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Financial Risks and Profitability of Agricultural Firms Listed at the Nairobi Securities  
Exchange, Kenya: A Theoretical Review

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**Financial Risks and Profitability of Agricultural Firms Listed at the Nairobi Securities Exchange, Kenya: A Theoretical Review**



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**Abstract**

**Purpose:** The agricultural firms in Kenya plays a pivotal role in the country's economic development, contributing substantially to food security, employment, and foreign exchange earnings. The study will investigate four independent variables liquidity risk, credit risk, market risk, operational risks. Establishment of the mediator role of capital structure and an evaluation of the moderator role of firm size. This will be investigated against dependent variable profitability.

**Methodology:** The research design and philosophy that will be used in the study includes; positivism and correlational design. Secondary panel data will be sourced to audited financial reports of agricultural firms listed under the NSE in a five-year period (2018-2022) Analysis of the data will entail the use of both descriptive and inferential statistics as well as regression and moderation-mediation analysis carried out using SPSS alongside the PROCESS macro.

**Findings:** Profitability of agricultural firms listed in the Nairobi Securities Exchange has shown a declining trend on average return on assets between the year 2018 to 2022 (CMA, 2015). Eaagads Limited posted a ROA of -0.07 in 2018, 0 in 2019 - 0.07 in 2020,0 in 2021 and 0.01 in 2022. Kapchorua Tea Kenya PLC had a ROA of 0.07 in 2018, which decreased to a -0.06 in 2019 and finally went down to 0.01 in 2020 0 in 2021 then 0.1 in 2022. Limuru Tea PLC posted a ROA of 0.01 in 2018 which remained constant to 0.01 in 2019 and went down to -0.02 in 2020 decreased to -0.04 in 2021 and raised to 0.05 in 2022. Kakuzi PLC had a ROA of 0.08 in 2018 which increased to 0.12 in 2019 and further reduced to 0.09 in 2020 to 0.05 in 2021 up to 0.12 in 2022. Sasini PLC posted a ROA of 0.02 in 2018 which remained constant to 0.02 in 2019, 0 in 2020 raised to 0.04 in 2021 and 0 in 2022. Williamson Tea Kenya Limited posted a ROA of -0.06 in 2018 dropped to a -0.02 in 2019, slightly raised to 0.02 in 2020, dropped to -0.02 in 2021 and finally slightly raised to 0.07 in 2022.

**Unique Contribution to Theory, Practice and Policy:** This study will be underpinned by six theories which are Liquidity Preference Theory (liquidity risk), credit risk (Credit Risk Theory), the market risk (Modern Portfolio Theory), the operations risk (Systems Theory), the firm size (Resource-Based View), and the capital structure (Trade-Off Theory). The results of the current study would add value to the academic knowledge in the field of financial risk management, as well as provide real advice to companies working in the agricultural sector and policy makers. The insights will help the stakeholders make informed financial and strategic decisions directed at improving the resilience and sustainability of the agricultural enterprises to conduct business in turbulent market conditions. This study therefore seeks to investigate the effect of financial risks and profitability of Agricultural firms listed at the Nairobi Securities Exchange, Kenya

**Keywords:** *Financial Risks, Profitability, Liquidity Risk, Market Risk, Credit Risk, Operational Risk*

**JEL Codes:** *E31, 011, C23*

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## **INTRODUCTION**

Financial risks are essential to strategic decision-making and operational stability particularly in the agricultural sector which is subject to changes in the market and environmental condition shocks. Good risk management, in turn, ensures asset protection, increases liquidity, and long-term competitiveness (Brealey, Myers, and Allen, 2020; Damodaran, 2020). Agricultural companies need risk mitigation structures that are highly functional because of the greater financial exposure of farms to the monetary risks associated with market price variations, weather variations, and changes in regulations (Hull, 2021).

Globally, inflation, disruptions in supply chains and fluctuations in the price of commodities have increased financial risks. IMF (2023) reported that in the year 2020, 2022 agricultural input costs in the U.S. increased by 15 percent, and Asian companies were struggling with currency fluctuations and trade barriers (FAO, 2022). Liquidity remains a concern, with 60 percent of agriculture companies globally indicating credit limitations in the year 2022 (World Bank, 2022). In Europe, borrowing costs rose by 2.5% from 2021 to 2023 due to higher interest rates (European Central Bank, 2023).

In Africa, the risks associated with credit and liquidity have increased due to poor financial markets and credit access. According to the AfDB (2022), credit risk increased by 20 percent in the Sub-Saharan African region. In West Africa, 55% of firms struggled with liquidity, while East African firms saw a 12% revenue decline between 2020 and 2022 due to price volatility and infrastructure gaps (EAC, 2023; AfDB, 2022).

In Kenya, financial risk persists where agriculture accounts for 33% of the GDP (Kenya National Bureau of Statistics, 2023). The Central Bank of Kenya (2022, 2023) reported that 40 percent of agricultural companies faced liquidity shortages, and non-performing loans grew by 8% percent in 2020-2023. The market risks have led to a 10% decline in the share prices of the firms listed on NSE, whereas 30% reported operational losses associated with outdated technologies and logistical issues (KNBS, 2023). These challenges highlight the importance of strategic capital structure with regard to improving financial performance (FAO, 2022).

### **Liquidity Risk**

Liquidity risk describes the possibility that a firm may experience difficulty in settling its short-term financial commitments when they fall due, even when the firm remains solvent in the long run (Saunders & Cornett, 2019). Agricultural firms listed at the Nairobi Securities Exchange (NSE) are particularly susceptible to liquidity risk because of seasonal production patterns, delayed cash inflows, and substantial working capital needs inherent in agricultural operations.

From a conceptual perspective, inadequate liquidity can disrupt operational activities, limit access to short-term financing, and increase reliance on costly borrowing. Firms that fail to maintain sufficient liquidity buffers may face operational interruptions and weakened financial stability. Conversely, effective liquidity management enhances financial flexibility and improves the firm's ability to absorb unexpected financial shocks (Ross, Westerfield, & Jordan, 2018). Liquidity risk is commonly assessed using indicators such as the current ratio, quick ratio, and operating cash flow measures.

### **Credit Risk**

Credit risk refers to the likelihood that a counterparty may fail to fulfill its financial obligations in accordance with agreed terms, resulting in potential financial losses for the firm (Giesecke, 2019). In the case of agricultural firms listed at the NSE, credit risk mainly arises from delayed

payments by customers, defaults on trade credit, and non-performance of contractual obligations by business partners.

Conceptually, elevated credit risk weakens cash flow reliability and increases the incidence of doubtful debts, which may necessitate higher impairment provisions and negatively affect profitability. Effective credit risk management, including careful assessment of counterparties and timely collection policies, supports stable cash flows and reduces exposure to financial losses (Basel Committee on Banking Supervision, 2011). Common proxies for credit risk include receivables turnover ratios, leverage ratios, and levels of non-performing receivables.

### **Market Risk**

According to (Hull, 2018). Market risk in this study refers to the potential for financial losses arising from fluctuations in market variables such as exchange rates and commodity prices. In the context of NSE-listed agricultural firms, this risk is characterized by a “double exposure.” On the one hand, these firms rely on imported inputs that are denominated in foreign currencies, particularly the US dollar, making them vulnerable to exchange rate volatility. On the other hand, they sell their agricultural commodities in international markets where prices are determined through global auction systems, such as the Mombasa Tea Auction. This dual exposure amplifies their sensitivity to both currency and global price movements.

Agricultural firms listed at the NSE are highly exposed to market risk due to their dependence on global commodity markets, imported agricultural inputs, and export revenues denominated in foreign currencies.

Conceptually, fluctuations in market variables can lead to unpredictable earnings and increased volatility in firm performance. Exchange rate movements may raise production costs, while changes in interest rates affect borrowing costs and investment decisions. Managing market risk through diversification, pricing strategies, and financial hedging mechanisms contributes to greater earnings stability and long-term financial sustainability (Mishkin & Eakins, 2018). Market risk is often measured using indicators of price volatility, exchange rate exposure, and sensitivity to interest rate changes.

### **Operational Risk**

Operational risk refers to potential losses arising from deficiencies in internal processes, human resources, technological systems, or external disruptions (Basel Committee on Banking Supervision, 2019). In agricultural firms, operational risk may stem from inefficient production systems, supply chain interruptions, equipment failure, labor constraints, or weak internal control structures.

From a conceptual standpoint, poor management of operational risk leads to inefficiencies, increased operating costs, and reduced productivity, all of which adversely affect firm outcomes. Strengthening operational processes and internal controls enhances efficiency and reduces the likelihood of costly disruptions, thereby supporting improved financial performance.

### **Profitability**

Profitability is a metric that quantifies the effectiveness and financial success of a company about the capital it has invested. Stated differently, it is a company's or an institution's capacity to make a profit or a quality or state of being profitable which is a measure of performance and a determinant of financial sustainability (Aplia, 2017). As stated by Al-Matari, Al-Swidi, and Fadzil (2014), profitability is the capacity of an organization to achieve specific financial goals,

such as financial performance. Paller (2022) posited that the aspect of profitability of a firm is its capacity to generate revenue and achieve profit once all expenses have been settled. The profitability of a firm is the extent to which it has met or surpassed its financial goals. It demonstrates the level of accomplishment of financial goals. In line with Baba and Nasieku (2016) profitability exhibits how a business utilizes its resources to produce income, hence it is relevant to the parties involved in their decision-making. Nzuve (2016) argues that a company's well-being mainly depends on its profitability or the power to generate revenue which is used as an indicator of the strengths and weaknesses of individual firms. Profitability is an indicator of the financial gains that a company may generate by effectively utilizing its available resources. It is a quantitative measure employed to assess the success of a business relative to its size, ultimately indicating its level of success or failure. Regardless of the industry, a substantial proportion of management decision-making pertains to operating and strategic management revolving around evaluating a company's productivity and profitability.

### **Return on Assets**

The return on assets (ROA) is an important indicator of profitability of Agricultural firms (Ongore & Kusa, 2020). It is a reflection of firm's capability to generate returns on asset management functions (Muraina, 2019). Return on assets gives an idea of how well a firm is doing in relation to bank size, therefore allowing for comparison of how well a firm is doing relative to another (Onyekwelu, Chukwuani & Onyeka, 2018). It is a ratio that is often used in literature to evaluate the profitability of firms. Return on asset is regarded as net income to total volume of assets ratio (Khrawish, 2019). It represents the measurement of firm managers' ability of generating income through the utilization of companies' assets. The ratio serves as a reflection of the efficiency of the management of agricultural firms in utilizing the resources at their disposal to generate or earn income (Combey & Togbenou, 2020).

Return on assets is a comprehensive ratio used to assess the profitability of firms (Khrawish, 2011). Boadi, Li and Lartey (2016) put forward that return on assets is a measure of profitability which also accounts for risk derived emanating from financial leverage. Empirical works such as Flamini, McDonald and Schumacher (2009) and Alper and Anbar (2011) recommended the use of ROA in assessing profitability. Return on assets is widely used as a profitability indicator which determines managers' earnings ability on firm's assets (Khrawish, 2011).

### **Agricultural Firms Listed on the NSE**

The firms in the Nairobi Securities Exchange (NSE) that are trading in crop farming, Agro Processing and exporting commodities such as tea, coffee and horticulture products have been investigated in this paper. As of 2023, there are six such companies listed in the NSE: Kazuki Plc, Limuru Tea Plc, Sasini Plc, Kapchorua Tea Plc, Williamson Tea Kenya Plc and Eaagads Ltd (NSE, 2023). The firms make a very important contribution to the economy of Kenya since agriculture contributes 65 percent of the entire export earnings to Kenya (Kenya National Bureau of Statistics, 2023).

In agricultural firms accounted for under IAS 41 (Biological Assets), operational risk is closely tied to the biological transformation process, making production inherently uncertain (International Accounting Standards Board [IASB], 2021). For listed companies such as Kakuzi and Sasini, the main drivers of operational inefficiency are typically crops diseases, and post-harvest losses. Pest infestations and disease outbreaks can significantly reduce yields and quality, directly affecting fair value measurements of biological assets, while post-harvest losses arising from poor handling, storage, or transport—further erode output and profitability

(Food and Agriculture Organization [FAO], 2019). Together, these factors create volatility in production levels and costs, making them central sources of operational risk in agricultural enterprises (Kakuzi PLC, 2023; Sasini PLC, 2023).

### **Statement of the Problem**

Agricultural companies have seen a steady drop in profits between 2018 and 2022. (CMA, 2015). Eaagads Limited posted a ROA of -0.07 in 2018, 0 in 2019 - 0.07 in 2020, 0 in 2021 and 0.01 in 2022. Kapchorua Tea Kenya PLC had a ROA of 0.07 in 2018, which decreased to a -0.06 in 2019 and finally went down to -0.01 in 2020, 0 in 2021 then 0.1 in 2022. Limuru Tea PLC posted a ROA of 0.01 in 2018 which remained constant to 0.01 in 2019 and went down to -0.02 in 2020 decreased to -0.04 in 2021 and raised to 0.05 in 2022. Kakuzi PLC had a ROA of 0.08 in 2018 which increased to 0.12 in 2019 and further reduced to 0.09 in 2020 to 0.05 in 2021 up to 0.12 in 2022. Sasini PLC posted a ROA of 0.02 in 2018 which remained constant to 0.02 in 2019, 0 in 2020 raised to 0.04 in 2021 and 0 in 2022. Williamson Tea Kenya Limited posted a ROA of -0.06 in 2018 dropped to a -0.02 in 2019, slightly raised to 0.02 in 2020, dropped to -0.02 in 2021 and finally slightly raised to 0.07 in 2022. As a result of these fluctuations the study seeks to investigate the effects of financial risks on agricultural firms listed at Nairobi Securities Exchange, Kenya setting and multi-risk interrelations.

Several sector-focused studies have been conducted, yet most have examined financial risks in isolation or in other industries. Indicatively, Ochieng and Murage (2020) compared the liquidity and credit risk in commercial banks and found that the both risks in banking greatly decreased ROA. Mutua (2022) studied market risk in the manufacturing industry and discovered that market risk had a strong negative impact on earnings but did not extend the research to agricultural companies. Also, Keter and Cheruiyot (2021) evaluated the effects of operational risk on the performance of listed logistics firms but failed to include agricultural setting and multi-risk interrelations. Moreover, Njoroge (2021) carried out a study on the financial performance of the listed agricultural corporations, he merely touched on the liquidity risk and failed to consider the intermediary variables such as capital structure, which is crucial in mitigating financial risks. Although these studies provide information, there is a contextual gap about the combined influence of different financial risks on the financial performance of the NSE-listed agricultural firms and a conceptual gap about the role of capital structure as a mediator and the size of firms as a moderator in the associations. The paper will address these gaps and determine the effects that liquidity risk, credit risk, market risk, operational risk and interest rate risk have on the financial performance of the agricultural companies listed in NSE. It will also evaluate the mediating effect of the capital structure and the moderating effect of firm size based on panel data at 2020-2024 period. The intention is to produce evidence-based observations, that can be used to support agricultural companies to become less vulnerable to financial uncertainties as they increase.

### **Research Objectives**

This study will be guided by the general and specific objective

#### **General Objective**

The general objective of the study will be to investigate the effect of financial risks and profitability of Agricultural firms listed at the Nairobi Securities Exchange, Kenya.

### **Specific Objectives**

- i.** To establish the effect of liquidity risk on profitability of Agricultural firms listed at NSE, Kenya
- ii.** To determine the effect of credit risk on profitability of Agricultural firms listed at NSE, Kenya
- iii.** To determine the effect of market risk on profitability of agricultural firms listed at NSE, Kenya
- iv.** To establish the effect of operational risk on profitability of Agricultural firms listed at NSE, Kenya
- v.** To establish the moderating effect of firm size on the relationship between financial risk and profitability of Agricultural firms listed at NSE, Kenya
- vi.** To determine the mediating effect of Capital Structure on the relationship between financial risks and profitability of Agricultural firms listed at NSE, Kenya.

### **Research Hypotheses**

The study seeks to test the following null hypotheses:

- i.** H<sub>01</sub>: Liquidity risk has no significant effect on profitability of agricultural firms listed at NSE, Kenya.
- ii.** H<sub>02</sub>: Credit risk has no significant effect on profitability of agricultural firms listed at NSE, Kenya.
- iii.** H<sub>03</sub>: Market risk has no significant effect on profitability of agricultural firms listed at NSE, Kenya.
- iv.** H<sub>04</sub>: Operational risk has no significant effect on profitability of agricultural firms listed at NSE, Kenya.
- v.** H<sub>05</sub>: Firm size has no significant moderating effect on profitability of agricultural firms listed at NSE, Kenya.
- vi.** Capital Structure has no significant mediating effect on profitability of agricultural firms listed at NSE, Kenya

### **Significance of the Study**

The study will be useful to a number of stakeholders. The results can also be applied by agricultural firm managers to learn the degree to which different financial risks influence the profitability of the organization and to increase the internal control mechanisms based on proper practices in risk management. Investors and shareholders will gain knowledge of financial vulnerability and robustness of listed agricultural businesses which will enable them make informed investment choices. The findings can be used by policymakers and regulators (including the Capital Markets Authority (CMA) and the NSE) to improve regulatory frameworks that can boost financial stability in the agricultural sector. Also, the research will contribute to the scholarly literature on financial risk management and firm performance in the Kenyan capital market.

### **Scope of the Study**

This paper is limited to agricultural companies that are listed on the Nairobi Securities Exchange (NSE) between 2018 to 2022. It is narrowed down to discussing five types of financial risks liquidity risk, credit risk, market risk, operational risk, and interest rate risk and how they affect profitability, (ROA) The mediating role of risk management practices and the

moderating role of firm size (proxied by the natural logarithm of total assets) are also considered in the study. Publicly available secondary data like audited financial statements and annual reports shall be utilized.

## **LITERATURE REVIEW**

This study was anchored by six theories, the Liquidity Preference Theory, credit risk, the Modern Portfolio Theory, Systems Theory, Resource-Based View, and the Trade-Off Theory. They give grounds to some study of the effect of financial risks on ROA at which the size of the company is a moderator and the capital structure is a mediator

The Liquidity Preference Theory (developed by John Maynard Keynes in 1936) points out that investors and companies like to have liquid assets as a source of meeting short-term commitments particularly when economic conditions are volatile (Keynes, 1936). The theory gives emphasis on the fact that liquidity risk comes forth when firms place liquidity much higher than long term investments and it has an impact on the financial productivity. Agricultural companies face liquidity risk as cash inflows are determined by seasons and fluctuating situation in the market; thus, cash reserves play a significant role in the maintenance of the operations (Van Greuning and BrajovicBratanovic, 2020). According to the theory, the firm that have better liquidity (e.g., better current ratios) may be closer to eliminating liquidity risk and becoming more financially stable and increasing ROA.

The Liquidity Preference Theory assists in the evaluation of the objective, on the relationship between the liquidity risk (in either the current ratio or quick ratio, depending on the financial statements of the NSE corporations) and a financial performance (ROA).

Credit risk theory proposed by Merton (1974) which can be viewed as a result given that the default of debt obligation can and does in turn affect financial wellbeing of a firm. The theory has structural models that establish the probability of default contingent on the leverage firms and the volatility of assets whereby high credit risk (high debt-equity ratio) enhances the cost of financial distress (Merton, 1974). The credit risk on NSE-listed agricultural companies is also high since it uses funds in the form of loans to fund its operations and capital investment particularly in an industry that the revenues vary easily (Gitahi & K Obonyo, 2020). The theory assumes that sound borrowing in the handling of credit risk would increase ROA.

Critics state that the foundation of the theory to use historical data on financial outcomes may not consider the variable shocks, e.g., those of a weather- or policy-related nature which may occur to agricultural companies (FAO, 2020). The assumption of market efficiencies also does not exist in emerging markets that are marked by a lack of credit information (Damodaran, 2020).

The objective is backed by the Credit Risk Theory which looks at the correlation between the profitability (ROA) and credit risk (in terms of debt to equity or non-performing loan calculated by NSE financial statements).

Modern portfolio theory (MPT) proposed by Harry Markowitz in 1952. The MPT suggests that an investor must diversify his/her portfolio in order to make more profits and minimize the risk that comes with it. The fact that MPT employs the beta coefficient, which is the degree to which an asset is sensitive to the variations in the markets, especially in the case of agricultural companies, which are at a risk of being influenced by the dynamics in the commodity prices (Markowitz, 1952). The market risk of NSE-listed companies affects the profitability in the face of stock price changes, commodity price changes, or both, including the ROA (Brealey et

al., 2020). MPT also advocates hedging techniques (e.g. futures contract) as a market risk mitigation strategy which enhances the sustainability of a company.

Opponents note that the application of historical beta by MPT was simply ineffective in response to the abrupt market shocks, e.g. climatic price variability in the agricultural industry (FAO, 2020). The assumption of market efficiency is invalidated in Kenya because it is assumed that there is an information asymmetry (Damodaran, 2020). The MPT also does not take into account the liquidity and operational risks, which, in turn, contribute to the situation with agricultural companies overall (Hull, 2021). However, its rigorous approach to quantifying market risk has been so robust, and recent applications of this paradigm have resolved such omissions by integrating VaR and stress testing (Jorion, 2021).

In our case, MPT will be useful in supporting specific objective iii, wherein the correlation between market risk (as defined by beta coefficient or stock price volatility data reported by NSE market) and financial profitability (ROA) is observed. It is described that the theory explains how a market characterized by a high level of volatility can influence ROA and is more desirable than the Capital Asset Pricing Model since it emphasizes more on the diversification approaches that the agricultural companies are interested in (Damodaran, 2020). The research technique employs secondary information to measure market risk, which is consistent with MPT that believes in measurable level of risk.

Systems Theory, published by Ludwig von Bertalanffy in (1968), states that the operational risk is caused by the disruption of internal processes or external linkages. In this case organizations are viewed as interrelated systems (Von Bertalanffy, 1968). The agricultural enterprises listed in the NSE are also affected by operational risk (supply chain disruption or unproductive production) to raise costs or postpones operations, directly affecting a return on assets (ROA) (Van Greuning & Brajovic-Bratanovic, 2020). The theory emphasizes the idea of dealing with risks as a whole in a bid to render a system resilient and this is highly important when it comes to agriculture because it involves the multifactor of operations that are complex in nature.

Critics argue that the holistic nature of the Systems Theory can make it hard to focus on certain sources of risks, thus overwhelming to apply the theory (Damodaran, 2020). It may lack company-specific information on indicators like the quality of management (Hull, 2021). However, its coordinated approach has an advantage in the agricultural sector because the risk of operations due to interdependent systems is (FAO, 2020). The criticism is resolved in more recent applications by providing data analytics that recognizes risk drivers (Wanjohi and Muturi, 2022).

The Systems Theory provides some credit to specific target by analysis of cost to income ratio or prevalence of operational losses which was assumed given by NSE financial reports as a measure of correlation between operational risk and financial profitability (ROA). The theory explains why the effect of interruption in business activities is reducing ROA and it is the better choice over the Failure Mode and Effects Analysis due to the whole picture perspective of risks in agriculture (Van Greuning and Brajovic-Bratanovic, 2020). The survey utilizes secondary data in quantification of operational risk, which is appropriate in the systemic position of the theory.

Resource-Based View (RBV) of Barney (1991) implies that the certainty of special assets and competencies that the company owns, and the scale of the company is a decisive factor that determines the results of strategic actions. Gitahi and Obonyo (2020) have inferred that capital

structure-profitability relationship is stronger in bigger agricultural companies and more total assets. This is considering the fact that larger firms are able to achieve economies of scale, sources of finance are easy to flow and such firms stand a better chance of hedging risk. The smaller companies cannot use resources to undertake effective risk management to improve ROA.

Critics mention that RBV overlooks such external environmental factors as market volatility that are highly significant in agriculture (Hull, 2021). Large firm size also has the capability to introduce bureaucracy, thereby making the resource benefits inefficient (Damodaran, 2020). However, the resource heterogeneity can be successfully applied to the RBV in order to define the impact that the size of the firm may have on the efficacy of its risk management (Wanjohi & Muturi, 2022). The relatively new developments address criticism by incorporating environmental scanning to align resources and the market scenario (Teece, 2018).

RBV is of special interest to the study because it aims at establishing the moderating effects of size of the business in the relationship between capital structure (e.g., risk disclosure score) and the financial profitability (ROA). The size of business will be measured by the natural log of total assets obtained by extracting them out of NSE financial statements. The theory explains that the larger firms leverage resources to enhance risk management in order to maximize the ROA and was deemed superior to the Agency Theory since it focuses on resource-based competitive advantages (Gitahi & K Obonyo, 2020). The study employs secondary data to determine the size of the firm and this is in line with the argument of the RBV that it is the physical assets of the firm that matter.

The Trade-Off Theory of Capital Structure by Myers (1984) states that it is a business imperative to undertake both benefits and costs analysis of debt and indebtedness to optimize its capital structure by using tax benefits and bankruptcy (Myers, 1984). The capital structure mediates the correlation between the profitability and financial risks by regulating the process through which financial risks such as liquidity and credit are converted to the financial outcome. In share-listed agricultural firms, capital structure (debt-to-equity ratio) influences the ROA through exposing the company to risks, regulating them with a perfect combination of financing (Brealey et al., 2020).

According to critics, the theory suggests that the market situation is always perfect, which does not occur in Kenya as individuals cannot access credit (Damodaran, 2020). Both the dynamic risks such as the volatility of prices in commodities are not incorporated in the static models (FAO, 2020). However, the trade-off focus on the theory is effective in the agricultural sector because companies rely on borrowings to conduct their operations (Mwangi and Kariuki, 2021). The criticisms have been overcome with newer implementations using the application of scenario analysis to indicate the impact of risk (Brealey et al., 2020).

## **Empirical Review**

### **Liquidity Risk and Profitability**

In their study, Mutua and Wanjohi (2023) used agricultural cooperatives in the Rift Valley region, Kenya to evaluate their economic performance due to the liquidity risk. The study was intended to find out what the influence of the liquidity risk on ROA is. It employed descriptive research design whereby its sample consisted of 55 agricultural cooperatives, 40 of which it was stratified. The multiple regression was conducted using SPSS version 26, and secondary data (2018-2026) in the form of financial statements were used. The results indicated that the low liquidity ratio measured in terms of current ratio significantly affected and reduced ROA

(-0.395,  $p = .003$ ), indicating that lower liquidity limited ROA. The study recommended robust liquidity management practices. Its focus on cooperatives and omission of capital structure analysis limit its applicability to NSE-listed agricultural firms. The current study addresses this by targeting listed firms and incorporating capital structure as a mediator.

Kinyua and Ndede (2021) examined the impact of liquidity risk on the NSE-traded commercial banks in Kenya. The study used a census approach to 11 banks with the purpose of employing a correlational design. Panel regression was used to analyze secondary data (annual reports, 2014–2020) through the use of STATA 15. The fact that liquidity risk had a negative effect on the return on assets ( $= -0.326$ ,  $p = .009$ ) helped highlight the necessity of employing suitable liquidity strategies. It lacks the mediation analysis and focuses more on the banking sector and thus does not apply to the agricultural enterprises. The present paper responds to them by focusing on agricultural companies listed on the NSE and investigating the mediating position of capital structure.

### **Credit Risk and Profitability**

Onyango and Kiptoo (2022) examined Agribusiness enterprises in the Central region of Kenya to determine the impact of credit risk on their profitability. The aim of the study was to establish how credit risk affected ROA. The research adopted a descriptive research approach and sampled 35 out of the 40 agricultural businesses randomly. Multivariate analysis was based on the secondary data consisting of financial records that were filtered and analyzed with the help of SPSS version 24 in order to conduct multiple regression. The adverse effect of loan defaults has been revealed by the fact that credit risk, based on the non-performing loan ratio, significantly lower ROA ( $0.408$ ,  $= 0.002$ ). The research suggested strict credit policies. It is limited to the unlisted firms, and does not focus on the firm size, thus cannot be generalized to NSE-listed firms. It is addressed in the present research by considering listed agricultural firms and the size of the firms as a moderator.

In another Ghanaian study, Asare and Mensah (2023) examined how credit risk affects agricultural firms listed in Ghana Stock Exchange. Data on panel analysis were based on annual reports (2015-2022), which was analyzed by a fixed-effects regression in STATA 16 and the study employed a census method to sample 10 enterprises. Findings revealed that low ROE was strongly correlated with high credit risk ( $= -0.298$ ,  $p = .006$ ), and the development of a very effective credit appraisal system is required. The Ghana environment, and lack of capital structure analysis limits applicability in Kenya. The present research fills this gap by using NSE-listed companies and analyzing the mediating impact of capital structure.

### **Market Risk and Profitability**

Wambui and Kipchumba (2023) examined the impact of market risk among the bottom lines of tea businesses in Nandi area in Kenya. The market risk was described as the extent of how price changes in commodities altered the assets returns (ROA). The correlational design was employed and the sample of 30 tea firms was purposive, comprising 25 firms. The analysis of secondary data involved the use of panel regression in STATA 14 using financial statements (2017-2022). Results indicated that market risk had a negative relationship with the ROA ( $0.381$ ,  $p = .004$ ), which was the consequence of changes in prices. The research suggested hedging principles. It is limited in its scope to unlisted firms and does not analyze the size of a firm, which restricts its applicability to NSE-listed firms. The present research deals with this by focusing on listed agricultural companies and including the size of the firms.

Nkosi and Dlamini (2022) conducted a study in South Africa focusing on the effects of market risk on agribusiness firms that are listed on the Johannesburg Stock Exchange. In the research, fixed-effects regression in Eviews 12 was applied to annual report panel data (20142021). It has focused on 18 companies and sampled 15 firms. Findings showed that market risk, which is a measure of interest rate volatility, had a negative ROE ( $= -0.324$ ,  $p = .007$ ). It was proposed in the study that risk management should be dynamic. It lacks mediation analysis and has a South African setting that limits applicability. The present paper addresses this gap by considering NSE-listed companies and analyzing the mediating role of capital structure.

### **Operational Risk and Profitability**

A study conducted by Kilonzo and Otieno (2022) focused on the effects of the operational risk on the bottom lines of agricultural cooperatives in Kiambu County in Kenya. The main purpose of the research was to find the impact operational risk had on ROA. The design was descriptive with 35 cooperatives as the target population with a random sample of 30 cooperatives. Financial records were studied as a secondary data (20152021) and analyzed with multiple regression in SPSS version 25. Findings indicated that the operational risk in terms of operational losses events had a negative impact on ROA ( $2 = -0.363$ ,  $p = .005$ ). The research suggested enhanced internal controls. It is too cooperative and not focused on capital structure to be generalized. This paper sheds light on this by targeting NSE-listed agricultural companies and analysing the role of capital structure.

In a study by Ndung and Kamau (2021), the impact of operational risk on manufacturing companies listed on NSE in Kenya was examined. The study employed an explanatory design, and the census method was used on 9 firms. Annual reports (20142020) included the secondary data, which was analyzed in terms of regression in SPSS version 23. The findings indicated a weak negative impact on ROA ( $-0.121$ ,  $p = .197$ ). Focus on manufacturing and no mediation analysis restricts applicability. The present paper discusses these by considering agricultural companies and investigating the mediating role of capital structure.

### **Capital Structure and Profitability**

Kiprop and Mutiso (2023) examined the financial performance of Kenyan agricultural listed firms on Kiprop and Mutiso (2023) examined the performance of agricultural enterprises listed on the NSE in Kenya with respect to capital structure and financial performance. In comparison to the ROA, the study aimed at quantifying the impact of the debt-to-equity ratio. Seven agricultural enterprises were chosen by employing a quantitative approach and a census methodology. In order to conduct the analysis of secondary data, which consisted of annual reports (20162022), we employed panel regression in STATA 16. The Hausman test showed that the model had fixed-effects. The results indicated that an increase in debt-to-equity ratio had a negative impact on ROA ( $= -0.376$ ,  $= .002$ ) which implied the increase in the cost of financial distress. The research suggested the use of a balanced debt and equity. The study ascertains a gap in the literature as it examines the effects of capital structure that takes the relationship between financial risks and performance as a moderating factor and has not been addressed widely.

Wanjiku and Waweru (2024) studied the influence of capital structure on commercial banks of NSE listed in Kenya. The study was carried out using a census approach targeting 11 banks through the correlational design. The analysis of the random-effects regression on the secondary data (annual reports, 20182023) was conducted in STATA 15. The results showed that the moderate debt-to-equity ratio had a positive impact on ROA ( $= 0.234$ ,  $= .016$ ), and too

much debt had a negative impact on performance. The banking concentration restricts relevance. It is addressed in the current study, as the focus is put on the agricultural firms and the mediating role of capital structure is analyzed.

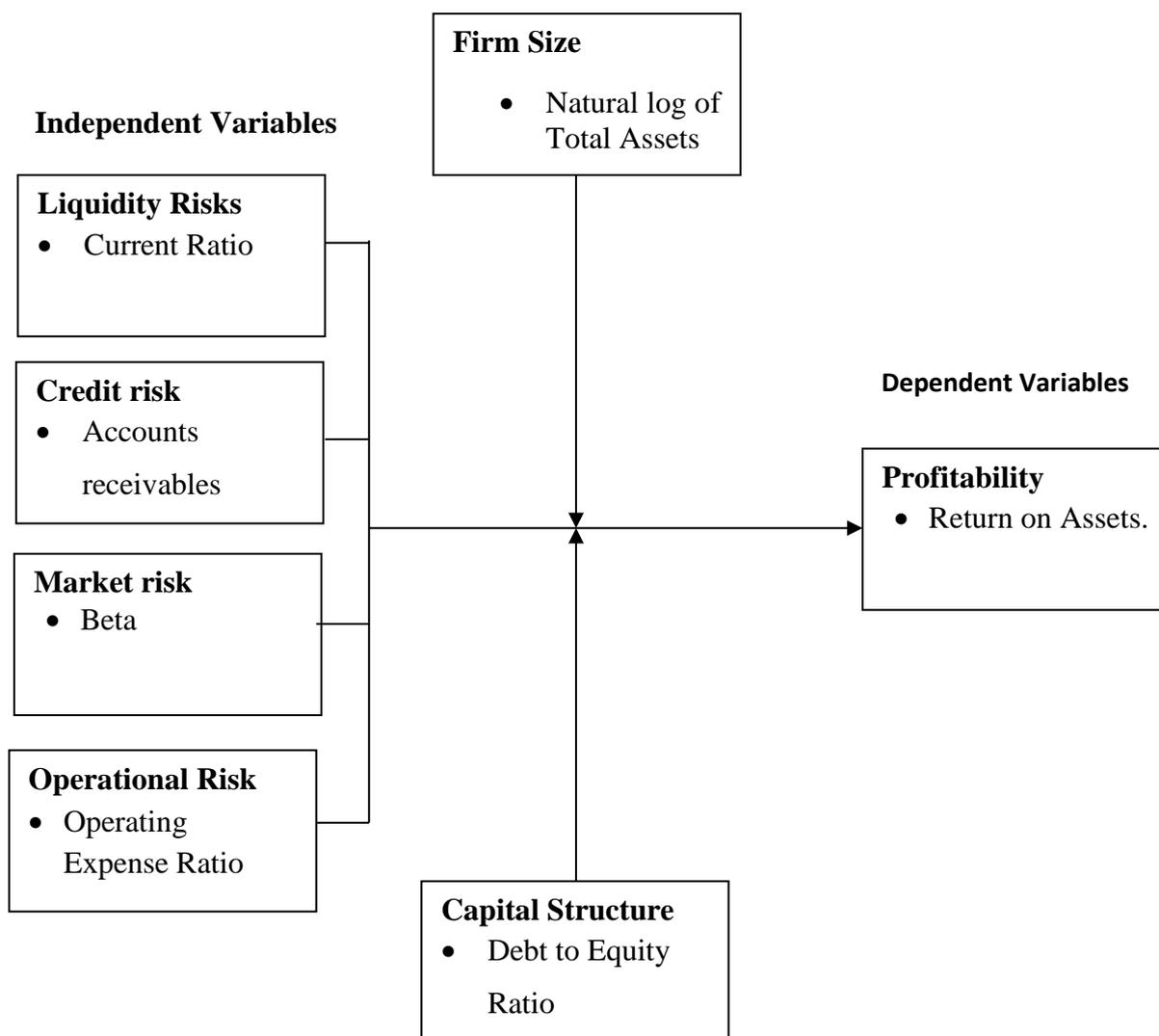
### **Moderating effect of Firm Size and Profitability**

Kinyanjui and Njogu (2022) investigated the relationship between financial risk and profitability by comparing the company size of the Kenyan manufacturing firms that were listed on the NSE. The study utilized a census method in the identification of 9 companies. The data on the panel were panel regression analyzed in STATA 14 with the use of annual reports (2015-2021). The results indicated that the negative impact of credit risk on ROA was reduced by larger firm size (0.279,  $p = .010$ ). Inapplicability is reduced by manufacturing focus and absence of analysis by mediation. This is taken care in the current study since it targets agricultural firms and adds capital structure.

A study conducted by Agyeman and Boateng (2023) in Ghana involved the analysis of firm size and financial performance of agriculture enterprises. Taking into account a census-style targeting of 10 listed enterprises, panel data (annual reports 2014-2022) were analyzed using GMM in EViews 12. Findings depicted that bigger companies were more stable in ROE because of enhanced risk management ( $= 0.308$ ,  $p = .006$ ). Ghanaian context and absence of mediation analysis preclude relevancy. The present paper fills this gap by concentrating on agricultural companies that are listed on the NSE and analyzing the role of capital structure

### **Conceptual Framework**

Mugenda and Mugenda (2003) define a conceptual framework as the hypothetical model that describes the model to be studied and the relationship between the dependent and independent variables. Figure 1 presents the conceptual framework of the study with W variables being liquidity, leverage, profitability and firm size. The X variable is profitability, Y is capital structure and Z is firm size.



*Figure 1: Conceptual Framework*

The research design and philosophy that will be used in the study includes; positivism and correlational design. Secondary panel data will be sourced to audited financial reports of agricultural firms listed under the NSE in a five-year period (2018-2022). Analysis of the data will entail the use of both descriptive and inferential statistics as well as regression and moderation-mediation analysis carried out using SPSS alongside the PROCESS macro.

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