

Control Activities and Operational Efficiency of Companies in Road Construction Industry in Kenya

Elson Kiplangat Kirui, Josephat Oluoch Oluoch, Elijah Maina Kimani, David Kimani Nduruhu

Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 – 00200, Nairobi, Kenya.

Abstract: Control activities are policies and procedures that ensure that management directives carried out. The objective of the study was to determine the effect of control activities on operational efficiency of companies in road construction industry in Kenya. The study was guided by stewardship theory. The research adopted the descriptive research design. The target population was the road construction contractors in Kenya and licensed by the National Construction Authority of which as of 1st July 2025 stood at 16,684 road works contractors. The sample size was 391 road works contractors, and their operations centred in Kenya. After applying Yamane (1967:886) formula, the study adopted a two-stage sampling technique. Stratified sampling technique was applied in grouping companies into NCA1 road works contractors, NCA2 road works contractors, NCA3 road works contractors, NCA4 road works contractors, NCA5 road works contractors, NCA6 road works contractors, NCA7 road works contractors and NCA8 road works contractors. Proportionate sampling was applied where a respondent was targeted in each of the 391 sampled companies. Data from NCA was my sampling frame. A pilot study was done where 40 respondents were selected randomly from the road works contractors in Kenya and the piloted respondents was not part of the study. The study collected primary data using questionnaire. Data collected was analysed using both descriptive and inferential statistics. Descriptive statistics included mean, frequency, standard deviation, variance and percentages whereas inferential statistics. P-value and T-test statistics derived from regression analysis and Pearson product moment correlation coefficient. The study established that control activities increase operational efficiency of companies in road construction in Kenya ($\beta=.081$: $p<.050$). The study concluded that control activities have a significant influence relationship with operational efficiency of companies in road construction in Kenya. The study recommends that companies in road construction should be managed by qualified expertise and that the government through NCA should come out with measures of handling political interferences. The study will add value to the knowledge base of scholars through new inventory management practices that enhance operational efficiency. Management of companies in road construction industry will be aided by this study in their improved effectiveness and efficiency of running their operations. The Government through economic planners will gain insights of inventory management practices in the pursuit of Kenya vision 2030 goals.

Key words: Control Activities, Operational Efficiency, Road Construction Industry, Companies, Kenya

Introduction

Operational efficiency emanates from the broader term of operational performance defined as a measure in which performance evaluated in terms of flexibility, speed, cost, dependability and quality (Imhanzenobe, 2019). A firm considered technically efficient if it can obtain maximum outputs from given inputs or minimize inputs in producing given outputs with the sole purpose of avoiding waste (Ahmed et al., 2020). In road construction industry, operational efficiency is an inevitable necessity for the competitive environment. To improve operational efficiency an organization must measure both the input and the output side of the internal controls (Cheng et al., 2018). Efficiency measured in three ways: maximization of output, minimization of costs and maximization of profits. Operational efficiency enables a firm to achieve the optimal return and at the same time help in curbing adverse economic conditions through proper utilization of available resources (Buer et al., 2021). Professional internal reporting in adherence to corporate governance, social responsibility and in compliance with the taxation regulations would lead to efficient operations especially in road construction industry.

Control activities are policies and procedures that ensure that management directives carried out (Eke, 2018). They are continuous actions that organizational members take to ensure proper execution of operations. Control activities designed to support accurate, complete and reliable financial transaction processing. Efficient control activities set the tone of an organization by influencing the control consciousness of its people. Organization structures establish expected standards of conduct and sets performance measures and incentives within the organization to reduce the potential for fraudulent behavior (Segun & Helen, 2020). It is the foundation for all other components of internal controls, providing discipline and structure. Control activities, which also serve as indices for measurement of internal controls includes segregation of duties, authorization, supervision, physical controls (security measures) and performance reviews.

Statement of the Problem

Operation efficiency in road construction industry is key in boosting the productivity and thus driving down the cost of routine operations to optimal level (Buer et al., 2021). However, management of companies in road construction industry is always in a dilemma on the optimal decision to attain the maximum outcome regarding control activities to achieve optimal operational efficiency. Control activities remain an academic debate among the other aspects that contribute to the success of any business.

Control activities are policies and procedures that ensure that management directives carried out (Eke, 2018). In Kenya, several important trends have recently emerged within the road construction industry of which is a major contributor to economic development (Mwangi & Waithaka, 2023). Delays in project completion and poor efficiency in the road construction industry has been experienced and has led to failure in achieving effective time and cost efficiency (Rivera et al., 2020). Umar and Dikko (2018) researched on the effect of internal control on performance of commercial banks in Nigeria. The findings of the study revealed that there is a positive and significant relationship between the four components of internal control (control environment, control activities, monitoring and risk assessment) and bank performance. The findings of the study are only applicable to commercial banks thus lacks universality. Abiodun (2020) researched on the internal control procedures and firm's performance in Nigeria's South-West region. The survey results indicated the positive relationship between internal audit control, risk assessment and monitoring practices and organizational success. Control practices and control environment, however, have a significant negative impact on firm performance. The study findings based on firms generally but not specifically road construction companies. Therefore, this research seeks to bridge that gap by plugging into the contextual and conceptual existing research gap.

Research Objective

The research objective of the study was to determine the effect of control activities on operational efficiency of companies in road construction industry in Kenya.

Research Hypothesis

H₀₁: Control activities does not significantly affect the operational efficiency of companies in road construction industry in Kenya.

Theoretical Review

This section entails the study of what the past academicians concluded pertaining control activities. The section was guided by the stewardship theory.

Stewardship Theory

Donaldson and Davis (1989) introduced stewardship theory. Stewardship theory is about the employment relationship between two parties, the principal (owner) and the steward (Manager) (Davis, et al., 1997; Donaldson & Davis, 1991). It too examines this relationship from a behavioural and a structural perspective. Theory suggests that stewards will behave in a pro-social manner, behaviour that aims at the interest of the principal and thus the organization (Davis, et al., 1997; Zahra et al., 2009). The assertion of stewardship theory is that efficiency of firm operations such as timeliness is the desired outcome of a stewardship perspective through control activities (Davis, et al., 1997; Tosi, Brownlee, Silva, & Katz, 2003). The underlying assumption of stewardship theory based on the humanistic model of man due to its foundation in sociology and psychology (Donaldson & Davis, 1991). This model assumes that individuals motivated by higher order needs fulfilment (Davis, et al., 1997). In the principal-steward relationship, a steward will put the interests of the principal ahead of self-serving interests (Corbetta & Salvato, 2004; Davis, et al., 1997; Davis, et al., 2010; Zahra, et al., 2009).

A principal will create an organizational structure where these stewardship behaviours can flourish. As such, a stewardship structure seen as collectivistic and cooperative, resulting in positive benefits for the organization (Davis, et al., 1997). When both parties choose to behave as stewards and place the principal's interest first, theory suggests a positive impact on performance because both parties are working toward the same goal (Davis, et al., 1997; Kellermanns & Eddleston, 2007). The choice of stewardship behaviour impacted by both psychological and situational factors (Corbetta & Salvato, 2004; Davis, et al., 1997; Vallejo, 2009). Psychological factors such as intrinsic motivation, high identification, and personal power can steer the behavioural choice to stewardship (Davis, et al., 1997; Zahra, et al., 2008). Intrinsic motivation exists within individuals and provides satisfaction in and of itself (Ryan & Deci, 2000); it is a psychological attribute of stewardship theory because steward managers motivated by intangible, higher order rewards (Davis, et al., 1997; Lee & O'Neill, 2003). Individuals who have high levels of identification with their organization are more likely to choose stewardship because they feel a strong sense of membership with their organization (Lee & O'Neill, 2003; Vallejo, 2009; Zahra, et al., 2008).

Stewardship theory applies a personal power perspective, describing power based on interpersonal relationships that develop over time (Davis, et al., 1997) which in turn influence and empower steward managers. These psychological factors facilitate the choice of stewardship, which ultimately have a positive impact on firm performance. Situational factors depict the organizational structure and include the management philosophy and culture (Craig & Dibrell, 2006; Davis, et al., 1997; Donaldson & Davis, 1991; Zahra, et al., 2008). Theory suggests that involvement-oriented, collectivist, low power distance cultures help influence the choice of stewardship behaviour (Davis, et al., 1997). An environment portrays an involvement-oriented management philosophy where employees are trusted with challenges, opportunities, and responsibility (Davis, et al., 1997; Eddleston, et al., 2012; Vallejo, 2009). In organizations typified by collectivism, individuals put the goals of the collective ahead of individual personal goals; the emphasis

is on belonging, identifying, and displaying loyalty due to the tight-knit social framework present in the organization (Davis, et al., 1997; Nicholson, 2008). Low power distance describes an environment where equality perceived between different levels of the organizational hierarchy (Davis, et al., 1997). An organizational structure that accommodates and influences the choice of stewardship behaviour helps facilitate efficient operations of the firm.

Empirical Review

Akinleye and Kolawole (2020) studied on the effect of internal controls and performance of selected tertiary institutions in Ekiti State, Nigeria: A committee of sponsoring organisations (COSO) framework approach. The study employed a survey research design. Primary data obtained and analyzed using multiple regression analysis. Findings from the study showed that the overall influence of COSO components of internal control on performance of selected tertiary institutions in Ekiti state was significantly positive. The scope of the study is on tertiary institutions not road construction industry.

Muraleetharan (2019) studied on the impact of internal control on efficiency of the organizations in Jaffna District in Sri Lanka. Primary data was collected through the questionnaire developed by the researcher after the review of literature and secondary data were collected from the books, journals etc. The study based on twenty-five organizations and two hundred and forty-four respondents in Jaffna District, which are private and public organizations in the district. Internal control and efficiency measured by correlation analysis and regression analysis. The study found that internal control and efficiency are statistically significant in determining efficiency of the organizations. The study used varied variables from what the researcher opts to use thus giving conceptual research gap.

Umar and Dikko (2018) researched on the effect of internal control on performance of commercial banks in Nigeria. A survey method employed, and the study used stratified random sampling, in which 382 questionnaires administered to either staff of operations, marketing, or security department in the Nigerian commercial banks. The questionnaire is a 5-point Likert-scale while the data collected analyzed using Statistical Package for the Social Sciences (SPSS) version 23 and Smart PLS 3. The findings of the study revealed that there is a positive and significant relationship between the four components of internal control (control environment, control activities, monitoring and risk assessment) and bank performance. The findings of the study are only applicable to commercial banks thus lacks universality.

Tuan (2020) conducted a study on the effect of internal control on the performance of Vietnamese construction enterprises. The study used 256 questionnaires sent to managers in construction businesses. After collecting 106 questionnaires, SPSS 20 used to process and analyze data. The research results show a positive relationship between elements of internal control and performance. The results of the study show that Vietnamese construction enterprises need to apply aspects of internal control to improve their performance. The scope of the study is on construction enterprises and not road construction industry thus lacks universality.

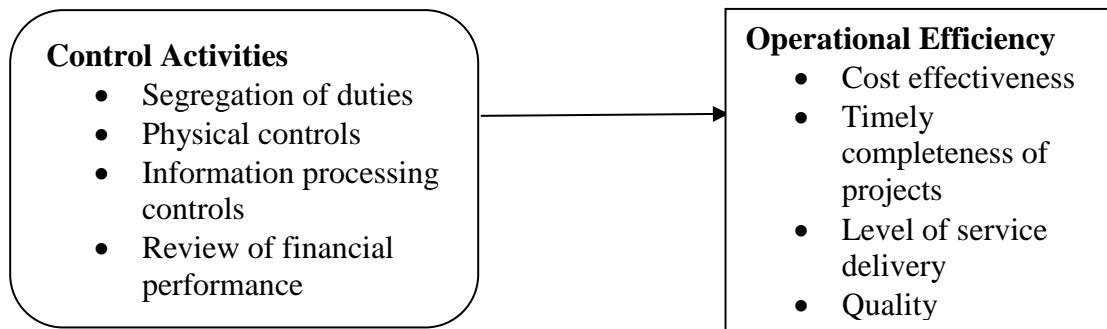
Abiodun (2020) researched on the internal control procedures and firm's performance in Nigeria's South-West region. The study framework developed based on an in-depth review of the literature and in accordance with stakeholder theory. The analysis followed a qualitative approach to descriptive research design. Multiple regression models used to check whether there is any impact on financial performance from internal audit control, control practices, risk assessment control, control environment and monitoring activities. The survey results indicated the positive relationship between internal audit control, risk assessment and monitoring practices and organizational success. Control practices and control environment, however, have a significant negative impact on firm performance. The study findings based on firms generally but not specifically road construction companies.

Conceptual Framework

Conceptual framework is an analytical tool that summarizes several variables and depicts them in a way that is simple to study and apply. The conceptual framework is a set of broad ideas used to explain the relationship between the independent variables - factors and the dependent variables - outcome (Din & El Haron, 2023). The goal of the conceptual framework is to categorize and describe concepts relevant to the study and map relationships among them (Mageto, et al. 2021). In this study, the independent variable is the internal controls, cash management moderator and the dependent variable is the operational efficiency as presented in Figure 1

Independent Variable

Dependent Variable



Research Gaps

Based on the previous researchers, there have been both positive and negative relationships between the control activities and the operational efficiency of firms. The studies have also shown the elements that attract firms to adopt control activities and the benefits that they obtain from adopting control activities. Some studies have also shown challenges accruing to those firms applying the control activities. Nonetheless, these researchers have not distinctly shown the link between control activities and the operational efficiency of companies in road construction industry. It is from these literature reviews that the researcher noted both the conceptual and contextual research gaps.

A study conducted by Umar and Dikko (2018) researched on the effect of internal control on performance of commercial banks in Nigeria. The study however focused on commercial banks in Nigeria. This study depicted a contextual research gap because it was conducted on other industries other than specifically the road construction industry. Muraleetharan (2019) studied on the impact of internal control on efficiency of the organizations in Jaffna District in Sri Lanka. The study used varied variables from what the researcher opts to use thus giving conceptual research gap. Thus, the study will conduct research on the effect of control activities on operational efficiency of companies in road construction industry in Kenya to fill these pertinent research gaps.

Research Methodology

Research Design

A research design outlines how the research was conducted. Research design is a plan and structure of investigation so conceived as to obtain answers to the research questions (Kuria & Kimutai, 2018). Descriptive research design was used in this study. This design will grant the researcher with fairly a lot of information from a huge sample of individuals. The design accurately describes an association between variables minimizing bias and maximizing the reliability of the data (Gitonga et al., 2022). This design intended to provide solutions to the hypotheses. According to Rasheed et al. (2018) descriptive research design utilizes both quantitative and qualitative data, which enables the researcher to have an in-depth examination of the key indicators under investigation. Descriptive research design is appropriate since it describes the elements of the study variables.

Population of the Study

A population refers to all individuals, units or elements that meet the selection criteria for a group to be studied, and from which a representative sample is taken for detailed examination. According to Menza et al. (2019) target population is a universal set of research of all members of actual or imaginary set of people, events or objects to which an investigator wishes to generalize the result. The target population of this study was 16,684 road construction contractors in Kenya and licensed by the National Construction Authority as of 1st July 2025.

Sampling Technique and Sample Size

This is a way of gathering information whereby information was collected from a study population representation. The study used a formula to determine the sample size for the study. Using formulas can be helpful in checking how particular size of a sample will affect estimations in case when sample size is initially determined from any reasons. The study adopted Yamane (1967:886) formula to determine the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

$$n_0 = \frac{N}{1+Ne^2}$$

Where:

n_0 is the sample size,

N is the population size

e is the desired level of precision,

95% confidence level and $p = 0.05$ are assumed

Therefore, the sample size for the study was:

$$n = \frac{N}{1 + N(e)^2}$$

$$n_0 = \frac{16,684}{1+16,684(0.05)^2}$$

$n_0 = 391$

The sample size for the study, therefore, was 391 road works companies.

Data Collection Instrument

The study will collect primary data for the purpose of determining the effect of internal controls on operational efficiency in the road construction industry in Kenya. Primary data was collected through structured questionnaire. Questionnaire contained close-ended questions able to capture more information from the respondents. This method was adopted because questionnaires provide an efficient and convenient way of gathering the data within the resources and time constraints (Pham & Nguyen, 2021). The structure of the questionnaire provides the flexibility for specific and unique responses to some of the questions (Umar & Dikko, 2018).

Pre-testing of Research Instruments

A pilot study was done before commencing on the actual study. The aim of the pilot study was to test the reliability and validity of the research instrument (Vu, 2021). Mugenda and Mugenda (2003) suggest that the piloting sample ought to represent 10% of the population size based on the study sample size. The accuracy and validity of the data instrument of the study was thus tested by administering it to 40 selected respondents randomly selected from NCA1 road works contractors, NCA2 road works contractors, NCA3 road works contractors, NCA4 road works contractors, NCA5 road works contractors, NCA6 road works contractors, NCA7 road works contractors and NCA8 road works contractors from Kenya. The instrument of the study was modified according to the pilot test responses. Piloting helps in revealing questions that could be vague which facilitates their examination until they communicate the same sense to all the subjects (Umar & Dikko, 2018).

Data Processing and Analysis

After collecting all the relevant data, the questionnaires were edited, coded and classified for completeness and accuracy. Qualitative data collected was analysed using descriptive and inferential statistics after coding them to make it meaningful for analysis. Descriptive statistics included mean, frequency, standard deviation, variance and percentages. Inferential statistics included regression analysis and Pearson product moment correlation coefficient. Regression analysis is a research method used when the study involves modeling and analyzing several variables, where the relationship includes a dependent variable and one or more independent variables to provide meaningful and accurate conclusions of the phenomenon under study (Oluwaleye et al., 2023). Information was displayed by use of bar charts, graphs, pie charts and tables to search for any correlation between the variables. The study adopted the linear regression model as shown in Equation 1

$\hat{Y} = \beta_0 + \beta_1 X_1 + \epsilon$ Equation 1

Where \hat{Y} represents the operational efficiency, β_0 is a constant, that is the y-intercept for the regression model, β_1 is the beta coefficient of control activities, X_1 represents control activities and ϵ is an error term.

Research Findings and Discussions

Descriptive Findings of Control Activities

The study sought to find out the effect of control activities on operational efficiency of companies in road construction industry in Kenya through the respondent’s views. The research findings showing the resultant means and standard deviations of the variable statements are presented in Table 1

Table 1 Descriptive Statistics for Control Activities

S/No	Control activities statements	N	Min	Max	Mean	Std Dev
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i.	The company segregates duties appropriately	288	2.00	5.00	3.6007	1.22272
ii.	The company has a strong physical control in place	288	1.00	5.00	3.5868	1.20370
iii.	The company adopts proper information processing controls	288	1.00	5.00	3.6389	1.15437
iv.	The company reviews financial performance systematically	288	1.00	5.00	3.7604	1.23603

From the findings, the respondents agreed that the company segregates duties appropriately (mean=3.6007; std dev=1.22272) and that, the company has a strong physical control in place (mean=3.5868; std dev=1.20370). Further, the respondents agreed that the company always adopts proper information processing controls (mean=3.6389; std dev=1.15437) and that, the company reviews financial performance systematically (mean=3.7604; std dev=1.23603). These findings concur with the study carried out by Akinleye and Kolawole (2020) which recommended that the overall influence of COSO components of internal control on performance of selected tertiary institutions in Ekiti state was significantly positive. This is also in corroboration with Muraleetharan (2019) which noted that internal control and efficiency are statistically significant in determining efficiency of the organizations. The finding results imply that the respondents agree that the control activities variable has a positive statistical significance in operational efficiency of road construction industry in Kenya

Inferential Analysis

The study carried a correlation analysis between control activities and operational efficiency of companies in road construction industry in Kenya. Result findings are shown in Table 2:

Table 2 Control Activities Correlation Analysis

		Operational Efficiency
Control Activities	Pearson Correlation	.360**
	Sig. (2-tailed)	.000
	N	288

** . Correlation is significant at the 0.01 level (2-tailed).

Control activities indicate a statistically positive significant relationship with operational efficiency of companies in road construction industry in Kenya (r=.360; p<.010). This implies that implementation of control activities in the companies in road construction industry in Kenya would yield a growth on its operational efficiency.

Linear Regression Analysis

From the analysis, it was noted that there exists a strong positive relationship between the study variable. This is shown by the correlation coefficient (R=.360). Also, R²=.129 meaning 12.9% variation in the operational efficiency of companies in road construction industry in Kenya is explained by the predictor variable in the model. However, 87.1% variation in the operational efficiency of companies in road construction industry in Kenya is due to other predictor variables not in the regression model. The summary for the linear regression model is shown in Table 3:

Table 3 Summary Model for the Linear Regression

R	R Square	Adjusted R Square	Std. Error of the Estimate
.360 ^a	.129	.126	.60309

a. Predictors: (Constant), Control Activities

F-Test of the Linear Regression Model

From the analysis, the linear regression model is statistically significant (F=42.463; p=.000) thus making the model good fit for the data. The significance value (p-value) is .000 which is less than .050 thus making the model statistically significant in predicting how the independent variable affects the dependent variable of the study. The ANOVA results are shown in Table 4:

Table 4 ANOVA^a Analysis Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.445	1	15.445	42.463	.000 ^b
Residual	104.024	286	.364		
Total	119.469	287			

a. Dependent Variable: Operational Efficiency

b. Predictors: (Constant), Control Activities

T-Test of the Linear Regression Model

From the findings, the test results show a positive significance of the predictor variable. Control activities is a significant predictor on operational efficiency of road construction industry in Kenya (t=6.516; sig.=.000). Hence, the research hypothesis that control activities does not significantly affect the operational efficiency of road construction industry in Kenya was rejected at significance level of 5%. The results of analysis are shown in Table 5

Table 5 Linear Regression Model Significant Test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	3.151	.152		20.728	.000
Control Activities	.264	.041	.360	6.516	.000

a. Dependent Variable: Operational Efficiency

Based on the findings of the t-test results, the independent variable was proved to be significant at significance level of 5%. Its p-value was less than .050 significance level. Therefore, the study variable result in the regression equation as shown in Equation 2

$$\hat{Y} = 3.151 + .264X_1 \dots\dots\dots \text{Equation 2}$$

Equation 4.1 depicts that if the companies in road construction industry in Kenya does not implement the control activities, operational efficiency would be constant at 3.151 unit. A unit increase in control activities will lead to .264 increase in operational efficiency of companies in road construction industry in Kenya.

Summary

Control activities and Operational Efficiency of Companies in Road Construction Industry in Kenya

The study revealed that the respondents agreed that the company segregates duties appropriately and that the company has a strong physical control in place. Further, the respondents agreed that the company always adopts proper information processing controls and that the company reviews financial performance systematically. Control activities indicated a statistically positive significant relationship with operational efficiency of companies in road construction industry in Kenya. It was noted that the findings on the effect of control activities on operational efficiency of companies in road construction industry in Kenya tied with the assertion of the stewardship theory that, efficiency of firm operations such as timeliness is the desired outcome of a stewardship perspective through control activities.

Operational Efficiency of Companies in Road Construction Industry in Kenya

It was noted that the respondents agreed that control activities have contributed to the cost effectiveness of the company, and that control activities have contributed to the prompt completeness of the projects of the company. Further, the respondents agreed that control activities have contributed to the high level of service delivery of the company, and that control activities have contributed to meeting quality demands of clients in the company.

Conclusions

The study concluded that control activities had a statistically positive significant relationship with operational efficiency of companies in road construction industry in Kenya. Hence, the road construction industry is advised to embrace control activities to enhance operational efficiency.

Recommendations

The study revealed that control activities is significantly relevant and therefore the study recommends that the management of the road construction industry should employ qualified expertise that are capable of handling well the management accounting concepts which leads to the company's day to day decisions pertaining policies and procedures. The study recommends that the government should come up with measures that will curb the high political interferences when it comes to the selection of the best contractor in awarding tenders. Based on the stewardship theory which explains the essence of timelines in efficiency of firm operations through control activities, the study recommends the application of this theory in that, by segregating duties, physical controls, information processing controls and proper review of financial performance, operational efficiency will improve significantly.

Suggestions for Further Studies

Since the study concentrated only on the effect of control activities on operational efficiency of companies in road construction industry in Kenya, the researcher suggests that similar research be done on other outcome measures like the financial performance, organizational performance and the like. This will give new findings on the effect of control activities from a different perspective. Also, the study suggests that other industries other than companies in road construction industry should be studied to fill the contextual research gaps that may exist. For example, finding the effect of control activities on operational efficiency of textile industry in Kenya. This will aid comparison of the research findings from different industries thus giving more reliable information based on the research findings.

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