DETREMINANTS OF INSURANCE COMPANIES PROFITABILITY: THE CASE OF ETHIOPIAN INSURANCE INDUSTRY

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Statement of Declaration

I, Geleta Haso Bame, declare that this thesis entitled "Determinants of Insurance Companies Profitability: The Case of Ethiopian Insurance Industry" submitted by myself for the award of M.Sc. Degree in Accounting and Finance at Addis Ababa University is my original work and has not been previously submitted for the award of any degree or diploma at this or any other University or College, and all the reference materials contained therein have been duly acknowledged.

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This is to certify that the thesis prepared by Geleta Haso Bame entitled "Determinants of Insurance Companies Profitability: The case of Ethiopia Insurance Industry": Panel Evidence submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance complies with the rules and regulations of the university and meets the expected standards with respect of originality and quality. Hence all reference materials contained therein have been duly acknowledged.

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ABBREVIATIONS AND ACRONYMS

Adj- Adjusted

APT- Arbitrage Pricing Theory

BJ- Bera-Jarque test

CLRM- Classical linear regression model

EIC- Ethiopian Insurance Corporation

FEM- Fixed Effect Model

GAAP- Generally Accepted Accounting principle.

GDP- Gross Domestic Product

HO- Null Hypothesis

IFRS- International Financial Reporting system

INV- Investment Income Ratio

INF- Inflation Rate

LEV- leverage

LOS- Loss ratio

MCS- Market share

MPT- Modern portfolio theory

NBE- National Bank of Ethiopia

NICE- National Insurance Companies of Ethiopia

OLS- Ordinary Least Square

Obs- Observation

PGR- Premium Growth Rate

Prob- Probability

REM- Random Effect Model

RID- Reinsurance Dependency Ratio

ROA- Return on Assets

ROE- Return on Equity

S.C- share company

VIF- Variance inflator factor

ABSTRACT

The development of social and financial stability, the growth of commerce and industry, and economic progress all depend critically on the presence and survival of powerful insurance companies. For several years, academics connected to the finance literature have been interested in profitability. But in the context of Ethiopia, the insurance industry received little attention. In order to determine the factors that affects the insurance businesses' profitability in Ethiopia, this study looks into the industry-specific, macroeconomic, and company-specific factors that were taken into account in the regression model. The study used secondary panel data covering the period 2018-2022 and out of the 18 insurance companies operating in the country, a sample of 17 insurers were selected by non-probability purposive sampling technique. To identify the relationship between the ROA and independent factors, a quantitative research technique and an explanatory way of research design were employed. Descriptive statistics, correlation analysis and fixed effect regression analysis were performed using the statistical software "Stata 14.2." to analyze profitability of the insurance companies in Ethiopia. Fixed Effect model regression results, suggest that industry-specific variables like market share and firm-specific variables like loss ratio, investment income ratio, and business age are significantly affects the profitability. The results also showed a positive correlation between market share, inflation, premium growth, reinsurance dependency, GDP growth, and investment income and profitability. The loss ratio, leverage, and age of the company were found to be negatively correlated with ROE. Ultimately, in order to keep their business profitable, managers should place a greater focus on investment opportunities, potential client, customer happiness, and pre-risk evaluation and selection, and claim handling.

Keywords*: Insurance company, Profitability (ROA), Determinants, Fixed effect, Ethiopia*

CHAPTER ONE

1. INTRODUCTION

This chapter consists of seven sections. Section one starts with the background of the study and continues to discuss the history of insurance companies in Ethiopia. In sections two and three problems of the statement and objectives of the research were addressed. The significance of the study is presented in section four. Then scope, and limitations of the study were discussed respectively in subsequent sections. The final section deals with the organization of the paper.

1.1 Background of the Study

Financial institutions play a significant role in the socio-economic growth and development of a nation. Insurance companies facilitate a nation's innumerable economic transactions through efficient and effective savings mobilization, risk transfer and indemnification, and financial intermediation processes (Salvatore, 2013), and (Mishkin, 2010) as cited by (Cudiamat and Siy, 2017). "By mobilizing long-term savings, these companies provide financial security to a nation's citizens. Insurers provide economic and social benefits in society such as mitigating the impact of losses, reduction in fear and uncertainty as well as employment creation (Mazviona et al.,2017).

Insurance companies are important for both businesses and individuals as they indemnify losses and put them in the same positions as they were before the occurrence of the loss (Tesfaye,2016)". A recent survey by (Naveed et al., 2011), shows that the efficiency of financial intermediation and transfer of risk can affect economic growth while at the same time, institutional insolvencies can result in systemic crises that have unfavorable consequences for the economy. If this crucial sector were missing, the consequences on the economy would be devastating.

"In Ethiopia the major financial institutions operating are banks, insurance companies and micro-finance institutions. For the last two decades, the Ethiopian financial institutions in general and insurance companies in particular have shown the impressive progress in terms of number and service which not only creates the employment opportunities but also

enhances the business activities in the Ethiopian economy (Meaza, 2014)". According to Mengistu et al. (2020), the concept of insurance particularly the "social insurance program" dealing with socio-economic problems has been around in Ethiopia for a long time. Members of a community pooled together resources to create an Idir (social insurance fund). The "premiums" ranged from material to moral support or other payments in kind. From the fund, "drawings were made out" to support the few unfortunate members exposed to perils.

The history of modern insurance service is as far back as a modern form of banking service in Ethiopia which was introduced in 1905. At the time, an agreement was reached between Emperor Menelik II and a representative of the British-owned National Bank of Egypt to open a new bank in Ethiopia. Correspondingly, modern insurance service, which were introduced in Ethiopia by foreigners, mark out their origin as far back as 1905 when the Bank of Abyssinia began to transact fire and marine insurance as an agent of a foreign insurance company (Abate and Sambasivam, 2013).

"According to a survey made in 1954, nine insurance companies were providing an insurance service in the country. The first significant event that the Ethiopian insurance market observation was the issuance of proclamation No. 281/1970, and this proclamation was issued to provide the control and regulation of insurance business in Ethiopia. Consequently, it created an insurance council and an insurance controller's office, it's strange impact in the sector. The controller of insurance licensed 15 domestic insurance companies, 36 agents, 7 brokers, 3 actuaries and 11 assessors in accordance with the provisions of the proclamation immediately in the year after the issuance of the law. After four years that was after the enactment of the proclamation, the military government that came to power in 1974 put an end to all private enterprises. Then all insurance companies operating were nationalized and from January 1, 1975, onwards the government took over the ownership and control of these companies and merged them into a single unit called Ethiopian Insurance Corporation. In the years following nationalization, Ethiopian Insurance Corporation became the sole operator (Hailu Zeleke, 2007), as cited by Meaza (2014)".

After the change in the political environment in 1991, the proclamation for the licensing and supervision of the insurance business heralded the beginning of a new era. Immediately after the enactment of the proclamation in 1994, private insurance companies began to increase (Mengistu et al., 2020)".

For insurance companies to be sustainable in the competitive environment, earning profit is a prerequisite (Tesfaye, 2016). There are a lot of complaints raised from investors' side on the performance of Ethiopian insurance. Thus, the financial soundness of the insurance industry in Ethiopia is not a compromising issue and evaluating the factors that affect the profitability of the industry is a highly researchable area. Factors that affect insurers' profitability could be under the control of the insurers' management internal factors whereas others might be out of its control (external factors). Understanding the internal and external factors that can have an impact on the profitability of insurers is essential not only for the insurance managers and supervisors but also for policymakers and regulators. Therefore, it requires empirical investigation to sort out what are the important factors affecting the profitability of insurance companies and this will help concerned bodies to focus on the relevant factors.

1.2 Statement of the Problem

The optimal performance of an industry as a whole and of any individual firm contributes to the growth of the industry, which in turn contributes to the economy's overall success by raising the market value of that particular firm. The corporate finance literature has found it more important to measure the performance of financial institutions because, in their capacity as intermediaries, these businesses not only offer a means of risk transfer and savings, but also assist in the proper channeling of funds from surplus to deficit economic units to support economic investment activities (Abate, 2011). Specifically, the insurance sector is a vital component of the immune and repair systems of economies, and its prosperous operations can serve as a catalyst for the growth of economies and other sectors.

According to Kihara (2012), insurance is a crucial component of a country's economic development as it provides financial security to individuals and businesses against unexpected losses. This is especially important in a world that is fraught with risks and

uncertainties. As such, it is important to understand the factors that drive insurers' profitability. Profitability serves as a key indicator of success for any business venture, and it is essential for the efficient generation of earnings across various projects. It is anticipated that the insurance sector would be robust and financially stable in order to achieve this through operational profitability. It is therefore necessary to look at the issue of not just assessing the financial performance of insurance businesses but also gaining a thorough understanding of the variables influencing financial success in the sector. Consequently, academics, professionals, and institutional supervisors have developed an interest in the factors that determine an insurance company's performance.

To the best of researcher's knowledge, in Ethiopia, the studies conducted in the areas of insurers' profitability determinants are few and even the results of the studies are inconsistent for some of the variables. For instance, the study by Mengistu et al. (2020), Msomi (2022), and Asrat and Tesfahun (2016) shows that premium growth has a positive and significant correlation with insurance companies' profitability. On the other hand, Taye (2016) found that premium growth had a negative and insignificant effect on profitability. Additionally, the researcher learned that most of the previous studies were carried out using GAAP-based financial reports whereas the industry having adopted the IFRS reporting system since 2018 G.C. Moreover, prior studies mainly focused on non-life (general) insurance.

The above mentioned gaps (inconsistency in previous findings, focus on the limited insurance business, and the change in the financial reporting system from GAAP to IFRS which may affect the ratio of the determinants used for this study), motivated the researcher as to further investigate the internal (age of the company, loss ratio, leverage, premium growth, reinsurance dependency, and investment income), and external(market share which is an industry-specific, and GDP and inflation which are macro-economic) factors impact on the profitability of insurance companies in Ethiopian.

1.3 Objective of the Study

The main objective of this study is to investigate the determinants of insurance companies' profitability in Ethiopian. Based on the above general objective, the study has the following specific objectives:

1. To examine the effect of company age on the profitability of insurance companies.
2. To examine the effect of leverage on the profitability of insurance companies.
3. To examine the effect of loss ratio on the profitability of insurance companies.
4. To examine the effect of investment income on the profitability of insurance companies.
5. To analyze the effect of reinsurance dependency on the profitability of insurance companies.
6. To analyze the effect of premium growth on the profitability of insurance companies.
7. To assess the effect of market share on the profitability of insurance companies.
8. To assess the effect of GDP on the profitability of insurance companies.
9. To examine the effect of inflation on the profitability of insurance companies.

1.4 Significance of the Study

This study assessed determinants of insurance companies' profitability in Ethiopia and provided evidence on what effect the firm-specific factors and the external factors have on the insurance company's profitability in Ethiopia. Analyzing and understanding the impact of different factors on insurance profitability in Ethiopia is a major stepping result to educating what should be done if profitability is to be improved. This study also provided a comprehensive framework and literature about firms' profitability, and factors influencing it in the case of insurance companies in Ethiopian.

The findings of the study will benefit the insurance companies, regulatory authorities, managers, employees, and others providing the opportunity to gain deep knowledge about the relationship between the factors and profitability. This in turn helps the concerned bodies know factors affecting profitability and thereby contributes their best to enhance the

profitability of the companies. The outcome of the study also potentially serves as a steppingstone for further research in the area.

1.5 Scope of the Study

The study is limited to the examining the internal and external factors affecting the profitability of insurance companies registered by the NBE and operating in Ethiopia using five years of panel data from 2018 to 2022. As the researcher managed to collect the required data, the study covered both life and non-life (general) insurance, and all the insurance companies, except Zemen Insurance S.co. The factors considered for this study i.e., company age, leverage, market share, loss ratio, investment income, reinsurance dependency, premium growth, GDP growth, and inflation were used in previous similar studies. The reason for selecting the afro-mentioned study period, i.e., 2018 to 2022 is to mitigate the variation of the ratio of the variables that might happen due to different financial reporting systems applied if the periods before 2018 were included.

1.6 Limitations of the Study

Though there are other several factors that affects profitability of the insurance companies, this study focused only on those mentioned under the scope of the study. Furthermore, the study covered only the period from 2018 to 2022 to maintain the consistency of the reporting system. Therefore, the researcher concluded that the above-stated limited study period and factors, and lack of considering qualitative data are considered as the major limitations.

1.7 Organization of the Study

The paper is organized into five chapters. In chapter one an introduction, background of the study, statement of the problem, objectives of the study, scope and limitations, and significance of the study were presented, whereas chapter two deals with a review of related literature in which theoretical literatures, empirical evidence, and conceptual framework are identified. Chapter three discussed research methodologies such as research approach, research design, sampling technique, data type and data source. Chapter four presents the

data analysis, presentation, and discussion. Finally, chapter five presents the summary, conclusion, and possible recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

This chapter deals with the concept of insurance, profitability, profitability-related theories, and empirical studies on determinants of insurance companies' profitability. The review is divided into three sections. The first section discusses theoretical reviews of the role of insurance companies, and the concept of profitability and profitability-related theories. Reviews of empirical literatures on determinants of profitability of insurance companies and research hypothesis, and summary of the literature and conceptual framework of the study are presented in the second and third sections, respectively.

2.2 Theoretical Review

In this section, the role of insurance companies, the concept of profitability, and profitability-related theories are presented.

2.2.1 The Role of insurance companies in the economy

Insurance serves several valuable economic functions that are similar and largely distinct from other types of financial intermediaries. According to (Malik,2011), insurance plays a crucial role in the development of commercial and infrastructural businesses. From the latter perspective, it promotes financial and social stability; mobilizes and channels savings; supports trade, commerce and entrepreneurial activity and improves the quality of the lives of individuals and the overall well-being of the country.

Koller (2012), suggests that insurance companies are playing the role of transferring risk and channeling funds from one unit to the other (financial intermediation). This implies that insurance companies are helping the economy of a country in one way by transferring and sharing risk which can create confidence over the occurrences of uncertain events and in another way, insurance companies like other financial institutions play the role of financial intermediation to channel financial resources from one to the other. The insurance sector is fundamentally rooted in risk management. All policies written are analyzed with various risks considered, and actuarial analysis is performed to understand the statistical

likelihood of certain outcomes better (“Investopedia”,2023). Based on variances between statistical data and projections, policyholder premiums are adjusted, or benefits are reevaluated

Generally, premium amounts paid within the insurance sector are a function of the risk associated with the related individual, property, or item being insured. Even if there are numerous types of insurance, they can be divided into two broad categories based on their role in the economy. Those are general insurance companies and life insurance companies. General insurance companies and life insurance companies are different from each other in terms of operation, investment activities, vulnerability, and duration of liabilities. Life insurers are said to function as financial intermediaries while general insurers function as risk-takers (Chen and Wong, 2004).

2.2.2 The concept of profitability

Profitability is one of the most important objectives of financial management because one goal of financial management is to maximize the owner`s wealth and profitability which in turn indicates better financial performance. The profitability of a firm can be evaluated by comparing the amount of capital employed i.e., the input with income earned i.e., the output. This is popularly known as return on investment or return on capital employed. Profitable means, insurance companies are earning more revenues than being disbursed as expenses (Reshid,2015).

Renbao Chen et.al (2004) stated in their investigation that “higher profits provide both the means (greater availability of finance from retained profits or the capital market) and the incentive (a high rate of return) for new investment”. Therefore, we can understand from the above explanation that insurance companies have double responsibility in one way they are required to be profitable to have a high rate of return for new investment. On the other hand, insurance companies need to be profitable to be solvent enough to make other industries in the economy as they were before even after risk occurred. Hardwick and Adams (1999) and Malik (2011) are among others, who have suggested that although there are different ways to measure profitability it is better to use return on asset (ROA).

2.2.3 Profitability-related theories

There is no universal theory that provides a unifying framework for the study determinant of the insurer's profitability. Because of this, this study tried to view some theories that are nearer to the concept of insurance profitability and its determinants.

2.2.3.1 Modern portfolio theory

Modern portfolio theory (MPT) was developed by Harry Markowitz in 1952. The theory suggests that investors can improve the performance of their portfolios by allocating their investments into different classes of financial securities and industrial sectors that are not expected to react similarly if new information emerges. It assists in selecting the most efficient investments by analyzing various possible portfolios of the given securities. By choosing securities that do not move exactly together, modern portfolio theory shows investors how to reduce their risk. It is based on expected returns (mean) and the standard deviation (variance) of the various portfolios.

MPT attempts to maximize expected portfolio returns for a given amount of portfolio risk, or equivalently minimize risk for a given level of return by carefully choosing the proportions of various assets. It models a portfolio as a weighted combination of assets so that the return of a portfolio is the weighted combination of the asset return. Since insurance firms are investments by themselves it is standard practice for them to invest in a diversified portfolio to minimize risk and harness the returns of the various investment options on offer. When choosing a portfolio, investors should maximize the discounted (or capitalized) value of future returns. Since the future is not known with certainty, it must be expected or anticipated returns that are discounted. By combining different assets whose returns are not perfectly positively correlated, MPT seeks to reduce the total variance of the portfolio return. MPT also assumes that investors are rational, and the markets are efficient.

MPT emphasizes maximizing returns while minimizing risks giving recognition to the existence of systematic and non-systematic risks. These concepts are usually referred to when discussing financial investments. Insurance being influenced by risks and returns as well, also finds meaning through MPT. Diversification is the solution for a victim of

concentration risk. Over-reliance on similar assets' profitability and hopes that contingent liabilities do not become actual obligations are risks that can wipe out risk- portfolios in an instant. Non-systematic risks and alphas are the main items that give underwriting skills meaning. Non-systematic risks can be eliminated by widening the coverage of insurance over more assured. In doing so, diversification is achieved. Alphas, on the other hand, represent the surprise return or inherent profitability of an asset and in converting this concept onto the insurance industry, this is perhaps the inherent characteristics of an insured property and how the hazards and other circumstances are minimized, where it is more probable that the premiums paid by the insured will eventually be kept at the end of the insurance policy coverage period. While financial assets are capable of delivering abnormal returns, insurable risks are also able to remain abnormally intact and avoid transforming into real obligations for the insurance company. The fewer obligations an insurance company has, the more profit they have.

2.2.3.2 Arbitrage pricing theory

Arbitrage Pricing Theory (APT) was proposed by Stephen Ross in 1976. APT agrees that though many different specific forces can influence the return of any individual firm, particular effects tend to cancel out in large and well-diversified portfolios. This is the principle of diversification and has an impact on the field of insurance. An insurance company has no way of knowing whether any individual will become sick or will be involved in an accident, but the company can accurately predict its losses on a large pool of such risk. However, an insurance company is not entirely free of risk simply because it ensures large number of individuals. Natural disasters or changes in health care can have major influences on insurance losses by simultaneously affecting many claimants.

Cummins (1994) states that insurance companies are corporations and insurance policies can be interpreted as specific types of financial instruments or contingent claims thus it is natural to apply financial models to insurance pricing. Charging a price at least as high as the competitive price (reservation price) increases the market value of the company. Charging a lower price would reduce the company's market value. Thus, financial models and financial prices are among the key items of information that insurers should have at

their disposal when making financial decisions about tariff schedules, reinsurance contract terms, etc.

2.2.3.3 Pecking order theory

Pecking order refers to a hierarchy of financing beginning with retained earnings followed by debt financing and finally external equity financing. The theory suggests that companies with high profitability may use less debt than other companies because they have less need to raise funds externally and because debt is the 'cheapest' and most 'attractive' external option when compared to other methods of capital raising (Kaguri 2013).

Donaldson followed by Myers suggests that management follows a preference order when it comes to financing. First, internal financing of investment opportunities is preferred because it avoids the outside scrutiny of suppliers of capital and there are no floatation costs associated with the use of retained earnings. Secondly, straight debt is preferred. Not only does debt result in less intrusion in management by suppliers of capital, but floatation costs are less than with other types of external financing. Also, asymmetric information and financial signaling considerations come into play. The third in order of preference is preferred stock, which carries some features of debt. This is followed by various hybrid securities such as convertible bonds. Finally, the least desirable security to issue is straight equity. The investors are the most intrusive, floatation costs are the highest and there is the likelihood to be an adverse signaling effect (Kaguri 2013)

2.2.3.4 Black swan theory

The concept of black swan events was popularized by Nassim Nicholas Taleb in 2008. It states that the world is severely affected by events that are rare and difficult to predict, events of low probability but high impact. Silberzath (2013), states that a black swan does not create a new category of events, but is simply the occurrence of a known category, the probability of which was underestimated. The Black Swan is an essential concept for understanding how we make mistakes in estimating the probabilities of different events belonging to a known universe.

Davidson (2010) states that since probabilistic risks can be quantified by human computing power, the future is insurable against risky probabilistic occurrences. The cost of such insurance, or self-insurance, will take into account all entrepreneurial marginal cost calculations (or by contingency contracts in a complete general equilibrium system). This insurance process permits entrepreneurs to make profit-maximizing rational production and investment choices even in the short run when dealing with risky known processes. It is just that the short run does not provide a sufficiently large sample, for enough black swans to appear to calculate the probabilistic risk of encountering a black swan. In the long run, those entrepreneurs who in their price marginal cost calculations include these insurance costs as if they knew the objective probabilities implicit in Knight's unchanging reality will make the efficient decision and will, in Knight's system, earn profit.

The greatest risks are never the ones you can see and measure, but the ones you can't see and therefore can never measure. The ones that seem so far outside the boundary of normal probability that you can't imagine they could happen in your lifetime even though, of course, they do happen, more often than you care to realize. What may be a black swan to society at large may have limited insurance impact; likewise, some events that cause catastrophic losses may not seem extreme from other perspectives. Nobody wants to de-risk, in the sense that they want to take some money off the table. It's all about pricing and quantifying risk, and of course, hedging against it.

Demand for protection against so-called tail risks is increasing as investors react to black swan events. An investor or a firm does not have to try to be too smart in trying to forecast what is going to happen and which hedge is going to perform better what they need to do is accumulate cheap protection. Insurance firms offer this cheap protection whereby large losses can be hedged against by paying small amounts known as premiums. By having such products, insurance firms accumulate premiums in a pool, since the occurrence of these events is minimal, they may end up paying none thus better financial performance.

2.3 Empirical Review of Insurers' Profitability Determinants

The disparity of profit among insurance companies over the years, within a country, would result in suggesting that internal factors or firm-specific factors, industry-specific factors,

and macroeconomic factors play a crucial role in influencing their profitability (Reshid,2015). It is therefore imperative to identify what are these factors as it can help insurance companies to act on what increases their profitability and investors to forecast and invest in better profitable insurance companies. To do so, it is better to see what factors were considered in previous times by different individuals in different countries.

Authors like Olarewaju and Msomi (2022), in their research study, examined factors affecting the profitability of reinsurance companies in Sub-Saharan Africa (SSA). The study was conducted using secondary data from 1991 to 2020 on the existing 42 reinsurance companies from 16 South-Saharan African countries. The variables considered in the study are GDP, Interest and exchange rate, Inflation rate, competition, premium growth rate, liquidity, investment performance, firms' size, underwriting risk, risk retention ratio, and operational efficiency. The result showed that factors such as GDP growth rate, competition, interest rate, exchange rate, liquidity, premium growth rate, size, investment performance, and operational efficiency have a positive correlation with the profitability of insurance companies. Whereas inflation rate, underwriting risk, and risk retention ratio have a negative relationship with the profitability of the insurance companies.

Kripa and Ajasllari (2016) studied factors affecting the profitability of insurance companies in Albania, based on the panel data set. The authors empirically tested 6 explanatory variables and the result of the study showed the performance of insurance has a positive correlation with premium growth rate, company size, and capital volume, and a negative correlation with liabilities, liquidity, and fixed assets.

Dhiab (2021) in his research, analyzed determinants of insurance firms' profitability in the Saudi insurance market, by using a sample of 20 Saudi insurance companies based on the secondary data collected from the Saudi central bank for the period 2009- 2017. The study result reveals that the premium growth rate, the tangibility ratio, and the fixed-assets ratio are the main factors positively affecting the profitability of Saudi insurance companies. Moreover, while the company size and the liquidity ratio are positively associated with profitability, their impacts are not statistically significant. On the contrary, the loss ratio,

liability ratio, leverage ratio, and to a lesser extent, the company age has a negative effect on the profitability of Saudi insurance companies.

Bhattarai (2020) in his paper, evaluated factors influencing the profitability of insurance companies in Nepal. The study result shows that all the independent variables employed for the study have a positive relationship with ROA. Further, the study concluded that financial leverage and firms' size are major determinants of profitability in Nepalese insurance companies. Horeral and Maganya (2020) in their paper examined determinants of insurance firm's profitability in Tanzania, and the study result shows that the age of the firm, and claim costs have a statistically significant influence on the profitability of Insurance companies in Tanzania while the size of a company was found to have no significant contribution to the firm's profitability.

Cudiamat and Siy (2017) examined the determinants of Philippines life insurance Companies' profitability. The analysis makes use of Return on Assets (ROA) as a measure of profitability that is influenced by selected firm level, industry level and macroeconomic factors. The result shows that most of the firm-level factors influence ROA while industry-level and macroeconomic factors have negligible effects on it. Daare (2016) in his paper, examined factors affecting general insurance companies' profitability in India. The researcher considered factors such as size, premium growth rate, capital adequacy, GDP, liquidity, and inflation as profitability determinants. The researcher's finding reveals that except for firm size and premium growth rate, other factors are statistically significant. And added that capital adequacy and GDP growth positively affect profit, while liquidity and inflation negatively affect the profitability of general insurance companies in India.

Alshadadil and Deshmukh (2021) in their research analyzed the determinants of the profitability of insurance companies in Saudi Arabia. The researchers empirically tested independent variables such as company size, debt ratio, loss ratio, retention ratio, and investment income, and concluded that the profitability of insurance companies is significantly associated with the size of the insurance company, debt ratio, and the rate of actual loss. The results also showed that the volume of written premiums is the most influential variable on the profitability of insurance companies, followed by the indebtedness rate and then the actual loss.

Sambasivam and Abate (2013), conducted a study on the performance of insurance companies in Ethiopia employing purposive sampling. Nine (9) insurance companies were selected from the insurance companies operating in the country. The study was conducted based on the secondary data obtained from the financial statements of the selected insurance companies and financial publications of the National Bank of Ethiopia. The study focused on firm-specific factors such as the age of the company, size of the company, the volume of capital, leverage ratio, liquidity ratio, growth, and tangibility of assets effect on profitability using return on asset (ROA) as a key indicator. They concluded that company growth, leverage, volume of capital, size, and liquidity are the most important determinant factors of profitability hence growth, size, and volume of capita are positively related. In contrast, liquidity ratio and leverage ratio are negatively but significantly related to profitability. The age of companies and the tangibility of assets are not significantly related to profitability.

Berhe and Kaur (2017) in their paper analyzed the determinants of insurance companies' profitability in Ethiopia for the period 2005/6- to 2014/15. The study was conducted using secondary data collected from the National Bank of Ethiopia & individual insurance companies. Seventeen insurance companies were included in the study. The results of the study show that the size of insurance companies, capital adequacy, liquidity ratio and growth rate of GDP were the major factors that significantly affect the profitability of insurance companies. On the other hand, leverage ratio, loss ratio, market share and inflation rate were found to have an insignificant effect on insurance companies' profitability.

Asrat and Tesfahun (2016) also evaluated the determinants of profitability in private insurance companies in Ethiopia from 2005 to 2015. The authors have tested both firm-specific and macroeconomic factors such as underwriting risk, reinsurance dependence, solvency ratio, premium growth, company size, the growth rate of GDP, Inflation, and interest rate. The result reveals that firm-specific factors like underwriting risk, and solvency ratio have a negative correlation and significant effect on the profitability of the insurance firm while the insurers' profitability is positively and significantly affected by company size, premium growth, and reinsurers' dependency has no influence on

profitability and statistically insignificant. The study also concluded that the macroeconomic factors; GDP growth rate has a significant influence on profitability, and inflation has an insignificant influence on insurers' profitability whereas interest rate was an insignificant variable.

Taye (2018) in his paper, has analyzed factors affecting the financial performance of insurance companies in Ethiopia taking a return on asset (ROA) as a key indicator of profitability. The author conducted the study based on secondary data which were collected from 12 insurance companies selected using a purposive sampling technique, and the National Bank of Ethiopia (NBE). The researcher concluded that previous profit performance and volume of capital positively and significantly affect the financial performance, but solvency margin and loss ratio have negative associations and significant effects. The lag GDP rate and current inflation have a positive and significant impact on ROA whereas the lag inflation and exchange rate had a negative and significant influence. He also added that leverage, premium growth, and investment ratio have insignificant effects on the profitability of the Ethiopian insurance companies.

Tadese et al. (2020) in their paper, examined factors affecting Ethiopian insurance companies' profitability, using return on assets as a key indicator. The study used secondary data from the National Bank of Ethiopia and individual insurance companies audited financial statements. Their study result reveals that there is a positive and significant relationship between ROA and liquidity, capital adequacy, real GDP as well as the real effective exchange rate. In contrast, ROA has a negative and significant relation with leverage, underwriting risk, and premium growth. Besides, ROA has a positive and insignificant relation with age and size whereas positive and insignificant relation with inflation.

Dawit (2021) conducted a study on factors affecting Ethiopian insurance companies for the period of 2010 to 2019, using ROA as a proxy based on the secondary data collected from the financial statements of sampled insurance companies and the National Bank of Ethiopia. His study result shows that investment income, firm size, market share and underwriting risk has a significant effect on the profitability of the companies. Whereas,

commission ratio, GDP, reinsurers dependency and diversification have insignificant impacts on the profitability of the insurance companies.

Tadesse and Gujral (2022) evaluated determinants of the profitability of insurance companies in Ethiopia from 2010 – 2019, using two key indicators: return on asset (ROA), and return on equity (ROE). Based on the panel data set, searchers empirically tested internal factors such as the size of the company, leverage, tangibility of asset, liquidity, loss ratio, growth of firm and premium growth with the external variable inflation and economic growth using secondary data obtained from financial statement of selected individual insurance companies, National bank of Ethiopia, and Ministry of Finance and Economic Development of Ethiopia (MoFED). The study concluded that company-specific factors particularly, the size of the company and firm growth were found to be positive and statistically significant variables that affect the profitability of insurance companies measured by both ROA and ROE.

2.3.1 Determinants selection and hypothesis development

According to several previous empirical studies, insurers' profitability is influenced by both internal and external factors. Whereas internal factors focus on an insurer's specific characteristics that the companies have control over them, external factors deal with industry-specific, and macroeconomic variables that are out of the companies' control. To accomplish the research objectives nine variables; six firm-specific, and three external factors were considered, and the expected effects of each variable on the insurance companies' profitability are discussed below.

2.3.1.1 Firm-specific determinants (internal factors)

The internal determinants of an insurance company's profitability are those management controllable factors that account for the inter-firm differences in profitability, given the external environment determinants are constant.

A. Age of the insurance company

Company age is measured by the number of years a company has been operating in the market since it originated, and it is among an important determinant of the financial

performance of insurance companies. The theory of learning by doing, explains the positive relationship, which posits that as the age of the firm increases, there is the likelihood of improvement in their productive efficiency over time by learning from their experience. Older firms are more experienced, have enjoyed the benefits of learning, are not prone to the liabilities of newness, and enjoy superior performance (Taye, 2016).

Several research were conducted on determinants of the profitability of insurance companies in different countries. As far as company age is concerned the study findings are argumentative. For instance, (Tadese et al., 2020), and (Sambasivam & Abate, 2013) study findings revealed that company age is positively and insignificantly related with profitability which means as the age of the company increases the profitability will increase, but the increase in profit due to the increase of company age is insignificant. On the other hand (Mengistu et al., 2020), and (Horeral & Maganya,2020) in their study concluded that company age negatively and significantly affects the profitability of insurance companies, whereas (Dhiab,2021) came up with different findings with another study; he concluded that company age is negatively and insignificantly affects the profitability of insurance companies. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulate the following null hypothesis.

H01: Company age has a positive and insignificant effect on the profitability of insurance companies in Ethiopian.

B. Leverage

It refers to the amount of debt used to finance the assets of a given firm and is measured as total debts to total assets. An insurance company with significantly more debt than equity is considered as highly leveraged. According to (Boadi et al.,2013) the risk of an insurer may increase when it increases its leverage and argued that insurance companies with lower leverage will generally report higher returns on assets. Therefore, the leverage ratio is expected to have a negative relationship with profitability.

Empirical evidence concerning leverage revealed a statistically significant and negative relationship with insurance companies' profitability (Mengistu et al.,2020), (Mingizem,

2017), (Tadese et al.,2020), (Bhattarai,2020), (Boadi, 2013), (Dhiab,2021), (Sambasiva and Abate, 2013). In contrast, according to (Teklit and Kaur, 2017) leverage is insignificantly and positively related to insurance companies' profitability. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulated the following null hypothesis.

H02: Leverage has a negative and significant effect on the profitability of insurance companies in Ethiopia.

C. Loss ratio

The loss ratio is the ratio of annual net claims to the premiums received. The loss ratio increases when the risk of the insured asset increases. However, the exposure to the risk units by the insurance companies helps them to manage properly their risk and the future risk even can be predicted possibly considering the law of large numbers. High annual insurance losses will tend to increase the level of corporate management expenses (e.g., claims investigation and loss adjustment costs) which could further aggravate a decline in reported financial performance. In contrast, insurers, and reinsurance companies with lower-than-expected annual losses are likely to exhibit better financial performance because, they do not incur such high monitoring and claims handling costs (Adams and Buklle, 2003) as cited by (Taye, 2016).

Empirical evidence concerned with the loss ratio reveals different results. For instance, (Taye, 2016), (Tadesse and Gujral, 2022), (Horera and Maganya, 2022), (Dhiab, 2021), (Tadese et al, 2020) have found that profitability and loss ratio are negatively and statistically significantly related. On the contrary, the study by (Teklit and Kaur, 2017), shows a negative and insignificant impact of loss ratio on the profitability of the insurance companies. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulated the following null hypothesis.

H03: Loss ratio has negative and significant effect on the profitability of insurance companies in Ethiopia.

D. Investment income

The investment income ratio is the ratio of an insurance company's net investment income to its earned premiums. It compares the income that an insurance company brings in from its investment activities rather than its operations. Insurers invest in a wide array of assets and must balance the desire to earn a higher return through riskier investments with the need to maintain liquidity in order to cover the liabilities associated with claims made against the policies that they underwrite("Investopedia",2021).

"Good investment returns can generate competitive advantages, particularly in situations where investments matter more than underwriting profits/losses. An increase in the allocation of available resources to productive investments is one of the major sources of profit which leads to good financial performance. All else being equal, high investment returns result in better financial performance for insurance companies. Good investment return will higher the financial performance again even enable them to meet unexpected loss, claims and competent in the finance industry (Heyman and Rowland, 2006)".

The empirical review as far as investment income is concerned, tried to investigate its influence on the insurance companies' profitability. For instance, the studies by (Feisel, 2020), (Dawit, 2021), (Burca and Batrinca, 2014), (Shiu, 2004), (Lee, 2014) and (Boyjoo and Ramesh, 2017) reveal investment has a positive and significant relationship with profitability. Consequently, the researcher formulated the following null hypothesis.

H04: Investment income has a positive and significant effect on the profitability of insurance companies in Ethiopia.

E. Reinsurance dependency

According to (Asrat and Tesfahun, 2016), insurers usually take out reinsurance cover to stabilize earnings, increase underwriting capacity, and provide protection against catastrophic losses. The reinsurance dependence is calculated as the ratio of gross written premiums ceded in reinsurance to total assets. Insurance companies reinsure a certain amount of the risk underwritten to reduce bankruptcy risk in the case of high losses (Taye, 2016). Although reinsurance improves the stability of the insurance company through risk dispersion, achievement of solvency requirements, risk profile equilibration and growth of

the underwriting capacity, it involves a certain cost. Therefore, a negative connection between reinsurance dependence and the insurer's financial performance is expected (Burca and Bartica, 2014).

The empirical finding by (Asrat and Tesfahun, 2016), has revealed that the relationship between reinsurance dependency and insurance companies' profitability is negative and statistically insignificant. Whereas the study result by (Taye, 2016) shows a positive and statistically insignificant relationship between reinsurance dependency and insurance companies' profitability. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulated the following null hypothesis.

H05: Reinsurance dependency has a negative and insignificant effect on the profitability of insurance companies in Ethiopia.

F. Premium growth

According to (Asrat and Tesfahun, 2016), premium revenue is the primary source of revenue for most insurers, and it is generally more persistent than other revenue sources. Therefore, premium growth should help predict future revenue and earnings growth. For insurance companies especially those writing long-tail policies, income in periods of premium growth is understated due to the overstatement of losses and loss expenses, which are measured undiscounted. If premium revenue is relatively stable over time, this bias is offset by the omission of interest expense on the loss reserve. However, when premium revenue increases (declines) over time, the omitted interest expense is smaller (larger) than the overstatement of the losses and loss expenses, and so income is understated (overstated) (Charumathi, 2013).

Empirical evidence concerning premium growth shows different results; the findings of (Kripa and Ajasllari, 2016), (Mengistu et al., 2020), (Msomi, 2022), and (Asrat and Tesfahun, 2016) reveal positive and significant relation with insurance companies' profitability. On the other hand, (Tadese et al., 2020) in their study have found premium growth has a negative and significant effect on profitability. Whereas (Taye, 2016) came up with the finding that concludes premium growth has a negative and insignificant impact on the profitability of insurance companies. As discussed above, the findings of the studies

show different results, but the researcher assumes the empirical result which is supported by the majority researchers and formulated the following null hypothesis.

H06: Premium growth has a positive and significant effect on the profitability of insurance companies in Ethiopia.

2.3.1.2 External factors (industry, & macroeconomic factors)

External factors deal with both industry-specific, and macroeconomic factors that are out of the companies' control.

G. Market share

Market share is measured by the ratio of an insurer's gross written premium to the industry's gross written premium. It constitutes how much is the percentage of the gross written premium of a given insurance company in comparison to the gross written premium of the insurance industry. The higher the percentage of an insurer's gross written premium to the gross written premium of the insurance sector, the greater the market share and thereby better profitability.

Empirical evidence concerning the market share shows different results. The study result of (Taye, 2016), (Cudiamat and Siy, 2017), (Teklit and Kaur, 2017) reveals the effect of market share on the insurance companies' profitability is insignificant. On the other hand, the study results of (Dawit, 2021), and (Feisel, 2020) have revealed that market share and profitability have a positive and significant relationship. Therefore, the anticipated sign and magnitude are subject to empirical examination. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulated the following null hypothesis.

H07: Market share has a positive and significant effect on the profitability of insurance companies in Ethiopia.

H. GDP growth

Gross domestic product is the market value of all finished goods and services produced in a country within a specified period, mostly one year. (Oshinloye et al, 2009) concluded that no country can experience meaningful development without the presence of a

formidable insurance industry, thereby making the insurance business in any nation indispensable irrespective of its quota to the gross domestic product. Poor economic conditions can worsen the quality of the finance portfolio, thereby reducing profitability. "If GDP grows, the likelihood of selling insurance policies also grows and insurers are likely to benefit from that in the form of higher profits".

According to (Taye, 2016), (Asrat and Tesfahun, 2016), (Suyehli, 2015), (Daare, 2016), (Feisel, 2020), and (Tadese et al., 2020) GDP growth positively and statistically significantly affects insurers' profitability i.e., the growth of the overall economic activity encourages demand for insurers services and indirectly results in harvesting higher profit. On the other hand, (Teklit and Kuar, 2017) came up with the relationship between GDP growth and profitability as negative and statistically significant, whereas (Dawit, 2021); (Tadesse and Gujral, 2022) found a positive and insignificant relationship between GDP growth and profitability. As discussed above, the findings of the studies show different results, but the researcher assumes the empirical result which is consistent with the theoretical literature and formulated the following null hypothesis.

H08: GDP growth has a positive and significant effect on the profitability of insurance companies in Ethiopia.

I. Inflation

Inflation refers to general annual inflation. It could affect insurance companies' profitability influencing both their liabilities and assets. An increase in inflation, increases the claim payments, and consequently reduces technical results and profitability. The inflation rate of Ethiopia has a negative and statistically significant impact on the profitability of insurance companies which implies insurance companies operating in Ethiopia with lower inflation rates generate more profit than higher inflation rates (Tadesse and Gujral, 2022).

The empirical evidence as far as inflation is concerned reveals different results; for instance, the study by (Tadese et al., 2020), (Horera and Mnaku, 2020), (Teklit and Kaur, 2017), (Cudiamat and Stephen, 2017), (Meaza, 2014), and (Asrat and Tesfahun, 2016) have identified that inflation has a negative and insignificant effect on insurance firms'

profitability. On the contrary, (Taye, 2016) came up with a positive and significant effect of inflation on the profitability of insurance companies, whereas (Dawit, 2021), and (Feisel, 2020) found that inflation has a positive and statistically insignificant effect on profitability, and the study by (Tadesse and Gujral, 2022) shows profitability and inflation have a significant negative relationship. As indicated above, results of the research show different results, but the researcher assumes the majority's result and formulated the following null hypothesis.

H09: Inflation has a negative and insignificant effect on the profitability of insurance companies in Ethiopia.

2.4 Summary of the Literature and Conceptual Framework

2.4.1 Summary of literature review

There are several empirical studies regarding determinants of profitability. A review of the literature shows that the research on the determinants of profitability has been comprehensively studied in developed countries around the world and in some emerging countries like Nepal, India, and Indonesia. Nevertheless, in Ethiopia, most of the research focused on banks and other non-financial sectors rather than insurance companies. Different scholars using empirical investigation on the determinants of profitability are resulting in dissimilar conclusions. For instance, an empirical study by (Tadese et al.,2020) indicates a positive and significant relationship between ROA and liquidity, capital adequacy, real GDP as well as the real effective exchange rate. Contrary, ROA has a negative and significant relation with leverage, underwriting risk, and premium growth. Besides, ROA has a positive and insignificant relation with age and size whereas negative and insignificant relation with inflation.

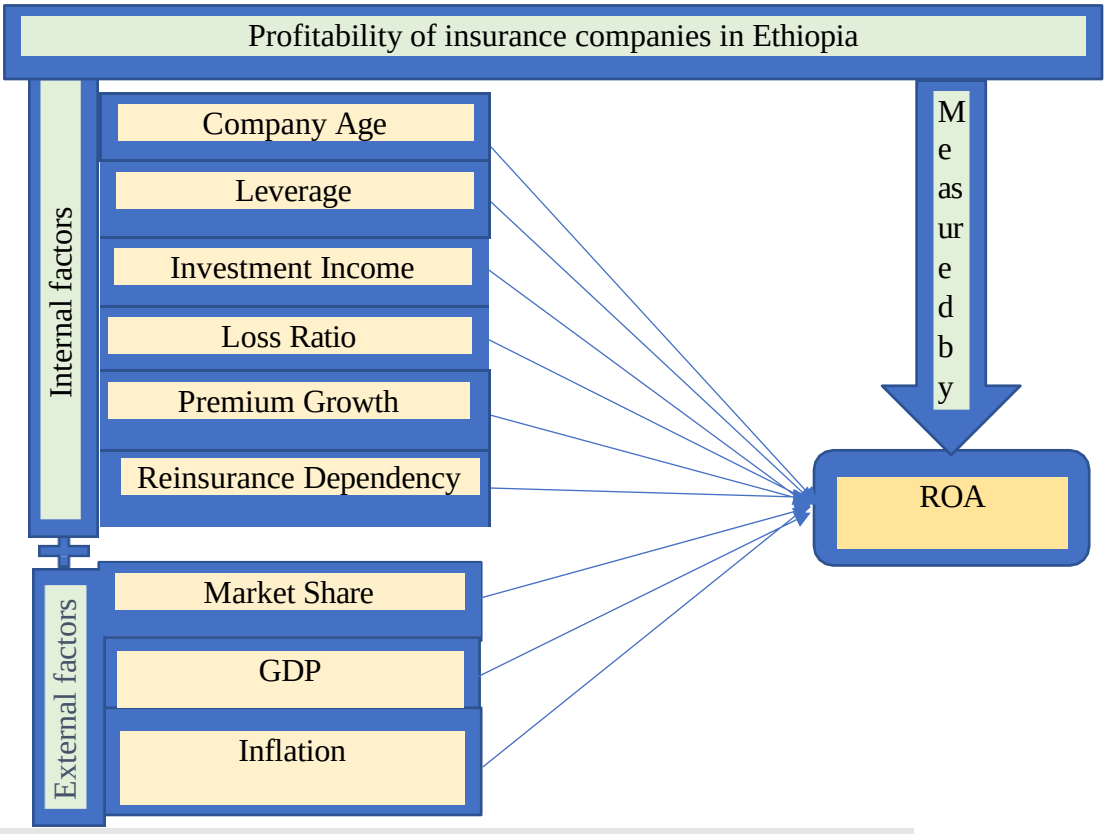
On the other hand, a study by (Abate and Sambasivam, 2013) investigated the determinates of Ethiopian insurance companies' profitability and indicated that company growth, leverage, the volume of capital, size, and liquidity are the most important determinant factors of profitability hence growth, size, and volume of capita are positively related. In contrast, liquidity ratio and leverage ratio are negatively but significantly related to profitability. The age of companies and the tangibility of assets are not significantly related

to profitability. In general, on top of such conflicting results, the lack of sufficient research on the factors affecting the profitability of insurance companies in the context of Ethiopia shows there is a knowledge gap to the best of the researcher. The statement of a problem clearly states the presence of knowledge imparity; it plays a huge part in motivating undertaking the research.

2.4.2 Conceptual framework of the study

Different empirical evidence suggests that the profitability of financial institutions is affected by both internal and external factors. Therefore, this study considered both internal and external determinants of Ethiopian insurers' profitability including company age, loss ratio, leverage, investment income, premium growth, reinsurance dependency, market share, GDP, and inflation. The study identified to what direction and to what extent these variables determine the profitability of the insurance companies in Ethiopia.

Figure 2.4.2: Conceptual framework of the study



Source: *Compiled by researcher from several prior research articles*

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the methodology which used in gathering data, processing the data, and translating the collected data into meaningful information. It provides the steps and procedures of the study that were used to identify the determinants of the profitability of insurance companies in Ethiopia. The chapter explains the research design, data type and source, research approaches, sample and sampling technique, data analysis techniques, variable definitions which encompasses the choice of the dependent variable and independent variables, diagnosis analysis and model specification.

3.2 Research Design

According to (Kothari, 2009). research design is a plan of precondition for gathering and analysis of data in a way that aims to combine significance to the research purpose with economy in procedure. It is the framework that specifies type of data collected, from where and how the data is to be collected and the collection procedure. The type of the problem in the study inclined to explanatory research that clarifies the relation between profitability and explanatory variables. Co-relational research plan aids the study by building numerical correlations that reveal the extent of liaison between dependent and independent variables (Saunders et al., 2016).

3.3 Research Approach

According to (Kothari, 2004), there are two basic approaches to research, viz., the quantitative approach and the qualitative approach. In the former case, quantitative data are generated and can be rigorously and rigidly submitted to quantitative analysis. The qualitative approach to research is concerned with the subjective assessment of attitudes, opinions, and behavior. Research in such a situation is a function of the researcher's insights and impressions. To comply with the objective of this research, the paper is primarily based on quantitative research, which constructed an econometric model to identify and measure the determinants of Ethiopian insurance companies' profitability.

3.4 Sample and Sampling Technique

For some research, it is possible to collect data from an entire population as it is of a manageable size. Sampling provides a valid alternative to a census when it would be impracticable to survey the entire population; budget and time constraints prevent the researcher from surveying the entire population; the researcher has collected all the data but need the results quickly. However, it should not be assumed that a census would necessarily provide more useful results than collecting data from a sample which represents the entire population (Saunders et al., 2009).

The target populations of this study were all insurance companies registered and in operation in Ethiopia. Currently, there are eighteen (18); 17 private-owned and 1 public-owned insurance companies operating in Ethiopia. To achieve the research objectives, 17 insurance companies; 16 private-owned and 1 public-owned insurance companies were selected using non-probability purposive sampling technique to include all insurance companies established and operating within the period specified under the scope of the study i.e., 2018 to 2022. The remaining insurance company; Zemen insurance S.C which was established on 17/01/2020 is excluded from the sample as it does not satisfy the required 5-years data.

Table 3.4: List of Insurance Companies operating in Ethiopia as of 2023

S. N	Insurance company name	Type	Date of establishment
1	Ethiopian Insurance Corporation	Life and General	1975
2	National Insurance Company of Ethiopia S.C	General	23/09/1994
3	Awash Insurance Company S.C	Life, and General	1/10/1994
4	Africa Insurance Company S.C	Life, and General	1/12/1994
5	Nyala Insurance Company S.C	Life, and General	6/1/1995
6	Nile Insurance Company S.C	Life, and General	11/4/1995
7	Global Insurance Company S.C	General	11/1/1997
8	The United Insurance S.C	Life, and General	1/4/1997
9	NIB Insurance Company	Life, and General	1/5/2002
10	Lion Insurance Company S.C	General	1/7/2007
11	Ethio-Life & General Insurance S.C	Life, and General	23/10/2008
12	Oromia Insurance Company S.C	Life, and General	26/01/2009
13	Abay Insurance Company	Life, and General	26/07/2010
14	Berhan Insurance S.C	General	24/05/2011
15	Tsehay Insurance S.C	General	28/03/2012
16	Lucy Insurance S.C	General	1/10/2012
17	Buna Insurance S.C	Life, and General	21/05/2013
18	Zemen Insurance S.C	General	17/01/2020

***Source**: NBE Website. (May 2023)*

3.5 Data Type and Source

The study used five years of panel secondary data obtained from NBE, and individual insurance companies' annual financial reports which contain detailed consolidated balance sheets and income statements. According to (Brookes, 2008), using panel data has the advantage of addressing a wide range of issues and challenging more complex problems,

examining how variables change dynamically over time or how the variables relate to each other and structuring the model in an appropriate way as well. The data were collected by reviewing the annual audited financial statements of Ethiopian insurance companies from year 2018 to 2022. On the other hand, to analyze the relationship that exists between the company's profitability, and macroeconomic variables, macroeconomic data were gathered from the NBE records through structured document review.

3.6 Data Analysis Techniques

The study used descriptive, correlation and regression analysis methods. Mean values and standard deviations, minimum and maximum values of panel data regression output were used to analyze the general trends of dependent and independent variables during 2018 to 2022G.C, based on the data collected from seventeen (17) insurance companies, and NBE. The Pearson correlation matrix was also applied to examine the relationship between the variables. In addition, fixed effect model regression was conducted using "Stata 14.2" software to determine the most significant and influential explanatory variables affecting the profitability of the insurance industry in Ethiopia.

According to (Brooks, 2008) panel data is favored for situations that often arise in financial modeling where we have data comprising both time series and cross-sectional elements. In addition, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time series or pure cross-sectional data alone. Accordingly, the study model focused on a panel data technique that comprises both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian insurance companies (seventeen) and the time-series element is revealed by the period of study (2018-2022). The validity of the model was checked using diagnostic tests such as normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test.

Therefore, the collected panel data was analyzed to determine the relationships between the dependent variable and explanatory variables like leverage, loss ratio, reinsurers dependency ratio, investment income ratio, premium growth, company age, market share, inflation, and growth rate of GDP, and dependent variable (ROA). Correlation is used to

determine the degree of relationships between the variables. Regression analysis is used to determine the contribution or predictability of the independent variables to the dependent variable.

3.7 Variables Measurement and Model Specification

3.7.1 Measurement of variables

In any quantitative research, to make it clear to the readers what groups of variables are receiving the experimental treatment and what outcomes are being measured, the variables need to be specified (Creswell, 2009). The study did not include all dimensions of the factors which affect the profitability of an insurance company i.e., external, industry and internal factors but limited to the following dependent, and independent variables.

3.7.1.1 Dependent variable

Dependent variables are those that depend on the independent variables; they are the outcomes or results of the influence of the independent variables. Other names for dependent variables are criterion, outcome, and effect variables (Creswell, 2009). In most research regarding determinants of profitability of banks and insurance companies, profitability is commonly measured by return on total assets (ROA) which is calculated as net profit before tax divided by total assets. According to (Malik, 2011), ROA is used as a better measure of financial performance than other ratios and it reveals how much profit a company earns for its assets. Hence, this study also used ROA as a proxy of a company's profitability.

3.7.1.2 Independent variables

Independent variables are those that (probably) cause, influence, or affect outcomes. They are also called treatment, manipulated, antecedent, or predictor variables (Creswell, 2009). From the many possible determinants of profitability of the insurance companies previously identified in similar studies, nine variables; six firm-specific variables (Age of the company, loss ratio, leverage, reinsurance dependency, premium growth, and investment income); one industry-specific variable (market share); and two macroeconomic related variables (GDP growth, and inflation) affecting the profitability of

insurance business in Ethiopia were considered. The study adopted the variables measurements that were used by previous similar studies as shown in Table 3.7.1 below.

Table: 3.7.1: Lists of Variables and their Measurements

Variables name	Symbol	Measurement of variables	Expected Sign
Profit	ROA	Net Income Before Tax / Total Assets	-
Leverage	LEV	Total Liability / Total Asset	-Ve
Investment income ratio	INV	Net Investment Income / Premium Earned	+ve
Age of the company	AGE	Company's service years since its establishment	+ve
Loss ratio	LOS	Net claims incurred. / Net earned premium	-Ve
Reinsurers dependency	RID	Premium ceded to reinsurers / Total Asset	-Ve
Premium growth rate	PGR	$GWP_t - GWP_{(t-1)}$ / $GWP_{(t-1)}$	+Ve
Market share	MCS	Firms' Gross premium / Industry's Gross premium	+ve
GDP growth rate	GDP	$GDP_t - GDP_{t-1}$ / GDP_{t-1}	+ve
Inflation rate	INF	$IR_t - IR_{t-1}$ / IR_{t-1}	-ve

Source: *Compiled from various prior research articles*

3.7.2 Model Specification

Model building involves specifying relationships between two or more variables, perhaps extending to the development of descriptive or predictive equations. Models need not include complicated mathematics. Decision makers often prefer simple models that everyone can readily understand over complex models that are difficult to comprehend (Zikmund, 2010). Panel data is favored over pure time-series and cross-sectional data because it can control for individual heterogeneity and there is lesser degree of multi-

linearity between variables (Altai, 2005). A panel data regression model can be estimated in different ways depending on regression coefficients, and error terms.

To decide which model is appropriate for this study different tests can be implemented, first Hausman test to select the appropriate model from the random effect and fixed effect model. Then after selecting the appropriate model from the random effect and fixed effect models, the Breush Pagan lagranian multiplier test should be implemented to select the appropriate model from the previous test result which is either the fixed or random model, and the OLS regression model. Notwithstanding, it is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population (Brooks, 2008). Thus, for this study fixed effect model was applied without conducting the Hausman test since the samples were taken according to the researcher's criteria which means the data were not collected randomly from the population. Hence, based on the hypothesis of the study the following model was specified.

ROA *it* **= β0 + β1***AGE it* **– β2** *LEV it* **– β3** *LOS it* **– β4** *RID it* **+ β5** *MCS it* **+ β6** *INV it* **+ B7** *PGR it***+ β8** *GDP t* **- β9** *INF t* **+** *ε it*

βo *= Constant*

β1, β2, β3 β4, β5, β6 β7, β8 and β9 = Coefficients of independent variables

I*= Insurance company and i = 1, 2, 3……..17*

T*= The index of time periods and t = 1, 2, 3….. 5*

ε it *= ai + uit, when ai all unobserved, time constant factor that affects ROA it*

uit *is often called the idiosyncratic error or time-varying error.*

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION, AND DISCUSSION

4.1 Introduction

This chapter analyzes, presents, and discusses data in detailed manner to respond to the research hypothesis and accomplish the objectives of the study. It includes the findings of the study that was designed to show the determinants of profitability of the insurance companies in Ethiopia. The study has a time series segment covering the period 2018 up to 2022 and a cross-section segment which considered seventeen Ethiopian insurance companies out of the total 18 companies currently operating. The chapter is organized into six sections. Section one deals with introduction, whereas sections two and three descriptive statistics and correlation analysis presented, respectively. Model specification, diagnosis test, and regression analysis, and results discussions were presented in sections four, five and six, respectively.

4.2 Descriptive Statistics

This section is concerned with the overall summary of all the variables involved in the model aimed to understand the distinct behavior of all the variables independently through computing their mean value, standard deviation, and related statistics, whereas the joint behavior of each variable with the rest of the others are also assessed using correlation analysis in next section. The mean values, standard deviation, minimum values, and maximum values for each variable under consideration are computed to measure the extent of the deviations (disparities) of the insurance companies under investigation, in terms of their company-specific, industry-specific, and macroeconomic factors. The result of descriptive statistics of the dependent and independent variables for seventeen insurance companies for the period of five years from 2018-2022 with a total of 85 observations summarized and reported in the following table.

Table 4.2: Summary of descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Obs
ROA	0.069	0.03	-0.064	0.13	85
AGE	18.549	9.909	5.08	46.5	85
LEV	0.645	0.09	0.232	0.867	85
MCS	0.059	0.084	0.01	0.442	85
LOS	0.598	0.141	0.048	1.017	85
INV	0.159	0.048	0.02	0.316	85
RID	0.095	0.036	0.011	0.237	85
PGR	0.211	0.398	-0.361	3.557	85
GDP	0.071	0.011	0.061	0.09	85
INF	0.224	0.067	0.153	0.34	85

Source**: "Stata" Output (**SUM ROA LEV AGE MS LR IR RID GDP PGR INF)

As it is shown in Table 4.2 above, the mean value of ROA for all insurance companies in the last five years was 6.9% with a minimum and maximum value of -6.4% and 13%, respectively. The mean value implies during the years under the study, Ethiopian insurance companies before tax profit on average was 6.9% of their total assets. The most profitable insurance company earned 13% profit before tax for a single birr invested in its total assets. Whereas the least profitable insurance company incurred a loss of 6.4% of its total assets. This illustrates the disparity of rates of return earned by insurance companies. Regarding the standard deviation, it means the value of ROA deviates from its mean by 3% both above and below which indicates the low variation of profit in the insurance industry during the study period. From this, it can be concluded that insurance companies incurred losses need to optimize the use of their assets to improve the return on their asset.

Regarding the age of the insurance company, it is measured by the year the company was in operation from when it originated. The mean value of company age is 18 years and 6

months with minimum and maximum ranging from 5 years and 1 months up to 46 years and 6 months, respectively and with a standard deviation of 9 years and 11 months. The standard deviation implies insurance companies' age deviates from its mean on both sides by 9 years and 11months. This indicates that there is a high variation in company age in Ethiopian insurance companies during the study period. The maximum and minimum company age was recorded by EIC as 46 years and 6 months, and Buna insurance company as 5 years and 1month, respectively.

The mean value of leverage which is a ratio of total debt to total assets is 64.5%. The minimum and maximum values of the variable show 23.2% and 86.7%, respectively. This is an indication that over the last five years the highly levered company utilized debt that amounts to 86.7% and the less levered company utilized about 23.2% debt financing. The standard deviation value indicates that insurance companies' leverage ratio varies from the mean by 9% on both sides during the period under consideration. The highest levered insurance company as compared with others was EIC with 86.7%, whereas the least levered company was Awash insurance with 23.2%. This implies that the EIC was more financed by debt than equity during the period of the study. This might be a lowly leveraged firm needs to attract more policyholders which leads to an increase in its premium revenue and will eventually end with high profit, but a highly leveraged company may not worry about attracting new policyholders as it has a monopoly over public-owned organizations' policyholders.

The market share, which is an industry-specific determinant is one of the variables considered for this study. It is measured by dividing the insurance company's gross written premium to the industry's gross written premium. As it is shown in the above table, the average value of market share is 5.9% with a standard deviation of 8.4%, and minimum and maximum ranged from 1% up to 44.2%, respectively. This indicates that in the past five years, the average market share for insurance companies was 5.9%, and the company with a high market share collected on average 44.2% of the industry's gross written premium, whereas the company with a low market share collected 1% of the industries gross written premium. The standard deviation indicates that the market share of insurance

companies deviate from the mean value by 8.4% during the study period. The highest market share of 44% was registered by EIC and the minimum 1% was registered by Global Insurance company. This might be due to the EIC having a monopoly over publicly owned organizations' policyholder. Whereas low market share exhibited company might be due to pre and/or post-accident poor customer service, high premium rate, low access to potential clients, poor marketing strategy, and outdated technology.

The mean value of the loss ratio during the last five years under consideration was 59.8% with the minimum and maximum ranging from 4.8% up to 101.7%, respectively. It is to mean that from the net premium collected over the years on average about 59.8% was paid as a claim to policyholders. This may point out that there was more risk on asset on average which causes the insurance business to pay more than half of the premium collected in the form of compensation for the asset or life damage. The standard deviation value indicates that the loss ratio of insurance companies during the period of the study varies from the average loss by 14.1% above and below.

The high loss incurred company paid about 101.7% from its net premium collected which implies the insured asset or life is highly exposed to risk, whereas the less loss incurred company paid only about 4.8% in the same period. This might be due to the risk of loss increases as the insured asset increases, and the effectiveness of risk-mitigating strategies that the specific insurance company follows.

The output of descriptive statistics indicates that the mean of investment income which is measured as net investment income to earned premium was 15.9% with minimum and maximum ranging from 2% up to 31.6% respectively, and a standard deviation of 4.8%. This indicates that during the last five years, Ethiopian insurance companies on average earned a net investment income amounting to 15.9% of their earned premium. The highest investment income registered during the period was by Nyala Insurance company (31.6%), whereas the least investment income was earned by EIC (2%). The standard deviation indicates that investment income deviates from its mean by 4.8% above and below during the study period which can be considered as a low deviation rate. This might be due to the lack of new investment opportunities, and challenges for expansion of the existing investment in connection to the instability in the country.

According to (Shiu, 2004), as cited by (Taye, 2016), reinsurance dependency increases operational stability, increases insurance dependency, i.e., lowering the retention level, reducing the potential profitability. The descriptive output mean value of the reinsurance dependency ratio was 9.5% with a standard deviation of 3.6%, and with minimum and maximum values ranging from 1.1% up to 23.7%, respectively. This indicates that on average during the period under consideration from the gross premium collected, 9.5% of the total assets were ceded to reinsurers. The standard deviation indicates that the reinsurance dependency varies from its mean by 3.6% on both sides which can be concluded as there was low variation and mostly concentrated around the average value of 9.5%. The minimum ratio of premium ceded shows that low dependency on reinsurers, which might be due to a higher capital base to unforeseen above-average loses and catastrophe.

The mean of premium growth which is measured as a year-to-year change in the new premium was 21.1% with the minimum and maximum values ranging from -36.1% up to 355.7%, respectively, and a standard deviation value of 39.8%. This indicates that during the last five years, insurance companies' average premium growth was 21.1%. The standard deviation implies a premium growth rate dispersed from the mean value by 39.8% to both sides during the period under consideration which is high. The highest premium growth variation exhibited during those years might be due to new premium directives by the regulatory body (NBE) that allows the industry to increase their premium rate, and inconsistency in marketing strategy implantation.

GDP growth is one of the macroeconomic variables used in this study, and as indicated in the table above, the mean value of the real GDP growth rate of the country over the past five years was 7.1%. The maximum and minimum growth of the economy recorded and reported during the year 2018 to 2022 were 6.1% and 9%, respectively with a standard deviation value of 1.1%. The standard deviation of 1.1% implies that there was low economic growth variation from the average value of 7.1% during the years under consideration, and it is consistent with a previous study by Meaza (2014). From this, we can conclude that during the period under consideration, GDP growth has no significant impact on the profitability of insurance companies in Ethiopia. The insignificant economic

growth variation exhibited during these periods might be due to the political instability, security problems such as a civil war, and COVID-19 impact as well.

Another macroeconomic variable used for this study is inflation. The mean value of the inflation rate was 22.4% with minimum and maximum values ranging from 15.3% up to 34%, respectively, and a standard deviation value of 6.7%. This implies that during the last five years, on average the general inflation rate of Ethiopia was 22.4%. The standard deviation value of 6.7% indicates that the inflation rate of the country was concentrated around the mean value of 22.4% above and below. From this, it can be concluded that inflation might have affected the profitability of the insurance companies negatively as inflation causes an increase in the prices of insured assets since it increases claim expense, but the premium policies are not adjusted periodically.

4.3 Correlation Analysis

Pearson's correlation coefficients were used to examine the strength of the relationship between the variables. According to (Brooks, 2008) the correlation between two variables measures the degree of linear association between them. Correlation is a measure of the strength and direction of any statistical association between two or more variables. The strength is measured based on a numeric value (0.00 to 1.00) called coefficient; meanwhile direction of the nature, which can be positive or negative. A correlation coefficient of 1 means variables have the perfect relationship, a 0.7-0.9 value of the correlation coefficient means strong, a 0.4-0.6 value of correlation coefficient means moderate, and a 0.1-0.3 value of correlation coefficient means weak (Dancy and Reidy's, 2004) as cited by (Lewis, 2018).

Table 4.3: Pairwise correlations

Variables	ROA	AGE	LEV	MCS	LOS	INV	RID	PGR	GDP	INF
ROA	1									
AGE	0.257	1								
LEV	-0.30	-0.06	1							
MCS	0.093	0.71	0.335	1						
LOS	-0.63	0.02	0.263	0.116	1					
INV	0.294	0.021	-0.56	-0.38	-0.25	1				
RID	0.06	0.179	0.361	0.501	-0.14	-0.43	1			
PGR	0.065	0.237	0.178	0.433	-0.06	-0.25	0.326	1		
GDP	-0.04	-0.09	0.012	0.001	0.184	-0.05	-0.18	0.06	1	
INF	0.058	0.133	0.063	-0.00	-0.24	0.027	0.3	0.03	-0.69	1

***Source**: "Stata" output*

Table 4.3 above, shows the correlation between the variables employed in this study, ROA (dependent variable); leverage ratio, age of the company, investment income ratio, reinsurance dependency ratio, loss ratio, premium growth rate, market share, inflation, and GDP growth (independent variables). According to the results, the profitability of the insurance companies (ROA) has a weak positive correlation with the age of the company (0.257), market share (0.093), investment income (0.294), reinsurance dependency (0.06), premium growth rate (0.065), and inflation (0.058). On the other hand, it has a negative moderate correlation with loss ratio (-0.63), and negative weak correlation with leverage ratio (-0.30), and GDP growth rate (-0.04). Looking into the pattern of the correlation between the explained, and explanatory variables, it can be concluded that ROA has neither perfect nor strong correlation with any explanatory variable considered in this model.

As to the correlation of the independent variables, the company age has strong positive correlation with market share (0.71), and a weak positive correlation with loss ratio (0.02), investment income (0.021), reinsurance dependency (0.179), premium growth rate (0.237), and inflation (0.133). While it has a weak negative correlation with leverage (-0.06), and GDP growth rate (-0.09). The leverage ratio has a weak positive correlation with loss ratio (0.263), market share (0.335), reinsurance dependency (0.361), premium growth rate

(0.178), GDP growth rate (0.012), and inflation (0.063), but a moderate negative correlation with investment income (-0.56). Market share has a moderate positive correlation with premium growth (0.433), and reinsurance dependency (0.501), but a weak positive correlation with loss ratio (0.116), and GDP growth (0.001), and a weak negative correlation with investment income (-0.38), and inflation (-0.001).

The loss ratio has a weak positive correlation with GDP (0.184) while it has a weak negative correlation with investment income (-0.25), reinsurance dependency (-0.14), premium growth rate (-0.06), and inflation (-0.24). Investment income has a moderate negative correlation with reinsurance dependency (-0.43), and a weak negative correlation with premium growth rate (-0.25), and GDP growth (-0.05), while it has a weak positive correlation with inflation (0.027). The correlation of reinsurance dependency with inflation and premium growth is weak positive (0.3), and (0.326), respectively, whereas weak negative with GDP growth (-0.18). The correlation of premium growth with GDP growth, and inflation is weak positive (0.06) and 0.03) respectively. The correlation between GDP growth and inflation is moderate negative (-0.69).

4.4 Model Specification (Fixed effect vs Random Effect)

In order to decide which model is appropriate for this study different tests can be implemented, first Hausman test to select the appropriate model from the random effect and fixed effect model. Then after selecting the appropriate model from the random effect and fixed effect model, the OLS model should be compared with the result of the previous comparison. Notwithstanding, it is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more plausible when the entities in the sample effectively constitute the entire population (Brooks, 2008).

For this study, all the target population i.e., Ethiopian Insurance companies operating during the period under the study were considered. Accordingly, only Zemen Insurance S.Co was excluded as it cannot satisfy the five years data required for the study. Hence, since nearly all the Ethiopian insurance companies were included in the study and the selection was not random, fixed effect model was chosen without conducting the Hausman

test. In addition, the fixed effect model was chosen over the random effect model since the researcher was only interested in analyzing the impact of variables that vary over time and need to control something within the individual company that may impact or bias the predictor or outcome variables.

4.5 Diagnostic Tests

The diagnostic tests were conducted to make sure whether the CLRM assumptions violated. The researcher has performed normality test, heteroskedasticity test, auto-correlation test, and multicollinearity test, and finds that the characteristics of the model and proposed variables do not violate the classical linear assumptions. The result of tests applied for CLRM assumptions is presented and discussed in the following section.

4.5.1 Heteroskedasticity test

According to (Brooks, 2008), it has been assumed that the variance of the disturbance is constant. This is known as the assumption of homoscedasticity. If we estimate regression models on data in which the variance is not constant, they will still result in errors that are zero on average (i.e., our predictions are still correct), but this may cause some independent variables not to be significant, whereas, in reality, they are. If the errors do not have a constant variance, they are said to be heteroscedastic. White test and Modified Wald test for groupwise heteroskedasticity in fixed effect regression model were used for general test of heteroscedasticity. Each test results and their implications are discussed below. The hypotheses for heteroskedasticity tests are presented as follows:

H0: There is no heteroskedasticity.

H1: There is a heteroskedasticity.

Table 4.5.1.1: White Test for heteroskedasticity

White's test for Ho: homoskedasticity against Ha: unrestricted heteroskedasticity chi2(53) = 57.06 Prob > chi2 = 0.3268 Cameron & Trivedi's decomposition of IM-test			
Source	chi2	df	p
Heteroskedasticity	57.060	53	0.327
Skewness	5.530	9	0.786
Kurtosis	1.790	1	0.181
Total	**64.370**	**63**	**0.428**

***Source**: "Stata" Output*

Table 4.5.1.2: Modified Wald test for groupwise heteroskedasticity

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model.
H0: sigma(i)^2 = sigma^2 for all i chi2 (17) = 207.70 Prob>chi2 = 0.0000

***Source**: Stata 14.2 "xttest3" Output*

As it is shown in Table 4.5.1.1, and Table 4.5.1.2 respectively above, the white test's result of pro > chi2 =0.3268 which is higher than 0.05 indicates that there is no evidence for the presence of heteroskedasticity, whereas the Modified Wald test for groupwise heteroskedasticity in fixed effect regression model result is prob>chi2 = 0.000 which is less than 0.05 indicates there is heteroskedasticity problem. Therefore, according to (Wooldridge, 2012) heteroskedasticity- robust standard error can be applied to adjust the standard errors to take account of heteroskedasticity. This method is known as

heteroskedasticity-robust procedures because they are valid at least in large samples whether the errors have constant variance, and we do not need to know which is the case. Hence the researcher was obliged to apply the robust standard error corrector while performing the fixed effect model regression.

4.5.2 Test for autocorrelation

Autocorrelation is a mathematical representation of the degree of similarity between a given time series and a lagged version of itself over successive time intervals ("Investopedia",2023). According to (Gujarati, 2004), autocorrelation is a correlation between members of a series of observations ordered in time as in time series data or space as in cross-sectional data. The classical linear regression model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. Which means the covariance between the disturbance terms over time is zero. If the disturbances are not uncorrelated with one another, it would be stated that they are "autocorrelated" or that they are "serially correlated". To test this assumption the Wooldridge test(xtserial) test for panel data was applied. The autocorrelation test hypotheses are as follows.

H0: There is no autocorrelation.

H1: There is autocorrelation.

Table 4.5.2 Autocorrelation test: Wooldridge test:

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F (1, 16) = 0.400
Prob > F = 0.5362

Source: *Stata 14.2 "xtserial" Output*

The Wooldridge test of autocorrelation indicates that there is no serial correlation with a p-value of 0.534 which is higher than 5%. Therefore, this study failed to reject the null and conclude that the data was free from the first-order autocorrelation problem.

4.5.3 Test for normality

The classical linear regression model (CLRM) assumes that each residual is distributed normally with zero mean and constant variance (Brooks, 2012). The normality assumption is that the mean of the residuals is zero. According to (Brooks, 2008) one of the commonly applied tests for normality is the Jarque Bera test. This test uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments, the mean and the variance.

The hypothesis of normality tests is presented as follows.

H0: The residuals are normally distributed. H1:

The residuals are not normally distributed.

This means that the p-values given at the bottom of the normality test screen should be greater than 5% (0.05) to not reject the null hypothesis of the normality at a 5% level of significance (Brooks, 2012).

Table 4.5.3: Jarque- Bera normality test

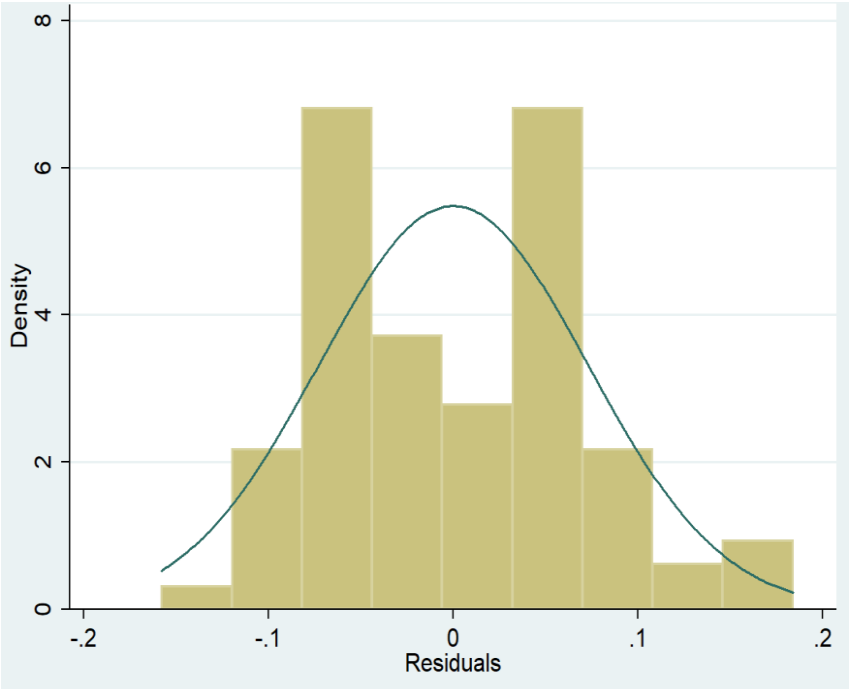
Jarque- Bera test for normality
Jarque-Bera normality test: 2.537 Chi (2)0.2813 Jarque-Bera test for Ho: normality:

Source: *Stata 14.2 "jb uhat" output*

The results of the test for this study as shown in Table 4.5.3 above, Jacque-Bera has a chi (2) value of 0.2813 which is considerably greater than the p-value of 0.05, then the study failed to reject the null hypothesis of normality at a 5% significance level. This implies that

the residuals are normally distributed. In addition to the test discussed above, normality can also be checked graphically through histograms. The histogram should be bell-shaped and resemble the normal distribution. In this case, the below graph indicates that the histogram has a bell curve and so the researcher concluded that the residuals appear to be reasonably normally distributed.

Diagram 4.5.3: Histogram for normality test



***Source**: Stata 14.2 "histogram" output*

4.5.4 Multicollinearity test

A high (but not perfect) correlation between two or more independent variables is called multicollinearity (Wooldridge, 2012). It is important to check for multicollinearity problems before running the model against the hypothesized explanatory variables (Negewo et al, 2016). They added that the existence of multicollinearity will hinder deriving estimators of parameter coefficients and thus make statistical influence difficult. As collinearity increases, the variance of the estimators increases and, in the limit, it can become infinite.

According to (Gujarati, 2004) multicollinearity could only be a problem if the pair-wise correlation coefficient among regressors is above 0.80. In addition, (Hair JF, 2006) argued that a correlation coefficient below 0.9 may not cause serious multicollinearity problems as cited by (Feisal, 2020). The speed with which variances and covariances increase will be computed using the variance-inflating factor (VIF). The VIF shows how the variance of an estimator is inflated by the presence of multicollinearity. As the variance of an estimator approaches 1, the VIF approaches infinity. That is, as the extent of collinearity increases, the variance of an estimator increases, and in the limit, it can become infinite.

Table 4.5.4: Multicollinearity test result: VIF

Variable	VIF	1/VIF
MCS	4.632	0.216
AGE	3.204	0.312
INF	2.357	0.424
GDP	1.987	0.503
RID	1.986	0.504
INV	1.841	0.543
LEV	1.788	0.559
PGR	1.306	0.766
LOS	1.292	0.774
Mean VIF	2.266	

Source: *"Stata 14.2" VIF output*

The result of VIF in Table 4.5.4 above, reveals that all independent variables have a VIF value which is below 10, since the VIF of all variables is even below 3, it can be concluded that there is no multicollinearity problem.

4.6 Regression Analysis

This section presents the overall empirical results of the regressions. Regression is a statistical technique that predicts the value of a dependent variable based on one or more

independent variables (Tadese et al., 2020). The regression analysis examines the relationship between the profitability (ROA) of the Ethiopian insurance industry as a dependent variable and the independent variables such as leverage, age of the company, loss ratio, investment income ratio, reinsurance dependency, premium growth, market share, GDP, and inflation as presented below.

Table 4.6.1: Regression results

ROA	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
AGE	-.008	.003	-2.40	.029	-.014	-.001	**
LEV	-.032	.045	-0.70	.491	-.127	.064	
MCS	.215	.084	2.56	.021	.037	.393	**
LOS	-.109	.04	-2.72	.015	-.193	-.024	**
INV	.24	.092	2.62	.019	.046	.435	**
RID	.129	.146	0.88	.391	-.181	.438	
PGR	.001	.002	0.58	.57	-.004	.006	
GDP	.04	.218	0.18	.856	-.422	.502	
INF	.103	.075	1.37	.188	-.056	.263	
Constant	.206	.065	3.16	.006	.067	.344	***

Mean dependent var	0.069	SD dependent var	0.030
R-squared	0.496	Number of Obs	85
F-test	58.976	Prob > F	0.000

**** p<.01, ** p<.05, * p<.1*

Source: "*Stata 14.2" regression output*

Based on the above-fixed effect model regression output, the regression equation is as follows:

$$\mathbf{ROA}_{it} = .0206 - .008\mathbf{AGE}_{it} - .032\mathbf{LEV}_{it} + .215\mathbf{MCS}_{it} - .109\mathbf{LOS}_{it} + .24\mathbf{INV}_{it} + .129\mathbf{RID}_{it} + .001\mathbf{PGR}_{it} + .04\mathbf{GDP}_{t} + .103\,\mathbf{INF}_{t} + \varepsilon_{it}$$

Where:

ROA= return on asset (before tax profit) of insurer i at time t

AGE= company age of insurer i at time t

LEV= leverage ratio of insurer i at time t

MCS= market share of insurer i at time t

LOS = loss ratio of insurer i at time t

INV= investment income ratio of insurer i at time t

RID= reinsurers dependency ratio of insurer i at time t

PGR= Premium growth rate of insurer i at time t

GDP= Growth of real GDP at time t

INF= general inflation rate at time t

I= insurance companies, 1,2….17

T= Time period, 1,2….5 years

ε= disturbance

Discussion of the findings is focused on the results of the above multiple regression output, and based on the result the effect of each explanatory variable on the profitability of insurance companies in Ethiopia is discussed as follows. As it is shown in Table 4.6.1 above, the model is very strongly significant (P-value = 0.0000) and with R-squared is about 49.6 %. This implies that the impact of explanatory variables on the profitability of Ethiopian insurance companies is around 49.6% which means 50.4 percent of the variation in profitability of the Ethiopian insurance companies determined by factors not included in this model.

The result also indicates that about four of the independent variables like the age of the company, market share, investment income ratio, and loss ratio have significant effects on the profitability of Ethiopian insurance companies. On the other hand, leverage, reinsurance dependency, premium growth, GDP, and inflation have statistically insignificant impacts on the profitability of the insurance companies in Ethiopia at any reasonable significance level. Among statistically significant variables, market share and investment income have a positive impact on the profitability while loss ratio and company age have a negative impact on the profitability of the insurance companies.

The null hypothesis of the F-statistic (an overall test of significance) is that all the coefficients of independent variables are equal to zero. The F-statistic (0.000) is significant at a 1% significance level which implies that ROA and determinant factors selected in the study adequately fit the model, and explanatory variables are jointly significant. This implies that all the explanatory variables have jointly statistically significant impact on the profitability of general and life insurance in Ethiopia and there is a 99.9% probability that the relationship among the variables is not due to mere chance. The fixed effect model regression result in the above table also shows that the coefficient intercept (α) is .206. This means that when all explanatory variables took a value of zero, the average value of ROA would take 0.206.

The impacts of each profitability determinant considered for this study were separately discussed in the proceeding section in the context of the above fixed effect model regression output.

4.6.1 Age of insurance company

Company age is measured by the number of years a company has been operating in the market since it originated, and it is among an important determinant of financial performance (ROA) of insurance companies. The theory of learning by doing, explains the positive relationship, which posits that as the age of the firm increases, there is the likelihood of improvement in their productive efficiency over time by learning from their experience.

In contrast to the above-stated theory, the result of this finding with a coefficient of -0.008 and p-value 0.029, reveals that age has a significant negative effect on the profitability of the insurance companies in Ethiopia. The standardized coefficient of the regression result implies that an increase in the age of a company by one year leads to a decrease in company's profitability by 0.8 percent, holding other factors constant. The result of the study is in line with the previous similar studies by (Mengistu et al, 2020), and (Sambasivam, 2013) who found a negative and significant impact of age on the profitability of insurance companies while it is against the finding by (Taddese et al, 2020), who came up with age has an insignificant positive impact on the profitability of Ethiopian insurance companies.

The negative relation between age and profitability is unexpected and against the research hypothesis, this may be due to the old system and technology adopted by the earlier established companies may cause the loss of their customers, as the unsatisfied customers may migrate towards the newly established companies so that as more and more companies join the market, the older companies may lose their market share in the industry. Hence, the researcher rejects the null hypothesis which states company age is a significant and positive determinant of Ethiopian insurance companies' profitability and suggests further study in the area to confirm using alternative research.

4.6.2 Leverage

Leverage as measured by total debt to total assets, happens to be one of the limiting factors in firms' profitability in the Ethiopian insurance sector. According to the fixed effect model regression result, the coefficient of leverage is negative and insignificant at any level of significance (P value = 0.491). The coefficient of leverage (-0.03) can be interpreted as; a one percent increase in the leverage ratio of the company would cause a decrease in the profitability of the Ethiopian insurance companies by 3.2 percent, other factors remaining constant. This indicates that there is an inverse relationship between leveraged and profitability of insurance companies. This may be due to highly levered companies may not easily find creditors since they are unable to pay their debt if they face bankruptcy. As a result, highly leveraged companies' market value, and potential policyholders' interest for these companies is low thereby lowering their profitability. The highest and lowest

leverage ratio of 86.72% and 23.23%, were registered by EIC, and Awash Insurance company, respectively.

The study result supports the theories of capital structure that tells us insurance companies with lower leverage will generally report higher returns on assets. The finding of this study is consistent with the results of previous similar studies, such as (Mengistu et al.,2020), and (Teklit, and Kaur,2017). In contrast, this result is against the findings of previous researchers such as (Hana,2015), (Mahari and Amero, 2013) and (Behaylu, 2017), which concluded leverage ratio and profitability have a positive relationship, and (Dhiab, 2021); (Mingizem, 2017), (Tadese et al., 2020), (Bhattarai, 2020), (Boadi, 2013), (Sambasiva and Abate, 2013) who came up with leverage has a significant relationship with the profitability of insurance companies. Hence, the researcher rejects the null hypothesis which states leverage is a significant and positive determinant of Ethiopian insurance companies' profitability.

4.6.3 Market share

Market share is industry-specific variable, and it is measured by the ratio of an insurer's gross written premium to the gross written premium of the industry. This study witnessed a positive and significant impact of market share on the profitability of Ethiopian insurance companies with a p-value of 0.021, and a positive coefficient (0.215). The positive coefficient indicates that an increase in the market share of insurance companies will leads to increased profitability. According to this study's finding, an increase in market share by one percent led to an increase in profitability of the Ethiopian insurance companies by 21.5%, other factors remain constant.

The positive and significant relation between market share and profitability might be due to higher market share giving the insurance companies the chance to utilize economies of scale to reduce costs and give insurance companies more power to set prices. This positive relationship is expected, and consistent with previous studies (Feisel, 2020), (Dawit, 2021), (Taye, 2016), (Tariku, 2017), and (Lee, 2014) which found a positive relationship between the market share and ROA. However, it is inconsistence with the study result of (Teklit and Kaur, 2017) which shows a positive and insignificant impact on profitability. Therefore,

this study is unable to reject the null hypothesis which states market share is a significant positive determinant of Ethiopian insurance companies' profitability.

4.6.4 Loss ratio

Loss ratio is measured by the ratio of net claim incurred to net premium earned in a year by each insurance company. The coefficient of regression result regarding the loss ratio indicates a negative relationship (-0.109) and its impact is significant at 5% with P-value = 0.015(1.5%). This implies that using a standardized coefficient and holding all other factors constant, a 1% increase in the loss ratio of insurance firms in Ethiopia led to on average a 10.9% decrease in their profitability, and this decline is statistically significant at 5% which is consistent with the theoretical aspects. The result indicates that a low loss ratio has a low negative impact on the profitability of Ethiopian insurance companies as it lowers the operating expenses.

The major causes of loss are lack of an adequate pre-risk evaluation and selection, claim handling practice, and moral hazard i.e., the possibility that insureds may deliberately cause an insured event or pretend that such event occurred to obtain insurance payment. During the years under consideration the highest loss ratio (101.7%) was exhibited by Africa Insurance company which incurred a loss of 1.1% of its total assets, whereas the low loss ratio (4.81%) was recorded by Nyala Insurance which earned a profit of 8.9%. This study result is consistent with the empirical results of (Taye, 2016), (Tadesse and Gujral, 2022); (Horera and Maganya, 2022), (Dhiab, 2021), (Tadese et al, 2020) which shows that profitability and loss ratio is negatively and statistically significantly related, but it is contrary to the study by (Teklit and Kaur, 2017), which states the negative and insignificant impact of loss ratio on the profitability of the insurance companies. Therefore, this study is unable to reject the null hypothesis which states loss ratio is a significant negative determinant Ethiopian insurance companies' profitability.

4.6.5 Investment income

The investment income ratio is measured by the net investment income to premium earned. The coefficient of the investment income ratio is (0.24) and statistically significant at a 5% significance level with a p-value of 0.019(1.9%) which is lower than a 5%. The

standardized coefficient of the investment income ratio shows that, with all other factors remaining constant, an increase in investment income by 1% leads to an increase in return on assets by 24.04%. This implies that the more insurance companies allocate their available resources to productive investments, the higher the expected investment income which contributes to their profitability. The finding of this research is in line with previous similar studies which conclude that investment income has a positive and significant relationship with the profitability (ROA) of insurance companies (Burca and Batrinca, 2014), (Shiu, 2004), (Lee, 2014), and (Boyjoo and Ramesh, 2017). Therefore, this study is unable to reject the null hypothesis which states investment income is a significant positive determinant of Ethiopian insurance companies' profitability.

4.6.6 Reinsurance dependency

Insurance companies usually take out reinsurance cover to stabilize earnings, increase underwriting capacity, and provide protection against catastrophic losses, nevertheless it involves a certain cost. The coefficient of reinsurance dependence which is measured as the ratio of premiums ceded to reinsurers to total assets was positive, but statistically insignificant even at a 10% significance level (p value= 0.391) indicating that its influence is negligible. The insignificant parameter indicates that the reinsurance dependence does not affect Ethiopian insurance companies' profitability.

Referring to previous studies, the results concerning reinsurance dependence were inconsistent. According to (Shiu, 2014) there is a negative relationship between reinsurance dependence and insurers' profitability, but it is not significant which is consistent with this study. However, (Lee, 2014) found a significant negative relationship between reinsurance dependence and insurers' profits. Hence, the researcher rejects the null hypothesis which states reinsurance dependency is an insignificant negative determinant of Ethiopian insurance companies' profitability since the actual result is found to be insignificant, but positive.

4.6.7 Premium growth

Premium revenue is a primary source of revenue for insurance companies, and it is more persistent source than other revenue sources. Thus, premium revenue growth indicates a

growth in business undertaken by the insurance companies. According to the regression result, the premium growth rate (PGR) has a positive and insignificant (p-value=0.57) impact on the profitability of the insurance companies with an estimated coefficient of (0.001) which is insignificant at a 5% level of significance. The positive coefficient indicates that insurance companies that underwrite more premiums over the years have a better chance of being profitable as they gain a return from premiums collected when the excessive attention on marketing to grow premiums with a proportionate allocation of resources towards the management of their investment portfolio is given.

The result implies that a 1% increase in the premium growth rate of the company causes a 0.1% increase in profitability, with other factors remaining constant. The finding of this study is consistent with the previous findings of (Asrat and Tesfahun, 2016), (Demis, 2016) who concluded a positive relationship between premium growth and profitability of insurance company while it is in contrast with the findings of (Charumathi, 2012) which reveals that premium growth rate negatively affects the profitability. Hence, the researcher rejects the null hypothesis which states premium growth is a significant and positive determinant of Ethiopian insurance companies' profitability.

4.6.8 GDP growth

Real GDP measures the total monetary value of goods and services produced in a country over a specified period, mostly one year. According to (Tadese, 2020), the growth rate of GDP reflects economic activity as well as the level of economic development and various factors related to the supply and demand for insurance products and services. In short RGDP measures or shows the adjusted economy of the country and it is measured by the growth in gross domestic products of the country. The coefficient of GDP is positive (0.04), but statistically insignificant at any significance level with a p-value (0.86) which is higher than 0.05(5%). The standardized coefficient of GDP is interpreted as all other factors remaining constant, an increase in the gross domestic product by 1% leads to an increase in the profitability of Ethiopian insurance companies by 4%. The insignificant but positive coefficient of the variable signifies that economic growth and profitability are directly related but the impact of economic growth is not too much during the period under consideration.

The finding of this study is congruent with the findings of (Meaza, 2014), (Dawit, 2021), and (Tadesse and Gujral, 2022) which show the positive and insignificant relationship between GDP growth and profitability. On the other hand, it is inconsistent with the findings by (Taye, 2016), (Asrat and Tesfahun, 2016), (Suyehli, 2015), (Daare, 2016), (Feisel, 2020), and (Tadese et al., 2020) who concluded that GDP growth has significant positive impact on profitability of the Ethiopian insurance companies, and also with the findings of (Teklit and Kuar, 2017) which indicates the relationship between GDP growth and profitability is negative and statistically significant.

The reason behind this insignificant result is while economic growth increases, demand for insurance coverage for activities like automobile insurance, homeowner insurance, and worker compensations is relatively inelastic. In addition, the lack of innovative products or investment opportunities and companies' fear of investing on risky investments, industry effects like price cutting, and moral hazards are also other reasons for this result. Hence, the researcher rejects the null hypothesis which states that GDP growth is a significant and positive determinant of Ethiopian insurance companies' profitability.

4.6.9 Inflation

Inflation could affect insurance companies' financial performance influencing both their liabilities and assets. In expectation of inflation, claim payments increase as well as reserves that are required in anticipation of the higher claims, consequently reducing technical results and profitability. The coefficient of inflation (0.103) is positive, but it is not statistically significant (p-values = 0.19), thus the effect of inflation on Ethiopian insurers' profitability is insignificant. This implies that using a standardized coefficient and holding all other factors constant, a 1% increase in inflation leads to on average a 10.3% increase in the profitability of Ethiopian insurance companies, but the result is not statistically significant at any significant level.

The result is consistent with findings by (Tariku, 2017), (Andres C, 2017), (Godfrey, 2012), and (Hadush, 2015) who found an insignificant positive relationship between inflation and ROA. On the other hand, the result is inconsistent with the hypothesis of the study and the findings of (Meaza, 2014), (Hana, 2015), (Teklit and Jasmindeep, 2016), (Asrat and

Tesfahun, 2016), (Andres and Stephen, 2017) and (Behaylu, 2017) which concluded that inflation has a negative and significant impact on the profitability of insurance companies.

Based on the result of this finding, the researcher concluded that the impact of inflation on Ethiopian insurance companies' profitability is insignificant. This might be due to inflation affecting both assets of the company and the ability to pay its obligation. Hence, the researcher rejects the null hypothesis which states inflation is an insignificant and negative determinant of Ethiopian insurance companies' profitability.

Table 4.6.2: Summary and comparison of hypothesized test and actual result

Explanatory variable	Abbreviation	Expected relationship	Actual relationship	Hypothesis status
Age of the Company	AGE	Positive and insignificant	Negative and significant	Rejected
Leverage	LEV	Negative and significant	Negative and insignificant	Rejected
Market Share	MCS	Positive and Significant	Positive and significant	Failed to reject
Loss Ratio	LOS	Negative and significant	Negative and Significant	Failed to reject
Investment Income	INV	Positive and Significant	positive and Significant	Failed to reject
Reinsurers Dependency	RID	Negative and Insignificant	Positive and Insignificant	Rejected
Premium Growth Rate	PGR	Positive and Significant	Positive and Insignificant	Rejected
Gross Domestic Product	GDP	Positive and significant	Positive and insignificant	Rejected
Inflation	INF	Negative and insignificant	Positive and Insignificant	Rejected

Source: *compiled by the researcher from related article & Stata output*

As shown in summary table 4.6.2 above, the independent variables: company age, market share, loss ratio, and investment income ratio have significant effects on Ethiopian insurance companies' profitability. The actual results of these variables are consistent with expected ones, except for company age. Therefore, the researcher failed to reject the null hypothesis for investment income, loss ratio, and market share.

CHAPTER FIVE

5. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

A strong and healthy financial system is a precondition for sustainable economic growth of a given country. In order to survive negative shocks and maintain good financial stability, financial managers and policymakers should identify the key performance determinants of insurance companies. Because of this, the current study specified an empirical framework to examine the firm-specific and macroeconomic factors affecting the profitability of insurance companies as measured by ROA. This study used secondary data during the period 2018-2022 and the sample of 17 insurance companies. Descriptive statistics and regression analysis were performed to describe the profitability of insurance companies. The following sections discussed the summary, conclusion remarks of the study, and applicable recommendations.

5.2 Summary of the Findings

Descriptive statistics, correlation analysis and fixed effect regression analysis were performed to describe the profitability of insurance companies. The result of descriptive analysis indicates that the average value of profitability (ROA) of Ethiopian insurance companies was 0.069. The regression result showed that market share, loss ratio, age of the company, and investment income significantly affect the profitability of insurance companies in Ethiopian.

The effect of investment income, and market share on profitability is positive, while company age, and loss ratio effect is negative. It means firms with high investment income, low loss ratio, higher market share and low service years have higher returns on assets (ROA). Among the determinants included in the study, investment income has the highest impact on profitability followed by the market share, loss ratio, and company age, respectively. The study results of investment income, market share, and loss ratio are consistent with the hypothesis, whereas the results of leverage, company age, GDP, premium growth, reinsurers dependency, and inflation are inconsistent. The regression result indicates that leverage, reinsurers dependency, premium growth, GDP, and inflation

have insignificant effects on the Ethiopian insurers' profitability with P-value of (0.49), (0.39), (0.57), (0.86), (0.19), respectively.

The coefficient of company age is -0.008 and statistically significant at 5% significance level with a p-value of 0.029 which is below 5%. The regression result of the study revealed that there exists a significant and negative relationship between the loss ratio and profitability of Ethiopian insurance companies with a regression coefficient of -0.109 and p-value of 0.015 which is below the 5% level of significance. The coefficient of regression result for investment income, and market share is 0.24, and (0.215) with a P-value of 0.018, 0.021, respectively.

The correlation matrix shows that ROA has a moderate negative correlation with a loss ratio (-0.63) and a weak correlation with the rest of the independent variables. Regarding the correlation between the independent variables, there is strongly positive (0.71) correlation between company age and market share, and a moderate negative correlation between GDP and inflation (-0.69), whereas the correlation among the rest of the variables is weak which is either positive or negative.

5.3 Conclusion

The purpose of this study was to identify the major determinants of profitability of insurance companies in Ethiopia that were in operation over the periods of 2018-2022, using return on assets (ROA) as a proxy of profitability against several internal and external variables that were regressed. The internal variables were the age of insurance companies, loss ratio, leverage, premium growth, reinsurance dependency, and investment income, and the external variables were market share which is an industry- specific variable; real growth rate of GDP and inflation which are macroeconomic factors.

Descriptive statistics, Pearson correlation matrices and fixed effect regression analysis were performed to describe the determinants of profitability of insurance companies in Ethiopian. The study revealed that the selected variables explained 49.6% of the change in the profitability of insurance companies in Ethiopia. This means the independent variables market share, leverage, reinsurers dependency, loss ratio, investment income, GDP growth, premium growth, inflation, and age of the company jointly explain about 49.6% percent of

the change in the profitability of insurance companies in Ethiopia. The results of the analysis also indicated that the age of insurance companies, investment income, market share, and loss ratio were the key determinants that significantly affect the profitability of insurance companies. Nevertheless, factors such as leverage, premium growth, reinsurance dependency, GDP growth, and inflation were found to have insignificant impacts on profitability.

Among the statistically significant variables affecting the profitability of the firm, the age of the company, and loss ratio have a negative impact on profitability while the other two variables; market share and investment income have a positive and significant impact on the profitability of the companies. The negative relation between age and profitability is unexpected and against the research hypothesis, this may be due to the old system and technology adopted by the earlier established companies may cause the loss of their customers.

5.4 Recommendations

Based on the study findings, the profitability of insurance companies in Ethiopian which is measured by ROA was affected by both the internal and external factors, i.e., age of the insurance companies, market share, investment income, leverage, premium growth, reinsurance dependency, loss ratio, inflation, and growth of GDP. Since the management of the insurance companies has control over the company-specific (internal) factors, it is possible to improve the profitability of the insurers by giving more attention to the identified insurers' specific and the industry-specific factors such as age of the insurance companies, market share, investment income, leverage, premium growth, reinsurance dependency, loss ratio. Therefore, based on this study's findings, the researcher has drawn the following recommendations.

- The macroeconomic variables (GDP, and inflation) do not seem to significantly affect the profitability of Ethiopian insurance companies. Therefore, insurance managers and policymakers should give high concern to firm-specific, as well as industry-specific determinants of profitability.

- The negative relation between age and profitability is unexpected this may be due to the old system and technology adopted by the earlier established companies may cause the loss of their customers, as the unsatisfied customers may migrate towards the newly established companies so that as more companies join the market, the older companies may lose their market share in the industry, so to mitigate the negative impact of age, company managers have to work on improving their customer satisfaction by providing quality service, adopting new technologies, and introducing new product line or unique service etc.
- The finding of the study indicates that insurance companies' profitability, is highly and positively affected by their market share. Therefore, to increase their profitability company's mangers need to increase the market share of the firm. This could be done by opening new branches in different parts of the country, by introducing new product/service lines, advertising services, and enhancing service quality. Hence, as an increase in market share leads to good profitability, managers of insurance companies should strive to improve their company's market share.
- Since firm-specific factors like the age of the company, and loss ratio have a significant negative effect on the profitability of the company, management of insurance companies should consider these factors while making financial decisions.
- Furthermore, though its impact is insignificant, leverage has an inverse relationship with profitability hence equity financing should be given priority over debt financing.

Finally, due to data limitation, and to maintain the consistency of reporting system (IFRS based financial report), the researcher was obliged to focus only on the last five years (2018 to 2022) performances of the incurrence companies. Therefore, further research should be conducted on this area with extended time, and more explanatory variables such as managerial efficiency, average cost per claim, investment mix etc. by using mixed research approach to identify which variables are the powerful determinants of insurance companies' profitability in Ethiopia.

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7. APPENDIX

Appendix I: List of insurance companies

Table 1: List of insurance companies operating in Ethiopia as of 2023

S.no	Insurance company name	Type	Date of establishment
1	Ethiopian Insurance Corporation	Life and General	1975
2	National Insurance Company of Ethiopia S.C	General	23/09/1994
3	Awash Insurance Company S.C	Life, and General	01/10/1994
4	Africa Insurance Company S.C	Life, and General	01/12/1994
5	Nyala Insurance Company S.C	Life, and General	06/01/1995
6	Nile Insurance Company S.C	Life, and General	11/04/1995
7	Global Insurance Company S.C	General	11/01/1997
8	The United Insurance S.C	Life, and General	01/04/1997
9	NIB Insurance Company	Life, and General	01/05/2002
10	Lion Insurance Company S.C	General	01/07/2007
11	Ethio-Life & General Insurance S.C	Life, and General	23/10/2008
12	Oromia Insurance Company S.C	Life, and General	26/01/2009
13	Abay Insurance Company	Life, and General	26/07/2010
14	Berhan Insurance S.C	General	24/05/2011
15	Tsehay Insurance S.C	General	28/03/2012
16	Lucy Insurance S.C	General	01/10/2012
17	Buna Insurance S.C	Life, and General	21/05/2013
18	Zemen Insurance S.C	General	17/01/2020

Source: National Bank of Ethiopia (NBE) Website. (May 2023)

Appendix II: Data Used for Analysis

Company	Year	ROA	Age	LEV	MCS	LOS	INV	RID	PGR	GDP	INF
Abay	2018	0.1299	7.83	0.5822	0.035	0.5501	0.1701	0.0941	0.194	0.0771	0.1677
Abay	2019	0.0848	8.83	0.6466	0.0275	0.5937	0.1346	0.0883	0.0711	0.09	0.153
Abay	2020	0.1153	9.83	0.6121	0.0244	0.2387	0.1407	0.0917	0.0852	0.0606	0.2155
Abay	2021	0.0753	10.83	0.6316	0.0262	0.5844	0.1344	0.1201	0.3381	0.0626	0.2448
Abay	2022	0.0816	11.83	0.6576	0.0249	0.5362	0.1682	0.103	0.1345	0.064	0.3404
Africa	2018	0.0452	23.58	0.66	0.0878	0.9011	0.1624	0.1067	0.1096	0.0771	0.1677
Africa	2019	0.0114	24.58	0.7102	0.0613	1.0171	0.1801	0.0718	-0.0479	0.09	0.153
Africa	2020	0.0412	25.58	0.7448	0.0516	0.8393	0.196	0.0824	0.0313	0.0606	0.2155
Africa	2021	0.0413	26.58	0.7457	0.0437	0.7832	0.168	0.1105	0.05	0.0626	0.2448
Africa	2022	0.015	27.58	0.7295	0.0351	0.8393	0.1677	0.0807	-0.0404	0.064	0.3404
Awash	2018	0.064	23.75	0.5473	0.1013	0.605	0.2	0.0747	0.124	0.0771	0.1677
Awash	2019	0.0573	24.75	0.5338	0.0879	0.6262	0.1819	0.0749	0.1824	0.09	0.153
Awash	2020	0.0611	25.75	0.2323	0.0804	0.631	0.2278	0.0834	0.1203	0.0606	0.2155
Awash	2021	0.0816	26.75	0.5463	0.0924	0.5768	0.1897	0.1312	0.4266	0.0626	0.2448
Awash	2022	0.0847	27.75	0.5457	0.1069	0.6132	0.1801	0.1532	0.383	0.064	0.3404
Berhan	2018	0.0651	7.08	0.6539	0.0157	0.5794	0.2113	0.0598	0.05	0.0771	0.1677
Berhan	2019	0.0623	8.08	0.684	0.0134	0.5067	0.1978	0.0614	0.1685	0.09	0.153
Berhan	2020	0.0815	9.08	0.6395	0.0126	0.4351	0.2097	0.0712	0.1474	0.0606	0.2155
Berhan	2021	0.0811	10.08	0.6211	0.0114	0.4772	0.2232	0.0688	0.1212	0.0626	0.2448
Berhan	2022	0.0729	11.08	0.6389	0.0147	0.5059	0.1959	0.0835	0.5475	0.064	0.3404
Bunna	2018	0.0719	5.08	0.6984	0.025	0.6327	0.1281	0.1147	0.2943	0.0771	0.1677
Bunna	2019	0.0663	6.08	0.668	0.0225	0.616	0.134	0.1208	0.2286	0.09	0.153
Bunna	2020	0.0316	7.08	0.7278	0.0224	0.712	0.1519	0.0953	0.2215	0.0606	0.2155
Bunna	2021	0.0472	8.08	0.7159	0.0243	0.6579	0.1317	0.1062	0.3448	0.0626	0.2448
Bunna	2022	0.0416	9.08	0.7684	0.0291	0.6761	0.1279	0.1189	0.433	0.064	0.3404
EIC	2018	0.0266	42.5	0.5691	0.1631	0.8516	0.1563	0.0107	0.1214	0.0771	0.1677
EIC	2019	0.0882	43.5	0.7826	0.3756	0.5759	0.0847	0.1392	3.5571	0.09	0.153
EIC	2020	0.0766	44.5	0.8212	0.4416	0.6682	0.0763	0.2057	0.4406	0.0606	0.2155
EIC	2021	0.0721	45.5	0.8672	0.4383	0.8192	0.0199	0.1278	0.232	0.0626	0.2448
EIC	2022	0.0861	46.5	0.8204	0.3982	0.3947	0.0673	0.2274	0.0854	0.064	0.3404
ELGI	2018	0.0632	9.67	0.6163	0.0198	0.5206	0.1454	0.0906	0.0218	0.0771	0.1677
ELGI	2019	0.0579	10.67	0.6755	0.0177	0.4065	0.1218	0.0898	0.2149	0.09	0.153
ELGI	2020	0.0432	11.67	0.7096	0.0187	0.4556	0.1131	0.0961	0.2939	0.0606	0.2155
ELGI	2021	0.0319	12.67	0.7388	0.0206	0.5958	0.0931	0.1325	0.3675	0.0626	0.2448
ELGI	2022	0.0561	13.67	0.6887	0.0211	0.5844	0.0926	0.1443	0.2236	0.064	0.3404
Global	2018	0.0833	21.5	0.5135	0.0133	0.5653	0.1362	0.0842	0.0953	0.0771	0.1677
Global	2019	0.0525	22.5	0.5538	0.0121	0.6961	0.1802	0.0698	0.2432	0.09	0.153
Global	2020	0.1043	23.5	0.5377	0.0106	0.4598	0.1867	0.0618	0.0763	0.0606	0.2155
Global	2021	0.0959	24.5	0.5287	0.0106	0.4623	0.1784	0.0765	0.2374	0.0626	0.2448
Global	2022	0.094	25.5	0.5137	0.0099	0.4922	0.1742	0.0566	0.1123	0.064	0.3404
Lion	2018	0.0536	11	0.7598	0.0527	0.6414	0.0641	0.1497	0.0037	0.0771	0.1677
Lion	2019	0.0683	12	0.7327	0.0416	0.6192	0.1039	0.1025	0.074	0.09	0.153
Lion	2020	0.0633	13	0.7113	0.0347	0.5952	0.1232	0.0936	0.0245	0.0606	0.2155
Lion	2021	0.0604	14	0.7083	0.0287	0.6137	0.1522	0.0939	0.0238	0.0626	0.2448
Lion	2022	0.0483	15	0.7472	0.0282	0.5337	0.1523	0.1002	0.1742	0.064	0.3404
Lucy	2018	0.0252	5.75	0.5795	0.0203	0.7061	0.1569	0.0637	0.1793	0.0771	0.1677
Lucy	2019	0.017	6.75	0.6255	0.0151	0.735	0.1664	0.0847	0.0126	0.09	0.153
Lucy	2020	0.0257	7.75	0.6058	0.0121	0.6285	0.1794	0.0794	-0.0185	0.0606	0.2155
Lucy	2021	0.0637	8.75	0.7442	0.0116	0.8376	0.1093	0.0984	0.189	0.0626	0.2448
Lucy	2022	0.0738	9.75	0.6988	0.0129	0.4081	0.1202	0.1329	0.3312	0.064	0.3404
Nib	2018	0.0439	16.17	0.6944	0.0719	0.8087	0.1963	0.0583	0.2319	0.0771	0.1677
Nib	2019	0.0738	17.17	0.6944	0.05	0.6562	0.206	0.0524	-0.052	0.09	0.153
Nib	2020	0.094	18.17	0.6472	0.0421	0.5424	0.2795	0.0521	0.0326	0.0606	0.2155
Nib	2021	0.0852	19.17	0.6428	0.0412	0.5264	0.2219	0.0837	0.2134	0.0626	0.2448

Nib	2022	0.0776	20.17	0.6103	0.0431	0.5903	0.1933	0.1072	0.2489	0.064	0.3404
Nice	2018	0.0902	23.75	0.6996	0.0384	0.619	0.1366	0.057	0.1068	0.0771	0.1677
Nice	2019	0.0876	24.75	0.683	0.0309	0.5935	0.1357	0.0593	0.0938	0.09	0.153
Nice	2020	0.0967	25.75	0.6671	0.0263	0.5442	0.1459	0.0807	0.0443	0.0606	0.2155
Nice	2021	0.1012	26.75	0.631	0.0235	0.5484	0.1678	0.0799	0.1081	0.0626	0.2448
Nice	2022	0.118	27.75	0.6162	0.0212	0.538	0.178	0.0811	0.0773	0.064	0.3404
Nile	2018	0.1054	23.25	0.5901	0.0662	0.7156	0.1743	0.0704	-0.0152	0.0771	0.1677
Nile	2019	0.0951	24.25	0.5752	0.0484	0.5644	0.1957	0.0564	-0.0043	0.09	0.153
Nile	2020	0.1005	25.25	0.5617	0.0432	0.5106	0.1705	0.0576	0.0947	0.0606	0.2155
Nile	2021	0.0801	26.25	0.6419	0.0433	0.5617	0.1679	0.0591	0.2429	0.0626	0.2448
Nile	2022	0.0868	27.25	0.62	0.0441	0.5946	0.2012	0.0676	0.2175	0.064	0.3404
Nyala	2018	0.1005	23.5	0.6266	0.1156	0.5319	0.1568	0.237	0.7651	0.0771	0.1677
Nyala	2019	0.1249	24.5	0.59	0.0542	0.3994	0.3164	0.0843	-0.361	0.09	0.153
Nyala	2020	0.1253	25.5	0.5767	0.0509	0.3319	0.2331	0.0856	0.1499	0.0606	0.2155
Nyala	2021	0.0794	26.5	0.5869	0.0492	0.473	0.2198	0.1209	0.1994	0.0626	0.2448
Nyala	2022	0.0887	27.5	0.5685	0.0552	0.0481	0.2364	0.1308	0.3412	0.064	0.3404
Oromia	2018	0.091	9.42	0.6669	0.0599	0.5815	0.1398	0.0854	0.141	0.0771	0.1677
Oromia	2019	0.0809	10.42	0.6705	0.0499	0.6002	0.1593	0.0745	0.1347	0.09	0.153
Oromia	2020	0.0513	11.42	0.6233	0.0455	0.7491	0.1828	0.0776	0.1172	0.0606	0.2155
Oromia	2021	0.0738	12.42	0.6329	0.0497	0.6057	0.1663	0.0971	0.3555	0.0626	0.2448
Oromia	2022	0.094	13.42	0.6194	0.0573	0.5558	0.1604	0.1128	0.379	0.064	0.3404
Tsehay	2018	0.0626	6.25	0.7356	0.0429	0.7179	0.1024	0.1194	0.2659	0.0771	0.1677
Tsehay	2019	0.059	7.25	0.7309	0.0331	0.687	0.1005	0.0916	0.0507	0.09	0.153
Tsehay	2020	0.0437	8.25	0.6797	0.0291	0.6926	0.1109	0.079	0.0758	0.0606	0.2155
Tsehay	2021	0.0409	9.25	0.6923	0.0309	0.6726	0.1082	0.092	0.3205	0.0626	0.2448
Tsehay	2022	0.0431	10.25	0.7131	0.0355	0.6686	0.107	0.1194	0.3716	0.064	0.3404
Unic	2018	0.0743	21.25	0.5456	0.0712	0.7131	0.1128	0.0687	0.1357	0.0771	0.1677
Unic	2019	0.056	22.25	0.5317	0.0588	0.6028	0.1237	0.0756	0.1266	0.09	0.153
Unic	2020	0.0705	23.25	0.5156	0.0538	0.4832	0.1568	0.0827	0.1197	0.0606	0.2155
Unic	2021	0.0939	24.25	0.5775	0.053	0.5965	0.2027	0.1031	0.2242	0.0626	0.2448
Unic	2022	0.0965	25.25	0.5721	0.0579	0.6088	0.2031	0.1238	0.3043	0.064	0.3404

Appendix III: Regression analysis

```
. xtreg roa age lev mcs los inv rid pgr gdp inf, robust fe

Fixed-effects (within) regression               Number of obs      =        85
Group variable: company1                        Number of groups   =        17

R-sq:                                           Obs per group:
     within  = 0.4961                                         min =         5
     between = 0.0285                                         avg =       5.0
     overall = 0.0021                                         max =         5

                                                F(9,16)            =     58.98
corr(u_i, Xb)  = -0.9239                        Prob > F           =    0.0000

                                (Std. Err. adjusted for 17 clusters in company1)
------------------------------------------------------------------------------
             |               Robust
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0075686   .0031577    -2.40   0.029    -.0142626   -.0008746
         lev |  -.0316537   .0449375    -0.70   0.491    -.1269169    .0636096
         mcs |   .2150008   .0838256     2.56   0.021     .0372985    .3927032
         los |  -.1086594     .03989    -2.72   0.015    -.1932223   -.0240964
         inv |   .2402437   .0917261     2.62   0.019     .0457932    .4346943
         rid |   .1286759   .1459037     0.88   0.391     -.180626    .4379778
         pgr |   .0013242   .0022836     0.58   0.570    -.0035168    .0061653
         gdp |   .0402727    .217986     0.18   0.856     -.421837    .5023824
         inf |   .1033276   .0751942     1.37   0.188    -.0560771    .2627323
       _cons |   .2055392   .0651173     3.16   0.006     .0674967    .3435816
-------------+----------------------------------------------------------------
     sigma_u |  .07334679
     sigma_e |  .01561392
         rho |  .95664757   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix IV: Multi collinearity test

```
. vif
```

Variable	VIF	1/VIF
mcs	4.63	0.215897
age	3.20	0.312110
inf	2.36	0.424202
gdp	1.99	0.503336
rid	1.99	0.503527
inv	1.84	0.543315
lev	1.79	0.559307
pgr	1.31	0.765650
los	1.29	0.773826
Mean VIF	2.27	

Appendix V : pairwise corrélation analysais

```
. pwcorr roa age lev mcs los inv rid pgr gdp inf
```

	roa	age	lev	mcs	los	inv	rid
roa	1.0000						
age	0.2572	1.0000					
lev	-0.3054	-0.0638	1.0000				
mcs	0.0934	0.7097	0.3349	1.0000			
los	-0.6341	0.0204	0.2632	0.1156	1.0000		
inv	0.2936	0.0212	-0.5648	-0.3831	-0.2519	1.0000	
rid	0.0600	0.1790	0.3610	0.5008	-0.1442	-0.4283	1.0000
pgr	0.0655	0.2372	0.1776	0.4327	-0.0600	-0.2489	0.3256
gdp	-0.0420	-0.0972	0.0125	0.0006	0.1837	-0.0484	-0.1815
inf	0.0582	0.1330	0.0630	-0.0012	-0.2360	0.0272	0.3001

	pgr	gdp	inf
pgr	1.0000		
gdp	0.0630	1.0000	
inf	0.0319	-0.6945	1.0000

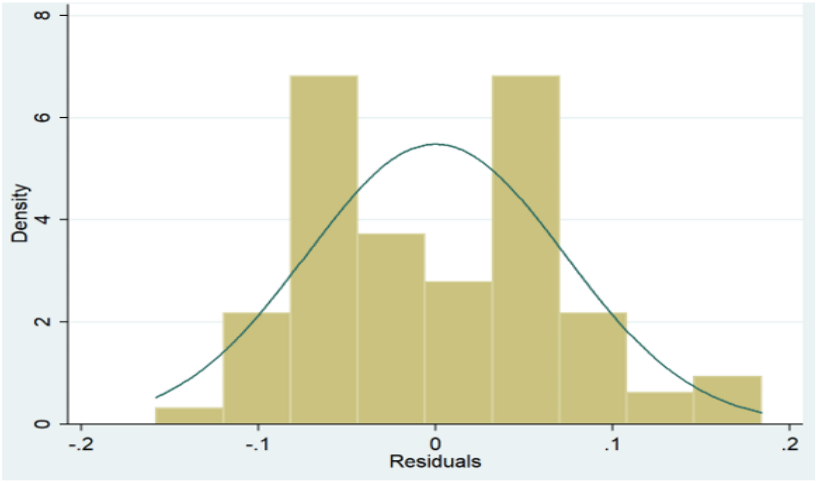
Appendix VI: Summary statistics

```
. sum roa age lev mcs los inv rid pgr gdp inf
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	85	.0691592	.030384	-.063747	.1298739
age	85	18.54882	9.90856	5.08	46.5
lev	85	.6449663	.09003	.2323477	.8672463
mcs	85	.0587482	.0839398	.0098694	.4416036
los	85	.5980489	.1409253	.0481402	1.017091
inv	85	.1592609	.0477296	.0198626	.3163584
rid	85	.0948705	.0358064	.0107079	.2369603
pgr	85	.2105026	.3984466	-.360994	3.557148
gdp	85	.0708545	.011245	.0606085	.09
inf	85	.2242882	.0671168	.153	.3404001

Appendix VII: Test for normality

Diagram 4.4.3: Histogram for normality test



Source: Stata 14.2 "histogram" output