

Effect of Competitiveness on Financial Performance of the Sugar Industry in Kenya

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Abstract

A firm's competitiveness and management efficiency in production gives it an edge over others in performance and profitability and thus being competitive and having an efficient management is important in enhancing a firm's performance. In this paper we therefore seek to empirically test the hypothesis that firm's firm competitiveness and management efficiency does not affect its financial performance. Using a sample of five sugar firms over the period 30th June 2005 to 2016 we estimate a fixed effects regression model to examine the impact of competitiveness and management efficiency on firm performance of sugar industry. The results revealed that firms with small production costs per tonne seem to perform highly compared to those whose industry production costs per tonne is high and thus we conclude that the higher the production costs per tonne the less profitable an entity is and as such and policy should encourage cost minimization measures. Similarly, the results affirm the existence of a negative relationship between management efficiency and firm performance. The negative relationship is an indication that the extent of managerial efficiency among the firms in the sugar industry is not so compelling as to drive a firm's financial performance. Based on these findings, we recommend that organizational management need to keep their production costs optimal as high costs negates their financial performance

1.1 Background of the Study

According to the Ministry of Agriculture, Livestock and Fishery (MoALF) , 2015 in its revised Strategic Plan 2013 - 2017, agriculture in Kenya was identified as one of the major economic sectors expected to stimulate the growth of the economy to a projected 10 percent of the Gross Domestic Product annually from 2008 to 2030. The sugar industry saves Kenya more than US\$ 250 million in foreign exchange annually sales, this may lead to achieving the goal of being globally competitive and prosperous country with a high quality of life and income per capita by 2030. Kenya's sugar manufacturing firms have over the last decade weak financial performance with huge debts despite its overall growth potential. It is predicted that if current trend continues to 2030, the growth forecasts in Kenya's Vision 2030 will not be attained. This, in turn, implies that the country may fail to attain the projected annual growth of 10 percent in Gross Domestic Product (Cheruiyot, 2017). It is apparent that the Kenya sugar industry has not performed financially according to the expectations of the government's goal of self-revenue sustainability. The sugar industry sector is one of the most important contemporary economic sectors. Because of their role and high impact in the development of the economy at the local and global level. In fact, it is relied upon by most

national economies of industrialized advanced countries where the manufacturing industries sector plays a significant role and hence cannot be ignored in the process of economic development in any state.

Equally important, Kenya's sugar industry is a source of livelihoods for many rural residents in the sugar growing belts. In addition, it ensures food security and provides sustainable livelihoods for millions of Kenyans, but it also suffers heavy government intervention. The industry is under constant threat of collapse due to perennial challenges. The major crises that the sub-sector is currently experiencing include liberalisation and increasing competition from cheap sugar imports, poor industry policies and structures that fail to address basic problems that would assist in recovery and continued government intervention that has resulted in mismanagement of the industry (Mwakio, 2009).

Mustry, Khushk, Memon and Saeed (2011) argued that an important indicator that influences financial performance of the industry is its competitiveness in its production cost. Similarly, Chetthamrongchai, Auansakul, and Spawn (2001) reported that costs of firm production are influenced by the price, quality, and dependability of purchased inputs. This is one of the most direct and obvious sources of competitiveness. More so, the cost of transporting sugarcane from the farm gate to the mills is quite high due to the multiple transport facilities and time-consuming activities involved in the delivery process. To gain a competitive edge in financial performance revenue optimization, a firm must lower input costs relative to those incurred by rival firms.

The KNAEP (2015) departmental committee on agriculture, livestock and co-operatives reported that Kenya is ranked among the countries with the highest cost of sugar production in the world. While the cost of production in the region is about US\$415 per metric tonne of sugar, the cost of production in Kenya is well more than US\$550 per metric tonne. This high cost of production is attributed to, among other factors, poor road infrastructure and high transport costs which indirectly affect performance of sugar industry in Kenya. The high cost of inputs of fertilisers, tractors and other agricultural type of supplies coupled with poor or unreliable extension services to the sub-sector is a major contributing factor to increased poverty and unsustainable sugarcane production in Kenya which impacts negatively on revenue optimisation.

Despite government's investments, the sugar industry still faces stiff competition locally and regionally resulting in low productivity and poor financial performance (Obange, Onyango, and Siringi, 2011). Self-sufficiency in sugar has remained elusive over the years as consumption continues to outstrip supply. Total sugar production grew from 368,970 tonnes in 1981 to 523,652 tonnes in 2010. Domestic sugar consumption increased even faster, rising from 324,054 tonnes in 1981 to 772,731 tonnes in 2007. Consequently, Kenya has remained a net importer of sugar with imports rising from 4,000 tonnes in 1984 to 258,578 tonnes in 2010. There, however, exists potential for Kenya to become and retain self-sufficiency in production and produce surplus for export (KSB, 2010).

1.2 Statement of the Problem

A firm's competitiveness in production gives it an edge over others in their performance and profitability and thus being competitive is important in enhancing a firm's performance. Existing

empirical evidence on this subject matter has however been limited in focus, scant, based on cross-sectional studies and majority being outside Kenya and thus limited in their applicability in addressing the sector's ailments. Mistry et. al. (2011) studied transportation costs as the only element of competitiveness affecting financial performance of companies' but KNAEP (2015) combined both poor road infrastructure and transport costs and found out that the variables had significantly affect firms' performance. Chetthamrongchai, Auansakul, and Supawan (2001) and Obange, Onyango, and Siringi, (2011) in their studies combined elements of costs as the price, quality and dependability of inputs purchased as cost elements and found out that all variables affected financial performance sugar firms. Omondi (2015), Odindo (2018), Kegode (2005) and Gicheru et. al. (2007) concurred that high production costs affects financial performance of the sugar industry. High transport costs, poor road infrastructure and elements of costs as the price, quality and dependability are elements of competitiveness which affect firm's performance. The previous authors did not specify how to test this production costs. The study used panel data methodology to test production costs on firm performance which was not applied in the previous studies. The prediction was tested using secondary data from a panel of six firms from 2005 to 2006. These are tracked for periods of up to 10 years. None of the authors performed analysis on the effect of competitiveness using cost per tonne combining both production costs as proxy to competitiveness on firms' financial performance. Therefore, there is need to carry-out a study using cost per tonne as an indicator of competitiveness on financial performance in the sugar industry in Kenya.

1.3 Objective of the Study

The objectives of the study are;

- i). To determine the effect of firm competitiveness on the financial performance of sugar industry in Kenya.
- ii). To determine the effect of management efficiency on the financial performance of sugar industry in Kenya.

1.4 Hypothesis of the Study

Based on the above objectives we set to investigate the following hypothesis;

- i). A firm's competitiveness position does not affect its financial performance.
- ii). Management efficiency does not affect its financial performance.

2.0 Literature Review

With respect to trade (Smith,1776), in the Classical theory demonstrated the gains from trade to be made when moving from a situation of autarky to free trade when countries have an absolute advantage in the production of different goods. If one country can produce goods using fewer inputs (labour) in production, then it will have an absolute advantage and should export the good; or alternatively countries should import goods that others can produce using fewer inputs this enhance good competitiveness Trade is thus attributed to differences in productivity. Ricardo (1817)

demonstrated that gains from trade could be made when two countries specialise in the production of goods for which they have a comparative advantage. All countries have a role in the division of labour based on their comparative advantage in terms of competitiveness among and between them. The Classical theory draws attention to less input (labour) in production that result into absolute advantage. Similarly, Ricardo (1817) emphasised that specialisation of labour should be based on comparative advantage.

Empirical literature on the nexus between competitiveness and firm performance abounds. Obange et al. (2011) emphasised on trade policies as a factor that affect competitiveness while Malecki (2007) and Porter (1990) agreed that economic and political production conditions have effect on competitiveness of the firm. Fahy and Smithee (1999) argued that organisation's resources are a competitiveness edge but contrary, Mwakio (2009) emphasises on cheap sugar imports, poor industry policies as key factors affecting financial performance. Barasa (2015) stated that illegal activities like poaching has negative effect on firm's competitiveness but Anon (2006) argued that technology, production economies, product quality, enterprise differentiation, advertising, promotion and other external factors that influence the competitiveness.

Chetthamrongchai, Auansakul, and Supawan (2001) carried out the research related to comparative cost analysis on transportation and other relevant costs of sugar cane production India, report that transportation has become a significant factor affecting the production costs of commodities. The production of sugar cane in Thailand is no exception. The cost of transporting sugarcane from the farm gate to the mills is quite high, owing to the multiple transport facilities and time-consuming activities involved in the delivery process. A large portion of this cost comprises truck rental and driver wages. These two elements together represent a high proportion of the overall production cost result in impairment of firm's performance.

Mazumder and Ghoshal (2003) examined the strengths and weaknesses of Indian steel industry. They prepared a SWOT analysis and identified major strengths, weaknesses, opportunities and threats in Indian steel industry. According to their study major strengths, included the availability of iron ore and cheaper labour. Weaknesses included higher cost of capital, low labour productivity, and opportunities included wider domestic market, growth of allied sectors and major threats included substitutes and technological changes. The study concluded that if the threats and weaknesses are overcome, there was higher financial performance in the Indian steel industry.

Odek, Kegode, and Ochola (2003) in their study stated that, currently, Kenya's sugar production cost high compared to other producers. Kenya's local sugar was selling at about US\$ 623 per tonne in 1996 and US\$673 per tonne in 2005, against the world average price of US\$296 and US\$276 in the same years, respectively. The 10 lowest cost sugarcane producers in the world are Australia, Brazil, Colombia, Guatemala, Fiji, Malawi, Swaziland, Thailand, Zambia and Zimbabwe. Sugar production cost in Kenya is one of the highest and the world price of sugar has always been below Kenyan cost of production. It is necessary to put in place some measures that enable Kenya sugar millers to enhance performance in their operations to be competitive.

Gohil (2005) examined the transaction cost vis-à-vis financial performance of sugar industry in India. The study was based on secondary data of the private sugar mills working in India during the period from 2000-01 to 2002-03 with a sample size of 44 private sector sugar mills. The main objectives behind the study were to examine the role of transformation vis-à-vis transaction cost in economic and financial performance of the Indian private sugar industry and to establish the policy implication of transaction cost approach for future development of sugar industry.

Gicheru, Waiyaki, and Omiti (2007) explored the technical efficiency levels in the sugar factories in Kenya and the factors that affect these levels using a stochastic production frontier approach over the period of 1996-2005 and using panel data. They found that the mean average inefficiency level for six sugar factories within the study period was 20.4 per cent. They argued that there was limited use of modern technology, which would have increased production at lower cost to enhance performance.

Akombo (2010) analysed Kenya's sugar industry competitiveness using Porter's Diamond model and concluded that reliable and affordable supply of cane raw material is also a major challenge with a majority (78%) of the companies raising the red flag. The poor state of road infrastructure has driven up the cost of cane heavily since the cost of transportation comprises about 35% of the overall cost which put companies' financial performance in a bad situation making them uncompetitive. Besides, the current payment system based on tonnage is considered injurious by the millers because much of the cane supplied contains little content of sucrose which is the main extract sought from cane.

Mustry, Khushk, Memon and Saeed (2011) conducted study at Technology Transfer Institute, Tandojam, Pakistan. Transportation was found as affecting the production costs of commodities. The expenditure on transportation was estimated at 16,076 million rupees for the group year 2007-08 reducing financial performance of firms. The study concluded that low sugar recovery percentage was the most serious problem faced by the sugar industry followed by de-zoning and transport costs.

A study by Obange, Onyango and Siringi (2011) suggest that given such a significant role of sugar industry to Kenya's economy and the role of sugar product in general, a market factor analysis is necessary to inform sugar industry organisation in Kenya and other countries similarly engaged in trade bloc arrangements. Kenya is a net importer of sugar of approximately 200,000 metric tonnes per annum, which implies domestic consumption level exceeds production; the deficit is compensated by sugar imports from low cost sugar producing countries in the COMESA region. It has been said the company, industry, or nation with the highest productivity could be the most competitive (McKee and Sessions-Robinson, 1989). Since this theory is based more on cost of production inputs, it will not be applied in the present study.

Huggins, Izushi, and Thomposon (2013) in their paper that sought to frame both theoretically and empirically the underlying tenets of regional performance competitiveness concluded that regional competitiveness is predicated on the presence of conditions that enable firms to compete in their chosen markets, and on the value these firms generate being captured by the respective region. The paper further assesses future avenues for theoretical and methodological exploration, highlighting the role of institutions, resilience and well-being in understanding how the competitiveness of

regions influences their long-term evolutions in the UK. They agree that the finding is consistent with endogenous approaches to regional development focused on factors such as human capital, education, and input and output costs.

In a study by Kalinda and Chisanga (2014) on - Sugar Value Chain: An assessment of the Growth Opportunities and Challenges in Zambia Sub sector, after employing a value chain approach and descriptive data analysis agreed that Zambia is one of the lowest cost producers of sugar globally. Growth in the sugar industry held great prospects for economic diversification and employment creation and despite being a low-cost sugar producer, growth of the sub-sector is constrained by high transaction costs including high fuel, electricity, transportation and distribution costs that affect the performance of the sector.

It is evident from reviewed literature that no study has been done on input production costs in enhance competitiveness of sugar industry performance in Kenya. Cheap sugar imports, poor industry policies as key factors affecting financial performance Most of studies and theories are based in foreign countries and are influenced by their national cultures. While the previous studies do not show that current liabilities coverage ratio as a proxy to firm's competitiveness on financial performance in sugar industry. It is thus expected that the present study applied production costs on financial performance on the sugar industry in Kenya.

3.0 Research Methodology

A cross-sectional retrospective research design was used for this study where the effect of liquidity was assessed in relation to financial performance of sugar industry in Kenya. This research design enables the researcher to observe two or more variables at one point in time and was useful for describing a relationship between two or more variables (Breakwell, Hammond, Fife-Schaw, and Smith (2006). In this study the population of the study, comprised 11 sugar firms as by Kenya Sugar Board 2010.

However not all firms were considered and thus we adopted a purposive sampling technique which is used in cases where the specialty of an authority can select a more representative sample that can yield more accurate results than by using other probability sampling techniques. The total sample thus considered for this study consists of five sugar firms registered with Kenya Sugar Board that were in operation and availability of firm's secondary data.

The data were extracted from secondary sources that included the financial reports of the five selected sugar manufacturing firms for the period for years ended 30th June 2005 to 2016. The period of study was long enough to avoid the firms' effects. Therefore, the panel data had sixty elements. The sugar factories were selected based on availability of data. They are Chemelil, Mumias, Nzoia, Muhoroni and South Nyanza. To study the effect of liquidity on sugar industry financial performance in Kenya, the study adopted the estimation model used by Kuznetsov and Muravyev (2001) which is modified and estimated in the following form:

$$ROA_{it} = \beta_0 + \beta_1 COST_{it} + \beta_2 MNGT_{it} + \beta_3 Z_{it} + \varepsilon_{it}$$

Where ROA_{it} is return on assets and is used as a measure of a firm's financial performance, $COST_{it}$ is Production Cost, $MNGT_{it}$ is a measure of management efficiency and Z_{it} is a vector of control variables that includes firm size, firm age and monetary policy that based on the literature also influence firm performance. The adopted control variables help to capture heterogeneity or individual effects as constants. Therefore, it contains a set of individual or group specific individuals which may be unobserved or observed all of which are taken to be constant over time resulting in a more effective model that is linear and fit by least sequences (Greene, 2008). β_0 , β_1 , β_2 and β_3 are regression to be estimated.

Table 1: Measurement of variables in the study

Variables	Definition	Measurement
Dependent Variable		
ROA	Return of assets	Dividing profit after tax (net income) by net reliable value of the asset
Independent Variable		
Liquidity	Funding Liquidity	Current Liability Coverage Ratio
Competitiveness	Production Costs	Production costs per tonne (Ksh/tonne)
Management efficiency	Optimization of company's revenue	Operating expenses as a percentage of company's revenue
Control Variables		
Monetary policy	Basis rate	Central Bank rate
Firm size	Firm size	Natural logarithm of book value of total assets
Firm age	Years of establishment	Natural logarithm of years since establishment

Source: Author (2017)

4.0 Results and Discussion

ROA, an indicator of what management has accomplished with the given resources (assets) is directly related to management's ability to efficiently utilize firms' assets, which ultimately belong to shareholders. A lower return on assets will indicate inefficiency hence poor financial performance. On average, we establish that the sugar industry is underperforming as indicated by the return on assets (ROA). The companies have a ROA of -0.32 an implication that their they have not been financially stable over time with the dip in financial performance for some companies being -6.92 percent. The variation in financial performance between the firms in the sugar industry is also low with the standard deviation from the mean being 1.19.

The competitiveness index of the sugar industry on average is established to be 10.51 with a lower variation across firms and the highest competitiveness index being 12.03 and the least being 4.09.

Managerial efficiency, a measure of a firm's effectiveness as measured the total cost of production to output stood at 41.67 percent and with a higher variation of 29.82 percent across firms. This suggests that the firm's efficiency is low as this means that allocation of resources by the firms substantially consumes the output and consequently low revenues as what is generated is used to cover the costs of production.

Table 2: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
ROA	-0.318	1.188	-6.920	1.320
Competitiveness	10.510	1.315	4.090	12.030
Monetary policy	9.519	2.281	6.420	15.750
Management efficiency	41.672	29.819	12.060	143.940
Firm size	21.970	1.832	15.860	24.180
Firm age	3.866	0.124	3.610	4.110

Source: Kenyan sugar factories data

The correlation between competitiveness and the dependent variable is ($r = -0.131$) shows that a higher index of competitiveness, as proxied by the firm's production costs per tonne has a negative effect on firm performance. Similarly, we establish that management efficiency is inversely related with firm performance and indication that they are not well aligned to a firm's operations and thus adversely affecting their performance

Table 3: Pearson correlation analysis

	ROA	CI	MPI	ME	Size	Age
Return on assets	1					
Competitiveness	-0.131	1				
Monetary policy	-0.035	-0.006	1			
Management efficiency	-0.189	-0.047	-0.071	1		
Size	0.625	0.181	0.046	-0.009	1	
Age	-0.087	0.055	0.111	-0.098	0.155	1

Source: Kenyan sugar factories data

Notes: ROA represents return on assets, CI is a firm's competitiveness, MPI is monetary policy innovations, ME is management efficiency while Size and Age are firm size and age respectively.

4.1 Diagnostic Tests

In order to ensure robustness of the results we conducted tests of multicollinearity, Stationarity Tests, heteroskedasticity, autocorrelation and the Hausman test to test for the appropriate model to estimate between a fixed and random effects model. In testing for multicollinearity, we adopted the variance inflation factor (VIF) tests where we established that VIF were less than 5 and in the spirit of Montgomery (2001) and Gujarati (2003) who indicated that VIF values should not as a rule of thumb be more than either 5 or 10 respectively we conclude that the model did not suffer from multicollinearity. The test for unit root was undertaken using the Im-Persaran-Shin (IPS) test which

allows for heterogeneous coefficients. The results of the Im-Pesaran-Shin (IPS) test indicated that the variables were non-stationary at level but stationary at level and thus the model incorporated variables at first difference.

In testing the spherical disturbances assumption, we adopted the Breusch-Pagan LM test of independence whose null hypothesis states that the spherical disturbances are homoscedastic or tests the null of poolability (Gujarati, 2003; Wooldridge, 2003). The Breusch-Pagan LM test with a $\chi^2(10) = 14.016$ is statistically insignificant (p -value = 0.1723) at all levels of significance and thus in line with Gujarati (2003) and Wooldridge (2003) we conclude that the spherical disturbance assumption has been met as the Breusch-Pagan LM test affirms that the cross-firm residuals are not correlated.

In addition, using the Wooldridge (2002) test for serial correlation which is a F-test under the null hypothesis of no first-order autocorrelation. The F-test statistic i.e. $F(1,4) = 0.014$ is found not be statistically significant (p -value = 0.9102) at all levels of significance and thus we conclude that there is no first-order serial correlation. In choosing between the fixed and random effects model we employ the Hausman test which is a χ^2 test which yield a $\chi^2 = 23.61$ with p -value = 0.0003 which is less than 0.05 thus this study applies the fixed effects regression model.

4.2 Fixed Effects Regression on the effect of firm competitiveness on ROA

The fixed effects regression equation adopted used the firm's return on assets to proxy for financial performance as a dependent variable. For the estimated model the F-values are significant at 1%, that is $F(4, 44) = 15.48$, p -value = 0.00 and thus implying that our model does not suffer from a specification bias which is further justified by the higher adjusted R-squared of 49.46% which is considered acceptable in a panel data analysis framework (Wooldridge, 2003) and thus imply that 49.46% of the variations in a firm's financial performance are jointly explained by the vector of independent variables.

The regression results reveal that competitiveness, as proxied by the firm's production costs per tonne, has a statistically significant negative effect on a firm's financial performance ($\beta = -0.354$, p -value = 0.000). This finding is consistent with the expected theoretical expectation that the higher firm's production costs per tonne the higher is their operational costs and thus are considered to be less competitive and this negatively affects their financial performance. In essence, higher production costs imply that more resources at the expense of prudent financial management is incurred and hence reducing the profit margins and consequently their return on assets.

The findings of a significant negative relationship between competitiveness and financial performance supports the Classical theories and shared view of Kalinda and Chisanga (2014) who argued that Zambia's financial performance of the sugar industry is constrained by high transaction costs including high fuel, electricity, transportation and distribution costs that affect the performance of the sector. Similar evidence is also presented by Chetthamrongchai, Auansakul, and Supawan (2001) from Thailand who concluded that a high proportion of the overall production cost result in impairment of firm's performance. In Nigeria, Girel and Giroh (2012) concludes that the high total cost of production significantly affected the sugar industry's financial performance. The

however contrast with Akombo (2010), how conclude that the current payment system based on tonnage is considered key factor affecting sugar industry financial performance because much of the cane supplied contains little content of sucrose which is the main extract sought from cane. The study concludes that high costs of production per tonne affect financial performance of the sugar industry in Kenya.

On management efficiency, the results show that it has a significant negative effect on financial performance ($\beta = -0.006$, p-value = 0.043). The negative relationship is an indication that the extent of managerial efficiency among the firms in the sugar industry is not so compelling as to drive a firm's financial performance. On the controls, we also note that firm size has a significant positive effect on firm performance ($\beta = 0.583$, p-value = 0.000) which conforms to theoretical expectations that the larger the firm is the more market share it commands and thus the higher her financial performance is. Changes in monetary policy is also seen to have a negative effect on a firm's financial performance ($\beta = -0.017$, p-value = 0.648) though the relationship that exists is insignificant. From this relationship we infer that changes in the monetary policy, proxied by central bank rate alters a firm's financing structure as debt becomes more expensive to repay as interest rates increases and thus a toll on the firm's financial performance.

With respect to a firm's age and financial performance we establish that there exists a significant negative relationship ($\beta = -4.802$, p-value = 0.001). This supports the proposition that older firms are contemporaneously reaching the end of their life cycle. Black et al. (2006) suggest that older firms are more likely to have finished their high-growth stage, while younger firms are faster growing.

Table 4: Fixed effects regression results of the effect of competitiveness and management efficiency on firm performance

Dependent Variable: ROA	Coef.	Std. Err.	t-stat	P>t	[95% Conf. Interval]	
Constant	9.591	5.652	1.70	0.097	-1.800	20.982
Competitiveness	-0.354	0.065	-5.43	0.000	-0.486	-0.223
Management Efficiency	-0.006	0.003	-2.08	0.043	-0.013	0.000
Monetary Policy	-0.017	0.037	-0.46	0.648	-0.091	0.058
Firm Size	0.583	0.059	9.88	0.000	0.464	0.702
Firm Age	-4.802	1.334	-3.60	0.001	-7.490	-2.114
F(4,44)					15.48	
Prob > F					0.00	
Overall Adjusted R-square					0.4946	

Source: Kenyan sugar factories data

5.0 Summary, Conclusions and Recommendations

The results of the data analyses undertaken to empirically test the nexus between a firm's competitiveness and management efficiency on financial performance of the sugar industry. Using a fixed effects empirical model to examine the impact of competitiveness and management efficiency on firm performance of sugar industry the results revealed that firms with small production costs per

tonne seem to perform highly compared to those whose industry production costs per tonne is high. In particular, the regression and correlation analyses and the hypothesis testing results showed a statistically significant negative relationship between firm's production costs per tonne and financial performance of sugar industry. Which concludes that with a higher the production costs per tonne the less profitable an entity is and as such and policy should encourage cost minimization measures. Similarly, the results affirm the existence of a negative relationship between management efficiency and firm performance. The negative relationship is an indication that the extent of managerial efficiency among the firms in the sugar industry is not so compelling as to drive a firm's financial performance.

Based on this study findings, the study recommends that organizations management need to keep their production costs optimal as high costs negates their financial performance, the sugar factories should heavily invest in raw material development and modern agrochemical practices to realize high yields through irrigation as it parts away from the tradition of relying on rains. In Western Kenya, due to upsurge in population, leading to diminished landholdings is it feasible to continue growing the crop in smallholding. The country can have a paradigm shift and relocate to coast and northern Kenya, through massive water storage facilities that would then allow irrigation and modern mechanization to cut down cost of production and increase production per tonne. Thirdly, the study recommends that the Kenya government continues to pursue competitiveness of a liberalized sugar industry in the face of removal of COMESA safeguards by February, 2019, it should vigorously implement the measures recommended in previous studies like: privatization of the public sugar companies, replacements with new technology machines, cost reductions through reduced taxation and provide sugar cane farmers with subsidies inputs to reduce costs of production.

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