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Effect of Supplier Quality Improvement Practices on Supplier Relationship Management of Energy Sector Firm Performance in Kenya

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Abstract: **The chief goal of this research was to explore the effects of supplier quality management practices of management of energy sector firm performance in Kenya. Specifically, the study sought to 1) Evaluate the influence of supplier quality improvement practices (SQIP) on the performance of the energy sector firms in Kenya (2) Determine the influence of supplier trust-based relationship practices (STBRP) on the performance of the energy sector firms in Kenya (3) assess the influence of supplier lead time reduction management practices (SLTRMP) on the performance of the energy sector firms in Kenya. The research employed a cross-sectional evaluation survey approach and quantitative method was used in the selection of the respondents and collection of data. A sample size of 264 respondents was picked through stratified random sampling. Primary data was collected by use of questionnaires which were administered through the drop and pick method. Linear regression analysis and Pearson's correlation coefficient were run to determine the relationship between supplier relationship management practices and performance of energy sector firms in Kenya. Based on the objectives and results of the study, improvement of performance of energy sector firms is a function of supplier quality improvement practices, supplier trust-based relationship practices and supplier lead time reduction management practices.**

Keywords: **Supplier Quality Improvement Practices, Supplier Relationship Management, Energy Sector Firm Performance, Supplier Trust-Based Relationship Practices, Supplier Lead Time Reduction.**

1. INTRODUCTION

Goal setting theory highlights the positive relationship between goals and performance (Fred, 2011). It provides that performance in organizations is enhanced when goals are specific and challenging. Goals are also used in organizations to evaluate performance. Morelli and Braganza (2012) stated that managers have a general agreement that goal setting improves performance and this is why they come up with goal-based programs such as Management by Objectives (MBO), high-performance work practices (HPWPs), Management Information Systems (MIS) and Strategic Planning. The concept of organizational performance is core to businesses because the major objective of businesses is to make profits. Performance is a formula for the assessment of the functioning of an organization under certain parameters such as productivity, employee morale and effectiveness with the aim of attaining sustainable competitive advantage (Porter, 2008).

Recent approaches to performance measurement have identified inadequacies of solely relying on quantitative and short-term indicators and have henceforth developed comprehensive models such as performance pyramids and hierarchies, intangible assets scorecard, performance prism, success dimensions and the Balanced Scorecard with the aim of capturing both the financial and non-financial drivers; they recommended that in this era of economic and competitive environment achieving sustainable competitive advantage in hotels requires clear interaction between strategy and performance measures (Uzel et al., 2015).

Supplier relationship management (SRM) is the SCM process that provides the structure for managing relationships with suppliers; as the name suggests, this is mirror image of customer relationship management; just as close relationships need to be developed with key customers, management should forge close cross-functional relationships with a small number of key suppliers (Lambert et al., 2012). SRM practices are strategies. These links need to move from mere financial and non-financial data collection to identification of causal relationships among measures, outcomes and strategies (Cuccia & Rizzo, 2011). The Balanced Scorecard has been used widely in literature because it integrates performance measurement with strategic issues (Mohsin & Lockyer, 2010; Balances Scorecard, 2011). It is also the first tool that attempted to measure performance based on non-financial measures.

Castellano, Kendall, Nikomarov and Swemmer (2015) supported the view of the UN that there is a direct correlation between economic growth and electricity supply. Sub-Saharan Africa is starved for electricity. The region's power sector is significantly underdeveloped, whether we look at energy access, installed capacity, or overall consumption. Electricity shortages mean that countries struggle to sustain GDP growth. From an electricity-access point of view, sub-Saharan Africa's situation is the World's worst; the only other region with a similar imbalance in South Asia (Castellano et al., 2015).

Energy Sector in Kenya constitutes firms in these three Industries: Petroleum, Electricity and Renewable Energy; and also the single statutory regulator named Energy Regulatory Commission under the Cabinet Secretary portfolio of Ministry of Energy and Petroleum for Policy setting and Energy Tribunal for dispute resolution. Kenya Bureau of Statistics (2016) reported that Energy sector performance in Kenya was measured by Electricity Supply, which contributed One Percent (1.0%) of the Gross Domestic Product (GDP); GDP for Kenya estimated to have expanded by 5.6 percent in 2015 compared to a 5.3 percent growth in 2014; the GDP and per capita GDP in 2015 were Ksh 6,224,370 Billion and Ksh 140,961respectively. Hence, Energy Sector contribution to GDP and GDP Capita was Ksh 62,244 Billion and Ksh 1,410 respectively.

Kenya is not one of the seven out of fifty-four African countries that have electricity access rates exceeding 50 percent; these are Cameroon, Côte d'Ivoire, Gabon, Ghana, Namibia, Senegal and South Africa (McKinsey & Company, 2017). An Indian tycoon named Ambani controls Kenya's oil import trade through Gulf African Petroleum Corporation (Gapco); Gapco dominates the business of importing oil into the Kenyan market; The company has bagged tenders for bringing in diesel, petrol and jet fuel more than any other firm; out of 25 of the 72 Oil Marketing Companies that operate in Kenya that have participated in the centralised fuel purchase and distribution system also known as the Open Tender System (OTS); Gapco has been outmuscling other players most of the time; the competitive rivalry among existing firms in reducing order from the highest intensity is Total Kenya, Vivo Energy, Galana, KenolKobil, Gulf Energy, Mogas, Dalbit, Oryx Energy's, Hass, Kencor and Hashi (Alushula, 2016).

There is evidence of SRM Practices in the Energy Sector firms in Kenya. SRM practices are fluid in the Business Environment described as VUCA. Sarkar (2016) defined the term VUCA - which stands for volatility, uncertainty, complexity and ambiguity - is a common phrase these days in the corporate world and was coined by the US Army. Rapid changes taking place in political, economic, social and technological fronts are making the organizational world increasingly VUCA. VUCA was subsequently adopted by strategic business leaders to describe the chaotic, turbulent, and rapidly changing business environment that has become the "new normal." By all accounts, the chaotic "new normal" in business is real. The financial crisis of 2008-2009, for example, rendered many business models obsolete, as organizations throughout the world were plunged into turbulent environments similar to those faced by the military (UNC Executive Development,2013). At the same time, rapid changes marched forward as technological developments like social media exploded, the world's population continued to simultaneously grow and age and global disasters disrupted lives, economies, and businesses.

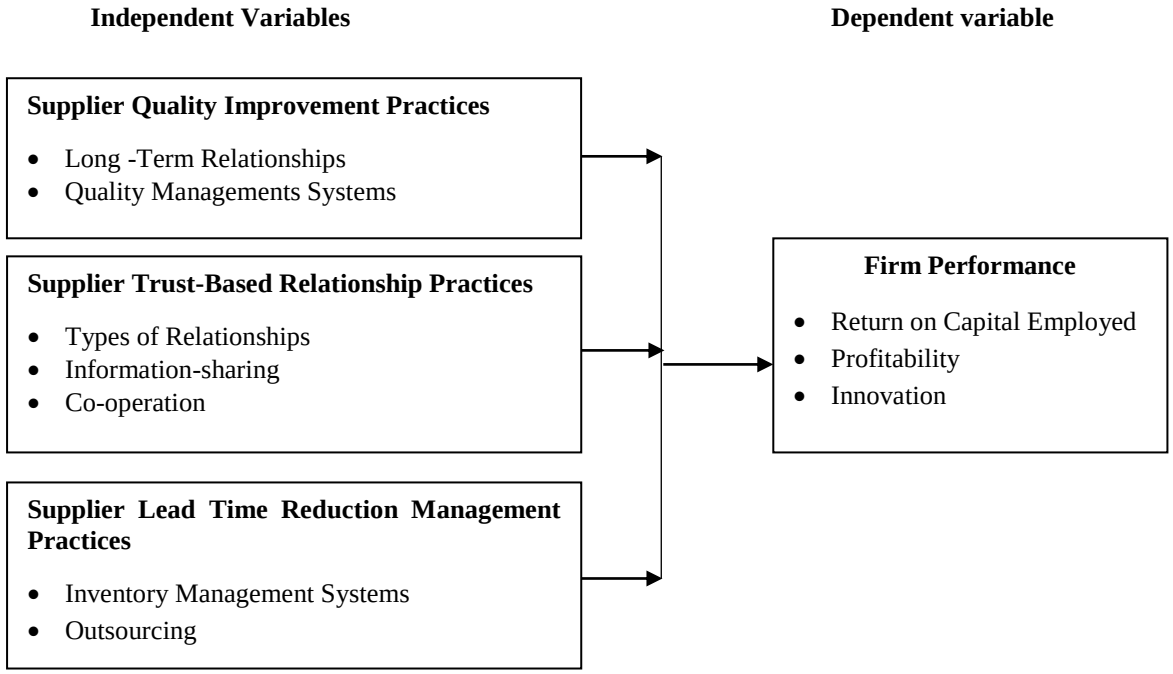
This research was conducted to determine if SRM practices are helping the Energy Sector firms which seem to be performing better (KIPPRA, 2010; The East African, 2016 and KNBS, 2016;). Also to contribute the further development of SCM field in the theory and practice (Halldorsson et al., 2015 and Barasa, Namusonge, & Iravo, 2016). This study sought to fill this gap of knowledge by assessing the influence of supplier relationship management practices on performance of Energy Sector firms in Kenya. This is because the researchers hypothesized that SRM Practices could be the answer to the question of Firm Performance in the Energy Sector Firms.

Specifically, the study was guided by the following objectives:

1. To evaluate the influence of supplier quality improvement practices on the performance of the energy sector firms in Kenya.
2. To determine the influence of supplier trust-based relationship practices on the performance of the energy sector firms in Kenya.
3. To assess the influence of supplier lead time reduction management practices on the performance of the energy sector firms in Kenya.

2. LITERATURE REVIEW

This study was informed by three theories: Principal-Agent Theory (PAT), Transaction Cost Analysis (TCA) and Network Theory (NT). The PAT theory was to understand and model all independent variables of the study: Supplier Quality Improvement Practices; Supplier Trust-based Relationship Practices; and Supplier Lead Time Reduction Management Practices. TCA offers a normative economic approach to determine the firm's boundaries and can be used to present efficiency as a motive for entering inter-organizational arrangements (Halldorsson et al., 2015). TCA was used to understand the merits and demerit of Supplier Collaboration in New Product Development Relationship Practices in SRM and Supplier Trust-based Relationship Practices on the performance of Energy Sector Firms. The performance of a firm depends not only on how efficiently it cooperates with its direct partners but also on how well these partners cooperate with their own business partners. MacCarthy & Jayarathne (2013) opined that Network Theory (NT) can be used to provide a basis for the conceptual analysis of reciprocity in cooperative relationships. The focus of NT was on developing Supplier Quality Improvement Practices and Supplier Trust-based Relationship Practices between the supply chain members in the Energy Sector Firms in Kenya. Based on the above theoretical framework, the following conceptual framework was derived:



3. RESEARCH METHODOLOGY

The study adopted a quantitative and qualitative research design to establish the associations among the key study variables. The study population was Energy Sector firms in Kenya licensed by Energy Regulatory Commission and with known with registered physical locations and contacts in Eldoret, Mombasa, Nairobi, Nakuru, Kisumu and other Towns (ERC, 2016a; ERC, 2016b; ERC, 2016c; ERC, 2016d; & ERC, 2016e) as shown in the table below:

Table 3.1: Target Population

Town in Kenya	Electric Power Undertakings Industry	Solar Energy Systems Industry	LPG Trade	LPG Transport Industry	Fuels and Lubricants Trade	No. of Firms
Eldoret	1	0	5	0	27	33
Kisumu	2	0	2	1	28	33
Mombasa	5	1	29	5	71	111
Nairobi	3	19	103	47	304	476
Nakuru	9	0	0	0	29	38
Other Towns	29	0	23	9	94	155
Total	49	20	162	62	553	846

Source: (ERC, 2016a; ERC, 2016b; ERC, 2016c; ERC, 2016d; & ERC, 2016e)

This Research applied stratified sampling technique where the energy sector firms are located that is; Eldoret, Kisumu, Mombasa, Nairobi, Nakuru and other towns in Kenya. This research applied the formulae from Saunders, Lewis and Thornhill (2009); Uzel, Namusonge and Obwogi (2015) to determine the sample size of 264 as shown in the table below:

Table 3.2: Sample Size

Town in Kenya	Target Population	Sample Size
Eldoret	33	10
Kisumu	33	10
Mombasa	111	35
Nairobi	476	149
Nakuru	38	12
Other Towns	155	48
Total	846	264

Source: (ERC, 2016a; ERC, 2016b; ERC, 2016c; ERC, 2016d; & ERC, 2016e)

The collection of study data involved primary data that was collected by use of a self-administered semi-structured questionnaire using the key-informant method. Secondary data were obtained from both published and unpublished records. Data relating to the Energy Sector Firms in annual and published financial statements in national newspapers, during Annual General Meetings messages and in-house magazines were used to provide secondary data information on relevant Performance Indicators.

A pilot study on the questionnaire was done in Mombasa County in Kenya using the sample size of 35 respondents. All aspects of the questionnaire were pre-tested including question content, wording, sequence, form and layout, question difficulty and instructions. The feedback obtained was used to revise the questionnaire before administering it to the study respondents. The regression analysis was used to test the significant effect of independent variables on the measures of overall performance of CSR. The logistic regression model for this study took the form:

$Y=\beta_0+ \beta_1X_1+ \beta_2 X_2 +\beta_3 X_3+ X_5+\varepsilon_i$

Where: -

Y = Dependent Variable Change Performance of Energy Sector Firms (ESFP)

X_1 = Change in Energy Sector Performance resulting from influence of SQIP

X_2 = Change in Energy Sector Performance resulting from influence of STBRP

X_3 = Change in Energy Sector Performance resulting from influence of SLTRMP

$\beta_0, \beta_1, \beta_2, \beta_3,$ = Regression Coefficient to be estimated

ε_i = Stochastic Term.

The following table outlines the relevant two-tail hypotheses tests and the respective regression models.

Table 3.3: Hypothesis Tests

Hypothesis Statement	Hypothesis test	Decision rule and anticipated model
H_{01}: there is no significant influence of SQIP on performance of Energy Sector Firms in Kenya	-Karl Pearson's coefficient of correlation - T-test H_0: $\beta_{1=}0$; H_0: $\beta_1 \neq 0$	Reject H_{01} if p-value $\leq$ 0.05 otherwise Accept H_{01} if p-value is > 0.05 ESFP= $\alpha + \beta_1$SQIP+ ε_i
H_{02}: there is no significant influence of STBRP on performance of Energy Sector Firms in Kenya	-Karl Pearson's coefficient of correlation - T-test H_0: $\beta_{2=}0$; H_0: $\beta_2 \neq 0$	Reject H_{02} if p-value $\leq$ 0.05 otherwise Accept H_{02} if p-value is > 0.05 ESFP = $\alpha + \beta_2$ STBRP + ε_i
H_{03}: there is no significant influence of SLTRMP on performance of Energy Sector Firms in Kenya	Karl Pearson's coefficient of correlation - T-test H_0: $\beta_{3=}0$; H_0: $\beta_3 \neq 0$	Reject H_{03} if p-value $\leq$ 0.05 otherwise Accept H_{03} if p-value is > 0.05 ESFP = $\alpha + \beta_3$ SLTRMP+ ε_i

4. FINDINGS

4.1 Descriptive statistics:

Respondents were asked to indicate agreement with each item used to measure the Independent variables and Dependent variables. Each item had a five-point scale ranging: 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, & 5=strongly agree; 1=Very Much below average, 2=below average, 3= average, 4= above average & 5=Very Much above average; and 1=Very Inferior, 2= Inferior, 3= average, 4= Superior & 5=Very Inferior.

4.1.1 Descriptive data of Supplier quality improvement Practices:

The table below shows the findings:

Table 4.1: Descriptive data of Supplier quality improvement Practices

	SD	D	N	A	SA	All			
Test Items	**% of Frequency**						**Sample Size (N)**	**Mean**	**Standard Deviation**
We, strive to establish long-term relationships with suppliers.	0.00	0.00	0.00	66.13	33.87	100.00	124	4.34	0.475
Our suppliers are actively involved in our new product	0.00	0.00	0.00	62.10	37.90	100.00	124	4.38	0.487
We, quality is our number one criterion in selecting suppliers	0.00	5.65	12.90	33.87	47.58	100.00	124	4.23	0.884
We, use mostly suppliers that we have accredited and / or ISO Certified.	0.00	4.84	8.87	43.55	42.74	100.00	124	4.24	0.810
We maintain close communication with suppliers about quality considerations and design changes.	0.00	0.00	0.00	41.94	58.06	100.00	124	4.58	0.495
We, actively engage suppliers in our quality Involvement efforts.	0.00	0.00	0.00	27.42	72.58	100.00	124	4.73	0.448
We would select a quality supplier(s) over one with a lower price.	0.00	0.00	0.00	48.39	51.61	100.00	124	4.52	0.502
Overall Mean Score	0.00	1.50	3.11	46.20	49.19	100.00	124	4.43	0.590

From the analysis in the above table respondents agreed that supplier quality improvement practices influenced the performance of energy sector firms with a mean of 4.43; 49.19% strongly agreed, 46.20% agreed, 3.11% were neutral, 1.50% disagreed and 0.00% strongly disagreed.

4.1.2 Descriptive data of Supplier Trust-Based Relationship Practices:

The table below shows the findings of Supplier Trust-Based Relationship Practices:

Table 4.2: Descriptive data of Supplier Trust-Based Relationship Practices

	SD	**D**	**N**	**A**	**SA**	**All**			
Test Items	**% of Frequency**						**Sample Size (N)**	**Mean**	**Standard Deviation**
We are comfortable sharing problems with our suppliers.	0.00	0.00	0.00	55.65	44.35	100.00	124	4.44	0.499
When, in dealing with our suppliers, we are willing to change assumptions, in order to find more effective solutions.	0.00	0.00	0.00	53.23	46.77	100.00	124	4.47	0.501
We believe that cooperating with our suppliers is beneficial.	0.00	0.00	0.00	49.19	50.81	100.00	124	4.51	0.502
We, emphasize openness of communications in collaborating with our suppliers.	0.00	0.00	0.00	45.16	54.84	100.00	124	4.55	0.500
Overall Mean Score	0.00	0.00	0.00	50.81	49.19	100.00	124	4.49	0.500

From analysis shown above, the respondents agreed that supplier trust-based relationship practices influenced the performance of energy sector firms with a mean of 4.49; 50.81% agreed, 49.19% strongly agreed, 0.00% were neutral, 0.00% disagreed and 0.00% strongly disagreed.

4.1.3: Descriptive Statistics of Supplier Lead Time Reduction Management Practices:

The table below shows the findings:

Table 4.3: Descriptive Statistics of Supplier Lead Time Reduction Management Practices

	SD	D	N	A	SA	All			
Test Items	% of Frequency						Sample Size (N)	Mean	Standard Deviation
We, seek short lead times in the design of our supply chains.	0.00	0.00	0.00	49.19	50.81	100.00	124	4.51	0.502
We, purchase in small lot sizes, to reduce supplier lead time.	0.00	0.00	0.00	44.35	55.65	100.00	124	4.56	0.499
When outsourcing, we consider supplier lead time as a greater priority than cost.	0.00	0.00	0.00	49.19	50.81	100.00	124	4.51	0.502
Our company strives to shorten supplier lead time, in order to avoid inventory and stock-outs	0.00	0.00	0.00	49.19	50.81	100.00	124	4.51	0.502
Overall Mean Score	0.00	0.00	0.00	47.98	52.02	100.00	124	4.52	0.501

From the table above respondents agreed that supplier lead time reduction management practices influenced the performance of energy sector firms with a mean of 4.52; 52.02% strongly agreed, 47.98% agreed, 0.00% were neutral, 0.00% disagreed and 0.00% strongly disagreed.

4.2 T-tests:

T-Tests were carried out on all variables to test for the equality of means in order to either accept or reject the Null Hypotheses. That is, if t-value=0 (If there's no significant difference expected between the means, at $\alpha = 0.05$, 2-tailed), Reject H0 if p-value $\leq \alpha$, otherwise Accept HA if the p-value is $> \alpha$.

4.2.1 T-tests on Supplier Quality Improvement Practices Measures:

The Firm's SQIP was assessed by seven measures but after factor analysis, these measures were reduced to three namely: Supplier Continuous Quality Improvements, Supplier Standardizations and Supplier involved in New Product Development. The significant results showed that the means were statistically different and the Null Hypothesis was rejected. Factor 1 had the first two constructs, Factor 2 had two constructs and Factor 3 had one construct; means have been identified in Table 4.4:

Table 4.4: T-tests on Supplier Quality Improvement Practices Measures

Component: Number & Name	SQIP Measures	Sample Size (N)	Mean	Std. Error Mean	t- value	Significance (p-value
1: Supplier Continuous Quality Improvements	Communication with Suppliers about quality reviews and design changes	124	4.581	0.044	102.952	0.000
	Suppliers engaged in quality improvement efforts	124	4.726	0.040	117.487	0.000
2: Supplier Standardizations	Establishing long-term relationships with suppliers	124	4.339	0.043	101.672	0.000
	Suppliers accredited and or ISO Certified	124	4.242	0.073	58.301	0.000
3: Supplier involved in New Product Development	Involvement of suppliers in New Product Development	124	4.379	0.044	100.106	0.000
Overall mean score = 4.453 T-test for equality of means: t-value = 0 = (H_{01}: there was no difference expected between the means, at $\alpha = 0.05$, 2-tailed). Reject H_{01} if P-value $\leq \alpha$, otherwise fail to reject H_{01}if P-value $> \alpha$						

4.2.2 T- tests on Supplier Trust-based Relationship Practices Measures:

The Firm's STBRP was assessed by four measures but after factor analysis, these measures were reduced to one namely: Supplier Trust. The significant results showed that the means were not statistically different and the Null Hypothesis was accepted. Factor 1 had the four constructs; means have been identified in Table 4.5:

Table 4.5: T-tests on Supplier Trust-based Relationship Practices Measures

Component: Number & Name	STBRP Measures	Sample size (N)	Mean	Standard Error Mean	t- value	Significance (p-value)
1: Supplier Trust	Comfortable sharing problems with suppliers	124	4.444	.045	99.197	.000
	Willingness to change assumptions when dealing with suppliers to find more effective solutions	124	4.468	.045	99.306	.000
	Belief that co-operation with suppliers is beneficial	124	4.508	.045	100.007	.000
	Openness of communications in collaboration with suppliers	124	4.548	.045	101.364	.000
Overall mean score = 4.492 T-test for equality of means: t-value = 0 = (H_{02}: there was no difference expected between the means, at $\alpha = 0.05$, 2-tailed). Reject H_{01} if P-value $\leq \alpha$, otherwise fail to reject H_{01}if P-value $> \alpha$						

4.2.3: T-tests on Supplier Lead Time Reduction Management Practices Measures:

The Firm's SLTRMP was assessed by four measures but after factor analysis, these measures were reduced to one namely: Supplier Lead Time. The significant results showed that the means were statistically different and the Null Hypothesis was rejected. Factor 1 had the three constructs; means have been identified in Table 4.6:

Table 4.6: T-tests on Supplier Lead Time Reduction Management Practices Measures

Component: Number & Name	SLTRMP Measures	Sample size (N)	Mean	Standard Error Mean	t- value	Significance (p-value)
1: Supplier Lead Time	Seeking short lead times in the design of the supply chains	124	4.508	.045	100.007	.000
	Procurement in small lot sizes to reduce lead time	124	4.556	.045	101.717	.000
	Strive to shorten lead time to control inventory	124	4.508	.045	100.007	.000
Overall mean score = 4.524 T-test for equality of means: t-value = 0 = (H_{03}: there was no difference expected between the means, at $\alpha = 0.05$, 2-tailed). Reject H_{01} if P-value $\leq \alpha$, otherwise fail to reject H_{01}if P-value $> \alpha$						

4.3 Correlations:

4.3.1 Correlations of supplier relationship management practices and Energy Sector Firms performance:

In order to establish the relationship between supplier relationship management practices and Energy Sector Firms performance, a correlation matrix was used.

Table 4.7: Correlation Results

		SQIP	STBRP	SLTRMP	ESFP
SQIP	Pearson Correlation	1			
STBRP	Pearson Correlation	.334**	1		
SLTRMP	Pearson Correlation	.316**	.824**	1	
ESFP	Pearson Correlation	.271**	-.061	.113	1

Table 4.7 reveals a varied degree of interrelationships among supplier relationship management practices and Energy Sector Firms performance. For instance, there was a significant positive correlation (r=0.271**) between SQIP and Energy Sector Firms performance. This, therefore, means that if Performance of Energy Sector Firms performance is influenced by positively by SQIP and SLTRMP as an SRM practice.

4.3.2: Multicollinearity:

Table 4.8: Multicollinearity of study variables

Model	Unstandardized Coefficients	Standardized Coefficients	Collinearity Statistics		
	B	Std. Error	Beta	Tolerance	VIF
Constant	32.861	11.207			
SQIP	.794	.215	.379	.512	1.955
STBRP	-3.059	.800	-.535	.275	3.642
SLTRMP	2.119	.879	.401	.194	5.160

From the results, the correlation coefficients showed that all the independent variables were correlated to each other. Their relationships were positive and statistically significant which established that the study variables had a high tolerance level and were free from multicollinearity. This is because none of the Variance of Inflation Factor (VIF) for all the study variables exceeded 10, the threshold beyond which multicollinearity was a problem (Kock & Lynn, 2012).

4.3.3: Regression:

This study was based on the following regression model:

$Y=\beta 0+ \beta 1X1+ \beta 2\ X2 +\beta 3\ X3 +\varepsilon i$

Where

Y = Performance of Energy Sector Firms

β0, β1, β2, β3, β4, β5 = Coefficient of Performance of Energy Sector Firms in Kenya equation

X1 = Supplier Quality Improvement Practices

X2 = Supplier Trust-based Relationship Practices

X3 = Supplier Lead Time Reduction Management Practices

ε = Standard Error Term.

Table 4.9: Model Summary for supplier quality improvement practices

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.271[a]	.074	.066	8.764
Note: a. Predictors: (Constant), SRM Practice X_1				

The results of ANOVA test which reveals that the variable Supplier Quality Improvement Practices statistically significantly predicted the performance of Energy Sector Firms in Kenya, F (1, 122) = 9.707, p< .05, R2 = .074.

Table 4.10: ANOVA (F-test) Analysis for supplier quality improvement practices

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	745.608	1	745.608	9.707	.002[b]
	Residual	9371.126	122	76.813		
	Total	10116.734	123			
Note: a. Dependent Variable: Performance of Energy Sector Firms						
b. Predictors: (Constant), SRM Practice X_1						

Where:

Y = Performance of Energy Sector Firms

$\beta_{0,}$ = Constant (Y- Intercept)

ε = Standard Error Term

β_1 = Coefficient of Performance in Energy Sector firms in Kenya equation

X_1 = Supplier Relationship Management practice

Performance of Energy Sector Firms in Kenya Y=57.962+0.569Supplier Relationship Management practice. From regression results, a unit increase in Supplier Relationship Management practice resulted in an increase of 56.9% change in Performance of Energy Sector Firm. The general regression model will be $Y=57.962+ 0.569X_1$

Table 4.11: Model Summary for Supplier trust-based relationship Practices

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.061[a]	.004	-.004	9.089
Note: a. Predictors: (Constant), SRM Practice X_2				

Table 4.10 shows the results of ANOVA test which reveals that the variable Supplier Quality Improvement Practices statistically significantly predicted the performance of Energy Sector Firms in Kenya, F (1, 122) = .458, p< .05, R^2 = .004.

Table 4.12: ANOVA (F-test) Analysis for supplier trust-based relationship Practices

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.822	1	37.822	.458	.500[b]
	Residual	10078.912	122	82.614		
	Total	10116.734	123			
Note: a. Dependent Variable: Performance of Energy Sector Firms						
b. Predictors: (Constant), SRM Practice X_2						

From Table 4.11, Linear regression for model Supplier Relationship Management practices $Y=\beta_0+ \beta_2 X_2+\varepsilon$

Where:

Y = Performance of Energy Sector Firms

$\beta_{0,}$ = Constant (Y- Intercept)

ε = Standard Error Term

β_2 = Coefficient of Performance in Energy Sector firms in Kenya equation

X_2 = Supplier Relationship Management practice

Performance of Energy Sector Firms in Kenya Y=80.463 + (-0.349) Supplier Relationship Management practice. From regression results, either a unit decrease in Supplier Relationship Management practice resulted in decrease of 34.9% change in Performance of Energy Sector Firm; or performance of energy Sector firms is known to depend on Supplier Trust-based Relationship Practices but the design used to generate the data, does not have sufficient power to detect that dependence. The general regression model will be $Y=80.463 + (-0.349) X_{2.}$

Table 4.13: Coefficients for supplier trust-based relationship Practices

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	80.463	9.313		8.640	.000
	SRM Practice X_2	-.349	.516	-.061	-.677	.500
Note: a. Dependent Variable: Performance of Energy Sector Firms						

4.3.4 Linear regression model on the influence of Supplier Relationship Management practices on performance of Energy Sector Firms in Kenya:

From the analysis in the table 4.11, the linear regression analysis models on the dependent variable which is performance of Energy Sector Firms in Kenya and independent variable which is Supplier Relationship Management practices, the coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between the Supplier Relationship Management practices and the performance of Energy Sector Firms in Kenya. The results of the linear regression indicate that R^2= .013 and R= .113 this is an indication that there is a moderate linear relationship between Supplier Relationship Management practices and the Energy Sector Firms in Kenya. The independent variable can only explain 1.3% of the variability of a dependent variable.

Table 4.14: Model Summary for supplier lead time reduction management practices

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.113[a]	.013	.005	9.048
Note: a. Predictors: (Constant), SRM Practice X_3				

Table 4.12 shows the results of ANOVA test which reveals that the variable Supplier Quality Improvement Practices statistically significantly predicted the performance of Energy Sector Firms in Kenya, F (1, 122) = 1.571, p< .05, R^2 = .013.

Table 4.15: ANOVA (F-test) Analysis for supplier lead time reduction management practices

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	128.633	1	128.633	1.571	.212[b]
	Residual	9988.101	122	81.870		
	Total	**10116.734**	**123**			
Note: a. Dependent Variable: Performance of Energy Sector Firms						
b. Predictors: (Constant), SRM Practice X_3						

From Table 4.13, Linear regression for model Supplier Relationship Management practices $Y=\beta_0+ \beta_2 X_2+\varepsilon$

Where:

Y = Performance of Energy Sector Firms

β_0, = Constant (Y- Intercept)

ε = Standard Error Term

β_3 = Coefficient of Performance in Energy Sector firms in Kenya equation

X_3 = Supplier Relationship Management practice

Performance of Energy Sector Firms in Kenya Y=63.425+0.595Supplier Relationship Management practice. From regression results, a unit increase in Supplier Relationship Management practice resulted in an increase of 59.5% change in Performance of Energy Sector Firm. The general regression model will be $Y=63.425+0.595X_3$.

Table 4.16: Coefficients for Supplier Lead Time Reduction Management Practices

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	63.425	8.623		7.356	.000
	SRM Practice X_3	.595	.475	.113	1.253	.212
Note: a. Dependent Variable: Performance of Energy Sector Firms						

4.4 Multiple Regression Results on the effects of Supplier Relationship Management practices on performance in terms of Profitability of Energy Sector Firms in Kenya:

Table 4.17: Model Summary for performance in terms of Profitability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.414[a]	.172	.137	2.047
Note: a. Predictors: (Constant), Suppliers Development Practices, Supplier Collaboration in New Product Development Relationship Practices, Supplier Trust-Based Relationship practices, Supplier Quality Improvement Practices, Suppliers Lead Time Reduction Management Practices				

The table results from ANOVA test shows that the Supplier Relationship Management Practices statistically significantly predicted the performance in terms of Profitability of Energy Sector Firms in Kenya, F (5, 118) = 4.890, $p< .05$, R^2 = .172. All five variables added statistically significantly to the prediction, $p< .05$.

Table 4.18: ANOVA (F-test) Analysis for performance in terms of Profitability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102.425	5	20.485	4.890	.000[b]
	Residual	494.285	118	4.189		
	Total	596.710	123			
Note: a. Dependent Variable: Finance Measures of Performance in Energy Sector Firms						
b. Predictors: (Constant), SRM PracticeX_5, SRM Practice X_4, SRM Practice X_2, SRM Practice X_1, SRM Practice X_3						

From table 4.14, the multiple regression models for performance in terms of Profitability,

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$

Where:

Y = performance in terms of Profitability of Energy Sector Firms in Kenya

β_0, = Constant (Y- Intercept)

ε = Random Error of the Model

β_1, β_2, β_3, = Coefficient of performance in terms of Profitability of Energy

Sector Firms in Kenya equation

X_1 = Supplier Quality Improvement Practices (SRM Practice)

X_2 = Supplier Trust-based Relationship Practices (SRM Practice)

X_3 = Supplier Lead Time Reduction Management Practices (SRM Practice)

Performance of Energy Sector Firms in terms of Profitability, Y= -3.908+ .113Supplier quality improvement Practices+ -.152 Supplier Trust-based Relationship Practices +-.042 Supplier Lead Time Reduction Management Practices

The general regression model arrived at was

$Y = -3.908 + 0.113X_1 - 0.152X_2 - 0.042X_3$

The Y-Intercept (β_0 = -3.908), predict that performance in terms of Profit of Energy Sector Firms in Kenya performance in terms of Profit of Energy Sector Firms in Kenya when all other variables are zero, implying that without the independent variables that include: Supplier quality improvement Practices; Supplier Trust-Based Relationship practices; Supplier Lead Time Reduction Management Practices; Supplier Collaboration in New Product Development Relationship Practices and Supplier Development Practices; the performance of Energy Sector Firms will be -3.908.

Regression results show that a unit change in Supplier Quality Improvement Practices resulted in 11.3% increase in Performance of Energy Sector Firm in terms of Profitability; a Unit change in Supplier Trust-based Relationship Practices resulted in 15.2% decrease in Performance of Energy Sector Firm in terms of Profitability; a Unit change in Supplier Lead Time Reduction Management Practices resulted in 4.2% decrease in Performance of Energy Sector Firm in terms of Profitability; a Unit change in Supplier Collaboration in New Product Development Relationship Practices resulted to 35.3% increase in Performance of Energy Sector Firm in terms of Profitability and a Unit change in Supplier Development Practices resulted to 16.7% decrease in Performance of Energy Sector Firm in terms of Profitability.

Table 4.19: Coefficients for performance in terms of Profitability

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.908	3.110		-1.257	.211
	SRM PracticeX_1	.113	.060	.221	1.891	.061
	SRM PracticeX_2	-.152	.222	-.109	-.685	.495
	SRM PracticeX_3	-.042	.244	-.033	-.172	.864
	SRM PracticeX_4	.353	.109	.286	3.247	.002
	SRM PracticeX_5	.167	.158	.153	1.059	.292
Note: a. Dependent Variable: Finance Measures of Performance in Energy Sector Firms						

From the table above Supplier Collaboration in New Product Development Relationship Practices X_4 (β =0.353, $p< 0.05$) has the strongest relationship with the Performance in terms of Profitability of Energy Sector Firms in Kenya, then followed by Suppliers Development Practices X_5(β =0.167, $p< 0.05$) and Supplier Quality Improvement Practices X_1(β =0.113, $p< 0.05$) respectively. Supplier Trust-based Relationship Practices X_2(β =-0.152, $p> 0.05$) and Supplier Lead Time Reduction Management Practices X3(β =-0.042, $p> 0.05$) could not significantly predict the Performance in terms of Profitability of Energy Sector Firms in Kenya.

4.5 Summary of Hypotheses Test Results:

Hypothesis	P - values	Decision
H_{01}: There is no significant influence of SQIP on the performance of Energy Sector Firms in Kenya.	.000	Rejected
H_{02}: There is no significant influence of STBRP on the performance of Energy Sector Firms in Kenya.	.000	Accepted
H_{03}: There is no significant influence of SLTMP on the performance of Energy Sector Firms in Kenya.	.017	Rejected

5. CONCLUSION AND RECOMMENDATIONS

The study findings showed Supplier Relationship Management practices that include; Supplier quality improvement Practices, Supplier Trust-Based Relationship practices and Suppliers Lead Time Reduction Management Practices significantly influence the performance of Energy Sector Firms in Kenya in terms of ROCE, Profitability and Innovation. This is supported by regression analysis findings with F (5, 118) = 13.596, $p< 0.05$, $R^2 = 0.366$. The Inferential analysis revealed that Supplier Lead Time Reduction Management Practices (SLTRMP) has the strongest relationship with the Performance of Energy Sector Firms in Kenya, then followed by SRM Practice $X_3(\beta = 2.119, p< 0.05)$ and Supplier Quality Improvement Practices (SQIP) SRM Practice $X_1(\beta = 0.794, p< 0.05)$ respectively. Supplier Trust-based Relationship Practices (STBRP) SRM Practice $X_2(\beta = -3.059, p> 0.05)$ could not significantly predict the Performance Energy Sector Firms in Kenya. Obviously, the researcher cannot suggest that Energy Sector Firms should not neglect it because of its insignificant influence on performance in the Study sample. Different benefits have been reported in the literature as a result of adopting these SRM practices. The results suggested that STBRP is less important in influencing the performance of Energy Sector firms than the positively powerful two SRM practices (SLTRMP and SQIP).

The study is a justification that the firms that incorporate Supplier Relationship Management Practices which include Supplier quality improvement Practices, Supplier Trust-Based Relationship practices, Suppliers Lead Time Reduction Management Practices to have a positive and significant influence on the performance of Energy Sector Firms in Kenya in terms of ROCE, Profitability and Innovation.

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