A SUPPLY CHAIN PERFORMANCE FRAMEWORK FOR SUGAR MANUFACTURING FIRMS IN KENYA: A FOCUS ON PRODUCT DIVERSIFICATION STRATEGY

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ABSTRACT

Globally, business diversification is increasingly being practiced by firms in a bid to increase their returns on investment and spread the firm's risks. Sugar industry worldwide has started entering into new lines of business as a way of reducing costs and building synergies aimed at improving long-term sustainability. Despite this, majority of sugar industries in Kenya are struggling to make profits and meet the expectations of the shareholders. The Common Market for Eastern and Central Africa safeguard measures that would come to an end on February 2021 poses potential threat to the existence of sugar manufacturing firms in Kenya. The central theme of this study was to establish the effect of product diversification strategy on supply chain performance of sugar manufacturing firms in Kenya. The study was guided by the resource based view theory. Research design used was descriptive survey. Stratified proportionate sampling was used to select 396 respondents from a total of 1518 top-level managers, section heads and supervisors of sugar manufacturing firms in Kenya. This study inclined more to the positivistic philosophy. The respondents comprised of top-level managers, line managers and supervisors. Structured questionnaires were used as data collection instruments. Findings were; that while product diversification was associated with supply chain performance, it was a relative significant predictor of the supply chain performance (r=0.483). Recommendation, outsourcing activities should also be considered necessary, especially to manage non-core functions of sugar manufacturing firms. In conclusion sugar manufacturing firms in Kenya can promote performance by adopting newer varieties of cane that are short maturing.

Key Words: Product Diversification, Supply Chain Performance

INTRODUCTION

Sugar manufacturing firms in Kenya are highly diversified; despite this most of them are performing dismally. In real sense the aim of diversification is to spread risks which have not been the case in Kenyan sugar manufacturing firms. Diversification of business has become a standard and important activity in most businesses around the world (Singh, 2007). Successful businesses use diversification as a way to produce fast returns and continue to be competitive. Ade (2012) noted in the study on diversification and success of manufacturing companies in Nigeria that diversification is crucial if a business is to stay competitive. Globally, markets have become more interlinked, and product development processes have been enhanced by easily distributing goods and information among countries (Robertson, 2013).

Companies are dedicated to maintaining the supply chain network to stay competitive and internationally relevant (Jiri, Nikotaos, & Grry 2014). Diversification is seen as a means of incorporating additional business operations which are not the same as the main business to support themselves in corporate expansion (Harry & Backer, 2014). Archana & Bhanduri (2015) argue that there are two significant motives of business diversification i.e defensive and offensive motives. The defensive motive may spread the risk of market decline or be forced to expand if established product or business orientation does not seem to provide more growth opportunities. Offensive motive may be conquering new positions and taking opportunities that promise greater profitability to the firm.

In the business trends of dynamic markets and fierce competition, diversification into new products and markets can avoid the risk of doing one business line in one industry (Marangu & Oyagi 2014). When diversification is properly applied, a company may avoid economic downturns, which typically occur concurrently in all industries and economies, and keep the business competitive in difficult times. Diversification is seen as a business strategy that seeks to boost corporate growth by burgeoning sales volume from new goods and markets (Deloof 2015).

Statement of the Problem

The sugar sub-sector is a means of livelihood for more than five million Kenyans. In comparison to other national and world producers the production costs in Kenya are high (Jabuya, 2015). In the majority of sugar mills there were severe financial crises, almost causing the sugar industry to collapse. This resulted to COMESA intervention which granted the sugar sector in Kenya two-year extension to improve its efficiency and productivity. This raises a question ''Why are sugar manufacturing firms in Kenya performing so poorly in this era irrespective of adopting various diversification strategies which can be effectively implemented to improve their supply chain performance?''

Numerous researchers have studied sugar processing companies. For example Archana and Saumitra (2015) carried out a study on diversification and firm performance, a case study of Indian manufacturing firm. The results indicated that horizontal diversification has a positive effect on firm's performance. Business diversification spreads the firms risk in turn improving organizational productivity and hence profitability, however performance of sugar manufacturing firms in Kenya is dismal in comparison to Brazilian, Indian, Cuban and Indian sugar manufacturing which have fully diversified their operations.

Objective of the study

The main objective of this study was to establish the effect of product diversification on supply chain performance of sugar manufacturing firms in Kenya.

LITERATURE REVIEW

The Resource-Based View (RBV) Theory

Core competences provide potential competitive advantage to an enterprise and are distinctive, unique, important, business tools which rivals can not copy, replace or replicate (Barney & Clark, 2001). Resource-based view implies the need to

have economic value that is deciding organisation's success for resources that are limited, difficult to replicate, difficult to imitate or to duplicate, unsubstitutable and not readily available in factor markets to establish competitive advantage (McIvor, 2009). According to Tobias, (2015) operations, goods or services should not be outsourced if they reflect the core competency of the business, i.e. if they are strategically relevant. On the other hand, non-core tasks can be outsourced so that the company will concentrate in what they do best; done correctly, outsourcing will result in 'game-changing value rates.'

Product Diversification and Supply Chain Performance

The Doaei, Anuar and Ismail (2008) research explored the relationship between the commodity diversification and the foreign divergence in Malaysia in terms of corporate diversification and financial efficiency. For the period 2006 to 2010, the scope of the analysis included 102 companies. Included in the analysis is Return on Assets (ROA) combined with different forms of diversification, including: total Product Diversification (TPD); related Product Diversification (RPD). There was no major correlation between diversification and performance. The results showed there was a contextual gap as the research centered on the Malaysian manufacturing firms while the current study is being performed in Kenya. Chia-wen & Liub (2008) have analyzed in depth the characteristics of diversification; the business environment of a company and its effect on economic results. The study found that product diversity and consumer diversity was positively correlated with business success, while the relationship between business environment and firm's performance was negative

Oladele (2012) looked at the effect of a product diversification policy on the output of Nigerian manufacturing firms. Firm output was calculated using the return on assets based on accounting. It added a dummy variable to include companies that concentrated on a single business segment. The findings showed that a rise in business size forced

manufacturing firms to diversify their products. The outcome of the Dummy variable suggested that ROA rates were higher for diversified firms. The study's conclusion was that as number of shareholders increases, the lesser the decision of firms to diversify. In addition, the gearing level of firm may also influence diversification decision which will improve performance level of an entity.

Afza, Slahudin and Nazir (2012) conducted a study to determine the relationship between diversification and financial performance in Pakistan. The study's spectrum was rated as either diverse or non-diversified by 65 Pakistanis firms. The dependent variable was measured in terms of Return on Assets. Contrasted with diversified firms, the results indicate better performance among non-diversified firms. Non-diversified firms, however, reported low performance with high return, while diversified firms had high performance with low yields. The research was carried out in Pakistan demonstrating contextual discrepancy with the existing analysis in Kenya. In the course of the interaction of diversification and corporate success in Belgium and Turkey, Boz, Yigit and Anil (2013) have defined different rates of diversification as having a varying degree of financial impact.

Kariuki (2013) examined the effects of business diversification on performance of firms whose shares are trading at the NSE through a descriptive research design. The population comprised all the 60 listed firms at the NSE hence a census. From the findings, the results indicated that all the variables under study had a positive relationship with firm performance including the control variable firms' size.

METHODOLOGY

This study inclined more to the positivistic philosophy. The research design employed in this study was descriptive survey research design, a survey research design fitted well with the investigation that did seek to assess the relationship between business diversification strategies and supply chain performance of sugar manufacturing firms in Kenya.

The population of the study included top-level managers, section heads and supervisors totaling 1518 in all sugar manufacturing firms. The top-level managers were selected because they were fully engaged in the formulation of organizational policies and strategies while the middle-level managers and functional managers were actively involved in the implementation of these policies and strategies. The study applied Yamane (1967) to get a sample of 316 respondents. To cater for non-response and loss of data from the unit of analysis, sample size was increased from 316 to 396 during data collection, processing and analysis. The researcher loaded the sample size upwards by 25.5%. This extended the sample size to 396 from an initial sample of 316 as recommended by Lavrakas (2008)
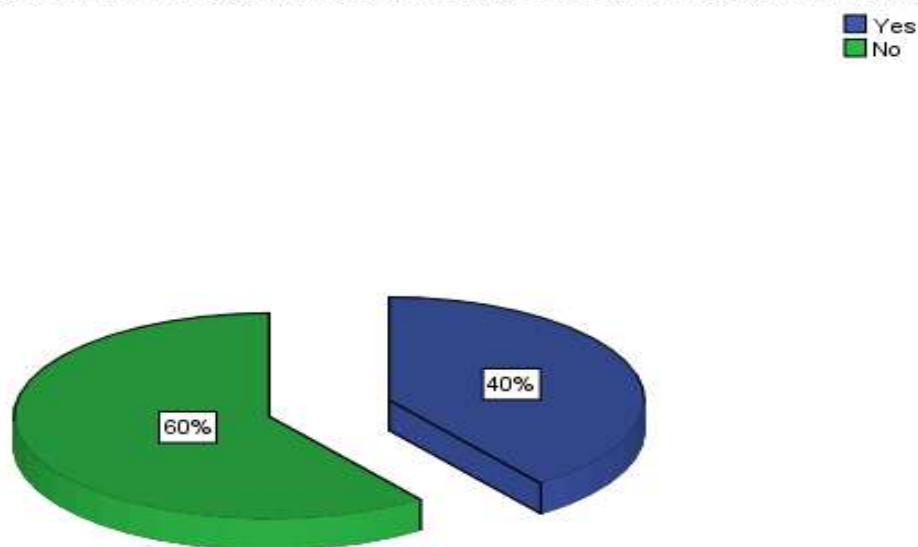
RESULTS

Figure1: Moving from Core Business

The findings in figure 1 indicated that 40% of the respondents said that their firms had diversified into other non-core business functions while 60% of the respondents posited that their firms had stuck to their core business function. However, some of the state-owned sugar manufacturing firms did not commercialize some of the diversified activities but the output was meant for firms' consumption. For instance, Nzoia Sugar company co-generation project was meant for internal consumption.

Traditionally, Diversification refers to the involvement of a firm in markets (or industries) beyond the market (or industry) boundaries in which it originally belongs (Berry, 1975; Gort, 1962). However, Ramanujam and Varadarajan (1989) alluded that Diversification is the entry of a firm or a business unit into new lines of business activity, either by processes of internal business development or acquisition, which entail changes in its administrative structure, systems, and other Management processes". Diversification can also be seen as a business development strategy allowing a company to enter additional lines of business that are different from the current Products, services and markets (conglomerate diversification) for instance Mumias sugar company attempted to venture into dairy industry where each farmer was given a heifer with the core purpose of promoting integrated farming, the project idea was highly elusive though it turned out to be a white elephant project (KPMG, 2014).

Table 1: Firm Products

	Category	Frequency	Percent
Products that are core to the business	Sugar-Industrial	156	43.8
	Sugar-non industrial	129	36.2
	Fortified sugar	59	16.6
	Ethanol	10	2.8
	Power generation	2	.6
Total		**356**	**100.0**
Products that are non-core to the business	Sugar-Industrial	17	4.8
	Sugar-non industrial	28	7.9
	Fortified sugar	25	7.0
	Molasses	156	43.8
	Ethanol	54	15.1
	Power generation	36	10.1
	Bottled water	26	7.3
	Briquettes	14	3.9
Total		**356**	**100.0**

Source: Field Data (2019)

From the table above, 43.8% said that industrial sugar was core business function of the sugar manufacturing firm, while 36.2% stated that non-industrial sugar was core, followed by fortified sugar (16.6%), ethanol (2.8%) and lastly power generation (0.6%). Regardless of state-owned sugar manufacturing firms diversifying, they have continued to report dismal performance. However firms are striving to manage the supply chain network in a bid to remain competitive and relevant on the global market (Jiri, Nikotaos & Grry 2014). Diversification from the core business is viewed as a business development strategy organizations are using to add additional business activities that are not the same as the core business to sustain themselves (Harry & Backer, 2014). This was supported by Archana and Bhanduri (2015) who postulated that there are two major motives of diversification, defensive and offensive. Defensive motive may be spreading the risk of market contraction or being forced to expand when current product or current market orientation seems to provide no further opportunities for growth. Offensive motive may be conquering new positions and taking opportunities that promise greater profitability to the firm. Offensive motive is the likely strategy that should be adopted by sugar manufacturing firms in Kenya.

Table 2: Descriptive Statistics for Product Diversification

	N	SD (%)	D (%)	N (%)	A (%)	SA (%)	Me	Std. Dev.	Max	Min.
Our company has expanded the existing Product line by introducing new Products related to the company's core business	356	14 (3.8)	12 (3.4)	68 (19.1)	160 (45.0)	102 (28.8)	4.03	1.001	5	1
The sugar firm has developed new Products not related to the company's core business	356	35 (9.7)	40 (11.2)	74 (20.9)	106 (29.7)	101 (28.4)	3.98	1.029	5	1
The company has modified the existing	356	11 (3.1)	41 (11.6)	71 (20.0)	158 (44.4)	74 (20.9)	4.35	1.019	5	1

	N						Mean	Std Dev	Max	Min
Product line by introducing new features and attributes										
Our company pursues opportunities beyond the current market in line with the introduction of new Products in the market	356	23 (6.6)	103 (28.8)	80 (22.5)	78 (21.9)	72 (20.3)	2.99	1.053	5	1
Industry attractiveness test is conducted by the Sugar firm before introducing new Product in the market	356	20 (5.6)	12 (3.4)	59 (16.6)	139 (39.1)	126 (35.3)	4.07	1.154	5	1
Our company performs cost of entry test before introducing new Product in the market	356	14 (3.8)	27 (7.5)	47 (13.1)	159 (44.6)	111 (31.3)	3.89	1.209	5	1
The company performs better-of-test before introducing new Product in the market	356	39 (10.9)	128 (35.9)	60 (16.9)	92 (25.9)	37 (10.3)	2.88	0.971	5	1
Broadened Product scope attracts the company's operational cost	356	14 (3.8)	27 (7.5)	47 (13.1)	141 (40.0)	127 (35.6)	4.81	1.136	5	1
The broadened Product scope allows our company's realize economies of scale and potential profit gains	356	46 (12.8)	59 (16.6)	120 (33.8)	119 (33.4)	12 (3.4)	2.99	1.006	5	1

Source: Field Data (2019)

The respondents agreed (45%) that their companies had expanded the existing Product line by introducing new Products related to the company's core business as depicted by a mean of 4.03 and standard deviation of 1.001. Respondents agreed (29.7%) that the sugar firms had developed new Products not related to the company's core business as depicted by a mean of 3.98 and standard deviation of 1.029; they agreed (44.4%) that the companies have modified the existing Product line by introducing new features and attributes as depicted by a mean of 4.35 and standard deviation of 1.019; they disagreed (28.8%) that their companies pursued opportunities beyond the current market in line with the introduction of new Products in the market (mean of 2.99 and standard deviation of 1.053). They also agreed that

(39.1%) industry attractiveness test was conducted by the sugar firms before introducing new products in the market as depicted by a mean of 4.07 and standard deviation of 1.154.

The respondents agreed (44.6%) that their companies perform cost of entry test before introducing new Product in the market as depicted by a mean of 3.89 and standard deviation of 1.029. 35.9% of the respondents disagreed that the companies perform better-of-test before introducing new Product in the market and respected (mean of 2.88 and a standard deviation of 0.971). 40% agreed that broadened product scope attracts Companies operational cost (Mean of 4.81 and a standard deviation of 1.136) while 33.8% of the respondents agreed that broadened product

scope allows sugar manufacturing firm realize economies of scale benefits and potential profit gains (mean of 2.99 and a standard deviation of 1.006).

Table 3: Descriptive Statistics for Supply Chain Performance

	N	SD (%)	D (%)	FA (%)	A (%)	SA (%)	Mean	Std. Dev.	Max	Min.
Quality of Products produced by our firm has improved	356	27 (7.6)	28 (7.9)	54 (15.2)	162 (45.5)	85 (23.9)	4.03	1.247	5	1
Quantity of Products produced by our Company has gone up	356	9 (2.5)	60 (16.9)	56 (15.7)	149 (41.9)	82 (23.0)	4.14	1.321	5	1
Product breadth (scope /variety) has expanded	356	28 (7.9)	59 (16.6)	77 (21.6)	128 (36.0)	64 (18.0)	4.29	1.240	5	1
Our Company produces the right quality of Products	356	7 (2.0)	36 (10.1)	51 (14.3)	178 (50.0)	84 (23.6)	4.32	1.058	5	1
Our Company has adopted lean manufacturing system	356	43 (12.1)	38 (10.7)	91 (25.6)	136 (38.2)	48 (13.5)	4.07	1.228	5	1
Our Company has experienced an increased customer base	356	26 (7.3)	50 (14.0)	93 (26.1)	118 (33.1)	69 (19.4)	4.16	0.906	5	1
Our company's Production system is very flexible and agile	356	18 (5.1)	73 (20.5)	110 (30.9)	97 (27.2)	58 (16.3)	4.41	1.226	5	1
Our company maintains optimal Inventory levels	356	34 (9.6)	28 (7.9)	117 (32.9)	103 (28.9)	74 (20.8)	3.98	1.021	5	1
Our Company's cut-to-crush time has improved	356	31 (8.7)	59 (16.6)	98 (27.5)	132 (37.1)	36 (10.1)	4.05	1.044	5	1
Our Company's Cycle time (farm to shelf) has reduced drastically	356	31 (8.7)	40 (11.2)	151 (42.4)	94 (26.4)	40 (11.2)	4.07	1.126	5	1
In our Company there is optimal utilization of resources	356	10 (2.8)	90 (25.3)	86 (24.2)	114 (32.0)	56 (15.7)	3.85	1.562	5	1
Product Diversification has increased our Company's sales volume	356	22 (6.2)	99 (27.8)	96 (27.0)	100 (28.1)	39 (11.0)	3.97	0.987	5	1
Technological Diversification has increased our company's customer base	356	19 (5.3)	80 (22.5)	88 (24.7)	115 (32.3)	54 (15.2)	4.03	1.139	5	1
Management Diversification has enhanced our company's operational flexibility	356	11 (3.1)	82 (23.0)	85 (23.9)	127 (35.7)	51 (14.3)	4.07	1.022	5	1

Source: Field Data (2019)

According to Table 3, the firm's quality of Products had improved (mean of 4.03 and standard deviation of 1.247). According to the responders, quantity of Products had also gone up (mean of 4.14, standard deviation 1.3) and so was Product breadth. The respondents also indicated that cut-to-crash time had significantly reduced. Challenges the firms face majorly are maintenance of optimum levels of supplies and utilization of resources. Abdelsalam and Ibrahim (2014) argued that supply chain performance effectiveness helps to provide many direct and indirect benefits for suppliers and

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manufacturing companies where it represents the ability to invent and produce solutions that add more value to customers than existing offers, also effectiveness adds great important for both manufacturing companies, supplier network and other parties.

Histogram graphs for Normality of Responses

The test for normality was also examined using the graphical method for each variable. This assumption presumes that the residuals are normally distributed and thus, it intends to determine the

distribution of data in the variables to be used in research. Miot (2017) posited that a good and decent data used in research is that which can be said to be normally distributed.

Product Diversification

Product diversification appears normally distributed when inspecting a normal curve that is superimposed on the histogram as shown in the Figure 2. The mean rank for the factor is 29.16 while the standard deviation is 8.038. The variable therefore qualified to be used in any parametric analysis envisaged.
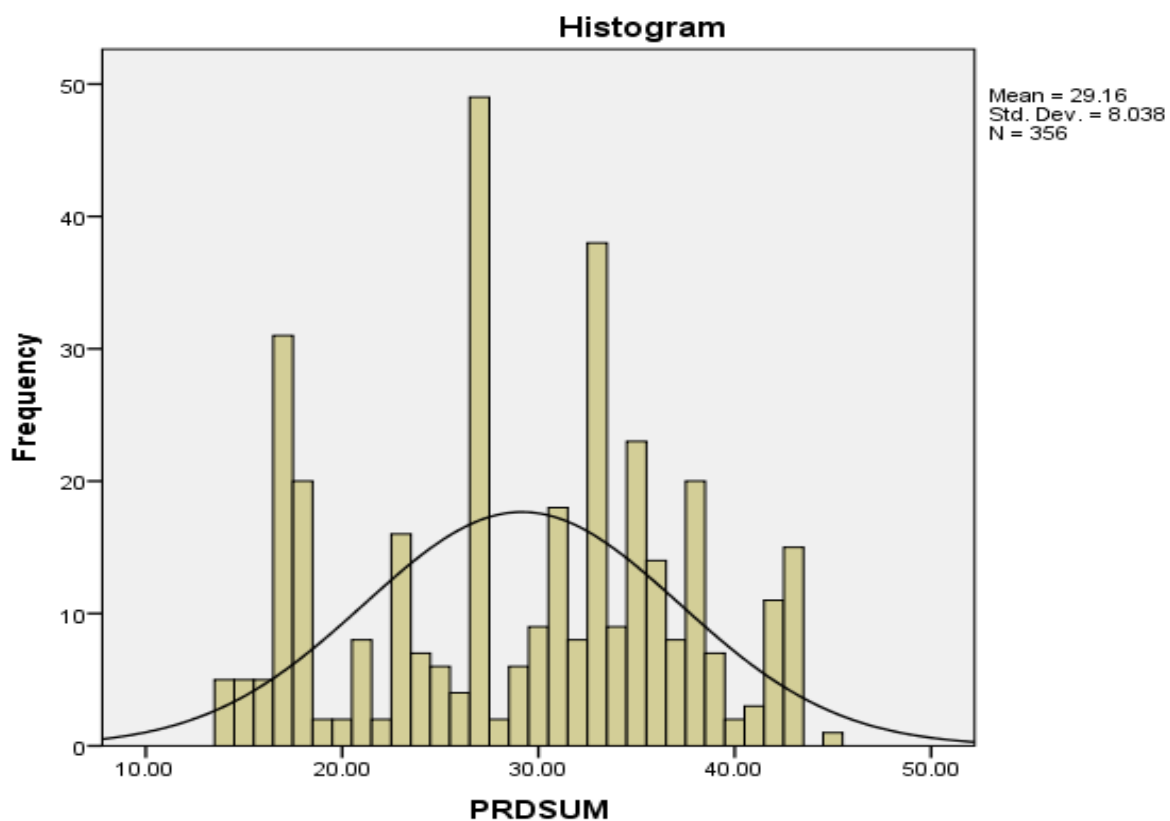

Figure 2: Distribution of Product Diversification Responses
Source: Field Data (2019)

Linearity between Product Diversification and Supply Chain Performance

An inspection of the scatter graph Figure 3 show that Product Diversification is linearly related to supply chain performance among the sugar millers

of western and Nyanza region. This was supported by the possibility of fitting goodness of fit line in the scatter plot. The slope of the line was 0.67X while the intercept constant was 31.62 based on the sum of scores for the variables.
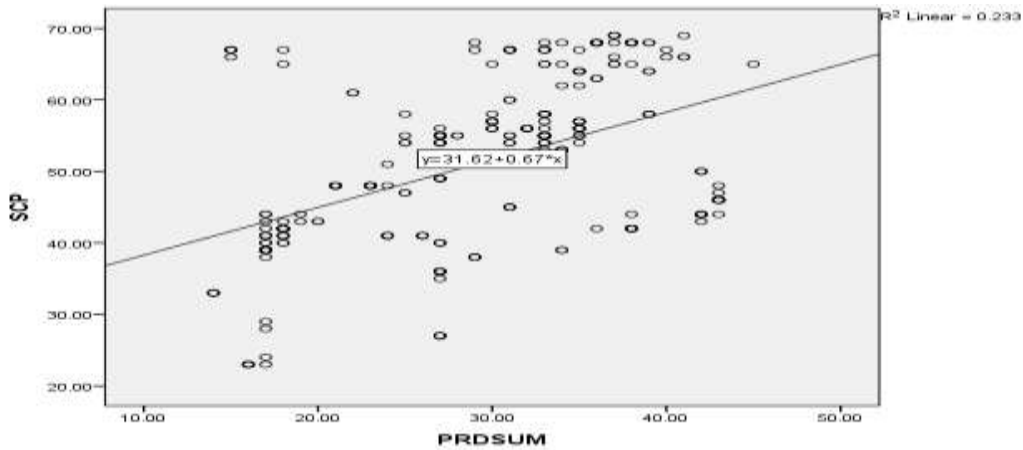
Figure 3: Linearity between PD and Supply Chain Performance
Source: Field Data (2019)

Test for Homoscedasticity

Homoscedasticity assumption means that standard deviation and variance of errors around the regression line is the same for all values of the predictor variables (Tabachnick & Fidel, 2001). It means that the residuals are rectangularly distributed around the predicted Dependent Variable and are more concentrated around the center (Pallant, 2005). The P-P plot is used to check or test for normality of the data collected by utilizing the graphical method to compare two probability distributions by plotting their percentiles against each other. The plot obtained is as shown in figure 4.

P-P Plot for Product Diversification

The P-P plot or graph generated when product diversification was measured against Supply chain Performance was as shown in figure 4;
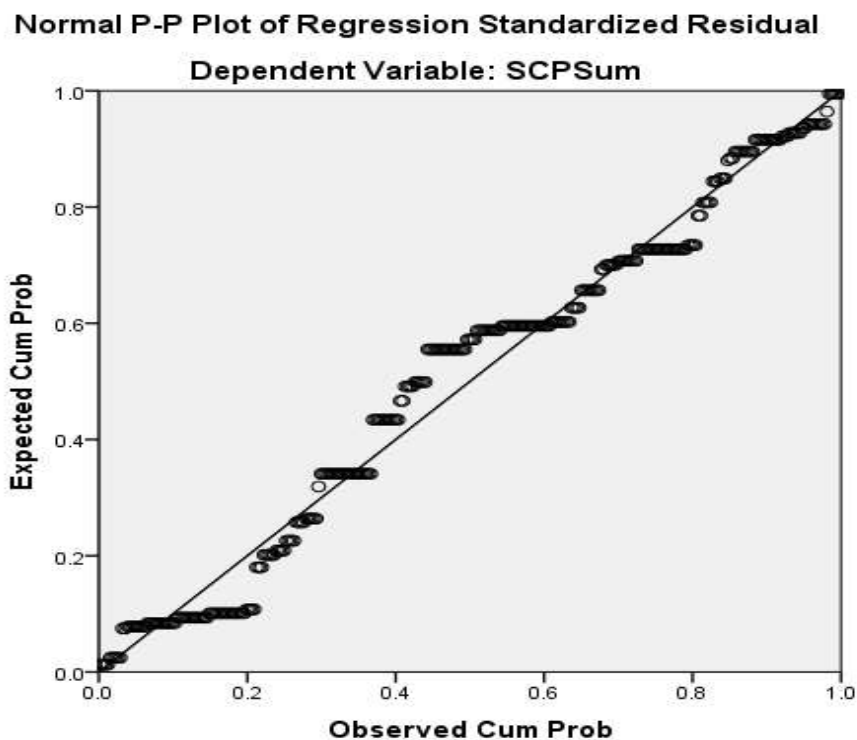

Figure 4: P-P Plot for Product Diversification
Source: Field Data (2019)

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Figure 4 indicated that the data collected on product diversification for this study was normally distributed, since most of the observed values are spread very close to the straight diagonal line and some of them even falling within the line.

Regression Analysis for Product Diversification

Table 4: Simple Regression Model Summary for Product Diversification

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
					Change Statistics					
1	.483[a]	.233	.231	9.73296	.233	107.623	1	354	.000	1.284

a. Predictors: (Constant), PRDSUM

b. Dependent Variable: SCP

Source: Field Data (2019)

From the study findings in table 4, the value of R-square was 0. 233. This implied that, 23.3% of variation of supply chain performance was explained by Product Diversification. i.e A one unit change in product diversification leads to 23.3% change in supply chain performance.

The correlation coefficients revealed that the relationship between Product Diversification and supply chain performance is positive, relatively significant and fairly strong (r=0.483) which means by diversifying Product range, the sugar firms are fairly likely to improve supply chain performance. This finding was consistent with that of Kering (2015) who studied Diversification strategies by Safaricom and realized the company increased its competitiveness through increased revenue streams and hence profitability. However, it was inconsistent with Panayiotis and Louca (2010) findings. In their study they concluded that diversification significantly reduces shareholder's wealth relative to single-segment firms.

Table 5: ANOVA Results for Product Diversification

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10195.194	1	10195.194	107.623	.000[b]
	Residual	33534.568	354	94.730		
	Total	43729.761	355			

a. Dependent Variable: SCP

b. Predictor: (Constant), PRDSUM

Source: Field Data (2019)

From the findings in Table 5 at 0.05 level of significance the ANOVA test indicated that in this model the independent variable namely; Product Diversification is important in predicting of supply chain performance as indicated by an F value of 107.623 and significance value=0.000 which is less than 0.05 level of significance. Further the statistical power of the model (eta square = 23.3%) mean this result is of major practical implication (Cohen, 1988).

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Table 6: Regression Coefficients for Product Diversification

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	31.617	1.944		16.265	.000	27.794	35.440					
PRDSUM	.667	.064	.483	10.374	.000	.540	.793	.483	.483	.483	1.000	1.000

a. Dependent Variable: SCP
Source: Field Data (2019)

From Table 6, the study findings revealed that Product Diversification had a significant influence on supply chain performance (t-statistic=10.374, p-value=0.000). This meant that increasing Product Diversification by a level or unit increases supply chain performance by 0.667 when all else remain the same. Therefore, at 5% level of significance the null hypothesis is rejected. Product Diversification positively influence supply chain performance.

Nonetheless, the findings in this study supported other studies conducted previously (Kariuki, 2013; Doaei & Ismail, 2008; Afza & Nazir, 2012; Oladele, 2012; Boz *et al.*, 2013; Nwakoby & Ihediwa, 2018; Yaser, 2018; Emeobong, 2019). According to Oladele (2012), increase in the size of manufacturing firms drives them to diversify their products. Consistently, Doaei & Ismail (2008) concurred that significant relationship existed between product diversification and organization performance. Dina & Shabbir (2016) found that synergies from product diversification are more likely to be realized when firms expand into related lines of business or industries. This translates to firms benefiting from declining unit costs by leveraging on product relatedness and thus expands the firm's performance. Further Emeobong (2019) confirmed that diversified organizations outperformed undiversified firms. However Kazuhiro (2013) affirmed that performance of highly diversified firms is lower than moderately and less diversified firms. Likewise Afza & Nazir (2012) posited that non-diversified firms showed better performance than diversified firms.

Suggestion for further study

The present study was conducted on Sugar manufacturing firms in Kenya and discovered relatively significant relationships between product diversification and supply chain performance. It would therefore be interesting to conduct a similar study in other sectors of the economy especially service sectors such as; insurance, education among others.

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