The Influence of Supply Chain Integration, Agility, and Innovation on Company Performance

ABSTRACT

This research aims to determine and investigate the role of supply chain integration, agility, and innovation in the performance of Micro, Small, and Medium Enterprises (MSMEs)operating in the food and beverage sector. By optimizing these factors, companies can enhance the value and profitability generated across the supply chain, encompassing value addition from suppliers to manufacturers, manufacturers to distributors, and ultimately to consumers.This value is created from the service value and price of a finished product, with the total costs borne by the entire supply chain system. The study focuses on MSMEs in the Yogyakarta region, employing random sampling techniques to gather data from various stakeholders, including owners, managers, and operational staff. Questionnaire-based data collection is followed by Structural Equation Model (SEM) analysis using AMOS software.The results of this research indicate that integration, agility, and innovation have a positive effect on company performance, both in terms of financial performance and operational performance.This study contributes to the supply chain literature, specifically in the food and beverage industry, by expanding the understanding of supply chain dynamics. To enhance supply chain integration, managers can implement broader strategies and utilize information technology for better collaboration. To improve supply chain agility, the focus should be on developing flexibility and partnering with agile businesses. Supply chain innovation can be promoted through investments in technology and prioritizing innovation in products, processes, and business models.

Keywords: Supply Chain Management, Company Performance, SMEs, Supply Chain Agility, Supply Chain Integration, Supply Chain Innovation.

1. INTRODUCTION

The current business landscape is fiercely competitive, demanding constant strategy development and evaluation for success. Effective operational strategies are crucial for enhancing efficiency, delivering quality products, and adapting to market dynamics. These strategies not only reduce costs and mitigate risks but also drive innovation.Moreover, they play a significant role in fostering employee growth and social responsibility,thereby contributing to a more sustainable and inclusive business environment.Therefore, implementing strong operational strategies is vital for sustained organizational success in today's dynamic environment.

In the realm of business competition, success hinges on a company's ability to produce goods and services more efficiently and effectively than its rivals, achieving the "cheaper,

better, faster" standard. It requires continuous effort due to the dynamic nature of the business landscape. By consistently improving performance, companies can remain competitive locally and globally. Indrajit and Djokopranoto[1] stress the importance of collaborating with business partners to enhance product and service creation processes. Integrating internal processes with those of partners not only boosts efficiency but also creates a competitive edge. Mahendrawathi and Pujawan[2] highlight the escalating global competition and the significance of product variety in meeting customer needs. They discuss how market demands have evolved, leading to increased expectations for responsiveness, innovation, and flexibility, prompting the adoption of concepts like time-based competition and agile manufacturing in the 1990s.

Industry players have recognized that more than enhancing internal processes alone is not needed to deliver affordable, high-quality, and fast products. Achieving these goals demands collaboration, coordination, and synchronization with all involved parties. Whether suppliers process raw materials, factories transform them into finished products; transportation companies deliver materials or distribution networks reach customers, seamless coordination is essential. This awareness has given rise to Supply Chain Management (SCM), emphasizing the significance of effective coordination in delivering cost-effective, high-quality, and prompt products.

SCM involves organizations working together to deliver products and services efficiently. [3] describe SCM as a way to integrate suppliers, manufacturers, warehouses, and stores to minimize costs while meeting service requirements. [4] emphasizes SCM's goal of maximizing value and profit at each stage of the supply chain, from suppliers to consumers. The supply chain is a system that starts with raw materials and ends with finished goods, involving activities like planning, sourcing, production, delivery, and returns. [5] defines the supply chain as a way to integrate stakeholders like the company, suppliers, and consumers into business processes.

Prior studies[6, 7] highlight how supply chain integration streamlines the flow of information, materials, and services, ultimately enhancing company performance. [8, 9] underscore that well-integrated supply chains lead to overall performance improvement, commonly termed as supply chain integration. Further research by [8, 9, 10, 11] confirms that supply chain integration boosts company performance. [12] echo this sentiment, emphasizing that integration improves product quality, reduces costs, enhances efficiency, and refines distribution.

Given the ever-changing business landscape, agility and innovation within the supply chain are essential. [13] argue that innovation addresses environmental uncertainty by providing profitable solutions to meet customer needs. [14] illustrates how supply chain innovation ensures sustainability. Research by [13] shows that higher supply chain innovation correlates with improved company performance attributed to innovative business models implemented with partners.

In addition to innovation, agility or flexibility within the supply chain is also necessary to address changing environments. [15] define agility as a dynamic capability that enables companies to enhance profitability, meet customer demand, and improve operational performance through company resources. [16] add that with agility in the supply chain, companies can respond to changing markets and substantially improve company performance.

In general, this study will examine the influence of a company's supply chain on its performance, focusing on supply chain integration, innovation, and agility. What sets this

research apart from previous studies is that it focuses on objects from developing countries. It is well-known that the business atmosphere differs greatly between developed and developing countries, so applying research results on supply chains from developed countries to developing ones may not be appropriate. The business sector under investigation in this study is the Food and Beverage SMEs (Small and Medium Enterprises) in the Special Region of Yogyakarta, Indonesia, which is classified as a developing country. Moreover, the dynamics between SMEs and large corporations differ, making this research particularly intriguing. SMEs face tighter competition due to resource limitations, limited access to financing, and pressure from large corporations that leverage economies of scale to compete in the same market. Additionally, the food and beverage sector is highly competitive due to market saturation, rapidly changing consumer trends, and the demand to maintain product quality and services in this challenging industry.

2. LITERATURE REVIEW

2.1 Supply Chain Management (SCM)

Supply chain management (SCM) generally refers to the integration of activities, from procurement of goods and services, transforming raw materials into intermediate and finished products, and efficiently delivering these products to customers. [3] define SCM as a series of approaches aimed at integrating suppliers, manufacturers, warehouses, and other storage facilities efficiently, ensuring products are distributed in the right quantity to minimize costs and meet customer needs. [17] explain SCM as managing activities to acquire raw materials, transform them into intermediate and finished products, and deliver these products to customers through distribution systems. Meanwhile, [18] defines SCM as the integration and management of supply chain organizations and activities through cooperative organizational relationships, effective business processes, and high levels of information exchange to form a high-performing value system that provides sustainable competitive advantages for its members.

From the experts' perspectives, it is clear that SCM plays a vital role in managing relationships within a company's operations and production processes. Good relationships with suppliers and customers are crucial for delivering products that add value while keeping costs low. Building trust with suppliers and customers helps companies grow. SCM also boosts overall supply chain competitiveness by creating more value for customers than competitors. It involves collaborating to enhance efficiency and effectiveness, especially for key customers' benefit. Understanding and meeting customers' needs is essential for company success and supply chain excellence.

[19] SCM is categorized into three main parts: upstream, internal, and downstream. Upstream SCM involves interactions between a manufacturing company and its suppliers, including production and distribution processes. These relationships can extend from raw material suppliers to various levels of the supply chain. In the supply chain's upstream section, procurement is the primary activity, while the internal segment involves transforming inputs into outputs within the organization. Downstream activities focus on delivering products to end customers, including distribution, warehousing, transportation, and after-sales service.

Supply chain management ensures the smooth flow of materials from suppliers to consumers, considering factors like timeliness, cost, and quantity. Robust information technology support is crucial for aligning material processing needs with consumer demands. Integration and coordination are key for efficiency, reducing costs, and maintaining competitiveness. [20] outline three aspects of supply chain management: efficient integration of suppliers, manufacturers, distributors, retailers, and customers; cost

control; and improving service quality to customers. Supply chain management involves various stakeholders working together to meet consumer needs, including manufacturers, suppliers, consumers, retailers, wholesalers, producers, and transporters.

2.2 Supply Chain Integration

[21] define supply chain integration as the interconnectedness, alignment, and coordination of processes, information, people, knowledge, and strategies across the entire supply chain to facilitate effective and efficient material flow. [22] Define supply chain integration as the integration from upstream to downstream (from suppliers to customers), incorporating horizontal integration aspects that involve internal function integration; examples include suppliers and customers within a company's supply chain. [23] define Supply Chain Integration as a complex network of supply chains. [8] also argue that supply chain integration typically demonstrates how companies strategically collaborate with their supply chain partners to manage business processes to create value. Furthermore, [13] suggests that high supply chain integration indicates the extent to which supply chain partners share activities. [24] states that the purpose of supply chain integration is to enhance a company's competitiveness and build relationships with external parties. Meanwhile, [25] mentions that the purpose of supply chain integration is to create a smooth and orderly flow of the supply chain with full integration involving end-to-end information (upstream to downstream).

Based on the viewpoints discussed, supply chain integration can be defined as a company's ability to bring together all parties involved in the supply chain, both internally within the company and externally. There are two main types of supply chain integration: external and internal. [26] suggests that internal integration is based on cross-functional responsibilities and strategic systems to interact or collaborate. [27] adds that this integration will involve collaborative efforts in product design, procurement, marketing, production, and delivery to meet consumer demand at minimum costs. Meanwhile, [28] argue that the scope of external integration involves integrating suppliers and customers.

2.3 Supply Chain Innovation

When facing market challenges, companies must be innovative. Regarding the supply chain context, [29] defines innovation as absorbing knowledge about the supply chain. Supply chain innovation, according to [14], involves integrated changes from incremental to radical changes in products, processes, marketing, technology, resources, and all related functions to create value for stakeholders. [5] adds that supply chain innovation relies on the expertise, skills, knowledge, and resources of supply chain partners, influencing product, service, process, administration, and organizational system value creation. [30] notes that companies typically innovate to sustain their business. From these discussions, supply chain innovation entails a company's ability to implement integrated changes to respond to market shifts. Such changes must be supported by knowledge absorption among supply chain stakeholders.

2.4 Supply Chain Agility

[31] define supply chain agility as a company's ability to respond to unpredictable environments and seize business opportunities. According to [32], supply chain agility is realized through a company's effectiveness in understanding market demand, reflected in its operational processes from start to finish. It aligns with [13] research, which describes agility practices as maximizing market knowledge to capitalize on profitable business opportunities amid evolving business landscapes. Thus, supply chain agility can be understood as a company's ability to collaborate with suppliers and stakeholders to tackle market challenges.

In general terms, supply chain integration refers to a company's capacity to navigate dynamic markets and capitalize on advantageous opportunities within the context of the supply chain.

2.5 Company Performance

[33] suggest that a company's performance is influenced by various factors, with the 1980s-1990s focusing on achievements in effectiveness and efficiency. [34] defines performance as a company's ability to achieve goals using resources effectively and efficiently. [35] further, elaborate that company performance entails reaching specific objectives within a set timeframe, ultimately benefiting the company as a whole. Improved company performance correlates with increased profitability, as noted by [36], who defines performance as the measure of accomplishments toward organizational goals, vision, and mission. Performance evaluation serves management's duty to stakeholders and aids in goal attainment. [37] highlight financial, operational, and market-based performance as common metrics in empirical research.

Financial performance is evaluated using accounting-based or financial data-based measurements. Kaplan and Norton (1992) argue that the limitation of all accounting-based measurements is their focus on past performance. [39] further argue that since the amount of historical data is limited, it may not reflect the future potential of a company. Therefore, companies are required to rely more than solely on accounting-based measurements. Return on sales, profitability, sales growth, productivity improvement, and production cost improvement are indicators commonly used by experts to measure a company's financial performance.

[40] define operational performance as the alignment of processes and performance evaluation of a company's internal business operations in terms of cost, customer service, delivery to customers, quality, flexibility, and process quality. Meanwhile, [41] states that operational performance refers to the quality of activities related to the flow and movement of goods, from raw materials supplied to finished goods delivered to end consumers. Operational performance is also known as non-financial performance, where all aspects can measure performance when information related to opportunities exists but has yet to be realized financially.

Regarding market-based performance, [42] argues that overall, market-based performance will be influenced when the market becomes aware of operational information about the company that is not included in financial performance results. Market-based performance measures include shareholder returns, market value added, and annual profits.

The assessment of a company's financial performance will only be represented by financial performance and operational performance. It is because market-based performance measurement can only be conducted on publicly traded companies, whereas the subjects in this study may not all be publicly traded companies. Therefore, in such circumstances, a combination of financial performance and operational performance measurements is sufficient to present the overall performance of the company.

2.6 Supply Chain Integration and Operational Performance

Supply chain integration refers to a company's ability to integrate all parties involved in the supply chain. [43] describes this process as complex. However, when a company implements supply chain integration, it opens up opportunities to combine both internal and external resources to achieve a competitive advantage. Supply chain integration also

enables companies to coordinate the entire supply chain, from suppliers to customers' hands. It makes the flow of information and goods smoother and facilitates all parties involved. Consequently, operational obstacles and bottlenecks can be avoided, leading to overall operational efficiency improvement. Research by [13] shows that supply chain integration significantly influences a company's operational performance in terms of cost-effectiveness, order fulfillment rate, operational cycle, inventory turnover, and business innovation processes. [44] Their study mentions that supply chain integration can enhance a company's financial performance through better production, distribution, and inventory planning. The findings of these studies are also supported by research conducted by [7, 45, 46].

2.7 Supply Chain Integration and Financial Performance

Supply chain integration is a fundamental capability of a company in modern business management that can significantly impact a company's financial performance. By practicing this, companies can build closer connections with suppliers, distributors, and other business partners in their supply chain. Several previous studies have indicated that supply chain integration is vital for improving a company's financial performance. [44, 47, 48] suggest that supply chain integration can enhance a company's financial performance through more mature production planning, distribution, and inventory management, which can reduce production costs, unproductive inventory, and logistics costs. As a result, operational efficiency increases, directly impacting costs by reducing operational expenses.

[1] argue that better visibility into a company's supply chain enables companies to avoid unnecessary inventory accumulation, save storage costs, and enhance their working capital utilization. It directly leads to increased profit margins. Additionally, supply chain integration facilitates companies in optimizing their logistics processes, reducing shipping costs, delivery times, and product losses. These improvements contribute to increased operational efficiency, cost reduction, and, ultimately, improved financial performance. However, [13] concluded in their study that supply chain integration does not significantly affect financial performance. It could be due to strong external factors where financial performance is sometimes influenced more by these factors than by supply chain integration, such as changes in consumer preferences and government regulations, among others, which may have a more significant impact on financial performance than supply chain integration itself.

2.8 Supply Chain Integration and Operational Performance with Supply Chain Agility as a Mediating Variable

[31] defines supply chain agility as a company's ability to respond to unpredictable environments and exploit business opportunities. Supply chain agility helps companies read market demand, which is reflected in the operational processes from upstream to downstream. [13] describes agility as a company's practice of maximizing its knowledge of the market to exploit profitable business opportunities amidst a constantly changing business environment.

With the concept of supply chain agility within supply chain integration, companies can improve their operational performance through better coordination, faster responsiveness, efficient inventory management, quality enhancement, higher customer satisfaction, and better cost efficiency. It helps companies compete in dynamic markets. [15, 16] found in their research that supply chain agility can influence a company's business performance, whereas supply chain flexibility can mediate the influence of supply chain integration on a company's performance. [49, 50] also suggest that supply chain agility can reduce lead time and total costs, impacting operational performance.

The [13] study concluded that supply chain agility could not mediate the relationship between supply chain integration and operational performance. It is because of the bullwhip effect, where an increase in market demand variance has a stronger influence. The bullwhip effect can be a significant barrier to the ability of supply chain agility to mediate the relationship between supply chain integration and operational performance in fluctuating situations.

2.9 Supply Chain Integration and Operational Performance with Supply Chain Innovation as a Mediating Variable

Supply chain innovation plays a pivotal role in bridging the gap between supply chain integration and optimal operational performance. It encompasses the adoption of cutting-edge technologies, the development of new business processes, and creative management strategies. Embracing supply chain innovation enables companies to become more responsive to changes in customer needs or the business environment. For instance, technologies like blockchain allow for more accurate and transparent supply chain tracking, facilitating quick changes and adaptations. This situation, in turn, enhances operational performance when dealing with sudden changes. Supply chain innovation also aids in improving product and service quality. By employing more advanced technologies, companies can enforce tighter quality control measures, leading to improved operational performance, particularly in customer satisfaction.

Supply chain innovation goes beyond adopting new technologies in supply chain integration processes. It also involves cultural and mindset shifts within a company. Through appropriate supply chain innovation, companies can mediate the relationship between supply chain integration and their operational performance, creating greater alignment and enhancing their competitiveness in an ever-changing market. Based on research findings by [13], it is concluded that supply chain innovation significantly mediates the relationship between supply chain integration and operational performance. These findings are further supported by other studies such as [51, 52, 53, 54, 55].

2.10 Supply Chain Integration and Financial Performance with Operational Performance as a Mediating Variable

Operational performance, as described by [56], reflects a company's service quality in satisfying customer needs through timely, high-quality product delivery at relatively low costs and high operational flexibility. This level of proficiency is also reflected in market share growth, profitability, and financial benefits. Effective operational performance maximizes the benefits of supply chain integration, creating positive synergies that stimulate company growth and profitability.[57] found a significant positive relationship between supply chain integration and operational performance. According to the Resource-Based View theory by [58], companies can achieve sustained competitive advantages by owning and controlling strategic assets, both tangible and intangible. These resources are directly related to operational performance and influence the company's financial state.

Supply chain integration is a strategy developed to enhance a company's performance or value. According to [56], this strategy improves not only operational performance but also overall financial performance by simplifying company operations. Financial performance is considered a secondary indicator of the success of supply chain integration strategies. Thus, changes in operational performance will also affect changes in financial performance in the context of supply chain integration.The research findings by [13] concluded that significant and positive operational performance can mediate the relationship between supply chain integration and financial performance. This viewpoint is also supported by [7, 56, 57].

3. METHODS

3.1 Measurement

This study adopts a quantitative approach. Quantitative research was conducted using primary data collected directly from questionnaire responses and other data obtained from the research object. Data collection involved the use of a questionnaire, which is a prepared list of questions directed at respondents serving as samples. This method allowed for the recording of relevant data related to the research problem. The questionnaire was measured using a 5-point Likert scale. The variables to be studied include independent variables (supply chain integration), mediator variables (supply chain management and supply chain agility), and dependent variables (operational performance and financial performance).

3.2 Sampling and Data Collection

[59] defines population as the entire subject of the research. In this study, the population consists of SMEs operating in the food and beverage industry sector in the Special Region of Yogyakarta. [59] also defines a sample as a part or representation of the population to be studied. Due to the large size of the population and limitations in time and cost, the sample needs to be limited. The sampling technique used is random sampling, which involves selecting samples randomly from the predetermined population. This technique can represent unbiased groups, making it a fair way to select samples from a larger population because each member of the population has an equal chance of being chosen.

According to [60], having a sample size that is too large can make it easier to find a suitable model. Therefore, it is recommended that an appropriate sample size, typically between 100-200 respondents, be used to estimate investment with the Structural Equation Model (SEM). Hence, the sample size will be determined based on the calculation of the minimum sample. According to [60], the determination of the minimum sample size can be obtained through the formula:

Minimum Sample = (Number of Indicators + Number of Latent Variables) x (Estimated Parameters)
Minimum Sample = (40 + 5) x 5 = 225 Respondents

According to the formula above, the minimum sample size for this study is 225 respondents. To account for unforeseen circumstances, such as questionnaires not being returned or incomplete, this study will sample 230 respondents. Finally, this study successfully obtained 230 respondents for further analysis.

3.3 Data Anlaysis Techniques

The data analysis method utilized in this research includes descriptive and statistical analysis. Descriptive statistics refer to statistical measures that describe the data's central tendency, dispersion, variance, maximum, minimum, kurtosis, and skewness. The purpose of this analysis is to present and analyze data by calculating these statistics to obtain the state and characteristics of the data. Following [61] theory, this research employs numerical methods to recognize patterns in the data, summarize the information within the data, and present it in the desired format. Furthermore, the research model will be analyzed using the Structural Equation Model (SEM) method with the assistance of AMOS software. SEM is a technique that allows for the simultaneous analysis of complex and intricate relationships. In simpler terms, as explained by [61], SEM provides adequate estimation techniques and is the most efficient for a series of multiple regression equations estimated simultaneously and

separately. In this examination, the hypothesis is considered accepted if the P-value < 0.05 or the critical ratio value > 1.96. The hypotheses of this research are summarized in the adopted research model from [13], as illustrated in Figure 1.

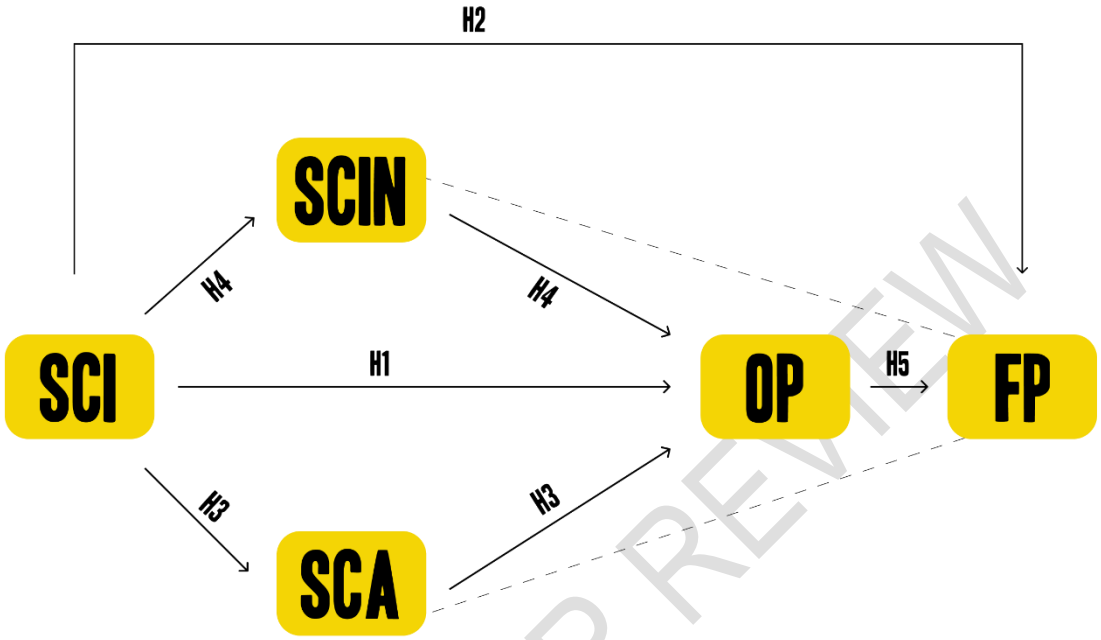

Fig. 1. Research Framework

The research framework is adopted from [13].

Notes: Supply Chain Integration (SCI), Supply Chain Innovation (SCIn), Supply Chain Agility (SCA), Operational Performance (OP), and Financial Performance (FP).

Based on Figure 1, this study posits four hypotheses as follows:

Hypothesis 1: Supply chain integration has a positive effect on operational performance.
Hypothesis 2: Supply chain integration positively influences financial performance.
Hypothesis 3: Supply chain agility mediates the relationship between supply chain integration and operational performance.
Hypothesis 4: Supply chain innovation positively mediates the relationship between supply chain integration and operational performance.
Hypothesis 5: Operational performance positively mediates the relationship between supply chain integration and financial performance.

4. RESULTS AND DISCUSSION

4.1 Respondent Profile

The analysis of respondent profiles is based on characteristics gathered from the questionnaire distribution, including company age, company characteristics, number of employees, company capital, position in the company, and Length of tenure. The results of the respondent profile analysis are presented in the following table (Table 1).

Table 1. Respondents Profile

Category	Frequency	%
Company Age		

Less than 5 years	33	14.3
5 - 10 years	148	64.3
11 - 15 years	35	15.2
16 - 20 years	11	4.8
More than 20 years	3	1.3
Company Characteristics		
Food	173	75.2
Beverages	57	24.8
Total Employee		
Less than 50 people	147	63.9
51 - 100 people	57	24.8
101 - 200 people	19	8.3
201 - 300 people	4	1.7
More than 300 people	3	1.3
Company Capital		
Less than 50 million	73	31.7
50 - 100 million	68	29.6
100 - 300 million	50	21.7
300 - 500 million	28	12.2
More than 500 million	11	4.8
Position in the Company		
Owner	118	51.3
Head of Supply Chain	39	17.0
Supply Chain Manager	28	12.2
Assistant Supply Chain Manager	38	16.5
Others	7	3.0
Tenure in Position		
Less than 1 year	3	1.3
1 - 3 years	59	25.7
4 - 7 years	102	44.3
8 - 10 years	45	19.6
More than 10 years	21	9.1

Souce: Primary data (2024)

4.2 Validity and Reliability Testing

The validity of this study is assessed using CFA (Confirmatory Factor Analysis) in AMOS. Variables are deemed valid if their estimated value exceeds 0.50; otherwise, they are considered invalid. Reliability testing evaluates the consistency of a measurement tool. In our study, we use CR (Construct Reliability) and VE (Variance Extracted) criteria. A variable is considered reliable if CR > 0.7 and VE > 0.5. The results of the validity test are summarized below (Table 2).

Table 2. Convergent Validity and Reliability of Data

Variable	Item	Loadings	CR	VE
Supply Chain Integration	IRP1	0.818	0.966	0.589
	IRP2	0.708		
	IRP3	0.792		
	IRP4	0.825		
	IRP5	0.747		
	IRP6	0.814		
	IRP7	0.852		

	IRP8	0.823		
	IRP9	0.803		
	IRP10	0.809		
	IRP11	0.791		
	IRP12	0.744		
	IRP13	0.695		
	IRP14	0.667		
	IRP15	0.729		
	IRP16	0.749		
	IRP17	0.760		
	IRP18	0.730		
	IRP19	0.698		
	IRP20	0.760		
Supply Chain Innovation	INP1	0.823	0.931	0.660
	INP2	0.771		
	INP3	0.745		
	INP4	0.883		
	INP5	0.867		
	INP6	0.829		
	INP7	0.760		
Operational Performance	KO1	0.700	0.871	0.576
	KO2	0.833		
	KO3	0.702		
	KO4	0.748		
	KO5	0.802		
Supply Chain Agility	KRP1	0.724	0.878	0.508
	KRP2	0.707		
	KRP3	0.692		
	KRP4	0.722		
	KRP5	0.705		
	KRP6	0.722		
	KRP7	0.716		
Financial Performance	KK1	0.658	0.870	0.532
	KK2	0.654		
	KK3	0.635		
	KK4	0.692		
	KK5	0.844		
	KK6	0.859		

Souce: Primary data (2024)
Notes: Supply chain integration (IRP), Supply chain innovation (INP), Operational performance (KO), Supply chain agility (KRP), and Financial Performance (KK).

Based on Table 2, the validity testing results with 230 respondents and 45 questionnaire items show that all questions demonstrated loading factors of>0.50. Therefore, all questions in the questionnaire are deemed appropriate. Additionally, reliability testing results are considered reliable if they have construct reliability values > 0.7 and VE > 0.5. The testing results indicate that the C.R. and VE values for the 5 research variables each exceed 0.7 and 0.5, respectively. Based on these findings, the entire research instrument is reliable and suitable for use in this study.

Next step: normality test. Normality testing is conducted using the z-value (critical ratio or C.R. in AMOS output) derived from the skewness and kurtosis values of the data distribution. The critical value is ± 2.58 at a significance level of 0.01. The results of the normality test are presented in Table 3 below:

Table 3. Normality Test
Souce: Primary data (2024)

Item	Min	Max	Skew	C.R.	Kurtosis	C.R.
IRP1	2.000	5.000	.561	3.472	-.286	-.887
IRP2	2.000	5.000	.297	1.837	-.418	-1.295
IRP3	2.000	5.000	.196	1.213	-.286	-.885
IRP4	2.000	5.000	.196	1.213	-.390	-1.208
IRP5	2.000	5.000	.380	2.352	-.054	-.167
IRP6	2.000	5.000	.306	1.897	-.306	-.948
IRP7	2.000	5.000	.355	2.199	-.472	-1.462
IRP8	2.000	5.000	.188	1.162	-.437	-1.352
IRP9	2.000	5.000	.588	3.640	-.062	-.192
IRP10	2.000	5.000	.230	1.423	-.318	-.986
IRP11	2.000	5.000	.291	1.799	-.433	-1.341
IRP12	2.000	5.000	.477	2.954	-.083	-.256
IRP13	2.000	5.000	.439	2.720	-.171	-.530
IRP14	2.000	5.000	-.339	-2.098	-.043	-.134
IRP15	2.000	5.000	.353	2.187	-.310	-.959
IRP16	2.000	5.000	.089	.553	-.376	-1.163
IRP17	2.000	5.000	.284	1.758	-.273	-.846
IRP18	2.000	5.000	.338	2.091	-.312	-.965
IRP19	2.000	5.000	.288	1.783	-.340	-1.051
IRP20	2.000	5.000	.233	1.441	-.294	-.910
INP1	2.000	5.000	.137	.846	-.243	-.753
INP2	1.000	5.000	-.164	-1.016	.442	1.367
INP3	1.000	5.000	-.118	-.728	-.633	-1.958
INP4	2.000	5.000	.223	1.382	.048	.148
INP5	1.000	5.000	.239	1.479	.122	.377
INP6	1.000	5.000	-.078	-.484	-.224	-.693
INP7	1.000	5.000	.092	.570	-.122	-.376
KO1	2.000	5.000	.242	1.501	-.105	-.325
KO2	2.000	5.000	-.080	-.498	-.239	-.739
KO3	2.000	5.000	.325	2.015	-.410	-1.270
KO4	2.000	5.000	.266	1.644	-.304	-.942
KO5	2.000	5.000	.266	1.650	-.172	-.531
KRP1	2.000	5.000	.164	1.017	-.428	-1.324
KRP2	2.000	5.000	.096	.596	-.487	-1.508
KRP3	2.000	5.000	.301	1.865	-.675	-2.090
KRP4	2.000	5.000	.097	.603	-.531	-1.645
KRP5	2.000	5.000	.181	1.124	-.587	-1.819
KRP6	2.000	5.000	.118	.733	-.395	-1.222
KRP7	2.000	5.000	-.089	-.549	-.182	-.563
KK1	2.000	5.000	.289	1.790	.060	.184
KK2	2.000	5.000	.009	.055	-.365	-1.128
KK3	2.000	5.000	.310	1.920	.099	.305
KK4	2.000	5.000	.053	.329	-.610	-1.889
KK5	2.000	5.000	.183	1.130	-.227	-.702
KK6	2.000	5.000	.379	2.344	.130	.404
Multivariate					-18.947	-2.209

Notes: Supply chain integration (IRP), Supply chain innovation (INP), Operational performance (KO), Supply chain agility (KRP), and Financial Performance (KK).

According to Table 3, the multivariate normality test indicates that the data meet the normality assumption because the value of -2.209 falls within the range of ± 2.58.

Subsequently, the structural model was identified. One way to determine whether there is an identification problem is to examine the estimation results. SEM analysis can only be conducted if the model identification results indicate that the model falls into the over-identified category. This identification is achieved by examining the degrees of freedom (df) of the model created, as shown in Table 4.

Table 4. Discriminant Validity: Cross-Loading

Number of distinct sample moments:	1035
Number of distinct parameters to be estimated:	99
Degrees of freedom (1035 - 99):	936

Souce: Primary data (2024)

Table 4 shows the model's degrees of freedom (df), which is 936. This result indicates that the model is over-identified because it has a positive df value.

Assessing goodness of fit becomes the primary objective in SEM analysis to determine the extent to which the hypothesized model "fits" or matches the sample data. The results of goodness of fit are displayed in the following Table 5.

Table 5. Goodness of Fit Evaluation

Goodness of Fit Index	Cut-off value	Research Model	Model
Chi-square	< 1008,286 (df=936)	1242,340	Not Fit
Significant probability	≥ 0.05	0,000	Not Fit
RMSEA	≤ 0.08	0,038	Fit
GFI	≥ 0.90	0,809	Marginal
AGFI	≥ 0.90	0,789	Not Fit
CMIN/DF	≤ 2.0	1,327	Fit
TLI	≥ 0.90	0,952	Fit
CFI	≥ 0.90	0,954	Fit

Souce: Primary data (2024)

Table 5 suggests that the research model is approaching a satisfactory fit. According to the goodness of fit (GoF) test, four criteria are met: CMIN/DF, RMSEA, TLI, and CFI; Chi-Square, Probability, and AGFI are not marginal; and GFI criterion being marginally met, GFI. Subsequently, hypothesis testing was performed to examine the proposed causal relationships in this study. According to [60], utilizing 4-5 adequately met goodness of fit criteria is sufficient to evaluate the suitability of a model. Based on this notion, hypothesis testing can be conducted in the research.

Finally, the hypothesis testing conducted aims to address the research questions or analyze the relationships within the structural model. The data analysis can be observed from the standardized regression weight values indicating the coefficients of influence among variables in Table 6.

Table 6. Hypothesis Testing

Hipotesis		Estimate	S.E.	C.R.	*P* value	Hasil
IRP → KO	H1	0.141	0.055	2.571	0.010	Supported
IRP → KK	H2	0.118	0.047	2.483	0.013	Supported

IRP → KRP→ KO	H3	2.238	0.025	Supported
IRP → INP →KO	H4	2.339	0.020	Supported
IRP → KO → KK	H5	2.117	0.034	Supported

Souce: Primary data (2024)

Notes: Supply chain integration (IRP), Supply chain innovation (INP), Operational performance (KO), Supply chain agility (KRP), and Financial Performance (KK).

Table 6 indicates that the CR value shows an influence by exceeding 1.96. Furthermore, if the P value is below 0.05, it also indicates its influence. Therefore, all hypotheses in this research are accepted.

4.3.1 Supply chain integration on Operational performance

The test results indicate that supply chain integration has a positive influence on operational performance (CR = 2.571, P value .01), thus supporting H1. The better the supply chain integration, the higher the operational performance will be. Supply chain management ensures that deliveries can be well-integrated. Supply chain management practices are crucial for the success of companies across different industries [62]. Supply chain integration connects companies with suppliers, customers, and others by integrating various aspects like relationships, functions, locations, activities, and processes. This integration also impacts operational performance by enhancing a company's resource utilization effectiveness.

Supply chain integration has a positive and significant impact on operational performance. Companies that are able to integrate their supply chains well have the potential to improve efficiency in production processes, optimize inventory management, reduce costs, enhance product quality, and overall respond to market changes better [63]. With optimal supply chain integration, the operational performance of the company will run smoothly, thus maintaining the overall quality of the company's work. [13] demonstrate that supply chain integration has a significant positive influence on a company's operational performance in terms of cost-effectiveness, order fulfillment rate, operational cycle, inventory turnover, and business innovation processes. These findings are consistent with research conducted by [7, 13, 44, 45, 46, 63], which concludes that supply chain integration has a positive impact on operational performance.

4.3.2 Supply chain integration on financial performance

The test results indicate that Supply Chain Integration has a positive and significant effect on Financial Performance (CR = 2.483, P value .013), thereby confirming the validation of H2. To enhance efficiency and effectiveness in business processes, companies need to implement supply chain management to improve customer satisfaction as well. Moreover, this integration can also help companies increase visibility and transparency in the supply chain, thus minimizing risks and improving delivery accuracy [63]. Supply chain agility is a way for companies to respond to changes in the business environment to remain competitive. Meanwhile, financial performance relates to a company's achievements concerning its financial goals and stakeholders in wealth enhancement.

Supply chain integration has a positive and significant impact on financial performance. The better the supply chain integration, the more it enhances financial performance. Organizational supply chain agility allows for faster and more effective responses to market uncertainties, balancing supply and demand and achieving shorter cycle times to maintain competitive positioning [64]. With a competitive edge, companies can improve financial performance. Hence, supply chain agility positively and significantly influences financial

performance. These findings are consistent with [44, 47, 48, 64], whose research concludes that supply chain agility positively affects a company's financial performance.

4.3.3 The mediation Effect of Supply chain agility on Supply chain integration and Operational performance

The test results indicate that Supply Chain Agility is able to mediate the influence of Supply Chain Integration on Operational Performance (CR = 2.238, P value .025), thus supporting H3. Supply chain agility is crucial for growth and resilience in an environment prone to rapid changes, enabling flexible responses from the supply chain. It is considered an extension of agile manufacturing, primarily focused on companies [65]. Additionally, supply chain agility expands the narrow concept of the supply chain.

Supply chain agility can mediate the influence of supply chain integration on operational performance. To enhance operational performance, supply chain integration must be implemented. The effectiveness of supply chain integration itself can be influenced by supply chain agility, which combines mindset, intelligence, and processes throughout the supply chain organization, enabling rapid responses to environmental uncertainties and changes reactively, proactively, and ultimately, predictively by relying on their relationship integration to meet end customer needs [64]. Thus, a supply chain can be well-integrated when there is supply chain agility, which then impacts a company's operational performance. Therefore, operational agility mediates the influence of supply chain integration on operational performance. These findings are consistent with [15, 16, 49, 50, 64], whose research concludes that supply chain agility mediates the influence of supply chain flexibility on SME performance.

4.3.4 The mediation effect of Supply chain innovation on Supply chain integration and Operational performance

The test results indicate that Supply Chain Innovation can mediate the influence of Supply Chain Integration on Operational Performance (CR = 2.339, P value .020), thus supporting H4. Supply chain integration is often associated with the level of alignment within a company's internal and external processes and strategic relationships with trading partners, enabling unique competencies in operational performance that can provide sustainable competitive advantages [63]. Supply chain integration has a positive effect on a company's operational performance, including reducing operational costs, enhancing performance, and improving product quality.

Supply chain innovation mediates the influence of supply chain integration on operational performance. Effective supply chain integration (internal, customer, and supplier integration) directly leads to higher operational performance [62]. Innovation provides opportunities to achieve many things, as it can foster and introduce new ways that can be applied in supply chain integration. Every supply chain needs the ability to evolve and adapt to changes in the business environment continuously, so supply chain innovation will enhance supply chain integration and ultimately impact the improvement of operational performance conducted by the company. Thus, supply chain innovation mediates the influence of supply chain integration on operational performance. These findings are consistent with [13, 51, 52, 53, 54, 55, 64]. However, there are slight differences in the variables studied. Their research concludes that supply chain agility, which requires adaptation to environmental changes, can mediate the influence of supply chain flexibility on company performance.

4.3.5 The mediation effect of Operational Performance on Supply chain integration and Financial performance

The test results indicate that Operational Performance can mediate the influence of Supply Chain Integration on Financial Performance (CR = 2.117, P value .034), thus supporting H5. Supply chain integration refers to the extent to which an organization can collaborate with supply chain management partners and manage organizational processes, whether domestic or international, to achieve product flow, information services, payments, and decision-making efficiently, providing maximum added value for service users [66]. Therefore, to achieve good financial performance, all supply chain members must understand their roles, contributing positively to the company's financial performance. In this regard, good operational performance can also influence the implementation of supply chain integration, which in turn affects financial performance.

Operational performance mediates the influence of supply chain integration on financial performance. Improving operational performance requires increased attention to operational activities while considering efficiency principles and consumer readiness as users of goods and services [62]. Improvement in operational performance across all areas, including the supply chain, will also enhance the implementation of supply chain integration by the company, thereby impacting consumer satisfaction as users of the company's services or products, which in turn will lead to a positive impact on financial performance. Therefore, operational performance mediates the positive influence of supply chain integration on financial performance. These findings are consistent with [7, 13, 56, 57, 66], whose research concludes that operational performance mediates the influence of supplier integration on financial performance.

5. CONCLUSION

This study aimed to investigate the roles of supply chain integration, agility, and innovation on the performance of SMEs in the food and beverage sector. The findings supported all hypotheses posited. The research revealed that practices related to supply chain integration, agility, and innovation have a positive impact on company performance. It aligns with [13] that supply chain integration practiced significantly enhances company operational performance. On the contrary, it does not directly predict the company's financial performance. However, supply chain integration indirectly affects financial performance through its impact on operational performance, particularly when coupled with supply chain innovation.Therefore, efforts to enhance supply chain integration should be balanced with investments in supply chain innovation to ensure sustainable performance improvement in the company.

Theoretically, this study contributes to the body of knowledge in the supply chain context, particularly in the food and beverage industry. It expands the existing literature and understanding of supply chain dynamics. Managerial implications for managing supply chains in SMEs in the food and beverage sector in Yogyakarta are as follows:

1. To expand supply chain integration, managers should devise comprehensive strategies to improve collaboration across different stages of the supply chain.Additionally, leveraging information technology and supply chain management systems can facilitate efficient information exchange among business partners.
2. To enhance supply chain agility, managers can focus on developing flexibility and agility in supply chain operations to address changes in market demand or disruptions in production processes. Moreover, selecting business partners with high agility capabilities can be considered in supply chain management.
3. To promote supply chain innovation, innovation should be the primary focus in supply chain management, whether in products, processes, or business models. Furthermore,

investments in new technologies such as IoT (Internet of Things) or blockchain can be utilized to enhance efficiency and transparency in the supply chain.

SMEs in the food and beverage sector in Yogyakarta should continuously evaluate and enhance operational flexibility to respond to market demand changes or emergencies. Building responsive partnerships with high agility capabilities to improve adaptation to changes is crucial. SME operators in the food and beverage sector in Yogyakarta should foster a culture of innovation throughout their organizations by incentivizing employees to contribute new ideas to supply chain management. Investment in new technology and management techniques is necessary to accelerate operational and product innovation. Moreover, local governments are encouraged to facilitate SME operators in the food and beverage sector through guidance, training, mentoring, and formalizing supply chain management for SMEs to enhance business productivity.

Future research should focus on refining measurement tools to ensure questionnaire statements accurately represent the variables under study. Moreover, employing more precise data collection techniques can enhance the research outcomes. This study primarily involved business operators in the food and beverage sector in Sleman, Yogyakarta. Future studies should consider replicating the research with a broader range of respondents to ensure consistency of findings.

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