International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Modern Distribution Channels in Multi-Echelon Supply Chain and Performance of Kenya's Manufacturing Sector

Benedict M. Kimwaki

PhD Candidate, Departmanet of Procurement and Logistics, School of Business and Entrepreneurship, Jomo Kenyatta University of Agriculture and Technology, Kenya
Email: *bekimwaki[at]gamil.com*

Abstract: ***This paper sought to establish the influence of distribution channels in multi-echelon supply chain on performance of the manufacturing companies in Kenya. Despite the merit surrounding the large manufacturing firms in Kenya, the performance of most of the firms has been declining over the recent past. While the decline of most of these companies have been blamed on factors such as poor management and increased competition, poor distribution systems have also been found to be major drivers of poor performance. The study employed a descriptive research design and targeted 454 large manufacturing companies in Nairobi. Purposive sampling was used to select 384 supply chain managers in these companies as the units of observation. The primary data was collected using questionnaires and SPSS was used to analysis the data in form of descriptive and inferential statistics. The study established that distribution channels had a positive and significant effect on supply chain performance of large manufacturing firms in Kenya. It was therefore concluded that the performance of the large manufacturing firms is highly dependent on the effectiveness of the distribution channels adopted as an aspect of distribution systems management. The study therefore recommended that there is need for large manufacturing companies to focus on enhancing the effectiveness of distribution channels and properly integrating them in order to enhance supply chain performance.***

Keywords: Distribution channels, Multi-echelon, Supply chain, Firm performance, manufacturing sector

1. Introduction

Distribution channel consists of a group of individuals or organizations that assist in getting the product to the right place at the right time. Distribution plays a vital role, primarily because it ultimately affects the sales turn over and profit margins of the organization. If the product can not reach its chosen destination at the appropriate time, then it can erode competitive advantage and customer retention. Most producers use intermediaries to bring their products to market. According to Flynn, Huoand Zhao (2010), they use a set of interdependent organizations in the process of making a product or service available for use or consumption by the consumer or business user. This process is what has been known as distribution channel. Kalubanga, Tumwebaze and Kakwezi (2012) noted that, distribution describes all the logistics involved in delivering a company's products or services to the right place, at the right time, for the lowest cost. In the unending efforts to realize these goals, the channel of distribution selected by a business play a vital role in this process. Well-chosen channel constitute a significant competitive advantage, while poorly conceived or chosen channel can doom even a superior product or service to failure in the market. Effective distribution provides customers with convenience in the form of availability (what, where, when-the right product, at the right place, at the right time), access (customers' awareness of the availability and authorization to purchase), and support (e.g. pre-sales advice, sales promotion and merchandising, post-service repairs).

The three major distribution approaches include the intensive distribution, selective distribution and exclusive distribution. Intensive distribution means that as may available outlets as possible hold this product, e.g. chocolate, newspapers, bread, etc. Intensive distribution will mean convenience to the customer and increase customer satisfaction. The sale of groceries in petrol and service stations is an example of how intensive distribution has grown (Croxton, Lambert, Dastugue & Rogers, 2012). Selective distribution is different in that some products are only available from some outlets, e.g. electrical appliances, certain brands of clothes and fashion products. Exclusive distribution is where possibly only one outlet in a certain geographic area supplies a product. This method of distribution usually relates to specialty products, e.g. special cars, specialist clothing, etc. often exclusive distribution is relevant to niche products (Melo, Nickel & Gama, 2016).

As noted by Katua (2014), that the manufacturing firms in Kenya have sought to adopt better supply chain practices including the distribution systems management to significantly enhance supply chain coordination. According to Chirchir (2015), adopting advanced methods of supply chain such as ICT integration, and inventory models which are aspects of distribution system management enhances adoption of practices such as information sharing so as to respond to customer requirement and enhance supply chain performance. The manufacturing sector is a significant contributor to Kenya's economy resulting in a 10% Gross Domestic Product, 12.5% exports and a 13% formal employment. The growth of the manufacturing industry has for years faced such challenges as growth due to challenges in the industry. The rise in increased output in the agro-processing industries has also facilitated growth in the manufacturing industry.

The supply chain managers have been faced with the dilemma of meeting customer needs in terms of quality and timeliness and saving on operational costs and holding inventory across their distribution centres. In Kenya, the large manufacturing companies have reported close to 32% decline in profits as a result of poor distribution systems which have seen their customer drop by over 40% while opting to other suppliers (GOK, 2016). According to Awad and Nassar (2010), lack of integrated supply chains has continually affected most of the manufacturing companies negatively by increasing the lead-time, increasing the held-up inventory and not meeting customer needs. Previous evidence has it that distribution system management is the answer to the supply chain problems of meeting customer needs, saving on operational costs and reducing lead time (Patriarca, Costantino & Di Gravio, 2016; Zhu, Liu, Chen, 2015). Integrating this process to minimize the inventory levels while at the same time reducing lead-time and meeting customer needs is the sole aim of distribution systems management. To address the existing gaps, this paper therefore sought to assess the influence of distribution systems management on supply chain performance in large manufacturing companies in Nairobi County, Kenya.

2. Literature Review

The paper is anchored on Social Network Theory. The social network theory dates back in 1930s in works by Moreno Jacob who sought to outlay how individuals and/or objects interrelate and connect to each other. The theory underpins the connection between nodes in a social system. Social networks have been defined as "a set of nodes (e.g. people or organisations) linked by a set of social relationships of a specified type" (Kong, 2011). A firm's position in its external networks may also be optimized through external process integration, which will facilitate the access to available external knowledge through the interactions. From this theory, the following framework is adopted.

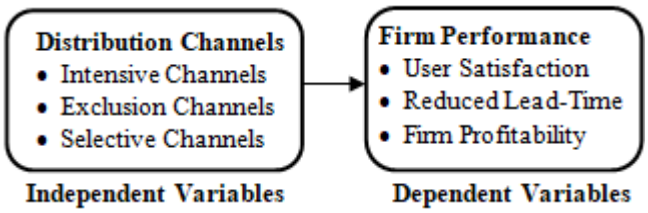

Figure 1: Conceptual Framework

Kaorapapong and Yenradee (2018) analysed the impact of pricing and inventory models with benefit sharing mechanism on supply chain performance. The study sought to assess how inventory models and pricing affected the supply chain performance. Their research was a case study and focused on plastic fashion accessory industry in Thailand. The scholars established that the inventory models such as Just-In-Time and manufacturer dominated policies influenced the flow of inventory thus determining the success of supply chain. Kaorapapong and Yenradee (2018) concluded that distribution systems are dependent on the inventory models through which

Achayo and Osodo (2017) carried out a study on the impact of distribution channel differentiation on organizational performance. The study sought to assess how distribution channels were differentiated and how this differentiation contributed to firm performance. The scholars focused on Sameer Africa in Nairobi Kenya and surveyed 120 staff members at the company and 90 dealers using correlational research approach. Their study found that distribution channels were key to organizational performance through which the products effectively get to the final user. Achayo and Osodo (2017) recommended that differentiation of the distribution channels play a critical role in winning the competitive advantage through coming up with cheaper and more effective modes of distributing the products to the final users.

Huo, Qi, Wang, and Zhao (2014) in a study on the impact of supply chain process integration on firm performance aimed at assessing how integration of various processes in a supply chain affects performance. Their study also analysed the moderating effect of competitive strategy. The scholars targeted 216 manufacturing entities in China and surveyed them in descriptive research approach. Their findings portrayed that through a well embraced and interconnected supply chain process where the manufacturers are properly linked with the distributors and the retailers all the way to the final consumers, the process becomes more effective thus promoting efficiency and customer satisfaction. Huo *et al.* (2014) view the main benefits of the integrated supply chain in terms of cost reduction, but also an increased value for the focal firm, its shareholders and members of it supply chain. Evans (2015) in a study on the impact of supply chain integration strategies on the performance of the pork processing industry in Rwanda shows that there is a positive relationship between internal factors, supplier and customer integration and a firm's performance.

3. Research Methodology

A descriptive research design method was adopted in the study. The method includes the phenomena explanation, proportion estimation of a population that contains similar characteristics and establishing the occurrence relationship relating to the variables under study (Myers, 2013).

The population targeted for the study incorporated of the large manufacturing firms (more than one branch, an annual turn-over of more than Kshs. 100 million or more than 50 to 500 employees) in Kenya (Waweru, 2018). According to KAM (2017), there are approximately 454 large manufacturing firms in Nairobi as at July 2017. The following sampling formula by Mugenda (2008) was adopted to obtain the appropriate sample size for the study.

$$n = \frac{Z^2pq}{d^2}$$

$$n = 384$$

The study adopted self-structured questionnaires to gather data from the respondents. Primary data was collected through the administration of questionnaires to the procurement or supply chain managers or their representatives at the manufacturing firms.

Mixed method of data analysis was applied in various stages of the study whereby both quantitative and qualitative techniques were adopted in the analysis. The acquired data was examined and scanned for any errors and later coded in the SPSS version 24 program. Through use of the coded data, the researcher generated statistical features such graphs, tables, and pie-charts which later was used in presenting the results of the study. Qualitative data was checked through and compared based on the relevancy and presented in form of explanations.

A multiple regression model was used to test for the relationship between the variables. The model combines the influence of the main independent variables on the dependent variable. The model was of the form;

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where;
Y = Supply Chain Performance of Large Manufacturing firms
β_0 = Constant Term
β_1= Constant regression coefficient representing the condition of the independent variable to the dependent variable (Beta coefficient)
X_1= Distribution Channels
ε = (Extraneous) Error term

4. Results and Discussions

The study had a sample of 384 respondents who were surveyed using structured questionnaires. Out of the 383 questionnaires issued, 259 questionnaires were dully filled and returned back for analysis. As shown on table 4.1, this represented a response rate of 67.6% which was considered to be adequate.

The study sought assess the influence of distribution channels on supply chain performance of the large manufacturing companies in Nairobi. The findings revealed that effective distribution channels influenced the ability of the companies to reach to a wide range of customers and meet their needs. The distribution channels determined the ability of the companies to have their products reach the end-users effectively hence the need for the channels to be chosen carefully.

Table 1: Level of Agreement with statements on Distribution Channels

Statement	N	Mean	Std. Dev.
The distribution channels adopted in our company are well thought to ensure effectiveness and avoid delays	259	3.89	1.01
The channels adopted are concentrated across all areas to cover any demand from our customers (intensive)	259	3.52	1.11
The channels adopted are limited to the demand of our products to reduce costs and wastage (exclusive)	259	3.64	1.11
The distribution channels are only adopted on the regions the management feels there should be (selective)	259	3.70	1.09
Through effective distribution channels our company has been able to reach to a wide range of customers and meet their needs	259	3.83	1.01

To affirm the statistical relationship between the independent variables and the dependent variable, a multiple regression model was used. The model was of the form:

$$Y=\alpha_0+\beta_1 X_1+\varepsilon.$$

The model summary, Analysis of Variance (ANOVA) and the regression coefficients were used to exemplify the results. According to Table 2 above, the value of R square is 0.747 which means that 74.7% variation in sustainable Supply Chain Performance wasdue to variations in Distribution Channels, with 25.3% of variation in sustainable Supply Chain Performance o being explained by other factors and not Distribution Channels. The significance value is .0000 which is less than 0.05 thus the model was statistically significant in predicting how Distribution Channels influenced sustainable Supply Chain Performance. Based on the regression results shown, holding Distribution Channels constant at zero, Supply Chain Performance would be 4.709. A positive unit change in Distribution Channels would lead to a 71.9% increase in Supply Chain Performance. At 5% significance level, distribution channels had a p=0.0000 which is <0.05, and hence the distribution channels have a direct and significant influence on supply chain performance.

Table 2: Model Summary for Distribution Channels

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.864[a]	0.747	0.746	.7513

Predictors: (Constant), Distribution Channels

ANOVA (Analysis of Variance)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	464.906	1	464.906	823.647	.0000[a]
	Residual	157.481	257	.5644		
	Total	622.387	258			

a. Predictors: (Constant), Distribution Channels
b. Dependent Variable: Sustainable Supply Chain Performance

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.709	.814		5.785	.0000
Distribution Channels	0.719	.149	.642	4.826	.0000

a. Dependent Variable: Sustainable Supply Chain Performance

The study sought to establish the role of distribution channels on the supply chain performance of the large manufacturing firms. The findings portrayed that out of the

three major channels of distribution (intensive, exclusive and selective channels), selective channels were the most applied among the large manufacturing firms. It was further established that the distribution systems adopted by the large manufacturing firms were well analysed to ensure that the right channels that were effective are selected thus steering the performance of the large manufacturing firms. The study found out that through well-established distribution systems, the firms were able to reach a wide range of customers as well as meeting their needs thus enhancing supply chain performance and the overall performance. The inferential analysis results revealed that distribution channels had a significant and positive impact on supply chain performance among the large manufacturing firms in Nairobi, Kenya.

5. Conclusion

The study concluded that distribution channels had an influence on the supply chain performance. Selective channels were the main distribution channel adopted by the large manufacturing firms which tells why they may not reach extensively to where their customers are since the distribution channel is not extensive to capture new markets.

6. Recommendations

The supply chain managers in the large manufacturing companies have the core duty of ensuring that the distribution channels adopted are effective, less costly and reliable. Through a well embraced intensive and exclusive distribution channels, the manufacturing companies are able to reduce the defectives while at the same time ensuring reaching to the furthest corner of their customers thus steering supply chain performance.

References

[1] Achayo, A., A., & Osodo, O. P. (2017). The Impact Of Distribution Channel Differentiation On Organizational Performance: The Case Of Sameer Africa Limited In Nairobi, Kenya. *International Journal of Business and Management Review* ,Vol.5, No.2, pp.1-11,

[2] Awad, H. A., & Nassar, M. O. (2010). Supply Chain Integration: Definition and Challenges. Retrieved from International Association of Engineers: http://www.iaeng.org/publication/IMECS2010/IMECS2010_pp405-409.pd

[3] Beheshti, M., Oghazi, P., Mostaghel, R., & Hultman, M. (2014). Supply chain integration and firm performance: an empirical study of Swedish manufacturing firms. *Competitiveness Review*, 24(1), 20-31.

[4] Benyoucef, L., Xie, X. & Tanonkou, G. A. (2013). Supply chain network design with unreliable suppliers: a Lagrangian relaxation-based approach. *International Journal of Production Research*, 51, 6435-6454.

[5] Bernado V. and Salido, L. (2018); Improving Order Lead Time: A Case Study. *Industrial Marketing Management*, Vol. 29 (1) pp. 37-44.

[6] Chauhan, S., & Mahadeo, J. (2016). Determinants of acceptance of ERP software training in business schools: empirical investigation using UTAUT model. *Int. J. Manage. Educ.* 14(3), 248–262

[7] Chirchir, M. M. K. (2015). Supply Chain Integration And Organizational Performance Of Commercial Banks In Kenya.

[8] Choi, T. Y., Dooley, K. J. & Rungtusanatham, M. (2001), "Supply Networks and Complex Adaptive Systems: Control versus Emergence," *Journal of Operations Management*, Vol. 19, pp. 351-366.

[9] Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13(3), 319–340

[10] Dombrowski, U. & Mielke, T (2014). "Lean Leadership – 15 Rules for a Sustainable Lean Implementation". *Procedia CIRP*. **17**: 565–570

[11] Evans, M. M. (2015*), Impact of supply chain integration strategies on performance of pork processing industry in Rwanda (case of German butchery in Kigali).* European Centre for Research Training and Development UK (www.eajournals.org).

[12] Flynn,B.,Huo,B.&Zhao,X.(2010).'Theimpactofsupplychainintegrationonperformance:Acontingencyandconfigurationapproach',*JournalofOperationsManagement*vol. 28,pp.58-71.

[13] Gürbüz, M., K. Moinzadeh, Y.P. Zhou. (2017). Coordinated replenishment strategies in inventory/distribution systems. *Management Science* 53 293–307.

[14] Huo, B., Huo, B., Han, Z., Han, Z., Prajogo, D., &Prajogo, D. (2016). Antecedents and consequences of supply chain information integration: a resource-based view. Supply Chain Management: *An International Journal*, 21(6), 661-677.

[15] Huo, B., Qi, Y., Wang, Z., & Zhao, X. (2014). The impact of supply chain integration on firm performance: The moderating role of competitive strategy. *Supply Chain Management: An International Journal*, 19(4), 369-384.

[16] Kalubanga,M.,Tumwebaze,S.,&Kakwezi,P.(2012).ExaminingtheEffectofMulti-ChannelProductDistributiononFirms'Performance.*InternationalJournalofEconomicsandManagementSciences* ,1(12),90-103

[17] Kaorapapong, C. &Yenradee, P. (2018) 'Impact of pricing and inventory policies with benefit sharing mechanism on supply chain performances.*European Journal of Industrial Engineering, Vol. 10*, No.40; 1-25.

[18] Katua, P. A. (2014). *The Impact of Supply Integration on the Supply Chain Performance in the Manufacturing Firms in Kenya* (Doctoral dissertation, School of Business, University of Nairobi).

[19] Kong, X. (2011), "Why are social network transactions important? Evidence based on the concertration of key suppliers and customers in China", *China Journal of Accounting Research*, Vol. 4 No. 3, pp. 121-133.

[20] Lwiki, T., Ojera, P. B., Mugenda, N. G. & Wachira, V. K. (2013). The Impact of Inventory Management Practices on Financial Performance of Sugar Manufacturing Firms in Kenya. *International Journal of Business, Humanities and Technology*, 3(5), 75 – 85

[21] Marklund, J. (2011). Evaluation of stock allocation policies in a divergent inventory system with shipment

consolidation. *European Journal of Operational Research* 211 298-309.

[22] Ohno, T. (1988), *Toyota Production System: Beyond Large-Scale Production*, CRC Press, ISBN 978-0-915299-14-0

[23] Olatunji, O.S. (2015) 'Adoption of information communication technology to enhnace suppy chain performance in Nigeria'. *African Journal of Business and Economic research*, 4(2), pp.73-84.

[24] Patriarca, R.; Costantino, F.; Di Gravio, G. (2016)Inventory model for a multi-echelon system with unidirectional lateral transshipment. Expert Syst. Appl. 2016, 65, 372–382.

[25] Ramachandran, G. & Neelakrishnan, S. (2017); An Approach To Improving Customer OnTime Delivery Against The Original Promise Date

[26] Sakwire, N., & Purindo, R. (2014). Multi-echelon distribution systems and supply chain effectiveness in South African Beverage companies. *Journal of supply chain and procurement*, 12(4); 109-126.

[27] Scheller, M. (2017). Optimal control of serial inventory systems with fixed replenishment intervals, *Operations Research*. 55, 674-687.

[28] Womack, J. P., Jones, D.T. & Roos, D. (1996), *Machine that Changed the World*, New York: Rawson Associates, ISBN 9780892563500

[29] Zaheer, Akbar and Geoffrey G. Bell (2005), "Benefiting from Network Position: Firm Capabilities, Structural Holes, and Performance," *Strategic Management Journal*, Vol. 26, pp. 809-825.

[30] Zhu, H., Liu, X., & Chen, Y.F. (2015). Effective inventory control policies with a minimum order quantity and batch ordering. *Int. J. Prod. Econ*,5, 168, 21–30.