Effect of Logistic Service Reliability Capability on Performance of Manufacturing Firms: The Moderating Role of Supply Chain Linkages

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Abstract

Business organizations striving to improve their performance rely on several capabilities including logistic service reliability capability. However, there is also a need to understand how external variables may moderate the effect of logistic capabilities and performance. This study evaluated the moderating effect of supply chain linkages on the relationship between logistic service reliability capability and firm performance of manufacturing firms in Kenya. The study anchored on explanatory research design. A sample size of 442 firms was selected using stratified and simple random sampling approaches. The study established that logistic service reliability capability positively and significantly affects firm performance, subject to moderation by supply chain linkages. For the design of management system in a firm, there is need to integrate and improve the overall effects of logistic service reliability capability by incorporating supply chain linkages in the model. There is need for firm managers to understand and find ways to effectively manage the interactions between logistic service reliability capability and supply chain linkages in order to improve performance and meet the customer requirements satisfactorily. In many manufacturing firms especially in developing countries such interactions are rarely studied.

Keywords: Performance; Logistic Capabilities; Logistic Service Reliability Capability; Supply Chain Linkages

INTRODUCTION

Firm performance refers to the extent to which organizations achieve a set of pre-defined targets that are unique to its mission (Wamba *et al.*, 2017). To achieve better forms of performance, organizations pay attention to financial and non financial performance measures (Lau & Sholihin, 2005; Oztekin *et al.*, 2015). These measures include financial gains (profit margins, rate of return on assets and investment, revenue, shareholders returns etc), market shares, enhanced corporate social responsibility, improved customer service, improved employee stewardship etc (Torres *et al.*, 2018; Owens *et al.*, 2019). More often, objective financial or non financial returns are readily available in every organization in forms of regular interval firm reports. Thus, from research perspectives, it is possible to evaluate more accurate performance of the firms (Hope *et al.*, 2013; Sunder, 2016). However, in many practical situations, there is a challenge in obtaining accurate and reliable objective financial or even non financial data from the firms (Fawcett *et al*., 2017). Under such circumstances, perceptual or subjective financial and non financial measures may be applicable, which has been established to aptly correlate with objective financial and marketing data of firms. As a result, both financial and non-financial measures were used in this study to measure performance. Based on extensive work in literature, seven measures, namely, profit, sales' growth rate, operational costs, market share growth, customer

relationship and customer satisfaction can be applicable in measuring firm performance (Al-Matari *et al.*, 2014) and are justified in the current study as measures of firm performance.

Firms strive to achieve performance by focusing on different strategies aimed at improving the firm's competitive advantage (Yang *et al.*, 2011; Cegarra-Navarro *et al.*, 2019; Kolade *et al.*, 2019). Indeed firms strategies ought to be built upon the firms core capabilities in line with the resource-based view (RBV) (Hsu *et al.*, 2008). The capabilities correspond to proficiencies and amassed knowledge, executed by coordinating activities with regards to the firms' assets (Teece, 2018). Several forms of capabilities exist which are critical sources of competency and can distinguish a company's strength from its competitors. These include logistic, market interface, infrastructure and technological capabilities (Yang *et al.*, 2009). The firm's core logistic capabilities have been widely recognized (Stank *et al.*, 2017; Prajogo *et al.*, 2018; Sundquist *et al.*, 2018; Wei *et al.*, 2019) as one of the strategies to improve firm performance (Huang & Huang, 2012). As a result, several authors have reported significant association between logistic capabilities and firm performance (Joong-Kun Cho *et al.*, 2008; Benitez-Amado & Walczuch, 2012; Shou *et al.*, 2014).

Logistics services reliability form an element of supply chain management concerning designing, implementation, and regulation of forward, and backward flow as well as storage of goods, services, and related information (Franceschini & Rafele, 2000; Chapman *et al.*, 2002). The foremost activities of logistics services reliability capability include shipping of raw materials, distribution, warehousing, and quick deliveries of end-products to consumers. Logistics service reliability capability enables the logistics firms to generate and set out resources to satisfy their customers and in so doing enhance service performance (Lai, 2004). Nevertheless, the operational success of logistic service reliability capability of firms may be affected by other externalities.

Linkages in supply chain are conducted through an arrangement of individuals, organizations, resources, and technologies within the firm (Nallusamy *et al.*, 2016). In adopting to use supply chain linkages, firms intent to allows for explicit and implicit connections with suppliers and customers (Tokito, 2018). It is clear that a number of firms have achieved positive outcomes by engaging supply chain linkages. However, how supply chain linkages moderate the relationships between logistic capabilities and performance of firms has received less empirical studies. As a result, systems of individuals, organizations, resources, activities, information and resources link through supply chain to help in moving products or services from supplier(s) to customer(s) (Kurian, 2013). Thus, the overall objective of this study was to establish how logistic service reliability capability affect the overall firm performance and how these relationships are moderated in view of supply chain linkages. In doing so, the following hypotheses were tested:

H_{01}: There is no relationship between firms' logistic service reliability capability and firm performance

H_{02}: There is no significant moderation effect of supply chain linkages on the association between the firms' logistic service reliability capability and firm performance

Theoretical perspective

This study used the resource-based view (RBV) theory which affirm that firms can achieve and maintain competitive advantages by developing and positioning important resources and

capabilities of the firms (Barney, 2001; Schroeder *et al.*, 2002; Kraaijenbrink *et al.*, 2010). In the context of the RBV, firms are viewed in terms of positioning and use of the assets and capabilities to create value. Firms which ultimately achieve advantage are those capable of accumulating rare, valuable, non-substitutable and difficult to imitate resources and capabilities. Capabilities of the firms take diverse forms such as innovation, organizational learning, and stakeholder integration (Siguaw *et al.*, 2006). Importance of the resources of the form, the original form of RVB predict that competitive advantage results from those resources and capabilities that are possessed and controlled by a single firm. Nevertheless, one of the criticisms of the RVB rarely take into account firm's resources extending beyond their boundaries, which may also create a competitive advantage and should also be considered. There is a relatively large literature in logistics services reliability capability considering the realm of RBV. The RBV therefore can present a theoretical foundation for this study to examine the relationships between logistic service reliability capability and supply chain linkages and firm performance.

Conceptual Model of the Study

The conceptual model depicting the relationship between Logistic Service Reliability Capability is shown in Figure 1.

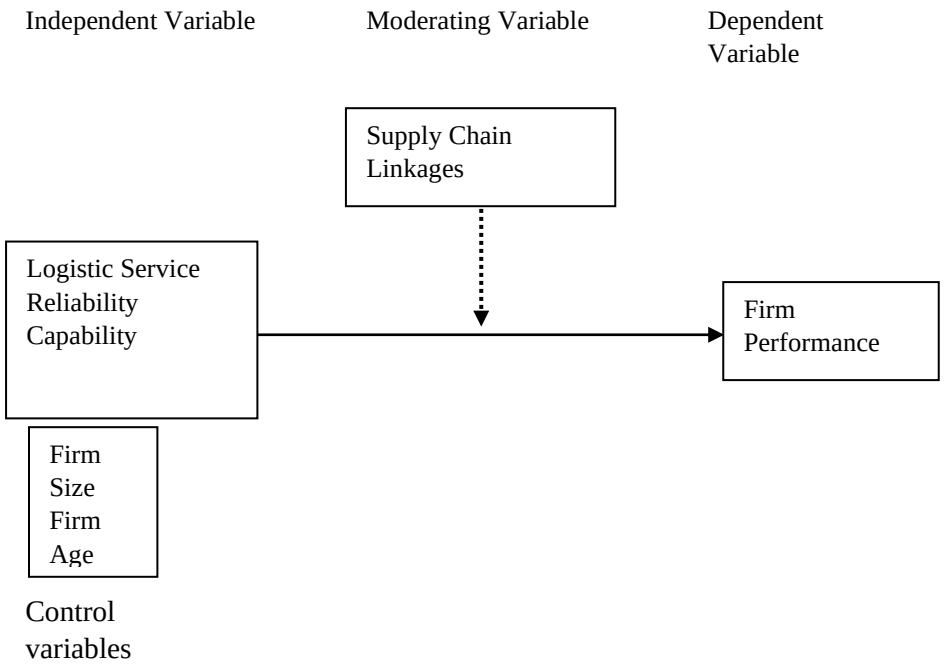

Figure 1: Conceptual Framework

METHODOLOGY

Research paradigm

The underlying issue in research paradigm the understanding of ontology, epistemology and methodology of research. This study adopted a positivist research paradigm. According the positivists, there exists a cause-effect relationship in nature between phenomena, which can be predicted with certainty (Garner *et al.*, 2016). The epistemological posture of positivists is that of objectivism of the existing phenomena and rarely affect what is being observed. Positivists assert that there are laws governing social phenomena where by applying scientific methods, laws can be formulated and factual inform presented. The methodology of the said paradigm attempts to solve a problem using the best possible ways relying on quantitative data (e.g, measurement, scaling, statistical analysis, questionnaires) and qualitative data (e.g., interviews, focus group discussion) to solve problems.

Research Design

The study adopted explanatory research design of a cross sectional nature. Explanatory research design analyses the cause-effect relationship between two or more variables (Leavy, 2017; Rahi, 2017). Hence the design was appropriate to the study because the research sought to establish a cause-effect relationship on the three constraints which is logistic service reliability capability, supply chain linkages and firm performance.

Population, Sample Size and Sampling

The study population was 750 manufacturing firms registered with Kenya Association of Manufacturers (KAM, 2018). The sample size for this study was computed using Borg and Gall (2014) formula which resulted to a sample size of 254 firms. The researcher targeted one purchasing and logistic manager in each of the selected firms. Thus, the total sample size was 508 respondents. Stratified sampling and simple random sampling technique were used to select the sample.

Research Instruments and Reliability

Structured questionnaires contain five-point Likert scale ranging from SD to SA was used to collect data for dependent, moderating and independent variables. The scale used in this study was adopted and modified to suit the context of this study.

The reliability of the research instrument was tested using the internal consistency technique by employing Cronbach Alpha value of 0.7. Internal and external validity was assessed to establish whether the research instrument truly measures what it is intended to (Patino & Ferreira, 2018).

Measurement of Variables

The dependent variable was firm performance measured using subjective measures of sales volume, profits, market share, customer satisfaction, customer loyalty and new products over the past three years as described in previous research studies (Farris *et al.*, 2010; Santos & Brito, 2012; Hill & Alexander, 2017). The independent variable for this study was logistic service reliability capability measured based on literature from previously published methods (Lu & Yang, 2010; Wilding *et al.*, 2012; Wiengarten *et al.*, 2014). The moderating variable was supply chain linkages which were determined followed previously published protocols (Shepherd & Günter, 2010; de Souza Miguel & Brito, 2011; Gopal & Thakkar,

2012). To reduce the effects of confounding variables, the study included two control variables vis: firm size.

Data Analysis

Metrics and score of attributes of the manufacturing firm performance, logistic service reliability capability and supply chain linkages were summarized using means ± Standard Deviation (SD). The normality of data distribution were computed using measures of skewness and kurtosis (Kim, 2013; Westfall, 2014). Pearson's correlations determined the interrelationships between logistic service reliability capability and firm performance (Bishara & Hittner, 2012). To test the degree of relationships between logistic service reliability capability and firm performance, together with the moderating effects of supply chain linkages, multiple linear regression models was applied (Wiley & Pace, 2015). The model was in the form as described:

For direct effect with control variables

$$FP = \beta_0 + \beta_1 FS + \beta_2 FA + \beta_3 LSRC + \varepsilon$$

For moderating role

$$FP = \beta_0 + \beta_1 FS + \beta_2 FA + \beta_3 LSRC + \beta_4 (LSRC * SCL) + \varepsilon$$

The assumptions of multiple regression analysis were adhered to (Williams *et al.*, 2013) and included: Linearity; normality (normal distribution, checked by skewness and kurtosis); multicollinearity in the data (degree of correlation between independent variables, checked by Tolerance and Variance Inflation Factor (VIF) where VIF < 10 and tolerance value > 0.2 signifies absence of multicollinearity (Lavery *et al.*, 2019); and Homoscedasticity (constant variance) of the errors, checked by looking at a plot of residuals versus predicted values. For all statistical analysis, significant was declared at $P < 0.05$.

RESULTS

Question Return Rate

From a total of 508 questionnaires, a total of 442 were returned which represent 87% return rate which is described as adequate. These response rates were considered very good when compared to the recommended response rates to verify consistency of measurements required for analysis of over 60% (Brace, 2018; Hendra & Hill, 2018).

Reliability of the Instruments

The alpha coefficient results of the reliability tests are shown in Table 1. Supply chain linkages had the highest reliability coefficient ($\alpha = 0.819$). Logistic service reliability capability had $\alpha = 0.724$ and the firm performance had a reliability score of ($\alpha = 0.757$). These response rates were considered very good when compared to the recommended response rates to verify consistency of measurements required for analysis of 0.7% (Taber, 2018). Therefore, all the items were included in the survey instrument and the data was used to draw conclusions from theoretical concepts.

Table 1: Construct reliability of the items in the questionnaire

	Cronbach's Alpha	
	Standardized items	Standardized items
Firm Performance	0.757	0.757
Logistic Service Reliability Capability	0.724	0.724
Supply Chain Linkages	0.819	0.814

Socio-demographic background

The overall results of the socio-demographic background of the respondents are presented in Table 2. There were a higher proportion of the males compared with females suggesting more male employees in the firms. Most of the employees (45.7%, n = 202) were aged 36 to 55 years followed by 26 – 35 years. The least but not last is 21.3% (94) are above 18 to 32 years; lastly, 1.4% (6) is above 63 years. In terms of educational status, 43.9% attained Bachelor degree, 27.9% Master degree, 18.3% Diploma, 3.6% (16) of the respondents have Certificate level of education. Majority of firms employed between 50 and 249 employees (46.4%) followed by > 250 employees (24.7%) while 5% had less than 10 employees. Finally, overall age of the firm indicated that most had been operational operation from 10 to 30 years followed by those operating between 51-70 years. The study further shows that 26.2% had operated for a period ranging from 51 to 70 years while 3.6% (16) were in operation for less than 10 years.

Table 2: Socio-demographic information (n = 442)

Socio-Demographic Attributes	Variable Attributes	Frequency	Percent
Gender (n = 442)	Male	235	53.2
	Female	207	46.8
Age	18-25 years	94	21.3
	26 – 35 years	140	31.7
	36 – 55 years	202	45.7
	< 55 years	6	1.4
Level of Education	Secondary school	5	1.1
	College Certificate	16	3.6
	College Diploma	81	18.3
	Bachelor degree	194	43.9
	Master degree	123	27.8
	PhD degree	23	5.2
No. of Employees	1-10	22	5.0
	11-49	106	24.0
	50-249	205	46.4
	> 250	109	24.7
Firm Age	< 10 years	16	3.6
	10-30 years	136	30.8
	31-50 years	85	19.2
	51-70 years	116	26.2
	> 70 years	89	20.1

Firm Performance

The overall score and metric attributes of the firm performance results are presented in Table 3. Statistics for normality indicated that the data obeyed normal distribution (Skewness and Kurtosis). The aggregated findings indicate that faster growth of the total sales volume (Mean = 4.3 ± 0.752), higher profits compared to that of main competitors (Mean = 4.24 ± 0.741), increased market share than main competitors (Mean = 4.43 ± 0.762). The firms also satisfied their customer on product quality compared with competitors (Mean = 4.38 ± 0.731), enhanced customer loyalty (Mean = 4.47 ± 0.61) and a high development of new products in the firm (Mean = 4.45 ± 0.672). The overall metric for firm performance was 4.33 ± 0.479 out of 5 which indicate very good performance.

Table 3: Metrics and score of attributes of firm performance

N = 422	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
Total sales volume has grown faster than that of our main competitors	1	5	4.30	0.752	-1.270	1.531
We have been achieving better profits compared with our main competitors	2	5	4.24	0.741	-1.084	1.614
Market share has increased faster than that of our main competitors	1	5	4.43	0.762	-1.483	1.661
We have achieved better customer satisfaction on product quality compared with our competitors	1	5	4.38	0.731	-1.352	1.819
There is a high level of customer loyalty with our customers	3	5	4.47	0.610	-0.692	-0.481
There is a high development of new products in our firm	2	5	4.45	0.672	-1.129	1.310
Mean firm performance			4.34	0.575		

Logistic Service Reliability Capability

Logistic Service reliability capability is characterized by the manufacturing firms' ability to create and deploy resources that would satisfy the logistic needs of their customers (Lai, 2004). The study therefore sought to establish the status of logistic service reliability capacity among manufacturing firms. From the findings in Table 4, the firms review failures due to client loss (Mean = 4.17 ± 0.908). The sampled manufacturing firms in Kenya engage in the identification of problem areas in the firm that have led to client loss due to poor services provision, timely delivery of the products and services. Once the weaknesses are inherent in the firm, the firm takes an affirmative action of identifying and the necessary action is taken with emphasis on meeting client specifications. The reason for this is that clients are the most important factor for the firms (Mean = 4.44 ± 0.742). Moreover, the firms search for prior solutions for logistic problems (Mean = 4.3 ± 0.701). This enables the manufacturing firms to identify problem before they actually occur by being pro-active. Besides, reverse logistics operations are developed by the firm (Mean = 4.21 ± 0.817). The implication is that the firms are more responsive to customers and are likely to exhibit higher productivity because of meeting customer requirements on time.

Firm differentiates its logistic service with that of competitors (Mean = 4.21 ± 0.807). Consequently, the firms are likely to attain an edge over rivals because of the uniqueness of

the service provision. Moreover, the firm creates solutions to specific situations and for specific clients (Mean = 4.17 ± 0.883). Emphasis is on meeting specific client requests so that they can exhibit customer satisfaction and loyalty. Furthermore, the firms simply the general logistic process (Mean = 4.37 ± 0.67). This has been made possible through the utilization of IT in decision making and when interacting with customers. In addition, logistic service reliability capability had a standard deviation ranging from 0.701 to 0.908 and skewness and kurtosis suggested that normality of the data ranged from -1.96 to + 1.96.

Table 4: Metrics and score of attributes of logistic service reliability capability

N = 442	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
Our firm Review failures due to the client loss.	1	5	4.17	0.908	-1.446	1.477
Clients are the most important factor to our company.	1	5	4.44	0.742	-2.214	1.684
Our firm search for prior solutions for logistic problems.	1	5	4.30	0.701	-1.084	1.548
Reverse logistics operations are developed by our firm.	1	5	4.21	0.817	-0.972	0.990
Logistic service is differentiated from our competitors.	1	5	4.21	0.807	-1.151	1.974
My firm creates solutions to specific situations and for specific clients.	1	5	4.17	0.883	-1.466	1.728
My firm simplifies the general logistic processes.	1	5	4.37	0.767	-1.532	1.179
Mean firm LSRC			4.20	0.579		

Supply Chain Linkages

Manufacturing firms engage in supply chain linkages since there are resources or capabilities that they lack which other members can furnish. Basing on the findings in Table 5, show that the customers jointly coordinate with the firm on production planning (Mean = 4.04 ± 1.021). The firms therefore incorporate customers' perspectives in the development of products. Similarly, the firm and its clients jointly do product development (Mean = 3.82 ± 1.066). As a result, the firms have a higher likelihood of outperforming competitors since customers are included during the onset of product development. Further, customers and their firm jointly identify opportunities for new markets (Mean = 4.04 ± 0.953). Besides, the firm carries out integrated management of demand with their customers (Mean = 4.14 ± 0.736).

In addition, the firm has joint link with suppliers on quality of the product (Mean = 4.3 ± 0.928) and shares its production plans with them (Mean = 4.06 ± 1.063). Besides, suppliers are allowed to contribute on product ideas (Mean = 4.18 ± 1.034). There is therefore a holistic approach in the development of products as perspectives of suppliers are included in product development. Also, suppliers participate in the design phase of products (Mean = 3.84 ± 1.072). Other than that, there is a high level of delivery and logistic communication with customers through information technologies (Mean = 4.13 ± 0.711). As well, the firm

has an integrated system for physical flow of the product with the firm among warehousing, production, packing and transport department (Mean = 4.21 ± 0.768). Finally, there is easy access to inventory levels in the supply chain (Mean = 4.35 ± 0.7). In general, the mean response for supply chain linkages was 4.1009, standard deviation 0.552, skewness -1.65 and Kurtosis 1.111.

Table 5: Metrics and score of attributes of supply chain linkages

Items	N	Mean	Std. Dev	Skewness	Kurtosis
Our customers jointly coordinate with my firm on production planning	442	4.04	1.021	-1.406	1.910
My firm and its clients jointly do product development	442	3.82	1.066	-0.964	0.516
Our customers and my firm jointly identify opportunities for new markets	442	4.04	0.953	-1.041	0.969
Our firm carries out integrated management of demand with our customers	442	4.14	0.736	-1.161	1.716
My firm has joint link with suppliers on quality of the product	442	4.30	0.928	-1.734	1.116
My firm shares its production plans with suppliers	442	4.06	1.063	-1.244	1.010
My firm allow suppliers to contribute on product ideas on product improvement	442	4.18	1.034	-1.419	1.643
Our suppliers participate in the design phase of our products	442	3.84	1.072	-0.990	0.539
There is a high level of delivery and logistics communication with customers (outbound) through information technologies	442	4.13	0.711	-1.139	1.021
Our firm has an integrated system for physical flow of the product within the firm among warehousing, production, packing and transport department	442	4.21	0.768	-1.274	1.608
There is easy access to inventory levels in our supply chain	442	4.35	0.700	-0.801	0.172
Mean firm supply chain linkages		4.05	0.651		

Correlation between Logistic Service Reliability Capability and Firm Performance

In this study, Pearson correlation analysis was conducted to examine the relationship between the variables (Jahangir and Begum, 2008; TohTsuihui *et al*., 2008). The Pearson's product moment of correlation coefficient, assesses the degree to which quantitative constructs are linearly related in a sample (Nikolić *et al*., 2012). Moreover, according to Wong and Hiew (2005), correlation coefficient value (r) range from 0.10 to 0.299 is considered weak, from 0.30 to 0.49 is considered medium and from 0.50 to 1.0 is considered strong. The findings in the Table 6 showed that logistic service reliability capability had a positive and significantly association with firm performance (r = 0.751, P <.05), which it had a positive and significantly correlated. Furthermore, the findings revealed that supply chain linkage was positively and significantly correlated with firm performance (r=.663,

p<0.05). This indicates presence of linearity in the data which give a foundation for regression model as indicated in the Table 6.

Table 6: Summary of statistical results and correlation for study variables

Variables	Firm Performance	Logistic Service Reliability Capability	Supply Chain Linkages
Firm Performance	1		
Logistic Service Reliability Capability	0.751**	1	
Supply Chain Linkages	0.663**	0.613**	1

**Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

Effects of Logistic Service Reliability Capability on Firm Performance

The regression test was done for both the controls and the independent variables (direct effect). The hypotheses tested the effect of logistic service reliability capability on performance of manufacturing firms in Kenya. The results of the study variables were presented in Table 7. The results indicated that the predictor explained 60.1% of the variation change on firm performance, where (R-squared = 0.601, Adjusted R-squared = 0.599). The findings also indicated that the coefficient of determination was significant as shown by (F = 220.282, p-value = <.000).

The hypothesis predicted that logistic service reliability capability has significant effect on performance of manufacturing firm. There was a statistical significance between logistic service reliability capability and performance (β = 0.707, *p-value* = < 0.000), ultimately leading to the rejection of prior formulated null hypothesis. Therefore, there is a statistically significant effect of logistic service reliability capability on firm performance. The findings concur with those of Yang *et al.*, (2009) who observed that logistic service reliability capability is a core competence in leading to superior performance and creating customer value. Similarly, both Lu and Yang's (2010) and Yang's (2012) were unequivocal that logistic service reliability capability facilitates the coordination of activities and makes use of resources for managing and integrating processes within supply chains which augment customer service performance. Logistic service reliability capability have also been previously equated to cost, quality, flexibility, delivery, and innovation, as drivers of superior firm performance (Wang *et al.*, 2015). The findings are also consistent with that of (Yang *et al.*, 2009) which established that liner manufacturing firms' logistics service capability can significantly lead to superior performance.

Table 7: Multiple linear regression statistics showing the relationship between logistic service reliability capability and performance of manufacturing firms

	Unstandardized Coefficients	Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
(Constant)	1.300	0.141	-	9.191	0.000		
Control							
Firm Size			-	-	0.000	0.557	
	-0.110	0.028	0.157	3.904		1.797	
Firm Age					0.000	0.539	1.856
	0.124	0.020	0.260	6.336			
Predictors							
LSRC					0.000	0.536	1.865
	0.702	0.031	0.707	22.83			
Summary statistics							
R	0.775a						
R Square	0.601						
Adjusted R^2	0.599						
Durbin-Watson	1.988						
ANOVA							
(F stat)	220.282						
Sig	0.000						

a Dependent Variable: Firm performance

Keyword: LSRC (Logistic Service Reliability Capability)

Moderating Role of Supply Chain Linkages on The Relationship Between Logistic Capabilities and Firm Performance

The hypothesis of the study postulated that, supply chain linkages have significant moderating effect on the relationship between logistic service reliability capability and performance; as it was ascertained by the results from Table 8, with the beta coefficient for supply chain linkages having (β = -0.1383, p-value = <.000). Therefore, the findings of the study rejected the null hypothesis and accepted that supply chain linkages significantly moderated the relationship between logistic service reliability capability and performance. This implies that the lower the emphasis on supply chain linkages, the lower the effect of logistic service reliability capability on supply chain innovation.

Table 8: Moderating effect of supply chain linkages on the relationship between logistic service reliability capability and performance

Predictors	Model (FP)	
	B	P-values
Employee	-0.1135	(0.000)
Firm Age	0.1191	(0.000)
LSRC	0.2880	(0.000)
SCL	0.1699	(0.000)
LSRC× SCL	-0.1383	(0.000)
R^2	0.7099	
F	177.4194	(0.000)

Level of confidence intervals in output: 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 5000

Keywords: LSRC (Logistic Service Reliability Capability); and SCL (Supply Chain Linkages).

CONCLUSION

This study tested a null hypothesis that there is no significant empirical relationship between Logistic service reliability capability and firm performance (H_{01}: There is no significant association between firms' logistic service reliability capability and firm performance). Moreover, we went further and postulated that the impending relationship was not moderated by supply chain linkage (H_{02}: There is no moderation effect of supply chain linkages on the association between the firms' logistic service reliability capability and firm performance). Whereas the study provided evidence of logistic service reliability capability significantly affecting firm performance, the relationship was significantly moderated by supply chain linkages. Other than that, the firms search for prior solutions for logistic problems and have ensured that reverse logistic operations are developed. Likewise, the manufacturing firms differentiate their logistic service with that of competitors and they are actively involved in creating solutions to specific situations and for specific clients. This will lead the firms meeting specific customers' needs, satisfaction and loyalty resulting in higher firm performance. Therefore, supply chain linkages provide a significant linkage on the relationship between logistic service reliability capability and performance.

Findings from this study extend the knowledge of logistic capabilities and firm performance frameworks in developing countries by considering the key dimension of logistic service reliability capability practices and moderating relationship of supply chain linkages. The research data strongly argue that for logistic service reliability capability to be successful, the consideration for supply chain linkages as a dimension is very significant.

RECOMMENDATIONS

Manufacturing firms need to improve their logistic service reliability capabilities so that they can enhance efficiency, quality service delivery, customer response and innovation within the firm in order to meet customer requirements satisfactorily. Emphasis should be on developing prior solutions for logistic problems and active involvement in creating solutions

to specific situations and for specific clients. Most importantly, manufacturing firms need to differentiate their logistic service with that of competitors so as to elicit superior firm performance.

The study introspection the evidence of highly varied and progressive moderating effect of supply chain linkages practices amongst manufacturing firms. Based on the current context supply chain linkages, managers should be appreciated as a resource and as a knowledge acquisition capability that can promise either temporary or sustainable superior performance of a firm, depending on whether the integrating variables are defensible. Managers should justify decisions that a firm makes to develop, strengthen, and protect linkages both at upstream and downstream of the supply chain. Even though the relational benefits of enhancing supply chain linkages are not easily quantifiable, the managers should understand that, these linkages can yield and can offer superior performance. While providing specific guidance as to what practices a firm should implement in linking with suppliers and with customers, conceptual development, strongly suggest a requirement for these practices.

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