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Operational cost uncertainty and financial performance of manufacturing firms in Kenya

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Abstract
Main objective of this study was to find out if uncertainty of operational cost of manufacturing firm in Kenya affects financial performance. Kenya manufacturing firms have not been performing as expected. They are to contribute to economic growth through GDP increment, market share, attract largest strategic investments in Key processing industry, increase sales locally and international, and employ 20% of Kenya Population. However, the manufacturing firms have been facing various financial and non-financial challenges. Average contribution to GDP has staggered at 10%, reported declining profit and sales, and some firms have moved out of market. Many factors have been cited to be contributing to declining financial performance. However, the influence of operational cost uncertainty on financial performance of manufacturing firms in Kenya is not conclusive. Hence, necessitating the current study to examine the influence of firm operational cost uncertainty on financial performance of manufacturing firms in Kenya. The study anchored its variable on agency theory. Indicators of operational cost uncertainty were Labor cost ratio and research and development ratio, and proxy of performance were ROS and ROE. The study adopted positivism Philosophy and correlation design. Target population was 856 manufacturing firms registered with KAM. A sample of 90 firms was selected using Stratified random sampling technique for 14 sectors and each sample picked by random sampling. The study covered 12 years starting from 2009 to 2020. Panel data was collected from audited financial statements using data collection instrument. Diagnostic tests were carried out to test assumption of linear regression and data analyzed using E-view 11.8. Results showed that operational cost uncertainty had positive and significant influence on financial performance of manufacturing firms in Kenya. The study recommends having enhanced research and development in place that will take advantage of market niche for products and technology for production.

Keywords: Operational cost uncertainty, Financial Performance and Manufacturing firms

1. Introduction

Operational cost uncertainty is a form of financial uncertainty that is likely to have an impact on manufacturing firm's performance depending on how firms manage situations and challenges. During economic crisis moments firms tend to reduce number of employee while some hire more to respond to demand in their operations. As firms strive to attain efficiency in their operation, while some opt to hire less staff as other firms lay off members of staff to reduce labor cost (Baum *et al*., 2018) [1]. It has been hypothesized that operational cost has direct significant influence on the bottom line of any firm, therefore, there is need for firms to manage well their operational cost (Markus, 2013) [7].

KPMG report (2017) showed that operational cost is a concern of all enterprises both small and large. They require robust management strategies that will satisfy compliance demand, contribute to better decision making and enhance the performance of a company. Proper cost-effective management strategy helps to improve organization processes and governance.

Effective Operational cost management can add value to the organization since it protects its capital base and earnings without affecting the ability for growth (Were, 2016) [17]. Investopedia (2019) has highlighted some of financial ratios of manufacturing firms which can be used as indicators of Operation cost. Revenue to employee ratio, employee turnover ratio, income cost ratios and manufacturing cost to total expenses ratio.

Financial performance for any firm is the ability firms to produce results that are predetermined according to set targets. The performance can be expressed in terms of loses and profit for a given period (Ozcan *et al*, 2017). Financial performance helps manufacturing firms to review how well they are using their acquired assets in generation of revenue. It helps to measures financial and non-financial soundness of manufacturing firms for a specific period. Manufacturing firms can compare financial performance with other manufacturing firms and also performance from one period to another for same firms (Olukemi, 2017). When a firm makes effective and efficient use of its resources to survive and grow during uncertainty period for a long period of time and aim at achieving their objects both financial and non-financial then they are said financially to be performing well (Warsame, 2016).

Financial performance of manufacturing firms can be done for one year and for one industry or and for several industries. This financial performance can be done in relation to either one objective or for multiple objectives. Generally manufacturing firm exist to achieve objectives of maximizing their revenue, realize growth and utility. Some manufacturing firms may have additional goals: social and economic help them in operating efficiently. However, these additional goals are of concern to most firms since they come with additional cost that may affect profit. (Muturi & Omondi (2013) [16].

Manufacturing firms operating in Kenya have used several indicators to measure their financial performance. Some firms have used profitability ratios to measure financial (Kayoyire & Shukla, 2016) and other firms have used ratio of return on assets by analyzing how efficiently manufacturing firms are using their assets to generate revenue (Kung'u, 2015). While other firms look at firm's contribution to countries growth in terms of GDP and general growth of economy (KAM, 2017). Performance also can be done in terms of total sales for a given period (Memba & Nyanuba, 2013) and also some analysts use employment rate (Osore & Ogeto, 2014).

Overall financial performance for manufacturing companies in Kenya is very important especial to investors who expect firms to grow and give them returns on their investment. This helps them to come up with decisions on investment to make using their resources. Their primary interest while entrusting their financial and other resources to manufacturing firms management is that they expect firms to make use of these resources and increase the value of firm (Njeru, 2015). In line with these expectations, agency theory explains that managers of firms need to be monitored constantly to have them act in the best interests of shareholders. This monitoring of managers generally comes with additional costs. Most firms monitor operational activities and performance by ensuring they have appropriate incentives, motivation and discipline structures in place. Most firms have put in place measure that ensure firm goals and goals of managers are both achieved concurrently. In most cases firm link incentives to specific responsibility centers and overall performance both non-financial and financial (Uzel, 2015).

Most of Manufacturing firms operating in Kenya have been major contributors to development of economy in terms of contribution to GDP and employment. Trend in GDP had shown steady increase then stagnated at an average of 10% for like a period of 10 years and started declining in the previous five years (KAM, 2017). This stagnation and decline were contrary to expectation. Manufacturing firms in Kenya are expected to gradually contribute to growth in GDP by 20% (Economic survey report, 2014). It was also noted that manufacturing sector growth has been at a slower rate when compared to general growth in general global Economy (Kenya Economic Survey, 2017).

Manufacturing firms in Kenya need to be on watch out for policies in global market, political, financial and environmental uncertainties that may lead to instability in prices of commodities and foreign exchange rates (African Development Bank Group, 2018). These Policies previously have led to a great change in life cycle of manufactured product, new business models and techniques of production that are improved. Firms have realized increased uncertainty in demand of product and prices of goods and services. Some macro-economic and micro economic forces have global impact on both financial and non-financial performance of manufacturing firms in Kenya.

Financial performance of Manufacturing firms in Kenya can be measure using profitability ratios like ROS, ROE, ROE, profit margin and changes in sales growth. Firms use ROE to measures return received by the owner of the business because of capital investment. ROA is used to show how efficiently, and effective firms are is utilizing their assets in the process of production of goods and services they sell. ROS provides insight into how much profit is being produced per Kenya shilling of sales. Increase in ROS is an indicator that a manufacturing firms are improving efficiency and if ROS is decreasing could be a signal of firms impending financial troubles. In relation to financial measures of performance, the current study used ROS and ROE which fits its objective. The same indicators were used by other studies (Zeitun & Tian, 2007; Rao *et al*., 2007; Adekunle & Sunday, 2010; Vijayakumar & Tamizhselvan, 2010).

2. Materials and Methodology

The study was guided by one major objective to find out if operational cost uncertainty had significant influence on financial performance of manufacturing firms in Kenya. The study anchored on agency theory with believe that during uncertainty periods firm's operational costs are volatile.

2.1 Study design

This research study adopted correlation research design which build a profile of study problem by collecting data for research variables and then carried out analysis on data to reveal the nature of relationship that existed between variables (Cooper & Schindler, 2013). According to Kothari (2014) research that is correlation in nature is normally used to acquire data and information pertaining phenomena's' relationship status as at time of study. It also describes characteristics or behavior of a given population in a systematic and accurate version (Sekaran, 2010). Correlation research design was used in other studies (Okechukwu *et al*., 2018; Baum *et al*., 2018) [1].

2.2 Target population

The study was based on a target population of 856 manufacturing firms operating in Kenya and were registered with Kenya Association of manufacturers (KAM) as at end of 2020. Manufacturing firms' KAM membership is 40% of large firms manufacturing foods and services in Kenya (Anzetse, 2016). This will give a better representative of manufacturing firms in Kenya.

Table 1: Target Population

Sector Members	No.	%
Service & Consultancy	104	12%
Building, Mining & Construction	29	3%
Chemical & Allied Sectors	79	9%
Energy, Electrical & Electronics	45	5%
Food & Beverages	187	22%
Leather & Footwear	9	1%
Metal & Allied Sector	83	10%
Motor Vehicle & Accessories	51	6%
Paper & Board	74	9%
Pharmaceutical & Medical Equipment	24	3%
Plastics & Rubber	77	9%
Fresh Produce	11	1%
Textiles & Apparels	64	8%
Timber, Wood & Furniture	19	2%
	856	**100%**

***Source*:** KAM 2020

2.3 Sample size determination

The sample of the study was selected from firms that are registered with Kenya Association of Manufactures using stratified random sampling technique from each sector depending on number of firms per sector. Stratified sampling technique was appropriate for this study since Manufacturing firms have 14 sectors with different population and percentage. To have a good representation, then each sector was considered as astrata. Number of firms sampled was randomly selected to have a good representative of the population. An appropriate random sample was picked from each sector to form a sample size of 90 manufacturing firms. Sample size was drawn using Nasuirma (2000) formula as shown below:

Sample size = NCV2/ (CV2 + (N-1) ε2)

Where N is the population Targeted; CV2 is co-efficient of variation normally given at 0.5%; ε is the desired tolerance level of confidence usually given as 95% therefore taken at 0.05%. This formula was used by other researchers (Nyabwanga *et al*., 2012; Mogere *et al*., 2013).

Sample size = (856*0.52)/ 0.52 + (856-1) *.052
= 214/2.3875
= 89.633
= 90 manufacturing firms

Table 2: Sample Size

Sector Members	Sample	%
Service & Consultancy	10	12%
Building, Mining & Construction	3	3%
Chemical & Allied Sectors	8	9%
Energy, Electrical & Electronics	5	5%
Food & Beverages	20	22%
Leather & Footwear	2	1%
Metal & Allied Sector	9	10%
Motor Vehicle & Accessories	7	6%
Paper & Board	8	9%
Pharmaceutical & Medical Equipment	3	3%
Plastics & Rubber	8	9%
Fresh Produce	2	1%
Textiles & Apparels	7	8%
Timber, Wood & Furniture	2	2%
	90	**100%**

***Source*:** KAM 2020

2.4 Data collection

Secondary data was gathered from audited financial statements of manufacturing firms under the study. Researcher and two other assistants used data collection instrument (DCI) as guide during data collection from sampled manufacturing firms that were registered under Kenya Association of Manufactures. This technique was more appropriate for this study since it helps one to collect tailored information for study and has been used during similar studies to collect data (Muturi & Mueni, 2015; Muiruri, 2015; Muriithi, 2016) [9].

2.5 Data analysis and presentation

Panel data collected was analyzed using Eviews 11.7 Version. Both measures of central tendency including standard deviation, median and mean was used during data representation. Multiple Panel regression analysis helped in measuring strength and nature of relationship which exist between variables. The model also helped in explaining magnitude and showing direction of relationship by use of correlation coefficient, determination coefficient and significance level. The following model was adapted during analysis:

ROS = f (LCOR, RD)
ROE = f (LCOR, RD)

The following model was used for regression:

$ROS_{it} = \beta_0 + \beta_1 LCOR_{it} + \beta_2 RD_t + \alpha_{it} + i_t$

$ROE_{it} = \beta_0 + \beta_1 LCOR_{it} + \beta_2 RD_{it} + \alpha_{it} + i_t$

Where:
LCOR = Labor Cost Ratio, RD = Research and Development
i = 1- n, t = 1, 2, ……12
n = Sample size, α_i = Manufacturing firm effect specific to a

firm and are assumed to be normally distributed and have variance which is constant. e_{it} =Error terms assumed to have normal distribution (denotes variables not included in the study.

3. Results

Table 3: Overall Descriptive Statistics

	Financial performance		Operational cost uncertainty	
	ROE	**ROS**	**LCOR**	**RD**
Mean	12.12	6.56	41.83	15.85
Maximum	67.65	97.53	1201.50	265.16
Minimum	-53.44	-48.52	0.00	0.04
Std. Dev.	15.71	12.06	51.60	16.14
Skewness	0.03	0.37	14.00	5.12
Kurtosis	5.27	10.76	279.10	64.64
Jarque-Bera	233	2734	3465566	175703
Probability	0.00	0.00	0.00	0.00
Sum	13086	7087	45180	17116
Sum Sq. Dev.	266405	156965	2873131	281059
Observations	1080	1080	1080	1080

The Mean for ROE and ROS was 12.12 and 6.56 with a maximum of 67.65 and 97.53 respectively. The mean for Labor cost ratio and for RD was 41.83 and 15.85 respectively. While maximum was 1201.50 and 265.16 for LCOR and RD respectively. From table 3. Minimum for ROE and ROS was -53.44 and -48.52 meaning that firms are exposed to a likelihood of making deep losses. Standard deviation was 15.71 and 12.06 for ROE and ROS, while LCOR and RD had standard deviation of 51.60 and 16.14. Meaning all the variables under the study were very volatile. ROE and ROS had skewness of 0.03 and 0.37 with Kurtosis of 5.27 and 10.76 respectively. For LCOR and RD, Skewness was 14 and 5.12 respectively with Kurtosis of 279.10 and 64.64 respectively. Normality of data was tested using Jarque-Bera whose probability was less than 0.05 meaning data taken together showed it was normally distributed.

3.1 Correlation Analysis

Table 4: Correlation Analysis

	ROE	**ROS**	**LCOR**	**RD**
ROE	1			
ROS	0.579	1		
	0.000	-----		
LCOR	-0.413	-0.985	1	
	0.025	0.001	-----	
RD	0.302	0.948	0.710	1
	0.031	0.002	0.011	-----

Table 4 shows ROS influences ROE and the influence is positive and significant. LCOR influences ROE and ROS significantly negatively since P-Values are less than 0.05. Furthermore, RD influences positively both ROE and ROS. The influence is not significance. There exists multicollinearity between LCOR and ROS and RD and ROS.

3.2 Regression Analysis of Operating cost Uncertainty and Financial Performance

The main objective of this study sought to find the influence of operational volatility on financial performance of manufacturing companies in Kenya. Multiple regression was applied to examine the influence of labour cost ratio and research and development cost ratio on financial performance of manufacturing companies in Kenya. Results in Table 5 indicates that 38.8% of changes in ROS and 45.0% of changes in ROE can be explained by labour cost ratio and research and development cost while the remaining percentage is associated with other attributes not incorporated in the model. Regression coefficients indicates that there was an inverse significant influence of labour cost ratio on ROS (β = -0.003, p value > 0.05). While research and development cost have positive and significant influence on ROS (β = 0.089, p value < 0.05). Further, there was an inverse and significant influence of labour cost ratio on ROE (β = -0.004, p value > 0.05), while research and development have positive and not significant influence on ROE (β = 0.034, p value >0.05). The resultant equations are:

ROS = 5.286 -0.003*LCOR + 0.089*RD
ROE = 11.762 -0.004*LCOR +0.034*RD

Table 5: Operational Uncertainty and Financial Performance

Dependent	Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROS	C	5.286	0.692	7.642	0.000
	LCOR	-0.003	0.003	-1.259	0.028
	RD	0.089	0.012	7.464	0.000
	R-squared	0.388	Mean dependent var		6.562
	Adjusted R-squared	0.332	S.D. dependent var		12.061
	S.E. of regression	9.861	Akaike info criterion		7.496
	Sum squared residuals	96076.000	Schwarz criterion		7.921
	Log likelihood	-3956.070	Hannan-Quinn criterion.		7.657
	F-statistic	6.881	Durbin-Watson stat		1.352
	Prob(F-statistic)	0.000			
ROE	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
	C	11.762	0.960	12.250	0.000
	LCOR	-0.004	0.004	-1.187	0.025
	RD	0.034	0.022	1.500	0.014
	R-squared	0.450	Mean dependent var		12.117
	Adjusted R-squared	0.399	S.D. dependent var		15.713
	S.E. of regression	12.180	Akaike info criterion		7.919
	Sum squared residuals	146576.100	Schwarz criterion		8.343
	Log likelihood	-4184.169	Hannan-Quinn criterion.		8.080
	F-statistic	8.876	Durbin-Watson stat		1.258
	Prob(F-statistic)	0.000			

4. Discussion

The main objective of the studied was to find the influence of operational volatility on financial performance of manufacturing companies in Kenya. Results of the correlation analysis indicated that labour cost ratio had inverse and not significant influence on financial performance of manufacturing firms in Kenya while research and development have positive and significant effect on financial performance of manufacturing companies in Kenya. The same results were shown by Panel regression analysis for relationship that exist between Operational uncertainty and financial performance of manufacturing firms. Meaning firms need to invest more in research and development to have information on marketing strategies and pricing of goods. Take advantage of price discrimination and build competitive advantage over their competitors. There exists inverse relationship between Labor cost ratio and financial performance of manufacturing firms. There is need for manufacturing firms to invest in technology and improve on methods of production. Firms are better off if they automate production of goods and services in order to reduce labor cost.

5. Conclusion and Recommendations

Since Labor cost ratio has negative and significant effect on financial performance of manufacturing firms in Kenya, there is need deliberate strategy and implementation to ensure that labor costs are kept at minimum. Automation of manufacturing process will ensure that quality and quantity products and services are done at reduced cost. Manufacturing firms in Kenya need to embrace research and development since it has positive influence on financial performance. Firms need to take advantage of technology and invest more in researching on markets and customer preferences. This will enhance sales both locally and international.

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6.1 Funding

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6.2 Analysis and Research

This study and analysis was conducted at Jomo Kenyatta University of Agriculture and Technology.

7. Declaration of interest

The author declares that has no conflict of interest. The manuscript of the study was organized in a manner that was chosen based on its relevance to the subject matter, work quality and exhaustively in fulfillment of the requirements for obtaining a doctorate degree in Finance.

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