
EFFECT OF LEAN STOCK PRACTICE ON SUPPLY CHAIN LEVERAGE OF SUGAR MANUFACTURING FIRMS IN KENYA

***¹Antony Okoth Oloo, ²Dr. Anthony Osoro & ³Dr. Peter Mwangi**

**¹Student, School of Business and Entrepreneurship Jomo Kenyatta University of
Agriculture and Technology, Kenya**

**²Lecturer, School of Business and Entrepreneurship Jomo Kenyatta University of
Agriculture and Technology, Kenya**

³Lecturer, School of Business and Economics University of Embu, Kenya

***Email of corresponding author: mahepitonnyx@gmail.com**

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ABSTRACT

Purpose of the Study: This research study assessed the effect of Lean stock practices on the supply chain leverage of sugar manufacturing firms in Kenya.

Statement of the Problem: Existing evidence from other contexts indicates that Lean stock practices significantly and positively influence sustainable performance in state corporate firms. However, most public sugar manufacturing firms in Kenya are facing supply chain leverage challenges, with over 70% of these firms on the verge of collapse, and an additional 10% have completely shut down. This raises the question of whether Lean stock practices, as an aspect of inventory control mechanisms, could be the missing link undermining the supply chain leverage of sugar manufacturing firms in Kenya; a phenomenon this study aims to investigate.

Methodology: A census survey was conducted on all 15 sugar manufacturing firms in Kenya, forming the unit of analysis. A sample size of 241 respondents, consisting of procurement officers, finance officers, production managers, and senior managers, was randomly obtained from the sugar manufacturing firms. Convenience sampling was then used to select officers and managers from these firms. Structured and semi-structured research questionnaires were used to collect

primary data from the respondents, with questionnaires dropped and picked up later to improve the response rate. The qualitative and quantitative data collected was analyzed using descriptive statistics in SPSS version 26. Inferential analysis was further conducted through correlation analysis, regression analysis, and hypothesis testing. The results were presented using tables, graphs, charts, and histograms.

Results: The study's findings show that Lean stock practices had a statistically significant positive effect on the supply chain leverage of sugar manufacturing firms in Kenya ($R = .779$, $R^2 = .607$, $\beta_3 = .326$, $p = .000$).

Conclusion and Recommendations: The study concluded that Lean stock practices contribute to the supply chain leverage of sugar firms in Kenya. Furthermore, the elimination of waste in production leads to cost control. Thus, it can be generally concluded that Lean stock practice is a significant positive predictor of supply chain leverage in Kenyan sugar manufacturing firms

Keywords: *Lean Stock Practice, Supply Chain, Leverage, Sugar Manufacturing Firms, Kenya*

INTRODUCTION

Supply chain leverage involves delivering the right product to the right person at the right time while maximizing profits (Waswa, Mukras & Oima, 2018). Today, the coordination of activities across the supply chain offers many opportunities. This is largely due to the introduction of inventory information systems, especially in the struggling sugar industry in Kenya. The scope of lean stock pertains to the management of stock in firms, involving replenishment, waste elimination, inventory carrying cost reduction, asset management, forecasting, inventory valuation or visibility, and inventory movement (Kunyiha, 2019). According to Barasaa and Makenzie (2021), the goal of lean stocks is to keep stocks at the lowest possible cost while eliminating stock-related wastes, and to assure continuous supplies for ongoing operations. When making decisions on inventory, management must find a compromise among the different cost components, such as inventory supply costs, inventory-holding costs, and costs resulting from insufficient inventories. This needs to be done while taking into account demand forecast information and lean systems.

Global firms face cutthroat competition in a bid to stay afloat and maintain market share (Block, 2018). This competition has been triggered by the need to achieve competitive advantage and economies of scale, especially in production throughout their supply chains, without exception for

lean inventory control related criteria. Over the last four decades, lean inventories in organizations, which result in reduced inventory and waste elimination, have become many Japanese firms' cost reduction agenda. This has led to the emergence of concepts like lean manufacturing and lean stocks (Griver & Dresner, 2020). Studies conducted in Japan assert that lean stocks aim at keeping inventories low, eliminating waste in production, and ensuring that customers get products whenever they demand them. Research reveals that lean strategies and techniques implemented by manufacturing firms in Korea have ensured uninterrupted operations in most firms (Srivastav & Agrawal, 2018). These measures also enhance their financial reporting systems, efficiency and effectiveness of operations, and adherence to prescribed rules and regulations (Saeed et al., 2019).

Finished goods, one of the most important materials forming inventory for trading in companies to meet customer demands, should be lean at all times to increase customer satisfaction (Kempa, 2021). These materials must be managed efficiently and effectively to lower waste in production systems (Wegner & Lindemann, 2018). According to Wiryawan (2019), companies must focus on value-adding activities such as production and procurement in order to increase their competitiveness. Lean inventory management is one of the most important activities in this regard. Failure in proper inventory management can cause production delays, unsatisfied customers, or working capital curtailment (Lacioni & Howard, 2019). Lean inventory refers to all attempts to eliminate waste in the goods or materials used by a firm for production and sale. Almost 60% of operational cash is allocated for inventory in any project (Hennink, Hutter & Bailey, 2020).

Therefore, good inventory management is compulsory to maintain materials at optimal costs. Companies need to implement better internal controls in their operations, for example, by establishing an inventory policy, building employee capacity, preparing planning, and so forth to increase inventory cost efficiency, especially in the manufacturing sector like sugar industries in the European Union market (Galovic & Bezic, 2019). Many decisions must be made to improve inventory management on firm profitability, to provide a direction and strategy for competitiveness and productivity. For example, Prempeh (2018) postulated a significant positive relationship between lean stock management and profitability. Studies by Eldin and Ragab (2019) supported this direct relationship between lean inventory management and profitability. Conversely, according to Opoku et al. (2020), a negative relationship exists between lean inventory management and firm profitability.

Semu and Ermias (2018) found that African organizations have historically ignored potential savings from lean inventory management, treating inventory as a necessary evil rather than as an asset requiring management. Many inventory systems are based on arbitrary rules, leading some organizations to have more funds invested in inventory than necessary, yet failing to meet customers' demand due to poor distribution of investment and inventory items (Manyuat et al., 2021). According to Jobira et al. (2022), lean inventory control practice involves activities to ensure that customers get required goods or services when needed or demanded, with limited waste in the system. In assessing inventory management practices in Ethiopia, Kebede (2020) asserts that lean inventories are vital for organizational progress. The cost of holding inventory, product proliferation, and the risk of obsolescence, especially in dynamic markets, often increase the expense of holding large inventories of finished goods. For Busola (2020), problems occur when inventory is not tracked correctly. In fact, non-lean stocks lead to wastefulness and extra costs; supplies get lost, shrinkage can move unchecked, stock-outs happen, and sometimes the inventory can balloon unnecessarily (Abdikni et al., 2018). Inventory forms a vital component of the production process since it links production to marketing and consumption to customer demand.

A study conducted by Iyengar and Bharathi (2018) found that firms adopting lean inventory systems improved their earnings per share. Lean inventories as a manufacturing strategy aim at creating a stockless firm or limiting stock to eliminate waste. As a result of inventory turnover improvement, firms become leveraged. However, many previous studies on inventory management have assumed that firms are standalone systems. Kiong'ora, Ngacho, and Otuya (2021) posited that standalone organizations do not interact with other organizations in the entire network of the supply chain, making proper inventory practices vital. Consequently, this study aimed at assessing the effect of lean stock practice on the supply chain leverage of sugar manufacturing firms in Kenya.

STATEMENT OF THE PROBLEM

Sugar manufacturing firms in Kenya have suffered massive losses; some have struggled to stay afloat, while others have completely collapsed (Onyango, Wanjare & Egessa 2022). According to previous sugar sector reports and studies by the Kenya Sugar Board (KSB) through the Agriculture and Food Authority (AFA), the primary issues include corporate leadership challenges and little or no concern for cost control in inventory management (Jabuya, 2018). These leadership

challenges are particularly prevalent in the acquisition of raw materials, work in progress, outputs, and distribution of finished products, which are vital areas of lean inventory practices in a firm's supply chain. Other challenges arise from productivity, competition, and weaknesses in the operating legislative framework and policies adopted (Shiamwama, Otieno & Museve 2022).

As per the findings of Kiongora, Ngacho, and Otuya (2021), the sugar industry in Kenya directly or indirectly supports over 6 million people, representing 16% of the entire population. It also contributes about 7.5% to the country's GDP (Ndi, 2019). Therefore, the supply chain leverage of these firms warrants investigation if shareholders' and investors' benefits and profits are to be realized (Nardo et al., 2020). Most public sugar manufacturing firms in Kenya are experiencing supply chain leverage challenges, with over 70% of these firms on the verge of collapsing and another 10% completely shut down (Waswa et al., 2018). This situation prompts the question of whether lean inventory practices, as an aspect of inventory control strategies in manufacturing, is the missing link bedeviling the supply chain leverage of sugar manufacturing firms in Kenya. This study aimed to investigate this phenomenon. Existing evidence in other contexts shows that lean inventory management is a significant aspect of inventory control that positively and significantly influences sustainable performance in state corporate firms (Njoki, Shale & Osoro, 2022).

Other studies by Namusonge, Mukulu, and Kirima (2018) postulated that lean inventory practices, through the application of waste-less inventory management systems, were found to positively impact the financial stability of hotels in the hospitality industry in Kenya. However, limited research studies exist on the relationship between lean stock practices and supply chain leverage of sugar manufacturing firms in Kenya. It is against this backdrop that this study aimed to assess the influence of lean stock practice on the supply chain leverage of sugar manufacturing firms in Kenya.

RESEARCH OBJECTIVE

To assess the effect of lean stock practice on supply chain leverage of sugar manufacturing firms in Kenya.

RESEARCH HYPOTHESIS

Lean stock practice has no significant effect on supply chain leverage of sugar manufacturing firms in Kenya

THEORETICAL REVIEW

The study was anchored on Stock diffusion theory and Theory of Constraints. These theories are explained as follows;

Stock Diffusion Theory

Stock diffusion theory gives a dynamic approach to inventory management used for non-stationary items with non-constant means and variance. According to stock diffusion theory, stock consumption is modeled as a Markov process with a slow diffusion term. Fokker Planck equation issued to derive the probability distribution of stock consumption and re order time. Management of the inventory distributed in this manner enables the firm or an organization to keep safety stock at minimum levels (Masudin *et.al*, 2018). On the other hand, it ensures that inventory costs are kept at minimum optimal levels without interrupting or halting the internal operations of the organization (Wamoto, Kwasira & Ndolo, 2022).

When fluctuations occur in supply market, the outcome is directly experienced by the product buyers and users at the end of the supply chain (Mekashaw, 2021). ‘Stock diffusion concept can also be applied in supply environment with random and controllable demand and continuous input flow with fixed uncontrollable rate under finite storage capacity’ (Nanjala *et. al*. 2022). To control inventory in such an uncertain environment, there is need to develop internal inventory control systems that allows direct and real time flow of information on materials which include raw material, semi-processed goods and finished products; information flow between suppliers and the organization. Organizations must develop internal structures, policies and procedures upon which all internal inventory control operations are based (Nyile, Noor & Osoro, 2021).

Theory of Constraints (TOC)

The Theory of Constraints works in close conjunction with lean manufacturing (Cox, Jeff & Goldratt, 2018). A lean system can be defined as all efforts aimed at eliminating waste through continuous improvement and limited inventory (Lancioni & Howard, 2019). According to the Theory of Constraints (TOC), a company that embraces lean strategies is likely to foster a positive culture, engaged employees, and an environment where everyone participates in continuous improvement (Abdullahi, 2020). As stated by Mekashaw (2021), a manufacturer strictly adhering to the Theory of Constraints typically focuses on the exploitation of the bottleneck whenever it

appears in the production process. However, the downside of the lean approach in the Theory of Constraints is that a firm attains financial leverage or improvement only when there are continuous improvement efforts aimed at eliminating bottlenecks.

To maximize the benefits of the Theory of Constraints, manufacturers need to blend five powerful concepts. These concepts include the identification of the system constraint, exploiting the constraint, subordinating everything else to the constraint, and finally, preventing inertia from becoming a constraint. After following these steps, the management of a firm then aims to implement the lean tools and techniques on the constraint. Therefore, the Theory of Constraints focuses on the mechanism for every lean activity in an organization (Bujang, et. al. 2018). It's important to note that the Theory of Constraints is mainly concerned with strategies that organizations use to overcome bottlenecks. By studying this theory, the researcher will gain an in-depth understanding of how lean stock practices can be implemented in sugar manufacturing processes in Kenya. This understanding aims to make these firms competitive. As a result, since the lean strategy is a component of inventory control practice, this theory will prove handy. Especially in developing hypotheses relevant for this research study.

EMPERICAL REVIEW

Nyile, Noor and Osoro (2019) studied the influence of supply chain leagility on the performance of humanitarian aid organizations in Kenya. They concluded that firms applying lean practices have higher inventory turnover compared to those not relying on lean manufacturing. However, significant differences exist in inventory turnover even among lean manufacturers, depending on their contingencies. Jayakumar et al (2018) assessed inventory control techniques in Kochi and found variations in the Economic Order Quantity (EOQ) and the number of units purchased. Marsudi (2018), in a study of Tanzanian firms, asserted that proper control and management of inventory are critical to ensuring uninterrupted production. He suggested that to achieve inventory control effectiveness, an organization should provide training, utilize computer applications, improve security, and motivate its members (Semu & Ermias, 2018). Chen et al (2019) examined the trend of lean inventories carried by American firms and revealed that abnormally high stock levels are characterized by long-term stock returns. Umair et.al (2019) evaluated whether a firm should use lean technology or responsive inventory policies and concluded that mismatched changes in sales and inventory are associated with lower profitability.

According to Shah (2018), in a study of fast-food restaurants in Nigeria, effective handling of orders and menu items is critical for survival in a competitive market. Ibhagui and Olokoyo (2019) posited that inventory control management flexibility is crucial for achieving a firm's performance. They found that organizations benefit from inventory control management through easy storage and recovery of material, improved sales viability, and reduced operational costs. Four hypotheses were developed and tested at a 0.1 level of significance using descriptive statistics and a non-parametric test (Chi-square). Nanjala, Immonje and Wasike (2022) found a significant correlation between inventory management and return on sales and equity when studying the economic challenges of inventory on the financial performance of sugar manufacturing firms. Mwangangi and Achuora (2019) researched the influence of lean supply chain on the performance of public universities in Kenya, finding a significant positive relationship between a Lean Supply chain and Organizational Performance. This suggests that the adoption of Lean Supply chain initiatives can likely enhance organizational performance in public universities in Kenya.

In Malaysia, Daud (2010) studied lean supply chain implementation in Malaysia's electrical and electronics industry, finding that cheaper costs towards internal waste lead and cycle time reduction were the most influential factors on lean supply chain performances, followed by better quality and faster throughput towards supplier engagement and collaboration. Hadrawi (2019) explored the link between supply logistics integration, competitive performance, lean process, and supply performance among 220 Iraqi manufacturing firms. The findings indicated a positive relationship between supply logistics and competitive performance (operational), and that supply performance and lean processes partially mediated this relationship. The study underscored the importance of managing both internal (production processes) and external processes (logistics and supply chain) of firms' operations in an integrated manner, with supply chain management acting through key internal processes to impact competitive performance.

CONCEPTUAL FRAMEWORK

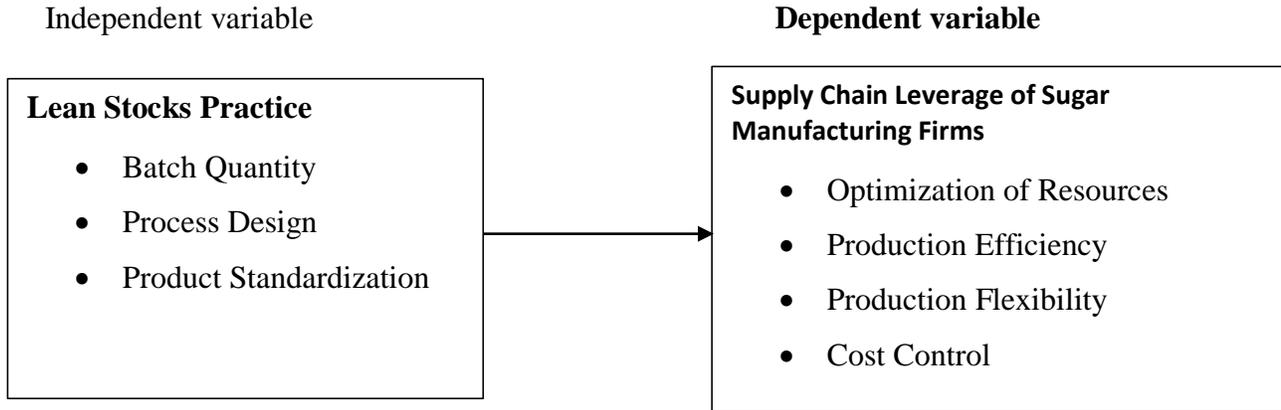


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

RESULTS AND DISCUSSIONS

The study had a response rate of 95%, which is considered sufficient for analysis. The majority of the respondents were aged between 21 and 40, which is likely due to their ability to learn new systems and technologies. The majority of the respondents were at the officer level, followed by managers and assistants. Employees with the designation of officer were the majority working in the procurement, finance, and operations departments.

Descriptive Statistics

The objective of the study was to assess the effect of lean stocks practice on Supply chain leverage of Sugar Manufacturing firms in Kenya. The descriptive results for the objective are as shown in Table 1

Table 1: Descriptive Statistics for Lean Stocks Practices

Statement	1	2	3	4	5	Mean	Std. Dev.
Wastes in stock management greatly affects the efficiency in the production output of our firm.	15.7% N (33)	15.7% N(14)	13.3% N (28)	45.2% N (95)	10.1% N (21)	4.50	0.783
Our firm’s process design affects the ability to hold lean inventories to yield standardized products.	10% N (21)	16.7% N(35)	11.9% N (25)	33.3% N (70)	28.1% N (59)	4.46	0.747
Our firm keeps lean supplies to reduce the amount of wastage in production process while maximizing plant utilization.	4.4% N (9)	9.5% N(20)	23.8% N (50)	37.1% N (78)	25.2% N (53)	4.65	0.744
Our firm adopts lean stock perfection strategy to ensure supply chain leverage.	6.2% N (13)	8.1% N(17)	21% N (44)	30.5% N (64)	34.2% N (72)	4.34	0.954
Our company ensures product standardization in the ordering of in raw materials to encourage quality improved resources.	3.3% N (7)	17.6% N(37)	13.3% N (28)	41% N (86)	24.8% N (52)	4.14	0.879
Our firm has adopted lean stock practice management to ensure cost reduction in production yield.	4.8% N (10)	5.2% N(11)	10.9% N (23)	50.5% N(106)	28.6% N (60)	4.33	0.799
There is batch production practice encouraged in our firm for cost reduction.	1.9% N (4)	10% N(21)	23.8% N (50)	28.6% N (60)	35.7% N (75)	4.32	0.841
Our firm’s production process design is responsible for the agility of our production	2.4% N (5)	11.9% N(25)	22.9% N (48)	31.4% N (66)	31.4% N (66)	4.13	0.885
Our firm practices lean stocks to eliminate wastage in the production system and reduce manufacturing cost.	3.8% N (8)	18.1% N(38)	27.1% N (57)	35.3% N (74)	15.7% N (33)	4.23	0.782
Adoption of lean stocks by our firm plays a major role in creating maximum capacity utilization of our plant.	4.3% N (9)	11.9% N(25)	28.1% N (59)	32.9% N (69)	22.8% N (48)	4.10	0.995

Table 1 reveals that among the ten items on the Likert scale testing lean stock practice, the item asking respondents whether waste in stock management greatly affects the efficiency of their firm's production output recorded a mean of 4.50 with a standard deviation of 0.783. Specifically, 45.2% of respondents agreed with the statement, while 10.1% strongly agreed. Moreover, 15.7% of respondents agreed and strongly agreed, while 13.3% were neutral, indicating the mode of the respondents that agreed with the statement was 45.2% (N=95). This aligns with Mbiriri's (2018) findings, which concluded that lean inventory techniques eliminated waste in organizations,

thereby improving their performance. The respondents were also asked if their firm's process design affects the ability to maintain lean inventories that yield standardized products. On this statement, 28.1% of respondents strongly agreed, while 33.3% agreed. In contrast, 11.9% were neutral, 16.7% disagreed, and 10% strongly disagreed. The mean score was 4.46, with a standard deviation of 0.747, and a median score of 16.5% (N=35). This indicates that a large number of respondents strongly agreed with the statement, aligning with Opoku et al.'s (2020) suggestion in a study of inventory management techniques and the performance of manufacturing firms.

Table 2: Descriptive Statistics for Supply Chain Leverage

Statement	1	2	3	4	5	Mean	Std Dev.
Our company has efficient production process because of reliable lead times by suppliers of raw materials.	19% N(40)	6.6% N(14)	12.4% N(26)	41% N(86)	21% N(44)	3.39	1.398
There is agility in the production of our firm resulting from predictable frequency of supplies of raw materials.	2.4% N (5)	16.6% N(35)	22% N(46)	32.4% N(73)	26.6% N(54)	3.58	1.170
Our firm has improved resources because of implementing waste elimination strategies in production process.	13.3% N(28)	9.1% N(19)	16.7% N(35)	29% N(61)	31.9% N(67)	3.97	1.376
Our firm has improved resources because of implementing proper process design in the production of sugar.	2.4% N (5)	11.4% N(24)	21% N(44)	33.8% N(71)	31.4% N(72)	4.05	0.964
Our sugar firm has adopted sound corporate leadership policies to achieve value addition and competence.	3.8% N (8)	5.7% N(12)	19.5% N(41)	40% N(84)	31% N(65)	3.84	1.050
Our firm has integrated the use of IT in its management of workers' resulting to improved human capital.	3.3% N (7)	7.1% N(15)	13.3% N(28)	34.3% N(72)	42% N(88)	3.88	1.076
Our company has reduced cost of production by implemented product standardization.	1.9% N (4)	8.1% N(17)	17.1% N(36)	25.8% N(54)	47.1% N(99)	4.04	0.847
Our firm has managed to reduce cost of production by implementing consumer surveys forecasting.	3.3% N (7)	10% N(21)	17.1% N(36)	31.9% N(67)	37.7% N(79)	3.71	0.947
Our firm has reduced manufacturing cost due to the implementation of batch production systems.	5.2% N(11)	11.4% N(24)	19.1% N(40)	27.6% N(58)	36.7% N(77)	4.12	0.970
There is agility in the production of our firm because of the production process design adopted.	4.3% N (9)	7.1% N(15)	14.8% N(31)	35.7% N(75)	38.1% N(80)	3.95	1.067

From table 2, among the ten items measuring the supply chain leverage of Kenyan sugar manufacturing firms, the item asking whether respondents' companies had efficient production processes due to reliable supplier lead times had the lowest mean (3.39) and a standard deviation of 1.398. Specifically, 41% agreed, 21% strongly agreed, while 19% strongly disagreed, 6.6% disagreed, and 12.4% were undecided. Conversely, the statement about reduced manufacturing costs due to batch production systems implementation scored the highest mean (4.12) with a standard deviation of 0.970. Here, 27.6% agreed, 36.7% strongly agreed, 11.4% disagreed, 5.2% strongly disagreed, and 19.1% were neutral, supporting Okumu & Bett's (2019) observation that batch production reduces manufacturing costs. The statement 'Our Company has efficient production processes because of reliable supplier lead times,' yielded a mean score of 3.58 with a standard deviation of 1.170. Although 32.4% agreed and 26.6% strongly agreed, 22% were undecided, and 16.6% were neutral. When asked about improved resources due to implementing waste elimination strategies, the mean score was 3.97 with a standard deviation of 1.376, indicating high data variability. As confirmed by Emobong' (2019), 31.9% strongly agreed and 29% agreed, while 13.3% strongly disagreed, 9.1% disagreed, and the rest were neutral. Lastly, the statement 'Our firm has improved resources because of implementing proper process design in sugar production,' had a mean of 4.05 and a standard deviation of 0.964. With 31.4% strongly agreeing and 33.8% agreeing, the results underscored Abimanyu et al.'s (2019) conclusion that production design is critical for resource improvement.

Correlation Analysis

The following section presents the correlation analysis of the study variables, focusing primarily on lean stock (LS) practices and supply chain leverage (SCL) in Kenya's sugar manufacturing firms. The relationships among these variables were assessed using Pearson's correlation analysis. The results are presented in Table 3.

Table 3: Correlation Matrix

Variable		LS	SCL
LS	Pearson Correlation	1	
	Sig. (two-tailed)		
	N	210	
SCL	Pearson Correlation	.729**	1
	Sig. (two-tailed)		
	N	.000	

The results reveal a significant positive relationship between lean stock practices and supply chain leverage in Kenyan sugar manufacturing firms ($r = 0.729$, $p = 0.00$). This indicates that an increase in lean stock practices corresponds to an increase in supply chain leverage, provided other independent variables are constant. Hence, the null hypothesis stating that lean stock practices do not significantly affect supply chain leverage in these firms is rejected. These findings align with the studies of Chen et.al. (2019), and Umair et.al. (2019), which concluded that discrepancies between sales and lean inventories lead to lower profitability and higher production costs. Moreover, these results support the findings of Ibhagui and Olokoyo (2019), who maintained that lean inventory control management flexibility, particularly by business executives, is essential for improving firm performance and reducing production costs.

Regression Analysis

The null hypothesis was that lean stock practices has no significant effect on supply chain leverage of sugar manufacturing firms in Kenya. Findings in Table 4 that follows shows that there was a significant effect of lean stocks practices on supply chain leverage of sugar manufacturing firms ($t = 9.179$; $p = .000$) implying that the null hypothesis was rejected with 95% confidence level. As a result, by rejecting the null hypothesis, the study therefore concluded that lean stocks practice has a significant effect on supply chain leverage of sugar manufacturing firms in Kenya.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.779 ^a	.607	.670	.22017

The findings in table 5 shows that Supply Chain Leverage model as a function of lean stocks practices, yielded an R^2 value of 0.607. This is an indication that 60.7% of the variation in supply chain leverage of sugar manufacturing firms in Kenya can be explained by lean stocks practices, a position supported by studies conducted by Wamoto, Kwasira & Ndolo (2023), who suggested that lean inventories were critical in production cost reduction.

To test the significance of the model, an Analysis of Variance (ANOVA) was done and the results are presented in Table 6.

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1749.619	4	437.405	74.212	.000 ^b
	Residual	1208.256	205	5.894		
	Total	2957.875	209			

The results from table 6 indicate that the overall model for supply chain leverage was statistically significant ($F_{4,205} = 74.212, p < .05$). The results imply that the independent variable is a good predictor of supply chain leverage of sugar manufacturing firms; since lean stocks practice predict the dependent variable supply chain leverage, thus supporting a strong relationship, between the independent and dependent variable.

Table 6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.	95.0% for B	
		B	Std. Error	Beta				Lower Bound	Upper Bound
1	(Constant)	2.507	.016			25.263	.000	1.976	2.938
	LS	.326	.036	.460		9.179	.000	.256	.396

The regression model concluded that lean stock practices had a significant effect on the supply chain leverage of sugar manufacturing firms in Kenya. Therefore, a unit increase in supply chain leverage corresponded to a 0.326 increase in lean stock practices. Further findings from Table 6 revealed that lean stock practices had a positive, significant effect on the supply chain leverage of sugar manufacturing firms in Kenya ($\beta = .326; p = .000$). The resultant regression equation is as shown below: $Y = 2.57 + 0.326 \times \text{Lean Stocks Practice}$. Lean Stocks practice, as an inventory control mechanism, had a significant effect on the supply chain leverage of sugar manufacturing firms in Kenya. These findings echo those of Mwangi, Muturi, and Noor (2019), who discovered that Lean Stock influenced the coordination of supply chain partners. The study results in Table 6 showed that the standardized beta coefficient of 0.460 indicates that when lean stock practices increase by 1 standard deviation, supply chain leverage increases by 0.46 standard deviations. These standardized beta coefficients suggest that Lean Stocks had a strong effect on the supply chain leverage of sugar manufacturing firms in Kenya. This implies that if all other inventory

management practices are held constant, a unit increase in Lean Stocks Practices could result in a 46% increase in the supply chain leverage of sugar manufacturing firms in Kenya.

CONCLUSION

The study results clearly indicated that lean stock practices have a significant positive effect on the supply chain leverage of sugar manufacturing firms in Kenya ($\beta = 0.326$, $p = 0.000$). This implies that, when all other factors are held constant, a unit change in lean practices leads to a 32.6% increase in supply chain leverage for sugar manufacturing firms in Kenya. Therefore, the regression results show that lean stock practices have a statistically significant positive effect on the supply chain leverage of these firms. This led to the rejection of the null hypothesis at a 95% confidence level.

RECOMMENDATIONS

Sugar manufacturing firms, especially the public ones, should ensure that available inventory control practices, such as lean production and lean materials, are implemented. Implementing these practices will promote the elimination of waste in the production system, potentially reducing production costs. By adopting lean stock strategies and practices, the manufacturing costs could be significantly reduced, providing sugar firms with a competitive advantage. These firms should also integrate lean systems, which aim to eliminate waste throughout the supply chain, into their corporate strategies. Such strategies could be reflected in the organization's vision and mission statements. The adoption of lean functions can also ensure maximum production efficiency in sugar manufacturing firms, potentially reviving some firms that have suffered from corruption issues over the years. In fact, some of the collapsed sugar firms might be rejuvenated through the implementation of lean strategies, especially after initial bailout attempts.

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