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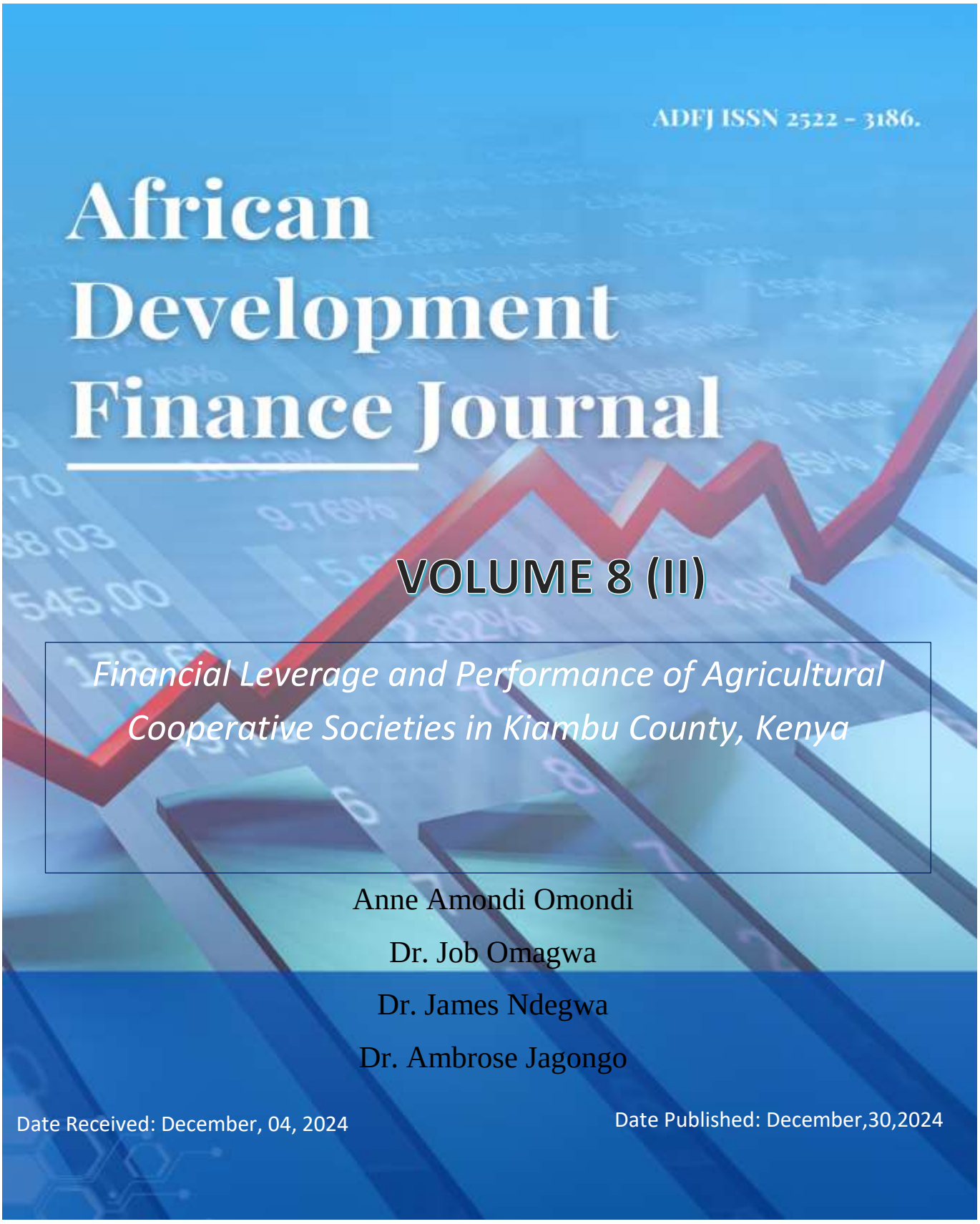

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Financial Leverage and Performance of Agricultural Cooperative Societies in Kiambu County, Kenya

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Abstract

Financial leverage decisions are critical to firm performance, yet empirical studies lack consensus on the nature and strength of the relationship between financial leverage and financial performance, with varying impacts depending on performance measures. In Kiambu County, Kenya, poor financial performance among agricultural co-operative societies has hindered potential growth, prompting some farmers to abandon agriculture for real estate ventures. The research examined the effect of financial leverage on financial performance among 25 active agricultural co-operatives in Kiambu County, focusing on capitalization mix, interest coverage, and asset coverage as the independent variable measures. Grounded on the trade-off, pecking order and agency theories, this research adopted a positivist philosophy and utilized an explanatory research design. The analysis of secondary data (2013–2017) from audited financial statements and the Directorate of Co-operatives was conducted through the application of panel regression, descriptive statistical methods and correlation techniques. Diagnostic tests included normality, multicollinearity, autocorrelation, heteroscedasticity, stationarity, and effects modeling. Results revealed a significant positive effect of interest coverage ($\beta = 2.01937$; $P = 0.015$) and a positive but insignificant effect of asset coverage ($\beta = 1.174203$; $P = 0.063$) on financial performance. Capitalization mix negatively affected performance significantly ($\beta = -0.2589299$; $P = 0.040$). Based on the study findings, managers should formulate optimal debt-equity strategies, reduce reliance on debt to mitigate financial risks and explore cheaper financing options to improve financial performance.

Keywords: *Financial Leverage, Agricultural Co-operative Societies, Asset Coverage ratio, Capitalization Mix, Economic Value Added, Financial Performance*

1. Introduction

The financial performance of Agricultural Co-operative Societies (ACs) plays a pivotal role in advancing the productivity of smallholder farmers within any economy (Okundi, 2011). The 1990s witnessed a wave of liberalization in the co-operative sector, driven by the argument of government regulation impeding the effectiveness of co-operative societies. Advocates of this approach contended that these societies could only realize their full developmental potential by

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embracing market-driven principles (Wanyama, 2009). Nevertheless, in a deregulated market environment characterized by the absence of subsidies and the elimination of monopolistic protections, co-operative societies have encountered intensified competition. This heightened competitive landscape has posed significant challenges in mobilizing investment capital, thereby adversely affecting their performance (Wanyama, 2009). Additional contemporary challenges undermining the performance of co-operative societies identified encompass unethical practices, poor financial management, a lack of managerial expertise and restricted access to financial resources (Kasungwa & Moronge, 2016).

The cooperative movement in Kenya contributes approximately 43% to the nation's Gross Domestic Product (GDP), representing the highest global contribution by cooperatives to a country's GDP (Republic of Kenya, 2015). Despite this impressive statistic, according to the Republic of Kenya (2007), only 3.63% of a sample of 220 co-operatives were deemed financially sustainable. Within the cooperative sector in Kenya, Agricultural Co-operative Societies represent 31% (Kenya Economic Survey, 2017). Effective management of agricultural co-operatives is particularly vital for the prosperity of small-scale agricultural enterprises (Nyoro, 2002). During the mid-1970s, agricultural co-operatives experienced robust growth, contributing an impressive 45% to the GDP. They also played a dominant role in marketing agricultural produce, including handling over 72% of coffee, 76% of dairy products, 90% of pyrethrum, and 95% of cotton. However, Wanyama (2009) noted a reduction in the market share of these co-operatives, which has fallen to less than 40%.

Agricultural co-operatives serve as essential pillars in the agricultural sector by offering critical services such as credit, inputs, equipment, and marketing for agricultural produce (Kumar, Wankhede & Gena, 2015). While their primary mission is not centered on profit maximization, these co-operatives must remain competitive to ensure their sustainability in an environment marked by growing market competition (Notta & Vlachvei, 2007). As member-based entities primarily reliant on member equity and devoid of a share market, agricultural co-operatives continue to grapple with stiff competition from more dominant players in the market (Wanyama, 2009). Additionally, many of these organizations have diversified into value addition, with some

expanding into manufacturing. This transition has significantly escalated the capital requirements for members, posing challenges for many in fulfilling their financial commitments.

In the face of intensifying competition, agricultural co-operatives have increasingly adopted alternative funding approaches by supplementing member equity with external financing to support their growth objectives (Luangsangthong & Zhang, 2013). The shift towards market-oriented agriculture has necessitated farmers' engagement with formal financial institutions, such as the Agricultural Finance Corporation and the Co-operative Bank of Kenya to secure loans. However, this transition has concurrently introduced intricate financial management challenges. For instance, the Komothai Coffee Growers Co-operative Society has encountered significant operational hurdles due to a mounting debt burden (County Government of Kiambu, 2017). This situation underscores the financial vulnerability of agricultural co-operatives. Notably, in 2017, the Kenyan government acknowledged this vulnerability by issuing a presidential pardon, absolving agricultural co-operatives of debts totaling 1.5 billion Kenyan shillings owed to the Agricultural Finance Corporation.

Decisions related to financing are pivotal as they address critical factors that influence organizational survival, foster growth, and aid in achieving strategic goals. As noted by Raza (2013), one of the fundamental roles of a finance manager is to enhance shareholder wealth and reduce the cost of capital through effective management of the capital structure. A core responsibility of a finance manager lies in optimizing the company's capital structure to maximize shareholder value and minimize the cost of capital. Similarly, Chadha and Sharma (2015) underscore the necessity of carefully evaluating the pros and cons of various funding sources to select an optimal mix that minimizes the cost of capital while maintaining an ideal balance. Organizations have the option to fund their activities using either equity or borrowed capital, both of which incur costs. Therefore, efficient management of these financial resources is crucial for attaining optimal financial performance. This study is dedicated to examining how financial leverage influences the financial performance of agricultural co-operative societies.

1.2 Research Problem

In Kenya, co-operative societies are acknowledged as key contributors to national development, with their presence spanning nearly every sector of the economy. It is estimated that 80% of Kenyans derive their income from co-operatives (Kenya Economic Survey, 2017). Given that most Kenyans rely on agriculture for their livelihoods, co-operatives play a critical role in driving the sector's growth. Roep (2017) highlights that co-operative societies' account for 40% of agricultural sector sales in Kenya. As a cornerstone of agriculture undertaken by small scale producers, agricultural co-operatives are vital in supporting the government's roadmap for development. However, their capacity to meet the desired outcomes of stakeholders and contribute effectively to national development is hindered by challenges such as deficient financial stewardship (Baka, 2013). Empirical evidence has linked financial leverage to the performance of co-operatives, yet this remains an underexplored area of study within the framework of Kenyan agricultural co-operative societies.

Despite the achievement of notable advancements by agricultural co-operatives in Kenya, concerns regarding their operational effectiveness and long-term viability persist (Kasungwa & Moronge, 2016). Driven by dwindling profits from commercial agriculture, many farmers have shifted their focus towards real estate, leading to food security concerns (Kenya Economic Survey, 2017). Within Kiambu County, agricultural co-operatives such as Lari Pyrethrum Co-operative Society, Kikuyu Location Farmers, Komothai Dairy and Nderi Farmers, have ceased operations owing to intensified competition, poor management practices and mounting debt (County Government of Kiambu, 2017). For instance, gross sales for coffee co-operatives in Kiambu County declined from 732,761,561 shillings in 2016 to 667,889,159 shillings in 2017. Similarly, pyrethrum co-operatives experienced a substantial drop in turnover, declining to 9,829,676 shillings in 2017 from 15,299,696 shillings in the previous year. Conversely, gross sales for dairy co-operatives showed only marginal growth, rising from 5,099,362,852 shillings in 2016 to 5,152,757,909 shillings in 2017. Payment rates to members also fluctuated, with coffee payments per kilogram increasing from 43 to 51 shillings, while milk payments per liter decreased from 38 to 36 shillings during the same period (County Government of Kiambu, 2018). Recognizing that financial leverage has been shown to influence performance in other domains, yet little is known

about its impact on agricultural co-operatives in Kiambu County, these inconsistent results underscore the necessity of conducting an empirical enquiry.

Although empirical research strongly supports the relationship between financial leverage and financial performance, co-operative societies have received limited scholarly attention in this area. Existing studies largely centered on publicly traded companies (Okoro, 2014; Enekwe, Agu, & Eziedo, 2014; Chesang & Ayuma, 2016; Maghanga & Kalio, 2014). Within co-operative societies, research has largely centered on Savings and Credit Co-operative Societies (SACCOs) (Kimathi, 2015; Kirimi, Simiyu, & Dennis, 2017; Gweyi & Karanja, 2014). Moreover, research examining the relationship between financial leverage and financial performance has yielded inconsistent results, with studies producing varying conclusions (Gweyi et al., 2014; Maghanga & Kalio, 2014; Singh & Bansal, 2016). These gaps and inconsistencies provide a compelling case for exploring this relationship particularly in Kiambu County, Kenya, where empirical studies are scarce.

This study aimed to address these gaps by incorporating a value-based performance measure, the Economic Value Added (EVA), in contrast to the conventional accounting-based measures like Return on Equity (ROE) and Return on Assets (ROA) often employed in past research. By focusing on the period from 2013 to 2017, the study sought to examine the effect of financial leverage on the financial performance of agricultural co-operatives in Kiambu County, Kenya. To address these research limitations, this study incorporated a value-based performance metric, Economic Value Added (EVA), as opposed to conventional financial performance metrics such as Return on Assets (ROA) and Return on Equity (ROE) which have been frequently utilized in prior research. Focusing on the period from 2013 to 2017, the research aimed to investigate the effect of financial leverage on the financial performance of agricultural co-operatives within Kiambu County, Kenya.

1.3 Research Objectives

This study primarily aimed mainly to assess the effect of financial leverage on financial performance of agricultural co-operatives in Kiambu County, Kenya. This research sought to achieve the following specific objectives: to determine the influence of capitalization mix on the financial performance of agricultural co-operatives within Kiambu County, Kenya; to establish the

impact of fixed charge coverage on the financial performance of agricultural co-operatives within Kiambu County, Kenya; and to investigate the effect of asset coverage on the financial performance of agricultural co-operatives within Kiambu County, Kenya.

1.4 Research Hypothesis

The following research hypothesis, tested at a 0.05 level of significance, guided this study:

H_{01} Capitalization mix has no significant effect on financial performance of agricultural cooperative societies in Kiambu County, Kenya.

H_{02} Degree of fixed charge coverage has no significant effect on financial performance of agricultural cooperative societies in Kiambu County, Kenya.

H_{03} Degree of asset coverage has no significant effect on financial performance of agricultural cooperative societies in Kiambu County, Kenya.

2. Literature Review

2.1 Theoretical Framework

This study is underpinned bt the following prominent theoretical frameworks: trade-off theory, pecking order theory and agency theory. These theoretical paradigms collectively offer valuable perspectives into the intricate nexus between financial leverage and the financial performance of agricultural co-operative societies, with an emphasis on those operating in Kiambu County, Kenya. Jensen and Meckling's (1976) agency theory addresses the conflicts that arise from divergent interests between shareholders and managers, referred to as agency conflicts. Two primary types of conflicts emerge: one between managers and shareholders and another between shareholders and debt holders. The latter arises because shareholders reap high returns from successful investments while transferring most of the risk to debt holders in cases of investment failure (Chipeta, 2012). Myers (1984) further elaborates that excessive debt can discourage shareholders from endorsing value-enhancing projects, as creditors are the primary beneficiaries during financial distress. McColgan (2001) identifies several dimensions of agency conflict, such as earnings retention, moral hazard, time horizon misalignments and managerial aversion, which give rise to costs associated with monitoring, bonding, and unresolved conflicts (Jerzemowska, 2006). This study adopts agency theory to examine how financial leverage can help resolve conflicts

between managers and members of agricultural co-operative societies, thereby fostering efficient resource management and aligning actions with members' goals.

The trade-off theory, as articulated by Myers (1984), is a foundational framework for understanding financial leverage, emphasizing the critical importance of achieving an optimal balance between debt and equity financing.Shahar et al. (2015) explain that the theory weighs the advantages of debt's tax shield and reduced agency costs against the risks of financial distress and potential bankruptcy. It builds on the revised proposition by Modigliani and Miller (1963), which recognizes the tax-saving benefits of debt, but highlights that these benefits are counteracted by costs associated with agency issues and financial distress (Baxter, 1967). Empirical studies indicate that firms typically avoid full reliance on debt due to the increased bankruptcy risk that offsets its tax advantages (Solomon, 1963; Kim, 1978). As argued by Persson and Ridderström (2014), a company achieves the ideal balance between debt and equity financing when the incremental benefits derived from tax shields are precisely offset by the incremental costs associated with financial distress.However, this equilibrium is theoretical and assumes several idealized conditions. Debt obligations, with their fixed payments, compel managers to enhance efficiency to avert bankruptcy (Jensen, 1986). Thus, the trade-off theory is pivotal for understanding how firms navigate the costs and benefits of leverage to maximize value (Çerkezi, 2013). This study applies the trade-off theory to investigate how agricultural co-operative societies balance the tax advantages of debt with the risks of financial distress to enhance their financial performance.

Contrary to the trade-off theory, the pecking order theory, as articulated by Myers and Majluf (1984), posits a hierarchical order to corporate financing decisions, shaped by information asymmetry and signaling effects. It asserts that managers, who act in the interest of existing shareholders, possess superior internal information compared to external investors, leading to potential conflicts. The pecking order theory cascading preference prioritizes internal financing, followed by debt, and finally equity, to reduce costs stemming from information asymmetry (Chen & Chen, 2011). Shahar et al. (2015) note that firms enhance value by selecting the least expensive financing options, favoring debt over equity to avoid undervaluation of securities in situations of high information asymmetry. Transaction costs are also integral, as debt often provides greater net

benefits than flotation costs (Myers & Majluf, 1984). Additionally, more profitable firms tend to rely less on debt (Mostafa & Boregowda, 2014). This theory emphasizes the importance of financing preferences in enhancing shareholder value, particularly firms' inclination toward debt financing. This study employs the pecking order theory to analyze how co-operative societies prioritize internal funds, debt, and equity financing based on information asymmetry and its implications for financial performance.

2.2 Empirical Review

2.2.1 Capitalization Mix and Financial Performance

The composition of capitalization, typically expressed as the debt-to-equity ratio, plays a pivotal role in shaping financial outcomes by reflecting the balance between debt and equity in financing an organization's activities. Research on the connection between the debt-to-equity ratio and financial performance has produced varied conclusions, often influenced by the research context and methodology applied. In their 2016 study, Chesang and Ayuma analyzed financial data from agricultural companies listed on the Nairobi Securities Exchange, concluding that profitability was not significantly influenced by the debt-to-equity ratio. These findings align with the trade-off and pecking order theories, which propose that the effect of leverage on firm performance varies depending on specific contextual factors. In a related study, Wamugo, Muathe, and Kosimbei (2014) examined the relationship between capital structure and firm performance among non-financial firms listed on the Nairobi Securities Exchange. Their analysis revealed that capital structure significantly influenced firm performance, indicating that an optimal mix of debt and equity could boost profitability. Nonetheless, the exclusive focus on listed companies in their study limits its relevance to agricultural cooperatives.

Research conducted by Raza (2013) on non-financial firms in Pakistan revealed a negative association between financial leverage and firm performance. This inverse relationship was attributed to the substantial costs linked to long-term debt financing. These findings align with the pecking order theory, which advocates for minimal reliance on external funding sources to optimize financial performance. Conversely, Gweyi and Karanja (2014) examined deposit-taking Savings and Credit Cooperative Organizations (Saccos) in Kenya and identified a weak positive relationship between the debt-to-equity ratio and profitability. Their results indicate that a prudent

combination of debt and equity financing could enhance the performance of cooperatives, highlighting the importance of achieving financial equilibrium.

Differences across sectors add another layer of complexity to these findings. For instance, focusing on India's fast-moving consumer goods (FMCG) sector, Singh and Bansal (2016) identified a significant negative correlation between financial leverage and firm value. These disparate outcomes emphasize the necessity of tailoring analyses to specific sectors and local contexts. Accordingly, when examining the influence of the capitalization mix on the financial performance of agricultural cooperatives in Kenya, a localized and sector-specific approach remains critical for deriving accurate and actionable insights.

2.2.2 Degree of Fixed Charge Coverage and Financial Performance

Evaluating a firm's capacity to meet its debt obligations, the interest coverage ratio (ICR) serves as a critical measure, and its connection to financial performance has been the focus of numerous studies.High ICR values indicate sufficient earnings to meet fixed financial obligations, positively influencing profitability by reducing the likelihood of financial distress (Altman, 1968). Empirical evidence supports this perspective. Ng'ang'a and Kiragu (2021) found that a strong ICR is positively associated with profitability and liquidity, as firms with surplus earnings can reinvest in productive ventures. Mureithi and Karanja (2017) emphasized that sustainable interest coverage levels are particularly crucial for agricultural cooperatives, as they safeguard members' capital and bolster financial performance in a sector prone to income fluctuations. Conversely, low ICR values signal financial vulnerability, which can discourage lenders and investors while limiting cooperative growth (Koech & Rotich, 2019).

Gweyi and Karanja (2014) identified a positive relationship between manageable debt levels and return on equity in Kenyan Saccos, suggesting that cooperatives with balanced fixed charges can improve their performance. Similarly, Maghanga and Kalio (2014), studying the Kenya Power parastatal, found that financial leverage has a significant but context-dependent impact on performance, influenced by organizational structure and operational scale. The broader economic environment also plays a role. Machogu and Yegon (2017) observed that cooperatives with high fixed costs often struggle to sustain turnover due to adverse economic conditions. This underscores

the necessity for prudent debt management strategies, especially for agricultural cooperatives in Kiambu County, which operate in sectors characterized by fluctuating revenues and external shocks.

2.2.3 Degree of Asset Coverage and Financial Performance

Assessing a firm's capacity to fulfill its liabilities, the asset coverage ratio (ACR) is a crucial indicator that measures the extent to which tangible assets can cover outstanding obligations.Agricultural cooperatives with strong ACR levels often demonstrate financial resilience, as they are better positioned to secure credit facilities and maintain operations during economic downturns (Titman & Wessels, 1988). Empirical findings by Machogu and Yegon (2017) highlight the significance of asset coverage in capital acquisition, with 63.3% of dairy cooperatives in Kericho County relying on bank loans for financing. This underscores the importance of asset-backed borrowing as a driver of cooperative performance. Similarly, Gweyi and Karanja (2014) noted that effective utilization of assets in Kenyan Saccos positively influences return on equity and profitability.

Conversely, other studies present cautionary insights. Chesang and Ayuma (2016) argued that over-reliance on long-term debt without sufficient asset coverage can lead to financial inefficiencies, particularly in agricultural contexts with unpredictable income streams. Maghanga and Kalio (2014) further observed that insufficient asset coverage can exacerbate financial distress in highly leveraged entities. These findings highlight the dual role of asset coverage as both a stabilizing factor and a determinant of financial performance. Consequently, it emerges as a critical area of focus for agricultural cooperatives in Kiambu County aiming for sustainable growth.

3. Research Methodology

The study employed a positivist philosophical stance, which is rooted in a quantitative approach for investigating phenomena (Smith, 1998). Philosophical orientations are instrumental in guiding the choice of research methodologies, as they inform foundational assumptions about both scientific and social dimensions. These dominant research paradigms (phenomenology and positivism) differ fundamentally in their assumptions regarding human nature, methodology, the theory of knowledge and the essence of reality (Hughes & Sharrock, 1997). Positivism posits that

reality exists independently of human influence, supports the use of empirical evidence to substantiate scientific claims, and is oriented toward identifying causation, testing hypotheses, formulating universal laws, and analyzing extensive datasets (Saunders, Thornhill, & Lewis, 2009). Guided by this theoretical foundation, the research utilized a scientific approach, employed empirical methods to test hypotheses, and conducted an analysis of a large population sample consistent with the positivist paradigm.

All registered and active agricultural co-operative societies located in Kiambu County formed the target population for the study. As of December 2017, the county had 25 active and registered co-operatives. According to Greenland (2005), a target population refers to the entire group of elements being investigated and for which information is sought. This study specifically focused on registered and active agricultural co-operatives due to the availability of their annual reports and financial statements, which were accessible through the Kiambu County State Department of Co-operatives office.

The study employed an explanatory research design, which seeks to uncover the causes and rationale behind observed phenomena while providing empirical evidence to either confirm or disprove explanations or predictions (Saunders et al., 2009). Primarily, this design tracks changes in the independent variable, measures its effects on dependent variables, and controls for confounding factors to prevent result distortion. Creswell (2014) explains that explanatory research often begins with quantitative methods and later incorporates qualitative analysis, making it well-suited for examining mechanisms behind phenomena without altering independent variables. This study aimed to evaluate the impact of financial leverage on the performance of firms by analyzing existing independent variables without introducing any external interventions.

Table 1.1 Target Population

Sub-County	Number of Agricultural Co-operatives	Percentage
Gatundu North	2	8
Gatundu South	7	28
Githunguri	3	12
Kabete	3	12
Kiambaa	2	8
Kiambu	2	8
Limuru	2	8
Lari	2	8
Kikuyu	2	8
Juja	0	0
Thika	0	0
Ruiru	0	0
Total	**25**	**100**

Source: Author and State Department of Co-operatives, Kiambu County, (2019)

3.1 Data Analysis and Findings

This study utilized a census approach, which involves gathering information from the population in its entirety and systematically enumerating each element and measuring specific characteristics (Lavrakas, 2008). This methodology enhances data validity by encompassing all pertinent manifestations that provide comprehensive and valuable insights (Saunders et al., 2009). A key advantage of a census is the elimination of sampling error. For this study, the total population comprised 25 active and registered agricultural co-operatives in Kiambu County, Kenya.

The study utilized secondary data, gathered through the use of a standardized data gathering form. Data extraction and organization were meticulously conducted using a standardized research

instrument to systematically gather relevant information from financial statements and annual reports. Specifically, data pertaining to financial position were meticulously extracted from the balance sheet, income statement, and the accompanying notes to the accounts. Additional data was gathered from the co-operatives' published annual reports.

The analysis employed panel data, which offers improvements in both the quality and quantity of data. The dataset consisted of 25 agricultural co-operative societies observed over the period from 2013 to 2017. The utilization of panel data was primarily justified by its capacity to effectively control for unobserved, time-invariant heterogeneity, a limitation inherent in purely cross-sectional analyses (Hsiao, 2007). If left unaddressed, such heterogeneity could introduce the incidental parameters problem, leading to biased parameter estimates. Panel data provides additional advantages, such as greater degrees of freedom, enhanced efficiency, reduced multicollinearity among variables, and increased variability. Moreover, panel data is particularly useful where the response variable may be influenced by unobserved factors that are potentially correlated with observed explanatory variables (Megersa, 2014).

Data analysis encompassed both descriptive and inferential statistical methods.Descriptive statistics was used to summarize the data, while inferential techniques was applied to investigate relationships among variables. The analyses were conducted using STATA 14.0 software, which is well-suited for handling panel data. Relevant financial ratios were computed from the secondary data using Excel worksheets for each of the co-operative societies. To address violations of classical linear regression assumptions, the Feasible Generalized Least Squares (FGLS) method was applied.

The overarching empirical model for this research was defined as: $Y_{it} = \alpha + X'_{it}\beta + \varepsilon_{it,}$ where Y_{it} represents the financial performance of firm i at time t; i denotes the firm (cross-sectional units) ranging from 1 to 25; and t represents the time period from 2013 to 2017. Model robustness was assessed through a series of diagnostic tests, including evaluations for normality, autocorrelation and multicollinearity. The operationalization of variables was described as the process of defining and measuring them, linking abstract concepts to observable phenomena.

The study further refined the analysis using the following specific empirical model:

$EVA_{it} = \alpha + \beta_1 CM_{it} + \beta_2 DFC_{it} + \beta_3 DAC_{it} + \varepsilon_{it}$

Where:

EVA_{it} = Economic Value Added of firm i at time t;

CM_{it} = Capitalization Mix of firm i at time t;

DFC_{it} = Degree of Fixed Charge Coverage of firm i at time t;

DAC_{it} = Degree of Asset Coverage of firm i at time t;

α = Constant term;

β_s = Coefficients of explanatory variables;

Subscript *i* = Firms (cross-section dimensions) ranging from 1 to 25;

Subscript *t* = Years (time-series dimensions) ranging from 2013 to 2017;

ε_{it} = Composite error term of the model.

4 Results and Discussion

This section presents the key findings of the study.

4.1 Descriptive Statistics

Descriptive statistics encompassed mean, minimum, maximum values, and standard deviation.

Table 1.2 Descriptive Statistics

Variable	Observations	Min	Max	Mean	Std. Dev.
EVA	125	-16.49659	2.824932	-1.504374	2.460512
ACR	125	-68.03129	1798.536	78.80899	274.6973
DER	125	0.001989	7.936122	1.45985	1.701996
ICR	125	-222.1936	356.4001	-9.386896	64.20662

The dataset consisted of 125 firm-year observations. Economic Value Added (EVA), the dependent variable, had an average of -1.504374 and a standard deviation of 2.460512, signifying

substantial variability. This suggests that, on average, agricultural co-operative societies in Kiambu County, Kenya, are unable to produce value from their investments, which may discourage potential investors. The highest recorded EVA, 2.824932, demonstrated that certain co-operatives managed to achieve returns exceeding their cost of capital.

For the Asset Coverage Ratio (ACR), the mean value was 78.80899, reflecting that most co-operatives possess the capacity to fulfill their debt obligations through asset liquidation. However, the standard deviation of 274.6973 highlighted considerable variability. The negative minimum ACR of -68.03129 indicated that, in some cases, liabilities outweighed assets, making debt repayment unfeasible under conditions of unprofitability. Conversely, the positive maximum ACR suggested reduced financial risk in certain instances.

The Debt Equity Ratio (DER) exhibited a mean of 1.45985, with a standard deviation of 1.701996, underscoring high variability. This implies that the majority of co-operatives are significantly leveraged, with debt levels amounting to 145.985% of equity, thereby increasing risk exposure for shareholders. The strictly positive minimum and maximum DER values confirmed that all sampled co-operatives had a greater proportion of debt compared to equity.

The Interest Coverage Ratio (ICR) averaged -9.386896, with a standard deviation of 64.20662, indicating that most co-operatives struggled to meet their interest payment obligations using earnings. The minimum ICR of -222.1936 reflected an extreme incapacity to service debt, whereas the maximum value of 356.4001 showed that some co-operatives successfully covered their interest payments. Nonetheless, these co-operatives may have failed to optimize leverage to maximize their earnings potential.

4.2 Correlation Analysis

Correlations between variables were examined to assess the possible link between financial leverage and the financial performance of agricultural co-operative societies in Kiambu County, Kenya. The correlation analysis revealed statistically significant but weak relationships between financial leverage and financial performance, measured using Economic Value Added (EVA). A weak positive association was observed between the Asset Coverage Ratio and EVA ($r = 0.2829$,

p = 0.014), as well as between the Interest Coverage Ratio and EVA (r = 0.2792, p = 0.016). These findings suggest that an increase in these ratios correlates with improved financial performance. Conversely, the Debt Equity Ratio exhibited a weak negative relationship with EVA (r = -0.2286, p = 0.0104), suggesting that higher levels of financial leverage are linked to lower financial performance. These results align with the observations of Geyser and Hall (2004), who found an inverse association between the Debt Equity Ratio and Return on Equity.

4.3 Regression Analysis

The regression analysis focused on examining the financial performance of agricultural co-operative societies in Kiambu County, which was designated as the dependent variable. Financial leverage, quantified using the Debt-Equity Ratio, Asset Coverage Ratio, and Interest Coverage Ratio, was employed as the independent variable. To assess the influence of financial leverage on financial performance, regression analysis was performed with the Debt-Equity Ratio, Asset Coverage Ratio, and Interest Coverage Ratio serving as the predictor variables.

Table 1.4 Regression Analysis

Variable	Coefficient	Standard Error	t	P>t
ACR	1.174203	0.6250757	1.88	0.063
DER	-0.2589299	0.124918	-2.07	0.040
ICR	2.01937	0.8172106	2.47	0.015
Constant	-8.051937	1.926463	-4.18	0.000
R- Squared = 0.1503			Prob > F = 0.0002	

Table 1.4 outlines the regression results, which highlight the relationship between financial leverage and financial performance, where Economic Value Added (EVA) was adopted as the dependent measure of performance. The results indicated that the regression model produced an R-squared value of 0.1503 and an F-statistic p-value of 0.0002. This suggests that financial

leverage accounts for 15.03% of the variation in Economic Value Added. Furthermore, the p-value (P=0.0002 < 0.05) validated the statistical significance of the regression model, affirming its adequacy in explaining the variations in Economic Value Added.

The findings further disclosed that the Asset Coverage Ratio exhibited a positive effect on Economic Value Added; however, this effect was not statistically significant (P = 0.063 > 0.05). On the other hand, the Debt-Equity Ratio demonstrated a negative and statistically significant influence on Economic Value Added (P = 0.040 < 0.05). Meanwhile, the Interest Coverage Ratio displayed a positive and statistically significant impact on Economic Value Added (P = 0.015 < 0.05).

4.4 Hypothesis Testing

Table 1.5 Capitalization Mix and Financial Performance

Direct Relationship Between	Coefficient	t- statistic	p-value	Level of Sig.
Debt Equity Ratio and EVA	-0.2589299	-2.07	0.040	0.05

The data summarized in Table 1.5 indicated a significant correlation between the Debt Equity Ratio and financial performance, with Economic Value Added (EVA) serving as the performance metric. This relationship was supported by a p-value of 0.040, which falls below the established 0.05 threshold for statistical significance. As a result, the null hypothesis was rejected, affirming that the Debt Equity Ratio has a meaningful impact on financial performance.

Table 1.6 Degree of Fixed Charge Coverage and Financial Performance

Direct Relationship Between	Coefficient	t- statistic	p-value	Level of Sig.
Interest Coverage Ratio and EVA	2.01937	2.47	0.015	0.05

The research sought to explore the influence of fixed charge coverage levels on the financial performance of agricultural co-operative societies located in Kiambu County, Kenya. Specifically, the hypothesis posited that fixed charge coverage levels do not have a statistically significant impact on the financial performance of these organizations. To evaluate this, the Interest Coverage Ratio (ICR) was utilized as an indicator of fixed charge coverage. Evidence from Table 1.6 revealed that the Interest Coverage Ratio had a statistically significant relationship with financial performance, as measured through Economic Value Added (EVA). This conclusion was drawn from a p-value of 0.015, which is below the 0.05 level of significance. Consequently, the null hypothesis—that fixed charge coverage does not significantly influence financial performance—was rejected, based on the significant association identified between the Interest Coverage Ratio and EVA.

Table 1.7 Degree of Asset Coverage and Financial Performance

Direct Relationship Between	Coefficient	t- statistic	p-value	Level of Sig.
Asset Coverage Ratio and EVA	1.174203	1.88	0.063	0.05

The research aimed to examine how the degree of asset coverage influences the financial performance of agricultural co-operative societies in Kiambu County, Kenya. A hypothesis was formulated stating that the degree of asset coverage does not significantly affect the financial performance of these co-operatives. To operationalize this concept, the study employed the Asset Coverage Ratio as a representative measure for the degree of asset coverage.

The results, presented in Table 1.7, revealed that there was no statistically significant relationship between the Asset Coverage Ratio and financial performance, which was assessed using Economic Value Added (EVA). This conclusion was based on a p-value of 0.063, which is above the commonly accepted significance level of 0.05. Consequently, the findings validated the null hypothesis, affirming that the degree of asset coverage does not exert a significant impact on financial performance, as measured by the relationship between the Asset Coverage Ratio and EVA.

5 Conclusion

The study established that the Debt-to-Equity Ratio exerts a notable and adverse influence on the financial performance of agricultural co-operative societies in Kiambu County, Kenya, as evaluated using the Economic Value-Added metric. This outcome underscores that an increased reliance on debt financing undermines the financial performance of these organizations. Therefore, it is imperative for management to prioritize achieving an optimal mix of debt and equity to improve financial results.

Moreover, the analysis revealed that the Interest Coverage Ratio positively and significantly affects financial performance. This observation highlights that borrowing can contribute to enhanced financial outcomes, provided that investment decisions are subjected to rigorous cost-benefit analyses to ensure sound financial judgment.

Lastly, the Asset Coverage Ratio, while exhibiting a positive correlation with financial performance, was determined to be statistically insignificant. Despite this, the findings suggest that maintaining a strong asset base has the potential to attract investments and support borrowing activities, ultimately fostering organizational growth.

6 Recommendations

Drawing upon the study's findings, the following recommendations are proposed:

i. Agricultural Co-operative Societies should develop and implement strategies for a balanced debt-equity mix to minimize over-reliance on debt, reducing financial risks and the likelihood of financial distress.
ii. Management of Agricultural Co-operative Societies should limit excessive borrowing and focus on sustainable financing options to avoid the negative financial impact of high Debt Equity Ratios.
iii. Agricultural Co-operative Societies should explore affordable funding sources to manage fixed charge obligations without depleting earnings, ensuring long-term financial stability.
iv. Agricultural Co-operative Societies should build and maintain strong partnerships with financial institutions to negotiate favorable credit terms, such as lower interest rates and flexible repayment plans.

v. The government should come up with policies that create an enabling environment for financial institutions to provide affordable loans specifically tailored for agricultural co-operatives.

References

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance, 23*(4), 589–609. https://doi.org/10.1111/j.1540-6261.1968.tb00843.x

Baka, L. O. (2013). The challenges facing co-operative societies in Kenya: A case study of Kenya Planter Co-operative Union (KPCU). *Public Policy and Administration Research, 3*(11), 32–43.

Baxter, N. D. (1967). Leverage, risk of ruin, and the cost of capital. *Journal of Finance, 22*(3), 395–403. https://doi.org/10.2307/2326656

Çerkezi, S. (2013). Financial leverage and its impact on firm performance: Evidence from Albania. *Journal of Applied Economics and Business*, *1*(3), 42–49.

Chadha, S., & Sharma, A. K. (2015). Determinants of capital structure: An empirical evaluation. *Studies in Economics and Finance, 32*(1), 17–44. https://doi.org/[Insert DOI if available]

Chen, L. H., & Chen, S. S. (2011). Financing hierarchy, market valuation, and leverage dynamics. *Journal of Corporate Finance, 17*(3), 589–610. https://doi.org/10.1016/j.jcorpfin.2011.01.001

Chesang, E. K., & Ayuma, D. C. (2016). Financial leverage and firm performance: Evidence from listed firms in Kenya. *International Journal of Research in Business and Social Science, 5*(6), 110–118.

Chesang, T., & Ayuma, E. (2016). Effect of debt-to-equity ratio on profitability of listed agricultural firms in Kenya. *International Journal of Economics, Commerce and Management, 4*(9), 76–93.

Chipeta, C. (2012). Agency theory and capital structure: Evidence from listed companies in South Africa. *African Journal of Business Management, 6*(4), 120–130.

County Government of Kiambu. (2017). *Annual report on co-operative societies in Kiambu County.* County Government of Kiambu.

County Government of Kiambu. (2018). *Economic review of co-operative societies in Kiambu County.* County Government of Kiambu.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Enekwe, C. I., Agu, C. I., & Eziedo, K. N. (2014). The effect of financial leverage on financial performance: Evidence from quoted pharmaceutical companies in Nigeria. *IOSR Journal of Economics and Finance, 5*(3), 17–25.

Greenland, S. (2005). Target population definition and importance in survey research. *International Journal of Epidemiology, 34*(1), 123–129.

Gweyi, M. O., & Karanja, J. (2014). Effect of financial leverage on financial performance of deposit-taking SACCOs in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 4*(2), 176–184.

Hsiao, C. (2007). Panel data analysis—Advantages and challenges. *Socio-Economic Planning Sciences, 41*(4), 211–223. https://doi.org/10.1016/j.seps.2006.10.002

Hughes, J. A., & Sharrock, W. W. (1997). *The philosophy of social research* (3rd ed.). Longman.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review, 76*(2), 323–329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jerzemowska, M. (2006). The main agency problems and their consequences. *Acta Oeconomica Pragensia, 14*(3), 9–17.

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research* (4th ed.). Harcourt College Publishers.

Kasungwa, S. N., & Moronge, M. (2016). Factors affecting the performance of co-operative societies in Kenya. *Journal of Business and Change Management, 3*(2), 48–56.

Kenya Economic Survey. (2017). Nairobi: Kenya National Bureau of Statistics.

Kim, E. H. (1978). A mean-variance theory of optimal capital structure and corporate debt capacity. *Journal of Finance, 33*(1), 45–63.

Koech, J., & Rotich, G. (2019). Financial leverage and financial distress of small and medium enterprises in Nairobi County. *Journal of Finance and Investment Analysis, 8*(1), 29–44.

Kumar, S., Wankhede, K. G., & Gena, H. C. (2015). Role of cooperatives in improving livelihood of farmers on a sustainable basis. *American Journal of Educational Research, 3*(10), 1258–1266. https://doi.org/[Insert DOI if available]

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods.* SAGE Publications.

Machogu, A., & Yegon, D. (2017). Effects of financial leverage on financial performance of agricultural cooperatives in Kericho County, Kenya. *Journal of Economics and Sustainable Development, 8*(16), 90–102.

Maghanga, M., & Kalio, A. (2014). The effect of financial leverage on the financial performance of listed firms in Kenya: Evidence from Kenya Power. *European Journal of Business and Management, 6*(13), 78–85.

McColgan, P. (2001). Agency theory and corporate governance: A review of the literature from a UK perspective. *SSRN Working Paper*.

Megersa, D. (2014). The advantage of using panel data in economic research: Evidence from the OECD countries. *International Journal of Economics and Finance Studies, 6*(2), 33–40.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review, 53*(3), 433–443.

Mostafa, W., & Boregowda, S. (2014). A brief review of capital structure theories. *Research Journal of Economics and Business Studies, 3*(2), 60–65.

Mureithi, A., & Karanja, J. (2017). Effects of interest coverage ratio on profitability of agricultural cooperatives in Kenya. *International Journal of Business and Social Science, 8*(4), 230–236.

Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance, 39*(3), 575–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187–221.

Ng'ang'a, J., & Kiragu, J. (2021). Influence of interest coverage ratio on financial performance of Kenyan agricultural cooperatives. *International Journal of Business and Management Review, 9*(1), 34–45.

Persson, K., & Ridderström, J. (2014). The trade-off theory of capital structure: Empirical evidence from listed firms. *Journal of Financial Economics, 10*(2), 120–134.

Raza, A. (2013). Impact of financial leverage on firm performance in non-financial sector of Pakistan. *Journal of Finance and Accounting, 4*(1), 14–20.

Saunders, M., Thornhill, A., & Lewis, P. (2009). *Research methods for business students* (5th ed.). Pearson Education.

Shahar, R., Ma'atoofi, A., & Yusuf, N. (2015). Trade-off and pecking order theories in SMEs' capital structure decisions. *International Journal of Business and Management, 10*(5), 230–242.

Singh, P., & Bansal, S. (2016). Financial leverage and firm value: Evidence from FMCG sector in India. *Pacific Business Review International, 8*(6), 85–93.

Smith, J. A. (1998). *Positivism and beyond.* Open University Press.

Solomon, E. (1963). Leverage and the cost of capital. *Journal of Finance, 18*(2), 273–277.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance, 43*(1), 1–19.

Wamugo, L., Muathe, S. M., & Kosimbei, M. G. (2014). Relationship between capital structure and performance of non-financial companies listed in the Nairobi Securities Exchange. *International Journal of Social Sciences and Entrepreneurship, 1*(12), 453-469.