DBA AFRICA MANAGEMENT REVIEW

VOLUME 12 NO 3
2022

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A Quarterly publication of the Department of Business Administration,
Faculty of Business and Management Sciences
University of Nairobi

ISSN NO: 2224-2023

http://uonjournals.uonbi.ac.ke/ojs/index.php/DBAAMR ISSN - 2224-2023
Sept 2022 Vol 12 No 3 Pgs 110-126

DBA Africa Management Review

Received Date
24/06/2022
Review Date
09/09/2022
Acceptance Date
17/09/2022

SUPPLY CHAIN INTEGRATION AND PERFORMANCE OF LARGE MANUFACTURING FIRMS IN KENYA

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Abstract

Intense competitive pressures have forced firms to go beyond their neighbourhoods to achieve competitive advantage. A feasible course of action for firms is embracing supply chain integration. However, there is concern as to whether implementing integration of supply chain leads to enhanced firm performance. Hence, the major aim of this research was to investigate the link connecting supply chain integration implementation and performance of large manufacturing firms in Kenya. In particular, the study examined the link connecting supply chain integration to firm performance. A cross-sectional descriptive research design was applied with primary data. From a sample size of 200 firms, 94 questionnaires were obtained to be usable resulting in a response proportion of 47%. The main data analysis method was partial least squares structural equation modelling (PLS-SEM). The study's findings show that supply chain integration significantly and positively affects organizational performance. The study confirms that supply chain integration can improve the performance of manufacturing firms in Kenya. This contributes to resolving the question of whether supply chain operations integration is beneficial for organizations. The study's conclusions are anticipated to give researchers guidance on the potential effects of supply chain integration deployment on organizational performance. This is particularly pertinent in the context of the developing world where such studies are scarce.

Key words: supply chain integration, firm performance, PLS-SEM

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Introduction

Intense competitive pressures have forced enterprises to go beyond their neighbourhoods to achieve competitive advantage. Sroka and Szántó (2018) argue that organisations have found themselves working in an environment which is rapidly changing due to globalization, vicious competition, diversification, rising demands and expectations of consumers and greater demand on corporate social responsibility. Fawcett, Magnan, and McCarter (2008) argue that the time may come when firms will have to choose which supply chain they are going to participate in since competition will be between supply chains. To succeed in this will require close collaboration among the participants in the interfirm activities within the supply chain. A means of achieving this is for them to integrate their operations; hence the concept of integration of supply chain.

Integration of supply chain is described as developing alliances between industries and other organisations in the supply chain so as to generate a resourceful and effective movement of information, resources, parts and materials to create valuable services and products for customers speedily and at low cost (Flynn, Huo, & Zhao, 2010). Koufteros, Verghese, and Lucianetti (2014) argue that supply chain integration can be used to achieve better behavioural response to some kinds of uncertainty through facilitation of lateral relations which advance coordination, collaboration and controlling of materials and information between supply chain members.

It is generally acknowledged that there are three aspects of integration of supply chain. These are supplier integration, integration of internal operations and integration of customers (Wong, Wong, & Boon-Itt, 2013). Supplier integration has been defined by Kim (2013) as an organisational process of purchasing and supplying entities applying and sharing strategic, operational and financial knowledge so as to create value for the participants. Pakurar, Haddad, Nagy, Popp, and Oláh (2019) contend that the key aim of integration of suppliers is to surpass any one organisation's boundaries in order to easily synchronise processes. Internal integration has been defined by Zhao, Huo, Selen, and Yeung (2011) as a collaboration and synchronisation of processes among functional departments of an organisation so as to meet expectations of customers. Wong, Lai, and Cheng (2011) note that integration of internal processes tears down functional departmental barriers, thus fostering sharing of information and strategic partnership, which in turn collaboratively develop and maintain measurement systems. Kim (2013) defines customer integration as the organisational practice of realising, explaining and use of customers in creating products which maximise their expectations and satisfaction. Lau, Tang, and Yam (2010) assert that the customer is the only person who has the ability to decide and to evaluate a product. This is because he or she has the probable buying power. Thus, the customer is a decision maker from a marketing viewpoint.

Firm performance or organizational performance is the extent to which an organization attains its financial and market goals in relation to the industry average, as defined by Green, Zelbst, Meacham, and Bhadauria (2012). It is the firm's performance at the strategic level, in contrast to operational performance which is at the process or work unit level. Shook et al. (2009) argue that a way of improving financial performance is to strategically forge closer relations with partners in supply chains to reduce supply and demand uncertainty.

For this study, the balanced scorecard (BSC) approach was used to measure firm performance. As Bhagwat and Sharma (2017) argue, BSC approach is superior to the traditional-based financial measures since it seeks to augment financial indicators of historical performance with those of desired future performance. BSC seeks to balance short-term versus long-term goals, non-financial versus financial metrics, internal versus external performance and leading versus lagging indicators.

Kaplan and Norton (1992) came up with the BSC, motivated by the need to place emphasis in the role of assets that are intangible in creation of value for a firm. BSC broadens performance measurement into four dimensions: internal, customer, financial, and learning and growth. The dimension of customer is concerned with value delivery to the customers while financial dimension is delivering value to shareholders. Internal dimension promotes effectiveness and efficiency in business processes while learning and growth is intended to sustain change capabilities and innovation through unceasing improvement and readiness for challenges in the future.

In this study, three dimensions; customer, financial and learning and growth were used for firm performance. For customer dimension, customer satisfaction measures were used (Banker & Mashruwala, 2007) while for financial dimension, operating income and total assets were applied since they show how different managers deploy their strategies to generate profit with the assets they have (Goel & Rhaki, 2013). For learning and growth, employee motivation was applied since motivated employees are likely to serve customers better. To complete the four dimensions of balanced scorecard competitive advantage measured the internal perspective but as a mediating variable.

Manufacturing firms are among the vital pillars of the economy in Kenya. It is vital for the attainment of Vision 2030 and it is crucial in job creation due to its backward and forward linkages with other sectors in the economy (Parliamentary Service Commission, 2018). According to the Big 4 agenda, policy interventions should raise the sectors' input to Gross Domestic Product (GDP) to 15 percent by the year 2022 as stated by Kenya National Bureau of Statistics (KNBS), (2018).

Manufacturing firms in Kenya contributed 7.6 percent to GDP in 2020 (KNBS, 2021). Manufacturing firms employ approximately 316,900 people representing 11.56 percent of formal employment and 2,933,900 labourers accounting for 20.22 percent of informal employment (KNBS, 2021). The sector's total employment averaged 18.9 percent, being second to the agriculture industry. According to KAM (2018), manufacturing share of GDP has averaged 10 percent from 1964 to 1973, rising marginally to 13.6 percent from 1990 to 2007 and dipping below 10 percent in recent years.

The continued weak performance of the sector is linked to a number of challenges. One of these is trade in illegal, inferior and counterfeit products which is a key hindrance experienced by manufacturing firms in Kenya today. Manufacturers lose forty percent of their share market; fifty percent of sales income and ten percent of goodwill because of the increase of counterfeit goods in the supply chain (KAM, 2018). A World Bank report (2018) on Logistic Performance Index (LPI) ranked logistical attractiveness of Kenya at number 63 in 2018, which is a deterioration from position 42 in 2016 when the World Bank conducted the survey last. Transport and related infrastructure and quality of trade are some of the measures in this index thus indicating infrastructural

challenges despite government's recent investment. In this environment of high institutional challenges, a firm that has integrated its supply chain is expected to do better than their competitors. The results of this research are expected to guide government strategy concerning institutional factors affecting manufacturing.

Literature Review

The study was anchored on resource-based perspective which posits that competitive advantage that can be sustained is possible if an organisation owns resources that are imperfectly imitable, rare, non-substitutable, and valuable (Barney, 1991; Halldórsson, Hsuan, & Kotzab, 2015). These resources can be grouped into three main groups: human, physical and organisational capital resources (Barney, 1991; Thoo, Tan, Sulaiman, & Zakuan, 2017). Human capital resources consist of capabilities of the workforce in terms of intelligence, training, experience, judgment and relationships. Physical capital includes technology, a firm's factory, assets, accessibility to raw materials and geographical location. Organisational capital are planning (formal or informal) and coordination systems of the firm, including intra-organisational and inter-organisational relations.

However, that a firm has these resources is no guarantee to competitiveness. It is the capability and decision-making prowess of an entity's management to organise and deploy these resources in an inimitable manner that is key to competitiveness (Boon-itt & Wong, 2011; Thoo et al., 2017). To achieve this internally, Fawcett, Osterhaus, Magnan, Brau, and McCarter (2007) posit that it entails disintegrating functional silos, information exchange between functions and the use of cross-functional teams. A number of researchers have taken the view that external integration is a resource that can be harnessed to the benefit of the focal firm. Rungtusanathan, Salvador, Forza, and Choi, (2003) argue that if an organisation develops linkages with customers and suppliers, the resultant connection should provide competitiveness to the organisation, to the extent that competitors have not formed such linkages. External integration enables cooperation among entities in the supply chain, including development of inter-organisational problem-solving routines, which resolve organisational goals and streamline business processes, leading to better operational performance (Yuen & Thai, 2017).

Halldórsson, Kotzab, Mikkola, and Skjøtt-Larsen (2007) contend that most supply chain management decisions are anchored on resource-based view, even if not directly. They posit that to counter changes and uncertainties in the external environment, firms establish arrangements among themselves to benefit from resource position barriers via these collaborative initiatives. This is especially true in circumstances of resource scarcity and/or stiff competition which makes firms appreciate that depending on internally generated resources only is not sufficient to achieve competitiveness.

A cause of low firm performance is uncertainty of demand and supply. A way of reducing uncertainty with suppliers is to forge closer relations, which can be actualised through supplier integration (Shook et al., 2009). On the demand side, uncertainty can be reduced through such initiatives as cultivating closer relationships with customers, which should ultimately lead to customer integration (Heczková & Stoklasa, 2010; Salam et al., 2017). Thus, it is expected that reduction of uncertainty or unpredictability in an organisation's supply chain through supply chain integration should result in improved performance.

Many researches have been carried out linking supply chain integration directly to organisational performance and the findings have not been consistent. Integration of supply chain was found to improve company performance in some studies (Yuen & Thai, 2017; Uwamahoro, 2018; Subburaj et al., 2020, Pakurar et al., 2019; Aduku & Ayertey, 2015;Wong et al., 2021, Hendijani & Saeidi, 2021). Other studies established a positive influence for some dimensions of supply chain integration while other dimensions had non-significant effect (Huo, Qi, Wang, & Zhao, 2014; Tarifa-Fernandez & De Burgos-Jiménez, 2017). Yet other studies found the connection linking supply chain integration implementation to performance to be insignificant (Danese & Romano, 2010; Han et al., 2007). Zhao et al. (2015), found that, too little or too much supply chain integration can have adverse effects on performance. This inconsistency on the role of integration of supply chain on organisational performance is thus a gap in knowledge. Another gap is that a number of researchers used only one or two aspects of supply chain integration as indicators of the explanatory variable (Huang et al., 2014; Kim, 2013, Yu, Huo, & Zhang, 2021). This study, therefore, proposed that introduction of supply chain integration in an organisation will enhance its performance.

Research Methodology

Cross-sectional research strategy was applied in this study. This research approach is appropriate if the general aim of the research is to examine if there are significant or notable associations among the variables at a given point in time (Teo, Wei, & Benbasat, 2003; Mugenda & Mugenda, 2003). The key goal of this research was to determine whether there is a connection linking supply chain integration to firm performance. Data was gathered across sampled firms at essentially the same point in time.

Large manufacturing firms in Kenya formed the population of this research. The research adopted the KAM classification that considered a large manufacturing firm to have one hundred employees or more. According to Kenya Manufacturers and Exporters Directory ((KMED), 2019), there were 679 such firms. The major rationale for choosing large scale manufacturing firms is that they have a high likelihood of exhibiting an elaborate supply chain management (SCM) strategy and practice of supply chain integration (Bolo, 2011). This is because they are likely to have existed for a longer period relative to the smaller ones and have experimented with various management styles.

To find the sample size, the study applied a suggestion by Hopkins, and Kuppelwieser (2014) for studies which use partial least squares structural equation modelling (PLS-SEM) approach. In this case it recommends the use of N:q ratio whereby N is number of cases while q is number of model's parameters. Jackson (2003) avers that the ideal ratio should be 20:1. This study has six parameters, β_1- β_6, as illustrated in Figure 1 in the overall research and hence the sample size was 20 x 6 = 120. The overall study had four objectives of which this article addresses only one objective whose specific parameter is β_1.

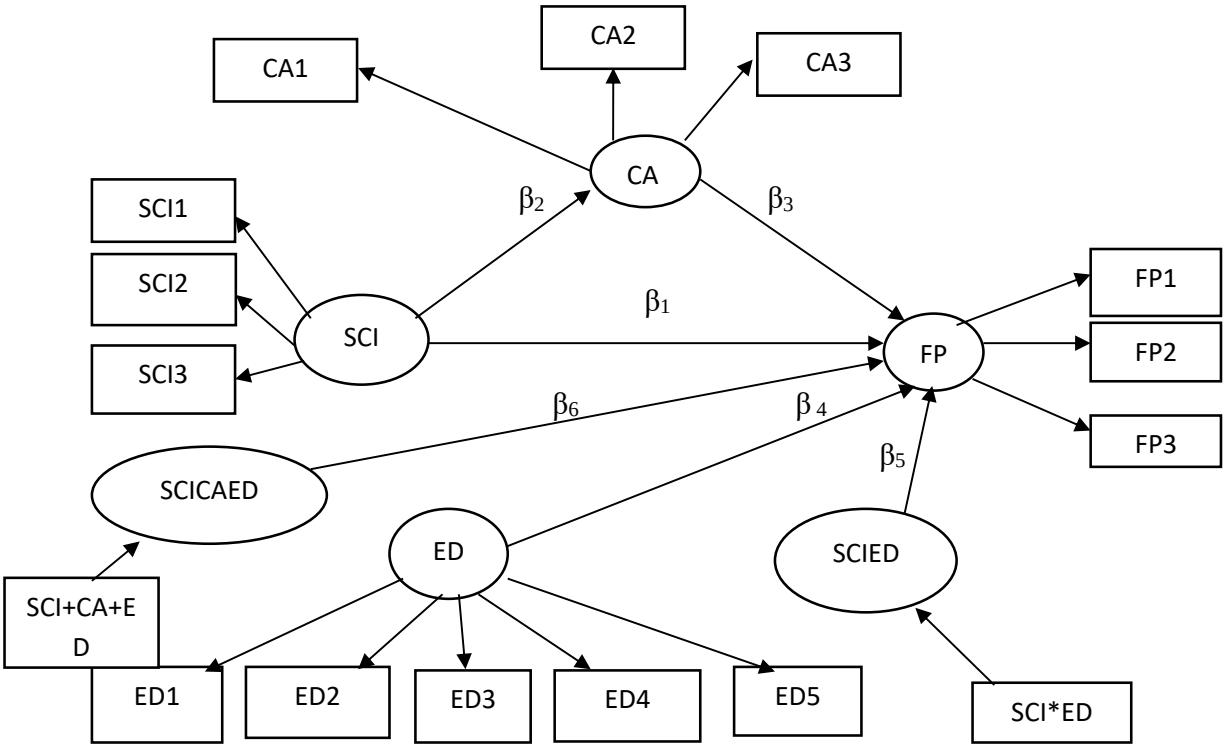

Figure 1: Overall Partial Least Square-Structural Equation Model Diagram of the Study

Israel (1992) asserts that on average 10% of respondents cannot be reached while 30% may not respond resulting in a total of 40%. Hence, to achieve a usable sample size of 120, the number of firms targeted were inflated by dividing 120 by (1 minus 0.4) which results in 200. Figure 2 below displays the path diagram for the link connecting supply chain integration to firm performance. Where SCI is supply chain integration, SCI1 is supplier integration, SCI2 is internal integration, SCI3 is customer integration, FP is firm performance, FP1 is financial performance, FP2 is employee motivation and FP3 is customer satisfaction.

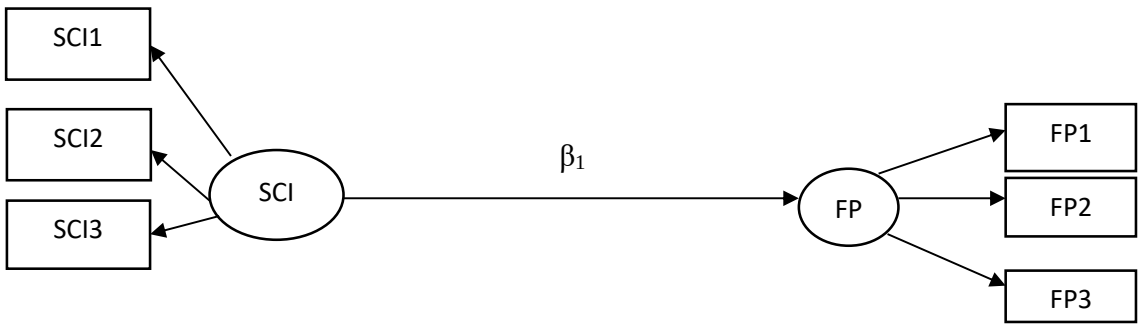

Figure 2: Path Diagram for the Connection Linking Supply Chain Integration to Firm Performance

Results

Out of 200 questionnaires administered to the research participants, 111 were returned. This represents a response proportion of 55.5%. As argued by Mugenda and Mugenda (2003), a response proportion of 70% is excellent, 60% is good and 50% is adequate for study. However, other researches have indicated that outcomes from studies with rate of response of 20 percent or even lower were not any statistically significant different from those of larger response proportion (Curtin, Presser, & Singer, 2000; Keeter, Kennedy, Dimock, Best, & Craighill, 2006). A detailed analysis of the questionnaires found that 17 of them were not useful for further study (8 had inconsistent responses, 5 had straight lining responses, 3 were not fully filled and 1 indicated more than one sector). Therefore, the useful questionnaires were 94 which represent a revised response rate of 47%.

Sampling adequacy and sphericity tests were carried out to assess suitability of factor analysis. To evaluate sampling adequacy, Kaiser-Meyer-Olkin (KMO) measures were used. According to Kaiser (1974), KMO values lower than 0.5 are not acceptable. Bartlett's test of sphericity was applied to assess for dimension reduction. This is possible if p values <0.05. All KMO measures were established to be more than the required minimum and their p values were <0.05. This indicates that all constructs are statistically significant. All the KMO for latent variables for supply chain integration and firm performance were from 0.500 to 0.868. The scales' Cronbach's Alpha for variables of supply chain integration were from 0.783 to 0.857 which are greater than the minimum required threshold of 0.7 hence internal consistency is confirmed. Table 1 displays the outcomes.

Table 1 Cronbach Alpha Test Outcomes for Measuring Internal Reliability of Questionnaire Item for Supply Chain Integration

	Variables	Cronbach's Alpha
1	Supplier Integration	0.783
2	Internal Integration	0.848
3	Customer Integration	0.857

Source: Researcher (2022)

Additionally, confirmatory factor analysis was done to determine unidimensionality. The outcomes are displayed in Table 2. It can be observed that the respective indicators of a particular latent variable loaded more heavily on their constructs than on any other construct. This therefore, implies that unidimensionality of the constructs is established.

Table 2: Confirmatory Factor Analysis Results for All Indicators and Constructs

Indicator	Supply Chain Integration	Firm Performance
Supplier Integration	**0.742**	0.264
Internal Integration	**0.900**	0.486

Customer Integration	**0.906**	0.557
Financial Performance	0.284	**0.620**
Employee Motivation	0.463	**0.877**
Customer Satisfaction	0.475	**0.777**

Source: Researcher (2022)

The next step in the analysis was to subject the two latent variables integration of supply chain and organizational performance to reliability and validity tests. The outcomes are displayed in Table 3. Each of the indicators of the two latent constructs have individual outer loadings which are above 0.7 except for financial performance with 0.512. However, Hulland (1999) contends that outer loading values should be carefully examined for the effect of subconstruct removal on the content validity. In particular values between 0.4 and 0.7 should be retained for purposes of content validity. In any case, the T statistics and P values show that this construct is statistically significant at 5% level ($T = 2.906 > 1.96$, $P = 0.004 < 0.05$).

Table 3: Reflective Outer Model

Indicators	Loadings	Indicator Reliability	T-statistics	P-Value
Financial Performance	0.512	0.262	2.906	0.004
Employee Motivation	0.897	0.805	24.332	0.000
Customer Satisfaction	0.840	0.706	14.352	0.000
Supplier Integration	0.724	0.524	10.620	0.000
Internal Integration	0.907	0.823	41.106	0.000
Customer Integration	0.909	0.826	51.054	0.000

Source: Researcher (2022)

The values for composite reliability and Cronbach's Alpha were useful in evaluating internal consistency reliability and outcomes are presented in Table 4. It can be observed that the composite reliability values of the two variables are both larger than the minimum required of 0.7 (Hair et al., 2011). It can also be noted table that the Cronbach's Alpha for firm performance is higher than the required minimum value of 0.7 and for supply chain integration is within the acceptable level of between 0.5 and 0.7 (Nunally, 1994). Hence internal consistency reliability is established.

Table 4: Cronbach's Alpha, Composite Reliability, and AVE of Latent Variables

Latent Construct	Composite Reliability	Cronbach's Alpha	Average Variance Extracted
Supply Chain Integration	0.804	0.631	0.590
Firm Performance	0.886	0.817	0.724

Source: Researcher (2022)

Convergent validity was evaluated using average variance extracted (AVE) and confirmatory factor analysis (CFA). Table 5 displays the outcomes of CFA on the evaluation of convergent validity. The cross-loadings of indicator items to their corresponding latent variables are higher than for other constructs except for financial performance (FP1) which will be retained for the purpose of content validity. Table 4 shows that the AVEs values for the two latent variables are higher than the required minimum value of 0.5 and hence convergent validity is established (Hair et al., 2021).

Table 5: Confirmatory Factor Analysis Outcomes

Indicators	Firm Performance	Supply Chain Integration
Financial Performance	**0.512**	0.283
Employee Motivation	**0.897**	0.467
Customer Satisfaction	**0.840**	0.482
Supplier Integration	0.254	**0.724**
Internal Integration	0.498	**0.907**
Customer Integration	0.562	**0.909**

Source: Researcher (2022)

Discriminant validity was evaluated by use of three criteria which are cross loadings, Fornell-Larcker criterion and Heterotrait-monotrait (HTMT) ratio (Henseler et al., 2014). It can be observed from Table 5 that the two constructs load more heavily on their indicators than on any other except one value of financial performance. Table 6 displays the Fornell-Larcker test results.

Table 6: Fornell-Larcker Test Analysis Results

Latent Construct	Firm Performance	SCI
Firm Performance	**0.768**	
SCI	0.548	**0.851**

Source: Researcher (2022)

The square root of AVE for the latent variable firm performance of 0.590 is 0.768. This value exceeds the correlation value in the firm performance column (0.548). Likewise, the square root of AVE (0.851) for the latent

construct supply chain integration is higher than the correlation level in the supply chain integration row (0.548). These results show that discriminant validity is established. Additionally, the HTMT value for the link connecting supply chain integration to firm performance construct is 0.709. This value is less than the maximum required of 0.85 as averred by Hair et al. (2021). These two results imply that discriminant validity is established.

Overall model fit was tested by use of the standardized root mean residual (SRMR). The root mean square difference between the observed correlations and the implied correlations in the model is known as SRMR (Henseler et al., 2014). Since it is an absolute measure of fit, a value of zero is an indication of a perfect fit. Therefore, as a rule of thumb, a model having a value lower than 0.1 is taken to have a good fit. The SRMR value obtained from Smart PLS for this model was 0.105 which is marginally higher than 0.1. Bootstrapping with 500 resamples was carried out to verify the significance of this value and was established to be significant at 5% level since T statistic is higher than 1.96 and P value is less than .05 (T = 7.752, P = 0.000). This implies that the model has a good fit. Table 7 exhibits the outcomes of significance of SRMR.

Table 7: Composite Model SRMR Results

Original Sample	Sample Average	Standard Error	T - Statistic	P- Statistic
0.548	0.565	0.071	7.752	0.000

Source: Researcher (2022)

Blindfolding procedure was used to assess predictive relevance of the model. The acceptable level of Q^2 value is required to be greater than zero for an endogenous variable (Chin, 1998). For this model, Q^2 equals 0.162 (Figure 2). This figure is higher than zero and hence predictive relevance for the model is affirmed.

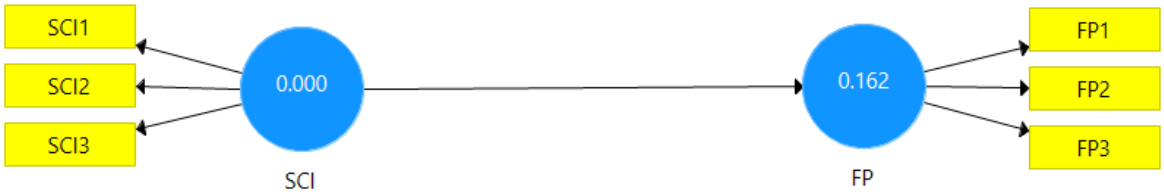

Figure 2: Structural Equation Model having Q^2 Value

Source: Researcher (2022)

After assessing validity and reliability of the measurement and structural models, coefficient of determination (R^2) is interpreted next. Also, the path coefficient is interpreted. From Figure 3, it is observed that R^2 is 0.300 for the firm performance construct. This implies that variation in supply chain integration accounts for 30% of the variation in firm performance. Peng and Lai (2012) contend that R^2 values of 67 percent, 33 percent and 19 percent represent substantial, moderate and weak variances in that order. Hence it can be concluded that the percentage variation in firm performance that

is explained by integration of supply chain falls in the moderate range.

Hair et al. (2021) argues that the effect size of an exogenous variable which is the drop in R^2 if the variable is not included in the model are as follows; f^2 levels of 0.35, 0.15 and 0.02 show that an exogenous variable has a high, moderate or low predictive relevance in that order for a given endogenous variable. For this model the f^2 value is 0.429 which means that integration of supply chain has a large predictive impact on organizational performance. Hypothesized connection linking supply chain integration to organizational performance results in a path coefficient of 0.548. This path coefficient is significant (T=7.752, p=0.000) as indicated in Figures 4 and 5

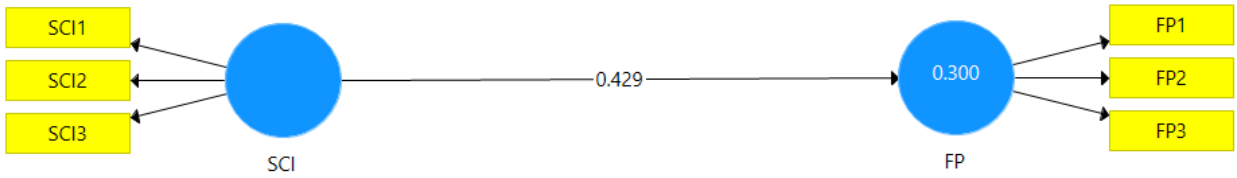

Figure 3: R^2 and f^2 Values for SCI and FP

Source: Researcher (2022)

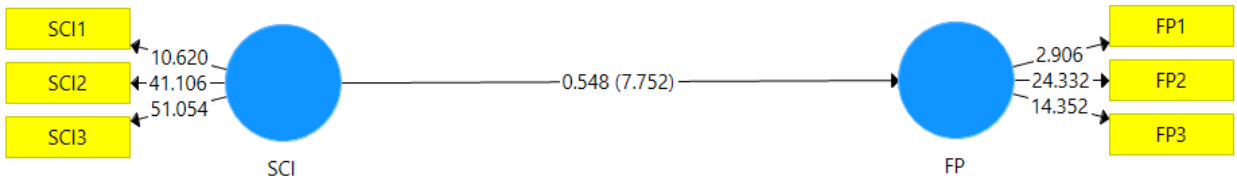

Figure 4: Path Coefficient and T Statistic for SCI and FP

Source: Researcher (2022)

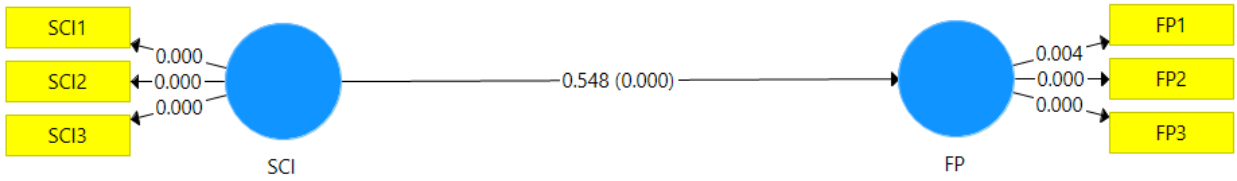

Figure 5: Structural Equation Model having Path Coefficient and P-values

Source: Researcher (2022)

Discussion

From the findings of the research, supply chain integration implementation had a significant positive influence on firm performance. These outcomes agree with conclusions of other researches (Aduku & Ayertey, 2015; Yuen & Thai, 2017; Uwamahoro, 2018; Pakurar et al., 2019; Sabburaj et al., 2020). The research adds to the body of knowledge in this area of the positive link connecting integration of supply chain to firm performance. This therefore is a step in decreasing the uncertainty linked to previous researches that have resulted in contradictory outcomes on whether supply chain integration implementation is beneficial or not to a company (Huo, Qi, Wang, & Zhao, 2014; Danese & Romano, 2010; Tarifa-Fernandez & De Burgos-Jimenez, 2017).

Another insight of the present research is that supply chain integration was broken

down into its three elements. Past studies either took supply chain integration to be a unidimensional variable (Beheshti et al., 2014a; Hanif et al., 2018); others broke it down into two constructs of internal and external integrations (Zhao et al, 2015; Yuen & Thai, 2017); yet others had only a subset of integration of supply chain (Huang et al., 2014; Huo, 2012; Danese & Romano, 2011). Supplier integration, internal integration, and customer integration were the three components of supply chain integration.

Supplier integration enables purchasing and supplying entities to share strategic, operational and financial knowledge so as to add value to the participants (Kim, 2013). The key aim of supplier integration is to surpass any one organisation boundaries in order to easily synchronise processes (Pakurar et al., 2019). Integration of internal processes tears down functional departmental barriers, thus facilitating sharing of information so as to meet customer expectations (Zhao et al., 2011; Wong et al., 2011). Finally, implementation of customer integration enables the participation of customers in product creation so as to maximise their expectations and satisfaction (Kim, 2013). As Lau et al. (2010) argue, the customer is the only person who has the ability to decide and evaluate a product.

The study also used a more encompassing measure of firm performance through the balanced scorecard as advocated by Kaplan and Norton (1992). The balanced scorecard seeks to address both financial together with non-financial indicators of performance. The financial indicators used in this study were percentage change in operating income and percentage change in assets while the non-financial measures were employee motivation and customer satisfaction. This is consistent with Bhagwat and Sharma (2017) who argued that the balanced scorecard approach is superior to traditional-based financial measures since it seeks to complement financial indicators of historical performance with those of desired future performance.

The link connecting supply chain integration implementation to firm performance was premised on resource based anchored on resource-based perspective which posits that competitive advantage that can be sustained is possible if an organisation owns resources that are rare, non-substitutable, valuable and imperfectly imitable (Barney, 1991; Halldórsson, Hsuan, & Kotzab, 2015). These resources can be grouped into three main groups: human, physical and organisational capital resources (Barney, 1991; Thoo, Tan, Sulaiman, & Zakuan, 2017). Human capital resources consist of capabilities of the workforce in terms of intelligence, training, experience, judgment and relationships. Physical capital includes technology, a firm's factory, assets, accessibility to raw materials and geographical location. Organisational capital are planning (formal or informal) and coordination systems of the firm, including intra-organisational and inter-organisational relations.

Conclusion

A key conclusion of this research is that if a firm implements supplier, internal and customer integrations, it will enhance its firm performance through improved financial performance, increased employee motivation and greater customer satisfaction (Huo & Zhao, 2010; Koufteros et al., 2014). Integration with suppliers enables the firm to go beyond its organisation's boundaries in order to easily synchronize processes (Pakurar et al., 2019). In contrast, internal integration tears down functional departmental barriers thus fostering optimal synchronisation of internal process (Wong et al., 2011). Customer integration enables the customer to participate in product creation, thus

maximizing their expectations and satisfaction (Lau et al., 2010).

Implication

A major contribution to knowledge of this study is that supply chain integration implementation results in enhanced performance of the firm. Effectively this finding complements the pool of knowledge on positive link connecting supply chain integration implementation to firm performance as supported by theory and empirical findings (Koufteros et al., 2014; Aduku & Ayertey, 2015; Subburaj et al., 2020).

Next, a contribution of this study is that it considered all the three dimensions of integration of supply chain: supplier integration, internal integration and customer integration as advocated by various researchers (Boon-Itt & Wong, 2011; Ganbold, 2017; Baharanchi, 2019; Iranban, 2019; Subburaj et al., 2020). This was to obtain the complete estimation of their impact on firm performance. This research therefore addresses the weaknesses of previous studies which only used some but not all dimensions of integration of supply chain (Huo, 2012; Huang et al., 2014; Beheshti et al., 214a; Yeu & Van Thai, 2017 Danese & Romano, 2011).

The study established that implementation of integration of supply chain results to enhanced competitive advantage and overall organizational performance. It is therefore recommended that firms integrate their activities. They should establish active customer-relationship management programmes as well as actively collaborate with their suppliers. These should reduce demand and supplier uncertainty. According to Fawcett et al. (2007), the companies should also integrate their internal activities by disintegrating functional silos, sharing information across departments, and using cross-functional teams. Implementation of supply chain integration reduces technological uncertainty resulting in greater predictability of the environment (Xiao, Petkova, Molleman, & van der Vaart, 2019). This would enable the firm to better cope with the competitiveness in the sector in which it operates and thus enhancing overall firm performance.

Limitations

The variables in the study were measured by use of perceptual data which tend to change over time and among different respondents. Future researchers should consider the use of objective data which are expected to bring out the relationships among the variables in the model more clearly and accurately. Future research should also be caried out in contexts other than large manufacturing firms. This research could be replicated in small manufacturing firms and in other sectors different from manufacturing and in particular in the service sector where there are few studies. The research could also be done in different parts of the world other than Kenya considering that they would have different cultural backgrounds.

Acknowledgement

We are obliged to Cyrus Kipkogei, Vitalis Kisang and Kevin Kipchumba for their inestimable support and coordinating the delivery of the instruments of collecting data and ensuing respondent's follow-up. We as well wish to appreciate every survey participant and their respective organizations for their worthy contribution.

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