ORIGINAL RESEARCH ARTICLE

Operational cost uncertainty and financial performance of manufacturing firms in Kenya

Pila Jane[1], *Muturi Willy*[1], *Olweny Tobias*[1]

[1]*College of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.*

Corresponding author: *jatuo2016@gmail.com*

ABSTRACT

The main objective of this study was to find out if uncertainty about the operational costs of manufacturing firms in Kenya affects financial performance. Kenyan manufacturing firms have not been performing as expected. They are meant to contribute to economic growth through GDP increments and market share, attract the largest strategic investments in the key processing industry, increase sales locally and internationally, and employ 20% of the Kenyan population. However, manufacturing firms have been facing various financial and non-financial challenges, including declining profit and sales, and some firms have moved out of the market. Many factors have been cited as contributing to declining financial performance. However, the influence of operational cost uncertainty on the financial performance of manufacturing firms in Kenya is not conclusive. Some studies found a negative relationship, while others found a positive relationship. Hence, the current study necessitates examining the influence of firm operational cost uncertainty on the financial performance of manufacturing firms in Kenya. The study anchored its variable on agency theory, which states that during financial uncertainty, operational costs are volatile. Indicators of operational cost uncertainty were the labour cost ratio and the research and development ratio, and proxies of performance were ROS and ROE. The study adopted positivism, philosophy, and an explanatory design. The target population was 856 manufacturing firms registered with the Kenya Association of Manufacturers. A sample of 90 firms was drawn from the population using the Nasuirma (2000) formula. The stratified random sampling technique was applied to 14 sectors, and each sample was picked by random sampling. The study covered 12 years, starting from 2009 to 2020. Panel data was collected from audited financial statements using a data collection instrument. Results showed that operational cost uncertainty had a positive and significant influence on the financial performance of manufacturing firms in Kenya. The labour cost ratio had a negative and significant relationship with the financial performance of manufacturing firms in Kenya. The research and development ratio had a positive and significant impact on the financial performance of manufacturing firms in Kenya. The study recommends manufacturing firms have enhanced technology in place to help reduce production costs. The study recommends having enhanced research and development in place that will take advantage of the market niche for products and technology for production.

Key Words: Operational cost uncertainty, financial performance and manufacturing firms

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

1.0 Introduction

Operational cost uncertainty is a form of financial uncertainty that is likely to have an impact on a manufacturing firm's performance, depending on how firms manage situations and challenges. During economic crisis moments, firms tend to reduce the number of employees, while others hire more to respond to demand in their operations. As firms strive to attain efficiency in their operations, some firms opt to hire less staff as other firms lay off members of staff to reduce labour costs (Baum et al., 2021). It has been hypothesised that operational costs have a direct and significant influence on the bottom line of any firm; therefore, there is a need for firms to manage their operational costs well through efficient operations (Gill et al, 2014).

The KPMG report (2017) showed that operational costs are a concern for all enterprises, both small and large. They require robust management strategies that will satisfy compliance demands, contribute to better decision-making, and enhance the performance of a company. Proper, cost-effective management strategies help improve organizational processes and governance. Effective operational cost management can add value to the organization since it protects its capital base and earnings without affecting its ability to grow (Were, 2016). Baum et al., (2021) has highlighted some of the financial ratios of manufacturing firms that can be used as indicators of operation costs. Revenue to employee ratio, employee turnover ratio, income cost ratios, and manufacturing cost to total expenses ratio.

Manufacturing firms have used several indicators to measure their financial performance. Some firms have used profitability ratios (Kroes and Manikas, 2014) and other firms have used the ratio of return on assets to analyze how efficiently manufacturing firms are using their assets to generate revenue (were, 2016). While other firms look at a firm's contribution to a country's growth in terms of GDP and the general growth of the economy, Performance can also be measured in terms of total sales for a given period (Lwiki et al, 2013), and some analysts also use the employment rate (Okechukwu et al., 2018).

Overall financial performance for manufacturing companies in Kenya is very important, especially to investors who expect firms to grow and give them returns on their investments. This helps them come up with investment decisions to make using their resources. Their primary interest while entrusting their financial and other resources to manufacturing firm management is that they expect firms to make use of these resources and increase the value of firms. 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 measures that ensure firm goals and the goals of managers are both achieved concurrently. In most cases, firms link incentives to specific responsibility centers and overall performance, both non-financial and financial (Osazefua, 2019).

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

Manufacturing firms in Kenya need to be on the lookout for policies in the global market and political, financial, and environmental uncertainties that may lead to instability in the prices of commodities and foreign exchange rates. These policies have previously led to a great change in the life cycle of manufactured products, new business models, and improved production techniques. Firms have realized increased uncertainty in the demand for products and the prices of goods and services. Some macro-economic and microeconomic forces have a global impact on the financial and non-financial performance of manufacturing firms in Kenya.

The financial performance of manufacturing firms in Kenya can be measured using profitability ratios like ROS, profit margin, and changes in sales growth. Firms use ROE to measure the return received by the owner of the business because of capital investment. ROA is used to show how efficiently and effectively firms are utilizing their assets in the production of goods and services. ROS provides insight into how much profit is being produced per Kenyan shilling of sales. An increase in ROS is an indicator that a manufacturing firm is improving efficiency, and if ROS is decreasing, it could be a signal of a firm's impending financial troubles. In relation to financial measures of performance, the current study used ROS and ROE, which fit its objectives. The same indicators were used by other studies (Lwiki et al., 2013; Muriithi, 2017; Okechukwu et al., 2018).

2.0 Materials and methodology

The study was guided by one major objective: to find out if operational cost uncertainty had a significant influence on the financial performance of manufacturing firms in Kenya. The study is anchored on agency theory, which states that during uncertainty periods, firms' operational costs are volatile. Baum et al. (2018) noted that during the uncertainty period, firms reduce labour, internal controls are less, and as such, operational costs are affected.

2.1 Study design

The study applied explanatory research design. This research design is applied to evaluate relationships among variables (Blumberg et al., 2014). According to Salter and Kothari, (2014), explanatory research is carried out to elucidate patterns of relationships among variables. It also describes the characteristics or behavior of a given population in a systematic and accurate way. A correlation research design was used in other studies (Okechukwu et al., 2018; Baum et al., 2018).

2.2 Target population

The study was based on a target population of 856 manufacturing firms operating in Kenya that were registered with the Kenya Association of Manufacturers (KAM) as of the end of 2020. Manufacturing firms under KAM are distributed throughout the country. Those that register with KAM are expected to keep complete financial records that are audited annually. The audited financial records are filed with KAM annually.

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

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%

Source: KAM 2020

2.3 Sample size determination

The sample of the study was selected from firms that are registered with the Kenya Association of Manufactures using stratified random sampling techniques from each sector, depending on the number of firms per sector. The stratified sampling technique was appropriate for this study since manufacturing firms have 14 sectors with different populations and percentages. The number of firms sampled was randomly selected to be a good representative of the population. An appropriate random sample was picked from each sector to form a sample size of 90 manufacturing firms. The sample size was drawn using Nasuirma's (2000) formula, as shown below:

$$\text{Sample size} = NCV2/ (CV2 + (N-1)\ \varepsilon 2)$$

Where N is the population targeted, CV2 is the coefficient of variation normally given at 0.5%, and 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

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

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%

Source: KAM 2020

2.4 Data collection

Secondary data was gathered from the audited financial statements of the manufacturing firms under study. Two research assistants were recruited to aid in data collection. Secondary data was gathered through the use of a secondary data collection sheet. The secondary data collection sheet included the period under the study of 12 years and all variables under the study. This technique was more appropriate for this study since it helps one collect tailored information for the study and has been used during similar studies to collect data (Muriithi, 2016).

2.5 Operationalization of variables

The study adopted financial performance as a dependent variable. The indicators of financial performance were return on sale (ROS) and return on equity (ROE). The explanatory variable for the study was operational cost, whose indicators were labour cost ratio (LCOR) and R research and development expense ratio (RD). Variables were used by Baum et al. (2018) during their study, and other researchers have used them (Okechukwu et al., 2018 ; Udiin & Hossain, 2020).

2.6 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, were used during data representation. Multiple:

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

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

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 = labour 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 a constant variance. e_{it} = Error terms are assumed to have a normal distribution (denotes variables not included in the study)

3.0 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 labour cost ratio and for RD was 41.83 and 15.85, respectively. The maximum was 1201.50 and 265.16 for LCOR and RD, respectively. From table 3. The minimum for ROE and ROS was -53.44 and -48.52, meaning that firms are exposed to a likelihood of making deep losses. The standard deviation was 15.71 and 12.06 for ROE and ROS, while LCOR and RD had a standard deviation of 51.60 and 16.14. All the variables in 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. The normality of the data was tested using Jarque-Bera, whose probability was less than 0.05, meaning the data taken together showed it was normally distributed.

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

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 both ROE and ROS positively. The influence is not significant. 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 was to find the influence of operational volatility on the 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 the financial performance of manufacturing companies in Kenya. Results in Table 5 indicate that 38.8% of changes in ROS and 45.0% of changes in ROE can be explained by the labour cost ratio and research and development costs, while the remaining percentage is associated with other attributes not incorporated in the model. Regression coefficients indicate that there was an inversely significant influence of the labour cost ratio on ROS (β =-0.003, p value > 0.05). While research and development costs have a 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 a positive and not significant influence on ROE (β = 0.034, p value >0.05). The resultant equations are:

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

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

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			

4.0 Discussion

The main objective of the study was to find the influence of operational volatility on the financial performance of manufacturing companies in Kenya. Results of the correlation analysis indicated that the labour cost ratio had an inverse and significant influence on the financial performance of manufacturing firms in Kenya, while research and development had a positive and significant effect on the financial performance of manufacturing companies in Kenya. The same results were shown by panel regression analysis for the relationship that exists between operational uncertainty and the financial performance of manufacturing firms. Meaning firms need to invest more in research and development on better methods of producing goods and services. They need to take advantage of price discrimination and build a competitive advantage over their competitors. There exists an inverse relationship between the labour cost ratio and the financial performance of manufacturing firms. There is a need for manufacturing firms to invest in technology and improve their methods of production. Firms are better off if they automate the production of goods and services in order to reduce labour costs.

5.0 Conclusion and recommendations

Since the labour cost ratio has a negative and significant effect on the financial performance of manufacturing firms in Kenya, there is a need to have a strategy in place to ensure that labour costs are kept at a minimum. Automation of the manufacturing process will ensure that quality

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

and quantity of products and services are achieved at reduced costs. Manufacturing firms in Kenya need to embrace research and development since it has a positive influence on financial performance. Firms need to take advantage of technology and invest more in researching markets and customer preferences. This will enhance sales both locally and internationally.

6.0 Acknowledgements

6.1 Funding

None

6.2 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.

6.3 Ethical approval

Ethical approval was sought from the National Commission for Science, Technology, and Innovation, License No. NACOSTI/P/20/7014, Applicant Identification Number 357104.

7.0 References

Baum, C. F., Caglayan, M., & Xu, B. (2021). The impact of uncertainty on financial institutions: A cross-country study. International Journal of Finance & Economics, 26(3), 3719-3739.

Gill, A., Singh, M., Mathur, N., & Mand, H. S. (2014). The impact of operational efficiency on the future performance of Indian manufacturing firms. International Journal of Economics and Finance, 6(10), 259-269.

KAM, (2020). KAM Policy and Sustainability Report, Retrieved from https://kam.co.ke/wp-content/uploads/2021/07/KAM-Policy-Sustainability-Report-2020-2-1.pdf.

KPMG, (2017). Survey of corporate responsibility of firms in Africa, Retrieved from https://home.kpmg.com/xx/e

Kroes, J. R., & Manikas, A. S. (2014). Cash flow management and manufacturing firm financial performance: A longitudinal perspective. *International Journal of Production Economics,* 148, 37-50.

Lwiki, T., Ojera, P. B., Mugenda, N. G., & Wachira, V. K. (2013). The impact of inventory management practices on financial performance of sugar manufacturing firms in Kenya. International Journal of Business, Humanities and Technology, 3(5), 75-85.

Mogere, K., Olooko, M., & Walter, O., (2013). Effect of inventory control systems on operational performance of tea processing firms: A Case Study of Gianchore Tea Factory, Nyamira County, Kenya. The International Journal of Business & Management, 1(13), 2321-8916.

Muriithi, J. (2017). Analysis of the Effect of Operating Costs on Financial Performance of Occupational Pension Schemes in Kenya. Research Journal of Finance and Accounting, 8(1), 40-49.

Nasuirma, D. K. (2000). Survey sampling theory and methods. Nairobi: University of Nairobi press

Nyabwanga, R. N., & Ojera, P. (2012). Inventory management practices and business

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8

performance for small-scale enterprises in Kenya. Journal of business management, 4(2), 203-267.

Okechukwu, E. U., Okoronkwo, B. O., & Eze, J. O. (2018). Decision making under uncertainty and organizational performance: An impact assessment among manufacturing firms in South East, Nigeria. The International Journal of finance, 6(10), 579-589.

Osazefua, I. J. (2019). Operational efficiency and financial sustainability of listed manufacturing companies in Nigeria. *Journal of Accounting and Taxation,* 11(1), 17-31.

Salter, K. L., & Kothari, A. (2014). Using realist evaluation to open the black box of knowledge translation: a state-of-the-art review. *Implementation science*, 9(1), 1-14.

Udiin, M. H., & Hossain, M. S. (2020). Impact of operating expenditures on firms profitability. ELK Asia Pacific Journal of Finance, 11(4), 1-18.

Were, A. (2016). Manufacturing in Kenya: Features, challenges and opportunities. International Journal of Science, Management and Engineering, 4(6), 15-26.

URL: https://ojs.jkuat.ac.ke/index.php/JAGST
ISSN 1561-7645 (online)
doi: 10.4314/jagst.v23i6.8