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SUPPLY CHAIN INTEGRATION AND FIRM PERFORMANCE: THE MEDIATING EFFECT OF COMPETITIVE ADVANTAGE AMONG 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 on whether competitive advantage has a mediating role on the link connecting supply chain integration to firm performance. This study endeavoured to explore this link. It was anchored on resource-based view theory. A cross-sectional descriptive research design was applied with primary data. The respondents of the study were persons who were in charge of the supply chain function in the sampled firms. From a sample size of 200 firms, 94 usable questionnaires were obtained resulting in a response proportion of 47%. The main data analysis method was PLS-SEM. The links connecting supply chain integration to competitive advantage and competitive advantage to firm performance were both found to be significant. The overall outcome of the mediation analysis was that there was a significant partial complementary mediating influence of competitive advantage on the connection linking supply chain integration to company performance. This helps to settle the debate to some extent on whether it is fruitful for companies to integrate their supply chain operations. These outcomes are also in congruence with resource-based perspective in the sense that integrating internal operations can be regarded as a rare, non-substitutable, valuable and imperfectly imitable resource. The study findings will also be useful to policy makers in developing appropriate legislations such as protection of copyrights and patents. Moreover, the findings of the study are expected to provide directions to scholars on the possible influence of supply chain integration on organisational performance with the possibility of competitive advantage acting as a mediating variable. This is particularly pertinent in the context of the developing world where such studies are scarce.

Key words*: competitive advantage, supply chain integration, firm performance, PLS-SEM, manufacturing firms in Kenya*

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 day 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 supply chain integration (SCI). Studies on the connection linking SCI to some aspects of performance such as organisational performance and competitive advantage are on the rise (Reklitis, Sakas, Trivellas, & Tsoulfas, 2021; Itang, Sufyati, Suganda, Shafenti, & Fahlevi, 2022).

Manufacturing is a key contributing sector to the economy in Kenya. According to Kenya National Bureau of Statistics, KNBS (2021) report, it contributed 6.5 percent to the Gross Domestic Product (GDP) in the year 2020. It also accounted for 18.9 percent of total wage employment (KNBS, 2021). Despite its importance, the sector faces some challenges. The sector's contribution to the GDP has virtually stalled at approximately 10 percent since independence, and has actually reduced to below 10 percent in recent years, according to Kenya Association of Manufacturers (KAM, 2018). Some of these challenges include poor quality, counterfeit goods in the supply chain flooding the market (KAM, 2018), poor coordination by government agencies (Were, 2016) and generally poor and inadequate infrastructure and logistics (World Bank Group, 2018). Policy interventions to spur growth in the sector have been launched from time to time by the Kenyan government, of which the ongoing ones are 'Vision 2030' and 'The Big 4 Agenda' (KNBS, 2020). A firm that has an integrated supply chain is expected to manufacture at lower costs hence be more competitive than its rivals.

Integration of supply chain can be described as developing alliances between industries and other organisations in the supply chain so as to generate an efficient 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). It is generally acknowledged that there are three aspects of SCI. These are integration of suppliers, 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. 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. 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.

Different scholars have operationalised the supply chain integration construct in various ways. Some have taken it as a unidimensional construct (Beheshti, Oghazi, Mostaghel, & Hultman, 2014a; Hanif, Hamid, & Gangouei, 2018). Others have broken it down into two types of integration; external and internal (Zhao, Feng, & Wang, 2015; Yuen & Thai, 2017). Other researchers used only a subset of supply chain integration. Huo (2012) used external integration alone. Danese and Romano (2011) had customer integration only while Huang, Yen, and Liu (2014) used supplier integration alone. The vast majority of researchers have, however, used the three dimensions of supply chain integration (Baharanchi, 2009; Ganbold, 2017; Uwamahoro, 2018; Iranban, 2019; Subburaj, Sriram, & Mehrolia, 2020). This study used all the three aspects of supply chain integration so as to get a complete estimation of their effects on company performance.

Competitive advantage is described as the disparity between two or more participants on any possible dimension that enables one to create better value for the customer than the other (Ma, 2000). Ma (2000) further argues that this definition extends on Porter (1985) in underscoring the significance of value creation for the customer. It drills down from the general kinds of competitive advantage such as cost and differentiation to a more elementary level, which facilitates operationalization. Tracey, Vonderembse, and Lim (1999) contend that high quality and reliability, timely delivery, fast new product introduction, enhanced customer service and enhanced deployment of capital, not just cost reduction, are the main sources of competitive advantage in the post-industrial environment.

Firm performance or organizational performance is the extent to which a company 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, Adams, Ketchen, and Craighead (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 capture 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: financial, customer, internal 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 since internal perspective is already addressed in competitive advantage. For customer dimension, customer satisfaction measures were used (Banker & Mashruwala, 2007) while for financial dimension, total assets and operating income were used since they show how different managers deploy their strategies to generate profit with the assets they have (Goel & Rhaki, 2013). Finally, for learning and growth, employee motivation was applied since motivated employees are likely to serve customers better.

Companies in the segment of manufacturing are among the significant pillars of the economy in Kenya. It is crucial 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 GDP to 15 percent by the year 2022 (KNBS, 2018).

Manufacturing firms in Kenya contributed 7.6 percent to GDP in 2020 (KNBS, 2021). It employs 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. In comparison, countries comparable to Kenya economically at independence like Democratic Republic of Congo, Vietnam, Cameroon, Malaysia and Bangladesh have their manufacturing sector contribution to GDP at 20.9 percent, 16.75 percent, 14.42 percent, 22.31 percent and 18 percent respectively (World Bank Group, 2021). These are all more than double that of Kenya.

Businesses are increasingly implementing supply chain integration strategies occasioned by tough competition as a result of globalisation, diversification and other organisational drivers (Vencataya, Seebaluck, & Doorga, 2016). Porter (2019) contends that a recurrent issue in contemporary supply chain researches is that organisations can probably enhance their performance if they embrace, position and integrate supplier, internal and customer information and processes. However, there is a contention as to whether implementation

of supply chain integration does indeed result in improved performance as measured by improved market share and profitability (Mask & Works, 2018). For a greater appreciation of the role of integration of supply chain on the performance of organizations, other researchers have called for the consideration of mediator factors such as competitive advantage (Lu, Ding, Asian, & Paul, 2018; Adnan et al., 2016; Cheraghalizadeh, Olya, & Tumer, 2021).

There is evidence proposing that competitive advantage is an intervening variable in the impact of integration of supply chain on firm performance. Vencataya et al. (2016) argue that the best-in-class companies obtain savings from prudent management of company assets and activities resulting in decreased costs and better products and services and this gives the firm a hedge over its competitors. Competitive advantage is then expected to lead to superior firm performance, as noted by Zubir and Sundram (2014). Therefore, more researches on the impact of implementation of supply chain integration on company performance that consider mediating variables are called for. The mediating variable for this study is competitive advantage.

Literature Review

This study was anchored on resource-based view theory (RBV). In the context of this research, the argument of RBV is that competitive advantage is possible if an organisation owns resources that are non-substitutable, rare, imperfectly imitable 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) argue that it entails breaking down functional silos, sharing information across functions and deploying 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).

Customers and suppliers are the driving forces for competitive advantage in an organisation. An example is supplier and customer participation in developing new products. Feng et al. (2010) argue that this can be a strategic resource for attaining higher quality levels, cost reduction, sufficient flexibility, fast and efficient delivery. The possession and deployment of internal assets such as human, physical and organisational capital should also lead to competitive advantage of an organisation (Thoo et al., 2017).

A number of researches reviewed on integration of supply chain and competitive advantage show a positive association (Lucas, 2015; Wijetunge, 2017; Baah & Jin, 2019). According to Quynh and Huy (2018), supplier integration had a negative impact on performance whereas customer integration had a positive impact. Hosseini, Aziz, and Sheiki (2012) found that the impact of external and internal integration on competitive advantage were negative and positive respectively while Rattawiboonsom (2016) found the results to be mixed, depending on the measure of competitive advantage. On the other hand, Freije, de la Calle, and Ugarte (2021) found a positive relationship on the customer integration but negative relationships result for internal integration and supplier integration. These contradictory findings present a gap in knowledge. This study, therefore, proposes that implementation of supply chain integration results in enhanced competitive advantage.

A company has competitive advantage if it can price its products lower in the market (due to low production cost), is able to deliver its product faster, has reliable delivery of high-quality products and finally, is flexible, that is, has the ability to react fast to customer changes in terms of new commodities or changes in volume of demand (Vencataya et al., 2016). If a firm has one or more of these characteristics, it will satisfy customers better than the competition and hence it is expected to do well in terms of market and financial indicators. In this regard, competitive advantage is to be construed as a rare, strategic resource which is difficult to replicate by new entrants or the competition, consistent with RBV (Barney, 1991).

Many studies have been carried out which link competitive advantage to firm performance and most of those reviewed showed a significant positive relationship (Lucas, 2015; Quynh & Huy, 2018; Baah & Jin, 2019). A study by Ozdemir and Aslan (2011) found the influence of competitive advantage on performance as positive but weak. In this study, it is proposed that competitive advantage of a firm leads to enhanced performance.

As discussed earlier, it is anticipated that implementation of supply chain integration could lead to enhanced competitiveness of a firm and in turn, this competitive advantage could probably lead to better performance. Also, the direct link connecting supply chain integration to performance has been argued out. In some researches, this link was found to be weak or even non-existent (Han, Omta, & Trienekens, 2007; Zhao et al., 2015). This

link could be enhanced through competitive advantage as a mediating factor. These mixed results in the literature present a research gap. Based on the above the study hypothesized that competitive advantage has no substantial mediating impact on the connection linking integration of supply chain to firm performance.

Research Methodology

Cross-sectional research strategy was applied in this research. This approach is appropriate if the general aim of the study is to investigate if there are significant or notable associations among the variables at a given point in time (Teo, Wei, & Benbasat, 2003; Mugenda & Mugenda, 2003). Data was gathered across sampled firms at essentially the same point in time. Many related studies have adopted this research design successfully (Magutu, 2013; Musuva-Musimba, 2013; Odock, 2016; Zhang et al., 2017; Pakurar, Haddad, Nagy, Popp, & Oláh, 2019).

Large manufacturing companies 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. The sampling frame for the research was the list of large-scale manufacturing firms in Kenya (KMED, 2019). This research applied Structural Equation Modelling (SEM) in analysing the data. There are various approaches for sample size determination using SEM such as the highest number of arrows directed at a latent variable (Marcoulides & Saunders, 2006) and use of N:q ratio where N is number of cases while q is number of parameters in the model. Hair, Sarstedt, Hopkins, and Kuppelwieser (2014) recommends the use of N:q ratio as it results in the larger sample size. This is the approach used in the study. Jackson (2003) avers that the ideal ratio should be 20:1.

This study had six parameters to be estimated and hence the sample size was to be 20 x 6 = 120. Israel (1992) asserts that on average 10% of respondents cannot be reached while 30% may not respond. Hence, to achieve a usable sample size of 120, the number of firms targeted were 120 divided by 0.6 which results in 200. To obtain the sample size from the various strata, a proportionate sampling strategy was used. Within each stratum, systematic random sampling was applied to pick the specific study firms.

This study applied PLS-SEM to analyse the data. Wong (2013) describes PLS-SEM as a soft modelling approach which makes no assumptions on the distribution of the data. The technique is the best alternative to covariance-based Structural Equation Model (SEM) when dealing with small sample size and yet the model is complex; where normality requirement is not met, if the study is not confirmatory but exploratory and when the main aim of the model is prediction (Kaufman & Gaeckler, 2015; Sarstedt, Ringle, & Hair, 2017).

Competitive advantage was hypothesised to mediate the connection linking supply chain integration to firm performance as suggested in Figure 1. Supply chain integration is represented by SCI which has supplier integration, internal integration and customer integration displayed as SCI1, SCI2, SCI3. Competitive advantage is

represented in the diagram as CA with Cost, Quality, Speed, Dependability and Flexibility as CA1, CA2, CA3, CA4, and CA5 respectively. Firm performance is represented as FP in the diagram and its indicators are financial performance, employee motivation and customer satisfaction represented by FP1, FP2 and FP3 in that order.

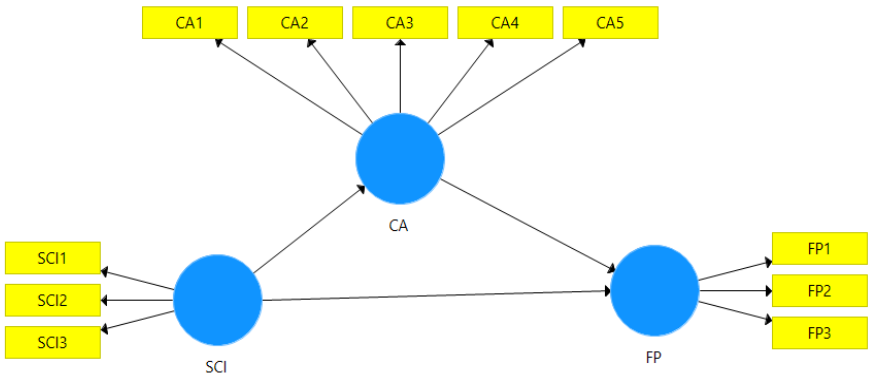

Figure 1: Path Diagram linking integration of supply chain, competitive advantage and firm performance

Results

Out of 200 questionnaires administered to the research participants, 111 were obtained. This represents a response proportion of 55.5%. As argued by Mugenda and Mugenda (2003), the 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 compared to those of larger response rate (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 applied to assess whether factor analysis was suitable. To assess sampling adequacy, Kaiser-Meyer-Olkin (KMO) measures were used. According to Kaiser (1974), KMO values <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 level of 0.500 and their p values were <0.05. This indicates that all constructs are significant statistically. Thus, sampling adequacy and sphericity tests confirmed the suitability of factor analysis. Internal consistency reliability was evaluated using Cronbach's Alpha. Table 1 shows the summary of Cronbach's Alpha values. According to Nunally (1994), values of

Cronbach's Alpha which are higher than 0.7 represent high reliability level; while values between 0.5 and 0.7 represent acceptable reliability level. All the Cronbach's Alpha levels were larger than 0.6 thus confirming internal consistency.

Table 1: Results of the Cronbach's Alpha Test for Measuring the Internal Reliability of Survey Items for Supply Chain Integration, Competitive Advantage, and Firm Performance

Construct	Cronbach's Alpha Value
Supplier Integration	0.783
Internal Integration	0.848
Customer Integration	0.857
Cost	0.773
Quality	0.863
Speed	0.771
Dependability	0.708
Flexibility	0.830
Financial Performance	0.687
Employee Motivation	0.820
Customer Satisfaction	0.756

Additionally, CFA was done. The results are presented 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: CFA Results for All Indicators and Constructs

Indicator	Supply Chain Integration	Competitive Advantage	Firm Performance
Supplier Integration	**0.742**	0.298	0.264
Internal Integration	**0.900**	0.410	0.486
Customer Integration	**0.906**	0.508	0.557
Cost	0.477	**0.833**	0.399
Quality	0.156	**0.664**	0.167

Speed	0.346	**0.825**	0.316
Dependability	0.263	**0.779**	0.330
Flexibility	0.505	**0.812**	0.495
Financial Performance	0.284	0.428	**0.620**
Employee Motivation	0.463	0.351	**0.877**
Customer Satisfaction	0.475	0.305	**0.777**

The aim of this research was to find out the mediating impact of competitive advantage on the connection linking supply chain integration to firm performance. Table 3 exhibits the indicator outer loadings, reliability, T statistics, and P values. Except for quality and financial performance, which have values of 0.663 and 0.603 respectively, all outer loadings are higher than the required minimum of 0.7. Nevertheless, both of them were retained for purposes of content validity since they are within the range of between 0.4 and 0.7 as contented by Hair, Hult, Ringle, and Sarstedt (2021).

Table 3: Outer Loading Model Results SCI, CA and FP

Indicators	Loadings	Indicator Reliability	T-value	P-value
Supplier Integration	0.742	0.551	12.118	0.000
Internal Integration	0.900	0.810	33.219	0.000
Customer Integration	0.907	0.823	44.545	0.000
Cost	0.833	0.694	25.976	0.000
Quality	0.663	0.440	5.807	0.000
Speed	0.824	0.679	14.739	0.000
Dependability	0.778	0.605	8.665	0.000
Flexibility	0.813	0.661	24.012	0.000
Financial Performance	0.603	0.364	3.913	0.000
Employee Motivation	0.881	0.776	17.202	0.000
Customer Satisfaction	0.789	0.623	10.208	0.000

In addition, bootstrapping results of 500 resamples show that each factor loading is statistically significant (T statistic > 1.96, P values <0.05).

The results of the internal consistency reliability assessment using Cronbach's Alpha and composite reliability are shown in Table 4. It can be observed that all Cronbach's Alpha levels are more than the

required minimum of 0.7 except for firm performance which is in the acceptable range of between 0.5 and 0.7. It can also be observed that every composite reliability value is higher than the minimum value of 0.7. Therefore, internal consistency reliability is established.

Latent Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Supply Chain Integration	0.817	0.888	0.727
Competitive Advantage	0.852	0.888	0.616
Firm Performance	0.631	0.807	0.588

Table 4: Results for Cronbach's Alpha, Composite Reliability and AVE

AVE and CFA tests were carried out to verify convergent validity. Table 4 shows that the AVE values for all the variables are greater than the minimum required level of 0.5 and thus convergent validity is confirmed. Table 5 displays the output of CFA for the evaluation of convergent validity. It is to be noted that the cross-loadings of indicator items to their corresponding variables are larger than for other latent variables. This is a further confirmation of convergent validity.

Table 5: Outcomes for Confirmatory Factor Analysis

Indicators	CA	Firm Performance	Supply Chain Integration
Cost	**0.833**	0.396	0.477
Quality	**0.663**	0.164	0.156
Speed	**0.824**	0.309	0.346
Dependability	**0.778**	0.326	0.263
Flexibility	**0.813**	0.496	0.505
Financial Performance	0.427	**0.603**	0.284
Employee Motivation	0.351	**0.881**	0.463
Customer Satisfaction	0.306	**0.789**	0.475
Supplier Integration	0.298	0.263	**0.742**
Internal Integration	0.411	0.489	**0.900**
Customer Integration	0.508	0.558	**0.907**

In order to establish discriminant validity, three tests were applied; Fornell-Larcker Criterion, cross-loadings of latent variable scores and HTMT ratio. Table 6 exhibits the Fornell-Larcker test analysis results.

Table 6: Fornell-Larcker Test Analysis Results

Latent Construct	Competitive Advantage	Firm Performance	Supply Chain Integration
Competitive Advantage	**0.785**		
Firm Performance	0.469	**0.766**	
Supply Chain Integration	0.492	0.540	**0.853**

The AVE for competitive advantage is 0.616 (Table 4) and its square root is 0.785 (Table 6). This value is larger than the other correlation values in the column (0.469 and 0.492). The square root for AVE for firm performance (0.766) is bigger than the correlation level in the column (0.540) and that in the row (0.469). Similarly, the square root of AVE for supply chain integration (0.853) is larger than all the correlation values in its row (0.492 and 0.540). Thus, according to Fornell-Larcker criterion these results show that discriminant validity is confirmed. On the basis of cross loadings, it can be observed from Table 6 that every item loads highest on its corresponding latent variable compared to any other latent variable. Finally, the HTMT values among paired latent variables in the model are all lower than the maximum required level of 0.85 (Table 7). This further establishes convergent validity.

Table 7: Heterotrait-Monotrait Ratios

	HTMT Ratio
SCI > Competitive Advantage	0.505
Competitive Advantage > Firm Performance	0.594
Supply Chain Integration > Firm Performance	0.709

Collinearity was evaluated through the use of variance inflation factor (VIF) and tolerance values. All the VIF values of the indicators are below 5 while their tolerance levels are larger than the required minimum of 0.2. This establishes that there is no multicollinearity in the outer model (Hair et al., 2021).

The collinearity statistics for the inner model for integration of supply chain and competitive advantage both had the tolerance values higher than 0.2 and the VIFs both lower than 5. This confirms that there is no collinearity in the inner model.

In this model, predictive relevance was carried out by use of blindfolding procedure. The acceptable level of Q^2 values for PLS-SEM models should be larger than zero for every endogenous variable (Chin, 1998). Results for Q^2 are displayed in Table 8 and

Figure 2. Both the Q^2 values are greater than zero and hence predictive relevance is established.

Table 8: Q^2 Values for the Endogenous Variables

Endogenous Variables	Q^2 Value	q^2 Value	Inference
Competitive Advantage	0.122	0.028	Small effect
Firm Performance	0.185	0.091	Medium effect

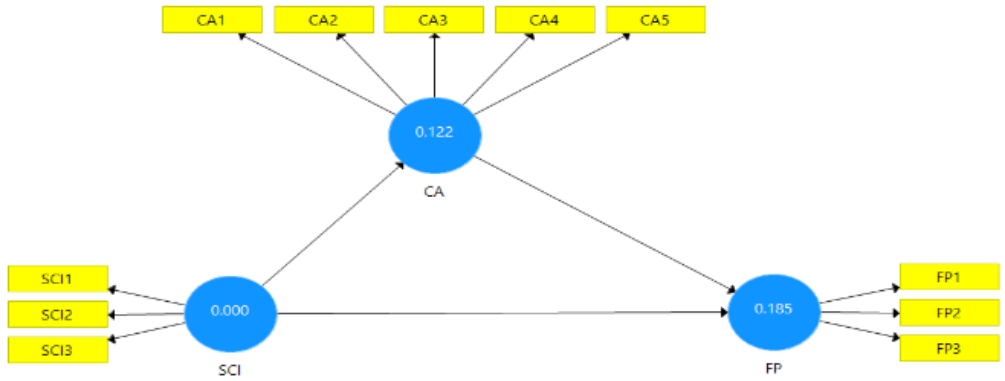

Figure 2: Q^2 Values for the Endogenous Variables

The effect size, q^2, allows for the evaluation of an exogenous variable's contribution to the level of Q^2 of an endogenous latent variable. It is obtained as the drop in the value of Q^2 if that exogenous variable is not included in the model (Hair et al., 2021). q^2 levels of 0.35, 0.15 and 0.02 show that an exogenous variable has a large, moderate or small predictive effect in that order for a given endogenous variable (Peng & Lai, 2012). It can be noted that competitive advantage has small effect while firm performance has medium effect.

Coefficients of determination, R^2 for the endogenous variables in the model are shown in Figure 3. According to Peng and Lai (2012), R^2 values of 67 percent, 33 percent and 19 percent represents large, moderate and low explained variance in that order. R^2 value for competitive advantage is 24.2%. This means that 24.2% of the variance in competitive advantage is attributed to the variation in supply chain integration. This value falls in the weak range. Similarly, R^2 value for firm performance is 34.6%. This implies that 34.6% of the variation in firm performance is explained by the variation in both competitive advantage and supply chain integration. This value 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 omitted from the model are as follows; f^2 levels of 0.35, 0.15 and 0.02 show that an exogenous variable has a large, moderate or small predictive effects in that order for a given endogenous variable.

For this model, the f^2 values are provided in Figure 3. It is to be noted that the greatest effect size is that of integration of supply chain as a predictor of competitive advantage (0.319) followed by supply chain integration as a predictor of organisational performance (0.193) and the weakest is that of competitive advantage as a predictor of firm performance (0.083).

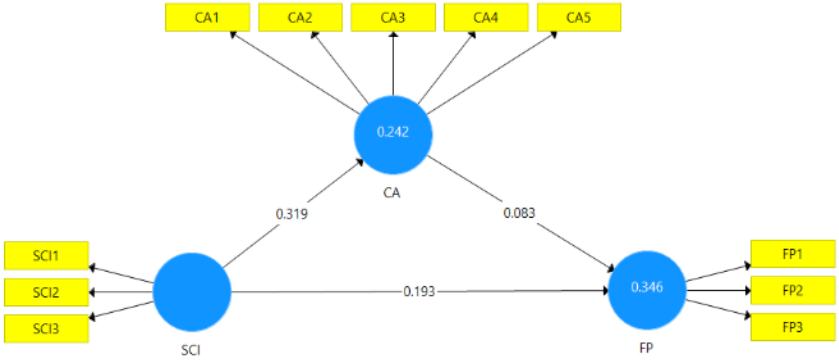

Figure 3: R^2 and f^2 Values

The overall goodness of fit for the model was assessed by use of the SRMR statistic which was determined to be 0.117. This is marginally more than the maximum required value of less than 0.1. However, SRMR is statistically significant for the model since the T level is higher than 1.96 while the p-statistic is below 0.05 (T=2.115, P=0.035). Hence it can be inferred from this significance test that the model has a good fit.

Mediation analysis was carried out by bootstrapping the sampling distribution of the indirect impact as suggested by Klarner, Sarstedt, Hoeck, and Ringle (2013) and Nitzl, Roldan, and Cepeda (2018). Essentially, the significance of direct and indirect effects are compared to assess whether there is mediation, and if it is there, the type of mediation is evaluated. The flowchart is displayed in Figure 4.

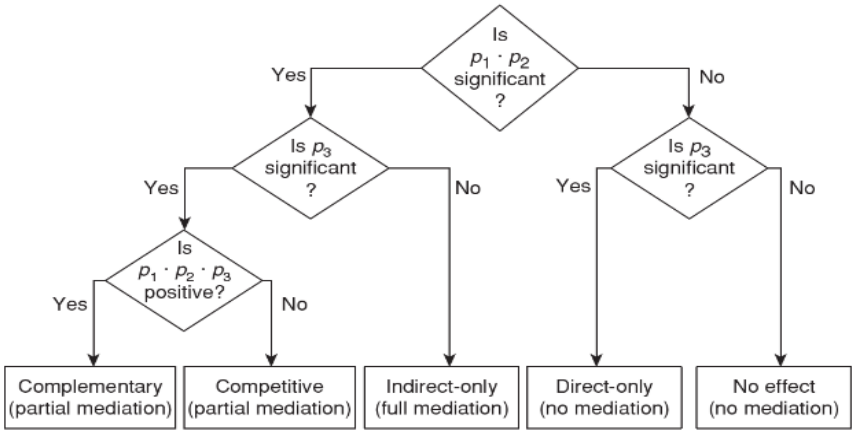

Figure 4: Mediation Analysis Chart

As can be observed in Figures 5 and 6, the indirect effect is significant (T=2.115, P=0.035). The direct role of integration of supply chain on company performance is also significant (T=4.017, P=0.000). In a situation where both the direct and indirect impacts are significant; also, the product of path coefficients of supply chain integration > firm performance, supply chain integration > competitive advantage and competitive advantage > company performance is positive (0.408*0.492*0.268=0.054) this is a complementary partial mediation. As a result, competitive advantage can be argued to be a key mediator variable in the link connecting integration of supply chain to organizational performance. It is to be noted that the link connecting supply chain integration to competitive advantage is statistically significant (T=6.847, P = 0.000). It can also be observed that the connection linking competitive advantage to firm performance is statistically significant (T=2.417, P=0.016).

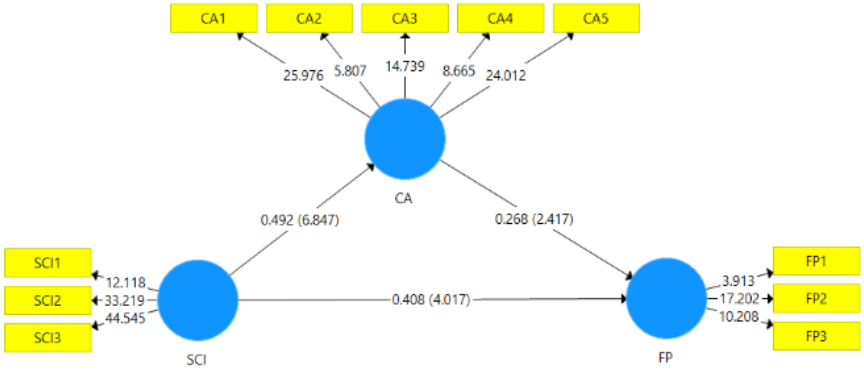

Figure 5: Path Coefficients and T-values for Supply Chain Integration, Competitive Advantage and Firm Performance

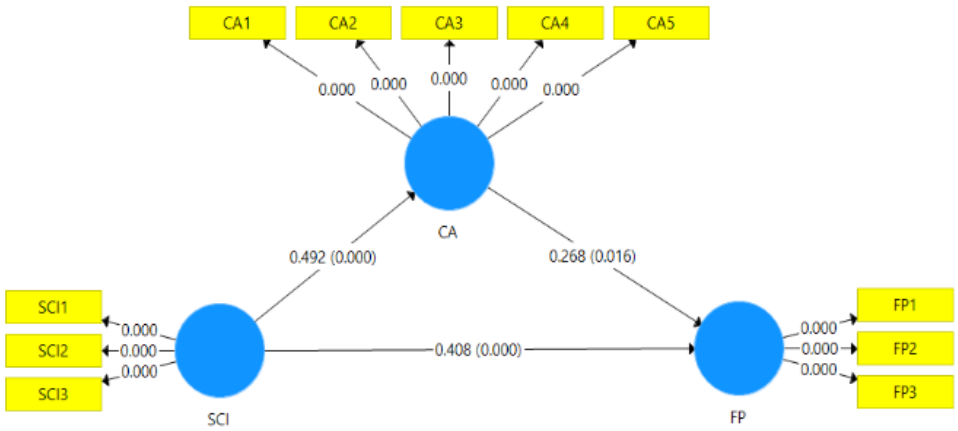

Figure 6: Path Coefficients and P-values for Supply Chain Integration, Competitive Advantage and Firm Performance

Discussion

In this research, a model was empirically developed and tested on the premise that if a firm implements supply chain integration, its competitive advantage will be boosted and this in turn will result in improved organizational performance. This model was validated by examining the following relationships: supply chain integration and competitive advantage, competitive advantage and firm performance, supply chain integration and firm performance, and also supply chain integration, competitive advantage and performance of the company.

It was hypothesised that implementation of supply chain integration would result in improved competitiveness of the firm. The result of this research is in line with this claim. This finding adds support of positive links of previous studies on the connection linking integration of supply chain to competitive advantage (Lucas, 2015; Wijetunge, 2017; Baah & Jin, 2019; Ploenhad, Laoprawatchai, Thongrawd, & Jermsittiparsert, 2019). This study also resolves the findings of previous researchers which either found the link connecting supply chain integration to competitive advantage as negative or those which found mixed results (Rattawiboonsom, 2016; Hosseini et al., 2012; Quynh & Huy, 2018).

The link connecting competitive advantage to company performance was also established to be statistically significant and positive as had been predicted. This outcome is in congruence with the outcomes of past researches (Lucas, 2015; Quynh & Huy, 2018; Baah & Jin, 2019). The model also tested the possible role of competitive advantage as a mediator on the influence of supply chain integration on company performance. This was done by testing the significance of the direct link connecting supply chain integration implementation to company performance and the indirect link of integration of supply chain, competitive advantage and organizational performance and both were found to be significant. The overall result was that competitive advantage positively and partially mediates the link connecting supply chain integration implementation to company performance. This outcome is in congruence with findings from past studies (Wijetunge, 2017; Ju, Park, & Kim, 2016).

The theoretical basis for the mediation impact of competitive advantage on the connection linking integration of supply chain to firm performance was anchored on resource-based perspective (Barney, 1991). Supply chain integration can be viewed as a resource that is rare, imperfectly imitable, valuable and non-substitutable. To the extent that an organization has integrated its activities relative to the competitors, then such a firm will gain competitive advantage. When a firm gains competitive advantage through lower pricing, high quality, reduced lead time and a product is delivered the way a customer expected, including the capacity of the organization to counter fluctuations in the volume of production and product mix, this inevitably results in enhanced organizational performance (Vencataya et al., 2016).

Summary And Conclusions

This research purposed to establish the mediating impact of competitive advantage

on the link connecting integration of supply chain to firm performance. A SEM model comprising of three latent variables with one having the intervening effect was formulated and tested. Results of hypotheses tests through PLS-SEM analysis showed that integration of supply chain had a significant positive association with both competitive advantage and firm performance. It was also found out that competitive advantage had a significant positive association with company performance. Further, the indirect impact of integration of supply chain on firm performance via competitive advantage was established to be significant and positive. Overally, it was established that competitive advantage positively but partially mediates the connection linking supply chain integration implementation to performance of the firm.

The conclusion of the research is that supply chain integration results in enhanced competitive advantage. This is through lower product pricing relative to the competition and higher quality products. Competitive advantage also results in lower lead-times and delivery of products/services to the customer the way they are expected. It also leads to the capability of the company to respond to fluctuations in the volume of production, time to market, the product mix and introduction of new products at short notice (Ploenhad et al., 2019; Shakkya, 2013; Feng et al., 2013; Zubir & Sundram, 2014).

Moreover, competitive advantage leads to enhanced firm performance through improved financial performance, increased employee motivation and customer satisfaction. If a firm is able to price its products lower in the market (due to low production cost) and is able to deliver its products faster, then customer satisfaction will be enhanced (Vencataya et al., 2016). Customer satisfaction can also be increased if an organization has a reliable delivery of high-quality products. Finally, a firm which is flexible in its operations, that is, has the ability to react faster to customer change in terms of new commodities or changes in volume of demand, then it is expected to satisfy customers better than the competition.

Implications

A contribution of this study is that it considered competitive advantage as a mediating factor on the connection linking integration of supply chain to company performance. This is in congruence with recommendations of past researchers on the need to explore mediating variables that could bring out the connection linking integration of supply chain to firm performance fully (Zubir & Sundram, 2014; Vencataya et al., 2016). The findings were that competitive advantage positively but partially mediates the link connecting supply chain integration implementation to company performance. This means that supply chain integration implementation leads to competitive advantage and this subsequently results in enhanced firm performance. This adds to findings by past researchers (Reklitis et al., 2012; Dikshit & Trivedi, 2012; Akmal et al., 2018; Baah & Jin, 2019). This study therefore helps to settle the debate on the mediating influence of competitive advantage on the connection

linking supply chain integration to company performance. A firm that has integrated its activities internally and externally relative to its competitors, can be argued to possess a resource that is rare, non-substitutable, valuable and imperfectly imitable consistent with resource-based view.

The outcomes of this research have fairly straight implications for policy and practice. The study confirmed that implementation of supply chain integration led to enhanced competitive advantage. Competitive advantage in turn led to improved firm performance. This conclusion is therefore a wakeup call to firms that have not integrated their activities internally, with suppliers or with customers to do so in order to upscale their competitive advantage. Organizations should also increase their competitiveness by producing at lower cost in order to realize lower prices of their products in the market.

Limitations And Suggestions For Further Research

This study applied the Likert scale meaning that perceptual measures were used in generating data for all the variables. Measures of perceptual are bound to vary across time and also among individuals. The hypothesised links between the research variables should be supported by more reliable and valid conclusions, which would be expected from objective data. Hence, future scholars should strive at using direct measures for the variables in order to enhance the validity of the outcomes. The response rate was relatively small necessitating the use of PLS-SEM technique for analysis. A higher response rate is proposed for future researches which can take advantage of covariance-based SEM technique which is more robust. The context of the study was large manufacturing firms in Kenya. Studies can be done in sectors other than manufacturing and also in small firms. Studies can also be done in other regions.

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