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SOURCES OF COMPETITIVE ADVANTAGE IN THE DAIRY INDUSTRY: SUPPLY CHAIN MANAGEMENT PRACTICES

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Abstract

Purpose: Ferocious competition in today's globalized markets and heightened customer expectations have pushed organisations into a constant search for new ways of securing competitive advantage. Against this backdrop, this paper sought to explore the effects of supply chain management (SCM) practices on the competitive advantage underpinned on resource-based view theory (RBV).

Methodology: The study adopts descriptive and explanatory research design with purposive sampling and quantitative data collection methods through crossed ended questionnaires from 109 dairy co-operatives in Kenya. Data collected was organized and cleaned using both excel and statistical package for social scientist (SPSS). Additionally, partial least squares structural equation modelling (PLS-SEM) techniques were used to analyze data in SmartPLS version 3.2.9 software, and the results for both descriptive and inferential were presented in tables.

Results: The findings show that SCM practices have a positive and significant (β= 0.736, t = 12.958, p=0.000) relationship with a competitive advantage. Further results show that supplier development has relatively high importance in explaining competitive advantage, followed by logistics management, information communication and technology, purchasing management, and customer relationship management. Specifically, the study recommends a close focus on the performance improvement of logistics management while monitoring the performance of the other four dimensions of SCM practices.

Unique contribution to theory, practice and policy: The study provides insights into the practice of SCM to the managers in the dairy industry. Additionally, the study contributes to the policy by providing a framework for improving competitive advantage in the dairy industry. Furthermore, the study contributes to the literature of SCM practices in the dairy industry as well as the development and validation of the Resource-based View (RBV) theory.

Key Words: *Supply chain management practices, competitive advantage, Resource-based view theory and structural equation modelling*

1.0 INTRODUCTION

The basis of competition nowadays is no longer between individual businesses as solely autonomous entities, but rather among the supply chains (SC). Consequently, organizations are pushed to a constant search for new ways of securing competitive advantage (CA) to endure in the highly globalised and competitive markets. Competitive advantage constitutes a set of capabilities that permit an organization to distinguish itself from its competitors (Ghatebi, Ramezani, & Shiraz, 2013). These capabilities manifest in terms of costs, prices, operational efficiencies, product offers and other related factors as well as the prices paid to farmers for their farm produce.

Strategic management literature has identified two complementary models of competitive advantage: industrial organization (I/O) and resource-based view (RBV). The I/O standpoints focus on external factors such as competitiveness in order to determine performance and profit potential. Comparatively, proponents of RBV argues that the fundamental sources and drivers of competitive advantage and superior performance are mainly associated with factors that are internal to the firm (Rose, Abdullah, & Ismad, 2010).

As internal resources, supply chain management (SCM) practices have become valuable sources of competitive advantage and enhancing profitability in the emerging competitive global marketplace (Banerjee & Mishra, 2015). By definition, SCM practices are a set of approaches undertaken in an organization to promote effective management of its supply chain (Dikshit & Trivedi, 2012). However, competitive advantage is an outcome of critical management decisions adopted by an organization.

Thus the ultimate success of the business rests on its managerial ability to execute effective SCM practices. Accordingly, business organizations must seek to understand the relative degree of relationship between their internal organizational resources and competitive advantage (Rose et al., 2010). Understanding the sources of competitive advantage will help business organisations to craft effective strategies based on the optimum combination of resources.

Statement of the Problem

The dairy industry in Kenya plays an important socio-economic role contributing 44%, 12% and 4 % of livestock, agriculture and the national gross domestic product (GDP) respectively. The industry provides the raw material for large, medium and small scale milk processing enterprises serving both the local and export markets. Hence, milk processors provide a useful link between dairy farmers and the milk market. Consequently, the Government of Kenya has provided an enabling environment to support the development of the Kenyan dairy industry and investment by the private sector in milk production, bulking, cooling, processing and marketing (MoALF, 2018). However, Kenyan dairy processing firms are facing stiff competition in the marketplace for milk and milk products. The low competitiveness of milk processing firms in Kenya is due to numerous challenges ranging from the seasonality of milk production, high cost of milk production and processing, compliance to milk quality and competition from the local informal milk channel as well as companies from the regional and international companies (Nassiuma & Nyoike, 2013). The informal milk chain dominates milk marketing in Kenya by controlling about 80% of marketed milk (Wanjala, Njehia, & Ngichabe, 2014). Kenya's dairy sector has experienced a surge in milk imports from Uganda, with 110.7 million litres imported into the country as of January to September 2019, from a low of 3 million litres in 2016 (KNBS, 2020).

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The inadequate milk supplies and low quality of raw milk delivered to the processing plants affect throughput and capacity utilization of the processing firms. As a result, milk processing firms are operating at low capacity utilization estimated at (40%-50%) of the dairy installed processing capacity (MoALF, 2017). Jointly these inefficiencies compromise the operating efficiency and the overall profitability of milk processing firms in Kenya threateneing their survival in the market. A competitive dairy processing sector ought to provide affordable dairy products that are accessible to both domestic and regional consumers. Therefore, there is a burning need for understanding ways of building competitive advantage in the milk processing firms. Therefore, dairy enterprises must recognize the role of SCMPs in improving not only their competitive advantage but also the capabilities of their elaborate network of their business partners for the performance of the entire supply chain (Kant, 2015). Despite the critical role of SCMPs in generating competitive advantage, literature is scarce, particularly in the milk supply chain in Kenya. Consequently, managers from agribusiness companies often do not know what to implement due to a lack of understanding of what embodies a comprehensive set of SCMPs (Govindaraju, Sundram, & Muhammad, 2016). Thus, the central goal of the current study is to uncover the effects of SCMPs on the competitive advantage using dairy co-operatives in Kenya.

2.0 LITERATURE REVIEW

2.1.2 Theoretical Framework

The current study is hinged on the resourced based view (RBV) theory espoused by Edith Penrose in 1959. The RBV theory stipulates that the fundamental sources and drivers of competitive advantage and superior performance are mainly associated with the strategic resources owned and controlled by a to the firm (Rose et al., 2010). According to Kamasak (2013), firm resources include all assets such as “capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm” that permits the firm to conceive and implement strategies that improve its efficiency and effectiveness. Accordingly, these resources must be valuable, rare, an inimitable and unsubstitutable to have the potential to generate superior performance (Saqib & Rashid, 2013). However, it requires a distinctive combination of these resources and capabilities to register meaningful gains in performance. Therefore, these resources must be combined to optimize their collective generation of capabilities such as low price, high product quality, high delivery dependability, and a shorter time to market (Tuan & Yoshi, 2010). To this end, RBV accentuates strategic choice, tasking the firm's management with the central role of finding, developing and deploying key resources to maximize returns. Therefore, SCM practices are conceptualized as internal organisational resources and test their impact on competitive advantage. These resources will enable dairy firms to build capabilities such as low price, high quality, flexibility delivery dependability and time to market.

2.1.2 Conceptual framework

The RBV theory provides a framework to analyze and explain the role of internal resources of an organization as the source of competitive advantage. In this view, SCM practices are conceptualized as resources, and their impact on competitive advantage examined using the conceptual framework shown in figure 1 below.

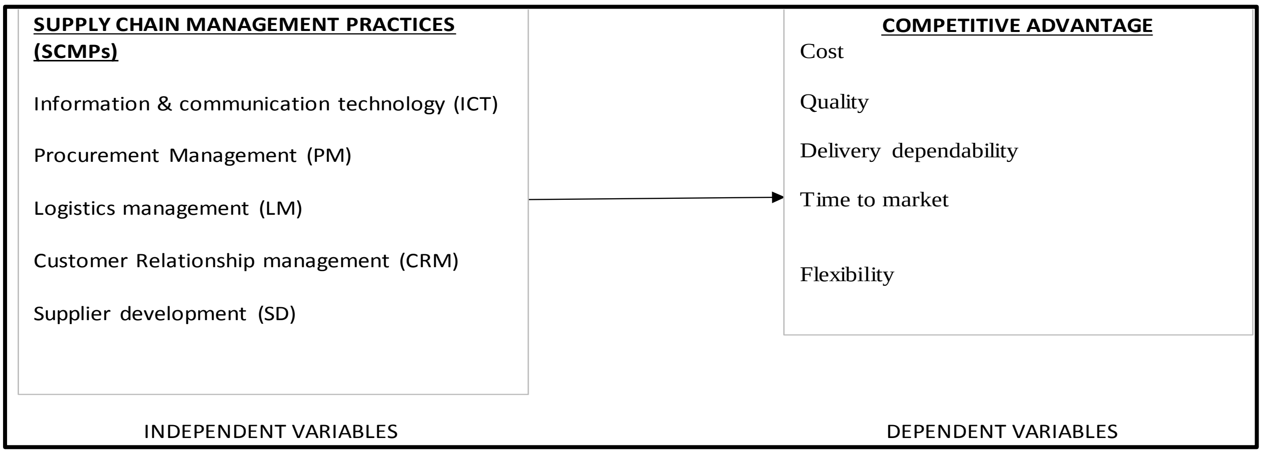

Figure 1: Conceptual framework

2.1.3 Hypothesis development

Extant literature shows that organizations implementing SCM have an enhanced competitive advantage in terms of low price, high product quality, high delivery dependability, flexibility and a shorter time to market. Previous studies indicate that various dimensions SCMPs influence supply chain competitive advantage through "price, quality, delivery, product innovation, and time to market" (Sundram, Razak Ibrahim & Govindaraju, 2011). Based on this literature, this study postulates the following alternate hypothesis:

$H1_a$: Supply chain management practices have a positive impact on the level of competitive advantage.

2.2. Empirical Review

2.2.1 Supply Chain Management Practices (SCMPs)

SCM practices are viewed from a variety of different perspectives and multi-dimensional concept (Sundram, Ibrahim, & Govindaraju, 2011). As a result, literature is replete with dimensions of SCMPs from a variety of perspectives but lacks consensus on relevant constructs (Tatoglu et al., 2016). For example, Anatan, (2014), used strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement as dimensions of SCMPS. Another study by Spina, Di Serio, Brito, & Duarte (2015) used Collaboration, demand and supply planning, inventory production and distribution management and logistics as dimensions of SCMPs.

Additionally, Barasa (2016), conceptualized four dimensions of SCM practice, namely green Supply Chain practices, supply chain collaboration practices, Customer Relationship Management, and information sharing. Furthermore, Memia (2018) conceptualized Supply chain collaboration Practice, Green Supply chain management Practice, Information Sharing Practice, Customer relationship management Practice. In the same breadth, Apopa (2018) used Supplier selection practices, Supply chain policies, Supplier Collaboration Practices, Risk management practices. Moreover, Chege (2017) used supplier relationship management practices, process management practices, customer relationships management practices and IT support practices.

The existing SCMPs are generic, necessitating the need for more specific practice to the dairy supply chain management. Kumar (2016) conceptualized "Information and Communication Technology Practices, Supplier Relationship Practices, Supply Chain Manufacturing Practices, Inventory management system, Warehousing Management System, Transportation Management System and Customer Relationship Management". While these dimensions of SCM practices are relevant to the dairy industry, their impact on organizational performance has not been empirically tested in the Kenyan context. Thus, the current study proposes Customer relationship management (CRM), information and communication technology (ICT), Logistics Management (LM), Procurement Management (PM) and Supplier Development (SD). The five SCMPs cuts across both sides of the supply chain and internal practices for the focal company.

2.2.2 Competitive advantage

Competitive advantage refers to the level at which an organization can create a secure position over its competitors. It consists of competencies that allow an organization to differentiate itself from its competitor's decisions (Banerjee & Mishra, 2015). Consequently, previous studies have considered various aspects of competitive advantage capabilities. Nik et al. (2014) considered pricing, premium pricing, product quality, dependable delivery, and product innovation as the dimensions of competitive advantage. The present study included price/cost, quality, delivery dependability, time to market and flexibility as measures of competitive advantage.

3.0 METHODOLOGY

3.1 Study design

The study adopts both descriptive and explanatory research design using both quantitative and qualitative approaches to address to study objectives. The study population comprised of dairy co-operatives operating in the thirteen major milk-producing counties in Kenya. A sample of 109 dairy co-operatives was purposively selected from a population of 150, where the unit manager represented each of them as the survey respondent. Primary data was collected using a crossed ended questionnaire in cross-sectional survey design. After the field survey, a total of 100 questionnaires were returned, representing approximately 92% response rate. However, only 89 out of the 100 questionnaires returned were complete and valid for analysis.

3.2 Measures of Variables

Multiple item scale was developed to measure the dimensions of SCMPs, namely Information and communication technology, Supplier Development, Procurement, Logistic, and customer relationship management. Further, multiple item scale was adopted from past studies to measure competitive advantage (Market, Operational and Customer satisfaction). The scale items for SCM practices were measured on 7 points Likert scale ranging from 1 for never to 7 for every time. Similarly, a 7 Likert scale ranging from 1= strongly disagree to 7 = strongly agree was adopted to measure competitive advantage.

3.3 Study Model

There are two ways to operationalize the outer model; reflective or formative. Indicators or manifest variable measured are assumed to be influenced, affected, or caused by the underlying latent variable in a reflective measurement model (Garson, 2016). In contrast, the indicators of a formative latent construct are the cause rather than being caused by the underlying latent construct (Joe F. Hair, Howard, & Nitzl, 2020). The decision criterion is to have 0 within the low and high bias-adjusted confidence limits. SmartPLS confirmatory tetrad analysis (CTA) algorithm was run to determine the type of measurement models in the current study. Thus, if the values of CTA results do not include **0** within their confidence limits, then the tetrad value is significantly different from 0, and the tetrad does not vanish (Gudergan, Ringle, Wende, & Will, 2008). The results in Appendix D and E justify conceptualization of both SCMP and CA measurement models as reflective. Consequently, SCM practices and competitive advantage measurement models are reflective, as shown in figure 2.

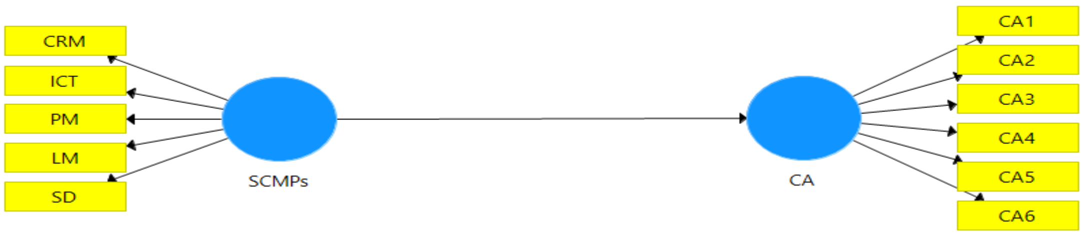

Figure 2: Measurement Model

3.4 Data Analysis

Structural equation modelling (SEM) techniques were used to analyze the research data in SmartPLS version 3.2.9 software. SEM allows the specification of complex inter-relationships between observed and latent variables (Sarstedt & Cheah, 2019). Extant literature has identified two conceptually different approaches to SEM: covariance-based (CBSEM) and variance-based (VBSEM) (Hwang, Sarstedt, Cheah, & Ringle, 2019). The current study settled on partial least squire (PLS)-SEM technique as the most appropriate statistical method for analyzing the set objectives. PLS is a variance-based SEM technique that has gained proliferation in a variety of academic disciplines such as international business marketing, human resource management, accounting management, strategic management, tourism, hospitality and agricultural science have applied PLS-SEM (Rasoolimanesh & Ali, 2018). One of the advantages of PLS-SEM over other VB-SEM techniques is its ability to specify complex inter-relationships between observed and latent variables (Sarstedt & Cheah, 2019). Secondly, PLS-SEM is a causal predictive approach to SEM that emphasizes prediction in estimating statistical models, while providing causal explanations (Joseph F Hair, Risher, Sarstedt, & Ringle, 2018). The interplay between explanation and prediction theory provides an understanding of the underlying causes and prediction, as well as a description of the theoretical constructs and the relationships among them (Shmueli et al., 2019). For instance, Sundram et al., (2011), applied PLS-SEM to investigate the impact of various dimensions of SCMPs on the performance of the supply chain in the electronics industry in Malaysia. Additionally, the study adopted a two-step approach starting with the assessment of the measurement model and followed by evaluation of the structural model as suggested by (Joe F. Hair, Ringle, & Sarstedt, 2011).

4.0 FINDINGS OF THE STUDY

4.1 Evaluation of Measurement Model

A confirmatory composite analysis (CCA) was run using SmartPLS algorithm to evaluate the reflective measurement models in terms of indicator reliability, internal consistency reliability, construct validity, convergent and discriminant validity (Joseph F Hair, Hult, Ringle, & Sarstedt, 2017).

4.1.1 Reliability Results

Indicator reliability was assessed by observing the indicator loadings and their significance. **Table 1** shows the values of outer loadings and their significance. All the standardized indicator loadings for the two measurement models were above the required minimum limit of 0.708 except for CRM (0.663), meaning that the latent variables captured more than 50% of each of its indicators. CRM was retained in the model after conducting a loading relevance test. However, two items CA7 and CA8 of competitive advantage were removed after the initial CCA result since their outer loading values were below the required threshold. Furthermore, t statistics of all the indicators loadings for the two constructs were ≥ 1.96, and their confidence interval values do not include zero, thus exhibiting a satisfactory degree of indicator reliability.

Table 1: Values of outer loading and their significance levels

	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values
CA1<-competitive advantage	0.730	0.728	0.067	10.939	0.000
CA2<-competitive advantage	0.855	0.852	0.032	27.078	0.000
CA3<-competitive advantage	0.751	0.750	0.062	12.087	0.000
CA4<-competitive advantage	0.812	0.809	0.071	11.417	0.000
CA5<-competitive advantage	0.828	0.829	0.034	24.345	0.000
CA6<-competitive advantage	0.786	0.786	0.053	14.946	0.000
CRM <- SCM practices	0.671	0.668	0.068	9.836	0.000
ICT <- SCM practices	0.739	0.721	0.060	12.109	0.000
PM <- SCM practices	0.855	0.732	0.077	9.654	0.000
LM <- SCM practices	0.723	0.858	0.026	33.221	0.000
SDP <- SCM practices	0.745	0.737	0.069	10.723	0.000

*Notes 1: **t ≥ 1.96 at 5% confidence interval in a two-tail test CA7 and CA8 were removed from the competitive advantage measurement model*

4.1.2 Construct Reliability and Validity Results

The study used Cronbach's alpha (α), Jöreskog's composite reliability ρc and Gold- steins Dillion composite reliability ρA to assess the construct reliability of both SCM practices and competitive advantage. According to Rasoolimanesh & Ali (2018), the values of all the three metrics should be higher than 0.7 to establish the construct reliability. Furthermore, the Average Variance Extracted (AVE) was used to test the convergent validity of the two research constructs. Accordingly, AVE value of 0.5 is cited as the minimum criterion to establish the convergent validity of a construct (Fornell & Larcker 2016). The results for the values of Cronbach's alpha, composite reliability (CR), and rhoA are displayed in **Table 2**. All three measures of reliability surpassed the minimum threshold of 0.7, thereby establishing the construct validity of the study constructs. The higher values indicate higher levels of reliability for the two research constructs. Additionally, AVE values of SCM practices (0.61) and competitive advantage (0.631) are above the minimum threshold of 0.5, indicating that both constructs captured over 50% of the variance of their items.

Table 2: Construct Reliability and Validity

Construct	Cronbach's α	ρ_A	ρ_c	AVE
Competitive advantage	0.883	0.889	0.911	0.631
SCM practices	0.804	0.832	0.864	0.561

Source 1: Authors' estimates based on survey data α= Cronbach's alpha≥708 and AVE> 0.5 AVE=Average variance extracted, ***ρ_A = Dillon-Goldstein ρ_c = Jöreskog's composite reliability***

4.1.3 Discriminant validity Results

Discriminant validity implies the extent to which the constructs differ from one another empirically. The current study utilized both Fornnel-Lacker criterion and heterotrait monotrait (HTMT) metric as the measure of discriminant validity. Additionally, HTMT was further examined for significance using confidence intervals. The upper bound of the 95% confidence interval of HTMT should be lower than 0.9 (Franke & Sarstedt, 2019). **Table 3** shows the HTMT value of 0.828, which was below 0.85 at **$CI_{97.5\%}$** confidence interval, a proof that the two constructs are empirically distinct from one another, confirming their discriminant validity.

Table 3: HTMT and confidence interval results

	HTMT	Sample Mean (M)	Bias	Confidence Intervals	
				2.5%	97.5%
SCMPractices->Competitive Advantage	0.847	0.850	0.002	0.669	0.979

Confidence interval at 5% two-tailed test

Similarly, **Table 4** shows the square root of AVE (bold figures) for each latent variable and the correlation among the latent variables. The result shows that the square root of AVE for each latent variable is larger than the other correlation values among the latent variables, confirming their discriminant validity (Hamid, Sami, & Sidek, 2017). Again, establishing the discriminant validity of the two constructs.

Table 4: Fornel-Lacker criterion results

CONSTRUCTS	Competitive Advantage	SCM Practices
Competitve Advantage	**0.795**	
SCM practices	0.736	**0.749**

Diagonals values = Squire root of AVE (bold figures)

4.2 Evaluation of Structural Model

The standard procedure for evaluating the structural model in PLS-SEM includes the test of collinearity (VIF), explanatory power R^2, effect size f^2, predictive relevance (Q^2), and path coefficients (β) (Joseph F Hair et al., 2018).

4.2.1 Assessment of Collinearity

The variance inflation factor (VIF) was used to assess collinearity among the independent latent variables with a cut of point of lower than 3 (Joseph F Hair et al., 2018). The inner VIF value of 1 was generated from the SmartPLS algorithm, demonstrating the absence of multicollinearity associated with SCM practices and competitive advantage.

4.2.2 Model Explanatory Power

The coefficient of determination R^2 was applied to illustrate the variance explained on competitive advantage by the SCM practices. The $\mathbf{R^2}$ values range from 0 to 1, with higher values indicating a greater explanatory power with values of 0.75, 0.50, 0.25, and below are considered substantial, moderate, and weak, respectively (Joseph F Hair et al., 2017). Additionally, the size of the impact of the SCM practices on the competitive advantage was assessed using Cohen's effect size (f^2) with values of 0.02, 0.15, and 0.35 indicate small, medium, or substantial effect on an endogenous construct, respectively (Joseph F Hair et al., 2018). Further, the predictive relevance of the model was assessed using the Stone-Geisser indicator **(Q^2)** using blindfolding algorithm with an omission distance of seven (D=7). In general, Q^2 values higher than 0, 0.25, and 0.5 depict small, medium, and substantial predictive relevance of the PLS model (Hair et al., 2018).

Table 1 is a summary of the results where R^2= 0.545 and Adjusted R^2=0.539, effect size f^2= 1.2 and Q^2=0.329. , meaning that the model has moderate explanatory power. In other words, SCMPs explain 53.9% of the variance of the endogenous construct CA. Additionally, the model has a substantial effect size given by f^2= 1.2. Furthermore, construct Cross-validated Redundancy result show **Q^2=0.329**, meaning that the model has a medium and satisfactory predictive relevance.

Table 5: Model Explanatory Power

	R^2	Adjusted R^2	Effect size (f^2)	Q^2
SCMPs>CA	**0.545**	**0.539**	**1.200**	**0.329**

Notes R^2 values 0.75= substantial, 0.50= moderate and $\leq$0.25= weak, $Q^2 \geq 0$= small, $Q^2 \geq$0.25=Medium and $Q^2 \geq$0.5 substantial predictive relevance, : f^2 values of 0.02=small, 0.15=medium, and 0.35= substantial effect

4.2.3 Path analysis

Path coefficients are standardized beta (β) values ranging from between –1 and +1(Joseph F Hair et al., 2017). According to Joe F. Hair et al., (2020), the closer the path coefficient values are to 0 the weaker they are in predicting dependent (endogenous) constructs, and the closer the values are to 1, the stronger they are in predicting dependent constructs. Furthermore, the size of the path coefficient should be statistically significant. From **Figure 4**, the path between SCM practices -> competitive advantage has a strong and significant path coefficient **(β= 0.736)**.

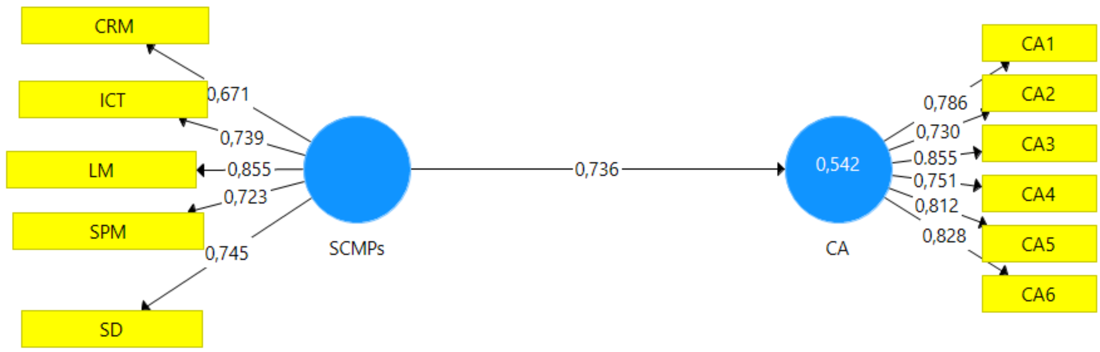

Figure 3: Structural Model

4.3.4 Hypothesis testing

Recently, studies recommend the use of t-values and confidence intervals from the bias-corrected and accelerated (BCa) bootstrap for hypothesis testing (Rasoolimanesh & Ali, 2018). Thus, the study executes bootstrapping procedure with 5000 subsamples at 5%, significance level and two-tail test using SmartPLS algorithm. **Table 6** presents the resultant bootstrap algorithms that confirm a significant direct relationship between SCM practices and competitive advantage (β = 0.736, t value = 12.649, ≥ 1.96 and p-value ≤0.05). Besides, the confidence intervals **CI** $_{2.5\%}$ = 0.612 and **CI** $_{97.5\%}$ = 0.833 do not include zero. Consequently, the alternate hypothesis that stated that SCM practices have a positive impact on the level of competitive advantage was accepted.

Table 6: Test of Statistical Significance

Path	Path coefficient (β)	Standard Deviation (STDEV)	T Statistics= (|O/STDEV|)	P Values	Confidence Interval	
					2.5 %	97.5%
SCMPs-> Competitive Advantage	0.736*	0.058	12.649	**0.000**	0.597	0.831

Notes 2: *t-Statistic ≥ 1.96, and P≤ 0.05 two-tail test at 5% confidence interval

4.3 Importance Performace Map Analysis (IPMA).

A post-hoc analysis was executed using importance-performance matrix analysis (IPMA) by setting competitive advantage as the target construct. The method allows managers to improve management strategies since it indicates the main factors that require an immediate response or improvement (Tailab, 2020). The higher the factor yield, the closer the factor is to 100, and all total effects should be higher than 0.10 and significant at p ≤ 0.05 (Martínez-Navalón, Gelashvili, & Debasa, 2019). Thus, the preference will be on improving the performance of those constructs that indicates importance about their explanation of a target construct, even though at the same time having a relatively low Performance.

Results in **Table 7** show that Supplier development has a relatively high total effect (0.245) on competitive advantage followed by logistics management (0.204), information and communication technology (0.161), purchasing management (0.149) and lastly customer relationship management (0.141). Similarly, supplier development has relatively high performance (74.157), followed by information and communication technology (70.787), sourcing and purchasing management (63.483), and lastly customer relationship management (61.348).

Table 7: IPMA of competitive advantage

MANIFEST VARIABLES (MV)	IMPORTANCE	PERFORMANCES
CRM	0.141	61.348
ICT	0.161	70.787
SPM	0.149	63.483
LM	**0.204**	**60.112**
SD	**0.254**	**74.157**

Notes 3: indicators importance = unstandardized effects) ***Indicator performance rescaled on 0 to 100***

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study examined the impact of SCM practices on competitive advantage in the dairy co-operative in Kenya. Evaluation of the measurement model revealed that the outer loading for the supplier development, logistics management, sourcing and purchasing management, information and communication technology, customer relationship management are strongly related to SCM practices. However, CRM has a relatively low outer loading of 0.663, compared SCM practices compared to the other four dimensions. The reason for this is that the implementation of CRM is dependent on a firm's position in the supply chain and hence may not be applicable in all the situations.

The finding revealed that SCMPs explains 54.2% of the variance of competitive advantage. Additionally, this model is relevant in explaining competitive advantage in the dairy industry in Kenya based on Stone-Geisser indicator Q^2= 0.329. Moreover, based on the effect size given by f^2= 1.2, SCM practices have a substantial effect on competitive advantage. Subsequently, IPMA results revealed that the five dimensions of SCM practices are all relevant in predicting competitive advantage. However, among the five dimensions of SCM practices, logistics management has relatively high importance (0.204) but low performance (60.112) and requires immediate managerial attention. Furthermore, the results disclosed that SCM practices have a positive and significant (β = 0.736, t value = 12.649, $\geq$ 1.96 and p-value=.000 $\leq$0.05). Consequently, SCM practices have a positive and significant impact on the level of competitive advantage in the Kenyan dairy industry.

These findings agree with the prevailing theory of supply chain management (SCM) and preceding studies indicating that high utilization of various supply chain management practices has a positive effect on competitive advantage. A study by Anatan (2014), confirmed that SCMP practices have significant effects on the competitive advantage in the Indonesian manufacturing companies. Another study by Nik et al. (2014), established a direct and significant effect of SCM practices and competitive advantage of food processing small and medium enterprises (SMEs) in Malaysia. Furthermore, Wijetunge and Ranwala (2018), established a positive relationship between SCM practices and firm competitiveness in manufacturing companies in Sri Lanka. Also, Jie, Parton and Cox (2013) established a positive and significant link between supply chain practices and competitive advantage in the Australian beef industry.

5.2 Conclusions

The study findings confirmed that the model was significant at 95% significance level for a two-tailed test, meaning SCM practices explains the variance of competitive advantage in Kenya. Consequently, organizations with high levels of SCM practices have high levels of competitive advantage compared to their peers in the market. Implementation of these SCM practices results in increased competitive advantage in terms of low cost, high quality, delivery dependability, flexibility and high product quality.

The study contributes to the practice of SCM to the managers by revealing SCM practices that have relative importance in explaining competitive advantage in the dairy industry. Additionally, the study contributes to policy interventions required to enhance the competitiveness of the dairy industry in Kenya. Moreover, the study contributes to the literature and the theory of supply chain management, which has drawn the attention of academicians in the field of strategic management. The majority of past studies have focused on SCM practices from non-agricultural supply chains. These SCM practices are generic which do not apply to the agricultural supply chains, particularly in the dairy industry. Thus, this study fills this knowledge gap in the literature of SCM practices applicable to the dairy industry.

5.3 Recommendations

The study recommends that managers in the dairy industry should infuse effective SCM practices in operations of milk processing in order to enhance the competitive advantage of their organization. The IPMA results suggest it is worthwhile for managers to pay close attention to improve logistics management which has a big room for performance improvement and have relatively high importance in explaining competitive advantage. Additionally, agribusiness managers should work closely with their suppliers and customers to build long term relationship and reduce the effect of the "bullwhip" effect in the formal dairy supply chains.

Simultaneously, policy inventions interventions from both the national and local governments are required to address some of the impediments that are beyond the enterprise level. Linking smallholder in the SC is a significant challenge while at the same time, their exclusion from the supply chain is economically and socially undesirable. Their integration requires the formation of co-operative institutions, to reduce transaction costs to both dairy enterprises and farmers; thus, the need for the government to facilitate such institutions.

Production of most of the agricultural commodities is capital and information/knowledge-intensive and riskier. At the same time, smallholders lack access to capital, improved technologies, quality inputs, extension services needed for running farm enterprises. It is therefore essential to strengthen institutional mechanisms that improve smallholders' access to credit, insurance, technology and other support services. Additionally, an enabling policy environment is essential to strengthening the supply chain and value addition particularly road infrastructure, connection to the national grid and alternative source of cheap energy and taxation regime to encourage investment in cold supply chain types of equipment.

Future studies should consider the moderating role of senior management commitment to the SCM philosophy, managerial capability in the relationship between SCM practices and competitive advantage

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APPENDIX

Appendix A: Indicator variables descriptive statistics

	Mean	Median	Min	Max	STDV	Excess Kurtosis	Skewness	Number of cases
CA1	4.910	5.000	1.000	7.000	1.562	0.280	-0.693	89.000
CA2	4.562	5.000	2.000	7.000	1.484	-0.892	-0.133	89.000
CA3	4.910	5.000	1.000	7.000	1.570	-0.192	-0.647	89.000
CA4	4.348	4.000	1.000	7.000	1.663	-0.714	-0.124	89.000
CA5	4.899	5.000	1.000	7.000	1.536	-0.516	-0.508	89.000
CA6	4.899	5.000	1.000	7.000	1.622	-0.514	-0.461	89.000
CRM	5.067	5.000	2.000	7.000	1.331	-0.380	-0.446	89.000
ICT	5.539	6.000	2.000	7.000	1.272	-0.209	-0.605	89.000
PM	4.809	5.000	1.000	7.000	1.421	-0.235	-0.372	89.000
LM	4.607	5.000	1.000	7.000	1.450	-0.504	-0.070	89.000
SD	5.966	6.000	3.000	7.000	1.011	0.396	-0.928	89.000

Notes 4: STDV= Standard deviation

Appendix B: Indicator Variables Correlations

	CA1	CA2	CA3	CA4	CA5	CA6	CRM	ICT	PM	LM	SD
CA1	1,000										
CA2	0,569	1,000									
CA3	0,620	0,605	1,000								
CA4	0,423	0,513	0,589	1,000							
CA5	0,609	0,404	0,667	0,480	1,000						
CA6	0,506	0,477	0,614	0,617	0,654	1,000					
CRM	0,343	0,305	0,353	0,324	0,372	0,493	1,000				
ICT	0,499	0,363	0,311	0,352	0,390	0,478	0,304	1,000			
PM	0,463	0,301	0,420	0,323	0,531	0,425	0,429	0,517	1,000		
LM	0,624	0,536	0,567	0,541	0,527	0,671	0,578	0,541	0,520	1,000	
SD	0,510	0,447	0,522	0,348	0,548	0,608	0,620	0,565	0,582	0,650	1,000

Appendix C: Latent variables Descriptive Statistics

	Mean	Median	Min	Max	Standard Deviation	Excess Kurtosis	Skewness
CA	0	0.111	-2.95	1.685	1	-0.221	-0.444
SCMPs	0	0.078	-2.99	1.717	1	0.017	-0.528

Appendix D: SCMP Measurement Model

SCMPRACTICES	T Statistics (|O/STDEV|)	P Values	CI Low	CI Up	CI Low adj.	CI Up adj.
1: ICT,MCT,MHG,MPP	1.465	0.143	-0.077	0.616	-0.186	0.724
2: ICT,MCT,MPP,MHG	0.833	0.405	-0.786	0.314	-0.959	0.487
6: ICT,MHG,SD,MCT	1.962	0.05	-0.649	-0.009	-0.75	0.092
10: ICT,MHG,MPP,SD	1.958	0.05	-0.707	-0.008	-0.817	0.102

Source 2: SmartPls CTA Algorithm

Appendix E: Competitive Advantage Measurement Model

COMPETITVE ADVANTAGE	T Statistics (|O/STDEV|)	P Values	CI Low	CI Up	CI Low adj.	CI Up adj.
1: CA1,CA2,CA3,CA4	0.315	0.753	-0.549	0.772	-0.824	1.046
2: CA1,CA2,CA4,CA3	1.594	0.111	-0.097	1.083	-0.342	1.328
4: CA1,CA2,CA3,CA5	2.353	0.019	0.146	1.35	-0.104	1.6
6: CA1,CA3,CA5,CA2	2.064	0.039	-1.311	-0.055	-1.572	0.205
7: CA1,CA2,CA3,CA6	0.972	0.331	-0.314	0.984	-0.584	1.253
10: CA1,CA2,CA4,CA5	2.095	0.036	0.057	1.191	-0.178	1.426
16: CA1,CA2,CA5,CA6	1.057	0.291	-0.388	1.373	-0.754	1.739
22: CA1,CA3,CA4,CA6	1.437	0.151	-0.265	1.95	-0.724	2.409
26: CA1,CA3,CA6,CA5	1.132	0.258	-0.288	1.145	-0.585	1.442

Source 3: SmartPls CTA Algorithm

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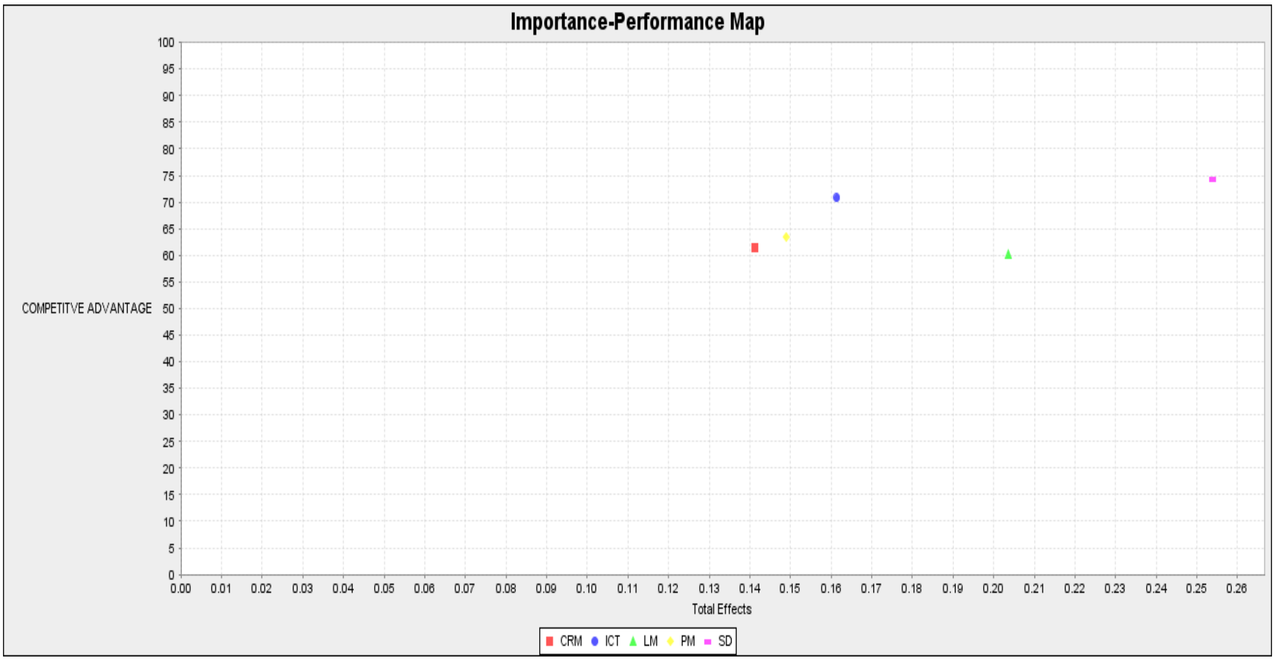
Appendix F: Construct Crossvalidated Redundancy

	SSO	SSE	Q² (=1-SSE/SSO)
COMPETITVE ADVANTAGE	534.000	358.311	0.329
SCMPRACTICES	445.000	445.000	

Notes 5: 0= small, ≥0.25=Medium and ≥0.5 substantial predictive relevance

Appendix G: IPMA map for Competitive Advantage



x-axis=Importance of individual SCMPs on a scale of 0 to 1, and the y-axis= Performance on a scale of 0 to 100.