# VALUE CHAIN FINANCING: RAW MATERIAL AND WORKING CAPITAL APPROACH FOR EDIBLE OIL MANUFACTURING COMPANIES IN KENYA.

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## ABSTRACT

The study sought to determine the moderating effect of firm characteristic on the relationship between financial performance and value chain financing through raw material and working capital in the edible oil manufacturing companies in Kenya. Using the secondary data which was extracted from the financial statements of edible oil manufacturing companies for the period 2008 to 2014. A positivism philosophy applying descriptive retrospective panel data approach was used during the study. Multiple regression analysis was conducted to establish the relationship of the financing variables (Raw material and Working capital) and the financial performance of the Edible Oil Manufacturing Companies in Kenya. The major findings and conclusions of this study were that, financing through raw material and working capital do not have statistical significant relationship to financial performance of Edible Oil Manufacturing Companies in Kenya.

**Keywords:** Value chain, Financial Performance, Edible oil, Raw Material, Working Capital

## 1. Background to the study

The performance of any firm increases the market value of that specific firm but also leads towards the growth of the whole industry which ultimately leads to the overall prosperity of the economy. Most domestic Edible oil processing in Kenya is undertaken by 15 edible oil manufacturing companies (KAM, 2014) accounting for 95% of the manufacturing base of the edible oil industry. Edible oil manufacturing companies are utilizing about 53% of capacity (KAM, 2014). Capacity utilization in the sector is therefore constrained both by the quantity and quality of oil seeds. Capacity utilization of the edible oil sub-sector is by far the lowest among the food manufacturing sector industries and also lower than the average of the Kenya manufacturing industries over the past few years. The edible oil sub-sector has thus diverse and significant constraints (James, 2013). Value chains have been accepted as an effective way of focusing on measures to improve the scale and impact of private sector financing, which include the financing made by smallholder farmers themselves as well as those made by large-scale domestic or foreign agribusiness investors. The prime objective of the value chain is to ensure the equal distribution of value generated among the members of the value chain (Nedelcovych & Shiferaw, 2012). The term 'Value Chain' was first used in a book "Competitive Advantage: Creating and Sustaining superior Performance" (Porter, 1985).

Financial performance depends upon capacity utilization and raw material availability is important for optimum capacity utilization in agriculture-based industry. One of the major steps in securing raw material requires the development of value chain and improving financing through the buyer-driven value chain. It is often in the buyer's interest to procure a flow of products and use finance as a way of facilitating and/or committing producers, processors and others in the chain to sell to them under specified conditions. Most often, when financing is involved, the conditions are binding through contracts and, therefore contract farming is the most common buyer-driven value chain model (Vorley, Lundy & MacGregor,

2008). Based on this study raw material was considering as one of the independent variables. Working capital (WC) management in the value chain also contributes to the improvement of financial performance of edible oil manufacturing companies. It is a measurement of a company's operating liquidity and its requirement increases or decreases with the volume of production of the company. According to Faden (2014), the financing in working capital required by a company will depend on company's characteristics such as size, growth rate, the products offered, or industry specific, corporate policy and value chain strategy and practices adopted by the company. Firm financial performance is also affected by firm characteristics, size and capital structure and may explain the wide variations. The size of the company affects the company's capital structure. Continuously increase of funding requirements of the company indicates the desire of the growth in profits by the company (Riyadi, 2006). Firms' financial strategies are represented by the level of leverage and corporate liquidity of the firm. Debt management is crucial because the firm must decide how and when to pay off liabilities according to available cash and interest rates. The level of leverage in this study is represented by debt to equity ratio.

## 2.      Research Problem

Edible oil manufacturing companies have grown in the last 5 years and production is increasing every year. As per 2014 reports of Kenya association of manufacturer edible oil industry is utilizing on an average only 53 % of their installed production capacity in Kenya. However, this is still lower than the capacity utilization in food sector which is on an average 80 % of the installed capacity in Kenya. It is not clear whether underutilization of production capacity is due to lack of internal or external financing in raw material and working capital. It is also not clear how much of the growth in financial performance of these companies is affected by the lack of financing in edible oil value chain. This study therefore investigated relationship between the raw material and working capital financing in the value chain and financial

performance of the edible oil manufacturing companies in Kenya and  to establish the moderating effect of firm characteristic on the relationship between financial performance and value chain financing through  raw material and working capital

## 4.        Literature Review

Porter (1985) analyzed the Value Chain an effort to understand the behavior of costs and the existing/potential sources of differentiation, arriving at the Porter's Value Chain analysis (VCA). Thereafter Porter's Theory of Competitive Advantage, which focuses upon individual industries, emerged to extend VCA and related it to performance (Porter, 1990). These cross Value Chain strategies established a principle that competitive advantage can be reached only by managing the entire Value Chain as a whole including all involved functions Salvatore (2002). Competitive advantage is necessary to satisfy customers by fulfilling customers' request (Wang, Lin, & Chu, 2011). The Competitive advantage theory suggests that firm should go for policies that create high-quality products to be sold at high prices (Wang, Lin, & Chu, 2011). According to MacGregor (2011) understanding Value Chain finance can improve the overall effectiveness of those providing and requiring agricultural financing in the value chain. The basic source of raw material is a purchase through supplier's contract and traders or import of raw material. Coordination is achieved through the specific details provided in the contract, outlining the requirements for both farm and firm, as well as the price points Bijman (2008). Gachora, Kibet, and Musiega (2014) empirically found that there was significant; increase in revenue generated by farmers, and the difference in effectiveness in cost reduction by on the performance of small-scale agricultural enterprise after using new Value Chain strategies. The study did not fully explain how the entire financial performance was exactly influenced.  A study by Ainapur, Singh, and Vittal (2011) established that Increased financing in Value Chain is expected to maximize revenue and minimize cost by

optimizing Value Chain financing activities like increased throughput (increase the output in the process), decreased inventory levels and increased revenues, thereby improving the organization's financial performance. Value Chain analysis helps us to evaluate how these financial and product market relationships impact the availability of Value Chain finance (Catherine, Meyer, & Dai, 2007).

Pareto's law has applications throughout the business, including inventory control, where it forms the basis for the ABC analysis. In evaluating inventory management Value Chain and how it leads to improvement in financial performance, the study reviewed the Pareto's Law in Inventory Control Techniques, also known as the Pareto Analysis Theory (ABC inventory classification) of Inventory management (Tanwari, Qayoom, & Shaikh, 2000; Okello & Were, 2014). Working capital management is considered from an operational view Hill, Kelly, and Highfield, (2010) consisting inventories, accounts receivable and accounts payable. A successful raw material inventory management has several benefits in both sides but as a common, it provides optimization for the flow of material and traces the raw material requirement continuously (Rai & Singh, 2011). According to Alvarado and Kotzab (2001), the inventory management Value Chain financings affected the financial performance but the findings did not provide in-depth fishing of the inventory management on the financial performance. Mulure (2013) found that the inventory turnover was influenced by planning, sourcing, making and deliverance of goods and affects the financial performance. Another study by Okello and Were (2014) found that physical movement of inventory, product development process, inventory management, lead time, technology and innovation have a significant influence on the performance of food manufacturing companies in Kenya. Empirical literature examines how financial characteristics, such as leverage and size have an influence on the firms' financial performance and growth. Firm size is one of the most influential characteristics in organizational studies. Kamau (2010) in his study on the

relationship between capital structure and financial performance of insurance companies in Kenya found out that there was a positive but weak relationship between capital structure and financial performance. Octavia and Brown (2008). has shown empirically that company size is positively related to the financial performance of the USA life insurance companies.

## 4. Research design and Methodology:

A positivism philosophy applying descriptive retrospective panel data approach was used during the study. Multiple regression analysis was conducted to establish the relationship of the financing variables (Raw material and Working capital) and the financial performance of the Edible Oil Manufacturing Companies in Kenya. The study targeted all the 15 edible oil manufacturing companies in Kenya engaged in the production of 95% edible oil produced in Kenya as at 31-12-2014. Final sample size was 12 X 7 = 84 panel data record. Unit of analysis for the study were all edible oil manufacturing companies in Kenya as on 31-12-2014. Study computed composite index's using principle component analysis and conducted data analysis using descriptive statistical analysis, correlation analysis, quantitative analysis and multiple regressions using panel data.

## 5. Preliminary tests

Various pre-estimation tests were conducted to bring out the best quality results. The unit root test was conducted on the variables in the model to ensure there is no stationarity effect in the model. The Levin, Lin, and Chu test was used since the study has 12 companies with total 84 observations from 7 time periods. The Levin-Lin-Chu (LLC) tests have as the null hypothesis that all the panels contain a unit root. The test rejects the null hypothesis and confirms that panels are stationary and do not contain the unit root. To test multi-collinearity Variance Inflation Factors (VIF) were computed for all the independent variables and moderating variables in the panel data. The independent or moderating variables with high VIF values

more than 10 were removed. VIF for all the variables included in the model have a mean VIF of 3.34 (recommended cut off is less than 10) and all individual VIF of all the selected variables is also less than 10. The study conducted the Hausman test to select the best model between fixed effects or random effects considering the panel data of the study. Based on husman test Fixed Effect model was adopted for conducting multiple regressions in the study.

## 6. Findings and Discussion

### 6.1    Measurement of financial performance

Study has three measurements for financial performance return on investment, return on equity Tobin Q measuring the financial performance of the companies. Principal components analysis (PCA) method was used to reduce the number of variables of interest into a smaller set of components. Composite index of dependent variables was generated using the principle component analysis (PCA) for the twelve edible oil companies over the period from 2008 to 2014 for 7 years.  An analysis was also done to bring out the individual Companies' financial performance as presented on Figure 7.1 below
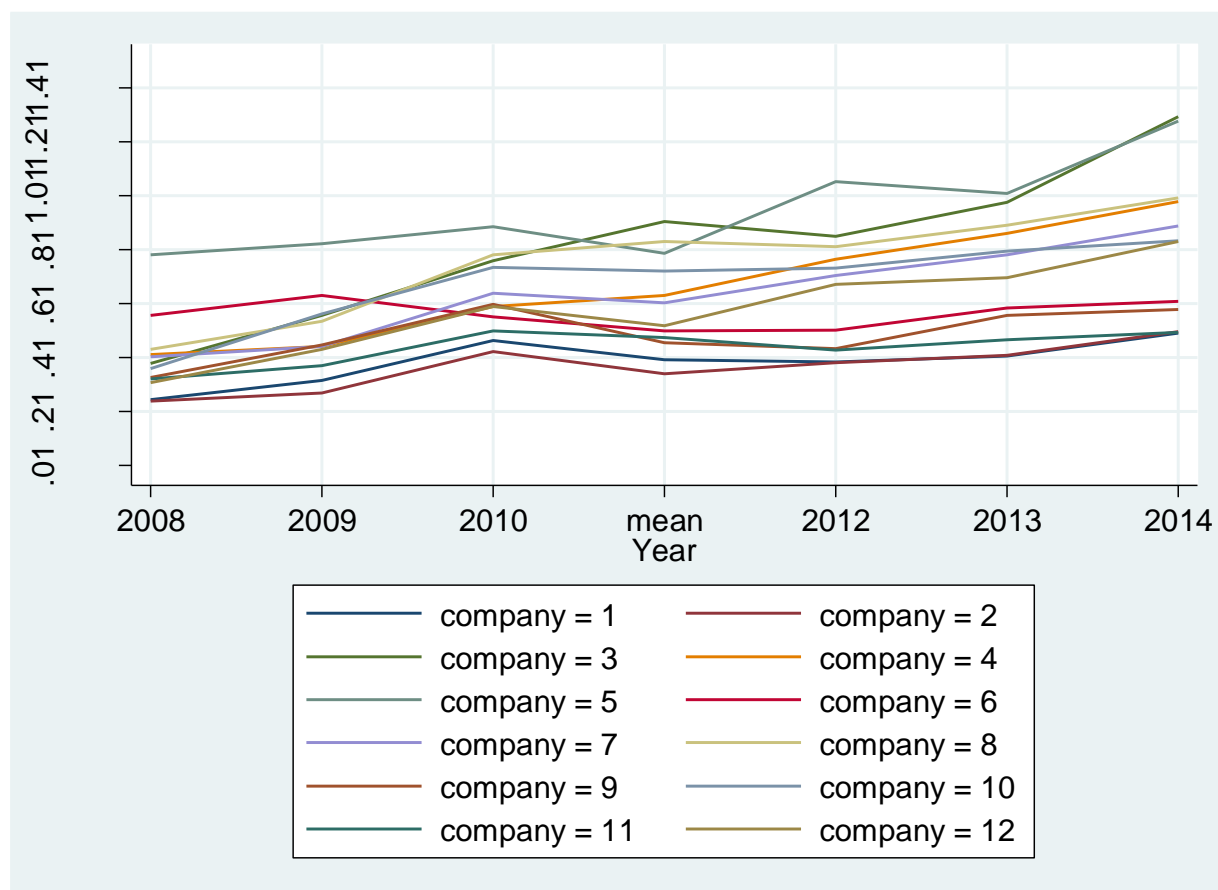
Figure 7.1: Individual Companies' financial performance (2008 - 2014)
Source: Researcher, 2015

## 6.2    Correlation Analysis

The study also conducted a Pearson product-moment correlation coefficient to assess the relationship between the independent variables and composite index of dependent variable. All tests were done at 5% level of significance. The relationship between financing in purchase of material through Supplier Contracts and financial performance in edible oil industry has a negative correlation between the two variables, ($r = - 0$, $p = 0.97$) and the relationship between financing in import of material and financial performance in edible oil industry has a negative correlation between the two variables, ($r = - 0.04$, $p = 0.704$).  In Overall, there was a weak negative correlation between financing in raw material purchase & operations with financial performance in edible oil industry in Kenya. Increase in financing in raw material and operation is correlated with decrease in financial performance. Further none of the financing

in raw material & operations variable was significant at 5% level of significance. However import of raw material is more significant at 5% level of significance than the purchase of raw material through supplier contract. Another study in which raw material financing through suppliers contract was studied by Bijman (2008) in which he tested and confirmed that efficiency in contracts is attained by ensuring relationship between farm and firm which improve the financial performance. The second objective of study which is financing of working capital was measured using inventory management, creditor's management, debtor's management and prepayments. The relationship between inventory management and financial performance in edible oil industry has a positive correlation between the two variables (r = 0.008, p = 0.942),  that between financing in creditors management and financial performance in edible oil industry also gave positive correlation between the two variables (r = 0.09, p = 0.418), while the relationship between financing in creditors management and financial performance in edible oil industry returned a negative correlation between the two variables (r = - 0.05, p = 0.639).The relationship between financing in prepayments and financial performance in edible oil industry also gave a positive correlation between the two variables (r = 0.11, p = 0.32).  In overall, there was a weak positively correlation between financing in working capital with financial performance in edible oil industry in Kenya. Increase in financing in working capital is correlated with increase in financial performance. Further financing in working capital variables was significant at 5% level of significance. However prepayments are more significant at 5% level of significance compare to inventory management, creditor's management and debtor's management. Week positive correlation means not significant relationship between financing working capital and financial performance but direction is positive means more financing helps in improving the financial performance. This result is similar to the result found in a study of inventory management by (Rai & Singh, 2011) confirming sufficient financing helps in optimization of material flow and improve financial performance. Another study of (Burkart & Ellingsen, 2004) empirically

tested and confirms that companies simultaneously give and take credit and gap in debtors and creditors should be properly assessed and financed to optimize financial performance.

The moderating variable firm characteristics was measured with firm size annual sale and firm capital structure. The relationship between firm size annual sales and financial performance in edible oil industry has a positive correlation between the two variables (r = 0.14, p = 0.192), while that between firm capital structure and financial performance in edible oil industry has a positive correlation between the two variables (r = 0.44, p = 0.000). In overall, there was a medium positive correlation between moderating variable firm characteristics with financial performance in edible oil industry in Kenya. An Increase in firm characteristics is positively correlated with increased financial performance. Further among the moderating variables, only firm capital structure (r= .44 p = .0.000) was very significant at 5% level of significance however other variable firm size annual sales was not significant. In a study by Kim, Liu, and Rhee, (2003) empirically tested the effect of Firm Size on Earnings of the companies and found positive relationship between the size and financial performance the same is found in this study and both studies found relationship very significant. Another empirically study by Kamau (2010) indicated significant positive relationship between capital structure and financial performance in insurance industry in Kenya. Similarly our study found positive significant relationship between capital structure and financial performance.

### 6.3    Multiple Regression Analysis

All independent variables were regressed against composite index  of financial performance . Results indicates that the coefficients of the model are significantly different from 0 and the P-value 0.000 is less than 5%. Besides global significance test, we also did significance tests of individual coefficients for each explanatory variable in the model. Overall regression is significant because $F_{(11,61)}$ value 7.24 is greater than F theoretical value (2.82),indicating that the regression model is well built. The coefficient of determination shows a good linear model

that explains the phenomenon of the change in the eleven analyzed variables according to the explanatory variables in an amount of 56,63%. The remaining 43.37% is about the influence of unregistered or not considered factors affecting the financial performance of edible oil industry in Kenya.

Holding all other variables constant each edible oil company is expected to have $\beta 0 = 0.67$ units of financial performance with a probability of 0.248. Study also indicate that Raw material (P-value = 0.992), Inventory management (P-value = 0.228), Creditors Management (P-value = 0.174), Debtors Management (P-value = 0.726), are not significantly affecting financial performance at 5% level of significance. This corroborates the study by other authors in their studies (Guest, 2009; Crespí, 2010) also considered composite financial performance index as our study did and adopted to measure financial performance.  This model explain 56.63 % variation in financial performance maximum compare to individual ROI, ROE and tobin Q confirming composite financial index is the best measure of financial performance for our data and hence the study further tested the model along with moderating variables.

### 6.4    Regression analysis results with the Moderating variable.

All the independent variables were tested against the moderating variables and the  composite index of the dependent variable (financial performance). Results indicate that the coefficients of the model are significantly different from 0 and the P-value 0.000 is less than 5%. Besides global significance test, we also did significance tests of individual coefficients for each explanatory variable in the model. Overall regression is significant because $F(11,61)$ value 12.19 is greater than F theoretical value (2.576), indicating that the regression model is well built. The coefficient of determination shows a good linear model that explains the phenomenon of the change in the eleven analyzed variables according to the explanatory variables in an amount of 72.87%. The remaining 28.13% is about the influence of unregistered or not considered factors affecting the financial performance of edible oil industry in Kenya.

Holding all other variables constant each edible oil company is expected to have $\beta 0 = -3.23$ units of financial performance with a probability of 0.001. Study also indicate that Raw material (P-value = 0.386), Inventory management (P-value = 0.063), Creditors Management (P-value = 0.623),  Debtors Management (P-value = 0.276), are not significantly affecting financial performance at 5% level of significance when regressed with moderating variable. Another study by Eriotis, Vasilio, and Neokosmidi (2007) empirically tested that larger firms are more likely to have a better credit rating thus financial institutions are more willing to lend funds to larger firms (Eriotis, *et al.,* 2007). Therefore, this implies that larger firms should have higher leverage ratios and in this study regression analysis found the similar result as model r-sqr changed to 72.87% from maximum r-sqr of 57.03 when the model was tested without moderating variable. This confirms that firms with large size and capital structure get batter terms for financing for value chain  from the banks and financial institutions. Based on this the study added firm characteristics as moderating variable in the final model.

## 6.5    Model selection for the study

The results of various models were summarized to select the model for testing the hypothesis of the study.

Table 1: Model summary

| Model Details | F Value | Fisher theoretical value | R-squ | P-value | Rho |
|---|---|---|---|---|---|
| Regression results with ROI | F(11,61) = 6.87 | 2.82 | 55.34 | 0.0000 | 63.53% |
| Regression results with ROE | F(11,61) = 6.92 | 2.82 | 55.53 | 0.0000 | 62.28% |
| Regression results with Tobin Q | F(11,61) = 7.35 | 2.82 | 57.01 | 0.0000 | 93.90% |
| Regression results with Composite financial index | F(11,61) = 7.24 | 2.82 | 56.63 | 0.0000 | 64.77% |
| Regression results with Composite financial index including moderating variable | F(13,59) = 12.19 | 2.576 | 72.87 | 0.0000 | 91.66% |

rho = Statistical dependence between two variables
Source: Data (2015)

Table 1. shows the results of five models adopted by the study. Further on comparison of R-

square value the model with moderating variable explain maximum 72.87 % of variance in financial performance of edible oil companies in Kenya. Based on this study adopted the results of model 5 regression results of independent variable and moderating variable with composite of financial performance index which explain the maximum variance in financial performance of edible oil companies with rho of 91.66 indicating the statistical dependence between the two variables. Model is as follows:-

$$y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{Mit} + u_{it}$$

The study utilized the value of $\beta_0$ to $\beta_{11}$ from selected model to evaluate the objectives and test the hypotheses. Multiple regressions provide a powerful method to analyze multivariate data. Considerable caution, however, must is observed when interpreting the results of a multiple regression analysis.

## 7.    Summary of finding

The study findings are captured hereunder in view of each of the 3 hypotheses. In view of hypothesis formed in the study.

### 7.1    Financing Raw material and financial performance

Hypothesis $H_1$ for financing raw material does not significantly affect financial performance of the edible oil manufacturing firms in Kenya; was tested and the results are as give on table 8.1 below.

Table 2:        Effect of raw material financing on financial performance

| Covariates | μ | Σ | R | P | β | P-value |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Purchase of raw material through Supplier Contracts | 0.3164 | 0.1345 | -0 | 0.97 | -0.23 | 0.386 |
| Import of raw material | 0.4586 | 0.1387 | -0.04 | 0.704 | * | * |

* Variable removed from model due to multi-collinearity
Source: Data(2015)

Descriptive statistics indicate that import of raw material has more variation from mean compared to purchase of raw material through suppliers contracts, while correlation analysis indicates a weak negative relationship with financial performance meaning that the relationship is not significant at the .05 (significance) level for both measurements of raw material variable.

As given on table 2, the regression results at 5 % level of significance, financing in raw material purchased through supplier contracts is not significant and variable measurements of raw material have a p-value of more than 5%. Raw material was removed from the regression model due to multi-collinearity problem with other variables in the study. Whereas financing of import of raw material variable was removed from the model due to multi-colinearity with very high VIF, the study did not rejected the null hypothesis at 5% level of significance indicating that financing of raw material does not affect the financial performance significantly. Keeping the other variables constant a unit increase in financing in raw materials index is expected to cause financial performance index to decrease by 0.23 per unit. A study by Kamau, Lawrence, Ricardo, and Ruerd, (2011) established the effect of certification of small holders on the financial performance of coffee production after having suppliers contract with farmers. The study by Guo *et al.*, (2005) support that purchase through contract farming improve financial performance. Another study (Birthal et al., (2005) indicate that the supply of raw material through contract farming integrate small and big farmers and improve the financial performance by reducing the cost of raw material. This study's findings confirm the findings of these previous studies.

**7.2     Financing of working capital and financial performance**

Hypothesis H2 that, financing working capital does not significantly affect the financial performance of the edible oil manufacturing firms in Kenya; was tested and the results are as give on table 8.2 below.

Table 3: Effect of Working Capital financing on financial performance

| Covariates | μ | Σ | R | P | B | P-value |
|---|---|---|---|---|---|---|
| Inventory management | 0.2612 | 0.298 | 0.008 | 0.942 | -1.55 | 0.063 |
| Creditors management | 0.0344 | 0.0074 | 0.09 | 0.418 | -1.03 | 0.623 |
| Debtors management | 0.1471 | 0.0165 | -0.05 | 0.639 | -1.15 | 0.276 |
| Prepayments | 0.0113 | 0.0025 | 0.11 | 0.32 | * | * |

* Variable removed from model due to multi-collinearity
Source: Data (2015)

Descriptive statistics indicated that variation from the mean is maximum for debtor's management and minimum for inventory management. Working capital inventory, creditors and prepayments have weak positive relationship while debtors management has a weak negative relationship with financial performance and the relationship is not significant at the .05 (significance) level for any measurement of working capital.

As given on table 3, the regression results at 5% level of significance for inventory management, creditors management, debtors management all the measurements of working capital variable have p-values of more than 5%. Prepayment was removed from the regression model due to multi-collinearity problem with other variables in the study. The null hypothesis was not rejected at 5% level of significance indicating that financing of working capital does not affect the financial performance significantly. Keeping the other variables constant a unit increase in financing in inventory causes financial performance index to decrease by 1.55 units while a unit increase in financing in creditors causes financial performance index to decrease by 1.03 units. A unit increase in financing in inventory on the other hand causes financial

performance index to decrease by 1.15 units. This finding is consistent with the findings by Afza and Nasir (2007), Wajahat, *et al.,* (2010), which found no significant relationship between working capital management and profitability. However a study by Ainapur and Vittal (2011) found that optimizing Value Chain financing activities increases throughput, decreases inventory levels and increases revenues, thereby improving the organization's financial performance. The study showed that the Value Chain financing maximize revenue and minimize cost. Another study by Tanwari (2000), on ABC analysis as an inventory control technique improve financial performance.

## 7.3     Firm Characteristics and financial performance

Hypothesis $H_3$ that firm characteristics do not significantly affect the financial performance of the edible oil manufacturing firms in Kenya; was tested and the results are as give on table 8.3 below.

Table 4:        Effect of moderating variable on financial performance

| Covariates | μ | Σ | r | P | B | P-value |
|---|---|---|---|---|---|---|
| Firm Size Annual Sale | 2.1381 | 0.1308 | 0.021 | 0.848 | 2.14 | .001 |
| Firm Capital structure | 0 .6947 | 0.4162 | 0.44 | 0.000 | 0.05 | 0.631 |

Source: Data(2015)

Descriptive statistics indicate that variation from the mean is maximum for firm size annual sale and minimum for firm capital structure. Both firm size annual sale variables and firm capital structure indicate moderate positive relationship with financial performance. The relationship of firm size annual sale is significant at the .05 (significance) level while relationship of firm capital structure is not significant at 5% level of significance.

As given on table 4 the regression results at 5% level of significance, firm size annual sale is very significant with p-value of 0.001 whereas  firm capital structure measurement of variable firm characteristics has a p-value of more than 5%. The null hypothesis is rejected at 5% level

of significance for firm size annual sale indicating that this does affect the financial performance significantly. Keeping the other variables constant a unit increase in firm size annual sale causes financial performance index to increase by 2.14 units. The null hypothesis for firm capital structure is not rejected at 5 % level of significance indicating that unit increase in firm capital structure causes financial performance index to increase by 0.05 units. A study by Razzaque *et al.,* (2006) who examined earnings management in textile sector of Bangladesh found similar results indicating the size of firm has positive relation with earnings management. This corroborates the result of our study. Another study by Kim, Liu, and Rhee, (2003) examined the relationship between corporate earnings management and the firm size. They observed that company size had a strong impact on the earning management a view similar to our study which found firm size has a very significant effect on financial performance. Another study that supports our study result on capital structure is that by Wacziarg, Romain, and Welch, (2003). which found that organizations do not use their debt and equity issuing and repurchasing activities to counter the mechanistic effects of stock returns on their debt equity ratios. Most of the stock has 40% debt ratio dynamics. It means remaining 60% ratio can be used to manipulate the capital structure, which has direct impact on cost of capital that leads to earning management and has a positive effect on financial performance.

## 8.    Post-estimates tests.

The study conducted diagnostic tests on post-estimation results obtained. Hetroscedasticity test result indicate that study data fits well at the .05 significance level with ($F(13,59)$) and $p<.0000$). $R^2$ of .7290 indicate that this model accounts for 72.90 percent of the total variance in the financial performance of edible oil companies. Based on the result of the modified Wald test p-value =< 0.00000 (i.e. significant) leading to the conclusion that there is no problem of heteroskedasticity in the model and results of multiple regressions are valid and can be used

for further predictions using the model. Study also conducted Wooldridge (2002) derived a simple test for autocorrelation in panel-data models which was implemented by Drukker (2003). This pooled OLS model fits the data not very well at the .05 significance level (F=9.081 and p<.0118). R² of .4693 indicate that this model accounts for 46.93 percent of the total variance in the financial performance of edible oil companies. When applied to the data, the test yielded a p-value of .0118 indicating very significant at 5% level. This implies that study should not reject the null hence the conclusion that the data does have first-order autocorrelation. Results from this model can therefore be used for predictions in edible oil industry in Kenya. The study conducted the normality test and dependent variable "Financial performance" satisfies the criteria for a normal distribution. The skewness (0.008) and kurtosis (0.5151) were both between -1.0 and +1.0. No transformation is necessary. The values of all independent variables, the skewness and kurtosis are both between -1.0 and +1.0 indicating that all independent variables are also normally distributed.

## 9.     Discussion

After reviewing data and analyzing each objective of the study, conclusions were drawn based on the finding of the study.  The study adopted the financial performance index model which showed the best fit regression model.

## 9.1     Effects of Raw Material Financing

The first objective of the study is to determine the effect of financing raw material on the financial performance of the edible oil manufacturing companies in Kenya. The study measured financing in raw material & operations by purchase of raw material through supplier's contract and import of raw material. Question of purchasing raw material through supplier's contract was supported by 2 companies (16.67%) out of 12 companies for financing raw material. The rest other 10 companies (83.33%) were found to be financing raw material

by purchasing in the open market in Kenya instead of suppliers' contract. All the 12 companies (100%) were found to be financing the import of raw material. In addition to this, the study also found that all the companies purchasing raw material in Kenya without suppliers contract. Analysis of raw material purchase through supplier's contract returned ($\mu$ = 0.3164, $\sigma$ = 0.1345, r = -0.0 , p= 0.97, $\beta$ = -0.23, P-value = 0.386) indicating week relationship. This lack of significance represents negative effect on the financial performance of edible oil companies. Import of raw material on the other hand has ($\mu$ = 0.4586, $\sigma$ = 0.1387, r = -0.04, p= 0.704, Not included in the model) indicating more variance from the mean of the cost of import of raw material. The relationship is not significant at 5% and due to multi-collinearity with other variables it was removed from the final model. The relationship between financing through suppliers contract and import of raw material (r = -0.90 P = 0.000) has a highly negative and significant relationship at 5% level of significance. Further financing through suppliers contract and operations cost (r = -0.40 P = 0.0002) are also having moderate negative relationship and is very significant at 5% level of significance. The study concludes that the companies financing in purchase of material through supplier's contract and import of raw material do not have significant relationship to the financial performance.

## 9.2    Effects of  Working capital financing

To establish the effect of financing working capital on the financial performance of the edible oil manufacturing companies in Kenya. The study findings show that all companies are financing working capital required for the operations.  Edible oil Industry financing in working capital measured by inventory management has a ($\mu$ = 0.2612, $\sigma$ = 0.0298, r = 0.008, p= 0.942, $\beta$ = -1.55, P-value = 0.063) indicating a big variance from the mean of the inventory management and has week positive non-significant relationship with financial performance. It also has a negative association with financial performance and a significance level at .063. Another variable, the creditors management has a ($\mu$ = 0.0344, $\sigma$ = 0.0074, r = 0.09, p= 0.418,

$\beta = -1.03$, P-value = 0.623) indicating normal variation between mean and standard deviation and week positive relationship and negative association with financial performance. It is however not significant at 5% level. The other variable, debtors management has ($\mu = 0.1471$, $\sigma = 0.0165$, r = -0.05, p= 0.639, $\beta = -1.15$, P-value = 0.276) indicating large variation between mean and standard deviation. It has a negative non-significant relationship and its association with financial performance is negative. Prepayment as a variable on the other hand has ($\mu = 0.0113$, $\sigma = 0.0025$, r = 0.11, p= 0.32, Not included in the model) indicating variation more than normal and moderate positive relationship with financial performance. It was removed from the model because of multi-collinearity between the variables. The relationship between financing import of raw material and inventory management (r = -0.427, P = 0.001) is highly significant and negative. Another very significant relationship is between financing creditors management and prepayment (r = 0.953, P = 0.000) indicating strong positive relationship between the two variables in the study. Based on the findings, the study concludes that the companies financing in working capital through inventory management, debtors management and creditors management do not have significant relationship to the financial performance.

### 9.3     Moderating Effects of Firm characteristics

Analysis was also done to determine the moderating effect of firm characteristics on the relationship between value chain financing and financial performance of the edible oil manufacturing companies in Kenya. Edible oil Industry firm characteristics measured by firm size annual sale returned ($\mu = 2.1381$, $\sigma = 0.1308$, r = 0.021, p= 0.848, $\beta = 2.14$, P-value = 0.001) indicating very large variation between the mean and standard deviation with non-significant moderate positive relationship with positive and very significant association with financial performance. Another variable firm capital structure has ($\mu = 0.6947$, $\sigma = 0.4162$, r = 0.44, p= 0.000, $\beta = 0.05$, P-value = 0.631) indicating normal variation between mean and standard deviation having very significant medium positive relationship with non-significant

positive association with financial performance. The relationship between financing firm size and firm capital structure (r = 0.241, P = 0.0272) is also significant indicating positive relationship between the two variables. On moderating variables, the study indicated that the firm characteristics measured through firm capital structure has very significant positive relationship to the financial performance.

## 10.    Implications of the Study and Areas for Further Research

This study estimated and compared the performance of different companies and the results indicate that each company can study industry norms and apply it to achieve the industry average or more in terms of financial performance. It also came out that additional financing in value chain affects the financial performance and therefore should be from long term sources of finance.  In the overall, the study recommends that a correct mix of investment in working capital should be determined to utilize the optimum capacity.  Knowledge of how and in which area financing is done by the edible oil manufacturing companies and how it affects the financial performance of edible oil industry in Kenya can help policy makers to give special incentives to financial institutions to promote the availability of funds to the companies in the long run. This can improve capacity utilization of the companies and improve direct tax collection for the government, reduce foreign exchange outflow and create employment opportunities for the society.

The study had a well specified scope and objectives. While seeking to meet the objectives and work within the scope, many interesting areas which are related to the subject but were not withing the scope of this study emerged. It would therefore be useful that further studies are conducted on how contracting arrangements with farmers for production of raw material in edible oil can be improved in Kenya, how base line needs of financing in value chain can be established for manufacturing sector in Kenya, weather it is profitable to have an independent organization supporting value chain financing in the different manufacturing sector in Kenya and why

edible oil companies are financing purchase of raw material from open market in Kenya instead of doing suppliers contract with farmers in large scale and stop importing the raw material.

## 11.        Limitations of the Study

The edible oil sector in Kenya is supported by ministry of industry together with all other industry. There is no specific unit of ministry of industries who keeps control of edible oil production and provide support for the development of this section of Industry. Compiling the list of edible oil company and obtaining initial information was a challenge. In order to overcome this problem the researcher contacted the edible oil sub-sector established by KAM and searched various sources to compile the required information.

## REFERENCES

Abuzar, M.A., & Eljelly. (2004). Liquidity - profitability trade off: *An empirical investigation in an emerging market, International Journal of Commerce and Management*, Vol. 14 Iss: 2, pp.48 – 61

Afza, T. and M.S, Nasir. 2007. Is it better to be aggressive or conservative in managing working capital?. *Journal of Quality and Technology Management*,. Vol 3, No. 2, pp 11-21 (ISSN: 1011-002x)

Ahn, D. 2004; Contract Farming, Farmer's Collective Action and Participation of the Poor in North Vietnam.

Ainapur, B., Singh, R. and Vittal, P.R. (2011). *TOC Approach for Supply Chain Performance Enhancement. International Journal of Business* Research and Management (IJBRM), 2 (4), 2011.

Alvarado, U. Y., and Kotzab, H. (2001). Supply chain management: *The integration of logistics in marketing*. Industrial Marketing Management, 30, 183-198.

Benjamin G, Dodd D, (1928), "SECURITY ANALYSIS" An expanded source book, 6th Ed. MC Grew Hi, NewYork.

Bijman, J. (2008), *"Contract farming in developing countries: an overview"*, Working Paper, Wageningen University, May.

Birthal, P.S., Joshi, P.K., and Gulati, A., 2005. *Vertical coordination in high value commodities: Implications for the smallholders. Markets*, Trade and Institutions Division Discussion Paper no. 85, Washington, D.C., USA: IFPRI.

Blumberg, Boris, Donald R Cooper, and Pamela S Schindler, (2011) *Business Research Methods. London*: McGraw-Hill Higher Education, 2011. Print.

Borg and Crall (1959) Research Procedures, *Prentices Hall*: New York, USA.

Breitung, J. (2000). The local power of some unit root tests for panel data. In Advances in Econometrics,

Breitung, J., and S. Das. (2005). *Panel unit root tests under cross-sectional dependence. Statistica* Neerlandica 59: 414-433. Volume 15: Nonstationary Panels, Panel Cointegration, and Dynamic Panels, ed. B. H. Baltagi, 161-178. Amsterdam: JAI Press.

Brealey A. R, and Myers, C.S. (2010),. *Principles of Corporate Finance,*. 4th edition., New York: McGraw Hill, New York.

Bryman, A. (2004). *Social research methods* (2nd ed.) Oxford University Press

Bryman, A. and Bell, E. (2003). *Business research methods.* Oxford University Press

Burkart, M. and Ellingsen, T. (2004) 'In-Kind Finance: *A Theory of Trade Credit'*, The American Economic Review, Vol. 94, (3), pp. 569–590.

Catherine, J. DAI R, L, Meyer, A. C., & DAI (2007). Value Chain Governance, and Access to Finance Maize, Sugar Cane and Sunflower Oil in Uganda micro REPORT # 88, USAID.

Campos, J. N, Ericsson N., and Hendry D. F. (1996): *Cointegration Tests in the Presence of Structural Breaksî, Journal of Econometrics*, 70, 187-220.

Chang, C., Lee A. C., and Lee, C. F. (2009) *"Determinants of capital structure choice": A structural equation modeling approach,‖ The Quarterly Review of Economics and Finance*, vol. 49, pp. 197-213

Chen-Lung, (2006), *Evidence from Taiwan Semiconductor industry, Review of Quantative Finance and Accounting* February 2006, volume 26, issue 1, pp 67-84

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance* 20: 249-272.

Churchill, Jr. & Lacobucci, D. (2005). Marketing Reserch Methodical Foundations 9th ed. Australia: Thomson South-Western.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences,* 3rd Ed. Mahwah, NJ: Lawrence Erlbaum ssociates.

Cooper, D. and Schindler, S. (2003). Business research methods, 7th Edition, Boston, McGraw-Hill.

Cureton, E.E. and D'Agostino, R.B. (1983). Factor Analysis: *An Applied Approach. Lawrence Erlbaum*, Hillsdale.

Dasgupta, S and Titman, Sheridan (1998), Pricing Strategy and Financial Policy (Undated). Available at SSRN:http://ssrn.com/abstract=7115

Dodd, J. L., and Chen, S. (1996). EVA: A new panacea? Business and Economic Review, 42, 26-28.

Drukker, D. M. (2003). Testing for serial correlation in linear panel-data models. *Stata Journal* (3)2: 168-177.

Drury, C. (2008) Management and Cost Accounting; London; Cengage Learning.

Eriotis N, Vasiliou D & Neokosmidi V Z. (2007). How firm characteristics affect capital structure: *an empirical study, Managerial Finance*, 33(5), 321-331

Eti, M. C., Ogaji, S.O.T., Probert, S.D., (2004). Implementing total productive maintenance in Nigerian manufacturing industries. Applied Energy, 79(2004), pp.385-401.

Faden, C. (2014). Boosting firm performance: Working capital management & supply risk chain steering as drivers. Optimizing firm performance (pp. 111-140) Springer.

Fisher, I (1906), "Nature of Capital and Income" *An expanded sourcebook*, (PP 3-13)

Fisher, I (1930), "Theory of Interest" *An expanded sourcebook*, (P.vii)

Gachora,J. W., Kibet, J. and Musiega, D. (2014). Supply Chain Cost Reduction Impact on Performance of Small Scale Agricultural Enterprise. International *Journal of Education and Research,* 2(4), 377-  390.

Gelman, Andrew. (2005). "Analysis of Variance—Why It is More Important than Ever." The Annals of Statistics 33(1):1–53.

Gonzalez, D. and Jose, L.G. (2010). Analysis of an Economic Order Quantity and Reorder Point   Inventory Control Model for Company XYZ.

Grant,  R.M. (1991). 'Porter's Competitive Advantage of Nations: an assessment. *Strategic Management   Journal,* 12(7), 535–549.

Greenwald, B. C., Kahn, J., Sonkin, P. D., & Van Biema, M. (2004). Value investing: from Graham to Buffett and beyond. John Wiley & Sons.

Gregory, A. W. and B. E. Hansen (1996): ìResidual-based Tests for Cointegration in Models with Regime Shiftsî, *Journal of Econometrics*, 70, 99-126.

Greene, William H. (2008). Econometric Analysis, Sixth Edition. Upper Saddle River, NJ: Prentice Hall.

Greene, W. (2000). *Econometric Analysis.* New York:Prentice-Hall.

Griliches, Z., and J. A. Hausman. (1986). Errors in variables in panel data. Journal of Econometrics 31:93-118.

Guo, H. Jolly, R. and Shu, J.; (2005). *Contract Farming in China*: Supply Chain or Ball and Chain? Paper  presented in the Minnesota International Development Conference, University of Minnesota, April 2005

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *Econometrics Journal* 3: 148-161.

Hausman, J. A., and D. A. Wise. (1979). Attrition bias in experimental and panel data: The Gary income maintenance experiment. *Econometrica* 1979:455-473.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica* 46: 1251–1271.

Hill, M.D., Kelly, G.W. and Highfield, M.J. (2010), 'Net Operating Working Capital Behavior: A First *Look', Financial Management,* Vol. 39, (2), pp. 783-805.

Hsiao, C. (1999). Analysis of panel data. Cambridge: *Cambridge University* Pres.

Ivo Welch (2003). Capital Structure and Stock Returns. *Journal of Political. Economy*. 112(1): 106-131

James A Newkirk. (2013). 'Edible Oil Value Chain Enhancement JP *Final Evaluation*

*Report'* UNIDO MDG-F-2053-D-ETH Ethopia.

Kamau E. (2010), "*Journal of Consumer Behaviour*" Volume 9, Issue 3, pages 206–213, June 2010

Kamau, M., Lawrence, M., Ricardo, F. and Ruerd, R. (2011). The impact of certification on smallholder coffee farmers in Kenya: The case of UTZ program. Nairobi, Kenya: Tegemeo *Institute of Agricultural Policy and Development.*

KAM, (2014) Kenya Association of Manufacturer , Edible Oil sub sector Nairobi. "Review of *edible oil industry report'* 2014 Nov.

Kenya Revenue Authority, (2009).*'Review of duty structures for manufacturing companies' Nov 2009.*

Kenya, Republic of Kenya (2011). Economic Recovery Strategy for wealth and employment creation (2007-20012). *Nairobi: Government Printers.*

Kenya Vision 2030, (2008), Kenya, Republic of Kenya Government Printers.

Kim, Y., C. Liu, and S G. Rhee. (2003) The Effect of Firm Size on Earnings Management. Workingpaper,

Kim, D., Cavusgil, S. T., and Calantone, R. J. (2006). Information system innovations and supply chain management: Channel relationships and firm performance. *Journal of the Academy of Marketing* Science, 34(1), 40-54.

Kohler, W. (2006). The "Lisbon Goal'' of the EU: rhetoric or substance?'. *Journal of Industrial Trade and Competition,* 6: 63–66.

Kothari, C. (2008). Reserch Methodology: Methods & techniques. New Delhi: New Age International (P) Ltd.

Laurel, B. (2011). Design Research: Methods and Perspectives. Cambridge, Mass: *MIT Press.*

Lee, S. M., Lee, D., and Schniederjans, M. J. (2011). Supply chain innovation and organizational performance in the healthcare industry. *International Journal of Operations and Production Management*, 31(11), 1193-1214.

Levin, A., C.-F. Lin, and C.-S. J. Chu. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics* 108: 1-24.

Lintner, J. (1965), The valuation of risk assets on the selection of risky investments in stock portfolios and capital budgets, *Review of Economics and Statistics* 47: 13-37.

MacGregor, J. (2011). *Business models inclusive of small farmers*. Conf. Paper prepared for FAO and the United Nations Industrial Development Organization (UNIDO) on Agro-industries Forum. New Delhi. India

Marangu, K. (2007). Kenya BDS Program, Experience in Value Chain Facilitation. Presentation at the AFRACA Agribanks Forum.

Miller, C. (2007). *Value chain financing in agriculture*." Enterprise Development and

Miles, M. B. and Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook, 2nd Ed. Thousand Oaks: Sage.

Minten, B., Randrianarison, L., and Swinnen, J.M.F., (2009). Global retail chains and poor farmers: Evidence from Madagascar. World Development, 27(11), pp.1728-1741.

Mossin. J. (1963). "Equilibrium in a capital asset market" *Econometrica* 34 (4), 768-783.

Muckstadt, J.A. and Sapra, A. (2010), Principles of Inventory Management: *When You Are Down to Four, Order More, Springer Series in Operations Research and Financial Engineering.*

Mugendu O. and Mugenda, A. (2003),. *Research method*, . Nairobi : Acts press, . Nairobi

Mukhereji, P. & Albion, D. (2010). Research Methods in Early Childhood: An Introductory Guide. London: SAGE Publications Limited.

Mulure, L. A. (2013). *Effect of Supply Chain Finance on Small And Medium Manufacturing Enterprises Performance:* A Case Of Nairobi County. Nairobi: University Of Nairobi

Nedelcovych, M. and Shiferaw, D. (2012). Private Sector Perspectives for Strengthening Agribusiness   Value Chains in Africa: Case Studies from Ethiopia, Ghana, Kenya, and Mali. Research-Based Advocacy for Africa Agricultural Development.

Neely, A., Adams, C., and Crowe, P., (2001). The Performance Prism in Practice. Measuring Business Excellence, Vol 5 , Issue 2,pp . 6 – 1 2.

Octavia, M. and Brown, R., (2008). Determinants of Bank Capital Structure in Developing Countries. Research Paper Series, Department of Finance, The University of Melbourne, Victoria 3010, Australia.

Okello, J. O. and Were, S. (2014). Influence of supply chain management practices on performance of the Nairobi Securities Exchange's listed, food manufacturing

companies in Nairobi. International *Journal of Social Sciences and Entrepreneurship,* 1 (11), 107-128.

Petrovic-Lazarevic, S., Sohal, A., and Baihaqi, I. (2007). *Supply chain management practices and supply chain performance in the Australian manufacturing industry.*

Porter, M.E. (1990). *The Competitive Advantage of Nations*. New York:  The Free Press,  A Division of McMillan, Inc.

Porter, M.E. (1985). *Competitive Advantage*. "Creating and sustaining superior performance" New York: Free Press

Rai, S., Singh, D. B., (2011). A Study of Issues Challenges Affecting ERP Implementations in SME'S. *Global Journal of Enterprise Information System*, Jan-March(3), pp.63-71.

Ray, G., Barney, J. B., and Muhanna, W. A. (2004). Capabilities, business processes, and competitive   advantage: choosing the dependent variable in empirical test of the resource-based- view. *Strategic Management Journal*, 25, 23-37.

Razzaque R M, Rahman M Z, Salat A (2006). Earnings management: An analysis on Textile sector of Bangladesh. The Cost and Management. 34(5): 5-13.

Roach, B. (2005). *Origin of the Economic Order Quantity formula*. Topeka, Kansas, USA: Washburn University.

Rottger, A. (2005) *Strengthening farm-agribusiness linkages in Africa. Proceedings of Expert Consultation.* AGSF Working Paper, No. 5, FAO, Rome

Saes, M.S.M. (2005), "Relational Contracts and Comparative Efficiency in the Brazilian Specialty Coffee Supply", Working Paper, University of Sao Paulo/Fapesp

Salvatore, D.  (2002). *International Economics*. 3$^{rd}$ edition. New York: Macmillan.

Sathe, V. (2003) Corporate Entrepreneurship: Top Managers and New Business Creation, Cambridge University Press, Cambridge

Saunders, M., Lewis, P., and Thornhill, A. (2007) Research methods for business students (4th edition) Harlow: Pearson Education

Schwarz, L.B. (2008). '*The Economic Order-Quantity (EOQ) Mode'*, Purdue University

Singh, G. and Asokan, S. (2005) *Contract Farming in India:* Text and Cases. Oxford & IBH Publishing, New Delhi *Benchmarking: An International Journal*, 18(6), 834-855.

Singh R., Origin of econometrics, Int. J.Res (2012). Comm., Econom. Manag., 2 (10), 62 -66,

Stewart, G. B. (1990). The Quest for Value: the EVA management guide, Harper Business, New York.

Sun, H., & Parikh, A. (2001). Exports, Inward Foreign Direct Investment (FDI) and Regional Economic Growth in China. Regional Studies, 35(3), 187-196.

Tanwari, A., Qayoom, L.A. and Shaikh, Y.G. (2000),. *ABC analysis as an inventory control technique.*

UBA- *União Brasileira de Avicultura*, (2005). Relatório Anual 2004-2005.

UNIDO, (2009). Agro-Value Chain Analysis and Development: The UNIDO Approach. A staff working paper. Vienna, Austria: UNIDO.

Vorley, B., Lundy, M. and MacGregor, J. (2008). *"Business models inclusive of small farmers."* Paper prepared for FAO and the United Nations Industrial Development Organization (UNIDO) as background to the Global Agro-industries Forum. New Delhi. 8-11 April 2008.

Wacziarg, Romain, and Karen .H. Welch (2003). Trade liberalization and growth: New evidence. NBER Working Paper 10152, *National Bureau of Economic Research, Cambridge,* MA

Wajahat Ali and Syed Hammad Ul Hassan. (2010). *Relationship between profitability and working capital policy of Swedish companies*. Essays.se, Retrieved from Swedish University Essays.

Wagner, S. M., Grosse-Ruyken, P. T. and Erhun, F. (2012). The Link between Supply Chain Fit and Financial Performance of the Firm. *Journal of Operations Management*

Walters, D (2009). *Marketing and Financial Management. Hampshire*, New York: , Palgrave Macmillan, Hampshire, New York.

Wang, W.-C., Lin, C.-H., and Chu, Y.-C. (2011). Types of competitive advantage and analysis. *International Journal of Business and Management*, 6(5), 100-104.

Warning, M. and Hoo, W. (2000); *The Impact of Contract Farming on Income Distribution:* Theory and   Evidence. Paper Prepared for Presentation at the Western Economics Association International Annual Meetings, June 2000

Wong, W. P., and Wong, K. Y. (2011).  Supply chain management, knowledge management capability, and their linkages towards firm performance. *Business Process Management Journal,* 17(6), 940-964.

Wooldridge, J. M.   (2002*). Econometric Analysis of Cross Section and Panel Data. Cambridge,* MA: MIT Press.

World Bank (2008) *World Development Report* 2008: Agriculture for Development, The World Bank,   Washington D.C.

World Bank (2009), *Investment Climate Assessment*: Kenya, The World Bank, Washington D.C.

World Bank (2014), *State and trends of carbon pricing*, The World Bank,Washington D.C.

Yusuf, A.M. (2003). *Inventory Control and Economic Order Quantity in National Electric Power Authority* (NEPA).