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Strategic Supply Chain Practices and Performance of Maize Milling Companies in Nairobi City County, Kenya

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Abstract

Purpose: The study analyzed how strategic supply chain practices affect maize milling companies' performance in Nairobi City County, Kenya. In particular, the study focused on how strategic supplier relationship management, supply chain integration, strategic inventory management, and logistics distribution strategy affect organizational performance.

Methodology: The method used was quantitative, descriptive, and cross-sectional correlational research within a positivist paradigm. A total of 140 respondents were selected from ten large-scale maize milling companies within five functional departments, determined by proportionate stratified sampling from the directory of the Kenya Association of Manufacturers (KAM). A structured Likert-scale questionnaire with 53 items was used to collect primary data. Descriptive statistics were computed, and multiple linear regression analysis was conducted using SPSS Version 26. All test statistics required for the suitability of the data for regression analysis were calculated: normality, multicollinearity, homoscedasticity, and autocorrelation.

Findings: All four strategic supply chain practices were positively and significantly related to performance, with the four variables jointly accounting for 65.9% of the observed variation in the composite performance score ($R^2 = 0.659$, $F(4, 131) = 63.328$, $p < 0.001$). Supply chain integration was the strongest predictor ($\beta = 0.311$; $p < 0.001$), followed by strategic supplier relationship management ($\beta = 0.272$; $p = 0.001$), logistics distribution strategy ($\beta = 0.270$; $p < 0.001$), and strategic inventory management ($\beta = 0.214$; $p = 0.003$). The study found that coordinated strategic supply chain practices play a significant role in the organizational performance of maize milling companies in Nairobi City County.

Unique Contribution to Theory Practice and Policy: It recommended improved supply chain integration, supplier relationship management, logistics distribution systems, and strategic inventory management to enhance performance and competitiveness in the maize milling industry.

Key Words: *Strategic Supplier Relationship Management, Supply Chain Integration, Strategic Inventory Management, Logistics Distribution Strategy and Organizational Performance*

1. Background of the study

Organizational performance remains a critical concern for firms operating in increasingly competitive and dynamic business environments. Organizations are required to enhance profitability, operational efficiency, customer satisfaction and competitiveness while sustaining long-term growth and survival (Mwangi & Otieno, 2023). Globalization, technological advancement, changing customer expectations and intensified competition have consequently increased the importance of strategic supply chain management as a source of competitive advantage (Christopher, 2022). Supply chain management involves strategically coordinating suppliers, manufacturers, distributors, retailers and customers to create value and improve efficiency (Mangan & Lalwani, 2021). Effective strategic supply chain practices, including supplier management, supply chain integration, inventory management and logistics distribution, enable firms to improve responsiveness, flexibility and competitiveness, with studies linking effective supply chain management to improved financial, operational and customer outcomes (Xu & Zhao, 2022).

The importance of strategic supply chain practices is particularly evident in agro-processing industries, where organizational performance depends heavily on the availability, quality, cost and movement of agricultural raw materials. Agricultural supply chains are characterized by seasonality, uncertain supply and demand, fluctuating input costs, infrastructure limitations and changing market conditions (UNCTAD, 2023). These conditions require firms to establish reliable supplier relationships, share information, coordinate supply chain activities, manage inventories efficiently and maintain effective distribution systems (Falodun & Abiri, 2025). Maize milling companies are especially exposed to these challenges because maize is a major agricultural commodity and an important source of food and industrial value addition, particularly in Africa, Latin America and parts of Asia (FAO, 2023). Globally, maize millers have increasingly adopted strategic and technology-supported supply chain approaches, including supplier partnerships, ERP systems, inventory planning and coordinated logistics, to improve production efficiency, profitability and competitiveness (Salarzadeh Jenatabadi et al., 2013; Mogikoyo et al., 2023).

Evidence from different countries demonstrates the importance of these practices in maize milling and processing. In the United States, coordination among farmers, grain handlers, processors, transporters and retailers, together with effective logistics and inventory management, has supported operational efficiency and responsiveness to commodity price and market fluctuations (USDA, 2024). In India, supplier development, warehouse management and improved distribution networks have been adopted to address seasonal production, fragmented supply and transportation challenges, with better supplier coordination and inventory planning associated with improved production effectiveness (FAO, 2023). Similarly, South Africa's maize milling sector benefits from knowledge sharing and coordination across sourcing, storage, transportation, processing and distribution activities (National Chamber of Milling of South Africa, 2024). Across Africa, however, maize supply chains continue to face challenges involving production, storage, infrastructure, procurement, market access and climate

variability (Ekwe et al., 2022; Likando, 2026; Gray, 2025). These experiences indicate that strategic supply chain practices can improve organizational performance, although their effects may vary according to infrastructure, technological capacity, market conditions and institutional environments (Christopher, 2022; UNCTAD, 2023).

In Kenya, maize milling is an important component of the food-processing sector because maize is a major food commodity and maize flour is widely consumed. The industry contributes to food availability, employment and agricultural value addition (KNBS, 2024). Nairobi City County provides an important context for examining strategic supply chain practices because of its concentration of manufacturing and food-processing activities, access to major consumer markets and extensive transport and distribution networks (KNBS, 2024; KAM, 2023). Maize milling firms, including large, medium and small enterprises, depend on reliable supplies of maize, efficient production, inventory management and effective distribution. However, commercial millers have experienced fluctuations in domestic maize availability, leading to changes in local sourcing and importation decisions (Nzaka et al., 2024a). Rising input, procurement, transportation and operating costs have further increased the importance of strategic supply chain management in maintaining production continuity and profitability (KAM, 2023).

Within this context, the study conceptualizes strategic supply chain practices through four dimensions: strategic supplier relationship management, supply chain integration, strategic inventory management and logistics distribution strategy. Strategic supplier relationship management involves developing long-term relationships with suppliers through communication, collaboration, information sharing and coordinated procurement, thereby improving supply reliability and reducing sourcing risks. Supply chain integration involves coordinating internal functions such as procurement, production, inventory and marketing with external partners, including suppliers, distributors and customers. Strategic inventory management focuses on maintaining appropriate levels of raw materials and finished products while minimizing holding costs and avoiding stock-outs, whereas logistics distribution strategy concerns the efficient transportation, storage and delivery of finished products to customers. Evidence from Nairobi's flour milling sector indicates that information sharing significantly influences supply chain performance and that supplier capabilities, competition, technology and infrastructure affect milling operations (Chenangat & Chege, 2025). Collectively, these practices enable maize millers to coordinate material and information flows and respond more effectively to changes in supply and demand.

Organizational performance in this study is viewed as a multidimensional construct comprising financial, operational, market and customer performance. Financial performance is reflected through profitability and sales growth, operational performance through production efficiency and lead-time reduction, market performance through market share, and customer performance through customer satisfaction (Kipchumba & Chepkwony, 2022; Siagian & Jie, 2021; Xu & Zhao, 2022). While previous studies have examined specific aspects of maize and milling supply chains, such as maize procurement and sourcing decisions (Nzaka et al., 2024a) and

information sharing among flour milling companies (Chenangat & Chege, 2025), limited empirical evidence exists on the combined influence of strategic supplier relationship management, supply chain integration, strategic inventory management and logistics distribution strategy on the multidimensional performance of maize milling companies in Nairobi City County. This gap provides the basis for the present study, which examines how the four strategic supply chain practices influence the financial, operational, market and customer performance of maize milling companies in Nairobi City County, Kenya..

Statement of the Problem

Maize milling companies in Kenya face a measurable performance challenge associated with inadequate maize supply, procurement costs and operational constraints. Evidence from the commercial maize milling industry shows that mills produced 4,629 metric tonnes (MT) of flour per day against an installed capacity of 6,084 MT, representing approximately 76% capacity utilization during a period of maize shortage. Large-scale mills accounted for 76.2% of total daily maize-flour production, demonstrating their dominant role in the industry. The underutilization indicates a production-performance problem associated with constrained raw-material supply. More recent evidence confirms that cyclical maize shortages affect commercial millers' operations, with some firms compelled to source maize from other regions or import it at higher cost, creating difficult trade-offs between maize availability and firm income (Nzaka et al., 2024a). For firms operating in Nairobi City County, such supply and cost pressures can affect production efficiency, lead times, sales growth, profitability, market position and customer satisfaction.

Despite this performance problem, empirical evidence remains limited on how an integrated strategic supply chain approach can improve the performance of maize milling companies in Nairobi City County. Existing studies provide useful but fragmented evidence. Nzaka et al. (2024a) examined commercial millers' decisions to import or purchase locally produced maize and the implications for firm income, but did not examine the influence of the broader strategic supply chain practices adopted in this study. Chenangat and Chege (2025) examined supplier relationship management and supply chain performance among 16 flour milling companies in Nairobi County. Their study found that information sharing significantly improved supply chain performance, while supplier collaboration, supplier quality and trust-based relationship management were not statistically significant. However, the study focused on supplier relationship management rather than examining its combined effect with supply chain integration, strategic inventory management and logistics distribution strategy on organizational performance.

The gap is therefore empirical, contextual and integrative. Existing evidence does not sufficiently establish how the four strategic supply chain practices individually and collectively

influence the financial, operational, market and customer performance of large-scale maize milling companies in Nairobi City County. This study addresses this gap..

Objectives of the Study

1. To determine the influence of strategic supplier relationship management on performance of maize milling companies in Nairobi City County, Kenya.
2. To assess the influence of supply chain integration on the performance of maize milling companies in Nairobi City County, Kenya.
3. To evaluate the influence of strategic inventory management on performance of maize milling companies in Nairobi City County, Kenya.
4. To examine the influence of logistics distribution strategy on performance of maize milling companies in Nairobi City County, Kenya.

2. Literature Review

Theoretical Review

The study's major elements were based on the Resource Based View (RBV) theory that attempts to account for the variation in organizational performance from the perspective of their resources and capabilities and the manner in which they are used. The resource-based approach was formulated with the concept of the growth to the firm developed by Penrose and formalized later in R.S. Barney et al. (2021) research on RBV that focuses on the firm specific resources and capabilities as a source of competitive advantages. RBV sees performance from the inside, rather than the outside – that is, in terms of the internal resources and capabilities of firms that allows them to create value and capture it. Resources and capabilities must be valuable, scarce and hard to imitate to create a sustained competitive advantage, and also have to possess the capacity to use them properly (Barney et al., 2021).

This study proposed the RBV theory as a theoretical foundation to provide insights about the relationship between SCP and organizational performance. An understanding of strategic supply chain practices was recognized as more than day-to-day activities. By long-term cooperation, synergy and information sharing with suppliers, FSRM can help build firm-specific relational capacity. Managing the supply chain can develop a company's coordinating capability in procurement, production and inventory and distribution. By adopting strategic inventory management, the firm's ability to manage the availability and amount of raw materials can be enhanced, while embraced logistics distribution strategy can enhance the firm's capability of cooperation in raw-material transportation, raw-material warehoused, and product delivered. These capabilities have the power to make the organization perform better than the competitors which means that firms can be assisted to operate more efficiently than their competition (Barney et all., 2021). This understanding is in line with what has been observed in the Nairobi flour milling sector which showed that information sharing had a statistically significant impact on the performance of the supply chains (Chenangat and Chege, 2025).

This study, however, did not rely upon assuming that any practice in the supply chain will always be a VRIN resource: Instead, the research idea was that this effective practice accomplished over time can establish organizational capacity that can produce value and be hard to replicated, as this capacity is hopelessly enmeshed in the routines, relationships, knowledge and experience of the firm. Long-standing relationships between a maize milling company and its suppliers, for instance, might provide information and reliable long-term sourcing opportunities that other companies may struggle to obtain in the short-term. Likewise, linkages between procurement, production, inventory and distribution activities can be integrated in a firm's routines that assist in coordination between different activities and in making them operate efficiently. Indeed, an increasing number of recent RBV scholarship propose that capabilities and value creation should be emphasized, as well as firms' ability to bundle and leverage resources even when individual resources are described within the framework (of RBV) (Barney et al., 2021).

The study also indicated the lack of effectiveness of the RBV explanation of organisational performance. RBV still struggles with issues regarding resource immobility, where firms get value added, and the resources' ability to adjust to the varying competitive marketplaces (Barney et al., 2021). These constraints are especially relevant to the Kenyan maize milling sector, which is set in an environment of dynamic but volatile and uncertain maize supply that includes logistical constraints and changing consumer demand. The study was therefore grounded in other theoretical frameworks that explain certain aspects of strategic SCP in conjunction with RBV.

The Relational View was used to elucidate strategic supplier relationship management, that is, the sharing of resources, knowledge and/ or joint ability enhancement of firms and their suppliers. By approaching the organizational outcomes as a result of interdependency and coordination among organizational components, it made System Theory a good tool to understand how to integrate the different functions of the supply chain. The development of strategic inventory management was driven by Lean Theory, and particularly in the joint effort of reducing waste and removing material flow barriers. Logistics distribution strategy was used to analyze logistics coordination, responsibilities and alignment between firms and their external logistics partners, based upon Agency Theory. In addition to RBV these theories provided complementary relational, systemic perspectives, efficiency and governance outlooks on how these four strategic SC practices affect organizational performance.

The overall theoretical framework of the research was grounded in RBV with additional theories from Relay-View, Systems Theory, Lean Theory and Agency Theory related to the 4 Strategic Supply Chain Practices. The framework integrated strategic supplier relationship management, supply chain integration, strategic inventory management and logistics distribution strategy in the discussion on organizational performance of the maize milling firms in Nairobi City County.

Conceptual Framework

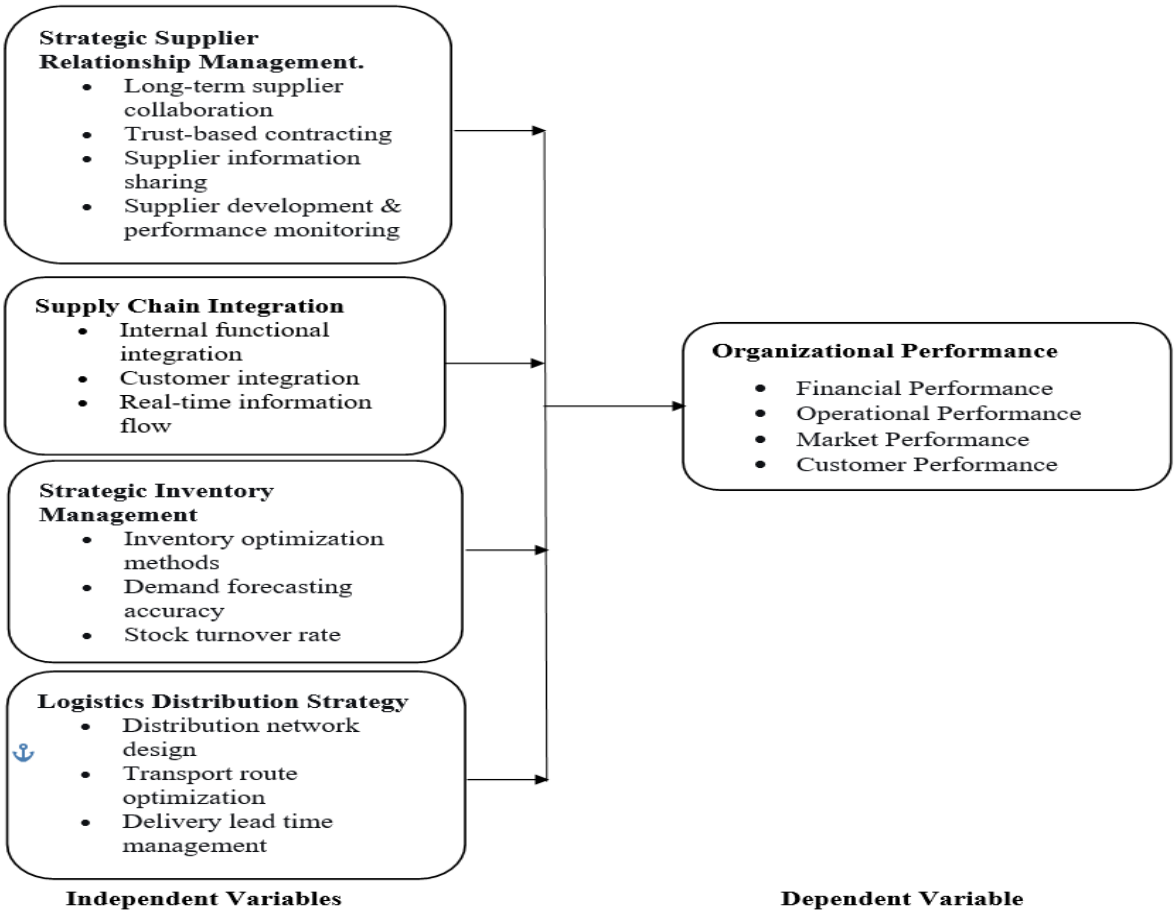

Figure 1: Conceptual Framework

3. Research Methodology

The study adopted a quantitative, descriptive-correlational and cross-sectional research design within a positivist research paradigm. The study targeted registered large-scale maize milling companies operating in Nairobi City County. The sampling frame was derived from the Kenya Association of Manufacturers (KAM) 2025 Directory, which identified 10 registered large-scale maize milling companies within the study area. The study focused on 200 employees occupying functional and managerial positions directly related to the strategic supply chain practices and operational performance examined who comprised Supply Chain, Operations, Procurement, Logistics and Distribution, and Warehouse and Inventory Management. The minimum sample size of 134 respondents was determined using Yamane's (1967) formula. Proportionate stratified sampling approach was utilized in distributing the sample. The primary research instrument was a structured 53-item Likert-scale questionnaire. A secondary data collection sheet was used alongside the questionnaire to obtain available financial information from participating firms. Data were coded, entered, cleaned and analyzed using SPSS Version 26. Data cleaning involved checking for completeness, inconsistencies and outlying responses before inferential analysis.

Descriptive statistics, including frequencies, percentages, means and standard deviations, were used to summarize respondent characteristics and the distribution of responses across the study constructs. Pearson's product-moment correlation coefficient was used to establish the direction and strength of linear relationships between each strategic supply chain practice and organisational performance and among the study constructs generally. Multiple linear regression was then employed to determine the individual and combined influence of strategic supplier relationship management, supply chain integration, strategic inventory management and logistics distribution strategy on organisational performance. Statistical significance was assessed at the 5% level of significance ($\alpha = 0.05$). The analysis reported the regression coefficients, coefficient of determination (R^2), adjusted (R^2), F-statistic and associated significance levels.

4. Results

Response Rate

This study used descriptive survey design and targeted 140 maize milling companies in registered large scale maize milling companies in Nairobi City County with respondents from five departments namely supply chain, operations, procurement, logistics/Distribution, and warehouse/Inventory Management. All 140 questionnaires that were distributed were returned. Of these, 4 (2.9%) were excluded due to item non-response which exceeded 20% on either the demographic scale items or the substantive scale items, so 136 cases were usable and available for analysis (97.1%).

Descriptive Statistics

Composite variable scores were computed by averaging item scores within each scale, with values ranging from 1.00 (Strongly Disagree) to 5.00 (Strongly Agree). Composite means were interpreted against the stated Likert bands: 1.00–1.79 Strongly Disagree, 1.80–2.59 Disagree, 2.60–3.39 Neutral, 3.40–4.19 Agree, and 4.20–5.00 Strongly Agree. Tables 1(a) through 1(e) present the mean and standard deviation for each sub-dimension and composite construct.

Strategic Supplier Relationship Management

Strategic Supplier Relationship Management was adopted to a moderate-to-high degree (composite mean = 3.74, SD = 0.52). Long-term supplier collaboration recorded the highest sub-dimension score (mean = 3.82), suggesting that milling firms had made real progress in cultivating durable supplier ties. Supplier information sharing recorded the lowest score of the four sub-dimensions (mean = 3.68), which pointed to a comparative gap in the routine exchange of operational and demand information with suppliers, an area that firms could strengthen without needing to renegotiate the underlying supplier relationships themselves.

Table 1 (a): Descriptive Statistics for Strategic Supplier Relationship Management

Variable / Sub-dimension	Mean	SD
Long-term supplier collaboration	3.82	0.54
Trust-based contracting	3.75	0.58
Supplier information sharing	3.68	0.61
Supplier development and performance monitoring	3.71	0.59
Composite: Strategic Supplier Relationship Management	3.74	0.52

Supply Chain Integration

Supply Chain Integration recorded the highest composite mean of all four independent constructs (mean = 3.75, SD = 0.48). Internal functional integration was the best-developed sub-dimension (mean = 3.88), indicating that coordination across procurement, production and distribution functions within firms was already fairly advanced. Real-time information flow was the weakest sub-dimension (mean = 3.65), which suggested that the technological and process infrastructure needed to move information instantly between functions had not kept pace with the internal coordination it was meant to support.

Table 1(b): Descriptive Statistics for Supply Chain Integration

Variable / Sub-dimension	Mean	SD
Internal functional integration	3.88	0.49
Customer integration	3.72	0.53
Real-time information flow	3.65	0.58
Composite: Supply Chain Integration	3.75	0.48

Strategic Inventory Management

Strategic Inventory Management recorded the lowest composite mean among the four independent constructs (mean = 3.59, SD = 0.56). Demand forecasting accuracy was both the

weakest sub-dimension within this construct and the weakest sub-dimension recorded anywhere in the study (mean = 3.52), while stock turnover rate management was comparatively stronger (mean = 3.64). The gap between these two sub-dimensions indicated that firms managed the inventory they already held more effectively than they predicted what inventory they would need.

Table 1(c): Descriptive Statistics for Strategic Inventory Management

Variable / Sub-dimension	Mean	SD
Inventory optimization methods	3.61	0.62
Demand forecasting accuracy	3.52	0.66
Stock turnover rate management	3.64	0.59
Composite: Strategic Inventory Management	3.59	0.56

Logistics Distribution Strategy

Logistics Distribution Strategy recorded a composite mean of 3.73 (SD = 0.49). Distribution network design was the best-developed sub-dimension (mean = 3.79), while transport route optimization trailed slightly (mean = 3.68). This gap suggested that firms had generally settled on sound distribution structures but had not yet fully optimized the routing decisions that operate within them, a distinction with practical implications for cost and delivery reliability.

Table 1 (d): Descriptive Statistics for Logistics Distribution Strategy

Variable / Sub-dimension	Mean	SD
Distribution network design	3.79	0.51
Transport route optimization	3.68	0.57
Delivery lead-time management	3.73	0.54
Composite: Logistics Distribution Strategy	3.73	0.49

Performance

Overall composite Performance was rated favorably (mean = 3.72, SD = 0.46). Operational performance achieved the highest rating among the four dimensions (mean = 3.81), consistent with the comparatively strong internal integration reported in Table 1(b). Market performance recorded the lowest relative mean (mean = 3.62), which, when read alongside the weaker transport route optimization and demand forecasting scores reported above, pointed to distribution and inventory planning as the more likely constraints on firms' external market outcomes than on their internal operations.

Table 1(e): Descriptive Statistics for Performance

Performance Dimension	Mean	SD
Financial performance (sales growth, profitability)	3.68	0.58
Operational performance (lead time, efficiency)	3.81	0.50
Market performance (market share growth)	3.62	0.61
Customer performance (satisfaction, reduced returns)	3.76	0.53
Overall composite Performance	3.72	0.46

Strategic Supplier Relationship Management fell within the "Agree" band (composite mean = 3.74, SD = 0.52). Long-term supplier collaboration recorded the highest sub-dimension score (mean = 3.82), indicating that milling firms have made progress in cultivating durable supplier ties. Supplier information sharing recorded the lowest sub-dimension score (mean = 3.68), pointing to a comparative gap in the routine exchange of operational and demand information with suppliers. Supply Chain Integration recorded the highest composite mean among the four independent constructs (mean = 3.75, SD = 0.48), also within the "Agree" band. Internal functional integration was the best-developed sub-dimension (mean = 3.88). Real-time information flow was the weakest sub-dimension (mean = 3.65), indicating that the technological and process infrastructure needed to move information between functions has not kept pace with internal coordination.

Strategic Inventory Management recorded the lowest composite mean among the four independent constructs (mean = 3.59, SD = 0.56), within the "Agree" band but closer to its lower boundary. Demand forecasting accuracy was the weakest sub-dimension recorded anywhere in the study (mean = 3.52), while stock turnover rate management was comparatively stronger

(mean = 3.64). Logistics Distribution Strategy recorded a composite mean of 3.73 (SD = 0.49). Distribution network design was the best-developed sub-dimension (mean = 3.79), while transport route optimization trailed slightly (mean = 3.68), suggesting firms have generally settled on sound distribution structures without yet fully optimizing the routing decisions within them. Overall composite Performance was rated favorably (mean = 3.72, SD = 0.46). Operational performance recorded the highest mean among the four performance dimensions (mean = 3.81). Market performance recorded the lowest relative mean (mean = 3.62).

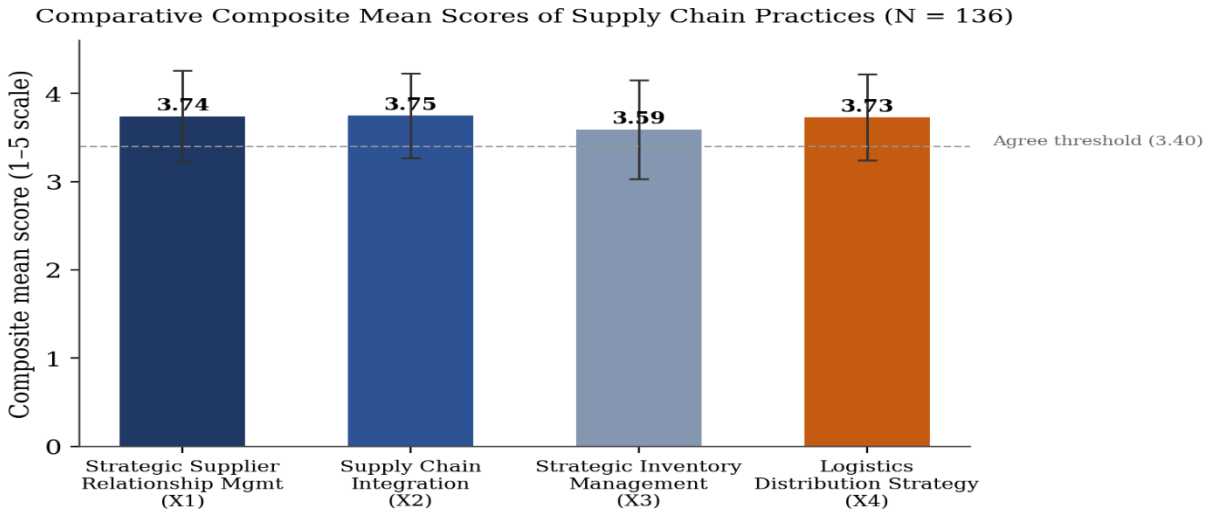

Figure 2: Comparative Composite Mean Scores of Supply Chain Practices

Overall, the five tables show that Nairobi City County's large-scale maize milling companies have adopted the four strategic supply chain practices to varying degrees, with composite means ranging from 3.59 to 3.75. Supply Chain Integration and Strategic Supplier Relationship Management recorded the highest levels of adoption, while Strategic Inventory Management recorded the lowest, driven primarily by the comparatively weak demand forecasting sub-dimension.

Correlation Between Independent Variables and Performance

The 4 independent variables were significantly and positively correlated with Performance with strong positive correlation ($p<0.001$). The strongest association was with Supply Chain Integration ($r = 0.721$), followed by Logistics Distribution Strategy ($r = 0.692$), Strategic Supplier Relationship Management ($r = 0.684$) and Strategic Inventory Management ($r = 0.635$). Correlations for all four practices were much lower between the highest and lowest showing that there was considerable association between all four practices and performance, with the highest association being that between integration and performance.

Multiple Linear Regression Analysis

A four-star multiple linear regression model was estimated to verify the contribution of the four strategic supply chain practices by analyzing different combinations of the variables, such as multiple, single, and zero combinations.

Model Summary

Table 2: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.812	0.659	0.649	0.272

The multiple correlation coefficient (R = 0.812) indicated a strong overall relationship between the combined predictors and Performance. The coefficient of determination ($R^2 = 0.659$) showed that the four strategic supply chain practices jointly explained 65.9% of the variance in Performance among the sampled milling firms.

Analysis of Variance (ANOVA)

ANOVA was used to test the overall statistical significance of the regression model.

Table 3: ANOVA Results

Source	Sum of Squares	df	Mean Square	F	p
Regression	18.734	4	4.684	63.328	0.000
Residual	9.690	131	0.074		
Total	28.424	135			

Note. Predictors: (Constant), X1, X2, X3, X4; Dependent Variable: Y.

The F-statistic, $F(4, 131) = 63.328$, $p < 0.001$, confirmed that the regression model was statistically significant and provided a reliable fit to the data.

Regression Coefficients

Table 4 presents the unstandardized coefficients (B), standard errors, standardised coefficients (β), t-statistics and p-values for each predictor, ranked from the strongest to the weakest standardised effect.

Table 4: Regression Coefficients, Ranked by Standardised Beta

Predictor	B	SE	β	t	p
Supply Chain Integration (X2)	0.298	0.072	0.311	4.139	0.000
Strategic Supplier Relationship Mgmt (X1)	0.241	0.068	0.272	3.544	0.001
Logistics Distribution Strategy (X4)	0.253	0.066	0.270	3.833	0.000
Strategic Inventory Management (X3)	0.176	0.058	0.214	3.034	0.003
(Constant)	0.418	0.185		2.259	0.026

All 4 independent variables had a positive effect that were statistically significant ($p < 0.05$) on the Performance. The relationships observed in this study were ordered by their relative predicting power, ranging from their highest beta value in bold to their lowest in normal. Supply Chain Integration was the strongest relative predictor (with a β of 0.311), followed by Strategic Supplier Relationship Management (with a β of 0.272), Logistics Distribution Strategy (with a β of 0.270), and Strategic Inventory Management (with a β of 0.214). The almost identical beta weight for both Strategic Supplier Relationship Management and Logistics Distribution Strategy did not reveal a clear difference in the practical effect of a unit increase in the variables, even though the unstandardized coefficient for Logistics Distribution Strategy was slightly higher (B = 0.253 compared to a B = 0.241).

Regression Equation and Practical Implications

Using the unstandardized coefficients in Table 4, the estimated regression equation was:

OP = 0.418 + 0.241(SSRM) + 0.298(SCI) + 0.176(SIM) + 0.253(LDS)

where OP denotes the composite Performance score; SSRM, Strategic Supplier Relationship Management; SCI, Supply Chain Integration; SIM, Strategic Inventory Management; and LDS, Logistics Distribution Strategy. The greatest unstandardized contribution was Supply Chain Integration, which had a small-to-medium positive effect on Performance (0.298) when considering the other three practices. The next was Logistics Distribution Strategy (B = 0.253), after which Strategic Supplier Relationship Management (B = 0.241) and Strategic Inventory Management (B = 0.176) came.

For the large-scale maize milling business managers, there were three practical implications emanating from these results. The first consideration was the investment priority, e.g., whether real-time information systems linking procurement, production and distribution would be the highest or the lowest return on performance based on the values of the standardised beta and the unstandardized coefficient, and the fact that the milling sector is frequently beset by financial constraints. Second, the moderate-to-strong intercorrelation between the four practices (r = 0.582 to 0.658) suggested that the companies rarely applied these practices separately; thereby, any gains in the practices of supplier relationship management and inventory control were better viewed as complementary to the practice of integration than as a substitution of it. Second, since all four practices were independently statistically significant predictors, no single practice alone was an abatement. The firms that implemented advanced supplier relationships, integration, inventory management and the distribution strategy would be more likely to experience performance gains than those that invested in one of these practices alone.

Performance Dimension Sub-Analysis

To explore the effect of each strategic SCP on a different outcome of the organisation, four separate regression models were created with the same four independent variables and a different dependent variable for each in the form of a performance dimension (financial, operational, market and customer performance). Table 5 shows the standardised coefficient for each model.

Table 5: Standardised Regression Coefficients by Performance Dimension

Predictor	Financial	Operational	Market	Customer
Supply Chain Integration	0.291***	0.345***	0.262***	0.281***
Strategic Supplier Relationship Mgmt	0.285***	0.210**	0.224**	0.268***
Logistics Distribution Strategy	0.242***	0.225**	0.312***	0.295***
Strategic Inventory Management	0.198**	0.282***	0.185**	0.162*
Model R^2	0.582	0.628	0.541	0.596
Adjusted R^2	0.569	0.617	0.527	0.584
F	45.68***	55.39***	38.64***	48.37***

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Financial Performance

The financial performance model explained 58.2% of the variance ($R^2 = 0.582$, Adjusted $R^2 = 0.569$, $F(4, 131) = 45.68$, $p < 0.001$). Supply Chain Integration ($\beta = 0.291$) and Strategic Supplier Relationship Management ($\beta = 0.285$) were the top two predictors, and the close proximity of their weights indicated that the financial benefits from the chain integration happened through two largely parallel pathways: operational efficiency arising from the tighter internal integration, and continuity of supply, volume discounts, and reduced transaction costs due to improved supplier relationships. Logistics Distribution Strategy ($\beta = 0.242$) and Strategic Inventory Management ($\beta = 0.198$) also made significant contributions, although the financial impacts of these were not as large.

Operational Performance

The model explaining the variance on the four dimensions most is the operational performance model ($R^2 = 0.628$, Adjusted $R^2 = 0.617$, $F(4, 131) = 55.39$, $p < 0.001$). The dominating predictor was Supply Chain Integration ($\beta = 0.345$) which equally conformed to the direct relationship of SC internal coordination to production efficiency and shorter lead time. The second strongest indicator here ($\beta = 0.282$) was the Strategic Inventory Management, pointing to the fact that, in four dimensions, the forecast accuracy of demand and the handling of stock were the indicators that best translated directly into the availability of raw materials and the continuity of production, as opposed to external and market-facing indicators. Logistics Distribution Strategy and Strategic Supplier Relationship Management were tied for 2nd place, with a β value of 0.225.

Market Performance

The market performance model explained 54.1% of the variance ($R^2 = 0.541$, Adjusted $R^2 = 0.527$, $F(4, 131) = 38.64$, $p < 0.001$). The coefficient of all the predictors was high and also distribution strategy (in terms of logistics distribution) was emphasized as the direct factor that affects competitiveness across the four dimensions (especially for its coefficient ($\beta = 0.312$)). The next in the series were Supply Chain Integration ($\beta = 0.262$), Strategic Supplier Relationship Management ($\beta = 0.224$) and Strategic Inventory Management ($\beta = 0.185$).

Customer Performance

The customer performance model explained 59.6% of the variance ($R^2 = 0.596$, Adjusted $R^2 = 0.584$, $F(4, 131) = 48.37$, $p < 0.001$). Logistics Distribution Strategy was again the strongest predictor ($\beta = 0.295$) as it concerned customers and their experiences of distribution corresponding to the milling firm through product availability, delivery timeliness and product condition on arrival. Internal Coordination was second, closely followed by Supply Chain Integration ($\beta = 0.281$), suggesting that internal coordination had a negative indirect impact on customer satisfaction, mediated through order accuracy and responsive service. Strategic Supplier Relationship Management ($\beta = 0.268$) influenced customers' outcome of satisfaction through continuity of supply and consistency of quality, but not directly, while Strategic

Inventory Management (β = 0.162) was the least significant supplier on customers' satisfaction, which implied that this had a greater indirect effect mediated by distribution and integration.

Cross-Dimensional Synthesis

Effect differentials could be seen in the disaggregated analysis. Only Supply Chain Integration was ranked in the top two predictors across all performance dimensions, reinforcing its place as the one most likely to influence the performance model. Logistics Distribution Strategy had the strongest influence on the two externally oriented dimensions market and customer performance while Strategic Inventory Management had its strongest influence on operational performance. The biggest impact on financial performance was made by Strategic Supplier Relationship Management. The pattern showed that the different possibilities of the supply chain were related to various types of outcomes of the Performance, confirming the multidimensional approach to performance used for this study.

Summary of Findings

Strategic Supplier Relationship Management Approach.

Strategic Supplier Relationship Management had a positive impact on the Performance with statistically significant (β = 0.272, t = 3.544, p = 0.001; bivariate r = 0.684, p < 0.001). Long-term supplier collaboration was its highest sub-dimension (mean 3.82) and shared information with suppliers and quart lowest (mean 3.68), indicating potential for improvement in this particular dimension. The discovery was consistent with the idea of the Relational View of inter-firm collaboration where relational rents leading to performance gains are found.

Supply Chain Integration

Supply Chain Integration had the largest statistically significant effects on Performance (β = 0.311, t = 4.139, p < 0.001; bivariate r = 0.721, p < 0.001) of the four CII practices examined. The sub-dimension of internal functional integration was most well-developed, with the sub-dimension of real-time information flow trailing (mean = 3.65). This is because, consistent with the emphasis in Systems Theory on the interdependent, coordinated processes that lead to beneficial performance, only the practice of integration ranked among the top two predictors on all four dimensions of performance.

Strategic Inventory Management

The latter was the least of the four practices and Strategic Inventory Management had positive, statistically significant but relatively weak effects on Performance (β = 0.214, t = 3.034, p = 0.003; bivariate r = 0.635, p < 0.001). The sub-dimension with the highest mean was Stock turnover rate management (3.64) while the weakest sub-dimension was Demand forecasting accuracy (3.52) across the entire study. Also, the finding confirmed the Lean Theory focus that waste can be eliminated by accurately planning for demand and identified forecasting as the most direct way to enhance the contribution of the practice to performance whilst practicing Lean.

Logistics Distribution Strategy

Logistics Distribution Strategy did have a positive, statistically significant effect on the Performance ($\beta = 0.270$, $t = 3.833$, $p < 0.001$; bivariate $r = 0.692$, $p < 0.001$). Its top sub-dimension was distribution network design (mean = 3.79) and its relatively lower sub-dimension was transport route optimization (mean = 3.68). As Agency Theory tends to focus on the mechanisms by which firms offload some of their duties to outside parties like customers and markets, the practice of the business recorded the highest influence of all predictors for market performance ($\beta = 0.312$) and customer performance ($\beta = 0.295$).

Overall Model Performance

The four strategic supply chain practices jointly accounted for 65.9% of the variance in Performance ($R^2 = 0.659$, Adjusted $R^2 = 0.649$, $F(4, 131) = 63.328$, $p < 0.001$). Supply Chain Integration ($\beta = 0.311$), followed by close Strategic Supplier Relationship Management ($\beta = 0.272$) and Logistics Distribution Strategy ($\beta = 0.270$), and then far behind Strategic Inventory Management ($\beta = 0.214$) led the rest. Since all four practices were found to have statistical significance the contribution of each practice was independent and as such all four practices were deemed to be treated as interconnected resources contributing to performance, which in its totality met the VRIN requirements of the VRIN model: valuable, rare, inimitable and non-substitutable, for a source of competitive advantage.

5. Conclusions and Recommendations

Conclusion

Strategic Supplier Relationship Management

Strategic supplier relationship management significantly influenced organisational performance. The finding indicates that maize milling firms benefit from maintaining long-term supplier relationships, trust, information sharing, supplier development and regular supplier monitoring. These practices can improve access to reliable maize supplies, reduce supply disruptions and strengthen procurement coordination, making supplier relationships a strategic resource rather than simply a purchasing arrangement.

Supply Chain Integration is the Most Influential Practice

Supply chain integration was the strongest predictor of organisational performance among the four practices. This suggests that effective coordination between internal departments, suppliers and customers, supported by timely information sharing, enables milling firms to coordinate procurement, production, inventory and distribution more effectively. The particularly strong effect of internal functional integration indicates that better coordination within the firm is central to translating supply chain capabilities into improved performance.

5.2.3 Strategic Inventory Management Matters Most Operationally

Strategic inventory management had the smallest overall standardised effect among the four practices, although its influence remained statistically significant. Its relatively stronger

relationship with operational performance suggests that effective inventory control contributes mainly to production continuity, stock availability and reduced operational delays. The weaker performance of demand forecasting compared with other inventory dimensions also indicates an area where milling firms could improve their ability to align stock levels with changing demand.

Logistics Distribution Strategy Influences Market and Customer Outcomes

Logistics distribution strategy significantly influenced organisational performance, particularly market and customer performance. This suggests that efficient distribution networks, transport-route optimisation and shorter delivery lead times help firms maintain product availability and respond more reliably to customers. In the competitive maize-flour market, effective distribution therefore contributes not only to operational efficiency but also to customer satisfaction and market retention.

Strategic Supply Chain Practices as Organisational Resources

The four strategic supply chain practices jointly explained 65.9% of the observed variation in organisational performance ($R^2 = 0.659$). This indicates substantial explanatory power and demonstrates that supply chain capabilities collectively matter for performance. The practices were also positively inter-correlated ($r = 0.582–0.658$), but the correlations remained below the level normally associated with serious multicollinearity. The findings therefore suggest that the practices are related but distinct capabilities that can operate together, rather than evidence that they are interchangeable.

Recommendations

Based on the findings and conclusions above, the study made the following recommendations for managerial practice and policy.

Increase supply chain integration. Effective Supply Chain Integration was the most important factor so investment needs in large scale maize businesses should focus on functional integration of the system of procurement, production and distribution. In particular, customer facing integration and the flow of information over real-time were sub-dimensions with relatively low adoption rates and may be an area of focus for improvement.

Enhance Demand Forecasting skills. The least effective sub-dimension was the one on demand forecasting accuracy, which was observed throughout the study. Focus on Forecasting should be a critical area for firms to develop their forecasting systems and their staff's ability in this area as it is the most direct way to improve the overall contribution of inventory management to performance.

Formalize supplier relationships. Strategic supplier relationship management has a positive impact on performance and firms should formalize their programmes for supplier development and develop an arm's length relationship with their suppliers which should be a structured and long-term partnership.

Optimize distribution networks. Transport routing, being the sub-dimension of distribution that offered firms the most opportunity for improvement, would also allow firms to improve market share and bolster customer satisfaction, as most of them already performed well on other aspects of the market and customer.

Take an integrative strategy as opposed to a broken down one. Since the four practices complemented and together accounted for a substantial portion of the variation in performance, the HR departments should not take isolated decisions about investment in their respective practices in the supply chain. Bookkeeping activities are very essential for conducting business activities and this is the reason why the firms must manage their supplier relations, integration, inventory management and distribution activities in the context of a single unified supply chain strategy.

Policy recommendation. The sector actors and policy makers in agro-processing industry and milling, in particular, should consider capacity building programme for agro-processing industry in Kenya on demand forecasting and supplier development, that will be sector specific. The results revealed that the two capacities were significant to competitiveness and consequently to the contribution of food security in the sector.

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