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STRATEGIC RISK MANAGEMENT AND PERFORMANCE OF CEMENT MANUFACTURING FIRMS IN KENYA

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ABSTRACT

Cement manufacturing firms play a crucial role in Kenya's economic development by supporting key sectors such as construction, infrastructure, and real estate. However, cement manufacturing firms in Kenya face significant challenges in various areas that impact their performance. The general objective of the study was to determine the influence of strategic risk management on performance of cement manufacturing firms in Kenya. Specifically, the study sought to examine the influence of risk assessment on performance of cement manufacturing firms in Kenya and to assess the influence of risk response on performance of cement manufacturing firms in Kenya. This study was guided by: The Theory of Planned Behaviour (TPB) and The Contingency Theory. The cross-sectional research design was selected for this study. The target population comprised of 126 management employees working in seven cement manufacturing firms namely Bamburi Cement Limited, East Africa Portland Cement Company, ARM Africa Limited, Mombasa Cement, Savannah Cement, National Cement and Lafarge cement. In this study, the unit of analysis was cement manufacturing firms while the unit of observation was the 126 management employees working in seven cement manufacturing firms. The study employed a census approach to collect data from the all the 126 respondents hence no sampling technique was used. Primary data was used in this study. The study used questionnaire to collect the primary data. Data analysis was done through use of descriptive and inferential statistics. Descriptive statistics such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used. Inferential data analysis was conducted by use of Pearson correlation coefficient, and multiple regression analysis. The study results were presented through use of tables and figures. The study concludes that risk assessment has a positive and significant effect on performance of cement manufacturing firms in Kenya. The study also concludes that risk response has a positive and significant effect on performance of cement manufacturing firms in Kenya. Based on the findings, the study recommends that the management of cement manufacturing firms should develop and implement well-structured risk response strategies to enhance operational performance and long-term sustainability. Effective risk response—through avoidance, mitigation, transfer, or acceptance—ensures that once risks are identified and assessed, appropriate actions are taken to minimize negative impacts or leverage potential opportunities.

Key Words: Strategic Risk Management, Risk Assessment, Risk Response, Performance of Cement Manufacturing Firms

Background of the Study

Manufacturing firms are businesses or companies that engage in the process of transforming raw materials, components, or parts into finished goods or products through the use of labor, machinery, tools, and equipment. These firms typically operate in industries such as automotive, electronics, textiles, chemicals, food production, and more (Jaber &Adaileh, 2020). Cement manufacturing firms are businesses that produce cement, a key material used in construction for making concrete, mortar, and other building products. Cement manufacturing firms play a crucial role in the construction and infrastructure sectors, acting as key drivers of economic development (Ahmad, Hadyait & Rashid, 2019). As the primary producers of cement, these companies supply a fundamental material used in the building of residential, commercial, and industrial structures, as well as in infrastructure projects like roads, bridges, and dams. Cement is often considered the backbone of the construction industry, and its availability directly influences the pace of urbanization and industrial growth in a given region or country (MdSaad, 2024).

Cement manufacturing firms are integral to technological advancement in construction materials. Over the years, cement firms have innovated by developing more sustainable production processes, reducing energy consumption, and lowering CO2 emissions. For instance, some companies have adopted alternative materials such as fly ash and slag to replace a portion of the clinker used in cement, which can significantly reduce the environmental impact of cement production (Sinha, 2024). This reflects the industry's growing commitment to meeting sustainability goals and responding to global concerns about climate change. Additionally, cement manufacturing firms contribute to local and national economies by creating jobs, supporting local suppliers, and stimulating trade. The production process itself requires a significant workforce, ranging from quarrying raw materials to managing complex kilns and logistical networks (Kortana, 2019). Furthermore, these companies often engage in community development through corporate social responsibility (CSR) programs, investing in infrastructure, education, and healthcare in the areas where they operate. On the global stage, cement manufacturing firms are crucial players in the supply chain of the construction industry. As countries industrialize and expand their infrastructure, the demand for cement continues to grow. In emerging economies, the expansion of urban areas, alongside increasing housing and commercial building projects, has led to a surge in cement production. On the other hand, in developed nations, cement companies are focusing more on improving efficiency and sustainability, while also ensuring compliance with strict environmental regulations (Derenyielo & Emem, 2020).

Strategic risk management refers to the process of identifying, assessing, and mitigating risks that could impact an organization's long-term objectives, goals, and overall strategy. It involves a proactive approach to understanding the uncertainties and potential threats that may affect the business environment in which an organization operates (Amour & Njenga, 2024). This type of risk management is focused on high-level, strategic decisions that can influence the organization's direction, sustainability, and competitive positioning. Strategic risk assessment involves evaluating the likelihood and potential impact of each risk on the organization's strategy. This step helps prioritize risks based on their severity and probability allowing the organization to focus on those that poses the greatest threat to its strategic goals (Gwangwava, *et al*, 2022). Strategic risk response is the phase where the organization develops and implements strategies to mitigate, transfer, accept, or avoid identified risks. This includes adjusting business plans, creating contingency strategies, and building resilience to navigate potential disruptions effectively

(Kinyua, Ogollah & Mburu, 2022). This study sought to determine the influence of strategic risk management on performance of cement manufacturing firms in Kenya.

The performance of cement manufacturing firms in Kenya has been influenced by several factors, including economic conditions, market demand, competition, and technological advancements. The cement industry is a significant contributor to Kenya's economy, providing employment and supporting infrastructure development, which is vital for the nation's growth (Ondiek & Muathe, 2023). In recent years, however, cement manufacturing firms in Kenya have faced various challenges while also benefiting from certain opportunities that have impacted their overall performance. The growth of the construction industry in Kenya has driven strong demand for cement. The ongoing urbanization and expansion of infrastructure projects, such as roads, bridges, and residential housing, have been key drivers of cement consumption (Cherotich, Karanja & Kariuki, 2022). The government's focus on the "Big Four Agenda," which includes affordable housing and infrastructure development, has further boosted cement demand. However, there has been an oversupply of cement in the market in recent years, leading to price wars and thin profit margins among manufacturers. Companies such as Bamburi Cement, East African Portland Cement, and Athi River Mining Cement (now part of National Cement) have had to navigate this competitive market by focusing on cost efficiency and improving production capabilities (Mureithi, 2024).

The performance of cement firms in Kenya is also impacted by the cost of raw materials, energy, and logistics. Raw materials like limestone and gypsum are essential for cement production, and fluctuations in the cost of these inputs can affect profitability. Additionally, energy costs are a significant concern, as cement production is energy-intensive, requiring large amounts of electricity and fuel (Macharia & Namusonge, 2023). Firms are increasingly investing in alternative energy sources, such as waste-to-energy projects, to mitigate the impact of rising energy prices. Transportation and logistics costs also play a crucial role in cement pricing, particularly for firms that have to distribute their products across Kenya's vast and often challenging terrain. Another significant factor affecting the performance of cement manufacturers is government policies and regulations (Ondiek & Muathe, 2023). While the Kenyan government has implemented measures to support the industry, such as imposing taxes on imported cement to protect local manufacturers, challenges such as the implementation of environmental regulations and the need for continuous investment in sustainable practices have posed operational hurdles for some companies (Cherotich, Karanja & Kariuki, 2022). Manufacturers are increasingly focusing on reducing their carbon footprints, investing in eco-friendly technologies, and ensuring compliance with environmental standards to maintain their competitiveness in both the local and global markets. Foreign investment has played a role in the Kenyan cement industry's performance. International companies like LafargeHolcim have established a strong presence, and new entrants have raised the stakes for local firms. This has led to increased competition, forcing domestic manufacturers to adopt modern technologies, improve product quality, and streamline operations in order to stay competitive. At the same time, international firms have brought capital, new technologies, and expertise that have raised the overall standards of the industry (Mureithi, 2024).

Statement of the Problem

Cement manufacturing firms play a crucial role in Kenya's economic development by supporting key sectors such as construction, infrastructure, and real estate. The cement industry is integral to the country's growth, as it provides the essential raw material for the construction of roads, buildings, and other infrastructure projects. Given Kenya's ongoing urbanization and the

government's focus on infrastructural expansion, including the "Big Four Agenda," the demand for cement is expected to remain strong (Macharia & Namusonge, 2023). Additionally, cement firms are significant contributors to employment, providing thousands of jobs both directly and indirectly through the supply chain. The industry's performance is, therefore, not only vital for national development but also for the overall stability and growth of Kenya's economy (Ondiek & Muathe, 2023).

The Cement Manufacturers Association of Kenya (CMAK) reported that energy costs alone make up to 30% of total production costs for cement manufacturers (Cherotich, Karanja & Kariuki, 2022). For example, Bamburi Cement, one of Kenya's largest producers, recorded a 12% drop in profits for the first half of 2023, citing high fuel costs and reduced demand due to an economic slowdown. The country's inflationary pressures, including rising transportation and raw material costs, have further strained profitability, contributing to a decline in overall industry profits. In 2023, the sector's profitability fell by 8.5% as reported by the Kenya National Bureau of Statistics (KNBS) (Mureithi, 2024). In 2022, cement imports into Kenya surged by 50%, leading to price competition and market fragmentation (Macharia & Namusonge, 2023). According to the CMAK, the market share of local cement producers dropped by approximately 5% in 2022, as cheaper imported cement became more widely available. As of 2023, the leading cement manufacturers, including Bamburi Cement and East African Portland Cement, faced challenges in maintaining their dominant positions, with Bamburi holding a 30% share of the market, down from 35% in 2019. Customer Satisfaction remains a critical concern for cement manufacturers, with issues related to inconsistent product quality, delayed deliveries, and high costs (Ondiek & Muathe, 2023). According to a 2023 survey by the Kenya Association of Manufacturers (KAM), 42% of cement consumers cited product quality issues, such as varying strength and durability of cement, as their primary concern. Inconsistent delivery times were also flagged, with 38% of consumers reporting delays in receiving their orders.

Strategic risk management plays a pivotal role in enhancing the performance of cement manufacturing firms by helping them anticipate, identify, and mitigate potential risks that could threaten their operations and profitability (Cherotich, Karanja & Kariuki, 2022). Various studies have been conducted in different parts of the world on strategic risk management and organization performance. Kinyua, Ogollah and Mburu (2022) researched on the effect of risk management strategies on project performance of small and medium information communication technology enterprises. Ondiek and Muathe (2023) conducted a study on risk management strategies and performance of small scale agribusiness firms and Cherotich, Karanja and Kariuki (2022) examined on the influence of strategic risk management on the performance of government owned entities. However, none of these studies focused on strategic risk assessment and strategic risk response on performance of cement manufacturing firms in Kenya. To fill the highlighted gaps, the current study sought to determine the influence of strategic risk management (strategic risk assessment and strategic risk response) on performance of cement manufacturing firms in Kenya.

Objectives of the Study

General Objective

The general objective of the study was to determine the influence of strategic risk management on performance of cement manufacturing firms in Kenya

Specific Objective

i. To examine the influence of risk assessment on performance of cement manufacturing firms in Kenya
ii. To assess the influence of risk response on performance of cement manufacturing firms in Kenya

Theoretical Framework

The Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) is a psychological framework that aims to explain how individuals make decisions and engage in specific behaviors. Developed by Ajzen, (1991), TPB expands upon the earlier Theory of Reasoned Action by incorporating the concept of perceived behavioral control. This addition recognizes that not all behaviors are under volitional control, allowing for a more comprehensive understanding of how intentions lead to actions (Olumide, 2023). At the core of TPB are three key components: attitude, subjective norm, and perceived behavioral control. Attitude refers to the individual's positive or negative evaluation of performing a particular behavior. This evaluation is shaped by beliefs about the outcomes of the behavior and the value placed on those outcomes. For example, if someone believes that exercising will improve their health and values good health, their attitude toward exercising will likely be positive (Ntahondereye, Opuodho & Muigai, 2024).

Subjective norm involves the perceived social pressure to engage or not engage in a behavior. This component considers how individuals feel others view the behavior and how much they care about others' opinions (Kitigin, 2020). Perceived behavioral control refers to the individual's belief in their ability to perform the behavior. This concept acknowledges that external factors, such as resources and opportunities, can influence whether a person feels capable of acting. For instance, someone may want to exercise but feel constrained by time or lack of access to facilities, affecting their overall intention and likelihood to act (Maitaria & Makhamara, 2024). This theory was used to examine the influence of risk assessment on performance of cement manufacturing firms in Kenya.

The Contingency Theory

Contingency Theory, developed by Fred E. Fiedler in the 1960s often associated with leadership and organizational management, proposes that there is no one-size-fits-all approach to leadership or management practices. Instead, the effectiveness of leadership styles, organizational structures, and management strategies depends on the specific context in which they are applied. This theory suggests that different situations require different kinds of leadership and management approaches for optimal performance (Ahmed & Sasaka, 2019). At its core, Contingency Theory asserts that various factors in the external environment and within the organization itself interact to determine the most effective leadership style or management practice. These factors can include the organization's size, its industry or sector, the complexity of its tasks, its culture, the skills and personalities of its employees, and the external environment such as market conditions or regulatory requirements (Rutabubura & Mulyungi, 2020).

One of the key principles of Contingency Theory is the idea of fit or match between the leader's or manager's style and the situational demands. For example, in a highly uncertain and rapidly changing environment, a more flexible and adaptive leadership style may be more effective than a

rigid, authoritarian approach (Njoga & Deya, 2024). Similarly, in organizations with complex tasks that require specialized knowledge and expertise, leaders who can facilitate collaboration and empower their teams may be more successful than those who rely solely on hierarchical authority. Contingency Theory also emphasizes the importance of understanding the unique characteristics of each situation and tailoring leadership and management practices accordingly (Lambaino, *et al*, 2020). This flexibility allows leaders and managers to adjust their strategies based on the specific challenges and opportunities they face, thereby enhancing organizational effectiveness and performance. Critically, Contingency Theory challenges the notion of a universally "best" or "ideal" leadership style. Instead, it encourages leaders and managers to be adaptive and responsive, continuously evaluating and adjusting their approach to align with the evolving needs of the organization and its environment. By considering the contingency factors and adapting their practices accordingly, leaders can optimize their effectiveness and contribute to the overall success of their organizations (Maina & Kimencu, 2024). This theory was used to assess the influence of risk response on performance of cement manufacturing firms in Kenya.

Conceptual Framework

A conceptual framework is a structured system of concepts and ideas that guide research, decision-making, or problem-solving within a particular field (Cooper, & Schindler, 2019). It provides a foundation for understanding and analyzing a specific phenomenon or issue. In this study, the conceptual framework presents the relationship between the independent variables and the dependent variable (Creswell, 2019). The independent variables are risk assessment and risk response while the dependent variable is performance of cement manufacturing firms in Kenya

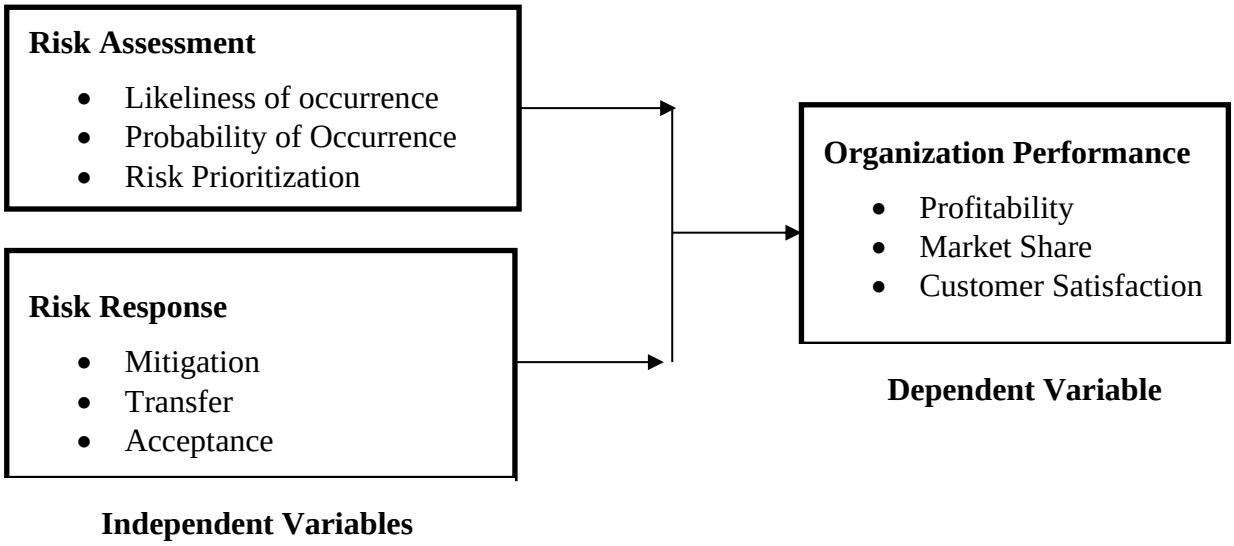

Figure 2. 1: Conceptual Framework

Risk Assessment

Strategic Risk Assessment is the process of identifying, analyzing, and evaluating the potential risks that could impact an organization's ability to achieve its long-term strategic goals. This process helps organizations anticipate uncertainties and challenges in the external and internal environments that may hinder their strategic objectives, allowing for informed decision-making and proactive risk management (Nyarangi & Ngali, 2021). Strategic risk assessment typically

involves identifying both external risks and internal risks. Hazards refer to conditions or events that have the potential to cause harm, damage, or adverse effects to people, assets, operations, or the environment. In the context of strategic risk management, hazards are typically considered as the sources or triggers of risk. The probability of occurrence refers to the likelihood or chance that a particular risk or hazard will materialize and cause its anticipated impact. In risk management, it is essential to assess the probability of a risk event occurring to understand its potential seriousness and to prioritize resources effectively. Risks can be categorized into different levels of likelihood, often using a scale such as high, medium, or low probability (Kitigin, 2020).

Risk prioritization is the process of ranking risks according to their severity, likelihood, and potential impact, allowing organizations to focus on the most critical risks that could have the greatest consequences on their strategic objectives. Not all risks are equal in terms of their potential to disrupt or damage the organization, so risk prioritization is essential to ensure that resources are allocated to address the most significant threats (Nyarangi & Ngali, 2021). Typically, risks are evaluated based on two main criteria: the probability of occurrence and the impact or consequences. For example, a risk with a high probability of occurrence but low impact might be considered less urgent than a low-probability risk with severe potential consequences.

Risk Response

Strategic Risk Response refers to the actions and strategies an organization takes to address the risks identified during the strategic risk management process. It involves developing and implementing plans to manage, mitigate, or take advantage of risks that could impact the organization's long-term objectives (Rutabubura & Mulyungi, 2020). The goal of strategic risk response is to reduce the likelihood of negative outcomes and minimize their potential impact while ensuring that the organization remains on track to achieve its strategic goals. Mitigation refers to the process of taking proactive actions to reduce the likelihood or impact of a risk. The goal of mitigation is to make the risk more manageable by addressing the root cause of the risk or by implementing controls that minimize its effect on the organization (Njoga & Deya, 2024). Transfer involves shifting the responsibility or burden of a risk to another party, typically through external means such as insurance, outsourcing, or contractual agreements. In this approach, the organization acknowledges the risk but decides that another party is better suited to manage or absorb it (Ahmed & Sasaka, 2019). The most common form of risk transfer is purchasing insurance, where the organization transfers the financial burden of certain risks, such as property damage, employee health costs, or liability, to an insurance company.. Risk transfer is often used when the organization recognizes that it may not have the resources, expertise, or capacity to manage the risk effectively on its own.

Acceptance is a risk response strategy where an organization acknowledges the existence of a risk but decides not to take any action to mitigate, transfer, or avoid it. This strategy is typically used when the risk's potential impact is low, or when the cost of managing the risk outweighs the possible benefits (Njoga & Deya, 2024). In other words, the organization accepts the risk as a part of its operations, knowing that the probability or impact is small enough that it is unlikely to cause significant harm to its objectives. For instance, a company may decide not to invest in extensive cybersecurity measures for a small, low-value project if the potential damage from a breach is minimal (Lambaino, *et al,* 2020). Similarly, a company might accept a minor operational risk in exchange for the flexibility or cost savings associated with a less controlled environment. Acceptance of risk often requires regular monitoring to ensure that the risk does not escalate

unexpectedly. While this strategy may seem passive, it can be a valid approach when the risks are deemed tolerable and manageable without substantial intervention (Maina & Kimencu, 2024).

Empirical Review

Risk Assessment and Organization Performance

Olumide (2023) conducted a study on the role of risk assessment and mitigation in strategic planning in Nigeria. The study adopted a desktop methodology. The study found that risk assessment and mitigation in Nigerian strategic planning reveals a recognition action gap in organizations. The study concluded that risk assessment and mitigation play pivotal roles in ensuring the success and sustainability of various initiatives. Nigeria.

Ntahondereye, Opuodho and Muigai (2024) assessed on the effect of risk assessment as an element of internal control system on the quality of financial reporting information in local governments of Rwanda. The study adopted a descriptive research design with a mixed qualitative and quantitative approach. The population of this study was made up of 30 Districts, including the local governments in Rwanda. The study found that there is a positive association between risk assessment and the quality of financial reporting information in local governments in Rwanda. The study concluded that there is a significant effect of risk assessment on the quality of financial reporting information in local governments in Rwanda.

Maitaria and Makhamara (2024) examined on risk assessment and performance of Kenyatta International Convention Centre, Nairobi, Kenya. This study adopted descriptive research design. The target group included 336 staff members from different departments. The study included 101 participants chosen through a stratified random sampling method. The study found that a positive significant correlation linking risk assessment and organizational performance. The study concluded that a strong and statistically significant connection between risk assessment and organizational performance.

Nyarangi and Ngali (2021) researched on risk assessment and financial performance of insurance companies listed in Nairobi Securities Exchange, Kenya. The study applied a descriptive research design. The target population of the study comprised of the six insurance companies listed in the NSE. The study found that there is a moderate level of implementation of risk assessment among the insurance companies listed in the NSE. The study concluded that the listed insurance companies have adopted risk assessment which influences their financial performance significantly.

Risk Response and Organization Performance

Ahmed and Sasaka (2019) conducted a study on the effect of risk response on the performance of non-governmental organizations: case of Shabelle Relief & Development Organization (SHARDO) Mogadishu Somalia. The study used descriptive research design. The study targeted a population of 128 employees of Shabelle Relief & Development Organization in Mogadishu Somalia. The study sample size was 91 employees of Shabelle Relief & Development Organization in Mogadishu Somalia. The study found that risk response had a positive and significant effect on organization performance at SHARDO. The study concluded that risk response affects organization performance.

Rutabubura and Mulyungi (2020) researched on the influence of the risk transfer on project success in access to finance Rwanda. Conclusive research design was used for this study. The sample size

is of 169 from a population of 291 using Slovin's formula. The study found that risk transfer had positive impact on project success at access to finance Rwanda, the success of projects depend on risk mitigation. The study concluded that insuring project staff has a positive and high effect on performance of Access to Finance Rwanda.

Njoga and Deya (2024) investigated on the influence of risk response strategies on performance of insurance companies in Nairobi County, Kenya. The study adopted descriptive research design and the sample size of 241 was determined using Taro Yamane's formula. The study found that risk response strategies had a positive and significant influence on performance of insurance companies in Nairobi Kenya. The study concluded that risk transfer is statistically significant in affecting organizational performance of insurance businesses within Nairobi County.

Lambaino, *et al* (2020) conducted a study on risk transfer strategies and supply chain resilience in the petroleum industry in Kenya. The study followed descriptive research design. The data was obtained through self-designed questionnaires from 87 registered oil marketing firms. The study found a positive but a weak relationship between risk transfer and supply chain resilience. The study concluded that risk transfer strategies have a positive influence on supply chain resilience.

RESEARCH METHODOLOGY

Research Design

The cross-sectional research design was selected for this study because of its ability to prove and/or disprove assumptions, cost less to perform and does not require a lot of time, capture a specific point in time, contain multiple variables at the time of the data snapshot and the data obtained through the research design can be used for various types of research (Bland, 2019; Orodho, 2018; Creswell, 2019).

Target Population

The target population comprised of 126 management employees working in seven cement manufacturing firms namely Bamburi Cement Limited, East Africa Portland Cement Company, ARM Africa Limited, Mombasa Cement, Savannah Cement, National Cement and Lafarge cement. In this study, the unit of analysis was cement manufacturing firms while the unit of observation was the 126 management employees working in seven cement manufacturing firms

Table 1: Target Population

No	Cement Manufacturing Firm	No. of Respondents
1	Bamburi Cement Limited	27
2	East Africa Portland Cement Company	26
3	ARM Africa Limited	20
4	Mombasa Cement	15
5	Savannah Cement	13
6	National Cement	15
7	Lafarge cement	10
	Total	**126**

Source: Kenya Association of Manufacturers (KAM) Directory. June, 2023

Sampling Frame

The unit of observation of the research consisted of management employees who are signed and responsible for formulating strategies and ensuring strategic risk management and the unit of analysis comprised of cement manufacturing firms namely: Bambara Cement Limited, Rhino Cement Foundation, East African Portland Cement Company, Mombasa Cement Company, Savanna Cement, Athi River mining Ltd and National cement company Ltd In Kenya. The sampling frame is a comprehensive list of all sampling units from which a sample can be selected (Creswell, 2019).

Sample Size and Sample Technique

The study employed a census approach to collect data from the all the 126 respondents hence no sampling technique was used. In a census survey, data are collected for all units in the population, if the population is small, a census may be preferable. The approach involved gathering information from every member of the target population.

Data Collection Instruments

Primary data was used in this study. Greener (2019) indicates that primary data is made up of first-hand information that has not been processed or analyzed. A questionnaire which is a form of quantitative data collection tool was used to collect primary data. The study's primary data was obtained using semi-structured questionnaires. The structured questions were useful as they enabled easy analysis of data and reduced the time and resources needed for data collection. The unstructured questionnaires helped the researcher get in-depth responses from the respondents as they give a chance to them provide views and suggestions on the various issues. Kultar (2017) points out that a questionnaire is a cheap tool for data collection is very effective in collecting information from a large population. Further the data would not be biased as the questionnaire guarantees anonymity.

Pilot Test Study

A pilot study, or, pilot test or pre-test is defined as a small-scale preliminary research that is conducted so as to evaluate time, cost and feasibility to improve on the design of a particular study prior to conducting the actual one or full-scale research project (Kultar, 2019). The researcher carried out a pilot study to ensure the data collection tool is reliable and valid. The pilot test helped correct some of the challenges encountered before undertaking the final study. The pretesting sample was made of 13 respondents, representing 10% of the sample size. The results from the pilot test were not used in the main study. In addition, the respondents used in the pilot test were excluded from the final study.

Data Analysis and Presentation

Before the data could be analysed, the researcher ensured the data was checked for completeness, followed by data editing, data coding, data entry, and data cleaning. Inferential and descriptive statistics were employed for analysis of quantitative data with the assistance of Statistical Package for Social Sciences (SPSS version 25). To summarize the respondent's responses in relation to their views on the various aspects of the variables, and the respondents' demographic information analysis was undertaken using descriptive statistics (Bhattacherjee, 2019).

Descriptive statistics such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used. Descriptive statistics therefore enables researchers to

present the data in a more meaningful way, which allows simpler and easier interpretation (Singpurwalla, 2019). Inferential data analysis was conducted by use of Pearson correlation coefficient, and multiple regression analysis. Inferential statistic is used to make judgments about the probability that an observation is dependable or one that happened by chance in the study. The relationship between the study variables was tested using multivariate regression models.

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Descriptive Statistics Analysis

Risk Assessment and Organization Performance

The first specific objective of the study was to examine the influence of risk assessment on performance of cement manufacturing firms in Kenya. The respondents were requested to indicate their level of agreement on the statements relating to risk assessment and performance of cement manufacturing firms in Kenya. The results were as shown in Table 2.

From the results, the respondents agreed that the organization effectively identifies potential hazards that could impact its strategy (M=3.832, SD= 0.657). In addition, the respondents agreed that they regularly assess hazards that could disrupt their business operations (M=3.824, SD= 0.609). Further, the respondents agreed that they assess the probability of occurrence for each strategic risk (M=3.809, SD=0.650). From the results, the respondents agreed that the probability of risks occurring is regularly reviewed and updated (M=3.751, SD= 0.828). In addition, the respondents agreed that risks are prioritized based on their potential impact on their strategy (M=3.733, SD= 0.710). Further, the respondents agreed that the organization effectively ranks risks to focus on the most critical ones (M=3.717, SD=0.741).

Table 2: Risk Assessment and Organization Performance

	Mean	Std. Deviation
The organization effectively identifies potential hazards that could impact its strategy.	3.832	0.657
We regularly assess hazards that could disrupt our business operations.	3.824	0.609
We assess the probability of occurrence for each strategic risk.	3.809	0.650
The probability of risks occurring is regularly reviewed and updated.	3.751	0.828
Risks are prioritized based on their potential impact on our strategy.	3.733	0.710
The organization effectively ranks risks to focus on the most critical ones.	3.717	0.741
Aggregate	**3.778**	**0.699**

Risk Response and Organization Performance

The second specific objective of the study was to assess the influence of risk response on performance of cement manufacturing firms in Kenya. The respondents were requested to indicate their level of agreement on various statements relating to risk response and performance of cement manufacturing firms in Kenya. The results were as presented in Table 3.

From the results, the respondents agreed that they take proactive steps to mitigate high-priority risks (M=3.901, SD= 0.921). In addition, the respondents agreed that risk mitigation actions are regularly updated and improved (M=3.879, SD= 0.806). Further, the respondents agreed that they actively seek opportunities to transfer risks to third parties when possible (M=3.844, SD=

0.839).The respondents also agreed that risk transfer methods are clearly defined and effectively applied (M=3.755, SD= 0.771). In addition, the respondents agreed that the organization accepts certain risks when the impact is deemed manageable (M=3.694, SD= 0.596). Further the respondents agreed that they have a clear process for deciding which risks to accept (M=3.683, SD=0.638).

Table 3: Risk Response and Organization Performance

	Mean	Std. Deviation
We take proactive steps to mitigate high-priority risks.	3.901	0.921
Risk mitigation actions are regularly updated and improved.	3.879	0.806
We actively seek opportunities to transfer risks to third parties when possible.	3.844	0.839
Risk transfer methods are clearly defined and effectively applied.	3.755	0.771
The organization accepts certain risks when the impact is deemed manageable.	3.694	0.596
We have a clear process for deciding which risks to accept.	3.683	0.638
Aggregate	**3.793**	**0.762**

Inferential Statistics

Inferential statistics in the current study focused on correlation and regression analysis. Correlation analysis was used to determine the strength of the relationship while regression analysis was used to determine the relationship between dependent variable (performance of cement manufacturing firms in Kenya) and independent variables (risk assessment and risk response).

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (risk assessment and risk response) and the dependent variable (performance of cement manufacturing firms in Kenya) dependent variable. Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients.

Table 4: Correlation Coefficients

		Organization Performance	Risk Assessment	Risk Response
Organization Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	110		
Risk Assessment	Pearson Correlation	.826**	1	
	Sig. (2-tailed)	.003		
	N	110	110	
Risk Response	Pearson Correlation	.834**	.160	1
	Sig. (2-tailed)	.002	.013	
	N	110	110	110

From the results, there is a very strong relationship between risk assessment and performance of cement manufacturing firms in Kenya (r = 0.826, p value =0.003). The relationship was significant

since the p value 0.003 was less than 0.05 (significant level). The findings conform to the findings of Olumide (2023) that there is a very strong relationship between risk assessment and organization performance.

The results also revealed that there was a very strong relationship between risk response and performance of cement manufacturing firms in Kenya (r = 0.834, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings are in line with the results of Victor Njoga and Deya (2024) who revealed that there is a very strong relationship between risk response and organization performance.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (risk assessment and risk response) and the dependent variable (performance of cement manufacturing firms in Kenya)

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873	.762	.763	.10120

a. Predictors: (Constant), risk assessment and risk response

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.762. This implied that 76.2% of the variation in the dependent variable (performance of cement manufacturing firms in Kenya) could be explained by independent variables (risk assessment and risk response).

Table 6: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	116.186	2	58.093	660.148	.000[b]
	Residual	9.432	107	.088		
	Total	125.618	109			

a. Dependent Variable: performance of cement manufacturing firms in Kenya
b. Predictors: (Constant), risk assessment and risk response

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 660.148 while the F critical was 3.081. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of risk assessment and risk response on performance of cement manufacturing firms in Kenya.

Table 7: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.217	0.057		3.807	0.000
	Risk Assessment	0.379	0.098	0.378	3.867	0.000
	Risk Response	0.365	0.094	0.364	3.883	0.001

a Dependent Variable: performance of cement manufacturing firms in Kenya

The regression model was as follows:

$$\mathbf{Y = 0.217 + 0.379X_1\ 0.365X_2 + \varepsilon}$$

According to the results, risk assessment has significant effect on performance of cement manufacturing firms in Kenya (β1=0.379, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings conform to the findings of Kitigin (2020) that there is a very strong relationship between risk assessment and Organization Performance.

In addition, the results revealed that risk response has significant effect on performance of cement manufacturing firms in Kenya (β1=0.365, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings are in line with the results of Victor Rutabubura and Mulyungi (2020) who revealed that there is a very strong relationship between risk response and Organization Performance.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study concludes that risk assessment has a positive and significant effect on performance of cement manufacturing firms in Kenya. Findings revealed that likeliness of occurrence, probability of occurrence and risk prioritization influences performance of cement manufacturing firms in Kenya.

The study also concludes that risk response has a positive and significant effect on performance of cement manufacturing firms in Kenya. Findings revealed that mitigation, transfer and acceptance influence performance of cement manufacturing firms in Kenya.

Recommendations

The study recommends that the management of cement manufacturing firms should prioritize the establishment of a comprehensive risk assessment system to enhance organizational performance. Conducting regular and systematic assessments of identified risks—such as operational inefficiencies, health and safety hazards, environmental impact, and market fluctuations—enables firms to evaluate the potential severity and likelihood of these risks, and to allocate resources effectively for mitigation.

The study also recommends that the management of cement manufacturing firms should develop and implement well-structured risk response strategies to enhance operational performance and long-term sustainability. Effective risk response—through avoidance, mitigation, transfer, or acceptance—ensures that once risks are identified and assessed, appropriate actions are taken to minimize negative impacts or leverage potential opportunities.

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