

INVENTORY MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE IN THE AUTOMOTIVE INDUSTRY IN KENYA

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ABSTRACT

Intense competition implies that the automobile dealers need to come up with the best ways for promoting their supply chain performance. This is because nearly three-quarters of the funds in the automobile industry is tied up in slow moving stock. Consequently, the industry is faced with the problem of having large inventory-built ups that ties up the capital thus affecting the supply chain performance. In order to restore normalcy, inventory management practices (IMPs) have been adopted by many dealers in the sector. However, the influence of these IMPs has not been adequately interrogated. Thus, the paper examined the influence of IMPs on the supply chain performance in the automotive industry. Specifically, the paper examined the influence of just in time and FIFO on the supply chain performance in the automobile industry in Kenya. The paper was anchored on the Transaction Cost Analysis (TCA) and the Theory of Constraints (TOC) and was based on the descriptive research design. Data was gathered using the questionnaires and analyzed using the descriptive statistics including the mean, standard deviation and the inferential statistics including the correlation and regression analysis. The results showed that IMPs influenced the supply chain performance in the automobile industry in Kenya. Just in time accounted for 61.5% of the variance in the supply chain performance while 68.3% of the variation in supply chain performance in the automobile industry in Kenya was explained by FIFO.

Keywords: *Supply Chain Performance, Automotive dealers, inventory management practices, Just-in-time, First in First Out*

INTRODUCTION

Inventory management is an ongoing procedure involving the planning, organization, and control of inventory (Otto & Kotza, 2023). Its objective is to reduce investment in inventory while ensuring equilibrium between supply and demand. The objective of this process is to decrease procurement and carrying costs, all the while upholding an optimal product inventory level to satisfy customer demand. Inventory management tracks stock trends, ensuring timely ordering and customer order fulfillment while minimizing shortages. Effective inventory management entails weighing inventory costs against its benefits. The primary advantages of Inventory management include enabling order fulfillment and increasing profits (Wang, 2019).

Typically, there is no one-size-fits-all solution; the circumstances vary for each company or firm, encompassing distinct features and limitations (Singh & Singh, 2020). However, the challenges of inventory management revolve around the balance between excessive stock and insufficient inventory. Consequently, inventory management has emerged as a central player within the realm of supply chain management activities. In essence, effective inventory management serves the critical purposes of supporting consistent production and overall financial stability (Nsikan, Etim & Uduak, 2023). As opined by Muhayimana (2023) inventory management is associated with the creation of a purchase plan that guarantees items are available the moment they are in need in addition to keeping the track of existing inventories and their use.

Globally, inventory management has often meant too much inventory and too little management or too little inventory and too much management. There can be severe penalties for excesses in either direction. Therefore, inventory problems have proliferated as technological progress has increased the organization's ability to produce goods in greater quantities, faster and with multiple design variations. Countries have compounded the problem by their receptiveness to variations and frequent design changes (Otto & Kotza, 2023). However, the strategic benefits of inventory management have become obvious. For example, the success of Japanese, European, North American firms has been highlighted in achieving unparalleled effectiveness and efficiency in logistics. In Britain, many firms have raised the bar in logistics by coordinating with other firms in their supply chains. Similarly, the United States of America has continued to pursue productivity improvement by reducing the amount of direct manufacturing labour expended per unit of output. This is a valid strategy because of the high labour content in the manufactured products. However, the proportion of unit cost due to labour has been steadily decreasing in recent years especially in Japanese automobile firms where remarkable performance on inventory management has been reported. However, on the African continent, there remain genuine concerns about inventory management practices since inventory is a reversible investment, which continually oscillates in size, guiding inventory decisions to ensure optimal level of inventory standards.

Inventory Management Practices

Inventory management practices (IMPs) refer to the models used to manage a firm's inventory with a view to reducing costs while satisfying customer's demands at the right quality, quantity, time and place (Awheda, 2016). In this regard, the IMPs are concerned with ascertaining the level of inventory, projecting demand in the future in addition to making decision on when to order and how the orders are made (Adeyemi & Salami, 2020). Since inventory management is an important aspect of supply chain performance, it is useful to employ the best practices that simplify the processes of supply chain management (Muhayimana, 2022). The automotive industry is facing enormous challenges because the market has become more demanding in terms of cost and functionalities (Benko & McFarlan, 2023). To guarantee market share, the industry players are compelled to make significant adjustments in the procurement and logistic processes (Lawson, 2022). This involves moving away from the mass production and customization of stock by carefully selecting IMPs that absolve any possible mismatch between supply and demand (Awheda, 2016). Selecting appropriate IMPs are crucial in the automotive industry as they can help reduce losses occurring as a result of overstocking and under-stocking in the supply chain. There are many IMPs commonly adopted in the automotive industry but this paper focused on JIT

and FIFO as conceptualized by Agus and Noor (2020).

Just in Time (JIT)

JIT is concerned with ensuring that appropriate quantity and amount of the required attributes are contextually and timely available. The application of JIT heralds qualitative positive adjustment with regard to profitability and operational effectiveness that ultimately results into the elimination of the undesirable wastages and expenses. Hutchins (2023) considers JIT as a process that is prepared for moment responses to the request without the necessity for overstocking or under stocking. JIT culminates into reduction in storage expenses as the dealer ends up spending less to secure storage a practice that results into less obsolete stocks in the supply chain. According to Franco (2017) the use of JIT calls for a much more disciplined way and a change of culture of handling the inventories. It also necessitates the adoption of collaborative decision-making, collective accountability, and holistic employee concern.

JIT strives to eliminate waste and ensures that the process that does no add value is done away with. It has been found over the years that JIT is very instrumental in reducing of expenses that appertains to inventories. This is because JIT ensures that the organizations require minimal inventories for immediate production are held. This significantly reduces costs that are associated with holding inventories (Kotanaee, 2019). Generally, the JIT methodology is based on three principles. These include waste reduction, continuous product or service quality enhancement and staff engagement in policy formulation and implementation.

First in First Out (FIFO)

FIFO is a method of inventory management in which pricing inventories is related more closely to the traditional flow of goods. The goods most recently purchased are the ones making up the ending inventory, therefore the goods on hand at the beginning of the year would have been the first ones sold (Agamy, Selah & Ramsy, 2020). The assumption that the older stock is usually the first to be disposed of is generally in accordance with good merchandising policies. In order to receive the highest price for a good, it has to be sold before it becomes obsolete, shop worn, spoiled, broken, or unsalable by any other means. FIFO also follows the assumption that a business must normally have a specific number of units of merchandise on hand in order to ensure uninterrupted operations. Any units sold are priced out at the most recent acquisition cost regardless of their actual cost.

The strength of FIFO lies in the flow of data reported to the balance sheet because the first purchased item is the first one removed from the inventory account, and the remaining balance consists of items at newer cost prices. FIFO is widely used by companies because the calculation and implementation is simple; the final inventory value on the balance sheet is in accordance with current prices and can avoid damage and obsolescence of inventory. The ending inventory value is the price of the last goods purchased and this method is likely to generate high profits if the price tends to increase. FIFO enables materials to be drawn from the cost record in a logical and systematic manner. The movement of materials also occurs in a continuous, orderly, single file manner representing a condition necessary to and consistent with efficient materials control, particularly for materials subject to deterioration, decay and quality are style changes. FIFO is

recommended whenever the size and cost of units are large, materials are easily identified as belonging to a particular purchased lot and not more than two or three different receipts of the materials are on a materials card at one time (Chesesio & Makoha, 2016). In this study FIFO was conceptualized as s indicate the particular itinerary of a product as it is being conveyed to the consumer. At the tail end of the cycle, FIFOs can still be retained as work coupons with the expressed possibility of improving customer service and quality control in future.

Supply Chain Performance

The term supply chain performance refers to quantity and quality measures such as customer satisfaction, order-to-delivery lead time, flexibility, distribution presentation, resource operation, source chain reaction time and delivery performance (Kleijnen & Smits, 2021). One of the keys to effective supply chain management is making supply chain part of the organizational strategy. In designing a performance measurement system, the first critical step is to define the core processes in the supply chain, describe the core processes into smaller parts, and calculate the resources involved in each of these process elements (Lemma, 2022). With an understanding of the factors that influence supply chain performance, companies are expected to be able to prepare their technical and practical supply chain management practices. Rolf (2023) emphatically adopted the Supply Chain Operations Reference (SCOR) model to conceptualize the supply chain performance in terms of reliability, consistency and efficiency. Stewart (2022) conceptualizes supply chain performance in terms of cost, flexibility, delivery performance, responsiveness, asset management. According to Beamon (2022) the Key Performance Indicators (KPIs) for supply chain performance includes cost and customer satisfaction conceived in terms of flexibility, responsiveness, cost, and reliability. Rolf (2023) adopted the SCOR model to define the supply chain performance by considering reliability, consistency and efficiency. The study considered supply chain performance in terms of customer satisfaction, inherent flexibility, distribution-presentation, time of chain reaction, order-to-delivery lead time, and performance of the delivery.

Globally, studies have presented different approaches to inventory management (Rizkya, 2022) particularly in the automotive industry (Jeffrey, 2018). In the United States of America (USA), Eroglu, Brent and Waller (2022) examined the IMPs adopted in manufacturing firms and found that thinness had a positive effect on profit margins. It was evident that poor IMPs were the main problems faced by automotive industries. In China, Chen, Frank and Wu (2023) observed that reliance on imported industrial raw materials and endemic bureaucratic delays were associated with communication problems in many organizations. In the United Kingdom (UK), Demeter (2023) revealed the existence of a favourable result of inventory turnover on firm's performance which was determined by sales return. Moreover, a significant link between inventory days-reduction and profitability was reported in a sample of UK automotive firms (Pong & Mitchell, 2012). In an Indian context, Ramachandran and Jankriaman (2023) discovered that a favourable bond existed between inventory management and the overall performance of the concerned firms. In Russia, inventory management has subtly turned out to be significant owing to the fact that diverse automobile dealers appeared to be concerned with finding ways of amplifying performance outcomes of their domestic supply chain. In China, the drifting away from monopoly to liberalization has eased the rigid financial policies which seed to have percolated into the

automotive industry. Consequently, many automobile dealers took advantage of the new regulatory adjustment in their supply chain performance (Shehu & Mahmood, 2022).

In Africa, many automobile dealers are currently focusing on reevaluating their IMPs especially at this time there are economic hardships that have escalated competition. For instance, in Ghana, frequent adoption effective IMPs has resulted into a corresponding increase in profitability for automobile dealers (Ocran, 2019). Obermaier and Donhauser (2023) found a significant impact of return on assets for automobile dealers that adopted JIT in the inventory management in South Africa. In East African countries, automobile dealers have continued to realize tremendous growth in the last five years (Okiro, Omoro & Kinyua, 2021).

In Kenya, the automotive industry is experiencing discernible financial constraints possibly due to inventory management hiccups. The challenges arise from building up slow moving stock which tends to tie up capital, consequently depriving the dealers the much needed regular incomes. As a result, the supply chain performance has been found to impact institutional competitiveness especially if inventory management is considered (Naliaka & Namusonge, 2022). According to Muhayimana (2022) a firms' overall inventory embodies a venture that is tied up till in the unsold stock with the possibility to attract insurable as well as storage costs. The paper interrogated the IMPs and their influence on supply chain performance in the automobile industry in Kenya.

Statement of the Problem

It is apparent that a large portion of the total liquidity and capital in the automotive industry is composed of slow moving stocks. As a result, the automobile dealers are confronted with the risk of financial difficulties. The outcome of this is that over 60% of the dealers select inappropriate inventory management practices. The failure to choose appropriate inventory management practices usually leads to poor supply chain performance. However, studies specific to the automobile sector in Kenya have not interrogated the perceived influence of IMPs on the performance of the supply chain. In this regard the dealers continue to grapple with the prospects of comprehending diverse IMPs that may have the potential of augmenting the performance of the supply chain. Consequently, a number of research enquiries investigating the relationship between IMPs and supply chain performance have been undertaken (Kemuma, 2022; Nsikan, et al, 2022) but these studies ignored IMPs in relation to the performance of the supply chain in the automobile sector. This has resulted into conceptual, contextual and thematic gaps in the conceptualization of the performance of the supply chain within the context of the automobile industry in Kenya. Therefore, this paper examined the influence of IMPs on the performance of the supply chain in the automobile industry in Kenya.

Specific Objectives

- i. To determine the influence of just in time on supply chain performance of automobile industry in Kenya.
- ii. To evaluate the influence of FIFO on supply chain performance of automobile industry in Kenya.

LITERATURE REVIEW

Theoretical Literature Review

The linkage between IMPs and supply chain performance has been anchored on the theoretical literature. Therefore, this paper was guided by the theoretical tenets of Transaction Cost Analysis (TCA) and Theory of Constraints (ToC).

Transaction Cost Analysis (TCA)

TCA was pioneered in 1981 by Williamson (mathematician and economist) who integrated TCA into a model of equilibrium in an attempt to conceptualize the transaction costs of economics in an organization. TCA asserts that organizational expenses ought to be maintained at a minimal level (Hall, 2023). For its application, therefore, TCA has attracted a wide scholastic acceptance in a myriad of fields of investigations notably economics, supply chain performance and institutional structures. Williamson (1981) argues that firms can considerably reduce their transactional costs by vertical integration and enhancing the degree of trust. In this theoretical conceptualization, the integration tends to minimize the required expenses such as in holding inventory without compromising quality service delivery. The theory has been chosen to guide the study because it presents mechanisms for promoting supply chain in an organization. This is because costs minimization results into accelerated profitability and in this regard, IMPs are projected to enhance supply chain performance if the management endeavours to minimize operational costs. Hence, the theory helped to explain how IMPs can augment the attainment of supply chain of the automobile industry in Kenya.

Theory of Constraints (ToC)

Developed by Goldratt in 1990, the theory of constraints (ToC) seeks to provoke the managers to initiate and execute activities oriented at eliminating or preventing constraints. The theory proposes that every business should be concerned about financial performance as its ultimate goal. This is concerned with the generation of cash now and in the foreseeable future. Since the requirements for the generation of cash may be set differently by different stakeholders, ToC recommends the development of frameworks for estimating the recognizable proof of those practices that may contribute to the realization of the goal of the business (Goldratt, 2004). In the context of supply chain performance, the constraints may include too long lead times, failure to fulfill the order, lost unusable inventory, high degree of critical orders and travel, high degree of decentralization, loss of key customer involvement and all non-appearances of controls identified in normal changes (Goldratt, 2004). In the automobile sector the use of IMPs could possibly help to minimize the losses linked with these problems thus enhancing achievement in supply chain.

Empirical Literature Review

Different IMPs have been analyzed to ascertain their supposed influence on supply chain performance and the outcome of the analysis has presented useful highlights in the relationship between IMPs and supply chain performance. This section presents a review of past studies and the evident gaps for further research.

Just in time (J.I.T) and supply Chain Performance

The Just in Time (JIT) is an inventory management practice which focuses on maintaining just sufficient material at the right place and at the right time in order to make first the right quantities of inventories (Carlson, 2002). In this regard, inventories are acquired only when demanded thus reducing the in-process inventory and its associated costs (Schonsleben, 2023). Previous studies have considered JIT in relation to organizational performance. For instance, Upadhye, Deshmukh, Garg and Sharma (2022) examined the influence of JIT on the implementation of Corrugated Packaging Industries in India. The study apparently made use of the survey design and used primary data gathered using questionnaires. The regression analysis in this particular research enquiry aided data manipulation. The results showed that JIT positively influenced the firm's performance. However, the study did not consider supply chain performance as considered in the current study. Chaudhari and Patel (2022) conducted an empirical review to determine the implementation of JIT in manufacturing firms. Employing a mixed-methods approach, and the questionnaire to collect data, the findings illuminated that JIT was a repeatable exercise in the organization adopted to enhance performance excellence in the manufacturing sector. It was adopted in this study to determine its contribution in the automotive industry.

Kaswan, Rathi and Singh (2019) examined the influence of JIT on decision making in the health care sector in India. Based on a systematic review, with past empirical investigations centering on the medical supply management, the outcome of the study failed to specify the factors that unilaterally supported significantly performance in the supply chain. As a result, the study differs contextually because the study did not use the systematic review. Similarly, the current study considered supply chain performance and not the overall firm's performance. In yet another significant study Qureshi (2023) examined the critical elements relevant for executing JIT in the cement industry in Pakistan. Proportional stratified sampling method was used to select 400 study respondents whose honest insights and unbiased opinions helped to generate the study's outputs. Considering cement sectors as the unit of analysis, interview guides were embraced in data collection which was consequently examined thematically and later it emerged that the study's JIT disproportionately minimized the associated defects linked with supply chain performance while exquisitely allowing the uninterrupted flow of operations. However, the study did not interrogate the appropriateness of JIT in the automobile sector. Hence the current study determined the extent to which JIT enhanced supply chain performance of the automobile industry in Kenya.

Locally, Kariuki (2023) examined the influence of IMPs (JIT, VMI, & ERP) with a focus on the performance of Laikipia County. Being guided by a well-articulated design (descriptive), the study identified a blend of probability-and/cum-non-probability sampling approaches/procedures as appropriate in selecting the study participants (60 procurement staff). The study contended that the selected IMPs clearly enhanced the county's performance. In particular, JIT outstandingly lowered the costs while also improving the relationship among the key participants. The study interrogated with certainty how JIT could possibly impact the supply chain performance of the automobile industry in Kenya.

FIFO and Supply Chain Performance

FIFO has found pragmatic use in stock tracking in diverse organizations. As a result, the link between FIFO and supply chain performance has considerably been pursued in past research. Imetieg and Lutovac (2022) critically examined FIFO method with time using MRP System via a case of construction projects in Libya. Being empirical in nature, it succinctly averred with certainty that FIFO evidently ensured availability of materials and other components which aided in keeping modicum stock of parts to facilitate planned delivery schedules. In view of the contextual and conceptual variances, however, applicable of the findings in the current study was precautionary in spite of existence of the correlation between costs and times involved in the procurement process.

Subramanya, Ramaa and Rangaswany (2020) studied the impact of FIFO technique on the performance of selected outlet dealers in India. With regard to the context of the referred study major retailers handling utility products in their chain stores were involved. Mixed methods were adopted and while considering 60 businesses, FIFO was conclusively discerned as being able to reduce the process length of transaction by about 773 minutes. This implied that FIFO could potentially upscale the anticipated supply chain performance even though the study wasn't based on the automobile industry. Mungu (2021) examined the perceived influence of inventory management on the general wellbeing organization, in Bungoma County (Kenya). Procedurally, 15 charitable organizations were incorporated as units of analysis. Acts of scrutinizing available inventories via FIFO, transport and determinable quality control, clear product specialization turned out to be the fundamental attributes of supply chain. The study considered FIFO as a parameter of a variable while in the current study FIFO was considered as an independent variable in the automobile industry.

Similarly, Ngugi, Muhalia and Moronge (2021) sought to determine the perceived influence of FIFO on its existing supply chain department. Methodologically, the supposed investigation was approached descriptively which included FMCGs (51) in Nairobi City. In consideration of the study population, a census of 51 managers at the FMCGs responded to the research questionnaires. It was evident that FIFO had a critical impact on supply chain performance. It was replicated in the current study area to see whether there are changes in the supply chain performance of the automobile industry in Kenya. Kisioya and Moronge (2019) examined the perceived determinants of supply chain performance of large-scale industrial firms in Kenya. In view of the afore-reviewed study, 5 industrial firms were studied from a descriptive perspective. To select 188 study participants, stratification was embraced. Well-structured instruments were adopted to gather primary data. The responses were keyed into the SPSS to facilitate data analysis. In consideration of the reviewed study, appropriate approaches were deployed in analyzing data. The results ascertained that FIFO clearly presented the opportunities for enhancing performance. However, the study did not interrogate the adoption of FIFO in relation to supply chain performance of the automobile industry in Kenya.

CONCEPTUAL FRAMEWORK

A conceptual framework is a representation of the interrelationship among study variables. Figure 1 shows the perceived association between predictor variables (IMPs) and the outcome variable (supply chain performance) alongside the discernible parameters.

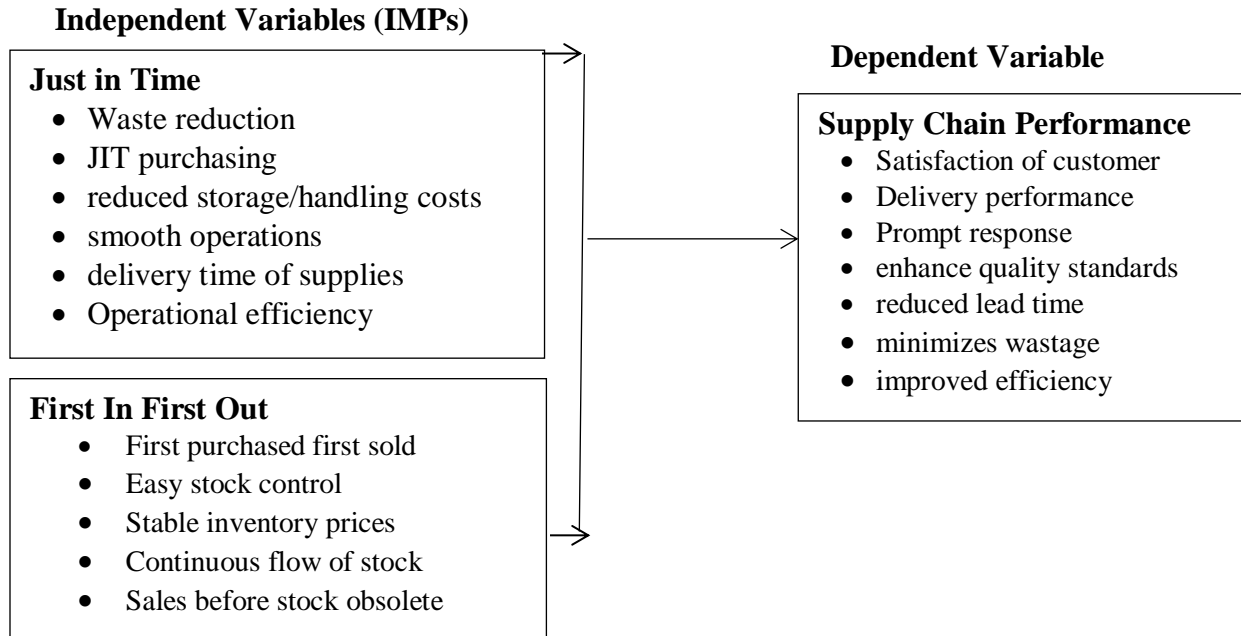


Figure 1: Conceptual Framework

As displayed in Figure 1, the predictor variables were JIT and FIFO. These variables were analyzed in relation to their influence on supply-chain-performance in the automobile sector in Kenya.

RESEARCH METHODOLOGY

Research Design

The study was anchored on the descriptive design. In its basic goal, the descriptive research aims to clearly present the true and accurate manifestation of research phenomena with a view to presenting new insights into the study variables. The descriptive design was taken to be the guiding approach to aid in answering pertinent queries regarding IMPs in the context of supply chain performance in the automobile industry. Conrad and Schindler (2023) observe that descriptive research is concerned with finding out who, what, where, when and how much. This design was preferred because it enabled the researcher to report items as they exist at CFAO Mobility. Moreover, the design provided the opportunity to explore the variables with no particular intention to ascertain the cause-effect relationship. Considering this susceptibility, the design is certainly touted to make it possible to analyze the IMPs adopted by the dealers in the automobile industry to enhance supply chain performance.

Target Population, Sample and Sampling Technique

Population is a group of individuals or objects that is the main focus of a scientific enquiry (Creswell, 2014). In this paper the employees of CFAO Mobility constituted the target population. Based on the population size, a census was taken and all the employees formed the sampling units. The census was preferred because the population was homogenous and relatively small. Hence, a census was taken for 191 employees at CFAO Mobility to represent the automobile industry in Kenya. The employees were deemed as the appropriate respondents owing to their comprehensive and elaborate involvement in the logistics and supply chain performance in the automobile sector in Kenya.

Instruments

Data was gathered from primary sources using the questionnaire. According Conrad and Schindler (2022) the questionnaire is frequently adopted in data collection as it provides the respondents with written items with options to select from based on their individual preferences (Creswell, 2014). The questionnaire was made up of diverse items with a bias on closed ended items (Mugenda & Mugenda, 2012). However, the elements deduced in the questionnaire reflected the study variables and their parameters. The questionnaire was piloted to ensure that it was valid, reliable and proficient in generating the same results after intermittent administration over time. Cronbach alpha was adopted to ascertain whether the items in the questionnaire were closely related or address the same variable. Cronbach alpha of values exceeding 0.7 were found and considered as sufficient evidence of the instrument's reliability.

Data Analysis Procedures

In this paper, means scores and standard deviation were considered as the methods of descriptive statistics. The relationship among the study variables was determined using Pearson correlation while the hypotheses were tested using the regression analysis. The multiple regression equation was: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$ (i)

Where:

Y = Supply chain performance

β_0 = Constant Term

β_1 to β_2 = Coefficients of Regression

X_1 = Just in time

X_2 = FIFO

ϵ = Error

RESEARCH FINDINGS AND DISCUSSION

Descriptive Statistics Results for Supply Chain Performance

The supply chain performance was considered as the outcome variable and the results pertaining to the responses to the statements used to examine supply chain performance are presented in table 1.



Table 1: Descriptive Statistics for Supply Chain Performance

Statements/Parameters	N	Mean	Std. Deviation
The organization responds promptly to variances in demand and supply of products	171	3.9279	.98822
The organization ensures that supply chain performance complies with specified quality standards	171	3.8198	.91650
The organization has experienced improved efficiency in resource management	171	3.8108	.96779
The organization has experienced reduced lead time of supplies delivery	171	3.7568	1.36326
It is easier to make accurate forecast which minimizes wastage in the supply chain performance	171	3.6396	1.18929
My organization has experienced improved efficiency in supply chain performance	171	3.5946	1.25320
My organization has experienced reduced storage and handling costs	171	3.4505	1.29852
The percentage of timely filled orders has generally improved at the organization	171	3.4324	1.21072
The supply chain process the automobile industry is error-free	171	3.0000	1.56089
There is a strong adherence to legal procedures and agreements in the supply chain performance	171	2.9730	1.47992
Valid N (listwise)	171		

From the results presented in table 1, supply chain performance was measured using ten statements. It is evident that the automobile industry responded promptly to variances in demand and supply of products ($M=3.9279$; $SD=0.98822$) and that it also ensured that the supply chain performance complied with specified quality standards ($M=3.8198$; $SD=0.9165$). Moreover, the respondents were committal that the automobile industry experienced improved efficiency in resource management ($M=3.8108$; $SD=0.96779$) as supply delivery reduced lead time ($M=3.7568$; $SD=1.36326$). Also the respondents were committal that it was easier to make accurate forecast which minimized wastage in the supply chain performance ($M=3.6396$; $SD=1.02110$) and as a result, the organization experienced improved efficiency in the supply chain performance ($M=3.5946$; $SD=1.21285$). However, the respondents were apparently noncommittal that their organization had experienced reduced storage and handling costs ($M=3.45045$; $D=1.29852$). Consequently, the respondents were apparently noncommittal that the percentage of timely filled orders generally improved in the automobile industry ($M=3.4324$; $SD=1.21072$) and that the supply chain processes were error-free ($M=3.000$; $SD=1.556089$). Moreover, the respondents were noncommittal about adherence to legal procedures and agreements in the supply chain performance ($M=2.9730$; $SD=1.47992$). These results imply that the respondents were noncommittal that automobile industry in Kenya had registered improved supply chain performance.

Descriptive Statistics Results for Just in Time

Just in time in the automobile industry in Kenya was examined and the responses to the statements pertaining to just in time are presented in Table 2.

Table 2: Descriptive Statistics for Just in Time

Statements/Parameters	N	Mean	Std. Deviation
The automobile industry employs current JIT best practices	171	4.4414	.64222
The automobile industry responds to feedback from stakeholders on the use of JIT	171	4.2793	.76481
JIT method has led to reduced storage and handling costs	171	4.2432	1.00196
JIT method has improved delivery time of supplies	171	4.1982	1.04290
The employees have adequate knowledge and familiarity with JIT	171	4.1081	.96626
The JIT approach used has resulted into changes in supply chain performance	171	4.0901	.90000
The use of JIT eliminates wastages associated with obsolescence and expiry of supplies	171	4.0180	.73833
Through JIT method the management has managed to reduce lead time of supplies delivery	171	3.9550	.87788
Through JIT practice the industry has improved efficiency in resource management	171	3.8649	.97688
Using JIT method ensures smooth operations due to stock outs at the automobile industry	171	3.8288	1.10267
Valid N (listwise)	171		

Table 2 presents the descriptive statistics for just in time in the automobile industry in Kenya. It was evident that the current JIT best practices were employed (M=4.4414; SD=0.64222). Similarly, the automobile industry responded to feedback from stakeholders on the use of JIT (M=4.2793; SD=0.76481). This implied that JIT method led to reduced storage and handling costs in the automobile industry (M=4.2432; SD=1.00196). The study also revealed that JIT method used in the automobile industry had improved delivery time of supplies (M=4.1982; SD=1.04290) as the employees had adequate knowledge and familiarity with JIT (M=4.1081; SD=0.96626). It is also evident that the JIT approach used and resulted into changes in supply chain performance (M=4.0901; SD=0.9000) and that the use of JIT eliminated wastages associated with obsolescence and expiry of supplies (M=4.0180; SD=0.73833). In the same vain, the respondents advertently concurred that through JIT method the automobile industry reduced the lead time of supplies delivery (M=3.9550; SD=0.87788). Also JIT enabled the automobile industry to improve efficiency particularly in resource management (M=3.8649; SD=0.97628) and ensured smooth operations due to stock outs in the automobile industry (M=3.8288; SD=1.100267). Based on these results it can be observed that just in time as an inventory management practice was carried out in the automobile industry in Kenya.



Descriptive Statistics Results for FIFO

The study examined FIFO as an inventory management practice in the automobile industry in Kenya focusing and the results obtained are presented in Table 3.

Table 3: Descriptive Statistics for FIFO

Statement/Parameters	N	Mean	Std. Deviation
Applying FIFO method has ensured that products stocked by the automobile industry do not become obsolete	171	4.1892	1.07461
By adopting FIFO method there is a continuous flow of stock in the automobile industry	171	4.1441	.96150
By adopting FIFO method there is usually a specific number of units of merchandise on hand	171	4.0901	.98673
The automobile industry is guided by FIFO in ensuring that the products purchased most recently are the ones making up the ending inventory	171	4.0901	.80396
The automobile industry has managed to control inventory by using the FIFO method	171	4.1802	.77692
FIFO ensures that the current prices of inventory in the automobile industry are reflected in the financial statement	171	4.2162	.67964
FIFO has enabled CFAO mobility to sell stock before it becomes obsolete	171	3.9279	1.01544
The goods on hand at the beginning of the year would have been the first ones sold	171	3.8919	1.19355
With FIFO method it is easier to alleviate inflation as oldest stock can be sold at the current inflated price	171	4.0631	.88707
With FIFOs there are scarcer opportunities for error in the supply chain management in the automobile industry	171	3.9730	1.13185
Valid N (listwise)	171		

As shown in table 3, ten statements were used to solicit the respondents’ views regarding the use of FIFO in the automobile industry. The results showed that by applying FIFO method the products stocked by the automobile industry did not become obsolete (M=4.1892; SD=1.07461). Moreover, FIFO method facilitated a continuous flow of stock in the automobile industry (M=4.1441; SD=0.9615). It was also evident that by adopting FIFO method there was a specific number of units of merchandise on hand (M=4.09013; SD=0.91276). In addition, the respondents agreed that the automobile industry was guided by FIFO in ensuring that the products purchased most recently were the ones making up the ending inventory (M=4.09; SD=0.8039) hence helping to control inventory (M=4.1802; SD=0.77692).



The respondents concurred that FIFO ensured that the current prices of inventory in the automobile industry were reflected in the financial statement (M=4.2162; SD=0.67964). It is also evident that majority of the respondents concurred that FIFO enabled the automobile industry to sell stock before becoming obsolete (M=3.9279; SD=1.0168) since the goods on hand at the beginning of the year were the first to be sold (M=3.8919; SD=1.19355). Moreover, with FIFO method it was easier to alleviate the inflation as the oldest stock could be sold at the current inflated price (M=4.0631; SD=0.88707). Furthermore, with the use of FIFO there are scarcer opportunities for error in the supply chain management in the automobile industry (M=3.9730; SD=1.3185). The generally high responses postulated that FIFO was carried in automobile industry in Kenya.

Correlation Analysis Results

Correlational analysis was carried out to determine whether there were significant associations between the study variables. In this regard, Pearson’s product-moment correlation coefficient (r) was used to examine both the direction and strength of the associations of the concerned variables. The results of the correlation analysis are presented in Table 4.

Table 4: Correlation Coefficients

		SCP	JIT	FIFO
SCP	Pearson Correlation	1	.630*	.547**
	Sig. (2-tailed)		.007	.000
	N	171	171	171
Just in time	Pearson Correlation	.630*	1	.287**
	Sig. (2-tailed)	.001		.002
	N	171	171	171
FIFO	Pearson Correlation	.547**	.287**	1
	Sig. (2-tailed)	.000	.002	
	N	171	171	171
* . Correlation is significant at the 0.05 level (2-tailed).				
** . Correlation is significant at the 0.01 level (2-tailed).				

The correlation statistics in table 4 show the existence of a significant moderate relationship between the study variables. For example, there was a significant positive but moderate relationship (r=0.630, p<0.05) between just in time and supply chain performance of automobile industry in Kenya. This suggests that as just in time increases, there is a tendency for supply chain performance to improve. Moreover, the relationship between FIFO and supply chain performance was found to be moderate but positive, with a correlation coefficient of 0.547 with the p-value being less than 0.05.

Regression Analysis and Hypothesis Testing

The regression analysis considered supply chain performance (outcome variable) as a function of just in time and FIFO. The results of regression analysis for the two independent variables are presented beginning with the model summary, followed by ANOVA and the beta coefficients.



Influence of just in time on Supply Chain Performance of Automobile Industry

The first objective examined the influence of just in time on supply chain performance of automobile industry in Kenya. The simple regression analysis for the influence of just in time on supply chain performance of automobile industry was computed and the results of the model summary are presented in Table 5.

Table 5: Model Summary for Just in Time and Supply Chain Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.784 ^a	.615	.635	.1092

a. Predictors: (Constant), Just in Time

Table 5 provides the model summary for the influence of just in time on supply chain performance. The coefficient of determination (R-squared) for the influence of just in time on supply chain performance was 0.615. This indicated that 61.5% of the variance in supply chain performance in the automobile industry in Kenya was explained by just in time. The adjusted R-squared, which takes into account the number of predictors in the regression model was 0.635 and the standard error of the estimate of 0.1092 reflected the accuracy of the regression model in predicting supply chain performance based on just in time. It was necessary to examine whether the model was fit and this was done by using ANOVA and the results presented in Table 6.

Table 6: Analysis of Variance for Just in Time and Supply Chain Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.407	1	2.407	13.446	.007 ^b
	Residual	52.171	170	.179		
	Total	54.588	171			

a. Dependent Variable: Supply chain performance

b. Predictors: (Constant), Just in time

Table 3 presents the ANOVA results for the regression model. It is evident that the regression model accounted for a significant amount of variance in supply chain performance as revealed by the F-statistic of 13.446 and a p-value of 0.007. This indicated that there was a significant influence of just in time on supply chain performance. Hence, the model summary displayed goodness of fit. The results for the beta coefficient for just in time and supply chain performance are presented in table 7.

Table 7: Regression coefficients for Just in Time and Supply Chain Performance

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.878	.745		2.522	.013
	Just in time	.695	.171	.513	2.242	.007

a. Dependent Variable: Supply Chain Performance

The first null hypothesis (H_{01}) stated that there is no significant influence of just in time on the supply chain performance in the automobile industry in Kenya. Bases on the results presented in table 4, there was a significant influence of just in time on supply chain performance of automobile industry in Kenya ($\beta_1=0.513$; $p\text{-value}=0.007<0.05$). Thus, a unit increase in just in time resulted into 0.513 unit increase in the supply chain performance. This presented sufficient evidence to reject the null hypothesis and conclude that just in time significantly influenced the supply chain performance of the automobile industry in Kenya. This implies that devoting attention to just in time may improve supply chain performance in the automobile industry in Kenya.

This is consistent with Kariuki (2023) who averred that supply chain performance outrightly depended on the extent to which procurement activities were guided by just in time. Similarly, a focus on just in time coheres with Carlson (2024) who found that just in time increased the likelihood of enhancing supply chain performance. It was also postulated by Lazaridis and Dimitrios (2024) who averred that the management ought to engender just in time as a mechanism of helping to realize improved supply chain performance. Moreover, Dimitrios (2021) contended that the realization of supply chain performance depended on effective just in time. It is also worth noting that IMPs can assist to visualize the future changes in organizational financial prospects. The results have also been supported by Kaswan, et al (2019) who ascertained that just in time presented a positive linkage with supply chain performance.

Influence of FIFO on Supply chain performance of automobile industry in Kenya

The second objective of the paper examined the influence of FIFO on supply chain performance of automobile industry in Kenya. The simple regression analysis for the influence of FIFO on supply chain performance of automobile sector in Kenya was computed and the results presented in Table 8.

Table 8: Model Summary for FIFO and SUPPLY Chain Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826 ^a	.683	.6199	.01043

a. Predictors: (Constant), FIFO

Table 8 presents the model summary for FIFO and supply chain performance. The results demonstrate that approximately 68.3% ($R\text{-square}=0.683$) of the variation in supply chain performance in automobile industry in Kenya was explained by FIFO. The adjusted R-square of 0.6199 accounts for the number of predictors in the model, providing a more accurate measure of the presumed association. The standard error of the estimate was 0.01043 which reflected the average distance between the predicted and actual values of supply chain performance based on FIFO. The ANOVA results for FIFO and supply chain performance are presented in Table 9.

Table 9: Analysis of Variance for FIFO and Supply Chain Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.846	1	6.846	26.364	.000 ^b
	Residual	48.742	170	.2747		
	Total	54.588	171			

a. Dependent Variable: Supply Chain Performance
 b. Predictors: (Constant), FIFO

The results presented in Table 9 reveal that the regression model which included FIFO as a predictor variable was significant (F=26.364, p=0.000) and displayed goodness of fit. The results of the regression coefficient for FIFO and supply chain performance are presented in table 10.

Table 10: Regression Coefficients for FIFO and Supply Chain Performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.710	.510		3.350	.001
	FIFO	.659	.124	.657	3.716	.000

a. Dependent Variable: Supply Chain Performance

The second null hypothesis (**H0₃**) stated that there was no significant influence of FIFO on supply chain performance of automobile industry in Kenya. However, the regression coefficients of $\beta_2=0.657$ with the p-value of $0.000 < 0.05$ show that FIFO significantly influenced the supply chain performance in the automobile industry. The results also imply that for every unit increase in FIFO, the value of supply chain performance increased by 0.657 units. Taking the p-value as a point of reference (p=0.000), the null hypothesis was rejected and it was deduced that FIFO significantly influenced the supply chain performance of automobile industry in Kenya. This is congruent with Eroglu, et al (2022) who found that FIFO reduced the possibility of failure in the context of supply chain performance while Imetieg and Lutovac (2022) contended that FIFO ensured timely completion of procurement procedures. Kisioya and Moronge (2019) concurred that FIFO increased the possibility of enhancing supply chain performance.

CONCLUSION AND RECOMMENDATION

Conclusions

The paper examined the influence of IMPs on the supply chain performance in the automobile industry in Kenya. From the findings, it is concluded that just in time accounted for 61.5% of the variance in the supply chain performance of automobile industry in Kenya. Secondly, the paper concluded 68.3% of the variation in supply chain performance of automobile industry was influenced by FIFO.



Recommendations

Given that just in time and FIFO were found to be significantly related to supply chain performance, the automobile sector should adopt these inventory management practices in order to promote supply chain performance. It is also recommended that the automobile industry should consider combining different inventory management practices in order to create a significant impact in the supply chain performance in their organizations. For policy makers, it is recommended that the inventory management practices should be regularly reviewed to ensure that they are compliant with the logistics involved in the supply chain performance. For the customers, supply chain performance is seen as an area that influences their experience with the automobile industry and prospective customers should continually monitor and identify automobile dealers that have factored in JIT and FIFO as part of their inventory management practices.

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