bird and Zolt, 2008). Electronic filing of tax-related matters, like registration and tax returns, has eased the businesses' working. Further, paperless compliances have lessened the administrative burden and prevented fraud (Barbone et al., 2012; Digal, 2020).

Technological change with the introduction of the GST Network for GST payers has helped businesses manage critical tax-related documents across the different geographical regions of the country with ease. The reduction in manual tracking for business taxation-related issues has been reduced, which has proved beneficial for them (OECD, 2019). Sury (2019) observed that technological infrastructure in the tax system through GSTN has resolved the three major concerns of MSMEs, which proved beneficial for their businesses- simpler tax design; a common platform for all tax-related matters, and harmonisation of taxes for different goods and services at central and state level.

Therefore, we can hypothesise:

Hypothesis 2: Technological advancement enhances the performance of MSMEs.

c *GST compliance*

Tax reform not only brings a change in the tax system but also overhauls the entire compliance process. Tax compliance implies acting by tax rules and regulations of the country. In order to obey the tax laws, the cost incurred is called tax compliance cost (Sandford et al., 1989). Chen and Taib (2016) and Hansford and Hasseldine (2012) opined that the indirect tax system's compliance consumes more time than personal tax, income tax, or capital gains. Because of resource constraints, MSMEs have to rely on external sources to adhere to the compliance procedures, rules and regulations, which adds to the additional cost for the firm in the form of professional fees, audit fees and consultation charges (Eichfelder and Schorn, 2012). Moreover, the preparation and complying costs of GST requirements for small businesses are high. It includes both time costs, i.e., cost involved in getting information about new rules and regulations, and non-time costs, i.e., equipment, software, training, accounting, and consultancy costs and telephonic call costs (Rametse and Pope, 2002; Gelardi, 2013). Therefore, the MSMEs are at time cost and real cost disadvantage with implementing new rules and regulations as it obstructs business growth (Bennison et al., 2007).

Therefore, we can hypothesise that:

Hypothesis 3: GST compliance system negatively influences the performance of MSMEs

d *Tax awareness and knowledge*

Tax awareness and knowledge about its reform are crucial for its successful implementation and working. They are one of the intervening variables that influence the compliance of any tax reform (Zulaikha and Nugroho, 2012). Adequate and in-depth

knowledge about new tax laws and regulations is required for the effective amenability of tax reforms (Anane and Asamoah, 2015; Behnud and Fahr, 2013). Clarity about rules and regulations helps in its easy compliance and does not obstruct the business (Mehta and Kaur, 2018). Proper tax knowledge helps to enhance the performance of the firms (Bhalla et al., 2022b). Knowledge narrows down the negative perception of the new tax reforms (Ahmad et al., 2015) and positively impacts firms (Mohan and Ali, 2018; Zainol Bidin et al., 2016). Further, knowledge supports SMEs in improving their performance, as empirically verified by Sherif et al. (2019).

Awareness has a direct relation to financial stability and business performance. Lack of understanding hampers the business (Shah and Dalwadi, 2018; Singh, 2018; Saira et al., 2010). Joseph and Jacob (2018) and Vaitinadane et al. (2019) stressed that small and micro units' business performance is affected due to a lack of taxpayer awareness and tax knowledge, unlike large companies. Australian SMEs' business was impacted due to non-compliance as the units were unaware of the new tax system (McKerchar and Hansford, 2015).

Therefore, we can hypothesise that:

Hypothesis 4: Tax awareness and knowledge enhances the performance of MSMEs.

4.2 Studies related to firm size and turnover

The firms' characteristics have been found to affect the business performance of MSMEs. Tax reform after GST implementation has broadened the economy's tax base by accumulating a large number of firms in the tax net. Small and micro firms have to get their registrations, tax returns, maintenance of records, and licenses upgraded with changed threshold limit (turnover prescribed for tax registration) (Sury, 2019; Sinha and Srivastava, 2020). Further, the study by Dawd and Charfeddine (2019) emphasised that a relationship exists between firm performance and its' size but not in mere disclosure.

4.3 Business performance

Resmi et al. (2021) emphasised that different parameters of performance and its assessment exist. Concerning the definition of business performance, researchers have different conceptualisations of business performance in general and particular. The governments do the tax reform to increase the tax revenues, which is directly related to the firms' profitability (OECD, 2020). That's why one of the most important parameters to measure the performance after tax overhaul is the firms' profitability (Klemm, 2010). Weingberger (2018) stated that the main aim of any tax overhaul is to lower the incidence of tax on businesses and enable its operational growth. As alteration in tax structure is done to remove imperfections of the earlier system, to mitigate the cascading effects, ease the working processes to increase the efficiency of the firms. Therefore, another vital parameters to examine business performance is its operational performance (Chandren et al., 2018; Hoseini and Briand, 2020; Sury, 2017).

Tax reform not only brings a change in the tax system but also overhauls the entire compliance process. Therefore, to survive in a new tax environment, MSMEs must upgrade infrastructure and require proper knowledge of its working, and this modification

in small firms adds up to the extra cost. MSMEs take help from external experts to handle tax affairs and new systems (Mulligan and Oats, 2016; van der Rijt et al., 2019). As MSMEs are resource constraints and have limited economies of scale, the compliance cost of the firms is another parameter to measure business performance (Wang et al., 2019; Bace et al., 2006; Ohja et al., 2019).

Keeping in mind the key variables of the present study, the authors cover these aspects to examine the relation of change in tax system, tax knowledge, GST compliance and technology tax transition with business performance. For gauging business performance, the parameters used for the study are reflected in Table 1.

Table 1 Business performance parameters

S. No.	*Scale items*	*Authors*	*Definition*
1	Operational performance	Chandren et al. (2018), Hoseini and Briand (2020) and Sury (2017)	It demonstrates how well the business works in terms of operating the functions of the business
2	Profitability	Klemm (2010), OECD (2020), Jacobson (1987)	It deals with the profit margins of the business
3	Compliance cost	Wang et al. (2019), Mulligan and Oats (2016)	It demonstrates the cost expanded in complying with new system

Source: Authors' Compilation

5 Research design and methodology

Firstly, the target population, sample size covered and sampling method applied are explained in Section 5.1, followed by the survey instrument and data, which are explained in Section 5.2. Then Section 5.3 demonstrates the research methodology best suited for the present study.

5.1 Sample size and sampling technique

In India, we have selected one of the industrial states, Punjab for our study. In 2019–2020, Punjab' MSMEs have shown a growth rate of 5% in economic activities and employment generation. Further, they contributed in Gross State Value Added of 26.66% from industries and 54.96% from services. By 2019, the MSME sector has shown a overall progressive growth in Gross Capital formation of 14.1% in Gross State Domestic Product as well (Economic and Statistical Organisation, Punjab 2019–2020). In order to determine the sample size for the study, we have first considered the total registered MSMEs (for the definition of enterprises, refer to Appendix A1) as per MSMEs Annual Report 2017–2018. As the population is segregated into three stratas- micro, small amd medium, we first adopted stratified random sampling. Later, based on total registered enterprises, we applied proportionate random sampling. As a result, a sample of 300 units was collected from Punjab, out of which 116 micro (39%); 150 small firms (50%) and 34 medium firms (11%).

- *Adequacy of the sample size*

The adequacy of the sample size is analysed using the **G-power tool** for the research, and the method opted (Faul et al., 2009). Using minimum suggested values verified by Cohen (1998), minimum R-square 0.10, statistical power 95% (α-error: 0.05), and four predictors (determinants of tax reform used in the study), the priori G-power estimates the minimum sample size is 191. Further, the post-hoc G-power estimates measuring a sample size of 300 and four predictors indicated the statistical power achieved is 99.67% (1-β error problem). A power of 80% or higher statistical power is considered acceptable as it signifies the lower probability of type II error. The samples results are above the suggested empirical verifications suggested by Cohen (1988), justifying the present study's sample size.

5.2 Data

A self-structured questionnaire was formulated and distributed among MSMEs of Punjab. A total of 500 questionnaires were distributed, out of which a response of 324 enterprises were collected. The respondents were managers, entrepreneurs, owners or experts who manage and handle the tax affairs of MSMEs.

All the variables and the data collected through the questionnaire is explained below in Table 2. The dependent variable for the study is the business performance, for which operational performance, cost and profitability have been used as the parameters. The independent variables are GST factors, namely, change in tax system, technology transition, GST compliance, and tax awareness and knowledge. The control variables used in the study are firms' size and turnover.

5.3 Research methodology

The study examines the impact of GST on MSMEs' operational efficiency, compliance cost and profit marginality. According to the established theories and detailed review (Sections 3 and 4), we have chosen the GST-related factors: tax system, tax awareness and knowledge, the technological shift goods and service tax network (GSTN) and GST compliances. The study's response variable, operational performance, was categorised on the Likert Scale of 1–5 (1 = strongly disagree, 5 = strongly agree); and cost and profit on the scale of 1–3 (1 = low and 3 = high). Further, the control variables used in the study are firms' size and turnover. For this, we have applied ordinal regression as it enables to predict the dependent variable with ordered multiple categories. Further, it helps to expedite the interaction between independent and dependent variables (with ordered levels). The essential advantages of applying the ordinal technique in evaluating the performance (ordered level) are that it helps to identify the strength of the independent variables' effect on the dependent variable, that is, impact on performance- low, neutral, or high. In addition, it helps to forecast the changes of the impact, that it assist on how much the performance/dependent variable will change in relation to different independent variables. Finally, it enables us to predict how a particular independent variable may affect the performance or what can be the possible outcome.

Table 2 Independent and dependent variables

Factors	*Definition*	*References*
Business Performance (Dependent Variable)	MSMEs are cautious to reveal the financial figures and performance openly, which in turn leads to low or no responses in research surveys. Then scholars had to use subjective measures like Likert Scaling in their empirical research to examine the performance. Subjective measure provide benefits to the scholars as it allows them to do the comparison-industru wise, size and unit-wise. Furthermore, these measures help maintain the results of different magnitudes and give more valid and reliable results as supported by the literature. Moreover, financial records are unable to be cross-checked for accuracy purposes. In the present study, respondents' perceptions of their business performance based on operational efficiencies, profitability, and costs are asked to measure on Likert Scaling Based on past studies, we have used Likert scaling for operational efficiencies to know the perception of the respondents that whether GST has impacted their firms' operational performance or not, on the scale of 1 to 5, which is represented as: • Operational Performance 1 = Strongly Disagree • Operational Performance 2 = Disagree • Operational Performance 3 = Neutral • Operational Performance 4 = Agree • Operational Performance 5 = Strongly Agree For profitability and cost- the scale of 1 to 3 is used, represented as: • Cost or Profit 1 = Decrease • Cost or Profit 2 = Constant • Cost or Profit 3 = Increase	Moodley et al. (2022), Hoseini and Briand (2020), Sury (2017), Vij and Bedi (2016), Wall et al. (2004), Masa'deh et al. (2015), Runyan et al. (2008), Haber and Reichel (2005) and Jacobson (1987)
Tax System	Respondents were asked whether the new system has removed the inefficiencies and major loopholes that hampered their businesses, which existed in the previous system. Their perception of the new system and its benefits in comparison to the previous one were asked in terms of ease, accessibility, central jurisdiction, uniform tax rates etc. on the five-point Likert scaling). The respondents were asked to rate their responses on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree)	Chandak (2019), Rao (2017), Silpa et al. (2018), Kadir et al. (2016) and Wilks et al. (2019)

Table 2 Independent and dependent variables (continued)

Factors	*Definition*	*References*
Technological Advancement	The new technological aspect has revolutionised the whole tax filing system and processes, record and documentation work. The GSTN network provided the taxpayers to deal with all the indirect tax related matters on a single platform. Based on this, respondents were asked to rate their perception of the advantages and disadvantages the GSTN caused on their businesses on the scale of 1 to 5 (1-strongly disagree and 5-strongly agree)	Evans et al. (1996), Lesage et al. (2020), OECD (2019), IAMAI Report (2016), and Dey (2020)
Tax Compliance System	With change in tax system and technological innovation, the operational framework of the tax compliance system changes. The respondents were asked to rate the impact of the new compliance system, the procedure, processes, technical jargon faced, and tax administration in accordance to their businesses on five-point Likert scaling (1 = strongly disagree, 5 = strongly agree)	Breen et al. (2002), Pope and Mohdali (2010) and Kannaa (2015)
Tax awareness and knowledge	In order to measure the level of tax knowledge and awareness among MSMEs, the respondents were asked few statements related to the tax rates, rules, threshold limits, tax fines and penalties applicable on their businesses. Further, they were asked whether they are aware about the special training session, workshops, orientation programs, webinars being conducted on GST. The Tax awareness and knowledge level is measured on the Likert scale 1 to 5 (1- not aware 5- extremely aware)	Choong and Lai (2006), Rao et al. (2019), Carolina and Simanjuntak (2011), Bornman and Ramutumbu (2019), Empson (2001) and Cooper and Robson (2006)
Firms' size and turnover (Control Variables)	The firms' characteristics information asked from the respondents related to the type of firms, that is, firm size- • Type1 = micro • Type 2 = small • Type 3 = medium. Further, the annual turnover is grouped into four categories which are: • Turnover 1 = up to INR 50 million • Turnover 2 = INR 50-250 million • Turnover 3 = INR 250-500 million • Turnover 4 = above 500 million	Audia and Greve (2006) and Crain (2011)

The regression equation for the same can be depicted as follows:

$$Performance, P = \alpha + \sum \beta x + \sum \gamma z + \varepsilon \quad (1)$$

where

Performance, P = operational, cost and profits

x = GST determinants (tax system, tax awareness and knowledge, the technological shift in the tax system and GST compliances)

z = Control Variables (firms' size and turnover)

ε = error term

Further, the ordinal regression equation for operational performance can be described as follows:

$$\log\left[\frac{p(x \geq x_i|y)}{1-p(x \geq x_i|y)}\right] = \propto + y_j\beta, \text{ for } i = 1 \text{ to } 5 \tag{2}$$

where

$p\ (x \geq x_i)$ is the cumulative probability of an event $(x \geq x_i)$

α is the term of intercept,

β is the path of regression coefficients with the measurement of the probability of occurrence of the event corresponding to y_j Covariates.

Likewise, for cost and profit performance parameters, the equation can be described as:

$$\log\left[\frac{p(x \geq x_i|y)}{1-p(x \geq x_i|y)}\right] = \propto + y_j\beta, \text{ for } i = 1 \text{ to } 3 \tag{3}$$

6 Empirical analysis

The section is bifurcated into (6.1) Statistical properties of model (6.2) the empirical results depicting the impact on business performance parameters- operational, cost and profitability.

6.1 Statistical properties

Table 3 reports the descriptive statistics of independent and dependent variables used in the current study. The mean value of tax system (3.707), tax knowledge (3.763), GST compliance (4.040) and technological transformation in tax system (4.103) are almost near four. The average value implies that respondents have agreed regarding the impact of GST implementation on performance. Later, three business performance parameters are used for the dependent variable. The mean values of operational performance (3.713), cost (2.417) and profitability (2.327) imply that most of the respondents have agreed that performance was impacted after GST, measured on the Likert Scale for operational performance (1 = strongly disagree, 5 = most agreed) and for cost and profit (1 = decrease, 3 = increased).

Table 3 Descriptive statistics

	Variables	*Mean*	*Std Deviation*	*Variance*	*Skewness*	*Kurtosis*
Independent variables	Tax system	3.707	0.4981	0.248	–0.576	–0.443
	Tax knowledge	3.763	0.6548	0.429	–0.144	–0.030
	GST compliance	4.040	0.4681	0.219	–0.259	0.410
	Technological transition	4.103	0.4968	0.247	–0.116	0.458
Dependent variables	Operational performance	3.713	0.5587	0.312	–0.553	0.369
	Cost	2.417	0.5072	0.257	0.185	–0.591
	Profitability	2.327	0.7496	0.562	–0.616	–0.979
Control variables	Firms' size	1.727	0.6532	0.427	0.347	–0.733
	Turnover	1.933	1.1104	1.233	0.841	–0.725

Source: Authors' Compilation via SPSS

Further, lower values of standard deviation and coefficient of variance reflect the consistency in respondents and their opinions regarding the impact of GST implementation on performance. For the skewness and kurtosis, values in the range of ± 1 are considered normally distributed. In the present study, all the variables are within the range and represent the normally distributed data.

Table 4 demonstrates the model fitting information using –2log likelihood (–2LL), explaining the model for an intercept (null) model and the full model (all predictor variables). The results represent that the –2LL ratio to chi-square has significantly improved all three business performance parameters. Final model for operational performance [χ^2 (9) = 134.362], cost [χ^2 (9) = 39.485] and profitability [χ^2 (9) = 25.245] is significant at 1% level (p-value < 0.000).

Table 4 Model fitting results

	Model	*–2 Log Likelihood*	*Chi-Square*	*Df*	*Sig*
Operational performance	Intercept Only	352.082			
	Final	217.720	134.362	9	**0.000*** **
Cost	Intercept Only	249.444			
	Final	209.959	39.485	9	**0.000*** **
Profitability	Intercept Only	337.882			
	Final	312.637	25.245	9	**0.003*** **

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Source: Authors' Compilation via SPSS

Table 5 represents the goodness of fit results of the model, compromising the deviance and Pearson chi-square test, which helps to determine whether the model exhibits a good fit to the data or not. As per Field (2018) and Petrucci (2009), the non-significant results

for both tests imply that indicators fit the data well. In the present study, for three performance parameters, the p-value > 0.000, that is, operational performance (0.926); cost (0.968) and profitability (0.632). These results suggest a good fit model.

Table 5 Goodness of fit model

Goodness of fit model				
		Chi-square	*Df*	*Significance*
Operational performance	Deviance	242.780	276	0.926
	Pearson	165.265	276	1.000
Cost	Deviance	572.400	181	0.872
	Pearson	147.482	181	0.968
Profitablity	Deviance	225.314	181	0.514
	Pearson	217.714	181	0.632

Source: Authors' Compilation via SPSS

Table 6 represents the pseudo-R-square. The pseudo R^2 is interpreted similarly to R-square, but it is not equivalent to the one found in Ordinary Least Square (OLS) regression. Nagelkerke R^2 gives the full coverage ranging from 0 to 1 and is considered more reliable than Cox and Snell as it explains and predict variables better (Pituch and Stevens, 2016; Osborne, 2015). The ordinal regression results stated in Table 6 explain that all the explanatory variables explain 57.4% of operational performance variance and 54.2% of cost variance. In the case of profitability, 46.7% of the variance is explained respectively.

Table 6 Pseudo R-square of the models

Operational	Cox and Snell	0.561
	Nagelkerke	0.574
Cost	Cox and Snell	0.523
	Nagelkerke	0.542
Profitability	Cox and Snell	0.454
	Nagelkerke	0.467

Link function: Logit.

Source: Authors' Compilation via SPSS

6.2 Empirical findings

Table 7 represents the regression coefficients and significance test for the independent variables used in the study. The results demonstrate the impact on business performance parameters-operational, cost and profitability.

Operational performance

For operational performance- tax system change, tax knowledge and technological shift via GSTN have become positive predictors. Even the control variables- firms' size (type)

and turnover- have shown performance variation after the GST implementation. The overall operational performance have shown a significant positive impact (p-value < 0.000). Out of the ordered level of operational performance from 1 to 5, the operational performance-4, has shown the highest impact ($\beta = 20.650$; p-value 0.000; wald statistics 73.678). This implies that respondents agree that GST has positively impacted their operational efficiencies. In regards to GST-related factors- for every one unit change in the tax system, there is a predicted increase of 1.44 in the log odds of operational performance of being enhanced (in comparison to lower bound). This depicts that tax system change enhances the MSMEs' performance positively. Likewise, tax knowledge and GSTN has also shown a positive influence with the predicted increase of 0.861 (tax knowledge) and 1.835 (GSTN) on the performance. All the variables are significant at 1% significance level (p-value < 0.000). Further, the results suggest that micro firms (Type 1) with 1.599 log odds, p-value at 5%, have shown the significant and positive influence in comparison to small (Type 2) and medium (Type 3) firms. Whereas, at the same time, firms with lower turnover have shown a negative effect. With every one unit increase in GST related factors, there is predicted negative downfall in the performance of firms with lower turnovers (–1.079). This further suggests that firms with higher turnover can cope with tax system reforms without much of a negative impact on their performance.

Table 7 Parameter estimation results

							95% Confidence interval	
		Estimate	*Std. ERROR*	*Wald*	*Df*	*Sig.*	*Lower bound*	*Upper bound*
				Operational performance				
Threshold	[Operational = 2.0]	**10.518**	**2.029**	**26.877**	**1**	**0.000*** **	**6.541**	**14.494**
	[Operational = 3.0]	**14.993**	**2.148**	**48.713**	**1**	**0.000*** **	**10.782**	**19.203**
	[Operational = 4.0]	**20.650**	**2.406**	**73.678**	**1**	**0.000*** **	**15.935**	**25.365**
Location	Tax system	**1.440**	**0.307**	**21.962**	**1**	**0.000*** **	**0.838**	**2.042**
	Tax Knowledge	**0.861**	**0.244**	**12.411**	**1**	**0.000*** **	**0.382**	**1.340**
	GST Compliance	–0.120	0.317	0.142	1	0.706	–0.742	0.502
	Technology (GSTN)	**1.835**	**0.370**	**24.550**	**1**	**0.000*** **	**1.109**	**2.560**
	[Type = 1.0]	**1.599**	**0.652**	**6.013**	**1**	**0.014** **	**0.321**	**2.877**
	[Type = 2.0]	0.579	0.535	1.171	1	0.279	–0.470	1.628
	[Type = 3.0]	0[a]	.	.	0	.	.	.
	[Turnover = 1.0]	**–1.079**	**0.541**	**3.977**	**1**	**0.046** **	**–2.140**	**–0.019**
	[Turnover = 2.0]	0.561	0.519	1.165	1	0.280	–0.457	1.578
	[Turnover = 3.0]	0.598	0.627	0.909	1	0.340	–0.631	1.826
	[Turnover = 4.0]	0[a]	.	.	0	.	.	.

Table 7 Parameter estimation results (continued)

		Operational performance						
							95% Confidence interval	
		Estimate	*Std. ERROR*	*Wald*	*Df*	*Sig.*	*Lower bound*	*Upper bound*
		Cost performance						
Threshold	[Cost = 1.0]	**–9.525**	**1.809**	**27.723**	**1**	**0.000*****	**–13.071**	**–5.980**
	[Cost = 2.0]	**–3.904**	**1.641**	**5.664**	**1**	**0.017****	**–7.120**	**–0.689**
Location	Tax system	**–1.062**	**0.288**	**13.556**	**1**	**0.000*****	**–1.627**	**–0.496**
	Tax Knowledge	**–0.526**	**0.223**	**5.595**	**1**	**0.018****	**–0.962**	**–0.090**
	GST Compliance	0.478	0.302	2.516	1	0.113	–0.113	1.070
	Technology (GSTN)	0.094	0.285	0.108	1	0.743	–0.466	0.653
	[Type = 1.0]	0.513	0.566	0.824	1	0.364	–0.595	1.622
	[Type = 2.0]	–0.129	0.454	0.080	1	0.777	–1.018	0.761
	[Type = 3.0]	0[a]	.	.	0	.	.	.
	[Turnover = 1.0]	**–1.101**	**0.481**	**5.233**	**1**	**0.022****	**–2.044**	**–0.158**
	[Turnover = 2.0]	–0.668	0.434	2.370	1	0.124	–1.517	0.182
	[Turnover = 3.0]	–0.726	0.523	1.927	1	0.165	–1.751	0.299
	[Turnover = 4.0]	0[a]	.	.	0	.	.	.
		Profitability						
Threshold	[Profitability = 1.0]	5.470	1.468	3.103	1	0.749	–2.406	3.346
	[Profitability = 2.0]	**2.175**	**1.473**	**2.179**	**1**	**0.040****	**–0.713**	**5.063**
Location	Tax system	**0.620**	**0.259**	**5.734**	**1**	**0.017****	**0.113**	**1.128**
	Tax Knowledge	0.023	0.197	0.014	1	0.907	–0.362	0.408
	GST Compliance	**–0.580**	**0.270**	**4.620**	**1**	**0.032****	**–1.109**	**–0.051**
	Technology (GSTN)	**0.444**	**0.258**	**2.969**	**1**	**0.085***	**–0.061**	**0.949**
	[Type = 1.0]	**1.126**	**0.515**	**4.780**	**1**	**0.029****	**0.117**	**2.136**
	[Type = 2.0]	**1.008**	**0.421**	**5.722**	**1**	**0.017****	**0.182**	**1.834**
	[Type = 3.0]	0[a]	.	.	0	.	.	.
	[Turnover = 1.0]	–0.738	0.455	2.630	1	0.105	–1.629	0.154
	[Turnover = 2.0]	**–0.713**	**0.422**	**2.856**	**1**	**0.091***	**–1.540**	**0.114**
	[Turnover = 3.0]	**–0.985**	**0.481**	**4.189**	**1**	**0.041****	**–1.929**	**–0.042**
	[Turnover = 4.0]	0[a]	.	.	0	.	.	.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Source: Authors' Compilation via SPSS

Costs

For costs, tax system changes and tax knowledge have helped in reducing the overall cost of the MSMEs. The costs have shown a decrease after GST, which is significant at 1% level (p-value < 0.000). Out of the ordered level performance of cost from 1 to 3, the cost = 1 has shown the highest impact (β = –9.525; p-value 0.000; wald statistics 27.723).

This implies that respondents agree that GST has reduced/decreased the costs of their firms. In regards to GST related factors, for every one unit of tax system change, there is a predicted decrease of –1.062 in the log odds of overall cost reduction (compared to upper bound). This depicts that change in tax system has reduced the overall cost of the firms. Likewise, tax knowledge has helped narrow the cost (log odds: –0.526; p-value < 0.05). The results also suggest that the firms with lower turnover has shown a negative association with the overall reduction of the firms (log odds: –1.101; p-value < 0.05).

Profitability

For profitability, the results emphasise that overall profit margins after GST has not decreased but remained constant. Out of the ordered level from 1 to 3, the profit performance-2, has shown the highest impact ($\beta = 2.175$; p-value 0.040; wald statistics 2.179). This implies that respondents agree that after GST, more or less the profit margins of MSMEs remained the same. As in regards to GST related factors, tax system change and technological shift via GSTN have come out to be positive predictors, whereas GST compliance system has negatively impacted the profitability margins of the firms. Regarding GST-related factors, for every unit change in the tax system, there is a predicted increase of 0.620 in the log odds of profitability margins (in comparison to the lower bound). This depicts that change in tax system positively influences the profits of MSMEs. In contrast, GST compliance system has harmed the profits of the MSMEs (log odds; –0.580; p-value < 0.05). This depicts that with every one unit increase in the GST compliance system, there is a predicted negative downfall in firms' profit margins. This further suggests that MSMEs find it hard to manage the cumbersome compliances, which has decreased their profits by blocking their business expansion. The results also emphasised that firms with higher turnover have shown higher negative impact (turnover 2: –0.713; p-value < 0.05 and turnover 3: –0.985; p-value < 0.05) as with high turnovers, these firms have to maintain high compliance records and file a high number of tax returns which have proved harmful for the profitability of the MSMEs.

As defined by Osborne (2017), the test of parallel lines indicates the assumption of proportional odds; that is, the relationship between independent variables is the same across all possible outcomes involving the dependent variable. Therefore, the non-significance of the results indicates the assumption is satisfied. Table 8 results demonstrate that for all the business performance parameters, the assumption is met for operational, cost, and profitability margins with the p-value > 0.05.

Table 8 Test of parallel lines

	Model	*–2 Log Likelihood*	*Chi-Square*	*Df*	*Sig*
Operational performance	Null hypothesis	217.720			
	General	177.545	40.175	18	0.448
Cost	Null hypothesis	209.959			
	General	188.346[b]	21.613[c]	9	0.133
Profitability	Null hypothesis	312.637			
	General	296.476[b]	16.162[c]	9	0.452

Source: Authors' Compilation via SPSS

7 Discussion and conclusion

The study's objective is to investigate the effect of GST on MSMEs' performance. The impact of GST-change in the tax system, tax knowledge, GST compliance, and technological transformation is analysed using the ordinal regression model. The major outcomes are-

Firstly, the change in the tax system has brought uniformity in the taxation rules for all goods and services. As a result, the firms have to register themselves under the single uniform indirect tax system, GST, which was not possible in the earlier tax systems (VAT, CST, Excise). This GST system has not only enhanced operational performance and profitability but also reduced the firms' compliance costs as earlier, businesses with multi-state operations had to follow different state tax rules. Different turnover slabs and tax rates burdened businesses with extra compliance costs and hampered their expansion (CII Report, 2019; Sinha and Srivastva, 2020).

Secondly, the technological shift in the tax system through the GSTN has enhanced the operational efficiency of businesses by providing them with a unified platform for all tax-related matters. GSTN led to flexibility in tax administration which led to better tax governance. Further, it narrows down the burdensome documentation process by digitalising the registration, filing of tax returns, payment of taxes, and other tax-related matters, which cuts the cost of doing and raises firms' profitability. Similar implications were supported by Bird and Zolt (2008) and Suparadianto et al. (2019) in their studies that technology eased the tax function and working procedures of businesses.

Thirdly, the empirical findings supported that tax knowledge has enhanced operational performance. Proper tax knowledge about the GST has made MSMEs more tax compliant and led to timely filing of tax returns, payment of taxes, and abidance of tax laws, which prevented heavy fines, penalties and losses. However, at the same time, the GST compliance system has shown a negative impact by increasing the administrative workload of the business through increased tax returns, cumbersome filing procedures, and technical issues, which eventually harmed the profitability of the firms. Similar implications were observed in Malaysian and Australian MSMES after GST (Chen and Taib, 2016; Siddiq and Prasad, 2017; Suman, 2017).

Fourthly, micro-enterprises have shown a more significant and positive impact on them. After the implementation of GST, the micro firms started to fall into the ambit of the tax net and the unique tax benefits, exemptions, and input tax credits are made available to them, which were inaccessible to them in previous tax systems (Shome et al., 1996; Sinha, 1987; Vasanthagopal, 2011)

7.1 Practical implications

The key significant implications are for the government, investors, policymakers and Micro, Small and Medium Enterprises. The government and policymakers should resolve the cumbersome compliance procedures as this will lower the administrative burden and helps them utilise the resources in the best possible way. Further, the GST department must provide a help desk for MSMEs to provide them timely assistance to solve the issues and queries related to compliance processes or tax filing. The results may also prove beneficial to institutional investors, particularly FII, and credit rating agencies, as they remain interested in investing in the MSME sector. The comprehensive analysis can help them in analysing how micro, small and medium enterprises react after the tax

policy change, respectively. In addition, comparing the different turnover levels and sizes of MSMEs can help investors assess the empirical impact on the costs and profit margins of the firms. For MSMEs, the results may prove beneficial, as they can have a better understanding of the effect of compliance system harming their profitability. Further, the results highlighted that with proper tax knowledge and awareness, MSMEs can lower their compliance costs as they can devote their time in business expansion. The results also showed a positive association of technological advancement with profitability which implies that digitalisation of tax-related matters enhances the operational efficiencies and may fetch higher returns for their ventures.

In terms of limitation, the current research is focused on one of the emerging states, Punjab only. If the samples from all over India had been selected, the results would have been more comprehensive. Whether the same results can be replicated across India is a scope for future research.

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Appendix

A1. Definition of MSMEs

Micro	Investment in plant and machinery does not exceed Rs. 25 lakh (Manufacturing); 10 lakhs (Servicing)
Small	Investment in plant and machinery is more than Rs. 25 lakh but does not exceed Rs. 5 crore (Manufacturing); more than 10 lakhs but does not exceed 2 crores (Servicing)
Medium	Investment in plant and machinery is more than Rs.5 crore but does not exceed Rs.10 crore (Manufacturing); more than 2 crores but does not exceed 5 crores (Servicing)

Source of Definition: Micro, Small and Medium Enterprises Development (MSMED) Act, 2006