
Supply Chain Flexibility and Performance of Food & Beverage Manufacturing Firms in Nairobi City County, Kenya

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Accepted, Nov 17th, 2025

Abstract

The performance of food and beverage manufacturing firms in Nairobi City County has been declining over the last three years. This is despite the government's ongoing efforts to promote industrial growth through tax incentives, policy reforms and infrastructural investments aimed at enhancing the ease of doing business¹Kimeu Reuben Mutisya. The general objective of this study was established the relationship between supply chain flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya. The specific objectives were to determine the relationship between supplier flexibility and inventory flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya. The study employed descriptive research design. The target population was 476 management staff in the food and beverage manufacturing firms in Nairobi City County. A sample of 217 management staff were selected using stratified random sampling. The study used primary data gathered using structured questionnaires. The collected data was coded and entered into SPSS for analysis. Data analysis entailed descriptive and inferential statistics. Descriptive statistics entailed frequencies, means, and standard deviation while inferential statistics entailed Pearson's correlation analysis and linear regression analysis. The findings showed that there exists a positive and significant relationship between supplier flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya. The findings also showed a positive and significant relationship between inventory flexibility and performance. Manufacturing firms should go beyond basic supply chain flexibility practices and adopt advanced digital systems that enhance real-time visibility and coordination across procurement, inventory management.

Keywords; *Supplier Flexibility, Inventory Flexibility, Performance, Food and Beverage Manufacturing Firms*

INTRODUCTION

Supply chain flexibility refers to a supply chain's capacity to adjust efficiently to changes in customer demand, production fluctuations, and supplier disruptions while being cost-effective and providing adequate service levels (Ngatia et al., 2024). According to Kuria and Ndeto

(2024), it is a supply chain's ability to adapt its sourcing, logistics, and operations to market conditions and uncertainties in order to maintain efficiency and competitiveness.

Supply chain flexibility is essential for improving the performance of companies that manufacture food. Businesses can swiftly adjust to changes in the market, customer preferences, and unforeseen interruptions like shortages of raw materials or delays in shipping when their supply chain is flexible (Odedo & Noor, 2024). Supply chain flexibility enables businesses to effectively adapt to demand variations, guaranteeing continuous production and reducing stockouts or surplus inventory. This flexibility boosts cost control, decreases waste, and increases operational effectiveness, all of which increase profitability and customer happiness.

According to Gereffi et al. (2022), China's food manufacturing companies' performance is directly related to how flexible their supply chains are, which is essential for adapting to the nation's changing market demands and international disruptions. The food manufacturing industry in China, one of the world's major centers for food production, benefits from a highly flexible supply chain that makes use of advanced technology, effective logistical systems, and strong supplier relationships (Sun et al., 2024). Flexible supply chains are essential for managing the intricacies of the food production business, and they are having a growing impact on the success of US companies like Tyson Foods, General Mills, and Kraft Heinz (Ervin, 2024). According to Ramos et al. (2023), these businesses understand that agile supply chain methods are necessary in light of the COVID-19 pandemic and other disruptions, as well as the quick changes in consumer preferences. To swiftly adapt meat processing to changes in demand, Tyson Foods has made investments in adaptable manufacturing methods (Draeger et al., 2021).

In India, the performance of food manufacturing companies is increasingly influenced by supply chain flexibility, particularly in reaction to the country's distinct market dynamics (Kumar & Singh, 2023). These businesses confront obstacles such as geographical variations in consumer preferences and unpredictable agricultural supply.

In Uganda, the performance of food manufacturing firms is influenced by their ability to maintain supply chain flexibility amidst challenges such as seasonal agricultural production, inefficient transportation networks, and fluctuating market demand (Galema et al., 2024). Businesses especially Dairy Farms have implemented advanced strategies like decentralized procurement and collaborate with numerous smallholder farmers in order to diversify their sourcing and lessen their reliance on a single source (Mubiru et al., 2023). Rwandan food manufacturers rely on supply chain flexibility to address restrictions such as land scarcity, a heavy reliance on imported products, and logistical inefficiencies (Rukundo, 2021). Companies like Kinazi Cassava Plant have reinforced their supply chains by joining cooperatives with small-scale producers, assuring a consistent flow of raw materials while keeping pricing stable (Virgin et al., 2022).

In Kenya, Food manufacturing enterprises' performance is heavily influenced by their capacity to maintain supply chain flexibility, allowing them to respond effectively to market demands, raw material variations, and logistical challenges (Kamau & Njeru, 2024). Leading enterprises such as Brookside Dairy, Unga Group, and Kenya Breweries Limited have employed a variety of sourcing strategies, balancing imports with local raw materials to maintain supply consistency. Some companies have incorporated contract farming, partnering directly with smallholder farmers to ensure consistent input supplies, while others have invested in improved warehousing and distribution to avoid spoilage and transportation delays according to Bradford (2022). Mwangi (2024) argue that, the use of digital tools such as blockchain for traceability and AI-

powered demand forecasting has increased productivity, helping businesses to reduce stockouts and production downtime.

Despite these developments, food makers in Kenya confront substantial barriers to supply chain efficiency (Karani, 2022). According to Okello (2023), poor road infrastructure in rural areas makes it difficult to convey agricultural produce to processing factories, while intermittent electricity supply raises operational expenses, driving businesses to invest in alternative energy sources such as solar and biomass. Furthermore, relying on imported components like wheat, edible oils, and food additives exposes businesses to currency swings and global supply chain disruptions, which raises production costs (Vuppalapati, 2022). Government policies, such as taxation on vital inputs and regulatory barriers, further complicate operations (Kashindi, 2021).

Statement of the problem

The performance of food and beverage manufacturing firms in Nairobi City County has been declining over the last three years. This is despite the government's ongoing efforts to promote industrial growth through tax incentives, policy reforms and infrastructural investments aimed at enhancing the ease of doing business. For instance, Unga Holdings Limited, a prominent flour milling company, faced significant financial struggles, leading to the planned layoff of up to 50 employees in December 2023. The company cited decreased sales volumes, high cost of inputs and high fixed costs as reasons for its challenges, affecting its profitability and operations. The company posted a loss of KES 959.3 million (US\$6.6 million), reversing a profit of KES 311.3 million (US\$2.1 million) from the prior year (Unga Group PLC (2024)). Similarly, Pwani Oil Products Limited, has encountered supply chain disruptions, including inconsistent raw material supply and increased transportation costs. These challenges have affected production schedules and profitability (The Star, 2023). As a result, some of the food and beverage manufacturing firms in Nairobi have reported reduced profit margins, layoffs, and in some cases, closure of operations, signaling an urgent need for interventions to revitalize the industry.

Prior research on supply chain management in Kenya has mostly concentrated on more general topics like procurement procedures and distribution, paying little attention to the particular function of supply chain flexibility in the food manufacturing industry (Mogaka, 2023). This study looks into how supply chain flexibility affects the performance of local food manufacturing companies in an effort to close the knowledge gap. It is anticipated that the results would help improve supply chain procedures and guide policy choices that increases the industry's competitiveness and sustainability.

Objectives of the Study

- i. To determine the relationship between supplier flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya.
- ii. To evaluate the relationship between inventory flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya.

LITERATURE REVIEW

Theoretical framework

Transaction Cost Theory (TCT)

The theory was proposed by Ronald Coase in 1937 and further developed by Oliver Williamson in 1975. It examines the costs incurred when firms engage in economic exchanges, particularly the costs of coordinating and managing transactions within and across organizational boundaries. The main tenets of the theory include the concepts of bounded rationality, opportunism, asset specificity, and uncertainty. Bounded rationality implies that decision-makers work within informational and cognitive bounds, whereas opportunism focus on how people's self-serving

actions can raise transaction costs. Asset specificity describes how much an investment is customized for unique transactions, while uncertainty shows the unpredictability that calls for adaptable risk management techniques. In order to eliminate inefficiencies, Williamson (1985) showed how to apply TCT to analyze supply chain structures and contracts. Moreover, he showed the importance of supplier flexibility in reducing transaction uncertainty hazards.

In this study, TCT is very important since it offers a framework for investigating how supplier flexibility might lower transaction costs, allowing Nairobi-based food manufacturing companies to improve their performance and operational efficiency. The theory is a vital lens for analyzing the dynamics of supplier flexibility in this industry since it emphasizes how crucial it is to manage supplier relationships in order to reduce uncertainty and maximize resource allocation.

Resource-Based View (RBV)

The theory proposed by Jay Barney in 1991, posits that a firm's resources and capabilities are central to gaining and sustaining competitive advantage. The main tenets include resource heterogeneity, which shows the distinct resources that set businesses apart from rivals, and resource immobility, which implies that these resources are difficult for businesses to transfer between one another. Additionally, for resources to be considered strategically valuable, they need to be valuable, scarce, unique, and arranged for efficient usage. Inventory flexibility is a crucial characteristic for adapting to market needs and uncertainties. Barney (1991) used RBV to analyze how internal resources, including organizational capabilities, human capital, and physical assets, contribute to business performance.

Grant (1996) showed its usefulness in matching resource capabilities with long-term organizational goals. Barney (1991) also stresses its capacity to recognize and utilize strategic resources for competitive advantage. RBV is relevant to this study because it focuses on inventory flexibility as a strategic asset that helps Nairobi City County food manufacturing companies maximize production efficiency and react quickly to changes in the market. By looking at inventory flexibility

Conceptual Framework

In this study, the independent variables were supplier flexibility and inventory flexibility and the dependent variable was the firm performance.

Independent Variables

Dependent Variable

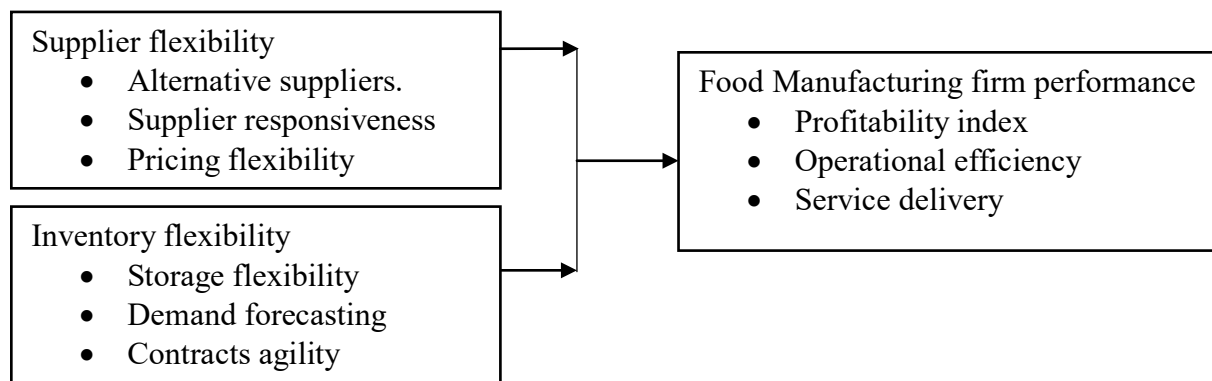


Figure 1: Conceptual Framework

Empirical Review

Ngatia et al. (2024) sought to evaluate impact of supplier flexibility on operational outcomes of food and beverage manufacturing enterprises in Kenya. A cross-sectional data collection strategy was adopted, targeting senior procurement managers from 246 food and beverage manufacturing

companies. Results include, supply chain flexibility shows a marked and upward linear association with the operational success of Kenyan food and beverage entities, an increase in supplier flexibility results in proportional rise in firm achievement level and the study confirmed that strategically implementing supplier flexibility is crucial for improving organizational efficiency and positioning.

Siagian et al. (2021) investigated the impact of supply chain integration on business performance through supplier flexibility, supply chain resilience, and innovation systems in Indonesia's manufacturing companies, particularly in response to COVID-19 disruptions. A quantitative research design was used, with data collected from 470 valid questionnaires and analyzed using the partial least squares (PLS) technique via SmartPLS software version 3.0. The findings showed that supply chain integration significantly enhances supplier flexibility by facilitating better information sharing and production planning. Additionally, supplier flexibility strengthens supply chain resilience by improving the ability to manage sudden changes in customer demand and production challenges.

The study by Jum'a and Bushnaq (2024) examined the impact of supplier flexibility on supply chain performance and explored the mediating role of supply chain flexibility in the relationship between supply chain integration and SCP within Jordan's manufacturing sector. Using a quantitative design, the study surveyed 219 managers from various manufacturing firms. Data were collected through an online self-administered questionnaire, and structural equation modeling was conducted using SmartPLS. The findings revealed that integrating and enhancing supply chain flexibility can significantly improve SCP in dynamic markets. Moreover, both SCI investments and supplier flexibility practices positively impact SCP, with SCF serving as a crucial moderator, driving improvements in productivity, cost reduction, and customer satisfaction.

Zhu and Liu (2024) explored the effect of inventory flexibility on financial performance with firm growth and firm size as moderating factors in China. A quantitative research design was used, analyzing empirical data from 1,953 listed manufacturing enterprises in China over a 16-year period (2005–2021). The study employed a moderation model and three-way interaction analysis to assess hypotheses. The data depicted a positive association amidst inventory flexibility and financial performance; however, this relationship weakens with firm growth. Furthermore, company size lowers the negative mediating influence of entity growth on association amid inventory flexibility and financial outcome.

Alex and Ngugi's (2023) study planned to determine impact of inventory flexibility on the operational success of Kenyan food and beverage companies. A descriptive study design was employed, with employees from Kenyan food and beverage enterprises serving as the target audience. Given the population's diversity, stratified sampling technique was used to provide a representative sample. Data was collected using structured research instruments and analyzed using descriptive and multiple regression techniques. Results depicted that material requirement planning significantly enhanced inventory flexibility and firm performance, as it allowed firms to respond efficiently to demand fluctuations and optimize inventory control. Additionally, radio frequency identification technology played a crucial role in improving inventory flexibility by enhancing real-time inventory tracking and reducing inefficiencies.

Research by Durach et al. (2023) sought to examine inventory and flexibility patterns and explored how firms respond to low-probability, high-impact disasters, specifically the 2011 Great East Japan Earthquake. Firms boosted long-term raw material stocks while increasing short-term

volume flexibility. Risk-averse organizations showed stronger responses, but these adjustments severely impacted performance.

METHODOLOGY

The study adopted a descriptive research design. According to Siedlecki, (2020), descriptive research design is a methodical approach to data collection and analysis that aims to characterize the features of a population, event, or phenomena. Using sample selection, a descriptive research methodology is a present-oriented method that looks at and pinpoints casting occurrences in a population (Safari & Kengere, 2023)

The target population for this study was 476 the management staff in the 119 food and beverage manufacturing firms in Nairobi City County. These included the heads of procurement administration, supply chain managers, warehouse managers and production managers of the food and beverage manufacturing firms in Nairobi City County, Kenya.

The sampling frame was obtained from the list of food and beverage manufacturing firms in Nairobi City County. Yamane's (1967) formula was used to determine the sample size as follows:

$$n = \frac{N}{1 + N(e^2)}$$

Where:

N=population size

n=sample size

e= level of precision (0.05)

$$n = \frac{476}{1 + 476(0.0025)}$$

n= 217 respondents

Stratified random sampling was employed to select 217 participants for inclusion in the study.

A structured questionnaire was used in data collection. Descriptive statistics was employed to summarize the data in this study. This entailed frequencies, means, and standard deviation. Additionally inferential analysis entailing Pearson's correlation analysis and linear regression analysis to determine the relationship between the independent variables and the dependent variable.

FINDINGS AND DISCUSSIONS

Response Rate

The number of questionnaires issued to the respondents was 217. Of these, 191 questionnaires were properly filled and returned, representing a response rate of 88.02%. The remaining 26 questionnaires, accounting for 11.98%, were either not returned, incompletely filled, or contained errors that rendered them unusable for analysis. The high response rate of 88.02% indicates strong participant engagement and provides a reliable basis for drawing meaningful conclusions from the collected data. According to Sammut et al. (2021) a response rate above 70% is considered excellent for generalization of research results.

Descriptive Results

Descriptive Results for Supplier Flexibility

The first objective of the study was to determine the relationship between supplier flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya. Participants of the research were supposed to indicate their agreement perspectives with

statements provided concerning supplier flexibility practice in their organizations. This was done in an ordinal scale ranging from one (1) to five (5). The lowest value of 1 indicated strong disagreement while the highest possible value of 5 indicated strong agreement. A neutral stand was represented by (3).

Table 1: Supplier Flexibility

	SD	D	N	A	SA	Mean	SD
Our company has multiple alternative suppliers for key raw materials.	5.57%	8.09%	11.18%	44.79%	30.37%	4.06	0.82
We can easily switch to alternative suppliers in case of disruptions.	2.09%	7.33%	13.61%	38.74%	38.22%	4.04	0.89
Our suppliers can quickly adjust order quantities based on our needs.	8.90%	7.85%	10.47%	48.17%	24.61%	3.72	1.01
Our suppliers respond quickly to urgent or unexpected orders.	12.09%	13.61%	8.38%	33.74%	32.17%	3.84	0.98
Our suppliers are open to negotiating prices based on long-term contracts.	2.62%	7.33%	8.90%	57.07%	24.08%	3.93	0.93
Our suppliers offer flexible pricing options based on order volume.	2.09%	13.61%	8.38%	52.36%	23.56%	3.82	0.84
Average						3.87	0.91

Source: Author (2025)

The analysis revealed that a significant majority (75.16%) of the respondents affirmed that their firms maintain multiple alternative suppliers for key raw materials. Only 13.66% refuted this, while 11.18% remained indifferent. The mean score of 4.06 and a standard deviation of 0.82 indicate that most firms deliberately structure their sourcing strategies to enhance supply continuity and mitigate the risk of operational disruptions. Ngatia et al. (2024) also found that supplier diversification strengthens a firm's resilience by minimizing dependence on single sources and allowing greater flexibility in response to supply shocks

Regarding the ease of switching to alternative suppliers during supply disruptions, 76.96% of participants indicated that their organizations are capable of doing so. In contrast, 9.42% expressed dissenting views, and 13.61% adopted a neutral stance. With a mean of 4.04 and a standard deviation of 0.89, the findings reflect a considerable degree of agility in supplier relationships an essential factor in sustaining production in the food and beverage manufacturing organizations. In terms of suppliers' ability to adjust order quantities in response to changing needs, 72.78% of respondents signaled agreement, while 16.75% disagreed, and 10.47% were undecided. The mean of 3.72 and a relatively higher standard deviation of 1.01 imply that while this flexibility is generally present in most of the F&B manufacturing firms, its consistency across firms and suppliers varies, possibly due to differences in supplier capacity or contractual terms. Siagian et al. (2021) argue that supplier flexibility in adjusting order volumes is a key enabler of supply chain responsiveness, which strengthens firms capacity to adapt to fluctuating operational and market demands with minimal disruption.

With respect to responsiveness to urgent or unexpected orders, 65.91% of the firms reported that their suppliers are quick to react. Meanwhile, 25.70% contradicted this view, and 8.38% maintained neutrality. A mean of 3.84 and a standard deviation of 0.98 support the notion that prompt supplier responsiveness is prevalent, albeit with some variability as evidenced by the substantial disagreement and indifferent responses.

Additionally, 81.15% of respondents acknowledged that their suppliers are open to negotiating prices under long-term contractual frameworks. Only 9.95% expressed disagreement, and 8.90%

remained non-committal. With a mean of 3.93 and standard deviation of 0.93, these results highlight a strategic orientation toward fostering collaborative supplier relationships that support cost stability and long-term performance gains in the F&B manufacturing firms. It is in line with Mostofa (2024) whose study detected that strategic supplier relationships contribute significantly to improved performance outcomes through stable pricing and reduced transaction costs.

About 75.92% of the participants affirmed the existence of flexible pricing options based on order volume, while 15.70% disagreed, and 8.38% were neutral. A mean of 3.82 and standard deviation of 0.84 suggest that such pricing arrangements are fairly widespread potentially enhancing the F&B firms' ability to manage procurement costs relative to scale and demand fluctuations. This echoes the findings of Sanni (2024) who noted that volume-based pricing incentives can reduce transaction costs and improve efficiency in buyer–supplier relationships.

The average across the supplier flexibility dimensions yielded a composite mean of 3.87 and standard deviation of 0.91. This pattern indicates that supplier flexibility is generally robust among food and beverage manufacturing firms in Nairobi City County.

Descriptive Results for Inventory Flexibility

The second objective of the study was to evaluate the relationship between inventory flexibility and performance of food and beverage manufacturing firms in Nairobi City County, Kenya.

Table 2: Inventory Flexibility

	SD	D	N	A	SA	Mean	SD
Our company efficiently utilizes storage space to accommodate inventory fluctuations.	1.57%	8.38%	17.28%	34.03%	38.74%	4.00	1.02
Our storage systems allow for quick retrieval and dispatch of inventory.	0.00%	6.81%	15.71%	37.17%	40.31%	4.11	0.91
Our company effectively forecasts demand to minimize stockouts or overstocking.	4.71%	6.81%	9.95%	46.60%	31.94%	3.94	1.06
Our demand forecasting techniques help in reducing unnecessary inventory costs.	1.57%	7.85%	13.09%	45.55%	31.94%	3.98	0.95
Our company has flexible contracts with suppliers to adjust inventory levels when needed.	3.60%	12.61%	21.99%	33.53%	28.27%	3.71	1.1
Our contracts with suppliers allow modifications based on changes in demand.	2.62%	13.09%	18.32%	41.36%	24.61%	3.72	1.06
Average						3.91	1.02

Source: Author (2025)

The results showed that 72.77% of the respondents indicated that their companies make efficient use of storage space to accommodate fluctuations in inventory levels. In contrast, 9.95% opposed this view, while 17.28% held neutral positions. The mean score of 4.00 and a standard deviation of 1.02 reflect a generally favorable utilization of inventory space, implying that spatial optimization is prioritized in managing dynamic inventory requirements. The findings agree with that of Reggin et al., (2022) who noted that flexible inventory storage plays a key role in coping with demand variability and ensuring operational continuity.

A strong majority of 77.48% of participants acknowledged that their storage systems are designed to facilitate the quick retrieval and dispatch of inventory. None of the respondents strongly disagreed, while 6.81% expressed disapproval and 15.71% remained non-committal.

The mean of 4.11 and standard deviation of 0.91 indicate a general adoption of optimal inventory storage systems which enhances responsiveness in inventory handling and order fulfillment.

On the aspect of demand forecasting to minimize the risk of stockouts or overstocking, 78.54% of the respondents expressed agreement. A smaller group, 11.52%, disagreed, while 9.95% reported a neutral stance. The corresponding mean score of 3.94 and standard deviation of 1.06 suggest that while demand prediction is widely practiced, the variability in responses points to differing levels of forecasting sophistication across the F&B firms. Moreover, 77.49% of participants concurred that their organizations' forecasting techniques help minimize excess inventory costs. Close to 9.42% did not support this view, and 13.09% remained neutral. The mean score of 3.98 and a standard deviation of 0.95 shows that most of the firms had reaped the benefits of low inventory holding costs, although some firms may still be refining their systems, as mirrored by the neutral and disagree stances.

When asked about the flexibility of supplier contracts in allowing inventory adjustments, when necessary, 61.80% of respondents agreed, 16.21% disagreed, and 21.99% remained neutral. The mean score of 3.71 suggest that most of the firms recognize some degree of contractual flexibility. Nevertheless, the SD of 1.10 indicates variation in responses which shows inconsistent experiences or contractual terms across the food and beverage firms. It was seen that 65.97% of participants affirmed that their contracts with suppliers are adaptable to shifts in demand, while 15.71% expressed dissent, and 18.32% remained undecided. The mean value of 3.72 and standard deviation of 1.06 indicate a generally positive perception, though some inconsistencies persist in the contractual mechanisms used to support inventory responsiveness.

The aggregated responses yielded an average mean of 3.91 and a standard deviation of 1.02. These findings point to a favorable disposition among food and beverage manufacturing firms towards practices that support inventory flexibility.

Descriptive Results for Performance

The study further sought for respondents' perspectives on performance of the manufacturing firms in their respective institution.

Table 3: Performance

	SD	D	N	A	SA	Mean	SD
Our company has experienced consistent profit growth over the past years.	7.33%	15.18%	10.47%	48.17%	18.85%	3.56	1.17
Our revenue streams have expanded for the last 3 years	2.62%	16.75%	12.57%	40.84%	27.23%	3.73	1.11
Our operations run efficiently with minimal downtime.	3.14%	11.52%	5.76%	47.12%	32.46%	3.94	1.06
The firm consistently meets production targets within scheduled timelines.	4.19%	5.24%	7.85%	52.88%	29.84%	3.99	0.98
Our customers are satisfied with the quality of our products.	0.00%	3.66%	6.28%	63.87%	26.18%	4.13	0.68
Our service delivery has consistently improved for the last three years	3.14%	7.85%	8.90%	59.16%	20.94%	3.87	0.94
Average						3.87	0.99

Source: Author (2025)

The analysis revealed that 67.02% of respondents affirmed that their companies had recorded consistent profit growth over the past years. However, 22.51% of participants held a contrary view, and 10.47% were ambivalent. The mean score of 3.56 and a relatively high standard deviation of 1.17 suggest that while profitability trends are generally positive, a significant

proportion of firms still grapple with financial inconsistencies or fluctuating earnings. With respect to revenue growth, 68.07% of respondents reported that their organizations had experienced an expansion in revenue streams over the past three years. In contrast, 19.37% disagreed, while 12.57% remained neutral. The mean score of 3.73 and a standard deviation of 1.11 indicate that although most firms are seeing upward revenue trends, this growth is not uniformly experienced across all organizations.

In terms of operational efficiency, 79.58% of respondents agreed that their firms operate with minimal downtime, whereas 14.66% expressed dissenting views, and only 5.76% were non-committal. A mean score of 3.94 with a standard deviation of 1.06 highlights a strong level of confidence in the firms' internal efficiency and capacity utilization. These results suggest that most firms have successfully streamlined their operations to minimize disruptions and enhance productivity. Similarly, 82.72% of the respondents affirmed that their firms consistently meet production targets within the scheduled timelines. Only 9.43% reported otherwise, and 7.85% neither agreed nor disagreed. The mean score of 3.99 with a standard deviation of 0.98 underscores the importance placed on operational timeliness and throughput, indicating mature production planning and scheduling capabilities in most of the F&B manufacturing firms in Nairobi City County.

Regarding product quality and customer satisfaction, an overwhelming 90.05% of respondents agreed that their customers are content with the quality of the products offered. Only 3.66% disagreed, and 6.28% were neutral. The high mean score of 4.13 and the relatively low standard deviation of 0.68 reflect a strong and consistent commitment to quality standards, which is likely contributing to customer retention and brand loyalty. Over 80% of the respondents acknowledged that their companies have experienced steady improvements in service delivery over the past three years. In contrast, 10.99% disagreed, while 8.90% maintained a neutral stance. The mean score of 3.87 and a standard deviation of 0.94 suggest a generally positive trajectory in service performance, although some firms may still be undergoing transitional improvements or structural adjustments.

The aggregated responses produced an average mean score of 3.87 and a standard deviation of 0.99. These findings indicate that most food and beverage manufacturing firms in Nairobi City County exhibit robust organizational performance across key dimensions, including profitability, operational efficiency, revenue growth, product quality, and service delivery. However, the presence of variation in profitability and cost control highlights the need for targeted strategies to address performance disparities and reinforce competitiveness across the board.

Inferential Analysis of the Variables

Correlation analysis

Table 4: Correlation analysis

		Performance	Supplier Flexibility	Inventory Flexibility
Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
Supplier Flexibility	Pearson Correlation	.793**	1	
	Sig. (2-tailed)	0.004		
Inventory Flexibility	Pearson Correlation	.799**	.291**	1
	Sig. (2-tailed)	0.001	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

Source: Author (2025)

The findings indicated a strong and statistically significant positive correlation between supplier flexibility and performance ($r = 0.793$, $p = 0.004 < 0.05$). This implies that food and beverage manufacturing firms that effectively segment their markets based on customer needs and profitability tend to experience better performance outcomes. These results resonate with the findings of Ngatia et al. (2024) who observed that supplier flexibility enhances supplier responsiveness hence improving organizational performance.

A strong positive correlation was also observed between inventory flexibility and performance ($r = 0.799$, $p = 0.000 < 0.05$). This relationship suggests that firms that actively invest in inventory flexibility, are more likely to register higher levels of demand hence increasing the organizational performance. This aligns with observations by Zhu and Liu (2024) who highlighted the role of inventory flexibility in strengthening customer relationships and driving profitability.

Regression Analysis

This section displays regression analysis outcomes undertaken to examine extent to which inventory management practices predict performance among food and beverage manufacturing firms in Nairobi City County.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.909a	0.826	0.822	0.27327

a Predictors: (Constant), supplier flexibility, inventory flexibility

Source: Author (2025)

The model summary indicates that supply chain flexibilities, specifically, supplier flexibility and inventory flexibility, have a strong explanatory power on performance among food and beverage manufacturing firms in Nairobi City County. The coefficient of determination (R^2) was 0.826, advocating that 82.6% of the variation in performance can be explained by these strategic marketing capabilities. The remaining 17.4% is attributed to other factors not covered in this study.

Table 6: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	1 Regression	66.02	2	33.01	328.53	.000b
	Residual	18.89	188	0.105		
	Total	84.91	190			

a Dependent Variable: performance

b Predictors: (Constant), supplier flexibility, inventory flexibility.

Source: Author (2025)

From the ANOVA results, the model was found to be statistically significant in explaining the influence of supply chain flexibilities on performance of food and beverage manufacturing firms in Nairobi City County, with an F statistic of 328.53, which is considerably higher than the critical F value of 3.04 at a 5% significance level. The corresponding p-value of 0.000 is below the 0.05 threshold, further confirming that the model is reliable.

Table 7: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.326	0.145		2.247	0.026
	Supplier flexibility	0.285	0.051	0.293	5.631	0.002
	Inventory Flexibility	0.243	0.05	0.26	4.891	0.000

Source: Author (2025)

From the findings, the constant value ($\alpha = 0.326$) represents the level of performance when supply chain flexibility is held at zero. This implies that even without any influence from the identified practices, there is a baseline level of performance in the organizations studied. The regression coefficient for supplier flexibility was 0.285 with a p-value of 0.002 ($\beta = 0.285$, $p < 0.002$). This indicates that supplier flexibility has a positive and significant effect on performance. For every unit increase in the effectiveness of supply flexibility, performance improves by 0.285 units. This finding is consistent with the study by Jum'a and Bushnaq (2024) which found that having alternative suppliers and pricing flexibility significantly improve the efficacy of performance in firms, leading to better performance outcomes.

Similarly, the regression coefficient for inventory flexibility was 0.243 with a p-value of 0.000 ($\beta = 0.243$, $p = 0.000$). This means that inventory flexibility has a positive and significant influence on performance. A unit increase in inventory flexibility is associated with an improvement in performance by 0.243 units. This outcome aligns with the study by Durach et al. (2023) which showed significant positive link between storage flexibility, demand forecasting and contracts agility enhances organizational performance.

Conclusion

It was concluded that firms that maintain multiple alternative suppliers and can easily switch during disruptions tend to experience greater profit growth and operational efficiency. Furthermore, the ability of suppliers to adjust order quantities and respond swiftly to urgent demands correlates with consistent production timelines and enhanced service delivery. A conclusion was made that supplier willingness to negotiate prices and offer flexible pricing options contributes to cost stability, which in turn supports customer satisfaction and the expansion of revenue streams. Additionally, it was concluded that supplier flexibility enhances the overall responsiveness of firms, enabling them to meet market demands while maintaining quality and performance consistency.

It was also concluded that that inventory flexibility is positively associated with the performance of food and beverage manufacturing firms. Efficient use of storage space and systems that support quick retrieval and dispatch were found to correlate with operational efficiency and timely achievement of production targets. Furthermore, effective demand forecasting and cost-reducing inventory strategies were linked to consistent profit growth and the expansion of revenue streams. A conclusion was made that flexible supplier contracts that allow inventory adjustments lead to improved service delivery and higher customer satisfaction. Additionally, the ability to modify supply terms based on changing demand supports overall stability and enhances firm performance.

Recommendations

Manufacturing firms should go beyond basic supply chain flexibility practices and adopt advanced digital systems that enhance real-time visibility and coordination across procurement, inventory, production, and distribution. Moreover, firms should build internal capabilities for rapid product changeovers and small-batch production to accommodate changing customer demands without incurring excessive costs. Developing supplier collaboration frameworks that support flexible contract terms and shared inventory management can further improve responsiveness and reduce operational inefficiencies. Policy makers, that is, the Ministry of Industrialization, Trade and Enterprise Development should introduce supportive frameworks that encourage the adoption of flexible and resilient supply chain systems among manufacturing

firms. This could include financial incentives such as tax relief or grants for firms investing in automation, smart logistics, or predictive inventory tools.

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