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Examining the impact of uncertainty on business performance via strategic cost management adoption and implementation: the case of agro-based industries in and around Punjab, India

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Abstract: Dynamic business environments require a change to survive. Strategic cost management (SCM) must re-conceive its future as new, improved, or reformed under opportunities and tough demands. Traditional cost management may not be adaptable to business turbulence. Increasing shareholder and customer demand, rapid information and technology improvements in manufacturing, and worldwide market rivalry with antiquated tools can be difficult. SCM goes beyond cost reduction and includes revenue

generation and competitive advantage. This article examines the relationship between adopting and applying SCM approaches and company success in agro-based industrial businesses. Empirical survey data from agro-based industrial companies in Punjab were analysed using multivariate data analysis. According to contingency theory, size, technology, total productivity maintenance, strategy, and organisation culture are factors related to strategic cost management. All dependent factors, including control variable size, favourably affected SCM acceptance and utilisation, which has a pragmatic effect on agro-based businesses. SCM utilisation also mediated performance.

Keywords: technology; total productivity maintenance; organisational culture; strategic cost management; return on investment; return on sales; customer satisfaction; business performance; manufacturing industry; India.

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1 Introduction

Due to erratic changes and environmental disruptions in the present scenario, traditional cost methods are inadequate. As the business environment frequently changes, one has to adapt to these changes to survive and compete. This has led the entities to inculcate strategic cost management techniques to manage their competitiveness, reduction of cost, revenue generation, and business performance measured in terms of financial and non-financial aspects along with maximisation of shareholders' wealth which is the ultimate objective (Gliaubicas and Kanapickienė, 2015; Felício et al., 2021).

Expansion of competition in global markets, Technology up-gradation, and increased business complexities with uncertainty have led to various emerging environmental challenges (Bayus, 1994; National Research Council (1986). Manufacturing firms have to carefully consider a transformation from industrial systems to post-industrial systems where growth relies on a quick reaction to customer's expectations for high-quality and customised products (Doll and Vonderembse, 1991; Hayes et al., 1988; Roth, 1996; Skinner, 1969, 1986; Goldhar and Lei, 1991; McCutcheon et al., 1994). In the post-industrial environment, stable and good quality products and services, delivery on time, frequent after-sale service to customers, timely upgradation in products, deploying the capital efficiently, and not focusing solely on cost reduction is the primary source of relative advantage (Skinner, 1986).

Conviction of relative advantage is the outcome of the decision-making process by managers through SCM information. The SCM concept was introduced in 1989 by Shank in the USA for the first time. SCM usage is recurrent in companies that come across

competition with high intensity (Gliaubicas and Kanapickienė, 2015). Nevertheless, little effort has been made in the context of observational queries designed to understand SCM implementation's attributes and factors (Cadez and Guilding, 2008). However, further research needs to be undertaken to understand the hypothesis relating to the adoption and usage of SCM in special reference to agro-based industries. According to Alleyne and Weekes-Marshall (2011), manufacturing firms utilise SCM to plan and control operational costs and thereby increase profitability (Gaikwad and Sunnapwar, 2020). Horngren (2009) also highlighted the importance of management accounting practices for the success of manufacturing concerns. Notwithstanding that the manufacturing sector is crucial for the GDP and numerous researches are conducted in the area, there is a shortage of studies on SCM and its contingent factors regarding agro-based manufacturing industries in and around Punjab, India. SCM research based on contingencies aims to analyse the structure that consists of countless accounting schemes and contingent variables (Fisher, 1995; Rashid et al., 2020).

The organisation's performance in the past is an important factor to be considered in adopting SCM techniques (Naranjo-Gil et al., 2009). Research undertaken in previous years has examined the relationship between firms and SCM utilisation (Pavlatos, 2015). This study examines how contingent factors affect the performance of agro-based industries through the adoption and usage of mediating factors, i.e., strategic cost management. Moreover, this study investigates the effect of SCM techniques on business performance, which has not yet been examined according to the researchers' knowledge. Thereby the importance of carrying out such a study, which will add value to the literature on the subject in question and help policymakers and decision-makers in their strategies relating to cost management.

2 Theoretical framework and hypotheses development

2.1 Strategic cost management and its techniques

Cooper and Slagmulder (2004) suggested that SCM is the acceptance of cost management methods, which helps to improve the position strategically and reduce costs. SCM helps produce justifiable relative advantage by using cost data to scrutinise the superior strategies. Hansen and Mowen (2006), El Kelety (2006), and Thapayom (2021) argued that SCM is an ideology along with a series of techniques for framing the company's future. Anderson (2006) concluded that the purpose of SCM is to synchronise the cost structure together with the strategy. To plan and manage short-term and long-term decisions, SCM techniques are used, which in turn leads to a reduction in costs and an increase in the value of the products.

Originally Guilding et al. (2000) introduced SCM techniques. He also helped identify the criteria for recognising specific cost techniques as strategic. The main feature of SCM implies a futuristic long-term approach with a focused context. SCM techniques must incorporate the external business environment and/or in the long-term; keeping this viewpoint in mind, Guilding et al. (2000) considered 12 SCM techniques from published writings, followed by Cravens and Guilding, 2001 who added a further three approaches. Cadez and Guilding (2008) gathered 16 SCM techniques from previous literature and further distributed the techniques into five major categories. These are shown in Table 1.

Table 1 Five major categories of SCM

Categories	*SMA techniques*	*Authors*
Plan, control and measurement of performance	• Benchmarking • Integrated performance measurement	• Elnathan et al. (1996) and Brownlie (1999) • Kaplan and Norton (1992, 1996), Ittner et al. (2003), Libby et al. (2004) and Chenhall (2005)
Cost control	• Attribute costing • Life-cycle costing • Quality costing • Target costing • Value-chain costing	• Bromwich (1990), Roslender and Hart (2003) • Czyzewski and Hull (1991), Shields and Young (1991) and Dunk (1992) • Heagy (1991) and Belohlav (1993) • Monden and Hamada (1991) and Cooper and Slagmulder (2004) • Hergert and Morris (1989), Shank and Govindarajan (1992) and Dekker (2003)
Accounting for competition	• Competitor cost assessment • Competitive position monitoring • Competitor performance appraisal	• Simmonds (1981), Jones (1988), Bromwich (1990) and Ward (1992) • Simmonds (1986) and Rangone (1997) • Moon and Bates (1993)
Accounting for customers	• Customer profitability analysis • Lifetime customer profitability analysis • Valuation of customers as assets	• Bellis-Jones (1989), Ward (1992) and Zeithaml (2000) • Foster and Gupta (1994) and Jacob (1994) • Slater and Narver (1994), Foster et al. (1996) and Zeithaml (2000)
Decision-making	• Strategic costing (strategic cost management) • Strategic pricing • Brand valuation	• Shank and Govindarajan (1988, 1993) and Shank (1996) • Simmonds (1982) and Rickwood et al. (1990) • Guilding (1992) and Cravens and Guilding (1999)

Source: Adapted from Cadez and Guilding (2008, p.839)

The contingency theory is most frequently applicable to management accounting-based research and strategic management (Henri et al., 2016; Lopez-Valeiras et al., 2015; Cadez and Guilding, 2012; Al-Mawali, 2015). No management accounting system is universally applicable and can be applied to industries under every situation (Otley, 1980; Oates, 2015; Al-Mawali, 2015).

To enhance the performance, the design of the management accounting system used in the industry must relate to the situations and conditions in which the industry operates. The main purpose of contextual theory is that the performance of the business will improve if a good fit occurs between SCM and the contingent factors. Nevertheless, a large amount of attention in published work on accounting has been on the idea of fit

(Drazin and Van de Ven, 1985; Al-Mawali, 2015). This research paper explored the effect of three contingent variables which have not been studied in the previous literature, i.e. technology, total performance management (TPM) and organisational culture (Chenhall, 2003; Abernethy and Bouwens, 2005; Pavlatos, 2018; Ahammad et al., 2021). Two contextual variables have been identified based on previous related work, i.e. strategy, age and size (Elhossade et al., 2020).

2.1.1 Technology

Another significant contingent factor that needs to be explored while analysing the influence of business performance through the usage of SCM techniques is technology (Dunk, 1992; Huang et al., 2010; Cadez and Guilding, 2008; Haldma and Lääts, 2002; Merchant, 1984 Waweru et al., 2005; Waweru, 2008; Khandwalla, 1977). Technology refinement is a major cause for stimulating change in management accounting techniques (Maina Waweru et al., 2004; Libby and Waterhouse, 1996; Ojra, 2014).

In this study of agro-based industries, a significant coalition is constructed between technological adaptation in terms of the increased manufacturing quality of the products, which can be increased through technological up-gradation, development of new products with modification in existing ones along with decreased manufacturing cost in various components of the products and business performance through SCM.

Accordingly, the following hypothesis has been made:

H1 There is a positive influence of Technology on SCM usage.

2.1.2 Total productivity maintenance

To establish a competitive edge over the competitors, another unexplored contingent factor is TPM. As production equipment is considered one of the crucial factors in manufacturing firms to generate more revenue and achieve long-term growth, maintenance of productivity plays a significant role (Neely et al., 2002).

In TPM, a significant prerequisite for operators is strengthening the propensity to reveal the abnormalities of the working equipment and focus on the quality of output based on the grounded perception that something is wrong (Sahoo, 2018).To have these abilities, the employees working in the firms shall have complete autonomy to be timely trained with adequate skills and resources and, most importantly, the freedom to make decisions on equipment maintenance. The present study focuses on the same and other aspects of equipment maintenance, such as providing necessary information about the use of equipment, timely replacement of worn-out parts, regular maintenance, etc. (Sharma et al., 2012). Accordingly, the following hypothesis has been made:

H2 There is a positive association between Total Productivity Maintenance and Strategic cost management usage.

2.1.3 Organisational culture

Organisational culture has been seen as a contingent factor in studying its effect on business performance through SCM adoption and usage. Various authors and researchers have defined it as a set of beliefs and values of an organisation's employees that they inherit. For the purpose of this study, organisational culture is a multifaceted component

that indicates how change is being managed in an organisation in terms of various aspects, such as whether flexibility is prevalent or not while adapting to change or change is discovered because of imposed pressures from higher authorities, clarity about the change being implemented, resistance and responsiveness to change and believes of people while managing change (Abu-Jarad et al., 2010).

Accordingly, the following hypothesis has been made:

H3 There is a positive influence of organisational culture on strategic cost management usage.

2.1.4 Strategy

Strategy refers to the ascertainment of basic goals that are long-term and organisational objectives, thereby adopting various courses of action and then leading to resource allocation to effectuate these goals (Chandler, 1962). Two different forms of strategies were proposed by Porter (1981).

1 Cost leadership strategy, which indicates that if the cost is low, it can strengthen the organisational propensity to produce more, and comparatively, it helps to market the product at a reasonable price to create an edge over the competitors (Gliaubicas and Kanapickien, 2015). Major emphasis is on lowering the cost, achieving a higher share in the market, making products more standardised, and effective cost control, ultimately leading to bulk production, thereby achieving economies of scale (Janjić et al., 2017).

2 Differentiation strategy, which can be summarised as an organisation's ability to offer products with special or singular attributes to its competitors, marketing unique and superior quality products. This strategy brings brand quality and innovation to product marketing and research (Hoque, 2003; Pavlatos, 2018). SCM attuned to reinforcing strategy can escalate a competitive edge, enhancing performance (Hoque, 2003). Usage of the cost management techniques given by Cadez and Guilding (2008) can help and strengthen the ability of an enterprise to calculate costs more accurately, which can assist managers in detecting activities wherever there is a need to reduce costs (Langfield-Smith, 1997; Ayda and Affes, 2014).

Accordingly, the following hypothesis has been made:

H4 There is a positive influence of strategy on strategic cost management usage.

2.1.5 Business performance

According to Tuan Mat (2010), "performance can be considered as a predecessor or a sequel factor of SCM and organisational transformation (based on Delaney and Huselid 1996)". According to the view of 'performance as predecessor', if a firm considers strategic cost management techniques over traditional management accounting techniques (Ojra, 2014) for improving business performance it is because of one critical reason that of lower financial performance (Laitinen, 2006; Granlund, 2001). Another view of 'performance as a sequel factor', to which the theory of contingency is related (Tuan Mat, 2010), it is emphasised that "if SCM techniques are implemented according to the suitability of environmental and organisational factors, performance would be elevated" (Otley, 1980; Chenhall, 2003).

Business performance is a proper fit between contingency factors and SCM (Cadez and Guilding, 2008). Over the last several decades, many researchers from various disciplines have devoted much of their efforts to develop various management accounting systems, including strategies that can emulate rapidly changing environments (e.g., Franco-Santos et al., 2007; Kaplan and Norton, 1993, 1996; 2000; Neely et al., 1996, Bitton, 1990; Franco-Santos and Bourne, 2005; Olve et al., 2019). Various performance attributes have been studied and reviewed (Alarcon and Bastias, 2000; Hambrick, 1980). In this study, performance is measured from two perspectives: financial and non-financial (e.g., Valančienė and Gimžauskienė, 2007; Husted and Allen, 2007; Klovienė and Gimžauskienė, 2009).

Financial measures entail variables such as return on investment (ROI) and return on sales (ROS), and Non-financial measures include customer satisfaction as a measuring variable. These will help the organisation elevate the business performance by clearly supervising core competencies of the organisation, strengthening efficiency, adapting to the dynamic environment, and thereby ascertaining and evaluating the firm's progress towards organisational goals and objectives (Kaplan and Norton, 1996).

Previous studies have stated that the fundamental measures of business performance regarding financial aspects include: ROI, the margin on sales, market share, return on assets (ROA), capacity utilisation etc. (Brush and Vanderwerf, 1992; Govindarajan and Gupta, 1985; Chen et al., 2005; Tuan Mat, 2010; Glaister et al., 2008; McDougall et al., 1994; Roth and Ricks, 1994; Jusoh, 2010; Pearce et al., 1987; Cadez and Guilding, 2008; Elbanna and Alhwarai, 2012), and the fundamental measures of business performance in regards to non-financial aspects include the satisfaction of the customer, the performance of personnel, quality of product/service, employee morale and attitude (e.g., Kaplan and Norton, 1992; Hoque, 2005; Brownell and Hirst, 1986; Govindarajan, 1986; Anderson and Lanen, 1999; Gul and Chia, 1994; Cadez and Guilding, 2008).

Accordingly, the following hypothesis has been made:

H5a Greater SCM usage and adoption positively influence the business performance in terms of customer satisfaction.

H5b Greater SCM usage and adoption positively influence the business performance in terms of ROI.

H5c Greater SCM usage and adoption positively influence the business performance in terms of Return on Sales.

2.1.6 Company size

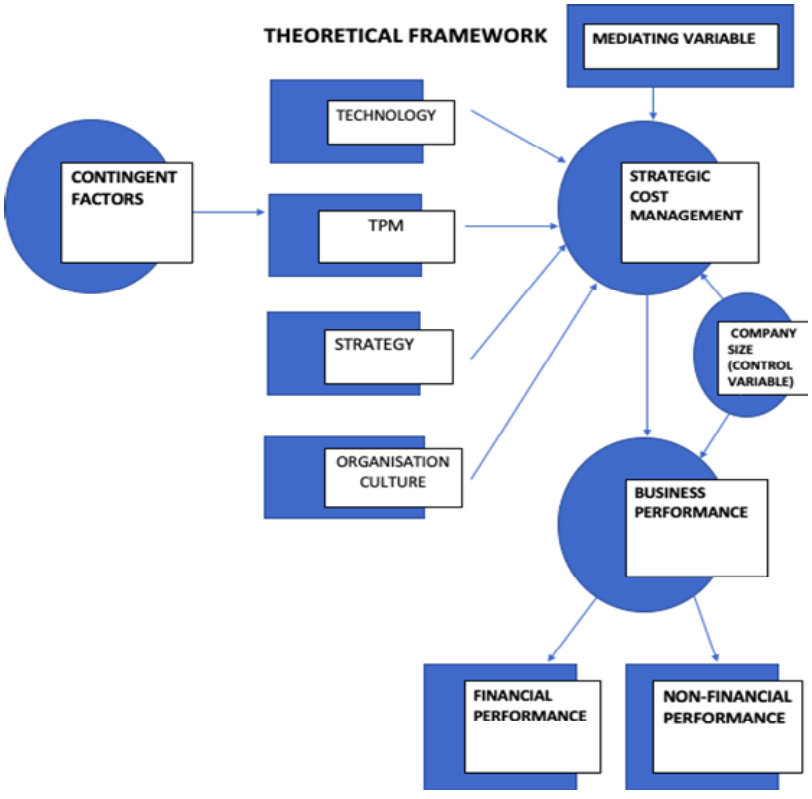
Company size refers to measuring the number of employees working in the organisation (Libby and Waterhouse, 1996). The larger organisation refers to more employment of employees. Ayda and Affes (2014); Van Nguyen and Brooks (1997) stated that a management accounting system is beneficial when it leads to an increase in the size of the company (Gliaubicas and Kanapickien, 2015), which stipulates that larger organisations embrace innovativeness more readily than smaller organisations, as they are more capable of managing risk, having abundance which is readily available with a robust infrastructure (Pavlatos, 2018).

3 Research methodology

3.1 Methods participants and procedure

The motivation behind the study is to explore the effect of contingent factors (Technology, TPM, organisational culture, strategy and size) on agro-based industries' business performance through SCM adoption and usage. Figure 1 shows the proposed hypothesised framework.

Figure 1 Proposed hypothesised framework (see online version for colours)



Source: Authors' formation

We initially contacted prospective participants for our survey using non-probability purposive sampling. These respondents referred further participants resulting in non-probability snowballing sampling. The responses were collected from participants who worked in the upper levels of management (supervisory roles upwards) of the automobile manufacturing industries in and around Punjab. An e-mail with a covering letter explaining the purpose of the study and a Google link to the questionnaire was sent to the prospective participants. The questionnaire had a glossary that described the terminology of SCM techniques adopted by Cadez and Guilding (2008). In accordance with suggestions by Kittleson (1997), after one week, the first reminder was e-mailed; the second reminder followed one week later, and after 15 days of the second reminder, the

questionnaire link was disabled. The study was carried out during the months from January to March 2019, when the manufacturing industries were busy meeting the targets as the harvesting season was approaching.

The manufacturing industries covered in this study were: Mahindra and Mahindra Swaraj Division, Mohali; SML Isuzu, Ropar; Sonalika International Tractors Ltd. Hoshiarpur; John deere Tractor, Mohali; Claas Combine, Morinda; Eicher Tractors Ltd. and Parwanoo. Out of 178 questionnaires, a total of 163 responses were received. The incomplete responses were not considered for the study, resulting in 152 responses for further analysis. The justifications for the 15 who have not shared their views were given as 'not having enough time', 'not interested in the study because SCM techniques contemplated in the questionnaire are not relevant to their industry', and 'the policy of the industry does not allow us to collate research questionnaires'.

3.2 Measures

To measure 'the extent of adoption and usage of SCM techniques', we used a technique adapted from a model developed by Cadez and Guilding (2008). The sample consists of 16 items measured on a seven-point Likert scale, where 1 – means 'not at all' and 7 means – 'to a great extent', where respondents were asked to specify their extent of adoption and usage of SCM techniques.

'Technology' was measured based on the variables adapted from Jaworski and Kohli (1993). The sample consists of three items measured on a seven-point Likert scale, where 1 means – 'not at all' and 7 means – 'to a great extent', where respondents were asked to specify the impact of technological up-gradation in terms of product innovativeness on the business performance.

'Total Productivity Maintenance' was measured based on items were taken from Ngozi et al. (2016). The sample consists of five items measured on a seven-point Likert scale, where 1 means – 'not at all' and 7 means – 'to a great extent', where respondents were asked to specify the impact of usage of TPM in terms of maintenance autonomy on the business performance.

To measure 'Organisational Culture', the items were adapted from a classified scheme provided by Hofstede (1980) and Schein (1985) and measured by Stock et al. (2013). The sample consists of six items measured on a seven-point Likert scale, 1 means – 'not at all' and 7 means – 'to a great extent' where respondents were asked to specify the impact of organisational culture in managing change on the business performance.

'Strategy' was measured based on the variables mentioned in the study by Porter (1981) and Abdel-Kader and Luther (2008). The sample consists of three items measured on a seven-point Likert scale, where 1 means – 'not at all' and 7 means – 'to a great extent', where respondents were asked to specify the impact of strategy in terms of cost leadership and differentiation on the business performance.

'Business Performance' was measured based on a model developed by Cadez and Guilding (2008) and Ojra (2014). The sample consists of 11 items measured on a 7-point Likert scale, 1 means – 'not at all' and 7 means – 'to a great extent', where managers were asked to indicate the impact on business performance in terms of financial and non-financial aspects.

Table 2 shows that the technology's mean value and standard deviation are 5.90 and 1.12, respectively. In addition, TPM has a mean value of 6.35 and a standard deviation of 1.41. Furthermore, the mean value of the strategy is 6.35, and the standard deviation is

0.908. Factors such as SCM show a mean value of 6.24 and a standard deviation of 1.09. business performance (non-financial aspect) in terms of customer satisfaction shows a mean value of 6.00 and a standard deviation of .653, and the mean value of the financial aspect in terms of return on investment and return on sales is 5.67 and 6.22, along with standard deviation of 1.44 and 1.00 respectively. On average, the number of Employees was 339, ranging from a minimum of 68 to a maximum of 589.

Table 2 Descriptive analysis

Factor	*N*	*Mean*	*SD*	*Minimum*	*Maximum*
Technology	152	5.9033	1.12895	5.33	7.00
Total productivity maintenance	152	6.3547	1.41849	5.00	7.00
Strategy	152	6.3558	.90858	4.75	7.75
Organisational culture	152	6.8639	1.22091	5.00	7.00
Strategic cost management	152	6.2448	1.09352	5.00	7.00
Customer satisfaction	152	6.0017	.65397	5.00	7.00
Return on investment	152	5.6775	1.44519	5.00	7.00
Return on sales	152	6.2278	1.00554	5.00	7.00
Number of employees	152	339.41	151.211	68	589

Source: Authors' compilation

3.3 Data analysis

To test the proposed hypothesised relationships, the researcher uses the structural equation modelling technique (SEM) with the help of AMOS version 21. This is a multivariate statistical analysis method employed in the study of structural relationships. This method examines the structural link between measured variables and latent constructs by combining component and multiple regression analyses.

Table 3 and Figure 2 indicates a correlation and discriminant analysis where it is depicted that there is a significant and positive relationship between Technology and SCM ($r = 0.194$; $p < 0.01$). TPM also has a significant and positive relationship with SCM ($r = 0.525$; $p < 0.01$). A significant and positive relationship between Strategy and SCM has been explored ($r = .474$; $p < 0.01$). In addition to this, the correlation between Organisation Culture and SCM is also positive and significant ($r = 0.434$; $p < 0.01$). On the same pattern, it has been observed that there is a positive and significant correlation between Customer Satisfaction, ROI, Return on Sales, Number of employees and SCM ($r = 0.617$; $p < 0.01$), ($r = .522$; $p < 0.01$), ($r = .412$; $p < 0.01$) and ($r = .127$; $p < 0.05$).

In addition to this, Table 3 also shows the correlation analysis and discriminant validity analysis results. To establish discriminant validity, the value of inter-construct correlation should be less than the square root of the AVE of that construct. In the present study, the value of the square root of AVE of all the constructs is more than the correlation value. This means that the present measurement model has achieved discriminant validity (Aggarwal et al., 2018b).

Table 3 Correlation and discriminant analysis

Variable	*SFL*	*CR*	*AVE*
Technology			
Increasing manufacturing quality in components and materials of current products	0.920***	0.922	0.798
Decreasing manufacturing costs in components and materials of current products	0.872***		
Developing new products with technical specifications and functionalities	0.888***		
Total productivity maintenance			
Training enhances our knowledge of equipment maintenance	0.776***	0.918	0.693
If we are given the necessary information about equipment maintenance, we will use it to maintain the equipment	0.861***		
Autonomy will increase our urge to maintain the equipment	0.778***		
With adequate resources, worn-out parts will be changed promptly	0.876***		
Regular maintenance workshops will increase our knowledge of equipment maintenance	0.865***		
Strategy			
Costs reduction efforts	0.728***	0.858	0.670
Price-cutting ability	0.905***		
Create something that is perceived as unique by the customers	0.813***		
Organisational culture			
People are flexible and adaptable when changes are necessary.	0.787***	0.936	0.710
People feel that most change results from pressures imposed from higher up in the organisation.	0.862***		
People have a clear idea of why and how to proceed throughout the change process	0.857***		
Most people believe that change happens too quickly and causes too much disruption.	0.814***		
People believe they can influence or affect their work through their ideas and involvement.	0.859***		
People believe that their concerns and anxieties during change are heard and considered.	0.874***		
Strategic cost management			
Attribute costing	0.808***	0.961	0.607
Life-cycle costing	0.776***		

Notes: ***p < 0.01, and **p < 0.05. SLF: standardised factor loading, CR: composite reliability, and AVE: average variance extracted.

Table 3 Correlation and discriminant analysis (continued)

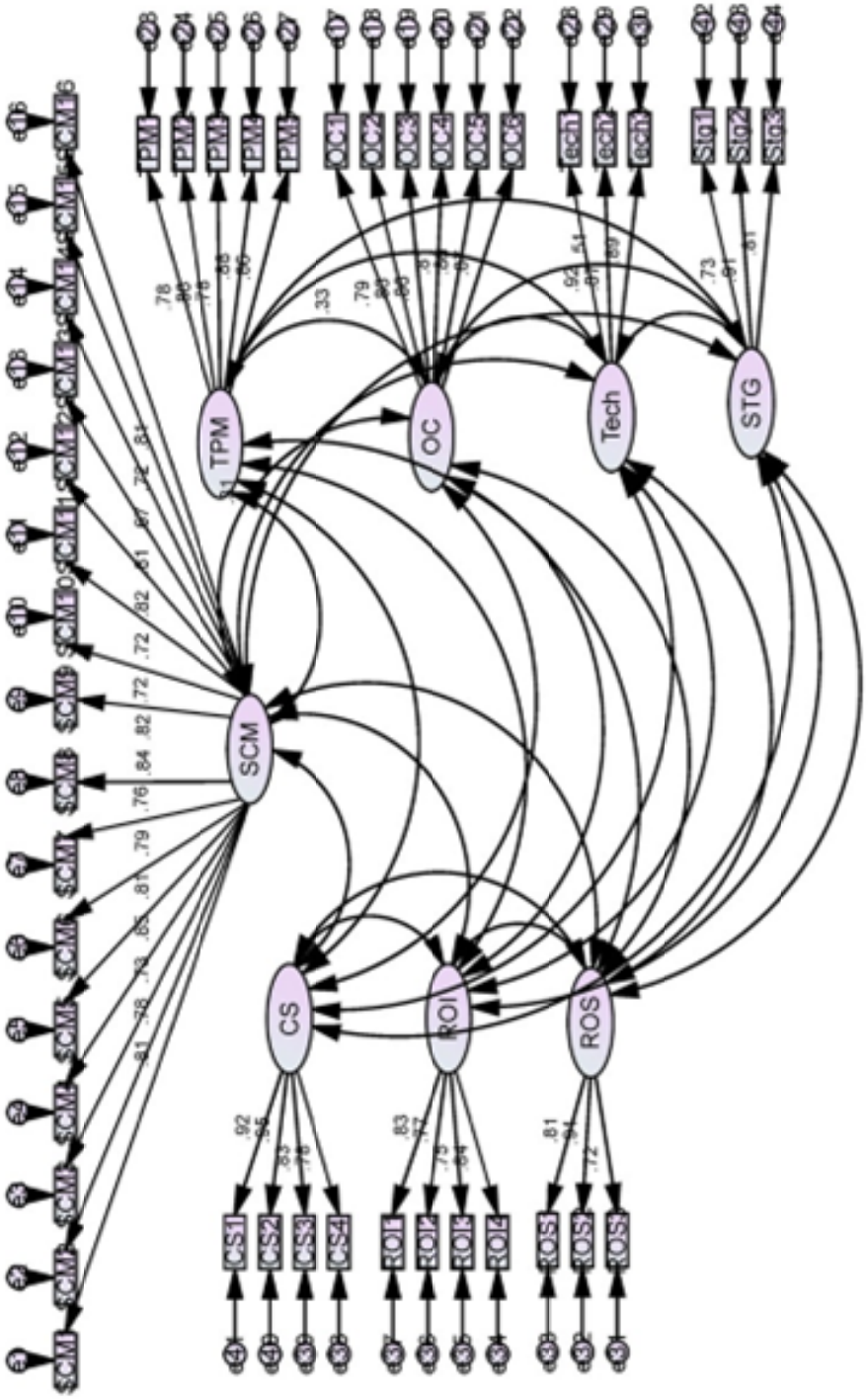
Variable	*SFL*	*CR*	*AVE*
Strategic cost management			
Quality costing	0.733***		
Target costing	0.846***		
Value-chain costing	0.814***		
Benchmarking	0.788***		
Integrated performance measurement	0.757***		
Strategic costing	0.840***		
Strategic pricing	0.822***		
Brand valuation	0.719***		
Competitor cost assessment	0.721***		
Competitive position monitoring	0.817***		
Competitor performance appraisal	0.805***		
Customer profitability analysis	0.672***		
Lifetime customer profitability analysis	0.715***		
Valuation of customers as assets	0.808***		
Customer satisfaction			
Customers are satisfied with the overall quality of our products	0.921***	0.926	0.758
Customers are satisfied with our company's delivery	0.948***		
Customers are satisfied with our company's response to sales enquiries	0.827***		
Customers are satisfied with our products.	0.776***		
Return on Investment			
The profit margin has increased	0.831***	0.875	0.638
Our return on investment reflects sound investments	0.771***		
Our profitability has exceeded our competitors	0.747***		
Our revenue growth rate has exceeded our	0.841***		
Return on sales			
Market share has increased	0.810***	0.855	0.665
Our sales growth has been outstanding	0.907***		
Our market share growth has exceeded our	0.718***		

Notes: ***p < 0.01, and **p < 0.05. SLF: standardised factor loading, CR: composite reliability, and AVE: average variance extracted.

3.4 Measurement model

According to Anderson and Gerbing (1988), the researchers need to follow the two-stage procedure to examine the proposed relationships. In the first stage, the researcher needs to establish the reliability and validity of the measurement model, and in the following step, the researcher needs to test the hypothesised relationships through the structural model. Table 3 shows the discriminant validity results, and Table 4 shows the convergent and reliability analysis results.

Figure 2 Structure equation model



Source: Authors' compilation

Table 4 Reliability and convergent validity

Variable	*SFL*	*CR*	*AVE*
Technology			
Enhancing current products by improving the quality of components and materials	0.920***	0.922	0.798
Reduced production costs in current goods' components and materials	0.872***		
Creating new commodities with technical requirements and functionalities	0.888***		
Total productivity maintenance			
Training enhances our knowledge of equipment maintenance	0.776***	0.918	0.693
If we are given the necessary information about equipment maintenance, we will use it to maintain the equipment	0.861***		
Autonomy will increase our urge to maintain the equipment	0.778***		
With adequate resources, worn-out parts will be changed promptly	0.876***		
Regular maintenance workshops will increase our knowledge of equipment maintenance	0.865***		
Strategy			
Costs reduction efforts	0.728***	0.858	0.670
Price-cutting ability	0.905***		
Create something that is perceived as unique by the customers	0.813***		
Organisational Culture			
People can change and adapt when they have to.	0.787***	0.936	0.710
People believe that most organisational changes result from pressures exerted by higher-ups.	0.862***		
Throughout the transformation process, people clearly understand why and how to proceed.	0.857***		
The majority of individuals believe that change is too rapid and disruptive.	0.814***		
People feel that their ideas and involvement in the workplace can have a positive impact.	0.859***		
During times of transition, people feel their fears and anxieties are considered.	0.874***		
Strategic cost management			
Attribute costing	0.808***	0.961	0.607
Life-cycle costing	0.776***		
Quality costing	0.733***		
Target costing	0.846***		

Notes: ***$p < 0.01$ and **$p < 0.05$. SLF: standardised factor loading, CR: composite reliability, and AVE: average variance extracted.

Source: Authors' compilation

Table 4 Reliability and convergent validity (continued)

Variable	*SFL*	*CR*	*AVE*
Strategic cost management			
Value-chain costing	0.814***		
Benchmarking	0.788***		
Integrated performance measurement	0.757***		
Strategic costing	0.840***		
Strategic pricing	0.822***		
Brand valuation	0.719***		
Competitor cost assessment	0.721***		
Competitive position monitoring	0.817***		
Competitor performance appraisal	0.805***		
Customer profitability analysis	0.672***		
Lifetime customer profitability analysis	0.715***		
Valuation of customers as assets	0.808***		
Customer satisfaction			
In general, our customers are happy with the quality of our items	0.921***	0.926	0.758
Our company's delivery lag time is well-received by customers	0.948***		

Notes: ***p < 0.01 and **p < 0.05. SLF: standardised factor loading, CR: composite reliability, and AVE: average variance extracted.

Source: Authors' compilation

Results of Table 4 shows that all the latent variables' items have standardised factor loading of more than 0.7, and they are significant at a 0.01 level of significance. Furthermore, the composite reliability coefficient for each construct is more than the minimum cut-off value of 0.7 (Hair et al., 1998; Aggarwal et al., 2018b). The 'average variance extracted' (AVE) for each latent variable is again more than the specified cut-off value of 0.5 (Fornell and Larcker, 1981). In addition, the composite reliability value for each factor is more than the value of AVE for that construct. It means that the measurement model of the present study has good reliability and convergent validity.

The results of Table 5 show the extent of percentages of responses for each SCM technique. Results showed that most sample companies use different SCM techniques in their organisations. For the 'costing' technique, the most used technique in our analysis is 'target costing'. The most used technique for the 'planning, control and performance measurement' factor is 'benchmarking'. Furthermore, the most widely used 'strategic decision-making' technique is 'strategic pricing'. the most used accounting technique for the 'competitor accounting' factor is 'competitor cost assessment'. Lastly, for the 'customer accounting' factor, the most widely used accounting technique used is 'lifetime customer profitability analysis'.

Table 5 The extent to which strategic cost management approaches are used

Techniques		*Percentage of responses*						
		1	*2*	*3*	*4*	*5*	*6*	*7*
Costing	Attribute costing	3	5	14	28	27	15	8
	Life-cycle costing	6	5	14	25	24	14	12
	Quality costing	4	7	20	28	21	12	8
	Target costing	4	9	13	19	16	18	21
	Value-chain costing	3	5	2	21	31	22	16
Planning, control and performance measurement	Benchmarking	2	5	15	17	20	22	19
	Integrated performance measurement	6	10	23	24	20	14	3
Strategic decision-making	Strategic costing	4	5	16	33	23	16	3
	strategic pricing	2	5	14	17	18	20	24
	Brand valuation	7	18	28	14	15	11	7
	Competitor cost assessment	2	6	6	17	24	21	24
	Competitive position monitoring	8	14	25	14	12	18	9
Competitor accounting	Competitor performance appraisal	9	5	12	15	18	24	17
	Customer profitability analysis	11	8	18	22	20	12	9
Customer accounting	Lifetime customer profitability analysis	3	4	7	16	24	21	25
	Valuation of customers as assets	6	7	11	15	21	18	22

Source: Authors' compilation

3.5 Structural model

Table 6 shows the results of the structural model. Results show technology's significant and positive impact on SCM ($\beta = 0.157$; $p < 0.01$). Further, the path analysis results showed a significant positive impact of TPM on strategic cost management ($\beta = 0.157$; $p < 0.01$). A similar type of pattern was observed in the relationship between strategy and strategic cost management. Results showed a significant and positive impact of strategy on strategic cost management ($\beta = 0.205$; $p < 0.01$). It means that with the improvement in the company's strategy, there will also be an improvement in strategic cost management.

Furthermore, the structural model results showed a positive impact of organisational culture on strategy on strategic cost management ($\beta = 0.219$; $p < 0.01$). Out of all technology, TPM, strategy and organisational culture, the most important factor affecting strategic cost management was TPM, followed by organisational culture, strategy, and last technology. In total, all these four independent variables explain 40.4% of the variance in strategic cost management.

Table 6 Structural analysis

Relationship		*Std β*	*t-value*	*p-value*	R^2	*Decision*
H1	Technology → strategic cost management	0.157	3.513	***		Accepted
H2	Total productivity maintenance → strategic cost management	0.346	6.767	***	40.4	Accepted
H3	Strategy → strategic cost management	0.205	3.802	***		Accepted
H4	Organisational culture → strategic cost management	0.219	4.317	***		Accepted
H5a	Strategic cost management → customer satisfaction	0.616	14.15	***	43.3	Accepted
H5b	Strategic cost management → return on investment	0.41	8.279	***	26.5	Accepted
H5c	Strategic cost management → return on sales	0.523	10.781	***	29.6	Accepted
	Number of employees→ customer satisfaction	0.058	1.68	*		
	Number of employees→ return on investment	0.151	3.103	***		
	Number of employees→ return on sales	0.311	6.283	***		

Note: ***p < 0.01, **p < 0.05 and *p > 0.05

Source: Authors' compilation

Moreover, the results of Table 6 showed that SCM had a significant and positive impact on customer satisfaction ($\beta = 0.616$; $p < 0.01$), a measure of a firm's non-financial performance. SCM explains 43.3% of the variance in customer satisfaction. In addition to this, results depicted that, again, there was a significant and positive impact of SCM on the return on investment ($\beta = 0.410$; $p < 0.01$), a measure of a firm's financial performance. SCM explains 26.5% of the variance in the financial measures of a firm's performance (return on investment). Moreover, the path analysis results showed a significant and positive impact of SCM on return on sales ($\beta = 0.523$; $p < 0.01$), a measure of a firm's financial performance. SCM explains 29.6% of the variance in financial measures of firm performance (return on sales).

4 Limitations of the study

The scope of our study is related to six agro-based business cases around the Punjab area in India. This could be deemed as a limitation since if the study included other manufacturing industries, other business sectors or regions, the results might have been different. However, this may be scope for further studies with different cases related to other industry sectors and regions.

5 Discussion

The research findings show that high performance is not directly the outcome of SCM techniques. This contradicts the findings by Cooper and Slagmulger (2004), Hansen and Mowen (2006), El Kelety (2006), and Thapayom (2021), who find that high performance is the outcome of SCM techniques.

Rather, the conclusions show that the superior performance result from a combination of contingent factors and SCM techniques. These results are supported by literature by Guilding et al. (2000), Cadez and Guilding (2008), Chenhall (2003), Abernethy and Bouwens (2005), Pavlatos (2018), and Ahammad et al. (2021). In fact, it is recognised that the SCM techniques, as proposed by Cadez and Guilding (2008), are still insignificant.

Management is resistant to discarding traditional techniques as they find them appropriate. Shortage of trained personnel is also one of the reasons for continuing with the traditional cost management system. The respondents in the study understand the benefits of SCM techniques, but it seems as if additional guidance and training need to be provided to the accountants to make them understand and apply the SCM techniques. Based on the survey from the six agro-based industries, benchmarking, target costing, lifetime customer profitability analysis, and strategic pricing are the most widely used techniques.

6 Conclusions and implications of the study

The findings of this study highlight the importance for decision-makers and strategists to look beyond SCM techniques. Usage of SCM is emphatically influenced by the 5 contextual factors' Technology, TPM, organisational culture, and strategy size' and SCM techniques adoption and usage, in turn, have a positive effect on the business performance. The findings ensuing from the SEM model confirmed the assumed relationships. The research concluded that high performance is not directly the outcome of SCM techniques; rather, superior performance results from a combination of contingent factors and SCM techniques.

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