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## Influence of Alternative Financing on the Relationship between Managerial Competency and Efficiency of Small and Medium Enterprises in Kenya

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### Abstract

Worldwide, Small and medium-size enterprises (SMEs) exhibit inimitable financial needs. While SMEs remain fundamental to economic growth, their mortality rate in Kenya approaches 90% by the second year, mainly owing to lack of credit. However, scholarly endeavors exploring the impact of alternative finance (AF) on managerial competency - efficiency nexus for manufacturing SMEs have received little attention in Kenya. To resolve this conundrum, a thorough study to investigate how AF impacts managerial competency - efficiency nexus is necessary. The study used a cross-sectional research design, employing both qualitative and quantitative research approaches. The target population was 171 SMEs registered with Kenya Association of Manufacturers. The accessible population was 136 SMEs owners/managers. A semi-structured questionnaire was used to collect primary and secondary data. Data envelopment analysis was used to measure efficiency, multiple regression modeling used to analyze the direct relationships while hierarchical moderated multiple regression analysis employed to test moderation. Partial Least Squares Structural Equation Modeling was used to test robustness of our results. The findings of this study demonstrate that managerial competency positively influences efficiency ( $\beta = 0.150$ ,  $t\text{-value} = 10.246$ ,  $P < 0.05$ ), and that alternative finance does moderate managerial competency relationships with efficiency (R-Square change of 21.7%). We suggest trainings for manufacturing SME owners/managers in Kenya on the pivotal role of alternative finance to facilitate SMEs achieve higher efficiencies and accelerate economic growth.

**Keywords:** Alternative Financing, Firm-Size, Efficiency, Small and Medium-size Enterprises

**JEL classification:** G200; G190.

## **Introduction**

The world over, Small and medium-size enterprises (SMEs) remain the fundamental engine to productivity and economic growth. (Abdulsaleh & Worthington, 2013;). Yet, adequacy of credit and business finance determines their survival rate (Ayyagari, Beck & Demirguc-Kunt, 2007; Kihimbo, Ayako, Omoka and Otuya, 2012). According to Juma, (2017), SME mortality rate in Kenya stands at 90% by the second year. Allen, Carletti, Qian, & Valenzuela (2012) illuminate the vital role of alternative finance (AF) in commercial finance in their global focus study on AF, providing firm-level data. Building a body of knowledge on the performance of SMEs and their need for alternative finance therefore, more so isolating those factors that contribute to enhancing their efficiency is vital.

Extant empirical evidence provides a universal picture of the formal finance - firm performance nexus (Adenkule, Adegbite, & Fakayode 2012; Erick, 2014). While SMEs financial behavior is significantly different from those of large firms, (Forkuoh, Li, Affum-Osei, & Quaye, (2015) those SMEs in start-up phase predominantly rely on alternative finance (Abdulsaleh & Worthington, 2013). Specifically, for SMEs, trade credit is the most prominent source of finance in both developing and developed countries (Giannetti, Burkart, & Elligensen, 2011; Murfin & Njoroge, 2012). Historically, SMEs in developing countries have benefited from venture capital (Karanja, Memba, & Gakure, 2012). Therefore, Non-Bank Financial Institutions (NBFI) are very important and pivotal in an economy (Kihimbo et al., 2012).

While SMEs sustainability is of great significance (Bowen, Morara, & Mureithi, 2009), their efficiency is influenced by characteristics such as size, age and managerial competency. This relationship could be moderated by variables such as alternative finance (AF). Prusa, (2012) has it that appropriate measure of efficiency encompasses both technical and allocative efficiency. Both may be calculated simultaneously by use of a "money-metric production" frontier framework which demands product heterogeneity and price endogeneity. Abdulsaleh & Worthington, (2013) emphasize that SME access to finance is fundamental, if they are to play their role of sustaining economic growth and spurring innovation for accelerating national economic growth. European Integration Studies - EIS, (2005), agree, adding that SME development as influenced by efficiency, require concerted efforts of various players, among them being local business associations (EIS, 2005).

Universally, SMEs suffer financial insufficiency compared to large enterprises. These challenges are more prevalent in poor and developing countries (Abdulsaleh & Worthington, 2013; Kihimbo, et al., 2012). In their research, on management of business challenges among SMEs in Kenya, Kenya national bureau of statistics - KNBS, (2017); World Bank Group - IBRD & IDA, (2017), identified lack of access to credit as a major challenge. However, AF solutions were not suggested. While AF appears to be the preferred mode of financing and maintaining start-ups, its impact on the sustenance of manufacturing SMEs is not well documented in Kenya.

This study is anchored on the Endogenous growth theory and Schumpeterian Theory of Innovation. Endogenous growth theory holds that economic growth is primarily the result of endogenous and not external sources, Aghion & Howitt, (1998). Investment in human capital, managerial capacity, innovation/adoption of technology, and knowledge of market are significant contributors to firm efficiency and growth (Romer 1994). This theory goes a long way to explain relationship between major factors of firm characteristics and efficiency, including factors such as managerial capacity, innovation, adoption of technology, and knowledge of market. Human capital is the aggregate labor-force in a company. Human capital impacts production through their level of efficiency, individual output, level of skill and type of learning curve before perfecting skills. Human capital cost is a major factor impacting price. The higher the output/skill/workmanship, the higher the expected economic growth. The higher the total labor cost, the lower the economic growth. The higher the ratio of output to labor costs, the higher the expected efficiency and real economic growth.

Managerial competency describes the entrepreneurial orientation and may include innovation, adoption of technology, risk attitude, level of education and experience, (Mburiah, Wanjau, & Kinyanjui, 2016). The study has adopted endogenous indicators of managerial competency (Aghion & Howitt, 1998), particularly

investment in managerial capacity as measured by level of innovation/adoption of technology, level of education and experience. The study hypothesized that higher managerial competency would drive efficiency. Further, better human capital leads to higher relative efficiency. We also viewed this interplay from the perspective of its moderation by alternative finance.

On the other hand, Schumpeterian Theory of Innovation proposes innovativeness, efficiency and constant renewal. Schumpeter (1934), holds that the entrepreneur innovator moves the economy out of static equilibrium by use of innovative skills (Schumpeter, 1942; March 1991). This theory suggests that firms attain a competitive advantage and improve efficiency if their owners and managers are innovative, skillful and informed (Uzkurt, Kumar, Kimzan, & Eminoglu 2013). Owners/managers of SMEs constantly rethink and renew the old by innovation, (Brown, Davisson, & Wiklund, 2001), by adjusting their actions riding on the wind of change and providing economic impetus (Bula, 2012). Innovative and dynamic entrepreneurs propagate microenterprises and journey them to SMEs and beyond in the business cycle, creating value.

According to Carmeli, (2001), arguing from a resource-based view, managerial competency is crucial in determining the level of performance of an organization. He finds a positive relationship was reported between managerial competency and efficiency of SMEs. According to a study by Industry Canada, (2003), there is a positive relationship between management competencies and efficiency of SMEs. Results from this study indicate that growth in revenues are significantly correlated with breadth of management skills, diversity and with the owners' intentions to pursue growth. The study recommended continuous skill development for better firm performance. Zarook, Rahman & Khanam, (2013) arrive at a similar finding in their study on the effect of management skills of SMEs on access to financing in Libya, while using a quantitative research method collected data from 557 SMEs. Their result showed that management skills, experience levels and education levels have significant positive effect on access to finance unlike business planning and political connections.

According to Mirie 2014), there are two possible approaches to measure performance. The parametric and non-parametric approaches. Parametric approaches include deterministic frontier method, stochastic frontier approach and thick frontier approach while non-parametric measures also known as mathematical programming frontier techniques include data envelopment analysis (DEA), and free disposal hull (FDH). DEA uses relative ratios to check efficiency of one firm against that of another (Mirie, 2014; Smith, (1997). Coelli, Rao, O'Donnell, & Battese, (2005) identified conversion of inputs into outputs ratios as a measure of productivity performance. They discussed DEA model among others. Their conclusion was that higher firm efficiencies were associated with higher levels of production.

Firm operational characteristics have variously been used as systems for defining, identifying, measuring and ensuring continuous improvement as well as management apparatuses in organizations. Firm pursue efficiency of operations to sustain competitive advantage. Sustainable competitive advantage assures survival and thrive of the firm through owner/manager action. The operational characteristics - efficiency nexus continues to attract extensive theoretical, conceptual and scholarly attention the world over, thereby accumulating a wealth of knowledge. While SMEs remain the fundamental engine to development and economic growth globally, recent accelerated momentum of economic growth strains credit services, necessitating new alternative finance (AF). However, scholarly endeavors to explore the impact of alternative finance on operational characteristics - efficiency nexus has received little attention, more so for SMEs who possess inimitable financial needs. Empirical studies have modelled characteristics and efficiency as independent and dependent variables respectively. However, the power of an independent variable is better fathomed through identification/introduction of moderating variables. To resolve this conundrum, we sought to answer the question: Does level of alternative finance influence the relationship between managerial competency and efficiency of SMEs in the manufacturing sector in Kenya? To answer this question, we posed two hypotheses:

*H<sub>01</sub>: There is no significant relationship between managerial competency and efficiency of SMEs in Kenya*

*H<sub>02</sub>: Alternative finance has no significant moderating influence on the relationship between managerial competency and efficiency of SMEs in Kenya.*

This paper has four other section. Following the introduction section is the methodology which provides the research and sampling design and the analytical models we have used. The next section is presents the descriptive and summary statistics of the data used in the analysis. After this section is a section on result and discussion. It illustrates the inferential analysis results and their interpretation. The last section provides the conclusions and recommendations.

## Research Methodology

We used a cross-sectional research design involving the analysis of quantitative and qualitative data at a specific point in time. The target population was 171 SMEs members of Kenya Association of manufacturers (KAM) through a census. Accessible population was 136 SMEs owner/managers, using alternative finance in their firm's capital structure. The study employed a self-administered semi-structured questionnaire to collect its primary and secondary data. We tested the questionnaire for reliability and achieved Cronbach Alpha scores of 0.70 and above on all sections of the instrument. A pilot study preceded, using twenty-one firms randomly picked from the manufacturing sector in Kenya. Construct validity was tested via KMO measuring sampling adequacy and Bartlett's test of sphericity, sensitive to departures from normality. This study did a Cook-Weisberg test to guard against heteroscedasticity. Normality tests including Kolmogorov-Smirnov test and the Shapiro-Wilk test were done to confirm that sample was from a population with a normal distribution (Shapiro, & Wilk, (1965). The study used variance inflation factor (VIF) to assure the absence of multicollinearity (Brien, 2007).

We employed hierarchical moderated multiple regression analysis to test the moderating effect of alternative finance. Aiken and West (1991) reported that the MMR approach involves the addition of interaction effects to a multiple regression model by comparing two different least square regression equations. Since some of the data in the study was converted to continuous from ordinal, a robustness test employing the Partial Least Squares Structural Equation Modelling (PLS-SEM) was done, to guard against spurious results.

Data envelopment analysis (DEA) was used to measure efficiency of SMEs using equations 1 & 2, (Adapted from Fried et al., 1993). Multiple regression modeling was used to analyze the direct relationships between managerial competency and efficiency using equation 3 while hierarchical moderated multiple regression (MMR) analysis was employed to analyze the moderating effect of alternative finance on the relationship between managerial competency and efficiency using equations 4 & 5. Analysis tools used included Data Envelopment Analysis Program (DEAP) version 2.1 and Statistical Package for Social Scientists (SPSS) version 20.

$$E_l = \text{Maximize } \sum_{k=1}^m U_k Y_{ki} / \sum_{j=1}^n V_j X_{ji} \quad (1)$$

Subject to:

$$E_l = \text{Maximize } \sum_{k=1}^m U_k Y_{ki} / \sum_{j=1}^n V_j X_{ji} = < 1, \text{ for } i = 1, \dots, n \text{ and } V_j \geq 0 \quad (2)$$

Where:

$m$  = number of outputs for each SME using  $n$  different inputs;

$n$  = number of inputs used by each SME to produce  $m$  different outputs;

$y_{ki}$  = is the amount of the  $k^{th}$  output for the  $i^{th}$  SME;

$x_{ji}$  = is the amount of the  $j^{th}$  input used by the  $i^{th}$  SME;

$u_k$  = is the output weight;

$v_j$  = is the input weight.

Equation 3 was used to test the direct relationship between firm managerial competency and efficiency. It also served the first step of the moderated multiple regression (MMR) to test the moderating effect of alternative finance on the relationship between managerial competency and efficiency.

$$E_i = \alpha_i + \beta_{x_i}X_i + \beta_{u_i}U_i + \beta_{l_i}I_i + \varepsilon_i \quad (3)$$

Where:

$E_i$  = Efficiency of SME  $i$  (Where,  $0 \leq E_i \leq 1$ );

$\alpha_i$  = Intercept, a sample-wide constant;

$X_i$  = Experience of management of SME $_i$ ;

$U_i$  = Education of management of SME $_i$ ;

$I_i$  = Innovativeness of management of SME $_i$ ;

$\varepsilon_i$  = error term;  $\beta_{x_i}, \beta_{u_i}, \beta_{l_i}$  = coefficients for the respective determinants;

$i = 1$ -\*to-  $n$  where there are  $n$  observations.

For hypothesis testing we used Step-wise moderated multiple regression (MMR). Moderating effects of AF was tested using moderated multiple regression (MMR) analysis. Aiken and West (1991) reported that the MMR approach involves the addition of interaction effects to a multiple regression model by comparing two different least square regression equations. Equation 4 introduces alternative finance as a predictor variable. Alternative finance moderated multiple regression model for efficiency on managerial competency.

$$E_i = \alpha_{21} + \beta_{x_{21}}X_i + \beta_{u_{21}}U_i + \beta_{l_{21}}I_i + \beta_{af_{21}}AF_i + \varepsilon_{21} \quad (4)$$

Where:

$E_i, X_i, U_i, I_i$ , = as defined in equation 3

$\alpha_{21}$  = Intercept, a sample-wide constant;

$AF_i$  = Moderating variable – AF index of SME $_i$ ;

$\varepsilon_{21}$  = error term

$\beta_{x_{21}}, \beta_{u_{21}}, \beta_{l_{21}}, \beta_{af_{21}}$  = coefficients for the respective determinants.

Equation 5 introduces alternative finance as an interaction variable as the last step of MMR. In this step the overall model should be significant in addition to the moderator and at least one of the predictor variables.

$$E_i = \alpha_{22} + \beta_{x_{22}}X_i + \beta_{u_{22}}U_i + \beta_{l_{22}}I_i + \beta_{af_{22}}AF_i + \beta_{xaf}(X_iAF_i) + \beta_{uaf}(U_iAF_i) + \beta_{iaf}(I_iAF_i) + \varepsilon_{22} \quad (5)$$

Where:

$E_i, X_i, U_i, I_i$ , = as defined in equation 4

$\alpha_{22}$  = Intercept, a sample-wide constant;

$AF_i$  = Moderating variable – AF index of SME $_i$ ;

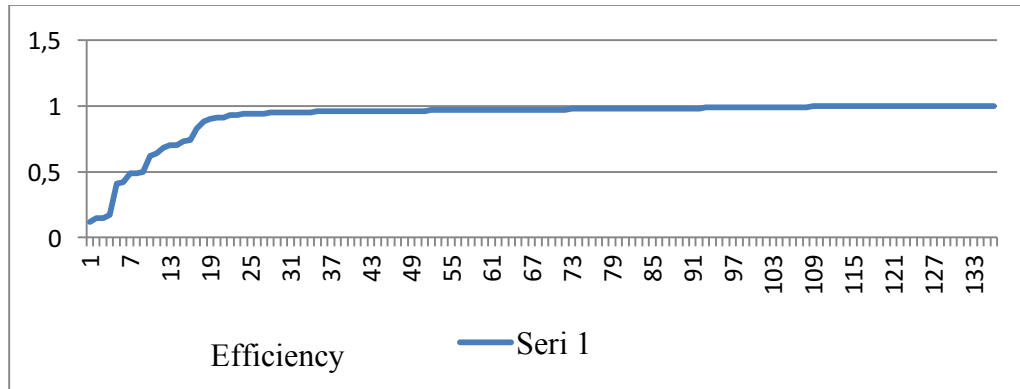
$\varepsilon_{22}$  = error term;  $\beta_{x_{22}}, \beta_{u_{22}}, \beta_{l_{22}}, \beta_{af_{22}}$  = coefficients for the respective determinants;

$\beta_{xaf}, \beta_{uaf}, \beta_{iaf}$ , = coefficients that indicate moderation.

## Empirical Data and Analysis

This study targeted owner/manager of manufacturing SMEs. The questionnaire required respondents to indicate their age bracket among three classifications thus: 18-30 years, 31-50 years and above 50. Majority (60%) of the respondents were in the 31-50 years' group. Those above 50 years were few at 33% while 18 to 30 years formed only 7% of the respondents. The results show that majority of the respondents were aged between 31 and 50 years.

Results of the data envelopment analysis indicate that for the sampled SMEs had efficiency values ranging from 0.12 to 1. Notice that the curve rises steeply in the beginning, such that within the first 20 observations, the curve reaches efficiency levels of above 0.85. Hence only a few 2.2% of the SMEs have efficiency of below 0.315. Most of the SMEs (86%) showed efficiency of above 0.89. The efficiency statistics were: Mean of 0.92; standard deviation 0.18 points; Skewness of -1.15; Kurtosis of 1.72, Figure 1.



**Figure 1:** SMEs Efficiency Distribution Curve

The SME's level of alternative finance was found to have mean of (141.56 million shillings) with a standard deviation of 101.75 million shillings and a positive moment coefficient of skewness of 0.95. Had a moment coefficient of Kurtosis of 0.25, a platykurtic curve. The SME with the highest alternative finance has 526.52 million shillings while the one having the lowest had 17.86 million shillings (Table 1).

Clarifying the connection between the financial growth cycle of SMEs and the owner–manager's life cycle, Briozzo and Vigier, (2009) assert that as the firm and its owner grow older, information asymmetries decrease, granting easier access to debt, while the owner's risk aversion and personal costs of bankruptcy increase with age, and hence the desire to borrow less. Managerial competency composed of three constructs, owner/manager innovation, level of education and years of experience. SME manager/owner's level of innovation was measured by average number of new branches opened and new products launched over the period 2012 to 2016. The study observed a close to normal distribution of new branches/products about the mean of 1.77, with a standard deviation of 0.44. A 0.0 moment coefficient of Skewness indicating perfect symmetry and a moment coefficient of Kurtosis of 0.22. The SME with the highest innovation had 2.9 while the one with the lowest had a score of 0.4 The study found out that on average, all the SMEs had at least opened a new branch or launched a new product over the period, Table 1.

Owner/manager education measurement used a 5 level Likert scale. Up to primary school, a score of 1; up to high school, a score of 2; up to Diploma level, a score of 3; up to first degree, a score of 4; then master's degree and above, score of 5. Owner/manager experience measurement used a 5 level Likert scale. Below 1 year - a score of 1; 1 year and less than 3 years - a score of 2; 3years and less than 6 years - a score of 3; 6 years and less than 10 years - a score of 4; 10years and above - with a score of 5. This ordinal data for owner/manager education and experience was converted to continuous data for compatibility (Table 1).

**Table 1:** Summary Statistics for Alternative Finance and Managerial Innovation

	AF	Innovation	Education	Experience
N	136	136	136	136
Mean	141.56	1.77	3.99	3.92
Std. Deviation	101.75	0.44	0.93	0.96
Skewness	0.95	0	-0.15	-0.04
Kurtosis	0.25	0.22	-1.5	-1.54
Minimum	17.86	0.4	2	2
Maximum	526.52	2.9	5	5

This paper analyzed the empirical data on efficiency, managerial competency and alternative finance using the analytical models described on the methodology section. We present results of the analysis in the results and discussions section.

For the pilot test sample; Cronbach's alpha value was above 0.70, below maximum of 0.905; test retest correlations above 0.6 with maximums of 0.845; KMO acceptable at 0.752; Bartlett's Test significant at 0.002 Shapiro – Wilk normality tests Sig  $\geq$  0.05; tolerance; 0.979 and 0.839 VIF acceptable between 1.194 and low of 1.021; and an acceptable Breusch -Pagan test for  $M^C$  of 0.957. For the sample: Variance Inflation Factor (VIF) range between 1.046 and 1.256. The values are below 5, the suggested cut-off score, thus there is then no risk of multicollinearity. Since tolerance ranges between .796 and .959 and the closer to 1 (one) the better, there is no apparent risk of multicollinearity. Results of Breusch-Pagan / Cook-Weisberg shows that the Lagrange multiplier constant variance (Chi-square= .684) is not statistically significant (P = 0.877). Thus, fail to reject the null hypothesis and conclude that the error variance is equal thus, heteroscedasticity is absent. For test against autocorrelation, a Durbin-Watson statistic of 1.9987 was obtained., this outcome is close to 2 (two), hence no risk of autocorrelation. Correlation between managerial competency and efficiency was 0.663 and was significant at the 0.05 level (2-tailed).

## Results and Discussions

We present inferential results in terms of the study's hypotheses. We begin with the results on the direct relationship between managerial competency and efficiency followed by the results on the moderating influence of alternative finance on the relationship between managerial competency and efficiency.

### Influence of Managerial Competency on Efficiency

Table 2 is a model summary of a regression run for efficiency on managerial competency for SMEs. Managerial competency in this case was measured as a composite of managerial competency construct. From the summary of the model, the study observed a strong positive correlation coefficient R of 0.663 and  $R^2$  at 0.439. An adjusted model can explain about 43.5% of the variations in level of efficiency in SMEs, given that adjusted  $R^2$  = .435

**Table 2:** Model Summary for Regression of Efficiency on Managerial Competency

<b>Model Summary</b>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1(M)	.663 <sup>a</sup>	.439	.435	.13353

a. Predictors: (Constant), Competency

Table 3 is an output of the analysis of variance (ANOVA) and t-test of the coefficients of a regression run of efficiency on managerial competency. A Two-way ANOVA isolates systematic data variability separate from random variability in data sets. It establishes the type of relationships between and among multiple data sets by use of the systematic variability. The linear regression F-test has the null hypothesis that the model explains zero variance in the dependent variable, (Thus,  $R^2$  =0). The F-test statistic (104.982) was found to be statistically significant since P-value <0.05. The study therefore, rejected  $H_0$  and accept the alternative that the model explains the variance in the dependent variable to a significant level. The t-values for the predictor variables were found to be statistically significant since P-value observed < 0.05 the tabulated critical P-value ( $\beta$  = 0.150, t-value =10.246, P<0.05). Therefore, then the null hypothesis of no relationship is rejected, accepting the alternative. Consequently, the study concluded that a positive relationship between the predictor variables and the dependent variable does exist.

**Table 3:** ANOVA and t-test Coefficients Output for Regression of Efficiency on Managerial Competency

Model		ANOVA				Coefficients					
		Sum of Square	Df	Mean Square	F	Sig	Unstandardized Coefficients	Std. Error	Standardized Coefficients	T	Sig.
1(M)	Regression	1.872	1	1.872	104.982	.000					
	Residual	2.389	134	.018							
	Total	4.261	135								
	Constant						.304	.061		4.989	.000
	Competency						.150	.015	.663	10.246	.000

a. Dependent Variable: Efficiency  
b. Predictors: (Constant), Competency

### Moderating Effect of Alternative Finance on Managerial Competency - Efficiency Relationship

We adopted the approach MMR to analyze the moderating effect of alternative finance on the relationship, between efficiency and managerial competency we first regressed efficiency on the measures of managerial competency i.e. education, experience and innovation. Table 4 presents the model summary. A positive correlation coefficient R of 0.541 is observed. As the predictor (managerial competency) increases, an increase in the dependent variable (efficiency) should be observed. An adjusted model can explain about 27.6% of the variations in level efficiency in SMEs as demonstrated by the adjusted R<sup>2</sup> value of .276.

**Table 4:** Model Summary for Multiple Regression of Efficiency on Managerial Competency.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.541 <sup>a</sup>	.292	.276	.15163

a. Predictors: (Constant), Innovation, Education, Experience.

b. Dependent Variable: Efficiency.

Table 5 presents the ANOVA output and the t-test results of the coefficients of the first step of the moderated multiple regression. The linear regression F-test has the null hypothesis that the model explains zero variance in the dependent variable, (Thus, R<sup>2</sup> =0). Since observed F-test statistic (18.050) is highly significant, where P-value <0.05. We therefore rejected the null hypothesis and concluded that the model has predictive power, since it explains to a significant level, the variations in efficiency level of an SME. Notice that that for all the predictor variables, the t-values are statistically significant since P-value observed < 0.05 the tabulated critical P-value. Specifically: Education regression coefficient is positive and significant with ( $\beta = 0.218$ , t-value =2.721, P<0.05); experience regression coefficient is positive and significant with ( $\beta = 0.331$ , t-value =4.128, P<0.05); innovation regression coefficient is positive and significant with ( $\beta = 0.215$ , t-value =2.880, P<0.05). Therefore, then null hypotheses of no relationship are rejected, accepting the alternatives. Consequently, we conclude that a positive relationship among the managerial competencies - predictor variables (education; experience & Innovation) and the dependent variable, efficiency, does exist.



**Table 5:** ANOVA and t-test Coefficients Output for Alternative Finance Moderated Multiple Regression of Efficiency on Managerial Competency.

Model		ANOVA			Coefficients						
		Sum of Square	Df	Mean Square	F	Sig.	Unstandardized Coefficients	Standardized Coefficients			
							B	Std. Error	Beta	T	Sig.
1	Regression	1.245	3	.415	18.050	.000					
	Residual	3.012	131	.023							
	Total	4.257	134								
	(Constant)						.246	.094		2.609	.010
	Education						.055	.020	.218	2.721	.007
	Experience						.072	.018	.331	4.128	.000
	Innovation						.041	.014	.215	2.880	.005

a. Dependent Variable: Efficiency.

b. Predictors: (Constant), Innovation, Education, Experience.

Since all the variables from step 1 are all statistically significant we proceed to introduce the moderator into the analysis as a predictor variable. The model summary of this step is presented in table 6. We find a positive correlation coefficient R of 0.571. As the predictor increases, an increase in the dependent variable (efficiency) should be observed. An adjusted model can explain about 30.6% of the variations in level of efficiency in SMEs as demonstrated by the adjusted R<sup>2</sup> value of .306.

**Table 6:** Model Summary of Alternative Finance Moderated Multiple Regression of Efficiency on Managerial Competency with AF as a Predictor Variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.571 <sup>a</sup>	.327	.306	.14850

a. Predictors: (Constant), AF, Education, Innovation, Experience.

b. Dependent Variable: Efficiency.

Table 7 presents ANOVA and t-test results of the second step of the MMR. The linear regression F-test has the null hypothesis that the model explains zero variance in the dependent variable, (Thus, R<sup>2</sup> = 0). Since observed F-test statistic (15.757) is highly significant, where P-value < 0.05, we reject the null hypothesis and concluded that the model has predictive power, since it explains to a significant level, the variations in efficiency level of an SME. When AF is introduced a predictor variable along with the measures of managerial competency. We observe that the t-values of all the variables are statistically significant since P-value observed < 0.05 the tabulated critical P-value. Specifically: education regression coefficient was positive and significant with ( $\beta = .219$ , t-value = 2.799, P < 0.05); experience regression coefficient was positive and significant with ( $\beta = .310$ , t-value = 3.924, P < 0.05); innovation regression coefficient was positive and significant with ( $\beta = .181$ , t-value = 2.443, P < 0.05); Alternative finance regression coefficient was positive and significant with ( $\beta = .189$ , t-value = 2.564, P < 0.05). Thus, null hypotheses of no relationship are therefore rejected. We concluded that alternative finance has positive moderating influence on the relationship between managerial competency (education, experience, & innovation) and efficiency.

**Table 7:** ANOVA and t-test Coefficients Output for Alternative Finance Moderated Multiple Regression of Efficiency on Managerial Competency with AF as a Predictor Variable.

Model		ANOVA			Coefficients						
		Sum of Square	Df	Mean Square	F	Sig.	Unstandardized Coefficients	Std. Error	Standardized Coefficients	T	Sig.
1	Regression	1.390	4	.348	15.757	.000					
	Residual	2.867	130	.022							
	Total	4.257	134								
	(Constant)						.285	.094		3.050	.003
	Education						.056	.020	.219	2.799	.006
	Experience						.068	.017	.310	3.924	.000
	Innovation						.035	.014	.181	2.443	.016
	AF						.034	.013	.189	2.564	.011

a. Dependent Variable: Efficiency.

b. Predictors: (Constant), Innovation, Education, Experience, AF.

Since all variables from the preceding step were found to be statistically significant, we introduce the moderator (AF) as an interaction variable as the last step in the MMR process. The model summary of this step is result is presented in table 8. Our findings indicate a positive correlation coefficient R of 0.509. As the predictor (managerial competency) increases, an increase in the dependent variable (efficiency) should be observed. An adjusted model can explain about 48.2% of the variations in level of efficiency in SMEs as demonstrated by the adjusted R<sup>2</sup> value of .482.

**Table 8:** Model Summary of Alternative Finance Moderated Multiple Regression of Efficiency on Managerial Competency with AF as an Interaction Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	.713 <sup>a</sup>	.509	.482	.12828

a. Predictors: (Constant), AF×Innovation, Education, Innovation, Experience, AF×Experience, AF×Education, AF.

b. Dependent Variable: Efficiency.

Table 9 presents the output of ANOVA and t-test of the regressions for the final step. The linear regression F-test has the null hypothesis that the model explains zero variance in the dependent variable, (Thus, R<sup>2</sup> =0). Since observed F-test statistic (18.812) is highly significant, where P-value <0.05. We reject the null hypothesis and hence concluded that the model has moderating power, since it explains to a significant level, the variations in efficiency level of an SME. Our findings indicate find that the t-values of all the variables were statistically significant since P-value observed < 0.05 the tabulated critical P-value. Specifically: Education regression coefficient was positive and significant as well ( $\beta = .052$ , t-value =2.833, P<0.05); experience regression coefficient was positive and significant ( $\beta = .047$ , t-value =3.034, P<.05); Innovation regression coefficient was positive and significant ( $\beta = .027$ , t-value =2.118, P<0.05); The regression coefficients of alternative finance was positive and statistically significant (= .468, t-value = 6.388, P<0.05; The coefficients of the interaction of AF with other predictor variables was also positive and statistically significant (education × AF was  $\beta = .037$ , t-value = 2.194, P<0.05; experience × AF was  $\beta = .042$ , t-value = 2.861, P>0.05; while innovation × AF was  $\beta = .027$ , t-value =2.108, P>0.05). Therefore, for education, experience and innovation, the null hypotheses of no relationship are rejected. Consequently, we conclude that AF does moderate the relationship between managerial competency's (education, experience and innovation) and efficiency.

**Table 9:** ANOVA and t-test Coefficients Output for Alternative Finance Moderated Multiple Regression of Efficiency on Managerial Competency with AF as an Interaction Variable

Model	ANOVA				Coefficients					
	Sum of Square	Df	Mean Square	F	Sig	Unstandardized Coefficients	Std. Error	Standardized Coefficients	T	Sig.
3						B		Beta		
Regression	2.167	7	.310	18.812	.000					
Residual	2.090	127	.016							
Total	4.257	134								
(Constant)						.429	.083		5.141	.000
Education						.052	.018	.206	2.833	.005
Experience						.047	.015	.214	3.034	.003
Innovation						.027	.013	.143	2.118	.036
AF						.468	.073	2.644	6.388	.000
AF × Education						.037	.017	.904	2.194	.030
AF× Experience						.042	.015	1.010	2.861	.005
AF × Innovation						.027	.013	.582	2.108	.037

a. Dependent Variable: Efficiency.

b. Education, Innovation, Experience, AF, AF × Experience, AF × Education, AF × Innovation

The moderating effect of AF on the relationship between efficiency and managerial competency is presented in a summary of the model predictive power in table 10, notice that the overall predictive power (R-Square change) of the model improves by 21.7 % from the initial R<sup>2</sup> of 29.2 percent to a new high of 50.9%. This implies that alternative finance has a moderating influence on managerial competency-efficiency relationship for manufacturing SMEs in Kenya

**Table 10:** Summary of Model Predictive Power

Moderated Regression Step	R-Square (%)	R <sup>2</sup> Change (%)	Sig P<0.05		
			Education	Experience	Innovation
1	29.2	29.2	Yes	Yes	Yes
2	32.7	3.5	Yes	Yes	Yes
3	50.9	18.2	Yes	Yes	Yes

Our findings support the endogenous growth theory on investment in managerial capacity and entrepreneurial orientation as measured by level of innovation/adoption of technology, level of education and experience (Aghion & Howitt, 1998). The findings are in line with the Schumpeterian Theory of Innovation. Managerial competencies when employed together with alternative finance can help SMEs reduce total cost of their products, attracting more customers. Investing AF on latest innovations could help firms capture new markets and develop a competitive advantage, enhancing efficiency. That due to AF moderating influence on managerial competency, larger firms would benefit more from use of alternative finance. Further, that, firms with more competent management would become more efficient faster by use of alternative finance. With the assured lower finance costs from alternative sources, the firm's efficiency is propelled with a higher momentum by experienced management, educated staff and innovative workforce, to new heights.

#### Test of robustness of results

To test robustness of our results, we conducted PLS SEM. Results of the direction and strength of the relationship and test of significance were consistent with those of the multiple linear regression (MLR) model. Results relating to influence of managerial competency on efficiency regression were, R-square =43.9, t-value>1.96 and p-value < 0.05, while results for moderation of alternative finance through

interaction with predictor variables were R-square =50.5. t-values>1.96 and p-values < 0.05. These results are presented in table 11.

**Table 11:** Comparison of MLR/SEM Models Results

t-value Influence of Managerial Competency on Efficiency			t-values of the interaction of Alternative Finance with Predictor Variables		
Variables	Models		Variables	Models	
	LR	SEM		MLR	SEM
Managerial Competency	10.2***	7.544***	Education × AF	2.19**	1.88*
			Experience × AF	2.86***	3.45***
			Innovation × AF	2.11**	2.06**
(***) , (**), (*) Results significant at 1%, 5% and 10% level of significance respectively					
R- square result for the Influence of Managerial Competency on Efficiency			R- square result for the interaction of Alternative Finance with Predictor Variables		
Models			Models		
LR	SEM		MLR	SEM	
43.9%)	43.9%		50.9%	50.5%	

## Conclusion

We conclude that there is significant relationship between managerial competency and efficiency of manufacturing SMEs in Kenya, and that alternative finance has significant moderating influence on the relationship between managerial competency and efficiency of SMEs in Kenya. Therefore, manufacturing SMEs in Kenya could enhance their efficiency by improving their managerial competency. Manufacturing SMEs which use more of alternative finance are bound to be more efficient than those which use less of alternative. It is therefore beneficial for managers/owners of SMEs to use more alternative financing in their firms. Our findings also indicate that when managerial competency and level of alternative finance are employed together, SMEs positively impact SME efficiency. A limitation of this study is that it did not delve into the determinants of choice of alternative finance. This is an area where future research could endeavor to illuminate. We recommend that financial experts hold training for owners/managers of manufacturing SME on the pivotal role played by alternative finance, to assist the SMEs enhance efficiency for accelerated economic growth. We propose that SMEs should broaden the use of alternative finance in training or hiring managers with higher innovation, higher competency levels and longer experience.

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