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Dr. Ezekiel Kiriinya Akwalu

Jomo Kenyatta University of Agriculture and Technology

Corresponding Author's Email: akwalu04@gmail.com

Abstract

Purpose: The purpose of this study was to evaluate the moderating effect of inter- organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya.

Methodology: This research adopted a descriptive research design. The target population of interest in this study were the 22 local pharmaceutical manufacturing and 149 importing firms that act as subsidiaries making a total of 171. The study sample was drawn from the list of 171 pharmaceutical firms, where various categories with the relevant information for the study were drawn. The study adopted a census sampling technique. The data was analyzed using SPSS 22 version by making use of multiple regressions analysis which helped to generate a weighted estimation equation (OLS) that was used to predict values for dependent variable from the values of the independent variable.

Findings: The results showed that inter-organization systems significantly moderated the relationship between supply chain relationship management practices and organizational performance.

Recommendations: Based on the study findings, it was recommended that management in pharmaceutical firms should integrate their systems with those of customers such as electronic inventory management, electronic customer feedback; integrate electronic sharing of market information among other IT systems. This is because the study confirmed that integration of IT systems by pharmaceutical companies would lead to improvement in terms of speed and quality services, waste elimination, increased inventory management, responsiveness, accuracy, customer feedback and reduced lead-times.

Keywords: *moderating effect, inter-organization systems, performance, pharmaceutical firms*

1.0 INTRODUCTION

Pharmaceutical chains and relationships are centered on competing branded medicines and are exposed to complex interactions between various players such as government bodies, health-care providers and manufacturing firms (Goswami *et al.,* 2016). In the past, pharmaceutical firms did not adopt supply chain management concepts but today several factors are forcing pharmaceutical firms to change their traditional manners of conducting business (Ahmad *et al.,* 2012). Their supply chains are more complex and different from other industry supply chains as they handle a diversity of items in widely varying quantities in response to the large number of diagnosis types and procedures (AbuKhousa *et al.,* 2014), and also because they require the participation of different stakeholders such as pharmaceutical manufacturers, wholesalers, distributors, customers, information service providers and regulatory agencies (Rajesh *et al.,* 2016).

The pharmaceutical firms represented firms involved with the production and distribution of medicines or drugs for treatment of different types of ailments McKinsey, 2015). Pharmaceutical firms are involved in research, development, manufacture, marketing and distribution of pharmaceutical products that are globally regulated because of the unique nature of supply and demand (Rasekh *et al.,* 2012). Scientific and technological transformation occurs in the pharmaceutical industry that allow drug producers to produce new profitable medicines even in conditions of diseases that cannot be treated well today and have formerly persisted against all treatments (Gholamhossein *et al*, 2015).

In the United states of America (USA) pharmaceutical industry is currently facing unprecedented challenges caused by slower sales growth, expiring patents, increasing competition from generics, shorter product life cycles, tighter regulations, adverse media coverage, reputational damage and a decline in the number of new innovative drugs under development (ITA, 2016).The Australian pharmaceutical industry is highly fragmented but regulated by government regulatory agencies such as the Therapeutic Goods Administration (TGA) and state contracting bodies such as Health Purchasing Victoria (Vikram & Caroline, 2011). Indian pharmaceutical industry is becoming increasingly blurred with increasing complexity due to large customer base (Rasekh *et al*. 2012). China is the global leader in the supply of active pharmaceutical ingredients and serves manufacturers around the globe. In order to align and avoid shortages of key products, pharmaceutical supply chains to their objectives, many companies are adopting supply chain relationship management strategies for seamless, stable and visible supply chains (Huang *et al*., 2014).

Organizational performance in this context, refers to how well the organization is doing in meeting its vision, mission and goals. The measures of performance include profitability or return on investment, productivity, innovation and adaptation, increased market share and customer satisfaction among others (Cristina *et al.,* 2012). Global pharmaceutical industry has witnessed a rapid growth over the years and emerged as one of the fastest growing industries in the world. The value of the global pharmaceutical market was estimated to be $816bn in 2016 and is projected to grow to USD 1.3 trillion by 2020, representing an annual growth rate of 4.9 percent.

China pharmaceutical industry has been on steady growth to become the second largest in the world estimated to surpass USD 300billion by the end of year 2018 and was forecasted to grow to grow to USD 574 by 2022 (Jordana *et al*., 2019). The pharmaceutical industry in India has experienced rapid growth accounting for 20% of global exports in volume and the largest generic

medicines exporter (Guan & Rehme, 2012). The industry has been globally ranked third largest country in terms of production volume after USA and china (Jigeesh *et al*., 2016). The manufacturing market size was valued at USD 324.42 billion in 2018 growing at compound annual growth rate (CAGR) of 14% from 2021 to 2028. The total pharmaceutical sales in USA accounted for $333 billion constituting 1.9% of GDP and 10.7% of total healthcare expenditure in 2016 (International trade administration (ITA) (2016)**.** China is the second largest pharmaceutical market in the world, forecasted to grow from $108 billion in 2015 to $167 billion by 2020, representing an annual growth rate of 9.1 percent (ITA, 2016). In 2011, Germany pharmaceutical sector was the fourth largest worldwide after the United States, China and India with annual sales of 32.25 billion Euros (SESRIC, 2015). Mexico is Latin America's second-largest pharmaceutical market, and a leading producer of high-tech medicines including antibiotics, anti-inflammatory drugs, cancer treatment procedures, and others. In 2015, Mexican pharmaceutical sales reached US$11.7 billion, and are expected to grow to a level of US$ 20.1 billion by 2025

Tanzania imports about 70% of the national drug requirement and local production accounts for about 30%. The pharmaceutical sector in Tanzania consists of eight manufacturing industries all producing generic pharmaceutical products using imported active pharmaceutical ingredients from India and China (Ogulini & Shukrani, 2012). The pharmaceutical expenditure reached TZS900bn (USD442mn) in 2015, and is forecasted to grow by 13.1% to reach a market size of TZS1.02trn (USD463mn) by 2023 (BMI, 2016). Several global demographic and economic trends are driving pharmaceutical consumption, including a rapidly aging world population and an associated rise in chronic diseases, increased urbanization and higher disposable incomes, greater government expenditure on healthcare and growing demand for more effective treatment (International trade administration (ITA) (2016).

In Uganda as of December 2019, Uganda had a total of 19 sites licensed for the manufacture of medicines and health supplies although only 11 of these were involved in commercial production of pharmaceuticals (UNIDO, 2013). Kenya is the biggest maker of pharmaceutical items among COMESA countries controlling 50% of the regions market (Export Processing Zone, 2015, Pharmacy and Poisons Board, 2015). An estimate of the Kenyan pharmaceutical market by Business Monitor International (BMI, 2017) showed that expenditure on prescription medicines in 2016 was Ksh 32.3billion which constituted 90.7% of the total market. The drug distribution system in Kenya can be classified into public (government), NGO, and private channels. The private sector is served by distributors (distributing both imports and locally-manufactured goods) and directly by local manufacturers (UNIDO, 2012). The forecast of Kenyan market by 2020, is KES136.08bn (USD1.28bn), experiencing a compound-annual growth rate (CAGR) of 13.2% (BMI, 2016).

1.2 Objective of the Study

To evaluate the moderating effect of inter- organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya.

2.0 LITERATURE REVIEW

2.2.1 Socio-Technical Systems Theory

The theory was proposed by Trist (1981). Socio-technical systems theory stresses the need for social and technical systems to be developed simultaneously (Mitev, 1996), which is beneficial for

the development of triadic relationships between suppliers, a focal firm and customers (Crocitto & Youssef, 2003). According to the socio-technical systems theory, information technology (IT) connects individual organizations and creates effective networks by enabling the transformation process (Venkatraman, 1994; Kumar & Van Dissel, 1996). IT can facilitate efficient and autonomic supply chain information flows in relation to product availability, inventory levels, shipment status and production requirements (Bharadwaj, 2000), and can be used to coordinate collaborative planning, demand forecasts and production schedules among supply chain partners (Olesen & Myers, 1999; Chae *et al.*, 2005).

IT is an important driver of SCI because it allows information to be linked seamlessly and effectively (Handfield & Nichols, 1999). It also allows vital information to be captured, organized and shared within and across firm boundaries (Clemons *et al.*, 1993; Mabert & Venkataramanan, 1998; Frohlich & Westbrook, 2001; Vickery *et al.*, 2003). Systematic integration, electronic data interchange and enterprise resource plans are important elements of IT (Tarn *et al.*, 2002, Curran, 1991; Swatman *et al.*, 1994; Hill & Scudder, 2002).

The social technical systems theory supports the moderating variable; inter-organization systems; by stressing the importance of linking organizations through an IT support system to create interdependent through visibility for a successful outcome. Through proper IT systems efficiency and responsiveness is achieved thus creating a strategic fit critical to customer order fulfillment and significant cost reductions hence performance.

2.2.2 Empirical review

Haque and Islam (2013) investigated the effects of supply chain management practices on customer satisfaction from pharmaceutical industry in Bangladesh with the objective of finding out the influencing dimensions of SCM practices and empirically examine the conceptual framework of proposed relationships and customer satisfaction. A quantitative survey was carried out among the managers and executives of various drug manufacturers in the pharmaceutical industry of Bangladesh. The findings of the study indicated that SCM practices as observed in the industry comprise three dimensions, namely, collaboration and information sharing, logistics design and IT infrastructure. This study addressed supply chain management practices in relation to customer satisfaction while leaving out aspect of relationship management in relation to performance.

The study identified IT adoption as a useful tool in improving four primary operational areas, namely; transaction processing, SC planning and collaboration, order tracking, delivery coordination and material forecast without depicting relational antecedents to IT adoption process. This is echoed in other studies that underscore the fact that should various communication software, tools or technologies, such as, enterprise resource planning (ERP), electronic data exchange (EDI), decision support system (DSS), be in place, it would go a long way in enforcing a safe and seamless exchange of information across the supply chain; this would result into a reduction in costs and in lead time for the delivery of products to the customers, culminating into improved customer satisfaction. The study focused on customer satisfaction as the dependent variable while the current study focuses on firm performance as the dependent variable.

Singh *et al.*, (2012) studied the Influence of inter-organizational integration on business performance with the objective of investigating the mediating role of organizational level supply

chain activities on inter-organizational information systems (IOIS) and activity integration on business performance of retailing organizations within Australia. The study followed a causal research approach and survey methodology to collect data from the managers of food and hardware retailers. The study findings indicated that inter-organizational information systems (IOIS) and activity integration have positive effects on customer responsiveness and financial performance of organizations. Organizational-level supply chain functions mediate the relationships between IOIS and activity integration and customer responsiveness, as well as financial performance. The integration of IOIS and inter-organizational alignment (IOA) with supply chain partners helps organizations to attain supply chain benefits such as just-in-time delivery, warehouse and on-shelf inventory reduction, cost minimizations, supply chain flexibility and traceability. The results of the mediating effects suggested that, facilitating supply chain activities at organizational levels helps integration of information systems and activities could improve customer responsiveness and financial performance. The study was conducted among retailing firms in Australia, whose findings may not be generalized for the pharmaceutical industry for a developing nation like Kenya.

Dehui *et al., (*2014) studied Relationships between intra-organizational resources, supply chain integration (SCI) and business performance with the objective of exploring the effects of intra-organizational resources, including top management support (TMS) and information technology (IT), on inter-organizational capabilities including supply chain integration (SCI) with a focus on supplier integration (SI) and customer integration (CI) and business performance. The study adopted descriptive research methodology where data was collected using questionnaire and observations made during company visits and interviews. The findings empirically demonstrated that TMS and IT are two important intra-organizational resources that serve as vital enablers of SCI and have different effects on its different dimensions. The study, however, did not focus on firms in the Kenyan context, thus limiting the generalization of the findings.

Okore and Kibet (2019) studied the influence of information sharing on supply chain performance in the tourism industry in the county government of Kakamega, Kenya. The study aimed at determining the influence of collaboration and networking on supply chain performance of tourism industry in Western Region. An explanatory survey design was used. The target population comprised of 459 employees working in 4 licensed tour companies and 5 licensed hotels in Kakamega County. It was found that networking influences supply chain performance. The study concluded that information sharing influences supply chain performance of tourism industry. The research recommended that the supply chain department needs to adopt effective networking programs in order to enhance customer satisfaction and supply chain efficiency hence increasing access of information about the suppliers and the management of the hotels and tour companies should provide different collaboration programs in order to increase suppliers to collaborating with other suppliers so as to provide information for the hotels and tour companies about their customers. The study focused on tourism industry whose operations differ from that of the pharmaceutical industry, showing a scope gap. The current research focused on pharmaceutical firms in Kenya.

3.0 RESEARCH METHODOLOGY

This research adopted a descriptive research design. The target population of interest in this study were the 22 local pharmaceutical manufacturing and 149 importing firms that act as subsidiaries

making a total of 171. The study sample was drawn from the list of 171 pharmaceutical firms, where various categories with the relevant information for the study were drawn. The study adopted a census sampling technique. The data was analyzed using SPSS 22 version by making use of multiple regressions analysis which helped to generate a weighted estimation equation (OLS) that was used to predict values for dependent variable from the values of the independent variable.

Pearson correlation was used to test the association and strength of the variables at the significance 0.05, while the goodness of fit were tested using ANOVA on how variables were fitting. The regression co-efficient was used to test the relationship between independent variables and the dependent variable at 0.05 level of significance. The joint significance of all the independent variables were tested based on overall effect on the dependent variables. The findings were presented using tables since tables are user friendly and show response frequencies as well as percentages of respondent's opinions on the influence of supply chain relationship management on the performance of pharmaceutical firms.

The regression model for the moderator was as follows:

$Y=\beta_0+ \beta_1X_1*M+ \beta_2X_2*M + \beta_3X*M_3+ \beta_4X_4*M +\varepsilon$

Where M is the moderator.

Where:

γ=Performance of Pharmaceutical firms

$\beta 0$=Constant of Regression

X_1=Transparency

X_2=Resilience Building

X_3=Collaborative Planning

X_4=Process Alignment

$\beta_1, \beta_2, \beta_3, \beta_4$ = Beta coefficients and

M= Inter- organization systems

ε=Error Factor

4.0 FINDINGS AND DISCUSSION

4.1 Descriptive Results

The respondents were asked to rate the extent to which they agreed with statements in the questionnaires concerning inter- organization systems in their firms and the results presented in table 1.

Table 1: Descriptive Results for the Moderating Effect of Inter-Organizational Systems

Statement	no extent	small extent	moderate extent	large extent	very large extent	Mean	SD
our firm has integrated information systems	3.72%	11.90%	18.96%	45.35%	20.07%	3.82	0.91
We receive and process orders electronically	1.86%	6.32%	15.99%	44.24%	31.60%	3.64	1.00
We manage inventory electronically	1.49%	9.67%	20.82%	43.12%	24.91%	3.88	0.91
We receive Customer feedback electronically	3.35%	9.67%	18.22%	45.35%	23.42%	3.99	0.92
Our firm electronically share market information	1.86%	10.78%	19.70%	43.87%	23.79%	3.78	0.90
Our customers pay electronically	2.23%	13.01%	19.70%	40.15%	24.91%	3.90	0.92
Our firm electronically coordinate deliveries	2.97%	11.90%	16.36%	44.24%	24.54%	3.98	0.92
Our firm electronically undertake corrective actions	3.72%	8.92%	19.70%	40.52%	27.14%	3.94	0.94
Average						**3.88**	**0.91**

According to the results, 65.42% of the respondents indicated that their firm had customer integrated information systems (mean=3.82). This is highlighted by Mihalis and Michalis, (2016) that information technology (IT) integration between firms is an enabler of supply chain flexibility, agility and hence higher business performance. Further to this, Fredrik *et al.*, (2016) articulate that in order to achieve a more integrated business process collaboration, information technology is a key enabler. According to Wu *et al.*, (2015), product oriented strategic alignment require an alignment between IT strategy and business strategy in product development.

Majority of the respondents 75.84% indicated that their firms receive and process orders electronically to a large extent (mean=3.64). This is in line with Wu et al. (2015) who highlighted the significance of inter-organization systems in performing tasks such as receiving and processing orders, receiving customer feedback online among others to be the most valuable piece of management in businesses creating a competitive advantage. Linking operational activities of the firm and linking of inter-firm relationships require investment in IT to guarantee organizational performance (Tarafdar & Qrunfleh, 2016).

This statement also agrees with Younghoon *et al.,* (2019) on the importance of the IT in building the absorptive capacity which is the ability of the firm to recognize the value of new external knowledge, incorporate and assimilate it as well as apply it to commercial ends that builds and strengthens a firm knowledge capability which greatly contribute to innovation as a result of exploration and exploitation that influence firm's performance in their approach to innovation. In addition, majority of the respondents, 68.03% indicated that their firm manages their inventory electronically to a large extent (mean=3.88). This aligns with Ashir (2016) and Link & Back, (2015) postulation that linking various business strategies and relationships with IT systems such as enterprise resource planning (ERP) and electronic data interchange (EDI) provide a high level of supply chain process integration through internet-based applications. This statement agree with Roya and Nima, (2019) that linking business operations with IT is important for improvement of supply chain agility, cycle time reduction, attain greater efficiency and timely delivery of products to customers.

Further, 68.77% of the respondent indicated that they received customer feedback electronically to a large extent (mean=3.99). This is in line with Younghoon *et al.,* (2019) and Bessant *et al.,* (2013) that business agility allows firms to rapidly respond to customer demand in real time to compete strategically in a highly changing business environment. IT efficiency and business agility are key capabilities that firms must acquire to enhance competitive advantage of a firm. The study also revealed that 67.66% of the respondents indicated a large extent on the statement that their firm electronically shares market information (mean=3.78). This aligns well with Roya and Nima, (2019) studies that revealed IT implementation in the supply chain provide timely, accurate and reliable information for decision making and higher performance. The results also showed that 65.06% of the respondents confirmed the statement that their customers pay electronically to a large extent (mean=3.90) which is in line with Younghoon *et al.,* (2019 that inter-organizational link through IT systems helps a firm mitigate risk of losing control of vendors as well as behavioral, relational, and financial risks. Moreover, many respondents 68.78% of the respondents indicated a score of large extent on the statement that their firms electronically coordinate deliveries (mean=3.98). This is in line with Wu et al. (2015) Market-oriented strategic alignment findings that the alignment between IT strategies and business strategies are core to support of all market-oriented activities.

The results further revealed that 67.66% of the respondents indicated that their firms electronically undertake corrective actions to a large extent (mean=3.94). These statements are in line with operational excellence findings by Wu et al. (2015) that IT linkage offers a competitive advantage to a firm due to enhanced responsiveness and productivity improvements in productivity relative to its competition. This statement is in agreement with Aboobucker *et al.,* (2019) that strategic alignment arises as collaboration among business strategy, IT strategy, organizational infrastructure and process, information systems (IS) infrastructure as well as process domains. This

will lead to greater communication and exchange of ideas among different functional division and thus strategic alignment of manufacturing, marketing and other functional areas for better organizational performance (Sardana *et al.*, 2016). Further Roya and Nima, (2019) stated that by embedding IT into a supply chain system, a firm is can improve channel specific assets through effective information exchange and better coordination with supply chain partners. On a five-point scale, the average mean of the responses was 3.88 however, the answers were varied as shown by the standard deviation of 0.91 which mean that the majority of the respondents indicated a large extent with the statements that the better the IT to business strategy alignment the better the firm performance and the worse the alignment, the lesser firm performance. this is well in line with (Van Grembergen & De Haes, 2017) that Information technology (IT) in many organizations supports the sustainability and growth of their businesses. Therefore, according Roya and Nima, (2019) linking of business strategies, activities and building of relationships through IT systems is the basis for organizations to improve the process of supply chain management (SCM) systems.

4.2 Regression analysis before moderation

The study investigated the combined effect of supply chain relationship management on performance of pharmaceutical firms in Kenya.

Table 2: Overall Regression Analysis before Moderation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.628	.604	.4319

a. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.542	4	5.135	27.459	.000[b]
	Residual	49.250	129	.187		
	Total	69.791	133			

a. Dependent Variable: Performance of Pharmaceutical Firms

b. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

Coefficients

Variables	β	Std. Error	t	Sig.
(Constant)	1.023	0.285	3.589	0.000
Transparency	0.332	0.054	6.148	0.000
Resilience Building	0.308	0.060	5.133	0.001
Collaborative Planning	0.336	0.058	5.7931	0.000
Process alignment	0.180	0.055	3.2727	0.009

a. Dependent variable: Performance of Pharmaceutical Firms

Regression model before moderation

$Y = 1.023 + 0.336X_1 + 0.332X_2 + 0.308X_3 + 0.180\ X_4 + \varepsilon$

Where;

Y is performance of pharmaceutical firms

X_1 is Collaborative Planning

X_2 is Transparency

X_3 is Resilience Building

X_4 is Process alignment and

ε - Error term

The results in Table 2 presented the fitness of model of regression model used in explaining the study phenomena. Transparency, resilience building, collaborative planning and process alignment were all found to be satisfactory variables in the overall firm performance. This was supported by coefficient of determination the R square of 62.8%. This shows that Transparency, resilience building, collaborative planning and process alignment explain 62.8% of the firm performance. Further, the results implied that the independent variables are good predictors of firm performance. This was supported by a calculated F statistic of 27.459 which is greater than the critical F statistic of 2.46 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level. Thus, the ANOVA results indicated that the overall model was statistically significant.

Regression of coefficients showed that Transparency and firm performance were positively and significantly related (β=0.332, p=0.000). These findings were consistent with Brinkhoff *et al* (2015) whose results found positive and significant relationship between Transparency and firm performance. The results also revealed that resilience building and performance were positively and significantly related (β=0.308, p=0.001). These findings were consistent with that of Dick, (2014) who found out positive and significant association. The results revealed that collaborative Planning and performance were positive and significantly related (β=0.336, p=0.000). These

findings were consistent with those of Montoya-Torres (2014) whose results showed that collaborative planning had positive and significant relationship with firm's performance. Regression of coefficients also showed that Process alignment and performance were positively and significantly related (β=0.18, p=0.009). These findings were consistent with those Lin (2016) whose results found that process alignment has a positive and significant effect on performance of the pharmaceutical firms.

4.3 Moderation Regression Model

The objective of the study was to establish the moderating effect inter-organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya.

Table 3: Overall Regression analysis after Moderation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.829[a]	.687	.624	.4229

Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	22.582	4	5.646	31.541	.000[b]
Residual	47.034	129	.179		
Total	69.616	133			

a. Dependent Variable: Performance of Pharmaceutical Firms

b. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

Regression Coefficient

Variables	β	Std. Error	t	Sig.
(Constant)	2.577	0.129	20.021	0.000
Transparency _IOS(X_1*M)	0.022	0.013	1.725	0.006
Resilience building _IOS(X_2*M)	0.017	0.015	1.818	0.007
Collaborative planning_ IOS(X_3*M)	0.039	0.014	2.791	0.006
Process alignment _IOS (X_4*M)	0.005	0.014	0.332	0.040

a. Dependent variable: Performance of Pharmaceutical Firms

The R^2 improved from 62.8% to 68.7% after moderation. This implies that inter-organization systems moderate the relationship between supply chain relationship management and

performance of pharmaceutical firms in Kenya. The results imply that the overall effect after moderation is significant. In addition, F statistic increased from 27.459 to 31.541.

The régression of coefficient showed that inter-organization systems moderate the relationship between Transparency and performance of pharmaceutical firms in Kenya (β=0.022, p=0.006). The results further showed that inter-organization systems moderates the relationship between resilience building and performance of pharmaceutical firms (β=0.017, p=0.007). The results further showed that inter-organization systems moderates the relationship between collaborative planning and performance of pharmaceutical firms (β=0.039, p=0.006). The results further showed that inter-organization systems moderates the relationship between process alignement and performance of pharmaceutical firms (β=0.005, p=0.04).

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Summary of Findings

The fifth objective of the study was to investigate the moderating effect of inter-organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. In Kenya most pharmaceutical firms act as distributors importing directly from manufacturers overseas, arrange shipment of goods from country of origin and customs clearance and handle the domestic sales of the products. It is highly fragmented pyramidal structure, characterized by poor relationships with a few manufacturers and importers or subsidiaries at the top and a large but undefined number of retailers at the base.

However, Inter-organization systems have proved to be of rare importance with most firms integrating them in their operations. Of notable importance is the integration of the electronic customer feedback and inventory management which has improved the performance of the firms. Additionally, electronic coordination, sharing of market information and processing orders electronically is vital in pharmaceutical industry and these practices are highly associated with great performance. The regression results revealed that inter-organization systems moderated the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The R^2 improved after moderation. This implies that inter-organization systems moderate the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The results imply that the overall effect after moderation is significant. In addition, the F statistic increased.

The Null Hypothesis was rejected implying the existence of mediating inter-organization on performance of pharmaceutical firms in Kenya. The integration of IT systems is good and imperative for any company whether it is operating as a retailer, producer or wholesaler. Therefore, the pharmaceutical management should ensure effective and skilled IT personnel to integrate these practices in the operations of the firms which will aid in improving the performance margins of the firms.

5.2 Conclusion

The study concluded that there is a mediating effect of inter-organization systems on the performance of pharmaceutical firms in Kenya. Integrating information systems and improving the payments and client interactions have strengthened and eased the business processes of the firms making them easily achieve their performance targets. Inter-organizations systems improve

the processes of other variables like collaborative planning, process aligning, Transparency, resilience building among others hence contribute to performance improvements.

5.3 Recommendation

The management in pharmaceutical firms should integrate their systems with those of customers such as electronic inventory management, electronic customer feedback; integrate electronic sharing of market information among other IT systems. This is because the study confirmed that integration of IT systems by pharmaceutical companies would lead to improvement in terms of speed and quality services, waste elimination, increased inventory management, responsiveness, accuracy, customer feedback and reduced lead-times.

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