Research Article

# Determinants of Corporate Financial Performance in African Insurance Market

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**The objective of this study was to determine the key determinants of corporate financial performance in the African insurance market. Quantitative research was employed. The researchers employed multiple regression models. The results of this study evidenced that internal factors, including underwriting risk, liquidity management, reinsurance, premium growth, capital adequacy, firm size, and firm age, affect the financial performance of insurance firms in Africa. Similarly, the study revealed that external factors, such as GDP and inflation rate, influence the financial performance of insurance firms in Africa. The researchers provided possible recommendations for policymakers and insurance firms across Africa.**

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## Introduction

The African insurance market plays a crucial role in promoting economic stability and resilience in the region. However, understanding the determinants of corporate financial performance within this market is essential for sustainable growth and profitability. This study aims to identify and analyze the key factors that influence corporate financial performance in the African insurance market. By examining these determinants, policymakers, industry practitioners, and researchers can gain valuable insights into enhancing the financial performance of insurance companies in Africa. The economic environment significantly affects the financial performance of insurance companies in Africa. Factors such as GDP growth, inflation rates, and interest rates can impact the demand for insurance products and services. For instance, during periods of economic downturns, decreased consumer spending and increased unemployment may lead to reduced insurance premiums. Conversely, a stable and growing economy may result in increased consumer purchasing power and higher demand for insurance products (Agyei-Mensah, 2018). Therefore, understanding the relationship between economic factors and corporate financial performance is crucial for insurance companies operating in the African market.

The regulatory environment plays a pivotal role in shaping the financial performance of insurance companies in Africa. Regulatory frameworks that promote transparency, accountability, and consumer protection are essential for building trust and confidence in the insurance industry. Effective regulation ensures that insurance companies adhere to solvency requirements, maintain proper risk management practices, and protect policyholders' interests (Babajide & Bankole, 2016). Inadequate regulation, on the other hand, can lead to financial instability, increased risk exposure, and poor financial performance. Therefore, understanding the impact of regulatory frameworks on corporate financial performance is crucial for fostering a healthy and sustainable insurance market in Africa. The level of competition within the African insurance market significantly influences corporate financial performance. Intense competition can lead to price wars, reduced profit margins, and increased customer churn. On the other hand, a balanced competitive landscape can incentivize insurance companies to innovate, offer better products and services, and improve

overall financial performance (Kehinde & Babajide, 2019). Therefore, analyzing the impact of market competition on corporate financial performance is crucial for insurance companies seeking sustainable growth and profitability in Africa.

Effective risk management is essential for insurance companies to maintain financial stability and performance. The African insurance market is exposed to various risks such as underwriting risks, investment risks, and operational risks. Companies with robust risk management practices are better equipped to identify, assess, and mitigate these risks, thereby safeguarding their financial performance (Ibrahim & El-Nahas, 2017). Conversely, poor risk management can lead to significant financial losses, reduced profitability, and potential insolvency. Therefore, understanding the relationship between risk management practices and corporate financial performance is critical for insurance companies operating in Africa. The effectiveness of corporate governance practices plays a crucial role in determining corporate financial performance in the African insurance market. Strong corporate governance frameworks promote transparency, accountability, and ethical behavior, which are essential for building trust among stakeholders. Companies with well-defined governance structures are more likely to make sound financial decisions, manage conflicts of interest, and achieve sustainable financial performance (Babajide & Bankole, 2016). Conversely, weak corporate governance practices can lead to mismanagement, fraud, and poor financial performance. Therefore, examining the impact of corporate governance on corporate financial performance is essential for insurance companies operating in Africa.

Understanding the determinants of corporate financial performance in the African insurance market is crucial for sustainable growth and profitability. By analyzing economic factors, the regulatory environment, market competition, risk management practices, and corporate governance, this study aims to provide valuable insights into enhancing financial performance within the African insurance market. The findings of this research will contribute to the existing literature and provide practical implications for policymakers, industry practitioners, and researchers seeking to strengthen the financial performance of insurance companies in Africa. The subject of determinants of corporate financial performance in the insurance industry has become a burning issue in the African insurance market due to the fact that the sustainability of insurance firms is the most important sector in any economy in the world. The financial performance of insurance companies is also relevant within the macroeconomic context, as the insurance industry is one of the financial system's components, fostering economic growth and stability (Burca & Batrinca, 2014).

Insurance business nowadays plays a significant role in the growth of the financial services, ultimately contributing to the overall success of the economy. Therefore, examining the determinants of organizations' performance has gained importance in the corporate finance literature. However, in the context of the insurance sector, it has received little attention, particularly in Africa (Hermes & Hudon, 2018). The financial performance of insurance companies can be analyzed at both the micro and macroeconomic levels, being determined by internal factors represented by specific characteristics of the company and external factors related to connected institutions and the macroeconomic environment (Deyganto & Alemu, 2019).

In prior studies, the determinants of corporate financial performance by insurance firms are less understood, and no substantive work using multiple insurance outcomes over a number of years has been undertaken. The concerns raised in reviews of individual insurance businesses in Ethiopia and normative discussions of what should constitute best practice do point to the need for a better understanding of the factors contributing to financial performance. This study, therefore, identifies and provides a framework for undertaking research related to factors affecting corporate financial performance in the insurance sector operating in Africa. Even though many studies have been conducted to identify the determinants of firm financial performance in different sectors, there are limited studies conducted in the insurance sector in Ethiopia. The empirical analysis of factors contributing to financial performance in relation to the insurance market is still at an immature stage, and this justifies the need to conduct more studies in this field to enhance the development of the insurance market.

The empirical studies of researchers such as Ayele (2012); Burca & Batrinca (2014); Meher & Zewudu (2020); Ejigu (2016); Karadağ Erdemir (2019); Sambasivam & Ayele (2013); Deyganto & Alemu (2019); Berhe & Kaur (2017); Hartarska & Mersland (2012); Hailegebreal (2016); Meher & Zewudu (2020); Sharma, Jadi, & Ward (2018); Kanbiro & Ayneshet (2019) have found that the financial performance of insurance firms is influenced by both internal and external factors. However, the aforementioned studies failed to address the literature and methodology gap by incorporating small-sized insurance firms in their samples. The maximum number of MFIs incorporated in their studies was 10. This study aims to improve the sample size by including 170 observations, considering 17 insurance firms in Africa with at least 10 years of audited financial statements. The researcher aims to identify the effects of underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate as explanatory variables on the profitability of selected MFIs from 2010 up to 2022 G.C. This is necessary for policy guidance on the effect of each specific variable on the profitability of insurance firms in Africa.

On the other hand, from the researcher's level of knowledge, there is limited research on similar topics in Ethiopia, and it will contribute to the existing stage of the study of corporate financial performance of insurance firms in Africa. Therefore, filling the aforementioned gaps is the aim of this research. Hence, the aforementioned studies failed to disclose the literature and methodology gap by incorporating those small-sized insurance firms in their samples. The maximum number of MFIs incorporated in their studies was 10. However, this study will improve the sample size to 221 observations by considering 17 insurance firms in Ethiopia, which have at least 13 years of audited financial statements. So, the researcher aims to identify the effect of underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate as explanatory variables on the profitability of selected MFIs from 2010 up to 2022 G.C for the necessity of policy guidance on the effect of each specific variable on the profitability of insurance firms in Africa. On top of that, there are a number of insurance companies cropping up in different parts of the country. Therefore, this study attempts to analyze the determinants of corporate financial performance in the insurance market in Africa.

## Research Objectives

The general objective of the study is to analyze the determinants of the financial performance of African insurance firms. In line with the general objective, the study will have the following specific objectives:

- To establish the effect of internal factors: underwriting risk, liquidity management, reinsurance, premium growth, capital adequacy, firm size, and firm age on the financial performance of insurance firms in Africa.
- To examine the impact of external factors: GDP and inflation rate on the financial performance of insurance firms in Africa.

## 2. Literature Review

### *2.1. Corporate Financial Performance*

Corporate financial performance refers to the assessment of a company's financial health and profitability. It encompasses various financial indicators such as revenue growth, profitability ratios, return on assets, and return on equity. Evaluating corporate financial performance is crucial for investors, stakeholders, and management to gauge the efficiency, effectiveness, and sustainability of a company's operations. It helps in measuring the company's ability to generate profits, manage risks, and create value for its shareholders. Understanding and analyzing corporate financial performance aids in making informed decisions regarding investment, strategic planning, and performance evaluation (Ross, Westerfield, & Jordan, 2018).

### *2.2. Empirical Review and Hypotheses Development*

The insurance firms operating in Africa are influenced by internal and external factors. The empirical findings in relation to the relationship between the dependent variable and independent variables have been explained in the following table. This study has identified significant variables that affect the profitability of insurance firms in Africa. Underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate serve as explanatory variables. Therefore, the details of each variable have been discussed below.

| Category | Variables | Measurement | Sign expected |
|---|---|---|---|
| **Dependent variables** | **Return on Asset (ROA):** Return on asset is a financial ratio that shows the percentage of profit that a company earns in relation to its overall resources (Dissanayake, 2012). | ROA = $\frac{Net\ income}{Total\ Asset}$ | |
| **Independent Variables** | **Underwriting risk** is the risk of loss borne by an underwriter. In insurance, underwriting risk may arise from an inaccurate assessment of the risks associated with writing an insurance policy or from uncontrollable factors. As a result, the insurer's costs may significantly exceed earned premiums (Deyganto and Alemu, 2019). | Natural log of the loss borne by an underwriter | (+) |
| | **Reinsurance** is insurance for insurance companies. It's a way of transferring or "ceding" some of the financial risk insurance companies assume in insuring cars, homes, and businesses to another insurance company, the reinsurer. It has a positive effect on firm performance (Abebe & Abera, 2019). | Natural log of the financial risk borne by an underwriter. | (+) |
| | Growth of premium: Increasing the number of policyholders (exposure growth). Growth of insurance has a positive effect on ROA (Deyganto and Alemu, 2019). | Natural log of the growth of premium by an underwriter. | (+) |
| | **Size of insurance firms:** The size of a business unit means the size of a business firm. It means the scale or volume of operation turned out by a single firm. The study of the size of a business is important because it significantly affects the efficiency and profitability of the firm (Agyei-Mensah, 2018). Another control factor that can affect the financial performance of banks in Ethiopia is its size. The longer the age of the firm, the higher its profitability (Burca & Batrinca, 2014). | Measured as the natural logarithm of total assets at year-end. | (+) |
| | **Capital adequacy ratio:** The ratio of Equity to total Asset is employed as a measure for Capital Adequacy. This measures the percentage of the total asset that is financed with equity or capital. Capital adequacy, therefore, describes the sufficiency of the amount of equity that can absorb shocks that the firm may experience. If a firm has adequate capital, its profitability will increase (Berhe & Kaur, 2017). | CAR = $\frac{Equity}{Total\ Assets}$ | (+) |
| | **Leverage:** Financial structure is the explicit mix of long-term debt and common equity that a firm uses to finance its operations. It refers to the balance between all of the firm's liabilities and its equities. | DER = $\frac{Total\ Debt}{Total\ Equity}$ | (+) |
| | **Age of firm:** One can measure firm age as the time between the initial creation of a firm and the present time (in years). One can measure firm age as the time between its going public and the present time (also in years) (Kehinde & Babajide, 2019). | Measured as the natural logarithm of the total number of years since establishment. | (+) |


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| Category | Variables | Measurement | Sign expected |
|---|---|---|---|
| | **Liquidity Management (LM):** Liquidity is another factor that determines the level of banks' performance. Liquidity refers to the ability of the bank to fulfill its obligations, mainly of deposits. In line with the theory of agency costs, empirical studies conducted in Ethiopia by (Lee, 2014). | LR = $\frac{\text{Current Asset}}{\textit{Current Liability}}$ | (-) |
| | **GDP:** Loan ratio is a ratio that measures the proportion of non-performing loans as against the total loans for a period. An increase in the GDP of a nation has a positive effect on ROA (Akinlo, 2012). | Measured as the market value of goods and services produced within the country's borders. | (+) |
| | **Inflation:** Another control factor that can affect the financial performance of banks in Ethiopia is inflation. According to the regression results of studies conducted in Ethiopia by Ayele (2012). | Calculate the inflation rate by subtracting the past date CPI from the current date CPI and then divide your answer by the past date CPI. Multiply the result by 100. Your answer is the inflation rate as a percentage. | (-) |

**Table 1.** Description of Variables and Hypotheses Formulation

### *2.3. Conceptual Framework*

Different empirical evidence suggests that the financial performance of financial institutions, specifically insurance firms, is affected by different factors. This study will use insurance financial performance by considering underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate as explanatory variables. The study will identify how these variables affect the financial performance of insurance in Africa.

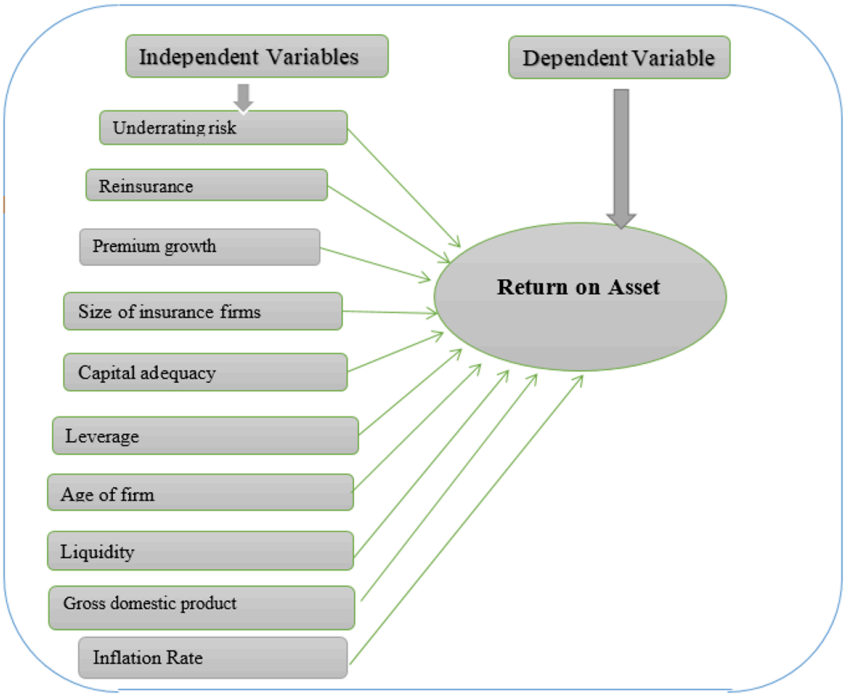


**Figure 1.** Conceptual Framework of the study

## 3. Methods

### *3.1. Research Approach*

As noted by Creswell (2009), the choice among the three research approaches (qualitative, quantitative, and mixed) is mainly guided by the research problem, apart from the underlying philosophy of each research method. In this study, a quantitative approach will be applied to meet the overall objective of the study and to answer research hypotheses and questions. In quantitative analysis, the researcher will use the following methods: First, correlation will be used to measure the degree of relationship between different variables under consideration. Second, regression analysis will be conducted to estimate the magnitude and direction of causal relationships between the chosen dependent and independent variables. Third, descriptive analysis will be conducted to estimate the mean, median, variance, and standard deviation.

### *3.2. Research Design*

A research design is a plan, structure, and strategy of investigation conceived to obtain answers to research hypotheses. The purpose of this research is to identify the effect of corporate governance of MFIs on financial performance measured through ROA. According to Gujarati (2004), using a Panel or longitudinal research design has advantages as it explicitly takes heterogeneity into account by allowing for individual-specific variables. By combining time series and cross-section observations, panel data provide "more informative data, more variability, less collinearity among variables, more degrees of freedom, and more efficiency." Studying the repeated cross-section of observations, panel data are better suited to study the dynamics of change and can better detect and measure effects that cannot be observed in pure cross-section or pure time series data. By making data available for several

thousand units, panel data can minimize the bias that might result if we aggregate individuals or firms into broad aggregates. Hence, the researchers used a panel research design to achieve the objective of this research.

### *3.3. Sampling Design*

Therefore, the target population for this particular study will be the 17 insurance institutions currently operating in Africa.

| Target population | Sampling techniques | Sample size |
|---|---|---|
| Currently, there are 107,571 insurance firms operating in Africa. | Purposive sampling | All 17 oldest insurance firms such as:<br><br>1. Old Mutual (South Africa) - Established in 1845<br>2. Sanlam (South Africa) - Established in 1918<br>3. Hollard Insurance (South Africa) - Established in 1980<br>4. Liberty Holdings (South Africa) - Established in 1957<br>5. Mutual & Federal (South Africa) - Established in 1831<br>6. Santam (South Africa) - Established in 1918<br>7. Saham Assurance (Morocco) - Established in 1949<br>8. Egyptian Takaful Life Insurance (Egypt) - Established in 2005<br>9. Ghana Union Assurance (Ghana) - Established in 1962<br>10. Botswana Insurance Company (Botswana) - Established in 1975<br>11. Mauritius Union Assurance (Mauritius) - Established in 1948<br>12. Namibian Insurance Association (Namibia) - Established in 1947<br>13. The Gambia National Insurance Company (Gambia) - Established in 1976<br>14. African Insurance Organization (Various African countries) - Established in 1972<br>15. Compagnie Française d'Assurance pour le Commerce Extérieur (CFAO) (Various African countries) - Established in 1855<br>16. National Insurance Corporation of Nigeria (Nigeria) - Established in 1969<br>17. Continental Reinsurance (Nigeria) - Established in 1985 |

**Table 2.** Sampling Design

*Source:* *https://www.atlas-mag.net/en/article/top-100-insurance-companies-in-africa*

The criterion for insurance to be included in the study required companies to have an eleven-year audited financial statement, particularly balance sheets and income statements, covering a period from 2010 to 2022 inclusive, which have been collected

through detailed document review.

### *3.4. Data Collection & Analysis*

To gather the necessary data, copies of audited financial statements in the form of income statements and statements of financial position over the period from 2010 to 2022 were used. The aim of this section is to briefly explain the various methods that will be chosen to analyze the quantitative and qualitative data. The quantitative data obtained from the company will be analyzed using MS Office Excel application and SPSS, and will be interpreted in percentages, tables, and graphs. The analysis of the relationship between dependent and independent variables is performed using correlation, regression methods, and descriptive statistics.

### *3.5. Model Specifications*

Financial performance of insurance firms is a quantitative variable that can be measured through multiple linear regression models. In the multiple linear regression model, the dependent variable financial performance (ROA) and 10 independent variables, and the error (represented by u), the model is given by the following.

$$ROAit = \beta 0 + \beta 1 * URit + \beta 2 * RIit + \beta 3 * GPit + \beta 4 * SIFit + \beta 5 * CAit + \beta 6 * LEVit + \beta 7 * AGit + \beta 8 * LMIit + \beta 9 * GDP + \beta 10 * IR + Uit \quad (1)$$

## 4. Results

The researchers analyzed 17 insurance firms operating in Africa using secondary balanced panel data from 2010 to 2022. This data offers a comprehensive overview of the African insurance industry over a significant period of time, providing us with valuable insights into market trends and firm performance. The results are presented in the form of summary tables, and descriptive statistics, correlation, and regression analysis are used to analyze the data to achieve the research objective, and the findings were discussed.

### *4.1. Descriptive Statistics*

Descriptive statistics summarize and describe the main features of a dataset. It includes methods for organizing, summarizing, and presenting data in a meaningful and informative way. Researchers and analysts use common descriptive statistics such as measures of central tendency (mean, median, and mode), measures of variability (range, variance, and standard deviation), and measures of correlation (covariance and correlation coefficient) to understand the dataset's characteristics, identify patterns and trends, and draw conclusions about the population from which the data was collected. Exploratory data analysis often employs descriptive statistics to better comprehend the data before applying more advanced statistical techniques. This section presents the descriptive statistics of dependent and independent variables used in the study for the sampled private commercial banks. The dependent variables used in this study were ROA, while the independent variables were underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate as explanatory variables. Table 3 demonstrates the mean, maximum, and minimum values, and standard deviation of the dependent and independent variables over the study period.

| Variables | ROA | UR | RI | PG | FA | CA | LVE | FS | LM | GDP | INF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mean** | 0.162174 | 4.093136 | 0.584385 | 4.114109 | 3.738110 | 3.863600 | 2.627172 | 0.108921 | 6.392647 | 1.064329 | 6.008585 |
| **Maximum** | 0.784520 | 8.293300 | 0.892000 | 7.384900 | 7.385400 | 11.87560 | 7.384900 | 0.669566 | 21.25000 | 23.44912 | 9.854500 |
| **Minimum** | 0.005300 | -0.592300 | 0.005300 | 0.000000 | 0.245500 | 1.104600 | 0.488180 | 0.001200 | 1.104600 | 0.000200 | 0.055851 |
| **Std. Dev.** | 0.250023 | 2.608876 | 0.195611 | 2.755210 | 2.231605 | 2.615699 | 2.407517 | 0.164659 | 6.947154 | 2.926940 | 3.150249 |
| **Observations** | 221 | 221 | 221 | 221 | 221 | 221 | 221 | 221 | 221 | 221 | 221 |

**Table 3.** Summary of Descriptive Statistics

*Source: Computed from E-views 10 results, 2023*

According to Table 3 above, the financial performance of insurance firms, as measured by ROA (net income to total assets), is based on 221 observations (panel data of 17 firms for 13 years from 2010 to 2022). The mean value is 16.21 percent. This result indicates that, on average, the sampled insurance firms earned a profit of 0.162174 cents for every birr invested in their assets. The maximum ROA was 78.452 percent, while the minimum was 0.5 percent, with a standard deviation of 0.250023. This shows that profitable firms earned 0.784520 cents of profit for each birr invested in their assets. In contrast, the least profitable firms earned only 0.005300 cents of profit for every birr invested in their assets during the study period. The standard deviation of 0.250023 shows the profitability variations among insurance firms. Regarding the explanatory variables presented in Table 3 above, underwriting risk (UR) also has a mean value of 4.093136 percent. This mean value suggests that 4.093136 cents of one birr of assets were invested in underwriting risk (UR). The maximum value of underwriting risk (UR) was 8.293300 percent, while the minimum value was -0.592300 percent, with a standard deviation of 2.608876. This indicates that companies with high underwriting risk (UR) have 8.293300 percent, and companies with low underwriting risk (UR) have -0.592300 percent. Reinsurance (RI) also has a mean value of 0.584385 percent. The mean value suggests that 0.584385 cents of one birr of assets were invested in reinsurance (RI). The maximum value of Reinsurance (RI) was 0.892000 percent, and the minimum value was 0.005300 percent, with a standard deviation of 0.195611. This indicates that companies with high Reinsurance (RI) have 0.892000 percent reinsurance, and companies with low reinsurance (RI) have 0.005300 reinsurance. Growth of premium (PG) also has a mean value of 0.584385 percent. The mean value suggests that 4.114109 cents of one birr of assets were invested in Growth of premium (PG). The maximum value of Growth of premium was 7.384900 percent, and the minimum value was 0.000000 percent, with a standard deviation of 0.195611. This indicates that companies with high Growth of premium have 7.384900 percent growth, and companies with low Growth of premium have 0.000 growth. Firm age (FA) also has a mean value of 0.584385 percent. The mean value suggests that 0.584385 cents of one birr of assets were invested in firm age (FA). The maximum value of firm age was 21.25000 percent, and the minimum value was 0.005300 percent, with a standard deviation of 6.947154. This indicates that companies with a long age have a 21.25000 percent profit, and companies with a short age generated 1.104600 profit. Capital adequacy ratio (CA) also has a mean value of 6.008585 percent. This mean value suggests that 6.008585 cents of one birr of assets were invested in sufficient capital. The maximum value of capital adequacy was 9.854500 percent, and the minimum value was 0.055851 percent, with a standard deviation of 3.150249. This indicates that companies with high capital adequacy have 9.854500 percent capital adequacy, and companies with low capital adequacy have 0.055851 percent. Leverage (LEV) also has a mean value of 3.863600 percent. The mean value suggests that 3.863600 cents of one

birr of assets were invested in a mix of debt and equity capital. The maximum value of leverage was 11.87560 percent, and the minimum value was 1.104600 percent, with a standard deviation of 2.615699. This indicates that companies with high leverage have 11.87560 percent leverage, and companies with low leverage have 1.104600 percent. Firm size (FS) also has a mean value of 1.064329 percent. The mean value suggests that 1.064329 cents of one birr of assets were invested in assets. The maximum value of firm size was 0.892000 percent, and the minimum value was 0.005300 percent, with a standard deviation of 0.195611. This indicates that companies with high firm size have 0.892000 percent profit, and companies with low size have 0.000200 percent. Liquidity Management (LM) also has a mean value of 3.738110 Br. This mean value suggests that, on average, the insurance firms operating in Ethiopia have 3.738110 Br in liquidity. The maximum value of liquidity was 7.385400 Br, and the minimum value was 0.245500 cents, with a standard deviation of 0.195611. This indicates that companies with high liquidity have a liquidity value of 7.385400 Br, while the minimum value of liquidity is 0.245500. The mean value of GDP, which is 0.108921 percent, indicates that GDP has a positive contribution to financial performance by 10 cents. The minimum and maximum values are 0.669566 percent and 0.001200 percent, respectively. The standard deviation of GDP statistics shows that the values range 0.164659 percent from its mean. Gross domestic product (GDP) tracks the health of a country's economy. It represents the value of all goods and services produced over a specific time period within a country's borders. Economists can use GDP to determine whether an economy is growing or experiencing a recession. Inflation has a mean value of 2.627172 percent. Inflation is the rate at which the value of a currency is falling, and consequently, the general level of prices for goods and services is rising. The mean value of inflation indicates that sampled firms were leveraged on average 2.627172 times their equity. The maximum value of the gearing ratio was 7.384900 percent, and the minimum value was 0.488180 percent, with a standard deviation of cents to 2.407517 percent.

### *4.2. Correlation Analysis Among Variables*

Correlation analysis is a statistical technique that researchers use to determine if there is a relationship between two variables and, if so, to what extent. It measures the degree to which the variables move together, which can be positive (they move in the same direction), negative (they move in opposite directions), or neutral (there is no relationship between them). The resulting correlation coefficient ranges from -1 to 1, with 0 indicating no correlation and -1 or 1 indicating a perfect negative or positive correlation, respectively. The following table shows the result of correlation analysis to determine the relationship between the dependent variable (ROA) and the independent variables, which include underwriting risk, reinsurance, premium growth, firm size, educational age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product, and inflation rate as explanatory variables.

| | ROA | UR | RI | PG | FA | CA | LVE | FS | LM | GDP | INF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ROA** | 1 | | | | | | | | | | |
| **UR** | 0.69969 | 1 | | | | | | | | | |
| **RI** | 0.2036658 | -0.09967 | 1 | | | | | | | | |
| **PG** | 0.643558 | 0.832166 | -0.1169260 | 1 | | | | | | | |
| **LM** | -0.51428 | 0.68243 | -0.29100 | 0.68019848 | 1 | | | | | | |
| **FA** | 0.052022 | -0.131327 | 0.06788709 | -0.21908578 | -0.17837191 | 1 | | | | | |
| **LEV** | 0.38451004041 | 0.549310 | 0.26856 | 0.5668 | 0.3344 | -0.399990 | 1 | | | | |
| **FS** | 0.65649 | -0.50693 | -0.5048956 | -0.464513 | -0.2361233 | 0.09342 | -0.5075 | 1 | | | |
| **LM** | -0.90562363 | -0.79357611 | 0.16856284 | -0.84498349 | -0.65178044 | 0.2019948 | -0.47651683 | 0.64547772 | 1 | | |
| **GDP** | 0.7409047 | -0.5204375 | 0.162451 | -0.51320 | -0.41043 | 0.163287 | -0.295256 | 0.482256 | 0.679494459 | 1 | |
| **INF** | -0.9106572 | 0.46355049 | -0.22845169 | 0.3764557 | 0.356258 | 0.02587 | 0.19229396 | -0.60351 | -0.74865210 | -0.6701583 | 1 |

**Table 4.** Correlation Matrix of Variables

*The analysis is based on a 1% and 5% significance level.*

*Source: Computed from E-views 10 results (2023).*

Correlation analysis is a statistical method used to evaluate the strength and direction of the relationship between two or more variables (Bujang & Baharum, 2016). It is commonly employed in research to determine how closely two variables are related. The correlation coefficient, which ranges from -1 to 1, is used to quantify this relationship. A correlation coefficient of 1 indicates a perfect positive correlation, meaning that as one variable increases, the other variable also increases. Conversely, a correlation coefficient of -1 indicates a perfect negative correlation, implying that as one variable increases, the other variable decreases. A correlation coefficient of 0 suggests no linear relationship between the two variables.

To conduct a correlation analysis, you would typically follow these steps:

1. Define the problem: Identify the variables you believe might be related.
2. Data collection: Collect data on the variables of interest.
3. Data inspection: Check the data for errors or anomalies such as outliers or missing values.
4. Choose the appropriate correlation method: Select the most suitable method based on your data.
5. Compute the correlation coefficient: Calculate the correlation coefficient using statistical software or formulas.
6. Interpret the results: Analyze and interpret the obtained correlation coefficient.
7. Check the significance: Test the statistical significance of the correlation.

It's important to note that correlation analysis does not imply causation; it merely identifies relationships between variables (Hussen, 2023).

As shown in the table 4 above, reinsurance, premium growth, firm size, Age, capital adequacy, leverage ratio, gross domestic product, as explanatory variables, were positively correlated with ROA with correlation coefficients of 0.1203098, 0.499937, 0.486274719, 0.32362345, 0.101678520, 0.38267599, 0.2077397, and 0.03654225. This correlation shows that the coefficient of reinsurance (-0.6996957), liquidity (-0.5142890865710276), and inflation (-0.384511) increases return on asset also moves in the same direction. This implies that as these variables increase, return on asset moves in the opposite direction.

### *4.3. Results of Regression Analysis*

### *Random versus Fixed Effect Model*

The results so far indicate that all CLRM assumptions were not violated, the OLS regression was BLUE, and can be safely applied. However, since this study used panel data, there are two types of panel estimator approaches that can be employed, namely: fixed effects models (FEM) and random effects models (REM) to robustly the OLS regression results and give more valid results. According to Brooks (2008), there are broadly two classes of panel data estimator approaches that can be employed in financial research. These are fixed effect models and random effect models. Fixed effects models allow the intercept in the regression model to differ cross-sectionally but not over time, while all of the slope estimates are fixed both cross-sectionally and over time. An alternative to the fixed effects model described above is the random effects model, which is sometimes also known as the error components model. As with fixed effects, the random effects approach proposes different intercept terms for each entity, and again these intercepts are constant over time, with the relationships between the explanatory and explained variables assumed to be the same both cross-sectionally and temporally. In order to choose and apply the appropriate model, the hypothesis was developed and tested by the Hausman specification test. The null hypothesis is: random effect model is appropriate, and the alternative hypothesis is: fixed effect model is appropriate. If the p-value is greater than 5 percent, the null hypothesis should be accepted; otherwise, the alternative hypothesis. Based on the Hausman specification test in the model, the random effect model can be appropriate for the estimation of the model since the p-value of the model is greater than 5 percent.

- H0: Random Effects model is appropriate
- H1: Fixed Effects model is appropriate

**Decision Rule:** Reject H0 if p-value is less than significance level 0.05. Otherwise, do not reject.

| Correlated Random Effects - Hausman Test | | | |
|---|---|---|---|
| Equation: Untitled | | | |
| Test cross-section random effects | | | |
| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | P-value |
| Cross-section random | 32.746015 | 10 | 0.567 |

**Table 5.** Hausman Test on ROA model

*Source: computed from E-views 10 results (2023)*


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As shown in Table 7, the Hausman specification test, the P-value for the ROA model was (0.567), which is greater than 0.05. Hence, the null hypothesis of the random effect model is appropriate and fails to be rejected at the 5 percent significance level. This implies that the random effect model is more appropriate than the fixed effect model in order to robustly improve the OLS regression results and provide more valid results.


doi.org/10.32388/52669M

| | | | | |
|---|---|---|---|---|
| Dependent Variable: ROA | | | | |
| Method: Panel EGLS (Cross-section fixed effects) | | | | |
| Date: 09/17/23. Time: 05:00 | | | | |
| Sample: 2010-2022 | | | | |
| Periods included: 13 | | | | |
| Cross-sections included: 17 | | | | |
| Total panel (balanced) observations: 221 | | | | |
| Swamy and Arora estimator of component variances | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| UR | 0.006413 | 0.002397 | 2.675785 | 0.0080 |
| RI | 0.014029 | 0.002825 | 4.966437 | 0.0000 |
| PG | 0.083087 | 0.041953 | 1.980472 | 0.0490 |
| FS | 0.036643 | 0.003353 | 10.92725 | 0.0000 |
| CA | 0.005961 | 0.001678 | 3.552229 | 0.0005 |
| LEV | 0.029789 | 0.065223 | 0.456724 | 0.0483 |
| FA | 0.006983 | 0.004280 | 1.631697 | 0.042 |
| LM | -0.008143 | 0.002392 | -3.403777 | 0.0008 |
| GDP | 0.015391 | 0.002142 | 7.183826 | 0.0000 |
| INF | -0.008002 | 0.001743 | 4.590009 | 0.0000 |
| C | 0.272789 | 0.060150 | 4.535166 | 0.0000 |
| | | | | |
| | | | | |
| | Effects Specification | | | |
| | | | S.D. | Rho |
| Cross-section random | 0.012601 | 0.0637 | | |
| Idiosyncratic random | 0.048322 | 0.9363 | | |
| | Weighted Statistics | | | |
| | | | | |
| | | | | |
| R-squared | 0.933517 | Mean dependent var | 0.118150 | |
| Adjusted R-squared | 0.930351 | S.D. dependent var | 0.192761 | |
| S.E. of regression | 0.050872 | Sum squared resid | 0.543469 | |


doi.org/10.32388/52669M

| | | | | |
|---|---|---|---|---|
| F-statistic | 294.8698 | Durbin-Watson stat | 1.313342 | |
| Prob(F-statistic) | 0.000000 | | | |
| | Unweighted Statistics | | | |
| R-squared | 0.957962 | Mean dependent var | 0.162174 | |
| Sum squared resid | 0.578131 | Durbin-Watson stat | 1.234600 | |

**Table 6**. Random effect regression results on ROA model

*The analysis was conducted based on 1(***), 5(**), and 10(*) percent significant levels.*

*Source: Computed from E-views 9 result (2023)*

R-squared is the coefficient of determination. It is the proportion of the variance in the dependent variable that is predictable/explained. Adjusted R-squared is the modified form of R-squared adjusted for the number of independent variables in the model. Estimations result of the operational panel regression model used in this study was presented in table 8 above. R-squared was measured the goodness of fit of the explanatory variables in explaining the variations in financial performance of insurance companies measured by ROA. As shown in the table above, adjusted R-squared value was 93. The result indicates that 93 percent variation in the dependent variable was explained by the explanatory variables in the model. That means the explanatory variables (underwriting risk, reinsurance, premium growth, firm size, Age, capital adequacy, leverage ratio, liquidity ratio, gross domestic product and inflation rate are jointly explain about 93 percent of the variation in the return on asset. The remaining 7 percent of the variation in the financial performance (as measured by return on asset) explained by other variables which are not included in the model (see table 8).

ROA = 0.272789+0.006413*UR+0.014029*RI+ 0.083087*PG+0.036643*FS+0.005961*CA+0.029789*LEV+0.006983*F-0.008143*LM+ 0.015391*GDP + -0.008002*INF

Beside this, F-statistics (294.8698), which is used to test the overall significance of the model, was presented, and the null hypothesis can be clearly rejected at the 1 percent level of significance, since the p-value was (0.0000), which was sufficiently low. This indicates the reliability and validity of the model at the 1 percent level of significance. The coefficients of underwriting risk (0.006413), premium growth (0.083087), capital adequacy (0.005961), leverage (0.029789), firm age (0.006983), reinsurance (0.014029), and GDP (0.015391) respectively show that a one-unit change has a positive effect on the financial performance of commercial banks. On the other hand, liquidity management (-0.008143) and inflation (-0.008002) have negative effects on the financial performance of insurance firms operating in Ethiopia, meaning that a one-unit change in reinsurance, liquidity management, and inflation has a -0.014029, -0.008143, and -0.008002 unit change in financial performance in the opposite direction. Based on the results shown in Table 8 above, all explanatory variables except leverage and firm age had statistical significance.

## 5. Discussion

It is crucial to thoroughly examine and interpret the results of a regression analysis in order to draw meaningful conclusions. When discussing the regression results, it is essential to explain the overall significance of the model, the strength and direction of each

variable's relationship with the dependent variable, and any potential issues or limitations of the analysis. Moreover, it is important to consider the practical implications of the results and how they can inform decision-making or future research. The main objective of this study is to analyze factors affecting the financial performance of insurance firms in Ethiopia. Based on previous studies and the findings of this study, this section discusses the general results obtained via the Random Effect Regression Model, as shown in the above Table 4.8. Referring to the literature, the results of each explanatory variable, including their impact on the level of ROA, are discussed.

When it comes to maximizing profitability, there are several theories to consider. Marginal Analysis Theory focuses on incremental costs and revenues associated with a decision. Agency Theory looks at aligning the interests of business owners and managers. Market Power Theory suggests exercising market power to increase profitability. Transaction Cost Theory aims to minimize costs associated with contracting, negotiation, and monitoring. Resource-Based Theory emphasizes leveraging unique resources and capabilities. Stakeholder Theory considers the interests of all parties involved in achieving long-term profitability. Game Theory examines strategic interactions between competitors. Capital Asset Pricing Model focuses on the relationship between risk and return. Cost-Benefit Analysis Theory involves weighing the costs and benefits of a decision. Finally, Behavioral Finance Theory looks at mitigating psychological biases and irrational behavior in decision-making. To test these hypotheses, the study employed random-effect generalized least squares (GLS). Considering the research hypotheses in Chapter Three, the researcher discussed the findings of this study as follows.

Concerning the underwriting of insurance firms, the regression result of this study showed that it has a positive and statistically significant effect on ROA with (β=0.006413) and is significant at the 1% level of significance because the p-value of 0.0008 is less than 0.01. Therefore, the researcher accepted H1. This finding is similar to the findings of studies by Deyganto and Alemu (2019), who found that underwriting has a positive effect on ROA. This finding is also supported by the ideas of the Market Power Theory, which suggests that exercising market power has a positive effect on profitability. The result in Table 8 shows that there is a positive and significant relationship between the number of reinsurance and ROA. An increase in investment in reinsurance leads to an increase in insurance firm profitability (ROA). The p-value is less than 0.05; therefore, the number of ROA has a significant effect on the profitability of the insurance firm.

The regression results, as shown in Table 8, confirm that the variable has a positive and statistically significant effect on ROA with a regression coefficient of (β= 0.014029), and the p-value is 0.000 at the 1% significance level. Therefore, the researcher accepts H2. There is still controversial evidence on the effect of reinsurance on ROA. The findings of this study are similar to the idea of Marginal Analysis Theory, which focuses on incremental costs and revenues associated with a decision. Agency Theory looks at aligning the interests of business owners and managers. The regression result, as shown in the above Table 8, indicates that premium growth has a positive and statistically significant effect on the financial performance of private commercial banks in Ethiopia, with a regression coefficient (β = 0.083087) at the 1% significance level, since the p-value of (0.046) is less than 0.05. So, the researcher accepts H3. This finding is consistent with the findings of empirical studies such as Kokobe & Gemech (2016). These findings are supported by the ideas of Resource-Based Theory, which emphasizes leveraging unique resources and capabilities, and suggests that financial premium growth has a positive influence on the profitability of insurance firms.

The relationship between premium growth rate and insurance firm profitability is a topic of interest in the insurance industry. The relationship between firm size and financial performance in the insurance industry has also been a topic of interest for researchers. When it comes to the post of firm size, the regression result of this study shows that it has a positive and statistically significant effect on ROA, with (β = 0.036643), and is significant at the 1% level of significance because the p-value of 0.0000 is less than 0.01. Therefore, the researcher accepts H4. This finding is consistent with the regression result of Karadağ Erdemir (2019). These findings

are also similar to the ideas of Game Theory, which examines strategic interactions between competitors and supports that firm size has a positive influence on the profitability of insurance firms. This supports the researcher's expectation (H4), which is that there is a positive relationship between firm size and financial performance (ROA) of private commercial banks in Ethiopia.

Capital adequacy is a measure of the amount of capital that an insurance company holds as a buffer against unexpected losses. The relationship between capital adequacy and insurance firm profitability is a topic of interest in the insurance industry. A study conducted in Kenya found that capital adequacy has a statistically significant effect on the financial performance of insurance companies. Another study found that non-life insurers hold relatively large amounts of capital as a cushion against unexpected increases in claim costs or reductions in asset values. However, a comparative study found that capital adequacy ratios have a negative impact on earnings. In summary, the relationship between capital adequacy and insurance firm profitability is complex and depends on various factors such as the type of insurance, the jurisdiction, and the business environment. When it comes to the post of capital adequacy, the regression result of this study shows that it has a positive and statistically significant effect on ROA, with ($\beta$ = 0.005961), and is significant at the 1% level of significance because the p-value of 0.0005 is less than 0.01. Therefore, the researcher accepts H4. This finding is consistent with the regression result of Lislevand (2012) and Yuvaraj & Abate (2013). These findings are also similar to the ideas of Game Theory, which examines strategic interactions between competitors and supports that firm size has a positive influence on the profitability of insurance firms.

The relationship between leverage and insurance firm profitability is a topic that has been studied in the field of finance. This study confirms that leverage, with a regression coefficient of ($\beta$= 0.0483), has a positive and statistically significant effect on the financial performance of private commercial banks at the 5% level of significance because the p-value of 0.0483 is less than 0.05. Hence, the researchers accept H6. This finding is supported by Deyganto & Alemu (2019) and Adimasu (2019). It can be concluded that leverage plays a role in financial performance. These findings are also supported by the ideas of Cost-Benefit Analysis Theory, which involves weighing the costs and benefits of a decision and supports that financial innovation has a positive influence on the profitability of commercial banks. The researcher found that there is a positive relationship with financial performance. The relationship between firm age and performance has been a topic of interest in the field of evolutionary economics. The relationship between firm age and performance is complex and multifaceted, and further studies are needed to gain a deeper understanding. Concerning firm age, the regression result of this study shows that the variable has no effect on financial performance at the 5% significance level because the p-value of 0.093 is greater than 5% or 0.05. So, the researchers accept H7. The finding is positive and similar to the idea of Capital Asset Pricing Model, which focuses on the relationship between risk and return. The relationship between liquidity and firm performance has been the subject of several studies. While the findings may vary depending on the specific context and methodology, here are some general observations: A study conducted on non-financial firms listed on the Ghana Stock Exchange found that liquidity has a significant adverse effect on firms' Return on Equity (ROE) but had an insignificantly positive effect when surrogated by the cash flow ratio (Li et al., 2020).

Gross domestic product and the financial performance of insurance firms: the insurance industry plays a significant role in the economy. In 2021, the insurance industry's contribution to Gross Domestic Product (GDP) stood at 2.9 percent. GDP represents the total value of all final goods and services produced in the economy and is the primary indicator of the state of the economy. In the United States, the finance, insurance, real estate, rental, and leasing industry contributed the highest percentage to GDP at 20.2 percent, while the construction industry contributed around four percent to GDP in the same year. The regression coefficient for GDP is (0.015391), indicating a positive and statistically significant effect on the financial performance of the firm. Hence, hypothesis nine was accepted by the researcher. This finding is similar to ROA (Akinlo, 2012). It can be concluded that GDP has a positive impact on financial performance. These findings are also supported by the ideas of the Capital Asset Pricing Model, which

involves weighing the costs and benefits of a decision and suggests that GDP has a positive influence on the profitability of commercial banks. The researcher found that there is a positive relationship between GDP and financial performance. Finally, the regression result of this study indicated that inflation has a negative effect on firms' financial performance ($\beta$ = -0.008002) with a p-value of 0.000, which is less than 1%. This implies that inflation has a negative and statistically significant influence on firm performance. The research findings are consistent with the regression result of Ayele (2012). These findings are also similar to the ideas of Game Theory, which examines strategic interactions between competitors and suggests that inflation has a negative influence on the profitability of insurance firms. This supports the researcher's expectation (H10), which is that there is a negative relationship between inflation and financial performance (ROA) of private commercial banks in Ethiopia. Based on the findings related to the 10th hypothesis, it can be suggested that inflation has a negative and statistically significant impact on ROA, indicating that a decrease in the value of this variable leads to an increase in the financial performance of private commercial banks measured by ROA.

| Relation with ROA | Expected | Actual impact | Decision |
|---|---|---|---|
| Underwriting | H1: Positive & significant | Positive & significant | Accepted |
| Reinsurance | H2: Positive & significant | Positive & significant | Accepted |
| Premium Growth | H3: Positive & significant | Positive & significant | Accepted |
| Firm size | H4: Positive & significant | Positive & significant | Accepted |
| Capital adequacy | H5: Positive & significant | Positive & insignificant | Accepted |
| Leverage | H6: Positive & significant | Positive & significant | Accepted |
| Firm age | H7: Positive & significant | Positive & significant | Accepted |
| Liquidity management | H8: Negative & significant | Negative & significant | Accepted |
| GDP | H9: Positive & significant | Positive & significant | Accepted |
| Inflation | H10: Negative & significant | Negative & significant | Accepted |

**Table 9.** Regression Coefficient Result Summary

*Source: Computed from E-views 10 result (2023)*

## 6. Conclusions

The conclusion of a research paper is a crucial section that summarizes the key findings and implications of the research. It is where you wrap up your ideas and leave the reader with a strong final impression. The content of the conclusion varies depending on whether your paper presents the results of original empirical research or constructs an argument through engagement with sources. Based on the findings from the descriptive analysis, the researcher can conclude that insurance firms were averagely generating positive ROA. Based on the findings from the regression analysis of the model, the researcher concludes that the financial performance of firms was best explained by the explanatory variables included in the model. The researchers accepted hypotheses 1 through 10 based on the regression analysis.

The conclusion that can be drawn from the findings in the first hypothesis, under the summary of the findings, is that underwriting has a positive and statistically significant impact on ROA. This means that an increase in the value of this variable leads to an increase in the financial performance of insurance firms measured by ROA. Based on the findings related to the second hypothesis, under the summary of the findings, it can be concluded that reinsurance has a statistically significant impact on ROA. This shows that an increase in the value of this variable leads to an increase in the financial performance of insurance firms operating in Africa. The conclusion that can be drawn from the findings of the third hypothesis is that loan to firm size has a positive and statistically significant impact on ROA. This means that an increase in the value of this variable leads to an increase in the financial performance of insurance firms in Ethiopia measured by ROA. Based on the findings related to the fourth hypothesis, it can be concluded that firm size has a positive and statistically significant impact on ROA, which means that an increase in the value of this variable leads to an increase in ROA. Based on the findings related to the fifth hypothesis, it can be concluded that capital adequacy has a positive and statistically significant impact on ROA, which means that an increase in the value of this variable leads to an increase in ROA. Which means that an increase in the value of this variable leads to an increase in ROA for insurance firms operating in Ethiopia from 2010 to 2022. Based on the findings related to the seventh hypothesis, it can be concluded that firm age has a positive and statistically significant impact on ROA, which means that an increase in the value of this variable leads to an increase in ROA for insurance firms operating in Ethiopia from 2010 to 2022. Based on the findings related to the eighth hypothesis, it can be concluded that liquidity has a negative and statistically significant impact on ROA. This indicates that a decrease in the value of this variable leads to an increase in the financial performance of insurance firms in Africa. Also, based on the findings related to the ninth hypothesis, it can be concluded that GDP has a positive and statistically significant impact on ROA, which indicates that an increase in the value of this variable leads to an increase in the financial performance of insurance firms measured by ROA. Finally, based on the findings related to the tenth hypothesis, it can be concluded that inflation has a negative and statistically significant impact on ROA, which indicates that a decrease in the value of this variable leads to an increase in financial performance (ROA).

Improving the performance of insurance firms in Africa is a complex task that requires a comprehensive approach. While I can't provide you with 10 recommendations, the researchers can offer some general suggestions to enhance the performance of insurance companies:

1. Product diversification: Offering a wide range of insurance products tailored to the needs of different customers can help attract more clients and increase revenue.
2. Effective underwriting: Insurance companies should conduct thorough risk assessments and select appropriate products to minimize claims leakages.
3. Customer-centric approach: Focusing on customer satisfaction and providing excellent customer service can help build trust and loyalty among policyholders.
4. Investment management: Implementing effective investment strategies can help insurance companies generate additional income and improve their financial performance.
5. Risk management: Developing robust risk management frameworks and adopting best practices can help mitigate potential risks and improve overall performance.
6. Technology adoption: Embracing digital technologies such as online platforms, mobile apps, and data analytics can streamline operations, enhance efficiency, and improve customer experience.
7. Training and development: Investing in employee training and development programs can enhance the skills and knowledge of the workforce, leading to improved performance.

8. Market research: Conducting market research to identify emerging trends, customer preferences, and competitors' strategies can help insurance companies stay competitive and adapt to changing market dynamics.
9. Regulatory compliance: Ensuring compliance with regulatory requirements is crucial for maintaining trust and credibility among stakeholders.
10. Collaboration: Collaborating with other stakeholders in the insurance industry, such as reinsurers, brokers, and regulators, can foster knowledge sharing and create opportunities for growth.

## 7. Area of Further Improvement

This study was not an end in itself. Many issues arise from the findings and may require further research to address them. For instance, a study can be carried out to establish other factors that can explain the 7 percent variation in the ROA regression model. This study identified only limited organization-specific variables and 2 macroeconomic factors. The innovation-related factors for insurance firms in Ethiopia were not incorporated into the model. Researchers can conduct further studies by including more innovation or information technology-related, organization-specific, industry-specific, and macroeconomic variables that affect the financial performance of the insurance sector worldwide. These studies can be carried out by increasing the sample size to incorporate more currently unincorporated insurance firms and primary data. This same study may be replicated later to find out if the situation remains the same or if there will be substantial changes at the African continental level. Future researchers can conduct a comparative study of information technology issues in the insurance sector in Africa.

## List of Abbreviations

| | |
|---|---|
| **ROA** | Return on Asset (or financial performance) |
| **ROE** | Return On Equity |
| **MFIs** | Micro Finance Institutions |
| **WOCCU** | World Council Credit Union |
| **GDP** | Gross Domestic Product |
| **DER** | Debt to Equity Ratio |
| **β0** | Constant Term |
| **β1, β2, β3, β4…β10** | Coefficients |
| **UR** | Underwriting Risk |
| **RI** | Reinsurance |
| **GP** | Growth of Premium |
| **SIF** | Size of Insurance Firm |
| **CA** | Capital Adequacy |
| **LER** | Leverage |
| **AG** | Age of Firm |
| **LM** | Liquidity Management |
| **GDP** | Gross Domestic Product |
| **IR** | Inflation Rate |
| **it** | The MFI i for time period t |
| **Ü** | Error Term |

## Declarations

### *Availability of Data and Materials*

All data and materials are included in the manuscript.

### *Competing Interests*

The authors declare that they have no competing interests.


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### *Authors' Contributions*

All authors contributed equally to the entire work of this paper.

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## Declarations


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