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The role of supply chain management, firm value, and competitive advantage in the food sector

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The adoption of supply chain management (SCM) is pivotal in boosting organizational competitiveness and performance. This study examines the relationships among SCM, firm value, company performance, and competitive advantage within the context of micro, small, and medium enterprises (MSMEs) in Surabaya, East Java, Indonesia. Employing a quantitative approach, we analyzed data collected from a sample of 100 MSMEs using SmartPLS to test various hypotheses. The findings indicate that effective SCM significantly influences a firm's value, performance, and competitive advantage. This study supports the mediating role of firm value by showcasing its robust influence on the relationship between SCM and competitive advantage. However, the mediating role of company performance on competitive advantage appears weaker. The discussion integrates relevant literature, highlighting the pivotal role of SCM strategies in enhancing productivity, fulfilling customer desires, and increasing competitiveness. This study also underscores the critical link between financial performance, value creation, and competitive advantage. Overall, this study contributes to the ongoing development of practical SCM knowledge by providing valuable insights for MSMEs seeking to navigate the challenges of an evolving business landscape.

1. Introduction

The current economic climate mandates a more judicious and prudent approach to consumer behavior wherein purchasers prioritize the value they receive from the products they buy (Okafor et al., 2021). Value encompasses an assessment of the pros and cons experienced by consumers regarding the benefits provided by a product. Companies must provide commodities that hold genuine value for their target markets by concurrently catering to their preferences and maintaining reasonable and affordable prices (Parnell & Brady, 2019). The concept of value relates to the amount that buyers are prepared to pay for a product, and a high level of value can be attained by offering a lower price than competitors with similar benefits, or by providing exceptional benefits that justify a higher price (Makalew et al., 2019). This pertains to the strategic approach that businesses can employ to produce goods with a perceived higher value than the costs involved. Consumers should perceive that, by purchasing goods from a company, the benefits received surpass the sacrifices incurred (i.e., the cost). This underscores the importance of businesses delivering compelling value propositions to enhance customer satisfaction and competitiveness in the market. Furthermore, companies must compete effectively by delivering enhanced value to consumers and stakeholders (Kurniawan, 2016). Ensuring long-term sustainability requires enterprises to align their resources with the target market and prevailing environmental conditions. Recognizing competition as a critical factor, businesses must develop strategic approaches to emerge victoriously in a competitive landscape (Makalew et al., 2019). Supply chain management

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(SCM) is crucial for improving competitiveness and achieving optimal organizational performance. Incorporating suppliers and customers into firms' value-creation strategies has been identified as a crucial factor for boosting competitiveness (Masa'deh et al., 2022; Tarifa Fernández, 2022). SCM involves a series of strategies to seamlessly integrate suppliers, manufacturing, warehouses, and storage to ensure the production and distribution of goods in the right amount, in the right place, and at the right time to reduce costs and satisfy consumer expectations (Zhang et al., 2022). SCM also involves managing organizational networks that include upstream and downstream interactions across various processes and activities and delivering value to customers in the form of products and services (Handoko et al., 2015).

SCM entails establishing strategic alliances that prioritize positive relationships with suppliers (Huang & Li, 2018). This collaborative approach extends beyond suppliers, encompassing the entire supply chain, and is responsible for the supply of raw materials from creation to the delivery of finished products to end consumers (supply chain members) (Mahadevan et al., 2023; Moskovich, 2020). SCM hinges on fostering mutually beneficial relationships among supply chain members and recognizing their interdependence. This strategy has been utilized due to its effectiveness in integrating all parties involved and addressing gaps in a company's business strategy. Comprehensive knowledge about products, services, processes, customers, stakeholder relationships, suppliers, people, the business environment, and organizational memory is integral for an enterprise to comprehend its purpose and achieve its goals (Handoko et al., 2015; Marinagi et al., 2014). Numerous studies have investigated organizational strategies aimed at continual development and enhanced competitiveness in global markets. Nordin (2008) emphasized that competitive advantage is derived from products with competitive pricing, diverse offerings, and robust customer relationships. Marinagi et al. (2014) contended that increasing competitive advantage requires effective internal functions and efficient information exchange within the supply chain. According to recent studies, such as those conducted by Jamaludin (2021) in Indonesia, Shaik (2021) in Saudi Arabia, and Doan (2020) in Vietnam, the implementation of SCM strategies can yield a favorable outcome with regard to a firm's competitive edge. Several studies also corroborate that companies are progressively acknowledging SCM as a pivotal element in establishing a sustainable competitive advantage for their offerings in densely populated and fiercely competitive markets (Hsiao et al., 2018; Huang & Li, 2018; Leppelt et al., 2013; Saber et al., 2014; Shaik & Abdul-Kader, 2013).

The potential influence of SCM on firm performance has garnered attention from scholars worldwide who have investigated evidence from diverse industries and countries. The prevailing belief is that a positive connection exists between effective SCM strategies and a company's competitiveness (Ruzo-Sanmartín et al., 2023). Across operations, technology, and strategies, closer integration with stakeholders in the value chain can empower businesses to navigate competition and market challenges (Chen et al., 2023; Orengo Serra & Sanchez-Jauregui, 2022). However, evidence of the SCM-performance relationship remains inconclusive and varies among studies (Masa'deh et al., 2022). While some studies have found no significant connection (Flynn et al., 2010), others indicate that SCM positively impacts performance (Cahyono et al., 2023; Chen et al., 2023). Additionally, some studies have reported negative outcomes (Rosenzweig et al., 2003), prompting a critical examination of whether the relationship is straightforward or requires further exploration. Consequently, recent studies have proposed new mechanisms by which SCM is related to firm performance. These include exploring moderation channels that link SCM to competitiveness (Munir et al., 2020), introducing alternative performance indicators (El Mokadem & Khalaf, 2023), investigating non-linear relationships (Terjesen et al., 2012), and incorporating diverse theoretical frameworks such as the resource-based view (Salam & Bajaba, 2023; Yang & Wang, 2023), "stakeholder theory" (Shafiq et al., 2020), "organizational information process theory" (Wong et al., 2020), and "the practice-based view" (Khan et al., 2023a). The expanding literature underscores a research gap that warrants further investigation.

In the present study, we put forth the notion of SCM in a comprehensive manner, taking into account both the downstream and upstream elements of the supply chain. We empirically tested this multi-dimensional standpoint using data obtained from direct survey responses collected through questionnaires. By concurrently examining SCM practices from both upstream and downstream perspectives, we aim to deepen researchers' understanding of the breadth and activities associated with SCM. This provides an opportunity to re-evaluate previous studies and their implications, shedding light on the consequences of SCM practices. This study's outcomes yield recommendations for MSMEs to improve their overall performance, company value, and competitive advantage through effective SCM practices. Substantial evidence from numerous studies highlights that the potential correlation between SCM and the enhancement of the overall organizational performance of MSMEs in response to economic changes is driven by the emergence of competitive advantage, which acts as a favorable catalyst.

The supply chain for food products (i.e., crackers) involves the sourcing of raw materials such as flour, seafood (e.g., fish, shrimp, squid, etc.), oil, salts, vegetable products, grains, packing materials, and other ingredients. The raw material procurement efficiency can affect production costs and product quality (Khan et al., 2023b). The sourcing, manufacturing, and delivery of products require processes to be streamlined for efficiency and consistency in producing quality goods (Masa'deh et al., 2022). Quality control measures across the supply chain are crucial to ensure that products meet safety and quality standards (Munir et al., 2020). This involves regular testing, inspection, and adherence to food safety regulations. Several MSMEs have embraced SCM practices to optimize operational performance (Anwana, 2024; Kilay et al., 2022; Modisa & Jaikaew, 2022). This includes forging partnerships with suppliers to streamline raw materials provision, cultivating strong consumer relations to ensure service satisfaction, and skillfully handling relevant information related to product

development for both suppliers and consumers. These practices enable MSMEs to effectively navigate the challenges posed by an evolving economic landscape.

This study makes valuable contributions to the pre-existing body of literature. First, it analyzes the intricate dynamics and operations of the food sector, with emphasis on MSMEs in the Indonesian context. This chosen focus is paramount because the food sector indisputably holds the title of being the most substantial contributor to overall industrial output within the vast Indonesian economy, which is characterized by a multitude of firms, mainly consisting of MSMEs; furthermore, understanding their dynamics is crucial for the well-being of the general economic landscape. Second, this study introduces a multi-dimensional construct to measure firm performance by incorporating both financial and market aspects. This broader perspective allows for a more nuanced evaluation of MSMEs' performance, providing insights into their holistic competitiveness. Third, we focus on firm value as a potential source of competitiveness, a facet that is often overlooked in the existing literature. While previous studies in Indonesia have predominantly examined organizational aspects (Cahyono et al., 2023), internal production efficiency (Sugiharti et al., 2019; Yasin & Esquivias, 2023), and SCM (Jamaludin, 2021) as sources of firm performance, our study emphasizes the often-neglected role of firm value in fostering competitiveness. We argue that SCM's goal extends beyond achieving high firm performance to enhance competitiveness, which encompasses both financial and non-financial dimensions.

This study not only delves into the theoretical foundation and hypotheses shaping its core material but also elucidates the research methodology in the next section. This alignment connects the formulation of the problem, the hypotheses, and the model framework with the development of equations for data testing. The aim is to present the findings in a more engaging way, fostering discussion by drawing connections with prior studies. Ultimately, our results can serve as valuable input for stakeholders and contribute to future scientific advancements by providing insights for subsequent researchers.

2. Theoretical Framework and Hypotheses Development

Worldwide, whether advanced or emerging, Indonesia is increasingly embracing global integration, intending to become a stable, prosperous, and highly competitive country. Indonesia aims to achieve accelerated economic growth while reducing poverty and socioeconomic disparities. Successful realization of these goals requires businesses to engage in well-integrated collaboration and harness innovative, creative elements (Chavez et al., 2022). Consequently, businesses must continually improve their achievements, including heightened sales, increased market share, and robust returns on capital and investments. The efficacy of these efforts in optimizing operational outcomes is reflected in a company's overall performance, manifested through diverse internal activities. Experience from developed nations highlights the fact that MSMEs can serve as hubs for innovation, production technology, skilled workforce creation, and flexible production processes to adapt to dynamic market demands. The effective implementation of SCM requires collaboration between both internal (top management) and external stakeholders, underlining the importance of strong business institutions (Handoko et al., 2015; Khurana et al., 2021), which play a pivotal role in stimulating productive activities, particularly in smaller communities. Presently, businesses tailor their strategies to consumer preferences, which is evident in the numerous product offerings aligned with consumer desires, thereby fostering domestic market competition (Perez-Franco & Phadnis, 2018). Unlike in the past, where producers segmented strategies based on sectors of the customer population, today's approach caters to individual preferences rather than specific fragments. The concept of competitive advantage, originally introduced by Porter, asserts that a company's performance in a highly competitive market is central to its competitive advantage (Ghatebi et al., 2013; Nordin, 2008). Strategy plays a crucial role in determining a company's capability and superiority in navigating competition, ultimately contributing significantly to its success when the right strategic concepts are applied (Heriqbaldi et al., 2023). Competitive advantage fundamentally arises from the value or benefits a company provides to its buyers. By effectively implementing one of Porter's three generic strategies, a company can achieve a competitive advantage (Porter, 1994).

The assessment of organizational performance entails an examination of both monetary and non-monetary indicators (Chavez et al., 2022; Jitmaneeroj, 2018). Monetary indicators offer an understanding of past endeavors, while non-monetary indicators such as customer contentment, efficiency, the cost efficiency of internal procedures, and the dedication and productivity of employees collectively shape forthcoming monetary performance (Akhtar & Mittal, 2015; Parnell & Brady, 2019). Financial measures demonstrate the outcomes of various actions beyond non-financial aspects. Effective company performance refers to successful and efficient business operations. Measurable results, reflecting a company's empirical conditions across diverse agreed-upon metrics, contribute to the assessment of business performance and the company's alignment with its financial goals (Amir & Lev, 1996; Cahyono et al., 2023, Doan, 2020). The process of creating value in business networks requires support to enhance internal operational efficiency, and SCM plays a crucial role (Huang & Li, 2018; Marinagi et al., 2014). SCM involves creating value-added goods and services, emphasizing the efficiency of inventory, cash flow, and information flow. Implementing these strategic options requires managerial tasks that assess organizational capability needs and aim to achieve specific goals. Strategic choice in this process is pivotal for creating consumer value and establishing competitive advantage (Carnahan et al., 2010; Handoko et al., 2015; Kurniawan, 2016), which forms the basis for a company to deliver value to buyers by surpassing the costs incurred during the value-creation process.

2.1. The impact of supply chain management on corporate value

Enterprises generate value by efficiently utilizing their resources to produce valuable information. The greater the value delivered to customers, the more lucrative the operations. The value chain comprises organizational activities aimed at creating value for customers. Porter (1994) introduced a model to analyze a company's value chain by scrutinizing all activities and their interconnections, identifying opportunities for cost reduction and differentiation within interconnected activities, ultimately influencing profits and providing insights into the origins of the company's value. The ultimate goal of each supply chain is to optimize the overall value generated (Nosratabadi et al., 2020). Within this interconnected cycle, various enterprises operate within distinct scopes but share the common objective of procuring and efficiently distributing goods to end consumers. Through such collaboration, added value is created for products. Partnerships with proficient companies contribute value to marketed products by enhancing aspects such as distribution/production speed, ordering processes, and repairs (Jitmaneeroj, 2018). This collaborative approach positively impacts a company's performance and influences its value from the stakeholder's perspective (Chen et al., 2023; Orengo Serra & Sanchez-Jauregui, 2022; Saber et al., 2014). Consistent with several previous studies, we developed our first hypothesis as follows:

H_1: *SCM has a positive impact on firm value.*

2.2. The impact of supply chain management on firm performance

Traditionally, performance assessment has relied heavily on financial metrics; however, in recognizing the broader spectrum, non-financial performance measures are gaining prominence (Cahyono et al., 2023; Jamaludin, 2021). The notion of the balanced scorecard highlights the significance of evaluating non-financial dimensions when gauging firm performance (Hsu et al., 2017). While financial, operational, and market-based performance are common metrics in empirical research, we focused on financial and operational performance due to the diverse target companies associated with such metrics, and not exclusively public enterprises (Hsu et al., 2017; Saini & Singhania, 2019; Saunila, 2014). Combining financial and operational metrics provides a comprehensive overview of overall firm performance. We posited that effective SCM would serve as a critical support system for organizational competitiveness and robust performance. This led us to formulate our second hypothesis:

H_2: *SCM has a positive effect on firm performance.*

2.3. The impact of supply chain management on competitive advantage

Competitive advantage essentially arises from the value or benefit that a company is capable of providing to purchasers, surpassing the costs involved in its establishment (Nordin, 2008). Purchasers are willing to be remunerated for this superior value, whether through reduced prices for comparable benefits or distinctive offerings that surpass the prices set by competitors. Metrics, such as efficient business processes, can be employed to assess a company's competitive advantage (Malik et al., 2021; Shafiq et al., 2020; Zhou et al., 2022). Attaining it involves presenting business operations that yield high-quality goods and services at competitive prices (Marinagi et al., 2014). This establishes a product in a favorable position in relation to quality, price, delivery, and flexibility when compared to competitors in the market. Reducing delivery time also contributes to competitive advantage as it enhances customer satisfaction (Carnahan et al., 2010; Jamaludin, 2021). Recognized as a strategic direction, sustainable competitive advantage is a means to achieve organizational objectives rather than an end goal in itself (Ruiz-Real et al., 2021). Enterprises leverage competitive advantage to attain their desired performance goals. Consequently, we developed the third hypothesis:

H_3: *SCM has a positive effect on a company's competitive advantage.*

2.4. Supply chain management: Competitive advantage through firm value and performance

In a dynamic business landscape, companies strive to establish a sustainable competitive advantage by enhancing product and service quality, service speed, and cost efficiency. Many companies are now adopting SCM principles to achieve this goal (Wang & Chen, 2013). Competitive advantage depends on the effective management of quality, time, and cost. Beyond seeking reasonable prices, customer expectations include quality products and prompt service processes (Ilmiyati & Munawaroh, 2016). Consequently, corporations must manage their value chains to deliver value to customers (Phusavat & Kanchana, 2007). Creating value involves the execution of business operations that encompass both core and support activities, necessitating various internal and external resources. Utilizing these resources incurs costs, prompting managers to swiftly identify and track costs in each value chain process. This ensures that costs align with activities that deliver value to customers and the company (cost management) (Fontana & Egels-Zandén, 2019). Cost management extends beyond cost reduction and involves strategic decisions such as investing in enhancing customer satisfaction, quality, and new product development, aiming to boost revenue and profits (Zanetti et al., 2020). The evolving business landscape encourages companies to foster integrated relationships within the SCM system, emphasizing collaborative ties with suppliers and customers (Chavez et al., 2023). Competitive advantage, the cornerstone of a company's resources, extends beyond internal

assets to include a broader SCM system. Top management shoulders the vital responsibility of efficiently managing the supply chain while maintaining the flexibility to respond to customer needs through robust supplier relationships. Organizational performance, the tangible output measured against expected results, is critical for competitive success (Gupta et al., 2020). Implementing SCM supports organizational competitiveness because highly engaged employees contribute to increased productivity, high performance, and enhanced corporate responsibility (Liao, 2006). Improved company performance stabilizes market positioning and fosters competitiveness. A company's ability to achieve optimal performance directly influences its competitive advantage. Studies have consistently indicated that robust SCM practices positively affect competitive advantage and firm performance (Ghatebi et al., 2013; Marinagi et al., 2014; Malik et al., 2021; Saber et al., 2014). We developed the following hypotheses based on insights from prior research:

H_4: *Firm value strongly mediates between SCM and competitive advantage.*
H_5: *Firm performance strongly mediates between SCM and competitive advantage.*

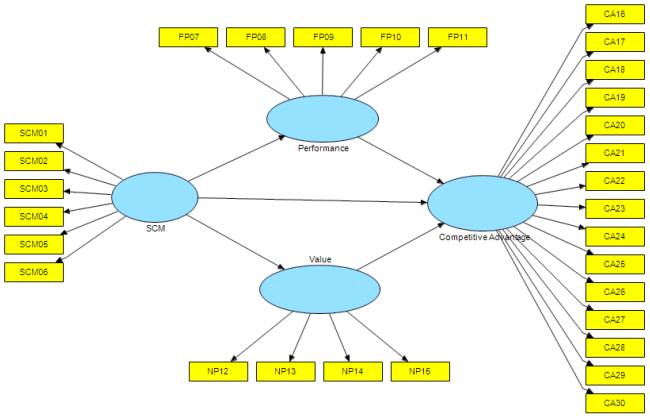

Fig. 1. Research models

3. Research Method

We employed a quantitative research approach utilizing a questionnaire for primary data collection. The target population consisted of fish cracker SMEs in the city of Surabaya, located in the province of East Java in Indonesia. Due to the unknown size of the exact population, we determined the minimum required sample size using the formula proposed by Levy and Lemeshow (1997).

$$n_0 = \frac{Z^2.p(1-p)}{d^2} \tag{1}$$

- n = number of samples sought
- z = normal table value with a certain alpha (the standard is 1.96)
- p = case focus
- d = Alpha (0.05)—5% of the 95% confidence level—is commonly used in studies.

Based on the computation, the findings suggest that the minimum number of participants needed for this investigation was 96, a value that the researcher had approximated as 100 respondents. The researcher chose the formula developed by Levy and Lemeshow (1997) due to the extensive and diverse target population. Snowball sampling was employed in the sampling process, whereby each participant recommended that other pertinent individuals form a subsequent research sample until the desired sample size was achieved. The criteria employed to assess the suitability of the sample were as follows:

1. Fish cracker MSMEs set up their businesses in Surabaya, East Java.
2. Fish cracker MSMEs already have a taxpayer identification number (TIN) in Surabaya, East Java.
3. Fish cracker MSMEs have a minimum of 25 employees.

The investigation involved a 5-point Likert scale; participants could choose from *strongly disagree* (STS), *somewhat disagree* (TS), *disagree* (KS), *agree* (S), and *strongly agree* (SS). Likert (1932) introduced this approach. Table 1 provides explanations and indicators of the research variables.

Our methodology encompasses the use of structural equation modeling (SEM) based on the concept of variance. We analyzed the data using Smart PLS, involving three distinct phases: assessment of the outer model, evaluation of the structural (inner) model, and examination of the hypotheses, which we substantiated through verification analysis (Jaya, 2020).

Table 1
Operational definition and variable measurement

No.	Variable	Operational definition	Variable measurement
1.	Supply chain management (X)	A system in which a company distributes its products and services to its customers.	1) Strategic supplier partnership 2) Customer relationship 3) Information sharing
2.	Financial performance (Z1)	Firm performance is a view of the company's overall state over a certain period of time; it is a result or achievement such that the company's operational activities have had an impact on available resources.	1) Sales target 2) Profit 3) Sales growth rate 4) Productivity 5) Production cost
3.	Firm value (Z2)	The form of public trust in the business over a period of several years.	1) Transparency 2) Accountability 3) Responsibility 4) Fairness
4.	Competitive advantage (Y)	The capacity acquired through a company's unique attributes and assets to achieve superior outcomes compared to other enterprises operating within an identical sector or market.	1) Competitive price 2) *Low cost* 3) Quality 4) *Delivery dependability (time)* 5) *Delivery dependability (amount)* 6) Needs adjustment 7) Product innovation 8) New advantage 9) *Time to market* 10) Product development speed 11) Market share 12) New product 13) Perception match 14) Market scope 15) Fulfillment

4. Results

We processed and analyzed the collected survey data to derive our findings. The following explanation outlines the respondents' demographic traits, which we categorized according to several criteria. We examined and grouped the data into tables based on gender. Of the 100 participants, there were 47 men and 53 women (Fig. 1). We further tabulated and classified this information based on business type.

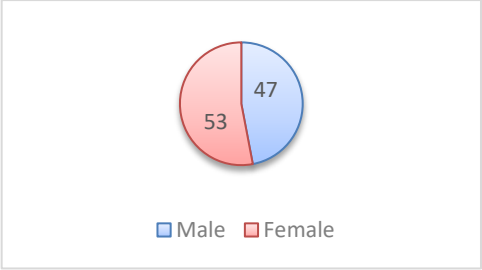

Fig. 1. The respondents' demographic traits by gender

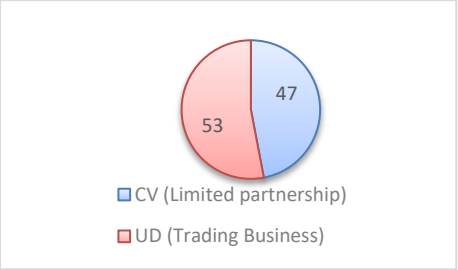

Fig. 2. The respondents' demographic traits by form of business

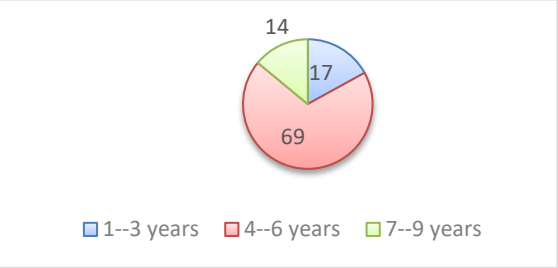

Fig. 3. The respondents' demographic traits by business age

We received data from the respondents and categorized them into two groups based on the type of business: *commanditaire vennootschap* (limited partnership [CV]) and *usaha dagang* (trading business–sole proprietorship [UD]). Both the CV and UD are common choices for MSMEs in Indonesia owing to their simplicity and ease of setup, both of which are characterized by unlimited personal liability for the owner(s) or partners. Of the 100 respondents, 40 completed the CV form and 60 completed the UD form (Fig. 2). Next, we determined the length of time that each respondent's business had been in operation. We categorized the respondents' businesses into three groups based on their operational duration, i.e., business age (see Figu. 3). Analysis of the data revealed that 17 respondents belonged to the first group (1–3 years), 69 to the second group (4–6

years), and 14 to the third group (7–9 years). Subsequently, we thoroughly scrutinized the data across several stages of the testing process.

Table 2 demonstrates that all inquiry items exhibited a correlation value (r) surpassing 0.3, and the alpha coefficient exceeded 0.6. This indicates the credibility and dependability of all inquiry items for each variable, warranting further investigation. The subsequent phase entailed examination of the outer model, evaluation of the structural (inner) model, and scrutiny of the hypotheses (Hair et al., 2014). The results are as follows.

Table 2
Validity and reliability test

Variable	Indicator	Items	Correlation (r)		Coefficient	
			r	Status	Alpha	Status
Supply chain management (X)	Strategic supplier partnership	SCM01	0.477	Valid	0.792	Reliable
		SCM02	0.891	Valid		
	Customer relationship	SCM03	0.918	Valid		
		SCM04	0.909	Valid		
	Information sharing	SCM05	0.909	Valid		
		SCM06	0.536	Valid		
Financial performance (Z1)	Sales target	FP07	0.777	Valid	0.782	Reliable
	Profit	FP08	0.751	Valid		
	Sales growth rate	FP09	0.709	Valid		
	Productivity	FP10	0.698	Valid		
	Production cost	FP11	0.666	Valid		
Firm value (Z2)	Transparency	NP12	0.974	Valid	0.857	Reliable
	Accountability	NP13	0.998	Valid		
	Responsibility	NP14	0.994	Valid		
	Fairness	NP15	0.983	Valid		
Competitive advantage (Y)	Competitive price	CA16	0.724	Valid	0.758	Reliable
	Low cost	CA17	0.660	Valid		
	Quality	CA18	0.724	Valid		
	Delivery dependability (*time)*	CA19	0.724	Valid		
	Delivery dependability (*amount)*	CA20	0.660	Valid		
	Needs adjustment	CA21	0.639	Valid		
	Product innovation	CA22	0.720	Valid		
	New advantage	CA23	0.720	Valid		
	Time to market	CA24	0.720	Valid		
	Product development speed	CA25	0.350	Valid		
	Market share	CA26	0.677	Valid		
	New product	CA27	0.639	Valid		
	Perception match	CA28	0.639	Valid		
	Market scope	CA29	0.559	Valid		
	Fulfillment	CA30	0.571	Valid		

4.1. Testing the outer model and evaluating the inner model

The outer model examination involved the composite reliability indicator (CRI) to assess a construct by computing the composite reliability value (CRV). The dimensions are considered dependable if their CRV surpasses 0.7 (Heriqbaldi et al., 2023). The results of the CRI computations are as follows:

Table 3
Results of composite reliability calculation

Dimension	***Composite reliability***	***R^2***
Competitive advantage	0.905	0.934
Financial performance	0.835	0.889
Supply chain management	0.911	0.000
Firm value	0.993	0.146

Source: Results from Smart PLS.

We employed the R^2 test for the internal structural assessment to measure the dependent constructs, while we used the Stone-Geisser Q^2 test to evaluate predictive relevance. The computations indicate that the R^2 values for competitive advantage and financial performance surpassed 0.2, demonstrating the significant impact of the underlying predictors at the structural level. By contrast, the R^2 value for firm value remained below 0.2, implying a comparatively minor influence of the underlying predictor at the structural level. Furthermore, we evaluated the inner structural model using the Q^2 test to determine its predictive relevance for the construct model. The results of the Q^2 calculations are as follows.

$\mathbf{Q^2}$= 1- (0.934)(0.889)(0,146) = 1- 0.121= 0.879

The calculation outcomes indicate that the Q^2 value was greater than zero; hence, we deemed the analysis model to be feasible and it had significant predictive value.

4.2. Evaluation of the hypotheses

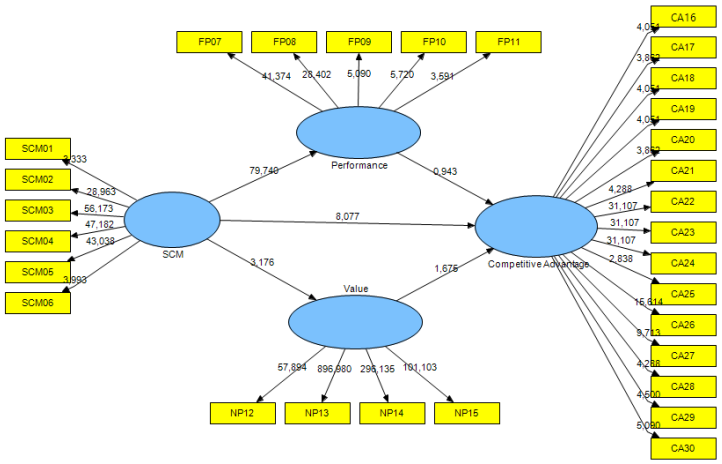

Fig. 2. Hypothesis test results

Source: Results from Smart PLS.

When tested the hypotheses, we compared the value of the t-count with that of the t-table. If the t-count exceeded the t-table value, we considered the association between the variables to be noteworthy and could subject it to additional scrutiny. For a dataset consisting of 100, we ascertained the t-table value (α = 10%) to be 1.290. Table 4 outlines the results of testing the hypotheses.

Table 4
Results of testing the hypotheses

	Hypothesis			Coef. path	t-count	Note
H1	SCM	→ The value of the company		0.127	3.013	Sig.
H2	SCM	→ Firm performance		0.014	66.702	Sig.
H3	SCM	→ Competitive advantage		0.125	6.415	Sig.
H4	SCM	→ The value of the company	→ Competitive advantage	0.058	1.636	Sig.
H5	SCM	→ Firm performance	→ Competitive advantage	0.150	0.812	Not. sig.

Source: The processed data

We further elucidate the obtained test results presented in Table 4 as follows. The first hypothesis—which posits that SCM has a positive effect on firm value, as indicated by the data testing outcomes—revealed a t-count value (3.013) greater than the t-table value (1.290). This finding is significant because it demonstrates that SCM influences firm value. Consequently, we did not reject H1. A positive coefficient indicates a positive relationship between SCM and firm value. Therefore, enhanced SCM activities increase a company's potential to create value for consumers and other stakeholders. In our framework, firm value includes transparency, accountability, responsibility, and fairness. Transparency in firm value can manifest by making the entire supply chain visible. This openness allows stakeholders to understand processes, trace the origin of products, and ensure that ethical standards are upheld at every stage. Accountability ensures that all parties involved are answerable to their actions, promoting ethical conduct and discouraging practices that might harm workers, communities, and the environment. Likewise, a company with a sense of responsibility will actively engage in sustainable practices, enforce ethical employment procedures, and responsibly manage natural resources throughout the network of suppliers, which is often synonymous with fair trade and just labor practices.

Proceeding to the subsequent hypothesis, which posits that SCM exerts a favorable impact on firm performance, the findings stemming from the examination of the data yielded a t-count value (66.702) that surpassed the corresponding t-table value (1.290). This confirmed that SCM affects company performance. Hence, we did not reject H2. The positive coefficient suggested a positive relationship between SCM and firm performance. Thus, improved SCM activities enhance production activities, leading to better overall performance. These results suggest that effective SCM is a critical driver of firm performance across various key indicators. By optimizing the flow of goods and services from raw material suppliers to end consumers, SCM can directly affect sales targets, profit margins, sales growth rates, productivity, and production costs. A well-coordinated supply chain, streamlined processes, and efficient logistics ensure the timely availability of products, reduce production costs and stockouts, and enhance sales performance. Improved productivity, achieved through better resource utilization and reduced lead times, further contributes to enhanced general firm performance.

The next hypothesis asserts that SCM positively affects competitive advantage. The results of the data testing yielded a t-count value (6.415) that was greater than the t-table value (1.290). This result suggests that SCM influences competitive advantage. Therefore, we did not reject H3. The positive coefficient indicated a positive relationship between SCM and competitive advantage. As such, enhanced SCM activities boost production activities, positively affecting both performance and competitive advantage. Effective SCM can help achieve economies of scale and operational efficiency, allowing firms to offer competitive prices and make their products more attractive to consumers. Streamlining supply chain processes contributes to lower costs, timely deliveries, enhanced cost competitiveness, and positive effects on consumers (satisfaction, trust, and loyalty). Reduced time to market (TTM) and accelerated product development speeds are the outcomes of efficient supply chain practices, providing a competitive edge. Furthermore, a well-managed supply chain can positively influence market share by promptly fulfilling customer orders, expanding the market scope, and aligning with consumer perceptions, thereby contributing significantly to overall competitive advantage.

We further examined the association between SCM and competitive advantage with firm value serving as a mediator. We therefore aimed to address the fourth hypothesis. The results of data testing revealed that the t-count value (1.636) was greater than the t-table value (1.290). These findings indicate that firm value can effectively mediate the robust relationship between SCM and competitive advantage. Consequently, we did not reject H4. The positive coefficient implies a substantial influence of the mediating variable, signifying that enhanced SCM activities positively impact production activities, leading to an increase in both firm value and competitive advantage. Additionally, we explored the connection between SCM and competitive advantage by introducing firm performance as a mediator. Hence, we investigated the fifth hypothesis. The data testing demonstrated a t-count value (0.812) that was less than the t-table value (1.290). This result suggests that firm performance has a limited ability to serve as a mediator in the connection between SCM and competitive advantage; consequently, we rejected H5. The positive coefficient implies a weak influence of the mediating variable on SCM in relation to competitive advantage. This indicates that activities pertaining to a company's SCM are not directly proportional to its improved performance, thereby directly affecting its competitive advantage.

4.3. Discussion

The application of SCM to a company's resources, facilitated by effective supply chain coordination, indirectly enhances company performance. This is likely attributable to the influence of well-integrated management collaboration, which boosts a company's productivity, fulfills customers' desires, and increases the production of goods; this in line with earlier findings (Chavez et al., 2023; Shaik & Abdul-Kader, 2013). Such endeavors support the achievement of increased sales, thereby fostering good and sustainable performance. Ruzo-Sanmartín et al. (2023) and Zhang et al. (2022) reported similar findings for companies in Egypt and online firms in China, respectively. Aslam et al. (2023) also found this to be true in Pakistan.

Effective SCM can boost financial and market-based performance measures by improving revenue growth, reducing operating costs, and increasing working capital efficiency, as evidenced by Galankashi and Rafiei (2022). As SCM implementation progresses smoothly and firm productivity increases, financial performance is likely to increase. The optimization of financial performance along supply chains is a crucial objective of SCM. The literature demonstrates the significant potential of SCM to enhance a firm's key financial outcomes (Wong et al., 2020). The establishment of robust SCM strategies can mitigate the impact of disruptions in SCM and minimize financial losses in both the short and long term (Baghersad & Zobel, 2021; Wang et al., 2024). SCM can expedite recovery from supply chain disruptions, reduce a firm's vulnerability to missed targets, and ensure the fulfillment of customer expectations.

Our findings support SCM as an indispensable prerequisite for maintaining competitiveness in the market, enhancing profitability, and meeting stakeholders' expectations in non-financial aspects such as sustainability, transparency, ethics, and other values. The results suggest a positive correlation between SCM, firm value, and competitiveness. This implies that SCM practices—such as establishing strategic partnerships with suppliers, improving customer relationships, and facilitating the exchange of information—play a critical role in gaining a competitive edge. Similarly, Shafiq et al. (2020) found a significant positive link between supply chain-related analytical capabilities, meeting ethical and social expectations, and competitive performance in the US manufacturing industry.

The implementation of effective SCM practices is linked to fulfilling customer expectations and matching stakeholder needs. Our findings indicate that firm value plays a vital role in improving competitiveness, which is consistent with the results of Malik et al. (2021), who emphasized the importance of traceability and transparency in enhancing competitiveness. Zhou et al. (2022) revealed similar outcomes for companies in China's food sector. The research indicated that implementing traceability measures can improve business performance, provided that effective SCM practices (such as quality management) are in place. Our research offers clear explanations for various measures of competitiveness such as pricing, expenses, quality, the reliability of delivery, product innovation, the time taken to bring a product to market, and other factors that are appropriate for evaluating competitiveness. Previous studies have employed some of these indicators and achieved relevant outcomes for other contexts globally. We built our holistic measure of competitive advantage based on earlier studies, such as the cost approach (Chavez et al., 2022), pricing (Doan, 2020), the market share (Cahyono et al., 2023), TTM (Jamaludin, 2021), and

operational performance (El Mokadem & Khalaf, 2023), among others. Our findings are in line with those of the studies in Indonesia, Vietnam, and Egypt.

This empirical research supports a framework outlining five essential aspects of SCM practices. Moreover, this study clarifies the connection between these strategies and the achievement of competitive edge from the perspectives of price/cost, quality, the dependability of delivery, innovation in products, and TTM. Our primary results suggest that cost, quality, and TTM are stronger indicators of competitive advantage than the dependability of delivery and product innovation. Our findings can be used to construct a model of SCM strategies and competitive advantage. The creation and validation of a multi-dimensional operational tool to gauge the optimal construct for SCM strategies offers SCM managers a valuable way to evaluate the comprehensiveness of their existing SCM strategies. An examination of the relationship between SCM strategies and competitive advantage demonstrates that the former can directly impact the latter. Effective SCM has emerged as a potentially valuable approach for MSMEs in the food sector to secure a competitive edge by boosting organizational performance. Thus, it is vital to gain a deeper understanding of SCM strategies to improve their implementation in MSMEs.

5. Conclusion

We examined the correlations among SCM, financial performance, firm value, and competitive advantage in the context of MSMEs engaged in the production of fish crackers in Indonesia. To accomplish this objective, we gathered data from 100 MSMEs operating in Indonesia's food sector and analyzed the data using SEM. The findings suggest that SCM has a positive impact on both firm value and performance as well as competitive advantage. Moreover, firm value plays a significant mediating role in the relationship between SCM and competitive advantage; conversely, firm performance plays only a weak mediating role in this relationship. We propose that competitiveness can be augmented by improving SCM practices, consolidating and adhering to meaningful firm value, and enhancing both financial and non-financial measures of firm performance.

This surge in the number of MSMEs in Indonesia's processed food sector has resulted in heightened competition among business entities. As businesses continue to expand, MSMEs must enhance their capabilities and performance to maintain competitiveness. In the context of business sustainability, it is imperative to focus on areas such as management, finance, and organizational resources to improve performance and build capacity. Furthermore, it is essential to recognize that financial performance alone is not sufficient for evaluating competitiveness. Firms can increase their competitiveness by embracing other aspects such as quality, effective delivery, innovation, TTM, and customer satisfaction.

To remain competitive, businesses must establish competitive advantages that enable them to thrive and grow in the international market. Companies can use various strategies to gain a competitive edge globally. However, there is an ongoing need for a general supply chain system that boosts competitiveness. SCM ought to be established as a comprehensive system and strategy of coordination, encompassing both traditional business functions and tactics, which span the entirety of a company and the supply chain. The primary objective of this holistic integration is to enhance the long-term performance of individual enterprises (Ghatebi et al., 2013; Perez-Franco & Phadnis, 2018).

One limitation of this study is the use of variables based on firm value, which are typically measured through fundamental analysis. However, we focused on specific criteria and indicators gathered through statements or questions. Although this method of choice may initially pose challenges for readers, a logical understanding of the theoretical basis makes it easier to comprehend our thought process. This limitation suggests an opportunity for future studies to replace this approach with a fundamental analysis aimed at unveiling impactful findings for the ongoing development of SCM research.

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