FACTORS AFFECTING PROFITABILITY OF INSURANCE COMPANIES IN ETHIOPIA

A Thesis Submitted to the School of Graduate Studies of Wolkite University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Accounting and Finance

By

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WOLKITE UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS DEPARTMENTS OF ACCOUNTING AND FINANCE

JUNE, 2023

WOLKITE, ETHIOPIA

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And

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Declaration

I hereby declare that this thesis entitled ***"Factors Affecting Profitability of Insurance Companies in Ethiopia",*** is outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged.

To the best of my knowledge, this study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Masters of Science in Accounting and Finance.

Almaz Seifu Abdo

June, 2023

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Certificate

This is to certify that the thesis entitles ***"Factors Affecting Profitability of Insurance Companies in Ethiopia",*** submitted to Wolkite University School of Graduate Studies, for the award of the Degree of Masters of Accounting and Finance and is a record of confide research work carried out by **Mrs. Almaz Seifu Abdo**, under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

Major Adviser's Name	***Signature***	***Date***
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Co Advisor's Name	***Signature***	***Date***
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EXAMINERS' APPROVAL SHEET

We, undersigned, members of the Board of Examiners of the final open defense by **Almaz Seifu Abdo** have read and evaluated her thesis entitled ***""Factors Affecting Profitability of Insurance Companies in Ethiopia",*** and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the **Degree of Masters of Accounting and Finance.**

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Lists of Acronyms and Abbreviations

APT	Arbitrage Pricing Theory
ARCH	White's test and Autoregressive Conditional Heteroscedasticity
BLUE	Best Linear Unbiased Estimator
CAPM	Capital Asset Pricing Model
CLRM	Classical Linear Regression Model
ER	Expense Ratio
ESH	Efficient Structure Hypothesis
EXR	Exchange Rates
FE	Fixed Effect
FEM	Fixed Effects Models
GDP	Growth Domestic Product
GMM	Generalized Method of Moments
GR	Premium Growth Rate
HHI	Hiershiman-Herfindahl Index
INF	Inflation Rate
LQ	Liquidity Ratio
MoFED	Ministry of Finance and Economic Development
MPT	Modern Portfolio Theory
MS	Market Share
MST	Market Structure Theory
NBE	National Bank of Ethiopia
OLS	Ordinary Least Square
REM	Random Effects Models
RMP	Relative-Market-Power hypothesis
ROA	Return on Asset
ROE	Return on Equity
ROI	Return on Investment
SCP	Structure-Conduct Performance hypothesis
SFF	Stability of Financial Forum

Abstract

The study examines the effects of internal factors, made up of firm specific variables, industry and the external factors or macroeconomic variables, on the profitability performance of insurance companies in Ethiopia. In particular, the study investigates the impact of liquidity, expense ratio, growth rate, market share, inflation and exchange rates on the profitability of insurers in nonlife markets. Profitability was proxied by Return on Assets (ROA). The study employs an unbalanced panel data sample of eleven non-life insurance companies from 2010 to 2021, with one hundred and thirty-two (132) non-life firm-year panel observations, obtained from the National Bank of Ethiopia. The models were estimated using the Ordinary Least Square (OLS) with fixed and random effects panel estimation techniques. The findings show that, Liquidity (LQ) Expense Ratio (ER) Market Share (MS) and Exchange Rate (EXR) have a positive and significant effect on ROA. The findings have implications that for economic regulators such as the National Bank of Ethiopia (NBE), it is recommended that sound monetary policies that strengthen foreign exchange be initiated, and Insurers should stay liquid based on our finding. Regulators should pay more attention to illiquid companies. Regulators could also limit share of illiquid assets in insurer's investment portfolio. In addition, it is suggested that insurers seek more efficient ways to manage their expenses and transfer risks to third parties in cases where insurers underwrite high risk policies or underwrite less risky policies.

Key Words: *Ethiopian Insurance Companies, Profitability, ROA.*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Globally, the insurance industry has experienced an enormous transformation specifically over the past decades intermediation, risk transfer and a financial system that is efficient towards mobilization saving is a primary function of insurance companies. Trade and resource arrangement is facilitated by one economic unit to another through transfer risk, channel funds, and financial institutions (Mwangi, 2019)

Financial institutions have come to be known for their crucial contribution to the success of many economies. The contributions of financial institutions to economic success, as evidenced from the 2007-2008 financial crises and its impact, have drawn the attention of academia into investigating various aspect of the sectors' performance and risk related issues. Insurance can be defined as a means of providing protection against possible eventualities through specialized functions such as funds mobilization for investments and the underwriting of risks (Appiah, 2019)

In recent times, much attention has been drawn to the factors of insurance companies' profitability owing to the direct impact of insurer profitability on all stakeholders such as; shareholders, consumers, investors, and employees (Kaya, 2015). (Alomari and Azzam, 2017) considers insurance as a "complementary sector for the financial, production and services sectors" of any economy.

Valuing the profitability of an insurance company is difficult due to the unique format of financial statement which is used by the insurance companies (Boyjoo and Ramesh, 2017).

The Ethiopian insurance sectors are also remains underdeveloped and they are targeted at the corporate market, focusing on general insurance and almost 90 percent of the population does not have any type of formal insurance. Insurance premiums represent about 0.47 percent of GDP for non-life insurance, and 0.03 percent of GDP for life insurance (Gieger and Moller, 2015). Therefore, this implies that the insurance sector in

Ethiopia does not grow as expected, they are less profitable and they cannot take a major part for the economic development in comparison to the banking industry. As per reporting of National Bank of Ethiopia (NBE) quarterly bulletin of 2022, the Ethiopian insurance sector have capital of 11.1 billion with the total branch of 635 across the countries in which 54.3 percent of their branches are concentrated in Addis Ababa currently (Annex 1).

To keep track of this financial soundness and reliability knowing the factors that affect insurers' profitability and identifying them clearly is important job for researchers and financial analysts. Therefore, the objective of this study is to assess the factors affecting insurance companies' profitability in Ethiopia. Eleven purposively selected insurance companies are taken as a sample from a total population of 18 insurance companies in Ethiopia. Quantitative research approach was employed; financial statements of the companies were used as sources of secondary data. The data was analyzed with multiple regression tests using a General Purpose Statistical Software Package by Stata Corp for Data Manipulation Version 12 (STATA 12) and Economic Views (Eviews 9).

1.2 Statement of the Problem

Despite the significant role of insurance to economic success, most empirical investigations within the financial sector have centered mostly on banks, with the insurance industry only receiving attention in recent works. The insurance industry, like any other industry is affected by various factors at the firm level such as size, capital, leverage and reinsurance policies; at the industry level by factors such as market share, competition and structure; and at the macroeconomic level by factors such as unemployment, interest rate, fluctuations in exchange rate, money supply, inflation rate, GDP, and other fiscal and monetary policies (Akotey et al., 2015).

As the insurance industry in Ethiopia continues to experience growth, it is imperative that, we understand what factors are critical and most likely to impact future performance by examining determinants of past performances, to draw meaningful conclusions. This is especially due to the fact that empirical findings from relevant literature have shown great

inconsistencies in the factors that determine financial performance across countries, different insurance markets and over different periods hence, contributing to our inability to generalize findings from any one particular study. That is, literature review shows that, different factors explain the performance of insurers in different insurance categories (life and non-life) and across different geographical markets, (Hadush, 2015).

Hence it is difficult to apply findings in one market or country to another. This paper therefore seeks to empirically determine the relevant factors that impact profitability specifically in the Ethiopian insurance markets of non-life market, and to stimulate further research and interest in the Ethiopian insurance industry.

While taking into consideration the absence of sufficient empirical inquiry, yet, this study contributes to the existing literature gap which is not included variable expense ratio in the previous research issues and the researcher attempted to supplement empirical evidence in the country by incorporating this insurance specific factor which was untouched by previous researchers which is the effect of expense ratio..

By taking this in to account, the researcher attempted to examine this factor along with other determinants of insurance companies' profitability which are previously studied. The study therefore, tried filling the gap that is in the previous research which have been done in Ethiopia are not used the variable such as expense ratio, and finally understanding the key factors and its magnitude of effect on profitability assists managers in developing an effective profitability strategy for their company.

1.3 Objectives of the Study

1.3.1 General Objective

The major objective of this study is to investigate the factors affecting the profitability of Ethiopian insurance companies for the period of 2010 to 2021.

1.3.2 Specific Objectives

Based on firm specific, industry specific and macro-economic factors that are found to significantly influence profitability in the prior studies, this study investigates the factors

affecting those Ethiopian non-life insurance companies and must consider in improving their profitability.

Hence, the study needs:

- To investigate the effects of liquidity on the profitability of non-life insurance companies in Ethiopia.
- To study the effects of expense ratio on financial performances of non-life insurance companies in Ethiopia.
- To determine the effects of premium growth rates on profitability of non-life insurance companies in Ethiopia.
- To know the effects of market share on the profitability of non-life insurance companies in Ethiopia.
- To study the effects of inflation on financial performances of non-life insurance companies in Ethiopia.
- To study the effects of exchange rate on financial performances of non-life insurance companies in Ethiopia.

Hence, the researcher explicates whether profitability of Ethiopian non-life insurance companies are affected by the firm specific, industry specific and macroeconomic factors.

1.4 Hypothesis

To achieve the objective, the study is developing all of the following research hypotheses. These hypotheses are developed based on related previous empirical studies conducted in Ethiopia and other countries concerning the issue under investigation.

H_{01} : Liquidity Ratio (LQ) of an insurance company has a positive and significant effect on profitability.

H_{02} : Expense Ratio (ER) of an insurance company has a positive and significant effect on profitability.

H_{03} : Premium Growth rate (GR) of an insurance company has a negative and significant effect on profitability.

H_4 : Market Share (MS) of an insurance company has a positive and significant effect on profitability.

H_{05} : Inflation (INF) of an insurance company has a negative and significant effect on profitability.

H_{06} : Exchange Rate (EXR) of an insurance company has a negative and significant effect on profitability.

1.5 Scope of the Study

Conceptually, this research is restricted to the factors affecting the profitability of non-life insurance companies operating in Ethiopia taking Return on Asset (ROA) as dependent variable and three firm-specific factors, one inter-industry factor and two macroeconomic factors as explanatory variable.

The factors are depicted based on trend, experience and the degree of influence on the profitability of the non-life insurance companies operating in Ethiopia from the empirical literatures.

Only 12 consecutive years' data and only 11 leading insurance companies from a total of 18 registered insurance companies in the country were used. Namely, the state owned business insurance company EIC, AIC, GLOBAL, NILE, AFRICA, NICE, NIB, NYALA, UNIC, LION, and OROMIA are included.

1.6 Limitations of the Study

Given that the study covered a specific period from 2010 to 2021, the results of the study are valid for only the period under review and may not be extended to periods outside of the scope of this study. A few missing data for some insurers could render the results invalid and limits generalization of findings and the researcher used subjective estimations for variables, due to unavailable data and could cause biases and limit validity of results..

This research has the limitation to analyze all non-life insurance companies in Ethiopia due to their variety of age of establishment and availability of data. Non-life insurance companies which are twelve years old and have data were selected for this study. Finally, the results are valid for the country under investigation and may not be generalized to other countries

1.7 Significance of the Study

The finding of this study has a great importance for the management of the insurers through identifying significant factors determine profitability and tries to pinpoint some possible solutions that may be applicable to achieve superior profitability and help to tackle, the ambiguities that hindering the profitability of the general insurance businesses operating in Ethiopia. Despite to that, this study enriches the knowledge of the reader to understand the profitability determinants; particularly for the insurance companies. Thus, the research has an effort to provide an empirical evaluation on the determinants of profitability of non-life insurance business, and contributing some issues to the literature which are essential for improving financial performance by providing evidence on firm specific, industry specific and macroeconomic factors. Despite, the finding of this research will be used as a bench mark for the future studies and also highlights areas where gap in literature exist which stimulate further research investigation of the issue at hand.

1.8 Structure of the study

The rest of this paper is structured as follows: Chapter two mainly focus on the previous studies by looking at issues with internal, inter- industry and external factors affecting insurance companies profitability, the factors that affect profitability in insurance companies so as to review appropriate literature. Chapter three looks at research design and development of methodology and discussion of the study variables. Chapter four presents analysis, findings and results and the last chapter presents summary, conclusions and recommendations.

CHAPTER TWO
REVIEW OF RELATED LITERATURES

2.1 Theoretical Review

It is obvious that, the theoretical review aims at giving the meaning of a basic terminologies, theories and creating a comprehensive theoretical framework for the study. The following sub-sections will present definition of insurance, role of insurance in economic growth and development, profitability definition and related profitability theories those used in order to achieve the end result of the study.

2.1.1 Insurance definitions and its role in economic growth

Insurance is a way of reducing uncertainty of occurrence of an event and is deriving plans to counteract the financial consequences of unfavorable events. It is basically a cooperative endeavor of a social device for eradicating the cost to society under the occurrence of certain types of risks (Sushma, 2012).

Insurance can be defined as a service provided as a financial benefit in favor of an individual, association or business in exchange for collected premiums that provides a benefit in case a risk occurs. It is an economic sector that includes the conception, production and marketing of this type of service (Berteji and Hammami, 2016). The insurance firms reinforce monetary and investment activities by providing long term funds for physical and social infrastructure while simultaneously boosting risk-taking abilities (Cudiamat and Siy, 2017).

According to the Stability of Financial Forum (SFF), 2000, there are three major categories of insurance which include Life insurance, Non-life insurance and Re-insurance. The life insurance market gives different products, with different protection and investment elements which consist of pension, saving, permanent health and term insurance. It is similar to the contractual saving and deposit in addition to their risk transfer mechanism. The non-life insurance industry is providing specific insurable event

in consequence of industry injury. The policies are short-term protection contracts and normally there is no investment element as an expectation of financial return. In addition to this, the non-life insurance provide policies related with personal and commercial lines which consist of fire insurance policies, motor insurance policies, product liability insurance policies, automobile insurance and others.

According to (Davies *et.al*, 2003), the unique attributes of insurance is worth focusing on those services that are not provided by other financial services providers and they spreading the financial losses. For instance, the contractual savings features of whole or universal life products, the indemnification and risk pooling properties of insurance facilitate commercial transactions and the provision of credit by mitigating losses as well as the measurement and management of non-diversifiable risk.

The insurance contracts involve small periodic payments in return for protection against uncertain, but potentially severe losses. This income smoothing effects from contracts help an organization to avoid excessive and costly bankruptcies and facilitate lending to businesses. Most fundamentally, the availability of insurance enables risk averse individuals and entrepreneurs to undertake higher risk, higher return activities than they would do in the absence of insurance, ensure efficient capital allocation, promoting higher productivity and growth (Brainard, 2008)

In general, during recent decades, there have been faster development rates in the insurance market activity in both developing and transition economies. The growth of insurance penetration such as life and non-life is used as a proxy for insurance sector growth (Brainard, 2008). They have several effects to promote financial stability, facilitate trade and commerce, enable risk to be managed more efficiently, encourage loss mitigation, foster efficient capital allocation and also can be a substitute for and complement government security programs (Skipper, 2001). They provide both economic and social benefits to the society through reduction of anxiousness, fear and increasing employment (Ahmed et.al, 2011). Therefore, a resilient and well-regulated insurance industry can highly contribute to economic growth and efficient resource allocation through transfer of risk and mobilization of savings, enhance financial system efficiency

by reducing transaction costs, creating liquidity and facilitating economies of scale in investment **(**Davies et.al, 2003).

2.1.2 Profitability of insurance companies

In the current complex world, the measuring of business performance is ambiguous concept in terms of its definition and evaluation. It is measured through profitability which is attached with an overall firm business performance (Borlea and Achim, 2010). Profitability is one of the largest goals of financial management in maximizing the owner's wealth of the shareholders. It is an essential determinant of firm's financial performance. Profitability is defined as proxy of financial performance which is one of the main objectives of insurance company's management (Burca and Batrinca, 2014). It also measured by ROA which are a major indicator of how profitable a company is relative to its total assets (Malik, 2011).

In this context, assessing the financial performance of the financial industry had been attracting an interest of many researchers. Particularly, the profitability of insurance companies has been the focus of several studies in emerging as well as developed economies with proxies of ROA which is one the most commonly used measure for profitability and performance of a company.

2.1.3 Profitability related theories

Different researchers have been come up with different conclusions regarding the determinants of profitability. But, there is no single theory which gives a correct and comprehensive explanation on the nature and determinants of profit. It is familiar that without profitability, the business will not survive in the long-run since the profitability is the measure the goal of all business ventures and success of the business economic unit. Therefore, to achieve better profitability, the insurance firm should consider the theories which discussed in different finance literatures and they must relate those theories with their operational activities.

2.1.3.1 Market structure theories

Traditionally, the Market Structure Theory (MST) of the firm is assumed that a firm's objective is simply to maximize profits. In the societies of modern industries, this theory is not applicable in practice, because most of the modern industries are involved in providing a variety of products/services, and they faced with much more complex decisions to be taken in a dynamic and uncertain business environment (Rasiah, 2010). The overall assumption of the market structure theory focuses on the consideration of industry structure (measured by market concentration level in term of market share ratio) which has an impact on profitability of insurance companies.

There are two theories that are proposed in MST. The first theory is Structure-Conduct Performance hypothesis (SCP) (also referred to as the Relative-Market-Power hypothesis (RMP)) states that a more concentrated sector favors high profitability and motivated by benefits of greater market power, which reflects the setting of prices that are less favorable to consumers (high policy holders, higher Gross Written Premium) as a result of competitive imperfections in markets (monopoly profits). Existence of superior management and high market share will lead the company to raise their profit Berger and (Hannan, 1989). (Goddard *et.al.* 2004) noted that, the relationship between market concentration and profitability is based on the SCP hypothesis and they have empirically positive relationship.

The second formulation of theoretical framework of MST is the Efficient Structure Hypothesis (ESH). It states that efficient firms in the market lead to increase in the firms' size and market share due to the aggressive behavior. This will help the large firms to maintain high profits through low cost as a consequence of concentrated market structures and collusion occur among firms. The ESH theory also states a positive relationship between firm concentration and profitability as an indirect consequence of efficiency. Generally, (Berger and Hannan 1989) states that ESH and SPC stand on similar observation on the relationship between concentration and performance (profitability). The findings of (Lee and Lee 2012), (Pervan and Kramaric 2012) and (Jovovic et.al, 2014) is also support this finding. However, the difference in two theories consisted mainly in ways of interpretation of the relationship. But, some empirical

evidence on the relationship between firm concentration and profitability is not conclusive.

2.1.3.2 Modern portfolio theory approach

The Modern Portfolio Theory **(**MPT) approach is the most relevant approach and it plays a vital role in financial institutions; particularly in bank, nonbank financial institutions and insurances (Nzongang and Atemnkeng, 2006). The theory was developed first by Markowitz in 1952. The major ideas of the modern portfolio theory are maximizing the expected portfolio returns for a given amount of minimum portfolio risk in a given level of return by carefully choosing the proportions of various assets. Markowitz explain the Modern portfolio theory as to which the investors should select a portfolio and make the highest possible return from a certain level of risk or get the lowest possible risk for a certain level of return. There is a positive relationship between the risk and the expected return of a financial asset (Sadiye, 2014).

Two types of risks are considered under MPT to determine the rates of return of asset portfolio held by the firms. The first is the unsystematic risks which are effectively minimized and possible by diversifying portfolio risk. It related to the firm specific factors for individual firm. Further side, the systematic risks are affected by the macroeconomic factors and even cannot be eliminated through diversification of the portfolios. (Erdugan, 2012) noted that the risk and return on firm's diversified portfolio is depending on domestic and foreign economic and financial variables for financial industry which are based on decisions taken by the financial manager. This is also real for the insurance companies in elsewhere. Since insurance firms are investments by themselves its standard practice for them to invest in a diversified portfolio to minimize risk and increase the returns through various investment options on offer. Thus, when choosing a portfolio, insurance firms should maximize the discounted (or capitalized) value of future earnings (Suheyli, 2015).

Further, the ability to obtain maximum profits depends on the feasible set of assets and liabilities determined by the management of the organizations and the unit costs incurred by the firm for producing each component of assets (Nzongang and Atemnkeng, 2006).

Therefore, this theory is also important for the insurance companies operating in elsewhere and all over the world.

2.1.3.3 Arbitrage pricing theory

The Arbitrage Pricing Theory (APT) was introduced by Ross in 1976. The theory assumes a positive relationship between risk and expected return of the firm. The APT model is an expansion of the Capital Asset Pricing Model (CAPM) and describes returns as a linear function of several rather than of single variable. The APT theory is less restrictive in comparison to CAPM. As noted by (Ouma and Muriu 2014), the APT theories are based on two basic assumptions such as capital markets are perfectly competitive and investors always prefer more wealth to less wealth with certainty respectively. Furthermore, the APT agrees on the existence of many different specific forces those can influence the return obtained any individual firm. As noted by (Suyehli, 2015), the effect of these specific factors may consider the principle of diversification which has highly influence the activities undertaken on the field of insurance. Despite to that, the APT are also uses multiple variables and is a multi-beta model by its nature. (Sadiye, 2014) also noted that, the sensitivity of movements in each variable is represented with a beta coefficient to indicate the unique sensitivity of each particular variable.

The Arbitrage Pricing Theories connects several types of risk associated with firm securities such as changes in interest rates, inflation and productivity with the expected return of the same securities used by the entities through combining both systematic and unsystematic risk which attributes the expected return of a capital asset to multiple risk factors. Thus, an insurance company has no way of knowing whether any particular individual will become sick or will be involved risk. This shows that an insurance company is not entirely free of risk since the insurers is insures a large number of individuals (Ouma and Muriu, 2014). With reference to the APT model, insurance firm's profitability is also affected by several macro-economic factors such as inflations, interest rates, money supply and exchange rates like other firms. In context to this, even if there is lack of the capital market in Ethiopia; some of the assumption of APT which discussed

above is related to profitability of the insurance industry operating in our countries. Therefore, this study considers some of the factors which affect profitability of the selected firms and relates some assumption of this theory with the issues under investigation.

2.2 Factors Affecting Insurance Companies Profitability

From different theories point of view, the factors that affect the profitability of insurance companies could be divided into two groups, internal and external factors. Internal factors mean the firm-specific variables, and external factors refer to the sector-specific and macroeconomic variables. The internal factors (firm-specific factors) are always related to internal efficiencies and managerial decisions of the firm and they are controllable by the manager of the firm. The industry specific variables are variables related to an external activity to some extent whereas the macroeconomic variable is totally related external factors. The managers cannot change the external related variable immediately like that of firm-specific variables which is controllable.

Depending up on the above stated theories, market structure theories and the modern portfolio theory highly insight that, the organizational performance is influenced by those internal and industry related factors those related to internal efficiencies and be controlled by management of the companies. In context to this, internal and industry related determinants used in this study include underwriting risk, reinsurance dependence, financial leverage, liquidity, diversification, industry concentration ratio and others among huge variables used in this studies. The modern portfolio theory also considers both firm specific and macro-economic related variables. On the other hand, the APT considers the external factors affecting profit ability of an organization other than the internal factors. Thus, the macroeconomic factors that can affect organizational profitability include Growth Domestic Product (GDP) and inflation rate among others a lot of variables discussed in the review of literature parts. Furthermore, considering the degree to which those variables influence the insurance company's profitability and identifying the relationship among those variables is clearly discussed in this research, particularly in Ethiopian general insurance business context.

2.3 Empirical Reviews

According to (Mazviona *et.al*, 2017) in Zimbabwe by using panel data for the period from 2010 to 2014 founds that the expense ratio, claims ratio and the size of a company negative and significantly affect insurance companies' performance whereas leverage and liquidity affect performance of the insurance companies positively.

(Boyjoo and Ramesh, 2017) investigate the factors influencing the performance of general insurance companies operated in Mauritius for a five consecutive years from 2011 to 2015. The study revealed that size of the company, underwriting risk, Leverage, liquidity, concentration ratio and investment performance has positive and significant impact on the profitability of the firm measured by ROA. Whereas reinsurance dependency and growth rate are negatively and insignificantly related with the ROA. However, sales profitability ratio, net operating expense, company age and premium growth are positively and insignificantly related with financial performance of general insurance companies operated in Mauritius.

(Krivopavic *et.al*, 2017) undertake the study on topic entitled the effects of corporate diversification on firm performance among Serbian insurance industry from 2004-2014 for eleven consecutive years through panel data. The finding of the study indicates that the relation between risk-adjusted returns measured by return on assets and return on equity and line-of-business diversification and performance measured by entropy is significant and positive. This implies that diversified insurers outperform undiversified insurers. The finding of *(*Krivopavic *et.al.* 2017) is also consistent with the finding of (Zhang 2015) who found negative and highly significant relationship between diversification and ROA which indicates that diversified insurers are underperform single-line insurers companies for those operated in highly competitive business environment. Based on the finding, the study recommends that, the management should formulate business strategies and diversification plans in the hope of better positioning themselves in the marketplace from their line of insurance companies.

(Daare, 2016) undertake the study to identify factors that determining non-life insurance companies` profitability in India on eight general insurance companies (2 publics and 6

private companies) from the year of 2006 to 2016 through the panel data. The secondary data which collected from annual audited financial statement is used in the study. The finding demonstrates that company size, liquidity and inflation found statistically significant factors that determine insurance companies` profitability in India. From those variables, the size, loss ratio, liquidity, age and GDP are positively correlated with ROA while capital adequacy, premium growth and inflation are negatively correlated with ROA. The author concluded that, insurance companies' specific factors such as age of the firm and liquidity of the firm are the most significant determinants of the profitability of insurance companies and inflation is statistically significant variable among macroeconomic variables in Indian non-life insurance. Based on the findings, study recommended that insurance mangers may put significant attention on managing current assets and current liability to maintain optimal liquidity position while inflation also important from external variables.

(Datu, 2016) investigate the relationship between insurer specific and macroeconomic indicator on profitability of Philippine non-life insurance market by using the panel data over the period of 2008 to 2012 for five consecutive years. The Return on assets (ROA) and operating ratio were used as a proxy for measuring profitability. Seven key firm specific and macro-economic variables are used in the study which includes diversification, market share, GDP, inflation, reinsurance dependence, underwriting risk, input cost and leverage. The ordinary least square multiple regression is used in analyzing data of the study.

The study's empirical finding underpinning that firm size, financial leverage, underwriting risk, reinsurance utilization and input cost have significant control on profitability in both operating ratio and ROA models, however macroeconomics variables have no significant effect on both models. In addition to that the finding states that underwriting risk, GDP and market share has negative significant impact on profitability of insurers whereas leverage, reinsurance dependency and inflation has positive significant link with the profitability. But diversification is positive and insignificant with the profitability measured by the ROA.

Therefore, based on finding of the study the author recommends that low underwriting risk, low reinsurance utilization, low input cost and smaller firm size fabricates positive effect on the profitability. The financial leverage firm could have negative consequence on the profitability since it lowers the market value of the firm. Despite to that, the study recommends a non-life insurer should conduct careful estimation and take into deliberation insurer specific indicators and macroeconomics factors have influence the profitability of the firm before implementing policies seeking for profit and competitiveness.

(Jibran *et.al,* 2016) empirically investigate the determinants that affect the profitability of non-life insurance companies in Pakistan. Only 20 companies were studied over the period of 9 consecutive years from 2005 to 2013. In order to analyze data and reach at a final conclusion, the secondary balanced panel data was collected from the financial statement of the non-life insurance companies with a total number of observations of 180. The study used two dependent variables such as ROA and ROE and five major independent variables namely firm size, liquidity, premium growth, inflation and economic growth were used in their studies. The OLS multiple regression model of the study was generated by running balanced panel data through Eviews 6 to reach at the final conclusion. The results of panel data that was run by Eveiws 6 software statistical package concluded that the determinants of both ROA and ROE are not same across the study. Current assets were proved significant in case of ROA, but it proved insignificant in case of ROE. The control variables also play their part in determining the profitability of firms. Current ratio has positive relationships with the ROA which shows that the higher current ratio will bring higher profits for firms. The size of the firm also proved to be vital in determining the profitability of the firms. It affects positively both the ROA and ROE of the firms as with the case of premium growth. The latter term also proves significant for both the measures.

Based on the finding, the study recommends that, the management of firm may use the finding to increase their profitability. Furthermore, the non-life insurers operated in Pakistan should increase their firm size and growths of their premiums in order achieve higher profits in their operation.

(Nyamu, 2015) undertake the study on the effect of macroeconomic factors on financial performance of insurance companies operated in Kenya which covered a period of 10 years from 2006 to 2015. In the study, the effect of the six major independent variable was analyzed which consist of interest rate, Exchange rate, Lending rate, Money supply, GDP and inflation. Despite to that, the financial performance the companies are used as dependent variables. In order to reach at the final conclusion, the study employed a descriptive research design. The multiple linear regression and correlation was used to analyze data for the study by using the SPSS. The finding which obtained by using the SPSS indicates that, an insignificant positive relationship between financial performance of insurance firms and GDP growth rate and inflation and an insignificant negative relationship between financial performance of insurance firms and lending rates, exchange rates and money supply. From this finding the study concluded that there is direct relationship between economic growth, inflation and an inverse relationship between lending rates, exchange rates and money supply and financial performance of insurance firms operated in Kenya.

Based on the findings, the study recommended that the government and ministries of finance and planning should undertake measures to ensure good performance of the economy. Despite to that, the government should undertake an effective mechanism to maintain that inflations rate, lending rates, exchange rates and money supply those do not have adverse effects on financial performance of firms.

(Hussain, 2015) investigated that, the relationship between macro economy and profitability of 39 insurance companies in post crisis scenario operated in Pakistan by using firm level and macroeconomic data from the period of 2006 - 2011 through panel data. The study consists of some firm specific factors such as firm size, financial leverage, and growth opportunity, diversifications, underwriting risk, working capital management, equity market and macroeconomic variables like inflations. Whereas, return on asset (ROA), as the proxy of measuring profitability. In order to analyze the data, the popular statistical model of panel data analysis that combines cross section and time series data and estimates panel least squares regression of a standard model is used by the researcher.

The result of the study shows that, macroeconomic environment, equity market conditions and inflation have a positive and significant impact on profitability of both life and non-life insurance companies in Pakistan whereas diversification is positively and significantly affect the profitability of the insurance companies. Based on the finding, the study recommends that, the management of non-life insurance companies should also keep in view the macroeconomic environment, equity market conditions, inflation in addition to firm specific characteristics including financial leverage, relative firm size, financial soundness, and growth opportunities, underwriting risk and diversification in particular to manage profitability. Despite to that, the Takaful business managers should especially focus on underwriting risk, diversification and working capital management to manage their return on assets.

(Kazeem, 2015) investigates the impact of firm specific characteristics on the financial performance of listed insurance firms in Nigeria from twelve (12) listed insurance firms for eight years from 2006-2013 through the panel data. In the study, the financial performance which measured by ROA is the dependent variable while age of insurance company, firm size, premium growth, loss ratio, liquidity and leverage are used as an independent variable. To reach at the final destination, the study employed multiple regressions as tool for analysis. The secondary data was obtained from the audited financial statements of the companies were analyzed by the multiple regression statistical tool. Despite to that, the panel data techniques (fixed and random effects model) were utilized to investigate the impact of firm specific characteristics on financial performance. The results of multiple regressions show that firm size, liquidity, loss ratio and leverage are most important and significant determinants of financial performance in Nigerian insurance industry. Hence, firm size, loss ratio and leverage are negatively related. In contrast, liquidity ratio is positively and significantly related with financial performance. Lastly, age of insurance company and premium growth is not significantly related with financial performance of listed insurance firms in Nigeria.

Based on the finding, the study recommends that an insurance companies operated in Nigeria should conduct careful evaluation and take into consideration on the firm specific characteristics (firm size, loss ratio, liquidity and leverage) that influence the financial

performance of the company before making major business decision as this will go a long way in improving their financial performance and achieve a greater profit and help the insurers competitiveness in the market.

(Mwangi and Murigu, 2015) conduct the study on the topic entitled the determinants of financial performance in general insurance companies in Kenya for the period 2009-10 to 2012-13 for four consecutive years through panel data. Their study employed multiple linear regression analysis, with return on assets as the dependent variable. The study used leverage, retention ratio, underwriting risk, liquidity, size, management competence index, ownership, equity capital and age as an independent variable. The OLS multiple regression models indicate that profitability was positively related to leverage, equity capital, and management competence index and negatively related to size and ownership structure. The study did not find a relationship between performance and retention ratio, liquidity, underwriting risk and age. Based on the finding, the study recommends that the general insurers in Kenya to perform better if they should increase leverage, equity capital and quality of staff.

(Saeed and Khurram, 2015) conducted the study on determining factor of the financial performance among Pakistani non-life insurance companies for nine (9) consecutive years. The data used in the study is based on balanced panel of 24 non-life insurance entities operated in Pakistan from the period of 2005-2013. The financial performance is measured by the proxy of Return on Asset which is dependent variable. The study uses six major firm specific independent variables such as size of firm, loss ratio, expense ratio, debt ratio, growth of premium and age of firm on performance deputations by return on assets a measure of the profitability. In order to extract the impact of selected factors, the Hausman test is employed to decide whether fixed or random effect model is appropriate for reaching at visible conclusion. The outcome of the study which analyzed by the fixed effect model put forward that age and loss ratio proves significant and negative impact on in determining performance of non-life insurance companies operated in Pakistan. Based on the finding, the study recommends that management should make payments of only spot on claims and try to avoid fraudulent claims in order to increase their proceeds. The imminent studies must explore some peripheral factors coupled with

inner ones to see the sights of the financial performance of insurance sector operated in Pakistan.

Moro and (Anderloni, 2014) conduct the study on the determinants of economic performances in the non-life insurance firms operating in the main European markets spanning from 2004 to 2012 by using the panel data for nine years. In order to end the study, the authors test the impact of several firm characteristics, such as dimension, capital structure and investment policies on economic performance. There are several independent variables used in the study including both firm specific and country specific such as leverage, size of the asset, size of the firm, reserve dimension, combination ratio, financial contribution, Investment yield, premium to asset ratio, reinsurance ratio measured by the premium and reserve, Internationalizations, diversifications, financial market indicator, Insurance market relative dimension, insurance market growth and the firm status. The Return on asset and Return on equity is used as the measure of profitability which are dependent variable. Multiple regressions are used to analyze the data through OLS. The study finding demonstrates that ROA is differently affected both by firm specific variables and macroeconomic variables for insurance company like negatively impact by asset-size, by underwriting activity; whereas the strategic choices such as internationalization and diversification while it is positively affected by investment activity, by reserves' dimension and by asset turnover. Surprisingly, it is not statistically affected, by reinsurance activity. For macroeconomic variables, the relevance of financial markets has a positive effect on profitability while variables linked to the country insurance market seem to have no impact on profitability. The cited firm-specific variables have the same impact on ROE, while the 2007 financial crisis and the subsequent economic crisis have a detrimental effect on shareholders' profitability. It is worth mentioning the positive relation with financial markets' dimension and the inverse relation with the rate of insurance market growth, which may result from the increase in competition in the non-life insurance industry.

(Lee, 2014) undertake the study on the relationship between firm specific factors and macroeconomics on profitability in Taiwanese property-liability insurance industry using the panel data over the1999 through 2009 for ten consecutive periods. Two dependent

variable such as operating ratio and return on assets for the two kinds of profitability indicators used to measure insurers' profitability and the impact of twelve independent variables which including underwriting, financial leverage, firm size, underwriting risk, firm growth, reinsurance, return on investment, market share, diversification, input cost, economic growth rate, inflation rates and financial holding. The multiple regression OLS model were used in the analyzing data and Random effect model were selected. The finding shows that underwriting risk, financial leverage, reinsurance dependence, financial holding and input cost has significantly and negatively related with the ROA whereas return on investment is positively and significantly related with ROA. This finding implies that high underwriting risk, subsidiaries of financial holding group compared with other insurance companies leads the Property and Causality insurance to lower profitability measured by ROA. In addition, economic growth rate has significant influence on profitability in operating ratio model but insignificant influence on profitability in ROA model.

(Jovovic *et.al,* 2014) investigate the assessment of performance of companies engaged in non-life insurance business in Serbia. Their studies are conducted basis of financial statements of non-life and composite insurers during the period of 2006-2013 by using CARMEL indicators on the panel data. In order to reach at the final result, the multiple regression analysis was used. In the study, the Returns on Assets, as a summary measure of insurer`s profitability is used in the function of dependent variable. The independent variables that used in their study consist of age of the company, combined ratio, Hiershiman-Herfindahl index (HHI), investment ratio, leverage, liquidity, reinsurance dependency and size of the firm. The data was analyzed quantitatively through multiple regressions. Based on the finding of the estimated model with individual fixed effects, the panel data demonstrates a significant and negative influence of the combined ratio, financial leverage and retention rate on the profitability (ROA) of non-life insurers, while the influence of the growth written premium rate, return on investment and company size is significant and positive in profitability of non-life insurers in Serbia. From the study finding perspectives, their study recommends that the insurance companies operated in Serbia should undertake relevant regulatory restrictions which lead the management of the non-life insurers to consider the compliance of the maturity structure between assets

and liabilities to safeguard the liquidity of insurers and continuously sustain the profitability of their companies through investment activities.

(Burca and Batrinca, 2014) investigated the factors that affect the financial performance of 21 insurance companies operating in the Romanian insurance market during the period 2008 -2012 for five consecutive years. For this purpose, the explanatory variables used were financial leverage in insurance, company size, number of years of operating in the Romanian market, growth of gross written premiums, equity, total market share, diversification, underwriting risk, investment ratio, reinsurance dependence, retained risk ratio, solvency margin, and growth of GDP per capita. ROA was utilized as an indicator of company performance. By applying panel data techniques, the authors showed that the major determinants of financial performance in the Romanian insurance market are financial leverage in insurance, company size, growth of gross written premiums, underwriting risk, risk retention ratio, and solvency margin. The finding that obtained by applying the panel data technique into the model indicates that market share and reinsurance dependency have positive significant relationship with the profitability measured by ROA whereas the GDP and underwriting risk has negative significant relationship with ROA. Despite to that the finding of the study implicates that diversification has positive impact on profitability but statistically insignificant with ROA. Based on this finding, the study considering the fact that the insurance companies from Romania are facing the combined effects of deteriorating market conditions and financial crisis impact and the effects of the financial crisis are still present and that the Romanian insurance market is below its potential, the insurance industry has interesting perspectives of evolution as whole.

(Sumaira and Amjad, 2013) conducted a study on profitability by focusing on the firm specific factor as a determinant of Pakistan insurance sectors from 2006-2011 for six consecutive years. Their studies are based on panel data of 31 insurance firms six (6) consecutive years. The study used leverage, growth opportunities, size, liquidity, age and earnings volatility as a key independent variable whereas the profitability is measured by Return on Asset (ROA). The ordinary least square multiple regressions are used in order to analyze the secondary data and reach at the final conclusion. The finding of their study

reveals a significant negative relationship between profitability measured by ROA and independent variables such as leverage, earnings volatility and age of the firm whereas size have significant positive relationship with profitability of insurance sector in Pakistan. In addition to that, the study also found insignificant relationship between growth opportunities and profitability as well as between liquidity and profitability.

(Pervan and Kramaric, 2012) investigate the influence of market share and diversification on non-life insurance performance for eleven (11) consecutive years from the period of 1999-2009. For the purpose of conducting their study, internal variables like firms' profitability from previous years, market share, diversification, control variables like ownership, industrial concentration, GDP per capita and inflation are used whereas ROA is used as a measure of the dependent variable. According to their studies the underlying relationships have been investigated in different industries and different disciplines states that still there is no consistency exists either in the magnitude or statistical significance of the relationship between market share (and diversification as well) on one side and companies' performance on the other side. Therefore, the direction of the relationship is also somewhat questionable. While some authors find this relationship to be positive, the others reveal its negative association. The impact of six independent variables such as firms' profitability from previous years, market share, diversification and control variables (i.e. ownership, industrial concentration, GDP per capita, inflation) on non-life insurance is companies' performance is tested on the empirical model by employing two-step Generalized Method of Moments (GMM) estimator in the study. Based on the result from the model, there is evidence of a negative and statistically significant influence of diversification and inflation on insurers' profitability whereas market share, GDP and past profitability is positive and statistically significant impact on profitability.

(Lee and Lee 2012) investigates the relationship between reinsurance and firm performance using panel data from the period of 1999 to 2009 on Taiwan property-liability insurance industry for eleven consecutive years. In the study, two dependent variables (Return on Asset and Return on Investment) and ten (10) firm specific profitability determinants of property-casualty insurance such as firm size, insurance leverage, financial leverage, underwriting risk, line-of-business concentration, liquidity

ratio, reinsurance price, growth of premium, return on investment and financial holding was used. In order to analyze the secondary data collected from the companies, the ordinary least square multiple regression model is used. The study finding shows that insurers with higher return on assets (ROA) tend to purchase less reinsurance and insurers with higher reinsurance dependence tend to have a lower level of firm performance, return on investment (ROI) and financial holding dummy have a significant correlation with reinsurance. The firm size, financial leverage, reinsurance, underwriting risks, liquidity ratio and ROI have a significant influence on firm performance. Other empirical results show that underwriting risks, liquidity ratio, reinsurance dependency and market has significant negative impact on profitability of non-life insurers whereas industry line concentration has negative and significant impact on profitability non-life insurers. The finding of (Iqbal et.al, 2013) on the relationship between ROA and Re-insurance dependence is also consistent with the (Lee 2012). Based on the finding, the study recommends that, managers have to strike a balance between decreasing insolvency risk and reducing potential profitability which have practical implications for the property-liability insurance industry and competent authorities in Taiwan.

2.3.1 Studies in Ethiopian

When we are coming back to the context of Ethiopia, the assessment of determinants of profitability in insurance companies appear to be very scanty work as the researcher's best knowledge. For instance, (Teklit and Jasmindeep, 2017) conduct the study on topic entitled internal and external determinant of insurance companies of profitability in Ethiopia for the year 2006-2015 through panel data. In the study, eight dependent variables were used such as size of insurance companies, capital adequacy, leverage ratio, liquidity ratio, and loss ratio and market share, growth rate of GDP and inflation rate. In order to achieve this objective, the fixed effect model was used instead of random effect model following the result of Hausman test. Panel data covering 10 years' period from 2005-06 to 2014-15 were analyzed for seventeen (17) insurance companies.

The results of the regression analysis revealed that size of insurance, 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 insignificant effect on insurance companies' profitability. The liquidity, loss ratio, Growth rate of GDP and inflation rate is negatively related with the profitability measured by the ROA. Based on the finding, the study suggested that managers of insurance companies as well as the policy makers in the country should take crucial measures by framing policies and strategies that aimed in improving the overall profitability of insurance companies.

(Demis, 2016) conducted the study on macroeconomic and firm specific determinants of profitability of insurance industry in Ethiopia. The study considers the firm specific factors which consist of age of company, size of company, leverage ratio, liquidity ratio, premium growth, technical provision, underwriting risk, solvency, re-insurance dependency and tangibility of assets and macroeconomic factors; GDP and Inflation on profitability of Ethiopian insurance industry. The study identifies that underwriting risk, technical provision, leverage and inflation have negative and significant effect whereas premium growth, age of the company, solvency ratio and GDP have statically positive and significant effect on the profitability of Ethiopian insurance industry. However, the study found that liquidity, re-insurance dependency, tangibility of assets and company size have no significant effect on the profitability of insurance industry in Ethiopia. Based on the finding, the study suggests that, insurance companies should critically consider underwriting risk and should minimize the accumulation used for technical provision and the level of leverage.

(Asrat and Tesfahun, 2016) investigate the determinant of profitability, particularly in eight Ethiopian private insurance companies from the period of 2005- 2015 through panel data. The data were analyzed by using multiple linear regression analysis. The firm specific factors used in this study include underwriting risk, reinsurance dependence, solvency ratio, premium growth, company size and three macro factors was used such as GDP, Inflations and interest rate. The regression result shows that profitability is significantly affected by firm specific factor which is underwriting risk negatively, company size positively, premium growth positively, and solvency ratio negatively and reinsurance dependency has no influence on profitability and statistically insignificant.

Whereas GDP has significant impact on profitability; whereas inflation and interest rate is considered as insignificant variable in the study. Based on the above finding, the study recommended that private insurance companies should reduce the impact of underwriting risk by improving their underwriting performance through techniques like risk and product selections with geographical and different pricing strategy. In addition to that private insurance company should improve their underwriting in favor of economic growth of the country via identifying the potential and priority direction of the overall economic activity and growth of the country.

(Mistire, 2015) have studied the determinant of profitability on insurance sector in Ethiopia. The study investigates both of the firm specific variables and macro-economic variables by using sample of nine companies over period duration of 2003 to 2014 by collecting through panel data and primary data. The firm specific variables used in this study include age of companies, size of companies, leverage, tangibility of assets, liquidity, premium growth, loss ratio, reinsurance dependence, solvency margin and the macroeconomic variable used in the is only GDP growth rate. The finding of the study states that loss ratio and leverage ratio is significant and negative impact on profitability of insurance companies, whereas all other variables have positive and significant impact on profitability. Based on the finding the study recommends that the management of the companies should pay great attention on ways to increasing the company assets, ways to control the companies leverage and finally the companies must employee highly qualified stuffs at top management position to get from the customer acceptance in Ethiopian general insurers.

(Hanna, 2015) conducted the determinant of profitability in Ethiopian insurance companies by considering both external and internal factors. The internal independent variables used in the study are company size, leverage, liquidity, firm growth, age, volume of capital and tangibility are used. Moreover, as external explanatory variables, inflation and GDP are used. The return on assert were used as the proxy of measuring profitability. In the study, a panel data covering the period of 2005 to 2014 are analyzed for a sample of nine insurance companies to reach on the final conclusions. The finding of the study shows that internal factors leverage, firm growth and tangibility of assets are

the most significant determinants of profitability of insurance companies in Ethiopia, of which, firm growth has positive impact, on the other hand leverage and tangibility of assets have negative impact on profitability of insurers. From macroeconomic factors, inflation has a negative and significant impact on insurers' profitability as well as company size, company age and GDP growth shows positive but insignificant relationship with insurers' profitability. And liquidity has negative and insignificant relationship with insurers' profitability. Based on the finding the authors recommend that an insurance company's management and investors should focus on how they promote the growth which significantly affects the profitability since the sector is still at the early stage of development.

(Hadush, 2015) investigates the determinants of profitability by considering both exogenous and endogenous variables such as liquidity, tangibility, volume of capital, premium growth, claim ratio, real GDP and inflation on general insurance companies operating in Ethiopia proxied by ROA to measure profitability. The econometric analyses have performed on a panel data for a sample of nine Ethiopian general insurance companies for the study period of 2005-2014. Based on the above data the finding of the study reveals that tangibility, volume of capital, premium growth, claim ratio, and real GDP are the most important determinants of profitability hence tangibility, volume of capital, premium growth is significant and positively related. In contrast, claim ratio and real GDP are negatively but significantly related with profitability. However, liquidity and inflation are not significantly related with profitability. Based on the finding, the study recommends that the general insurance companies operated in Ethiopia should pay due attention in the way they reducing incurred claims by identifying the risk areas and managing it by implementing good management guidelines and risk management techniques to minimize their risk exposure at the time of underwriting. In addition to that the management of the companies must pay attention on all significant factor affecting the profitability of the company's in order to increase the profitability of general insurers operated in Ethiopia as a whole.

(Suyehli, 2015) also examine the determinants of the of insurance companies' profitability in Ethiopia. The mixed research approach was used in the study which

consists of depth interview with manager and annual report of the firm. Panel data covering eleven-year period from 2004 – 2014 are analyzed for a sample of nine insurance companies in Ethiopia. The find from the study demonstrate that underwriting risk, technical provision and solvency ratio have statistically significant and negative relationship with insurers' profitability. However, reinsurance dependence has negative but insignificant relationship with profitability. On the other hand, variables like liquidity, company size and premium growth have a positive and statistically significant relationship with insurers' profitability. In addition, economic growth rate has significant influence on profitability whereas inflation has insignificant influence on insurers' profitability. The study provides evidence that underwriting risk, technical provision and liquidity are the most important factors that affect profitability of insurance companies in Ethiopia. And finally, the study recommends that, the insurance companies' managers as they give high attention to underwriting risk, technical provision and liquidity which increases profitability of the sector significantly.

(Meaza, 2014) conducted a study on the effects of firm specific factors (size of company, leverage ratio, liquidity ratio, loss ratio/ risk, tangibility of assets, growth and managerial efficiency) and macroeconomic factors (economic growth and inflation) on profitability proxies by ROA (dependent variables). In the study, the data is collected from a sample of ten insurers by using panel data with the time duration of 2008-2013 for six consecutive years. The result of the study demonstrates that size, leverage, tangibility of asset, loss ratio, firm growth and managerial efficiency have significant impact on profitability (ROA). Whereas firm size, tangibility of asset, firm growth and, managerial efficiency is positively related. In contrast, leverage and loss ratio are negatively and significantly related with profitability. Liquidity, inflation, and economic growth are not significant determinants of profitability**.** Based on the finding the study recommended that, the insurance managers and policy makers should give more attentions to firm-specific determinants of profitability than macroeconomic variables; since investigating the effects of macroeconomic variables on profitability of companies more use longer period observations.

(Mehari and Aemiro, 2013) conduct their study on factors determining insurance companies' performance in Ethiopia by considering the variables (size, leverage, tangibility, loss ratio (risk), growth in writing premium, liquidity and age) on performance of insurance companies in Ethiopia which measured by (ROA). In order to conduct the study, the sample of nine insurance companies was selected over the period of 2005-2010 through the panel data. The finding of the study shows that insurers' size, tangibility and leverage are statistically significant and positively related with return on total asset; however, loss ratio is statistically significant and negatively related with ROA. Thus, insurers' size, Loss ratio, tangibility and leverage are important determinants of performance of insurance companies in Ethiopia. But, growth in writing premium, insurers' age and liquidity have statistically insignificant relationship with return on asset. Based on the data, that analyzed through SPSS, the regression results demonstrate that growth, leverage, volume of capital, size, and liquidity are identified as most important determinant factors of profitability hence data growth, size, and volume of capita are positively related. In contrast, liquidity ratio and leverage ratio are negatively but significantly related with profitability. The age of companies and tangibility of assets are not significantly related with profitability.

Finally, (Ayele and Samasivam, 2013) undertake the study on firm specific factor influencing financial performance of insurance companies in Ethiopia from the period of 2003 to 2011 by selecting sample of nine insurance companies through panel data. In order to conduct the study, the researcher examined the effects of firm specific factors (age of company, size of company, volume of capital, leverage ratio, liquidity ratio, growth and tangibility of assets) on profitability measured by ROA which is dependent variable. The secondary data obtained through panel data from the financial statements (Balance sheet and Profit/Loss account) of insurance companies and financial publications of National Bank of Ethiopia (NBE) are analyzed by using OLS multiple regression methods through SPSS Software. The finding of the study indicates that firm growth, leverage, volume of capital, size, and liquidity are identified as 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 with profitability. Lastly, age of company and tangibility of assets are not significantly related with profitability.

Based on the finding the study recommends that, both management and regulatory bodies of the insurers should pay attention external and internal factors affecting profitability of insurance companies in Ethiopia as indicated in the study.

2.3.2 Conclusion and Gap from Reviews of Related Literature

An investigation of the factors affecting profitability has been more of focus on digging theoretical and empirical studies in finance research. As highlighted from the above empirical reviews, a large number of studies have been investigated on the factors determining profitability in different jurisdictions. But a scanty of study had been conducted in the selected area from developing countries as far as the researcher concerned and they are also insufficient in amount. For instance, in order to conduct this study, some of the literatures were taken from Pakistan, Kenya, India, Taiwan, Nigeria and other European countries for an intention of identifying non-life insurance business profitability determinants. Some of the previous researches that conducted on these jurisdictions as well as in Ethiopia have also documented unclear results on relationship between profitability which measured by return on asset and some other variables used to measure it as a proxy. For instance, (Mazviona *et.al*, 2017), (Sumaira and Amjad, 2013) and (Lee and Lee, 2012) indicates that, financial leverage of the non-life insurance companies is positively related with profitability. Whereas (Kozak, 2011) and (Kazeem, 2015) found inverse relationship between leverage and profitability of general insurers. Despite to that, (Mazviona *et.al*, 2017), (Daare, 2016), (Kazeem, 2015) and (Lee and Lee, 2012) found positive relationship between ROA and the firm liquidity.

When coming back to context of Ethiopia, some of few researches are conducted in the area of factor affecting insurance companies' profitability; particularly in general insurance.

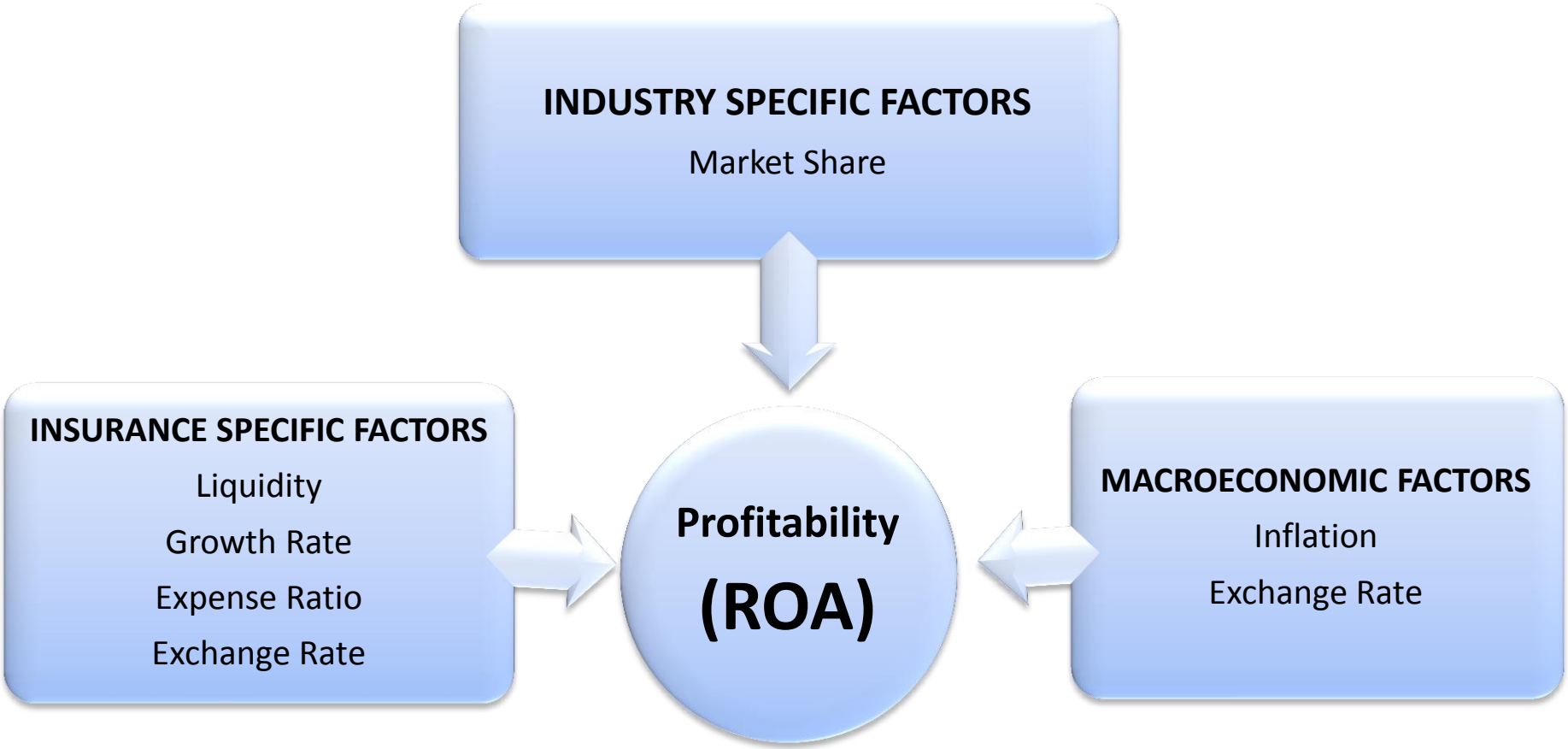
The empirical evidences regarding factors affecting insurance companies' profitability in Ethiopia, as tried to review in this study, focused mainly on factors such as size of companies, leverage, loss ratio, reinsurance dependence, motor insurance, market share,

GDP, and inflation. Moreover this study tried to extend the previous studies by incorporating other factors. To the researcher's knowledge factors like *motor insurance* and current ratio have not been adequately addressed by previous studies.

Therefore, the study attempted to fill this gap and augment its own possible contribution to the existing literature.

2.4 Conceptual Framework

This section provides conceptual framework that guides the study. According to (Becker 1998), the conceptual framework grounds the study in the relevant knowledge bases that lay the foundation for the importance of the problem statement and research questions or hypothesis. In addition to that, a conceptual framework is made up of theoretical and empirical work relevant to investigate specific purpose. Therefore, the study's conceptual framework consists of six independent variables namely Liquidity, Expense Ratio, Premium Growth Rate, Market Share, Inflation, and Exchange Rate. The conceptual framework that designed and paraphrased by the researchers from previous studies is represented in the following diagram.



Source: *Researcher's Formulation, 2023*

Figure 1: Factors of the Profitability of Insurance Companies (Conceptual Frameworks)

CHAPTER THREE
METHODOLOGY

3.1 Research Design

This study employed an explanatory research design. As explained by (Kothari, 2004) explanatory research design examines the cause and effect relationships between dependent and independent variables. Therefore, since this study was designed to examine the cause and effect relationship of Ethiopian non-life insurance companies by taking profitability as a dependent and six different variables as an independent variable, The nature of the research problem tends to be explanatory which seeks to explain the relationship between profitability and it related determinants in the study (Creswell, 2009).

3.2 Research Approach

This study employed a quantitative research approach to ensure effectiveness of the research process and meet the objective of the research. The quantitative research approach, which constructed an econometric model, was used to identify and measure the determinants of profitability. Specifically, multiple regression analysis is adopted to measure the effect of determinants on profitability. The use of multiple regressions considers the simultaneous relationships amongst the multiple numbers of independent and dependent variables found across the regression model, therefore best suited to the nature of the study.

3.3 Data Type, Source and Method of Collection

3.3.1 Data Type and Source

There was a critical review of the secondary panel data obtained from audited annual financial statements, particularly balance sheet and income statement, of the selected non-life insurance companies of Ethiopia and audited annual reports of National Bank

of Ethiopian (NBE) over the twelve years' study periods (2010 - 2021 G.C). The time period selected is based on the reason that is providing recent time observation.

The data collected and analyzed is a balanced panel of eleven insurance companies in Ethiopia operating over the last 12 years. Panel data is selected by the researcher in order to meet the research objectives as it best fits better than the single time series or cross-sectional alone.

In addition to the above core data sources, previous related empirical studies were discussed to make the study robust. Other macro level data are also obtained from the NBE (Research Directorate) as reported to them by MoFED.

3.3.2 Method of Data Collection

Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increases the credibility and value of the research findings (Koul 2006). Accordingly, document review was used for this study to collect the required data which is relevant for addressing the objectives of the study from audited financial statements of each insurance company included in the sample size.

3.4 Sample Design

3.4.1 Target population

For the study the target population is all insurance companies that currently registered by NBE and under operation in the country. The country has one public-owned and seventeen private insurance companies which are operating throughout the country**.**

3.4.2 Sample size

In order to reach meaningful conclusion, there is no need to sample from the eighteen insurance companies, as they are already few in numbers to collect information over the period of 2010-2021 G.C. But lack of 12 years data that is required for the analysis purpose in most of the newly established private insurance companies; the numbers of sampled insurances are reduced to eleven. The sample size is sufficient to make sound conclusion about the population as far as it covers more than 61% of the total population.

Accordingly, available audited financial statements of twelve consecutive years from 2010-2021 G.C. of each insurance company include in the sample frame. Thus, to make the panel data structured, i.e. every cross-section follows the same regular frequency with the same start and end dates. Besides, twelve years is assumed to be relevant because five years and above is the recommended length of data to use in most finance literatures. The procedure used for drawing the sample from the available lists is the insurance service year profile, for the reason that the study intend to use document sources. Therefore, sample size is decided based on the availability of operating data in the insurance operating in Ethiopia. When the subject used in the sample is homogeneous, using purposive sampling technique is appropriate Singh, (2006). Therefore, the researcher used purposive sampling method to draw the sample from the population.

3.5 Description and Measurement of Variables

This section has attempted to see the dependent and independent variables with their measurements.

3.5.1 Dependent Variable

Return on Asset

There are many different ways to measure profitability. Return on Assets (ROA), Return on Equity (ROE), Technical Profitability Ratio, Profit Margin, Return on Invested Capital (ROIC) and Embedded Value Approach (EVA) are important profitability measures used by different stakeholders.

Many scholars suggest that ROA is the key ratio for the evaluation of insurance profitability. ROA was developed in 1919 by Dupont and it emphasizes the insurance's ability to efficiently use its assets which gives an indication of the capital intensity of the company and is comparable for companies in similar industry (Maria, 2014). It shows how much profit has been generated by one unit of asset and it is indicator of how efficiently assets are used. The greater the ROA, the better the company performs.

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$$

3.5.2 Independent Variables

This subsection describes the independent variables that are used in the econometric model to estimate the dependent variable. Following prior researches towards the determinants of insurance' profitability, the independent variables are classified into insurance specific or internal, external or macroeconomic variables. The insurance specific variables are internal factors and controllable for insurances managers while the industry-specific and macroeconomic variables are uncontrollable and hence external. . The choice of independent variables is based on their theoretical relationship with the dependent variable, so in this particular study the Independents variables used to estimate the dependent variable are listed as follows:

Current Ratio (Liquidity)

Current Ratio is one of the measures of liquidity. The liquidity ratio measures the firm's ability to use its near cash or quick assets to retire its liabilities.

It is calculated as dividing current assets to current liabilities. It shows the ability of a company to pay its liabilities that will be paid in one year with its cash that will be obtained in one year. Current ratio should be between 1.5 and 2. Current assets are used as representative of liquidity since liquid assets are stated in this section of balance sheet.

While high liquidity gives power to pay short-term liabilities and hence financial strength, it may also cause waste of sources and affect company's profitability negatively. In normal economic circumstances, fixed assets generate more investment returns than current assets do (Sayılgan, 2010). Having high liquidity means surrendering more profitable investments. If a company misses more profitable investment opportunity, then it will generate less cash in the future meaning that its financial strength will be affected negatively. The balance should be established considering financial strength and profit opportunities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Expense Ratio

Expense ratio gives us what percentage of premium is used by insurance companies for paying all the costs of acquiring, writing and servicing insurance and reinsurance. The expense ratio shows an insurance company's efficiency without considering its claims on its policies and investment gains or losses. It is calculated by dividing the expenses related to acquiring, underwriting and servicing premiums to the net premiums earned by the insurer. Advertising, loss adjustment expenses, employee wages, commissions for the sales force, taxes on the insurer's earning are expenses which can be included in expense ratio.

Expense ratio is a very strong indicator of operational efficiency. Insurers can reduce expense ratio, hence increase operational efficiency, by making adjustments in their business mix, distribution channels. For example, merging with or acquiring a company or using online channels for marketing standard products such as traffic insurance to eliminate intermediary commission could reduce expenses. (Swiss Re, 2018)

$$\text{Expense Ratio} = \frac{\text{Underwriting expenses}}{\text{Net premiums earned}}$$

Growth Rate

Premiums are the most important source of income for insurers. Premiums are collected from clients after an insurance contract is made and invested in different kinds of instruments such as treasury and corporate bonds, stock markets, savings account. Premiums generate income for insurers till claims payments are made. Growth rate is simply the change in size of the company as measured by the percentage change in total assets. (Kripa & Ajasllari, 2016)

$$\textbf{Growth Rate (GR)} = \frac{\textbf{Current year Premium} - \textbf{Last year Premium}}{\textbf{Last year Premium}}$$

Market Share

Market share (MS) of a company is the share of its business activity when compared to other similar companies in the industry. It is measured as the total premium collected by a company to total premium collected in the industry as a whole over a given period of time. This study applied the empirical theory of Structure-Conduct-Performance (S-C-P), for which market concentration was proxied on the Herfindahl Hirschman Index (HHI). HHI is a measure of concentration applicable in many contexts such as market concentration. (Rhoades 1993) states that, the HHI is "useful in analyzing horizontal mergers because such mergers affect market concentration" which evidence points to as an important determinant of market structure and competition.

The HHI accounts for the number of firms in an industry and shows their relative market sizes, by squaring their market shares and summing the squares for all firms in the market as follows:

$$\text{HHI} = \sum_{N=1}^{n} (MSi)^2$$

Where; MS is market share

Thus,

$$\text{MS} = \frac{Insurer's\ Premium}{Gross\ Industry\ Premium}$$

Inflation

Inflation (INF) occurs when the prices of goods and services increase over time. Inflation cannot be measured by an increase in the cost of one product or service, or even several products or services. Rather, inflation is a general increase in the overall price level of the goods and services in the economy.

$$\textbf{Inflation rates (INF)} = \frac{I_t - I_{t-1}}{I_{t-1}}$$

Exchange Rate

Exchange rate is very important for countries having huge current account deficits. For these countries, inflation also increases due to the changes in exchange rates. The increase in prices of imported goods used in repair process in claims such as car parts causes increase in loss ratio of insurers. High volatility in exchange rates cause uncertainty reducing economic activity. On the other hand, insurers that deposit premiums in foreign exchange savings accounts benefit increases in exchange rates.

3.6 Model Specification

In many financial studies utilizing panel data, pooled ordinary least square (OLS), fixed effect model (FEM), and the random effect model (REM) are the three commonly applicable panel data estimator models. Which model has the best estimation power, however, depends on the results of different model specification tests such as the Hausman model specification test and Breusch and Pagan Lagrangian Multiplier (LM) test (Abdu 2020).

In order to examine the insurance's specific factors and macro-economic variables along with external factors affecting the profitability of insurance of the selected insurance, a balanced panel regression analysis is formulated as follows:

For each insurance profitability,

$$\boldsymbol{ROA_{it} = \beta_0 + \beta X_{it} + \varepsilon_{it}}$$

Where;

- ROA_{it} Represents a dependent variable (insurance profitability i at time t),
- X_{it} Is explanatory variable vector of insurance i at time t;
- β_0 Is intercept/constant term/,
- β is coefficient which represents explanatory variables slope;
- ε_{it} Represents the random error term (scalar).
- Subscript i represented cross-section (insurances) and t represented time-series dimensions (years).

Hence,

The model used to measure the impacts of firm-specific factors, industry specific factors and macroeconomic factors on the profitability of non-life insurers in Ethiopia is presented as follows:

$$\boldsymbol{ROA_{it} = \beta_0 + \beta_1 LQ_{it} + \beta_2 ER_{it} + \beta_3 GR_{it} + \beta_4 MS_{it} + \beta_5 INF_{it} + \beta_6 EXR_{it} + \varepsilon}$$

Where:

- LQ_{it}": Liquidity "i" in period "t"
- "ER_{it}": Expense Ratio "i" in period "t"
- "GR_{it} ": Growth Rate "i" in period "t"
- "MR_{it}": Market Share "i" in period "t".
- "INF_{it}": Inflation Rate "i" in period "t"
- "EXR_{it}": Exchange Rate "i" in period "t"
- "ε" Error term

The following table presents the summary of hypothesized expected sign for the relationship between the explanatory variables (independent variables) and insurances' profitability (dependent variable)

Table 1: Description of Variables, Measurements, and their likely Sign

Types of the Variables	Name	Indicator/Symbol	Proxy	Significance	Expected sign
Dependent Variable	Return on Asset	ROA	$\frac{Net\ income}{Total\ Asset}$	Higher NI/TA indicates higher performance.	
Independent Variables	Internal Insurance-Specific Variables	Liquidity (LQ)	$\frac{Current\ Asset}{Current\ Liability}$	Higher LQ indicates higher insurance's ability	+
		Expenses Ratio(ER)	$\frac{Underwriting\ Expence}{Net\ Primium\ Earned}$	Higher ER indicates higher insurance's ability	+
		Growth Rate (GR)	$\frac{\text{Current year Premium} - \text{Last year Premium}}{\text{Last year Premium}}$	Higher GR indicates reduced insurance's ability	-
	Industry Specific Factors	Market Share(MS)	$\frac{Insurer's\ Premium}{Gross\ Industry\ Premium}$	Higher share indicates higher performance	+
	External Factors	Foreign exchange Rate (EXR)	Foreign exchange rate	Dollar/Birr	-
		Inflation rate (INF)	$\frac{I_t - I_{t-1}}{I_{t-1}}$	Higher GDP deflator growth indicates higher inflation	-

Source: *Researcher's formulation, 2023*

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The previous three chapters defined the problem, articulated the objectives, and reviewed literatures relevant to the topic. Furthermore, so as to meet the research objective and to test research hypotheses, the research design used in the study was also discussed. In this chapter, the collected data are presented and analyzed. It has first analyzed the descriptive statistics of the dependent and independent variables followed by correlation analysis and the test for the classical linear regression model/CLRM and the results of the regression analysis were presented.

4.2 Descriptive Statistics

The descriptive statistics are explained in terms of central tendency i.e. mean value and on measure of dispersion like standard deviation, range maximum and minimum observation value as shown in Table 2 below.

Table 2: Descriptive Statics

Variable	Observations	Mean	Std. Dev.	Min	Max
LnROA	132	-2.57286	0.66701	-5.86562	2.17086
LnLQ	132	-0.21669	0.39693	-1.41581	0.48978
LnER	132	0.68833	0.41869	-0.81939	2.04213
LnGR	132	-1.59877	0.79641	-5.20925	0.42734
LnMS	132	-2.73983	0.77474	-4.21208	-0.63283
LnINF	132	2.47294	0.62068	1.02961	3.52929
LnEXR	132	3.12128	0.31684	2.60506	3.77714

Source: *Own estimation Using STATA 12*

Table 2 provides a summary of the descriptive statistics of the dependent and independent variables for twelve year from 2010 to 2021 for eleven insurance companies with a total 132 observations. For the total sample, the mean of ROA was 2.6 with a minimum of -5.86 and a maximum of 2.2. That means, the most profitable insurance among the sampled insurances earned 2.2 Birr of profit before tax for a single birr invested in the assets of the firm.

On the other hand, not profitable insurance company of the sampled lost 5.86 Birr of profit before tax for each birr invested in the assets of the firm. In addition to that, the standard deviation which analyzed through STATA 12 software for ROA was 0.66 which implies the presence of good variations among the profitability across the insurance companies included for this study. According to (Brooks, 2008) indicates that a low standard deviation shows data are very close to the mean, whereas high standard deviation shows data are spread out over a large range of values. Therefore, this result indicates that as the insurers need to optimize the premium written to increase the return on their assets.

As presented in table 2 above, the first explanatory variable of the study, LQ which is estimated by dividing current assets to current liabilities has a minimum value and maximum value of -1.41 and 0.49 respectively while the mean value is -0.22. These imply that there is an insurance company who pay their short term liabilities of non-life insurers' business line with maximum value of 0.49 and with a minimum value of -1.41 during the selected period. This result shows that Ethiopian insurance companies are liquid and also shows the existence of large variation among the liquidity level for insurance companies under reflection. According to the theory of agency costs, high liquidity of assets could raise agency costs and reinvestment risk. Undoubtedly, agency cost and reinvestment risk would put harm on the profitability of a company. In this occasion, it is, therefore, likely that insurance companies with less liquid assets outperform those with more liquid assets (Adams and Buckle 2000).

As presented in table 2 above, the other explanatory variable of the study, firm premium growth rate has a mean value of -1.59 and a minimum value and maximum value of -5.21

and 1.43 respectively. These imply that there is an insurance company who underwrite non-life insurers' business line with maximum value of 1.43 and a non-life insurer with a minimum value of -5.21 during the selected period.

The variable inflation rate has the mean value is 2.47, the minimum value and maximum value of 1.03 and 3.52 respectively. The maximum inflation was recorded in the year 2012 (i.e. 35%) and the minimum was in the year 2010 (i.e. 10.3%). The rate of inflation was highly dispersed over the periods under study towards its mean with standard deviation of 62%. This implies that inflation rate in Ethiopia during the study period was somewhat unstable and might could have high impact on the financial performance.

The final variable for this study is exchange rate, and has the mean value 3.12, the minimum and maximum value of 2.60 and 3.78 respectively. The rise of exchange rate implies the declining of the value of birr as compare to the dollar value. The minimum and maximum value of exchange rate is 2.60 and 3.78 respectively. The standard deviation has the value of 0.32 which indicates, it has high dispersion from the mean.

4.3 The Diagnostic Tests

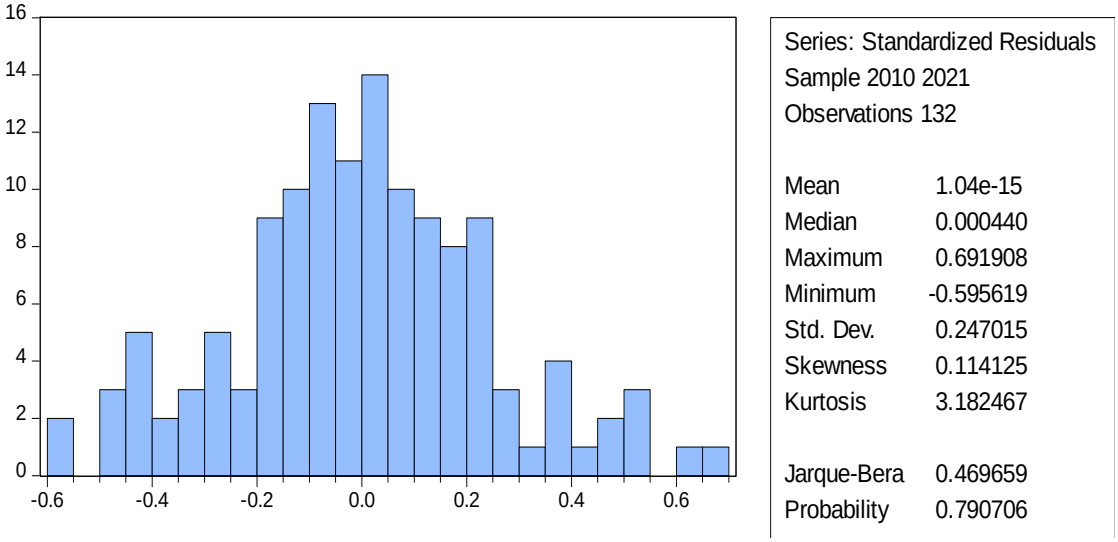
Every estimator of the model should have to meet the Ordinary Least Squares (OLS) assumptions before the estimation carried out. If the estimators of the model satisfy the OLS assumption, it is possible to say the estimators are BLUE (best linear unbiased estimator) (Brooks, 2008). The econometric estimation technique that used in this study is (OLS). The diagnostic test in this research is described as follows:

4.1.1 The Normality Test

A normal distribution is not skew and defined to have a coefficient of kurtosis 3. Jarque-Bera formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are 0 and 3 respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the distribution are. The Jarque-Bera probability statistics /P-value/ is also expected not to be significant even at 10% significant level (Brooks,

2008). The study develops the following hypothesis to check the normality: Ho: The residuals are normally distributed H1: The residuals are not normally distributed

As shown in the Histogram below, the value of Skewnes and Kurtosis is 0.114125 and 3.18246 respectively and the Jarque-Bera statistics was not significant even at 10% level of significance as per the P-values shown in the histogram was 0.7907. Hence, the null hypothesis of normally distributed is failed to reject at 5 percent of significant level. This implying that there is no significant evidence for the presence of not normally distributed. The Jarque Bera P-value of the model also supports the presence of normally distribution of the residuals. Therefore, we could conclude that the residuals are asymptotically normal in this study.



Source: *Own estimation of research on Eview 9*

Figure 2: Normality test result

4.1.2 Multicollinearity test

The term Multicollinearity refers to a linear relationship between explanatory variables, which may cause the regression model, biased (Gujarati, 2004). Most of the time, it is common to test if there is Multicollinearity among explanatory variables before going into estimation and interpretation of the model. Most econometric literatures reveal that the presence of Multicollinearity results in inflated standard errors which make inferences from estimation highly problematic (Gujarati, 2004). If an explanatory variable is an

exact linear combination of the other explanatory variable, then we say the model suffers from perfect co linearity and it cannot be estimate by OLS (Brooks 2008).

Perfect multicollinearity will usually be observed only when the same explanatory variable is inadvertently used twice in a regression. This assumption does allow the independent variables to be correlated but they cannot be perfectly correlated. How much correlation causes multicollinearity however, is not clearly defined. While (Hair et al, 2006) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem. Therefore, in this study's correlation matrix for six of the independent variables shown in the Table 3 below. The results in the following correlation matrix show that the highest correlation is 0.6324 which is between exchange rate and liquidity.

Table 3: Multicolinearity

	LnLQ	LnER	LnGR	LnMS	LnINF	LnEXR
LnLQ	1.0000					
LnER	0.3121	1.0000				
LnGR	0.1443	-0.0203	1.0000			
LnMS	-0.1754	0.2814	0.0249	1.0000		
LnINF	-0.1926	-0.196	0.2869	-0.1598	1.0000	
LnEXR	-0.6324	-0.4151	-0.22	-0.1185	0.1903	1.0000

Source: *Researcher's computation with STATA, 2023*

Table 4 below, shows that the multicollinearity issue of the explanatory variables of this study is checked by correlation coefficient and Variance Inflation Factor (VIF). Here, in this case, Multicollinearity problem exists when VIF of the predictor variable is greater than 10. Hence, both Tables 3 and 4 confirm that a multicollinearity problem does not exist since the Pearson correlation coefficients of predictors were less than 0.70, and VIF was less than 3. Hence, for both cases, there is no multicollinearity problem in this study (Assfaw, 2019a).

Table 4: Variance Inflation Factor

Variable	Vif	1/Vif
LnEXR	2.08	0.48035
LnLQ	1.96	0.51070
LnER	1.42	0.70585
LnMS	1.27	0.78776
LnINF	1.25	0.80203
LnGR	1.21	0.82828
Mean VIF	1.53	

Source: *Researcher's computation with STATA, 2023*

4.1.3 Heteroskedacity Test

According to Brooks (2008), hetroskedacity means that error terms do not have a constant variance. If hetroskedacity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid, as it will underestimate the variances and standard errors. There are several tests to detect the hetroskedacity problem, which are Park Test, Glesjer test, Breusch-Pagan-Goldfrey test, White's test and Autoregressive Conditional hetroskedacity (ARCH) test. For this study, the White's test employed to test for the presence of hetroskedacity.

An estimator of the asymptotic covariance matrix of the OLS estimator is said to be hetroskedacity -robust if it converges asymptotically to the true value even when the variance of the errors of the regression is not constant.

Table 5: Tests of Hetroskedacity.

H0: sigma(i)^2 = sigma^2 for all i	
chi2 (11)	375.370
Prob>chi2	0.000

Source: *Researcher's computation with STATA, 2023*

Tabel 5 above shows that, there were the problems with heteroscedasticity. So if there were a problem with hetroskedacity, the issue would be handled by the clustered robust standard error estimations on the random effect model /Table 8 below/. Then, the estimation results of the linear regression model on the dependent variable would be estimated by using the model.

4.1.4 Autocorrelation

The "Durbin-Watson statistics", is the classic test statistics for serial correlation. A Durbin-Watson close to 2.0 is consistent with no serial correlation, while a number closer to 0 means there is probably serial correlation, Brooks, (2008). Hence, as explained by Eview in the Table 9 below, the value of Durbin-Watson statistics model result of 1.4936 for ROA which is less but closer to 2.0 is consistent with no serial correlation but the study is not free from autocorrelation.

4.1.5 Correlation Analysis

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. The values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear sense; while a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Brooks, 2008). The primary objective of correlation analysis is to measure the strength or degree of linear association between two variables (Gujarati & Porter, 2009). The correlation result of a sample size approaches to 100; the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Mayers et.al, 2006).

Table 6: Correlation Matrix with Dependent Variable

	LnROA	LnLQ	LnER	LnGR	LnMS	LnINF	LnEXR
LnROA	1						
LnLQ	0.261	1					
LnER	0.528	0.318	1				
LnGR	-0.087	0.145	-0.013	1			
LnMS	0.258	-0.178	0.275	0.026	1		
LnINF	-0.217	-0.195	-0.232	0.289	-0.164	1	
LnEXR	-0.099	-0.633	-0.449	-0.219	-0.120	0.189	1

Source: *Own estimation of research STATA 12*

Accordingly, the correlations of LQ, ER, MS to ROA have statistically significant positive linear relationship while GR and EXR have statistically insignificant but negative linear relationship with ROA.

4.4 Choosing Fixed Effect vs. Random Effect Models

The results discussed prior indicated that, not all CLRM assumptions are violating. Consequently, the OLS regression safely applied. However, since the organized data are estimated based on the panel model, which includes cross sectional and time series dimensions for the insurance companies in Ethiopia for the period of 2010 to 2021, there are two types of panel estimator approaches need to be applied, namely: fixed effects models (FEM) and random effects models (REM) which are commonly used models for the panel data (Brooks, 2008).

In order to choose fixed or random effect model a formal test so called Hausman test is used which was based on the null hypothesis in favor of random effect model estimator or the hypothesis states as: Ho: Random effect model is appropriate and H_1:Random effect model is not appropriate or fixed effect (FE) model is appropriate. The decision rule is when the prob>chi2 or the P- value is greater than the given level of significant (usually 5%), then we fail to reject the null hypothesis (Ho), thus random effect model is appropriate. On the other hand, if the P- value is less than a

given level of significant or 5% we reject the null or the fixed effect model is appropriate (Woodridge, 2006).

4.4.1 The Hausman Test

H_0: Random effect model is appropriate. If P-value>5%, we fail to reject the null hypothesis.

H_1: Fixed effect model is appropriate. If P-value<5%, we reject the null hypothesis.

Table 7: Hausman Test Result for ROA Dependent

Correlated Random Effects - Hausman Test
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.775298	6	0.0956

Source: *Own estimation of research on Eview 9*

Table 7 above shows that when ROA is dependent variable, the Hausman test result shows the P-value of 0.0956 which is greater than 0.05 implying that, random effect model is more appropriate equation.

4.5 Regression Result and its Interpretation

This section presents the regression result of random effect model that made to examine the factors affecting the profitability, ROA of insurance companies in Ethiopia. Accordingly, the regression results are done by Eview 9 and STATA 12 software. As stated earlier in model selection that is Hausman test, random effect regression model is an appropriate model in this study. Thus, in this study the model used to examine the determinants of insurance companies profitability in Ethiopia is developed as:

$$\boldsymbol{LnROA_{it} = \beta_0 + \beta_1 LnLQ_{it} + \beta_2 LnER_{it} + \beta_3 LnGR_{it} + \beta_4 LnMS_{it} + \beta_5 LnINF_{it} + \beta_6 LnEXR_{it} + \varepsilon} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{1})$$

Where:

"ROA_{it}": Dependent Variable Return on Asset;

"β_0": Y-intercept.

"β_i": Coefficient of variable where "i" ranges from 1 to 12.

"LQ_{it}": Liquidity "i" in period "t"

"GR_{it}": Growth Rate.

"ER_{it}": Expense Ratio "i" in period "t"

"MR_{it}": Market Share "i" in period "t".

INF_{it}": Inflation;

EXR_{it}": Exchange Rate

"ε" Error term

The coefficients of explanatory variable estimated by the use of (OLS) technique are presented in the Table 8 below and demonstrate both coefficients of explanatory variables and corresponding p-values. Hence, the model for dependent variable ROA could be developed.

The hetroskedacity issue rose under Tabel 5 above for this model is alleviated by the robust standard error estimations on the random effect model which were applied to handle the consequences on OLS estimator (Table 8 below).

A robust standard error is a technique applied to obtain unbiased standard errors of OLS coefficients under hetroskedacity by the White's Standard Errors, Huber-White Standard errors, Eicker-White or Eicker –Huber-White standard errors (Economic theory Blog, 2022). Hence, the estimation results of the linear regression model on the determinants of non-life insurance companies' profitability in Ethiopia are presented in Table 8 below.

Table 8: Summary Results of Clustered Robust Random Effect Regression Model

					Wald chi2(6)	=	151
					Prob > chi2	=	0.000
		Robust					
LnROA	Coef.	Std. Err.	z	P>z	[95% Conf.		Interval]
LnLQ	0.5214	0.1221	4.27	0	0.2819		0.7608
LnER	0.7396	0.2158	3.43	0.001	0.3166		1.1626
LnGR	-0.0255	0.0565	-0.45	0.652	-0.1364		0.0853
LnMS	0.1566	0.0339	4.61	0	0.0900		0.2232
LnINF	-0.0579	0.0720	-0.80	0.421	-0.1991		0.0832
LnEXR	0.7549	0.3100	2.43	0.015	0.1472		1.3626
_cons	-4.8536	1.0532	-4.61	0	-6.9178		-2.7893

Source: *Researcher's computation with STATA, 2023*

Moreover, the correlation result between premium growth rates and inflation had negative correlation with ROA and insignificantly correlated at 5% significant level. This indicates that as a ratio of premium growth rates and inflation to profitability moves to the opposite direction, but the negative relationship are not statistically different from zero.

In contrary to the above explained variables, the Pearson correlation coefficients of Liquidity, Expense Ratio, Market Share and Exchange Ratio had positive relationship with return on asset with a coefficient of 0.5214, 0.7396, 0.1566 and 0.7549 at 5% significant level respectively.

Thus, the model for ROA can be rearranged as:

$$\boldsymbol{LnROA_{it} = -4.85 + 0.52LnLQ_{it} + 0.74LnER_{it} - 0.03LnGR_{it} + 0.16LnMS_{it} - 0.06LnINF_{it} + 0.75LnEXR_{it}} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . . \ldots \ldots \ldots \ldots (\mathbf{2})$$

Table 9 below on the other hand shows that, the regression outputs of Eviews 9.

The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). R-squared coefficient of 0.4061 obtained from the Eviews 9 revealed that, 40.6% of the variation ROA in the insurance companies in Ethiopia are explained by the selected explanatory variables such as: $LnLQ_{it}$, $LnER_{it}$, $LnGR_{it}$, $LnMS_{it}$, $LnINF_{it}$and $LnEXR_{it}$ as explained above. The R-square result affected by other factors that are not included in the model but could be explained in the insurance markets in Ethiopia account for the remaining 59.4 %.

The Adjusted R-Squared value in the model, which takes into account the loss of degrees of freedom associated with adding extra variables inferred to see the explanatory powers of the models shows satisfactory levels, which mean that nearly 37% of the volatilities in ROA are explained by the volatilities of independent variables included in the equation, (Brooks, 2008). Therefore, in the table 9, an adjusted R square having value of 0.3694 for ROA shows that 37% of the dependent variables are explained by the independent variables included in the model. The adjusted R-squared value indicates the total variability of determinants of insurance companies' profitability was explained by the variables in the model. Thus these variables collectively, are good explanatory variables to identify the determinant of insurance companies' profitability in Ethiopia.

The F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered fit. The regression in the model in the Table 9 above, F-statistic takes a value of 11.05623 for ROA results which are greater than 5; hence the model is fit for estimation. Furthermore, F-statistics tests for the joint impact of all explanatory variables on the dependent variables. A corresponding p-value of zero attached to the test statistic shows that the null hypothesis that all of the slope parameters are jointly zero should be rejected even at 1 percent level of significance. This implies that all selected explanatory variables can affect the level of ROA.

Table 9: Results of Random Effect Regression Model for ROA

Dependent Variable: LNROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNLQ	0.516598	0.156908	3.292371	0.0014
LNER	0.743803	0.123621	6.016792	0.0000
LNGR	-0.025320	0.059716	-0.424004	0.6725
LNMS	0.156501	0.071447	2.190434	0.0309
LNINF	-0.058427	0.090637	-0.644622	0.5207
LNEXR	0.753872	0.202453	3.723696	0.0003
C	-4.852892	0.664785	-7.299945	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	0.106205	0.0611
Idiosyncratic random	0.416338	0.9389

Weighted Statistics			
R-squared	0.40613	Mean dependent var	-2.03995
Adjusted R-squared	0.36940	S.D. dependent var	0.54079
S.E. of regression	0.42644	Sum squared resid	17.64024
F-statistic	11.05623	Durbin-Watson stat	1.60204
Prob(F-statistic)	0.00000		

Unweighted Statistics			
R-squared	0.405415	Mean dependent var	-2.600840
Sum squared resid	18.92104	Durbin-Watson stat	1.493602

Source: *Own estimation of research E.view 9*

4.5.1 Regression Result of Liquidity

As shown in the above Table 8 above, liquidity of insurance companies has a statistically significant and positive relationship with ROA and the relationship is significant at 0.05% level. According to the regression result in the tables above, a 100% increase in

liquidity generates a 52.14% increase in ROA. Therefore, liquidity influences Return on Asset positively and significantly. As reviewed in the empirical literature above, this regression result is supported by the finding of (Jibran, et, al. 2016), (Suyehli, 2015) who used two dependent variables namely, ROA/ROE and found that Liquidity has positive and statically significant effect.

From this finding the researcher recommends that liquid assets should be converted into cash quickly and without losing its value. Volatility in Ethiopian economy makes long term investments disadvantageous. Insurers should stay liquid based on our finding. Regulators should pay more attention to illiquid companies. Regulators could also limit share of illiquid assets in insurer's investment portfolio. The finding is supported by (Reshid, 2015), (Shiu, 2004) and (Jadi, 2015). The finding conflicts with the findings of (Doğan, 2013), (Öner Kaya, 2015), (Ahmad & Prasetyo, 2018), (Berhe & Kaur, 2017).

4.5.2 Regression Result of Expense Ratio

The regression result in Tables 8 shows that, ER has significant and positive impact on ROA. The coefficients of this relationship is 0.73967 for ROA, which indicates that, holding other things constant, a 100% increase in ER leads to a 73.9% increase in ROA in the study period. This implies that expense ratio has a positive and statically significant effect on profitability of insurance companies in Ethiopia. The regression result of Expense Ratio is in line with empirical evidences found by (Saeed and Khurman, 2015) which is positive and statically significant.

4.5.3 Regression Result of Market Share

The regression result shows that, Market Share (MS) has positive and statistically significant impact on ROA, showing a 100% increase in MS results a 16% increase in ROA, keeping other things constant. The positive sign of the coefficient indicates a direct relationship between MS and ROA. This result is similar to the empirical founding of (Ahmad & Prasetyo, 2018). The coefficient of market share which is measured as ratio of total written premium of the company to total gross written premium of the industry in

this study was positive,(0.016) and statistically significant even at 5% significance level indicating that its impact is not negligible. The significant parameter indicates that the market share significantly affect Ethiopian insurance profitability. Referring to previous studies Cassandra R. Cole et al (2015) in their multivariate analysis, they find evidence that market concentration and insurers' underwriting profits are positively related. More specifically, insurers in states with greater market share are more profitable than insurers in states with lower levels of market share which is consistent to this study too.

To the contrary, as stated in Öner Kaya (2015) Pervan et al. [2010] have investigated the determinants of profitability in the Bosnia and Herzegovina insurance industry between the years of 2005–2010. According to their results, age of company, market share, and past performance are positively and significantly related with current profitability they have also found that foreign-owned companies perform better than domestically owned companies; and there is no significant relationship between diversification and profitability.

4.5.4 Regression Result of Exchange Rate

The regression result in Table 8 above shows that, EXR has significant and positive impact on ROA. The coefficients of this relationship shows that a 100% increase in EXR results a 75% increase in ROA, holding other things constant. This implies that EXR has a positive and statically significant effect on profitability of insurance companies in Ethiopia. The regression result of Exchange Ratio is in line with empirical evidences found by (Saeed and Khurman, 2015) which is positive and statically significant.

To summarize, this chapter presents the results of the hypotheses of the independent variables tested on the dependent variable (ROA).

Empirical results provide detailed discussions on sample descriptive statistics and mean comparison between ROA and independent variables (liquidity ratio, expense ratio, premium growth rate, market share, inflation and exchange rates) followed by correlation analysis to determine the relationship between dependent variable and towards independent variables.

Regression analysis is also used to describe the profitability among insurance companies. ROA is affected positively by liquidity ratio, expense ratio, market share and exchange rates while premium growth rate and inflation affects profitability in negative way. The findings of this study contribute towards a better understanding of financial performance in Ethiopian insurance companies. ROA and six other variables that represent liquidity ratio, expense ratio, market share, exchange rates, premium growth rate and inflation were developed to test which factors best describes profitability of Ethiopian insurance companies.

The results show that liquidity ratio, expense ratio, market share and exchange rates are the most important factors affecting profitability of insurance companies in Ethiopia. The results show that there is no relationship between profitability premium growth rate and inflation rates.

Table 10: Summary of Actual and Expected Signs of Explanatory Variables on the Dependent Variables.

No	Explanatory Variables	Symbol	Dependent Variable	Expected Impact	Actual Impact	Actual Result
1	Liquidity	LQ	ROA	+	+	Significant
2	Expense Ratio	ER	ROA	+	+	Significant
3	Growth Rate	GR	ROA	-	-	Not Significant
4	Market Share	MS	ROA	+	+	Significant
5	Inflation	INF	ROA	-	-	Not Significant
6	Exchange Rate	EXR	ROA	-	+	Significant

Source: *Researcher's formulation, 2023*

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The objective of the study was to identify the factors affecting profitability of insurance companies in Ethiopia for the period of 2010 to 2021. It used ROA as a measure of profitability against the selected internal or Firm-specific, Industry-specific and Macroeconomic variables.

The internal variables were Liquidity, Expense Ratio and Insurance Growth Rate; from Firm Specific Factors, Market Share and from Macroeconomic factors Inflation and Exchange Rates were regressed. Quantitative approach and multiple regression analysis were employed to ensure effectiveness of the research process and meet the objective of the research effect on profitability.

The mean value and standard deviation of liquidity is -0.22 and 0.39 respectively. This result shows that Ethiopian insurance companies are liquid and also shows the existence of good variation among the liquidity level for insurance companies under consideration.

The coefficient of market share which is measured as ratio of total written premium of the company to total gross written premium of the industry in this study is 0.15 and p-value of 0.000 indicating that impact of MS on profitability has positive and significant at 5% precision level.

The coefficient and p- value of liquidity is 0.52 and 0.000 directs their positive r/s b/n profitability and liquidity which is statistically significant at 5% significance level. Henceforth, it is recommended that liquid assets should be converted into cash quickly without losing its value. Volatility in Ethiopian economy can make long term investments disadvantageous.

Accordingly, Liquidity, Expense Ratios, Market Share have statistically significant positive relationship with insurers' profitability. Furthermore, Exchange Rates also have statistically significant relationship with ROA. This means that the exchange rate has

positive and statistically significant impact on profitability of non-life insurance companies. When the exchange rate increase the profitability of insurance also increases. When the purchasing powers of birr as compare to dollar decrease the ROA also decreases. Hence, exchange rate has positive relationship with ROA.

However, the rest variables, growth rate and inflation have insignificant relationship with the profitability of non-life insurance companies in Ethiopia.

5.2 Conclusion

The observed findings on the factors affecting insurance companies' profitability in Ethiopia for the sample taken suggested the following conclusions.

The mean value and standard deviation of liquidity is -0.22 and 0.39 respectively. Showing that Ethiopian insurance companies are liquid and existence of good variation among the liquidity level for insurance companies under consideration.

Liquidity of an insurance company has a positive impact on profitability with strong significance coefficient, having high liquidity means surrendering more profitable investments that generates balanced financial strength.

From this finding the researcher it is recommended that liquid assets should be converted into cash quickly and without losing its value. Volatility in Ethiopian economy makes long term investments disadvantageous. Insurers should stay liquid based on our finding. Regulators should pay more attention to illiquid companies. Regulators could also limit share of illiquid assets in insurer's investment portfolio.

Expense ratio is positively related the profitability measure as expected. This result shows that expenses take an important place in general insurer's cash outflows. . It is thought that the main reason for this is the low commissioning and reduced administrative and managerial expenses take an important place in financial performances of business insurances.

The share of a company has a positive and significant impact on profitability with 5% significance level. This indicates that larger insurance companies of the country experience more significant increases in profitability through economies of scale. Consequently, the larger the firm is the better the profitability.

The study found positive results for the effect of exchange rate on insurers' profitability in Ethiopia. In the sample, findings presented evidence of positive and significant relationship with ROA at 5 percent (5%) significance. This implies that, as the exchange rate of Ethiopia depreciates, insurers' profitability is adversely impacted. This could be explained by the general economic contraction experienced by countries with depreciating currencies. Also, this could imply that most insurers pay out a huge portion of their premiums collected in Ethiopian Birr to foreign re-insurers (Appiah, 2019).

5.3 Recommendation of the Study

Based on the result of the analysis conducted in the previous chapter and the above conclusions, the researcher has drawn the following recommendations.

- Insurance companies should acquire sufficient liquid assets that should be converted into cash quickly without losing its value.
- Firm specific factors are mostly determining the profitability of non-life insurance companies in Ethiopia. Therefore, it is recommended that the board and management of non-life insurance company should give high attention on firm specific related factors.
- It is thought that commissioning and advertisements along with managerial expenses are the main sources of premiums and take an important place in financial performances of Ethiopian business insurances. So that the managements of the industry should raise high level of outlays for advertisements and commissioning.

- The exchange rate has positive and statistically significant impact on ROA. We recommended that the government should control the increase of purchasing power of birr in the economy by raising export and the raising of import did not greater than as export product. When export rise leads to increase the value Birr to the Dollar value. This may enhance the financial performances of non-life insurance companies' profitability.

5.4 Recommendations for Future Research

- Given the key role that the sector plays in the economy of the country, future research should focus on internal, external and inter-industry factors that would provide better insights for both management and regulatory bodies.

- Other issues that could be covered in future research include whether insurance companies effectively and efficiently indemnify risks and intermediate savings for the provision of risk to the other sectors in the economy, or whether they allocate resources and manage risks efficiently hence factors affecting profitability of insurance companies and their implications in risk management practices.

- On the roots this study, the researcher concluded that the firm specific factors are mostly determine the profitability of non-life insurance companies in Ethiopia. Therefore it is recommended that the board and management of non-life insurance company should give high attention on firm specific related factors.

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Annexes

1. Insurance Companies Operating in Ethiopia since June 2022

Sq. No.	Name of Insurer	Abbreviated Name	Year of Establishment	Establishment Capital in Ethiopian Birr
1	Ethiopian Insurance Corporation	EIC	9/1/1976	11 million
2	National Insurance Company of Ethiopia S.C.	NICE	9/1/1994	9 million
3	Awash Insurance Company S.C.	AIC	10/1/1994	25 million
4	Africa Insurance Company S.C.	AFRICA	12/1/1994	30 million
5	Nyala Insurance Company S.C.	NYALA	1/1/1995	35 million
6	Nile Insurance Company S.C.	NILE	4/1/1995	12 million
7	United Insurance Company S.C.	UNITED	4/1/1997	8 million
8	Global Insurance Company S.C.	GLOBAL	11/1/1997	7 million
9	Nib Insurance Company S.C.	NIB	5/1/2002	30 million
10	Lion Insurance Company S.C.	LION	7/1/2007	16 million
11	Ethio-Life and General Insurance S.C.	ELIFE	10/1/2008	6.5 million
12	Oromia Insurance Company S.C.	OROMIA	1/1/2009	26 million
13	Abay Insurance S.C.	ABAY	5/1/2011	7.5 million
14	Berhan Insurance S.C.	BERHAN	5/1/2011	9.7 million
15	Tsehay Insurance S.C.	TSEHAY	3/1/2012	11 million
16	Lucy Insurance S.C.	LUCY	10/1/2012	8 million
17	Bunna Insurance S.C	BUNNA	5/1/2013	6.7 million
18	Zemen Insurance S.C.	ZEMEN	1/1/2020	79.9 million

Source: *Compiled from NBE Annual Report, 2022; Official Websites of Insurers*

2. The Analyzed Data Sheet

ID	Year	LnLQ	LnER	LnGR	LnMS	LnINF	LnEXR	LnROA
1	2010	0.0836	1.1903	-1.9661	-0.9180	1.0296	2.6051	-2.3138
1	2011	-0.0084	0.8815	-1.8076	-0.9789	2.8959	2.8278	-2.4715
1	2012	-0.0613	0.8285	-0.9457	-0.9910	3.5293	2.8753	-2.4715
1	2013	-0.0328	1.0951	-1.7989	-1.0074	2.6027	2.9254	-2.1962
1	2014	-0.0153	1.1928	-2.2903	-1.0630	2.0919	2.9744	-1.9991
1	2015	-0.0554	1.1995	-2.5485	-1.1189	2.0412	3.0236	-1.9737
1	2016	0.0616	1.1957	-1.9939	-1.1406	2.2721	3.0819	-2.0019
1	2017	0.1062	1.1596	-1.6253	-1.1231	2.0015	3.1402	-1.9181
1	2018	0.0307	1.1697	-2.4830	-1.3764	2.6810	3.3055	-3.3171
1	2019	-0.8385	0.3899	0.4273	-0.8193	2.5337	3.3642	-2.4741
1	2020	-1.0934	1.6733	-1.1918	-0.7445	2.9907	3.5548	-2.5153
1	2021	-1.3731	0.2243	-0.7402	-0.6328	3.0057	3.7771	-2.7275
2	2010	-0.1837	0.8882	-5.2000	-2.5458	1.0296	2.6051	-2.4036
2	2011	-0.2425	0.6242	-0.6434	-2.3363	2.8959	2.8278	-2.7243
2	2012	-0.1617	0.7515	-0.8752	-2.3282	3.5293	2.8753	-2.5345
2	2013	-0.1176	1.2178	-1.6499	-2.3221	2.6027	2.9254	-2.1181
2	2014	-0.1497	0.7267	-3.2827	-2.4373	2.0919	2.9744	-2.3969
2	2015	-0.1837	0.7956	-2.1423	-2.4574	2.0412	3.0236	-2.3094
2	2016	-0.1938	0.6399	-1.2089	-2.3456	2.2721	3.0819	-2.5987
2	2017	-0.1061	0.6388	-1.6351	-2.3297	2.0015	3.1402	-2.4383
2	2018	-0.6138	0.1000	0.1520	-1.8911	2.6810	3.3055	-2.9315
2	2019	-0.7412	0.3951	-3.7980	-2.2414	2.5337	3.3642	-2.7127
2	2020	-0.7182	0.4557	-1.8605	-2.2871	2.9907	3.5548	-2.5725
2	2021	-0.5104	0.4294	-1.6125	-2.3837	3.0057	3.7771	-2.7174
3	2010	-0.1749	0.6005	-4.2100	-3.8179	1.0296	2.6051	-2.8409
3	2011	-0.0840	0.2797	-2.5837	-3.9580	2.8959	2.8278	-3.5353
3	2012	-0.0878	0.2180	-0.8393	-3.9392	3.5293	2.8753	-4.2346
3	2013	0.1266	1.1471	-1.1177	-3.8258	2.6027	2.9254	-2.1807
3	2014	0.3015	1.2130	-1.4247	-3.7623	2.0919	2.9744	-2.1033
3	2015	0.4898	1.1563	-1.5609	-3.7028	2.0412	3.0236	-2.2350
3	2016	0.3846	1.0485	-1.6976	-3.6841	2.2721	3.0819	-2.3474
3	2017	0.2210	0.7411	-0.2300	-3.9997	2.0015	3.1402	-2.5246
3	2018	-0.1200	-0.0413	-0.5062	-3.8614	2.6810	3.3055	-2.6514
3	2019	-0.1842	0.0834	-1.4763	-4.0281	2.5337	3.3642	-2.9445
3	2020	-0.1516	0.1859	-2.0271	-4.0947	2.9907	3.5548	-2.4599
3	2021	-0.2768	0.1912	-1.7446	-4.2121	3.0057	3.7771	-2.4964
4	2010	-0.0753	0.7171	-2.3500	-2.5088	1.0296	2.6051	-1.9810

4	2011	-0.0364	0.5534	-1.6652	-2.5484	2.8959	2.8278	-2.4504
4	2012	0.0854	0.6074	-1.0191	-2.5805	3.5293	2.8753	-2.2832
4	2013	0.1051	0.7348	-1.8212	-2.6001	2.6027	2.9254	-2.3166
4	2014	0.0862	0.7309	-1.9171	-2.6150	2.0919	2.9744	-2.1758
4	2015	0.1427	0.5132	-1.6965	-2.5778	2.0412	3.0236	-2.5054
4	2016	-0.1647	0.2278	-2.0020	-2.6005	2.2721	3.0819	-3.4819
4	2017	-0.1919	0.9134	-1.4275	-2.5476	2.0015	3.1402	-2.0823
4	2018	-0.5497	0.0000	-1.3436	-2.6493	2.6810	3.3055	-2.7621
4	2019	-0.9475	0.3438	-1.3673	-2.7947	2.5337	3.3642	-3.0377
4	2020	-1.1067	0.4362	-2.2990	-2.8894	2.9907	3.5548	-2.2947
4	2021	-0.9968	0.5173	-1.3553	-2.9384	3.0057	3.7771	-2.6566
5	2010	-0.0080	0.7406	-4.8000	-3.7815	1.0296	2.6051	-3.0475
5	2011	0.1139	0.0680	-0.9871	-3.6775	2.8959	2.8278	-5.8656
5	2012	0.0512	1.4497	-0.4004	-3.5050	3.5293	2.8753	-2.0844
5	2013	0.1473	1.5866	-0.6340	-3.2490	2.6027	2.9254	-2.3514
5	2014	0.1162	1.1312	-1.8987	-3.2614	2.0919	2.9744	-2.7724
5	2015	0.1890	1.4451	-2.2641	-3.2937	2.0412	3.0236	-0.9846
5	2016	0.0713	0.6878	-1.6130	-3.2614	2.2721	3.0819	-2.4858
5	2017	0.0898	0.1735	-1.6757	-3.2519	2.0015	3.1402	-2.4659
5	2018	-0.2826	0.1000	-1.4353	-3.3719	2.6810	3.3055	-2.4826
5	2019	-0.3064	0.4193	-3.2502	-3.7063	2.5337	3.3642	-2.5055
5	2020	-0.2640	0.4993	-5.2093	-3.8912	2.9907	3.5548	-2.4227
5	2021	-0.1656	0.4923	-1.6778	-3.9983	3.0057	3.7771	-2.3967
6	2010	-0.1176	1.1633	-2.3500	-2.1156	1.0296	2.6051	-2.8483
6	2011	-0.1898	0.9958	-1.2306	-2.0721	2.8959	2.8278	-3.1172
6	2012	-0.3979	0.8562	-1.7557	-2.2531	3.5293	2.8753	-3.0643
6	2013	-0.6105	0.8139	-2.3500	-2.4399	2.6027	2.9254	-2.9504
6	2014	-0.4593	2.0421	-2.2893	-2.4954	2.0919	2.9744	-2.6990
6	2015	-1.0090	0.9241	-2.1689	-2.5183	2.0412	3.0236	-2.7705
6	2016	-1.3373	0.9307	-2.6695	-2.6007	2.2721	3.0819	-2.8471
6	2017	-0.3306	0.7787	-2.2370	-2.6614	2.0015	3.1402	-3.0147
6	2018	-0.9053	0.3000	-1.0403	-2.6923	2.6810	3.3055	-2.7535
6	2019	-1.2157	-0.0756	-1.2300	-3.1552	2.5337	3.3642	-2.1100
6	2020	-1.4158	0.1266	-0.9876	-3.0289	2.9907	3.5548	-3.8294
6	2021	-0.7515	0.1797	-2.6864	-3.2414	3.0057	3.7771	-3.8148
7	2010	-0.0205	0.5863	-1.8000	-2.3985	1.0296	2.6051	-2.5565
7	2011	-0.0001	0.5201	-1.5303	-2.4153	2.8959	2.8278	-2.5643
7	2012	-0.0311	0.6437	-0.5896	-2.3145	3.5293	2.8753	-2.6029
7	2013	0.0505	0.7164	-2.4162	-2.3985	2.6027	2.9254	-2.4240
7	2014	0.1025	0.8822	-1.3541	-2.3209	2.0919	2.9744	-2.3431

7	2015	0.0947	0.5456	-1.7986	-2.2988	2.0412	3.0236	-2.6695
7	2016	0.0545	0.3997	-2.5182	-2.3708	2.2721	3.0819	-2.9721
7	2017	0.0275	0.4290	-2.1591	-2.4237	2.0015	3.1402	-2.9023
7	2018	-0.5046	-0.4280	-0.9500	-2.4302	2.6810	3.3055	-3.0174
7	2019	-0.6766	0.2815	-2.0014	-2.6758	2.5337	3.3642	-2.8257
7	2020	-0.5922	0.5103	-2.0358	-2.7435	2.9907	3.5548	-2.5195
7	2021	-0.7501	0.5437	-2.0724	-2.9033	3.0057	3.7771	-2.6361
8	2010	-0.0178	0.6942	-2.5000	-2.6898	1.0296	2.6051	-2.2914
8	2011	0.0175	1.0148	-1.9227	-2.7662	2.8959	2.8278	-2.0460
8	2012	0.0949	1.0054	-0.8408	-2.7478	3.5293	2.8753	-1.9654
8	2013	0.1330	0.9928	-0.9573	-2.5925	2.6027	2.9254	-2.0086
8	2014	0.1969	1.0264	-1.2996	-2.5034	2.0919	2.9744	-2.1058
8	2015	0.2188	0.0000	-0.9782	-2.3153	2.0412	3.0236	-2.2393
8	2016	0.1608	0.0000	-1.8410	-2.3175	2.2721	3.0819	-2.2985
8	2017	0.2424	0.4498	-1.3984	-2.2589	2.0015	3.1402	-2.0247
8	2018	-0.3433	0.1400	-0.5506	-2.1371	2.6810	3.3055	-2.4877
8	2019	-0.6636	0.0000	-2.6725	-2.4427	2.5337	3.3642	2.1709
8	2020	-0.8478	0.2500	-3.5740	-2.6054	2.9907	3.5548	-2.8334
8	2021	-0.6081	0.8286	-1.8591	-2.7390	3.0057	3.7771	-2.7297
9	2010	0.1565	1.3393	-0.3500	-2.5680	1.0296	2.6051	-2.1697
9	2011	0.1734	0.8068	-1.5107	-2.5813	2.8959	2.8278	-2.5319
9	2012	0.2195	0.9098	-0.9576	-2.5968	3.5293	2.8753	-2.2914
9	2013	0.2378	1.2993	-1.5782	-2.5788	2.6027	2.9254	-1.9768
9	2014	-0.0930	1.0636	-1.7005	-2.5631	2.0919	2.9744	-2.1875
9	2015	-0.3166	0.8851	-2.4384	-2.6105	2.0412	3.0236	-2.0353
9	2016	-0.3305	0.7343	-1.5950	-2.5752	2.2721	3.0819	-2.7217
9	2017	-0.3554	0.7836	-1.6926	-2.5684	2.0015	3.1402	-2.5621
9	2018	-0.5764	-0.0860	-0.3729	-2.3779	2.6810	3.3055	-2.3746
9	2019	-0.9098	0.3954	-1.3200	-2.7652	2.5337	3.3642	-2.9269
9	2020	-0.7205	0.4389	-2.6700	-2.8886	2.9907	3.5548	-2.7215
9	2021	-0.4514	0.3717	-2.1603	-3.0579	3.0057	3.7771	-2.6767
10	2010	0.0765	1.2550	-2.4100	-3.9041	1.0296	2.6051	-2.9140
10	2011	0.0524	0.2091	-0.3191	-3.5707	2.8959	2.8278	-3.7986
10	2012	0.1083	0.9680	-0.0733	-3.2538	3.5293	2.8753	-2.7944
10	2013	0.1159	1.0971	-0.9567	-3.0983	2.6027	2.9254	-2.4472
10	2014	0.1838	0.9787	-0.6970	-2.8461	2.0919	2.9744	-2.6123
10	2015	0.1740	1.0024	-1.6229	-2.7971	2.0412	3.0236	-2.3098
10	2016	0.1309	0.7146	-1.3282	-2.7115	2.2721	3.0819	-2.8551
10	2017	0.1807	0.6692	-2.1599	-2.7645	2.0015	3.1402	-2.7798
10	2018	-0.1652	1.5800	-0.9802	-2.7794	2.6810	3.3055	-2.5111

10	2019	-0.2515	0.4909	-1.3817	-2.9277	2.5337	3.3642	-2.5515
10	2020	-0.1265	0.2578	-1.3913	-2.8959	2.9907	3.5548	-2.9554
10	2021	-0.1271	0.4648	-1.1007	-2.8872	3.0057	3.7771	-2.6855
11	2010	0.1121	0.7053	-1.4800	-3.9132	1.0296	2.6051	-2.6000
11	2011	0.0191	0.5248	-0.8547	-3.7716	2.8959	2.8278	-2.9346
11	2012	0.0616	0.7600	-0.6439	-3.6897	3.5293	2.8753	-2.2903
11	2013	0.1727	0.7662	-1.1060	-3.5734	2.6027	2.9254	-2.5027
11	2014	-0.1431	0.8216	-0.8051	-3.3559	2.0919	2.9744	-2.6312
11	2015	-0.2101	0.6720	-1.7729	-3.3302	2.0412	3.0236	-2.7507
11	2016	-0.3572	-0.8194	-1.4323	-3.2655	2.2721	3.0819	-2.7100
11	2017	-0.3930	0.4783	-1.5264	-3.2310	2.0015	3.1402	-3.3142
11	2018	-0.6963	1.0250	-0.7293	-3.1709	2.6810	3.3055	-3.0142
11	2019	-0.5307	0.3630	-1.6366	-3.3655	2.5337	3.3642	-2.8267
11	2020	-0.5170	0.3734	-1.8001	-3.4029	2.9907	3.5548	-2.8603
11	2021	-0.5334	1.7450	-1.8175	-3.5308	3.0057	3.7771	-2.8105

Source: *Own Estimation using the Data, 2023*