THE DETERMINANTS OF MOTOR INSURANCE PROFITABILITY IN THE ETHIOPIAN INSURANCE INDUSTRY

BY

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ADDIS ABABA, ETHIOPIA

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The determinants of Motor Insurance Profitability in the Ethiopian Insurance Industry

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Proposal Approved by Board of Examiners

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DECLARATION

I, Desalegn Ayehu Belle declare that this project entitled **the determinants of motor insurance profitability in the Ethiopian insurance industry** is my original work produced under the guidance of my advisor Teklegiorgis Assefa (PhD), and has never been published and/or submitted for any award of degree in any other University. Any source used is duly acknowledged in this study.

By: Desalegn Ayehu Belle

Signature: _____

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ACRONYMS AND ABBREVIATIONS

BLUE	Best Leaner Unbiased Estimator
FEM	Fixed Effect Model
GLS	Generalized Least Square
GWP	Growth Written Premium
IFAA	Insurance Fund Administration Agency
LR	Loss Ratio
NBE	National Bank of Ethiopia
OLS	Ordinary Least Square
REM	Random Effect Model
ROA	Return on Assets
ROE	Return on Equity

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Abstract

The purpose of this study was to analyze the determinants of motor insurance profitability in the Ethiopian insurance industry. The study used longitudinal panel data which encompasses both cross-sectional and time-series data. The total population of the study was 18 insurance companies operating in Ethiopia. Panel data for six consecutive fiscal years from 2015/16 to 2020/21 from six insurance firms were collected. Purposive sampling was used by selecting those insurance firms which separately publish motor insurance data on their annual reports. The dependent variable was Return on Assets (ROA) which measures the profitability of Insurance firms. The independent variables were loss ratio, motor premium growth, age of the firm, and size of the firm. A quantitative research approach was applied. Multiple panel regression analysis was applied. Generalized Least Square (GLS) regression was also applied to get the best estimates. Data were processed using STATA 15. The findings of the study indicated that the loss ratio showed a negative significant effect on motor insurance profitability at a 5% significant level. But the age of the firm showed a positive effect on motor insurance profitability but at a 10% significance level. The rest independent variables size of the firm and the motor premium growth rate showed an insignificant effect on motor insurance profitability. Based on the findings of the study the researcher recommended that the management of insurance firms should control their loss ratio by designing stringent follow-up of the claim department and devising better risk management techniques to get better profitability.

Key Terms**: -* ***Profitability, Motor Insurance, Insurance Industry

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

Insurance is highly related to the concept of risk. To understand the concept of insurance, understanding risk is better. Risk can be defined as a condition of exposure to adversity. It can also be defined as a condition of adverse selection from the expected outcomes to happen (Insurance Information Institute, 2010). There are means of risk management techniques. The first one is risk control which deals with risk avoidance and risk reduction. The second technique is risk financing which again covers two concepts named risk retention and risk transfer. Our main focus is on the second one; risk transfer. This is because insurance is all about a mechanism of risk transfer (Promislow, 2011).

The history of insurance goes back many years in which it can be considered the history of society. During the period from 4000 to 3000 BCE, it was the Babylonian merchants who started the concept of insurance. During that time merchants were agreed to a contract called bottomry, whereby they can take loans but subject to the condition that if there was any hazard or loss to the shipment in the sea, the loan will not be repaid (Britannica, n.d.). It was also in the 15th century that marine insurance became highly developed in Lloyds' coffee shop (Insurance Information Institute, 2010). Insurance and the economy go hand in hand. It is sometimes difficult to think about the success of the one without the involvement of the other (Birritu, 2012)

According to the Global motor insurance market report (2020), the Global Gross Written Premium (GWP) is increasing. There is much justification forwarded for this increment. Among all, it is the increment in the gross premium written of motor insurance that is the leading segment. For example, motor insurance contributes about 36.3% of non-life insurance premiums at a global level. The report also assesses the status of Africa's motor insurance trend. Africa's motor insurance premiums amounted to USD 68.15 billion (Global Motor Insurance Market, 2022).

Insurance is broadly classified as life and non-life (general) business. The non-life business is also called property and casualty insurance. The general insurance products can be broken down as property, engineering, liability, and pecuniary insurance (Nile Insurance s.c Annual Report, 2020). In Ethiopia, the trend of motor insurance reveals almost the same trend by being the leading component of the non-life insurance business. Motor insurance is the dominant one among the general insurance businesses. For example, in the fiscal year, 2019/20 the share of motor insurance class of business among the non-life insurance is 58.2% contributing Birr 263.4 million from the total non-life coverage of Birr 446.4 million (Nile Insurance s.c Annual Report, 2020.)

Though Motor insurance is the dominant product; its profitability is not going at the same pace as its market share. Maichel-Guggemoos & Wagner (2018) stated in their study that motor insurance was not that much a profitable line of business. There are different reasons identified by different scholars. Yusuf & Francis (2014) stated in their study the effect of claim cost on the profitability of general insurance was too high. In most of the fiscal years, the motor loss ratio is beyond the industry average and the limit set by the Governor, NBE. As an example, it was 86% and 82% in the Lion insurance company s.co during the fiscal years 2015/16 and 2016/17 respectively (Lion Insurance Annual Report 2016-2017).

The loss ratio is the ratio of the total claim to the premium income. Hasibuan, Sadalia & Muda (2020) stated in their study that the claims ratio is considered the ratio that most influences negatively the level of profitability. Their findings revealed that it has a negative significant effect on the profitability performance of insurance companies on the Indonesian stock exchange. Zanghieri (2017) also concluded his study of the business cycle and insurance profitability: evidence from Italy found claim cost and frequency are negatively affecting profitability. Ben Dhiab, L. (2021), also found in his study that the loss ratio has a negative significant effect on Saudi insurance companies. Malik (2011) showed the existence of a negative relation between loss ratio and profitability. Gofta (2020) reviled the existence of a negative significant effect of loss ratio on motor insurance profitability.

Ben Dhiab (2021) found in his study that the growth of premiums has a significant postive effect on Saudi insurance companies. Therefore, it is in this context that the researcher decides to study the determinants of motor insurance profitability in the Ethiopian Insurance.

1.2 Statement of the Problem

Insurance is a mechanism of risk transfer. The most common categories in Insurance operation are Life and Non-life insurance (Promislow, 2011). Motor insurance is the dominant one among the Non-life insurance businesses in Ethiopia. The industry's gross written premium for the year 2020/21 was Birr 13.9 billion. From this total, the general business's share was 93% which is Birr12.9 and the remaining balance of Birr 1.0 billion (7%) was registered by the Life insurance business (Nyala Insurance, 2021)

Motor class of business covers more than 50% % of the gross written premium (GWP) of the non-life insurance business in Ethiopia (NBE, 2018). Even, it dominates the non-life gross written premium. For example, in the company's annual reports it is found that motor insurance occupies 64% of Lucy's insurance, 71% of Lion's Insurance, and 70% of Tsehay's insurance (Annual reports, 2015-2020). Though it covers the largest share, its profitability is not good. It was even at a loss for some time (Berhan Insurance, 2015:2019). For example, in the year 2019/20 and 2020/21 Lucy's insurance motor underwriting result was in a deficit by Birr 5.5 million and 7.1 million respectively (Lucy Insurance Annual reports, 2020 & 2021). From the above data, it is understood that motor insurance is not a profitable line of business. Therefore, studying the factors that determine its effectiveness is important. These were the main points that the researcher tried to study.

Motor insurance is highly endangered of high claim costs and too low premium rates. The cost of vehicle repair and spare parts price is skyrocketing. The annual reports of insurance companies show that there is stiff price competition in the industry. This competition leads to price cuts. If insurance companies properly manage their motor insurance business, they have a chance to change this huge business portfolio into a profitable manner.

In general, Insurance profitability is researched somehow in-depth (Ortyński, 2016), (Ahmeti & Iseni, 2022), (Reshid, 2015), etc. However, motor insurance profitability is not a well-researched topic (Maichel-Guggemoos & Wagner, 2018), (Gofta, 2020), and (Zebiba, 2019). Even those research papers conducted on motor vehicles are more inclined toward other aspects of motor vehicles like road safety and accident. Hence, identifying the determinants that affect the profitability of the motor insurance business will help insurance companies in Ethiopia to make Motor insurance more profitable, and indicate the management to decide on how motor insurance is influenced and take proper policy measures. This study will again contribute its part to improving the profitability of motor vehicle insurance. Therefore, contribute to improving the aggregate profitability of the industry in general and the insurance firm in particular.

1.3 Research Questions

1.3.1 The main research questions

What are the determinants of Motor insurance profitability in the Ethiopian Insurance Industry?

1.3.2 The specific research questions

What is the effect of the premium rate on motor insurance profitability?

What is the effect of claim cost on motor insurance profitability?

What is the effect of company size on motor insurance profitability?

What is the effect of company age on motor insurance profitability?

1.4 Objectives of the study

1.4.1 General Objective

The general objective of the study is to analyze the determinants of motor insurance profitability in the Ethiopian Insurance Industry.

1.4.2 Specific Objectives

- To investigate the effect of premium growth on motor insurance profitability.
- To evaluate the effect of claim cost on motor insurance profitability.
- To examine the effect of company size on motor insurance profitability.
- To evaluate the effect of the age of the company on motor insurance profitability.

1.5 Significance of the study

The study of the determinants of motor insurance profitability helps the management of EIC to identify the key determinant factors of motor insurance profitability and apply more policy decisions for improving the company's motor insurance profitability. The findings will be helpful to serve as a springboard for further study. Insurance companies will also get some insight to further study motor insurance profitability as it is the major product type among the non-life insurance categories.

1.6 Scope/delimitation of the Research

The study is delimited within the territory of Ethiopia and six insurance firms operating in Ethiopia. Conceptually, the study analyzed the effects of only four independent variables namely premium growth rate, loss ratio, company age, and company size on profitability

1.7 Limitations of the study

This study is limited to focusing only on the effect of four independent variables which were assumed to affect the profitability of motor insurance. Therefore, other factors which have either a direct effect or a moderating effect were not considered in this study. Additionally, due to consideration of some selected insurance firms, the generalization of findings is expected to be difficult.

1.8 Organization of the study

Mainly this project work is organized into five chapters. In addition, the references are listed at the end of the paper.

The first chapter was the introduction part of the study. In this chapter background of the study, statement of the problem, the research questions, objectives of the study, significance of the study, scope or delimitation of the study, and limitations of the study are included.

The second chapter was a review of the literature of the study. In this chapter, the theoretical literature review, empirical literature review, the conceptual framework, and finally hypothesis of the study are discussed.

The third chapter discussed the research approaches, research design, population and sample design, data type and source, Method of data analysis, econometric model specification, variable definition, and ethical considerations.

The fourth chapter discussed data presentation, analysis, and discussion. In this chapter, descriptive statistics and panel data regression analysis are discussed. Different Model specifications and assumptions tests are also tested and interpreted. The results and coefficients of GLS regression results are also discussed and interpreted in this chapter. Finally, the formulated hypotheses are tested.

The last and the fifth chapter was about a summary of the findings and conclusions which were based on the research question and hypothesis of the study. Then after, the limitations and recommendations for future researchers were forwarded.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

Introduction

This chapter discussed both the theoretical literature review and the empirical review. Moreover, the conceptual framework is depicted diagrammatically to easily understand the readers. In the theoretical literature review section, the definition and concept of insurance, the functions of insurance, the principles of insurance, a history and overview of the Ethiopian Insurance Industry, motor insurance, the concepts of profitability and its measurement, and determinants of motor insurance profitability are covered. On the other hand, under the empirical literature section, previous works of literature related to motor insurance profitability are reviewed.

2.1 Theoretical Literature Review

2.1.1 The definition and Concept of Insurance

According to the new commercial code of Ethiopia proclamation number 1243, insurance is defined as a contract whereby a person, called the insurer, undertakes, against payment of one or more premiums to pay to a person, called the beneficiary, the sum of money where a specified risk materialize. Insurance is a mechanism of risk transfer. It uses the law of large numbers (New Commercial Code of Ethiopia, 2021)

Insurance is a form of risk management in which the insured transfers the cost of potential loss to another entity in exchange for monetary compensation, known as the premium. Insurance allows individuals, businesses, and other entities to protect themselves against

significant potential losses and financial hardship at a reasonably affordable rate. The main focus here is a significant loss, because if it is a small amount of loss no need for insurance. The owner can handle it in his pocket. In this small amount of loss, the insured need not pay a premium for the insurance case because it is a very small amount of risk that can be covered on its own. Insurance is appropriate when you want to protect against a significant monetary loss (Venugopal and Rajan, 2001). Take life insurance as an example. If you are the primary breadwinner in your home, the loss of income that your family would experience as a result of our premature death is considered a significant loss and hardship that you should protect them against. It would be very difficult for your family to replace your income, so the monthly premiums ensure that if you die, your income will be replaced by the insured amount. Similar scenarios apply to other types of insurance products. If the potential loss will have a damaging effect on the person or entity, then buying an insurance contract is important (Venugopal and Rajan, 2001).

According to Venugopal and Rajan (2001), the following were among the cases that demand purchasing insurance contract. These are protecting family after one's death from loss of income, ensuring debt repayment after death, covering contingent liabilities, protecting against the death of a key employee or person in your business, buying out a partner or co-shareholder after his or her death, protecting your business from business interruption and loss of income, protecting yourself against unforeseeable health expenses, protecting your home against theft, fire, flood, and other hazards, protecting yourself against lawsuits, protecting yourself in the event of disability, protecting your car against theft or losses incurred because of accidents, and many more.

The insurance industry safeguards the assets of its policyholders by transferring risk from an individual or business to an insurance company. Insurance companies act as financial intermediaries in that they invest the premiums they collect for providing this service. Insurance company size is usually measured by net premiums written, that is, premium revenues fewer amounts paid for reinsurance. There are three main insurance sectors: property/casualty, life/health, and health insurance (Insurance Information Institute, 2010).

In addition to eliminating risk for the individual through transfer, from the viewpoint of the society Insurance is defined as the insurance device that reduces the aggregate amount of risk in the economy by substituting certain costs for uncertain losses. These costs are assessed based on the predictions made through the use of the law of large numbers. Another societal viewpoint of insurance is an economic device for reducing and eliminating risk through the process of combining a sufficient number of homogeneous exposures into a group to make the losses predictable for the group as a whole(Vaughan, E. & Vaughan, T. 2007).

2.1.2 The functions of Insurance

Insurance has many functions. According to Venugopal and Rajan (2001), the functions of insurance can be studied in two parts (i) Primary Functions, and (ii) Secondary Functions.

Primary Functions:

Insurance provides certainty: The main function of insurance is to protect the probable chances of loss. The time and amount of loss are uncertain and at the happening of risk, the person will suffer loss in absence of insurance. The insurance guarantees the payment of loss and thus protects the assured from suffering. The insurance cannot check the happening of risk but can provide for losses at the happening of the risk (Venugopal and Rajan, 2001).

Insurance provides protection: The main function of the insurance is to provide protection against the probable chances of loss. The time and amount of loss are uncertain and at the happening of risk, the person will suffer loss in absence of insurance. The insurance guarantees the payment of loss and thus protects the assured from sufferings. The insurance cannot check the happening of risk but can provide for losses at the happening of the risk (Venugopal and Rajan, 2001).

Risk-Sharing: The risk is uncertain, and therefore, the loss arising from the risk is also uncertain. When risk takes place, the loss is shared by all the persons who are exposed to the risk. The risk-sharing in ancient times was done only at the time of damage or death; but today, based on the probability of risk, the share is obtained from each insured in the shape of a premium without which protection is not guaranteed by the insurer.

Secondary functions:

Besides the above primary functions, the following functions can be considered secondary functions of insurance (Venugopal and Rajan, 2001).

Prevention of Loss: The insurance joins hands with those institutions which are engaged in preventing the losses of the society because the reduction in loss causes the lesser payment to the assured and so more saving is possible which will assist in reducing the premium. Lesser premium invites more business and more business cause a lesser share to the assured. So again premium is reduced, which will stimulate more business and more protection for the masses. Therefore, the insurance assists financially the health organization, fire brigade, educational institutions, and other organizations which are engaged in preventing the losses of the masses from death or damage (Venugopal and Rajan, 2001).

Insurance Provides Capital: Insurance provides capital to society. The accumulated funds are invested in a productive channel. The dearth of the capital in the society is minimized to a greater extent with the help of investment in insurance. The industry, the business, and the individual benefit from the investment and loans of the insurers.

Insurance Improves Efficiency: The insurance eliminates worries and miseries of losses at death and destruction of property. The carefree person can devote his body and soul together for better achievement. It improves not only his efficiency, but the efficiencies of the masses are also advanced.

Insurance helps Economic Progress: The insurance protecting the society from huge losses of damage, destruction, and death, provides an initiative to work hard for the betterment of the masses. The next factor of economic progress, the capital, is also immensely provided by the masses. The property, the valuable assets, the man, the machine, and the society cannot lose much in the disaster (Venugopal and Rajan, 2001).

2.1.3 The principles of Insurance

Insurance is bound to major principles. These are the principle of utmost good faith, the principle of indemnity, the principle of insurable interest, the principle of subrogation, and the principle of proximate cause.

The principle of Insurable Interest:

The principle of insurable interest shows how the insured person will have a legal entity to the subject matter insured. For example, a person who wants to purchase motor insurance for his car will be asked for a title deed. The title deed is the proof of ownership of the property. Hence, the one who comes to the insurance company has proof of ownership. This is the concept of insurable interest. Insurable interest is a person's legally recognized relationship to the subject matter of insurance that gives them the right to effect insurance on it (Study Notes IIQAS, 2013).

Principle of Indemnity:

Indemnity is applied when an accident occurred. It states that either the insurance company or the insured should benefit from the repair or replacement of the damaged property. It is similar to the principle of an equitable share of risk. Assume a car had sustained damage. In this case, the insurance company has a liability to repair the vehicle into a condition that was before the accident, but not over or under the previous condition (Insurance Information Institute, 2010)

Principle of Utmost Good faith:

The principle of utmost good faith states that a person who buys the insurance has to tell every material fact about the subject matter insured. There is good faith. But this one is Utmost good faith reflecting the degree to which the insurance company binds with to know information that the insured knows about the risk (Insurance Information Institute, 2010)

Insurance is subject to a more stringent common law principle of good faith, often called the principle of utmost good faith. It means that each party is under a duty to reveal all vital information (called material facts) to the other party, whether or not that other party asks for it (Study Notes IIQAS, 2013).

Principle of subrogation:

The principle of subrogation gives the right to the insurance company to recover any cost lodged to its client from the faulty person. For example, two cars collide and sustained an accident. Both cars have purchased a comprehensive cover. The insurance company of a not faulted client has the right to reimburse the claim cost incurred for its client. So the insurance company has exercised its subrogation right (Insurance Information Institute, 2010)

Subrogation is the exercise, for one's benefit, of rights or remedies possessed by another against third parties. As a corollary (i.e. a natural consequence of an established principle) of indemnity, subrogation allows proceeds of claim against a third party to be passed to insurers, to the extent of their insurance payments. At common law, an insurer's subrogation action must be conducted in the name of the insured (Study Notes IIQAS, 2013).

2.1.4 History and overview of the Ethiopian Insurance Industry

According to Zeleke (2007), the history of Ethiopian insurance goes back to the year 1905. It was in 1905 that the Bank of Abyssinia was established as the first bank in Ethiopia and serves also as an acting firm on behalf of a foreign insurance company to underwrite fire and marine policies. As stated in Samuel (2021) initially, the insurance industry in Ethiopia was dominated by foreign insurance companies doing insurance business through agents. According to the first survey of the Ethiopian insurance market in 1954 by the then Ministry of Commerce and Industry, 19 offices were providing insurance services in the country. Except for Imperial Insurance Company of Ethiopia Limited which was the first domestic insurance company established in 1951, the remaining 18 represented local offices, branches, and/or agents of foreign insurance companies. Another survey of the insurance industry which was conducted in 1960 by the same ministry showed that there were a total of 33 offices operating in Ethiopia of which only Imperial Insurance Company of Ethiopia Limited continued to be the only domestic company. But later on, more domestic insurance companies joined the industry. Though not fully owned by Ethiopians, 15 domestic insurance companies were operating in Ethiopia during the 1960s. Foreigners had an ownership interest in those insurance companies and were participating in the boards of management and company management positions. 3 In 1974, the military junta confiscated all the 13 insurance companies operating in the market at that time and formed the Ethiopian Insurance Corporation (EIC) as the sole insurance service provider in the country. The Ethiopian insurance market thus became a state monopoly until 1994. The 1990s ushered in economic liberalization that led to the revival of private sector participation in the financial sector (Zeleke, H. 2007).

This has led to the formation of many private insurance companies. The first insurance business Proclamation No. 86 of 1994 signaled the beginning of a new era in the insurance industry. It opened up the insurance market for competition and thus ended the monopoly of the business. In the year 2012, the old proclamation was repealed and new Proclamation

No. 746/2012 was issued. Then, it was amended by Proclamation No.1163/2019 effective from the 9th day of January 2020. The industry is regulated and supervised by NBE, whereby Supervision of Insurance Business, which is under the body of NBE, is responsible to follow insurers' activities by way of off-sit and on-sit surveillance reports. The off-site surveillance report includes quarterly and annual financial and non-financial information of an insurer. Manner of Reporting Quarterly and Annual Returns, Directives No SIB/38/2014, is essential for NBE to receive information, financial and non-financial, to conduct effective off-site surveillance that enables it to assess the financial soundness, managerial effectiveness, and stability of each insurer and the sector ongoing basis (Zeleke, H. 2007).

Currently, the Ethiopian insurance Market is manifested with a low level of market penetration and development. From the overall insurance market, the Life insurance business covers 7% which is very low. The industry's aggregate contribution to the national GDP is also below 1% (Nyala Insurance, 2021). According to the National Bank of Ethiopia report, as of the fiscal year 2020/21, the numbers of insurance companies that are operating in the country are eighteen. Of this ten of them are licensed to sell both life business and non-life insurance business. That means they are mixed insurance companies. The remaining eight are allowed to service the non-life insurance business (Nyala Insurance, 2021).

The total number of branches reached 635. Intermediaries in the industry are counted as 2,340 sales agents, 61 insurance brokerage firms, 105 loss Assessors, and 3 insurance surveyors. The industry's gross written premium for the year 2020/21 was Birr 13.9 billion. From this total, the general business's share was 93% which is Birr12.9 and the remaining balance of Birr 1.0 billion (7%) was registered by the Life insurance business (Nyala Insurance, 2021).

2.1.5 Motor insurance

A motor vehicle can be defined as a car, bus, truck ,or other vehicle powered by a motor that uses roads(Cambridge Dictionary, n.d).

According to Cannar (1994), Motor insurance covers losses, injuries, or death due to either collision, overturning, theft, or a fire that occurred on the vehicle insured and is classified into three based on their coverage scope. These are third party, third party fire and theft, and comprehensive.

Third Party only Cover

Third-party insurance covers third-party bodily injury and property damage arising out of the use of a motor vehicle. It indemnifies the insured against legal liability for death of or bodily injury to third parties and damage to third party property caused by the lawful use of the insured vehicle (Cannar K, 1994)

Third party Fire & Theft Cover

This type of insurance is wider than the above insurance type (a). Covering all the risks stated in third-party policy but includes the cover extension of theft and fire to the property. Third-Party, Fire & Theft cover provides indemnity first for loss of or damage to the insured vehicle by fire, external explosion, self-ignition, lightning theft, or attempted theft; second to the insured against legal liability for death of or bodily injury to third parties and damage to third party property caused by the lawful use of the insured vehicle (Cannar K, 1994)

Comprehensive cover

Comprehensive cover provides indemnity in two basic categories. First, indemnifies for loss of or damage to the insured vehicle by accidental collision or overturning, fire,

external explosion, self-ignition, lightning, theft or attempted theft, and impact damage. Second, to the insured against legal liability for death of or bodily injury to third parties and damage to third party property caused by the lawful use of the insured vehicle
It covers third-party liability and property damage to the vehicle i.e. damage arising out of the fire, theft, and accidental damage to the vehicle. By the name implication, when we say Comprehensive, it doesn't mean that it covers all risks. There are specified coverage, conditions, and exclusions to the policy contract (Cannar K, 1994)

For underwriting and rating purposes, motor vehicles are classified by their use and type as follows. Commercial vehicles are constructed or adapted for the carriage of goods and passengers. These are subdivided as Goods Carrying Vehicles (vehicles such as pick-ups, trucks, and tankers including their trailers used for the carriage of goods). Goods carrying vehicles are further subdivided as Own goods vehicles and general cartage vehicles. Own goods vehicles are vehicles used for the carriage of insured's goods whilst general cartage vehicles are vehicles used for the carriage of goods for hire and reward Passengers Carrying Vehicles. These are vehicles such as taxis, minibusses, buses, etc. used for the carriage of passengers. They are further subdivided as public service vehicles and own service vehicles (Insurance Information Institute, 2010)

In Ethiopia, third-party insurance is compulsory according to Ethiopian law. Proclamation no.: 799/2013 was issued to make such cover compulsory and set other details of the policy. The compulsory third-party insurance provides coverage for the third-party person/entity repairing cost of the vehicle, any property damage, or medication expenses that are encountered as a result of an accident by the insured. Ethiopian Insurance Corporation offers Compulsory Third Party Insurance coverage. This type of cover indemnifies the insured against compulsory legal liability for death of or bodily injury to third parties and damage to third party property caused by the lawful use of the insured vehicle (Proclamation 799, 2013).

2.1.5 The concept of profitability and its measurement

According to Moyer, James, & William (2006) profitability was defined as a measure of monetary performance and is one of the most objectives of insurance companies' performance indicators. Profit is an important precondition for enhancing competitiveness, attracting investors, and improving the extent of solvency, and thus, strengthening consumers' confidence. The financial analysis of a company is a crucial tool employed by actuaries within the process of decision-making on the underwriting and investment activities of the insurance firm. The financial performance of insurance companies is additionally relevant within the macroeconomic context since the insurance industry is one of the financial system's components, promoting economic process and stability. Profitability ratios measure how effectively a firm's management is generating profits on sales, total assets, and, most importantly, stockholders' investment. Therefore, anyone whose economic interests are tied to the long-run survival of a firm will be interested in profitability ratios.

Malik (2011) defined profitability as one of the foremost significant objectives of monetary management because one goal of monetary management is to make the most of the owner`s wealth and profitability is a very significant determinant of performance. Profitability ratios are an indicator of the companies' overall efficiency; it is usually used as a measure of incomes generated by the company during a period based on the level of capital employed, net worth, and earnings per share (Kabajeh and et al, 2012).

Though assessing profitability can be measured by Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin to Total Assets, and operating profit to Total Assets, the famous and best metric for measuring profitability are Return on Assets (Mohanty & Mehrotra, 2018). Return on Equity (ROE) is the ratio of net income to common equity; measures the rate of return on common stockholders' investment (Brigham & Houston, 2003). The ratio of net income to total assets measures the return on total assets (ROA) after interest and taxes (Brigham & Houston, 2003)

Most researchers in the field of insurance widely use return on asset (ROA) as a measurement of the profitability of the insurance firms. Ahmeti & Iseni (2022), Gofta (2020), Azmi, Irawan, & Sasongko (2020), and Zebiba (2019)) are some of the researchers who adopted ROA as a measurement of profitability in their study. Hence, the researcher adopted such metrics to measure the profitability of motor insurance as it is a well-known measurement of profitability in the financial sector.

Comparing profits to revenue is a useful operational metric, but comparing them to the resources a company used to earn those displays the feasibility of that company's existence. Return on assets is the simplest of such corporate bang-for-the-buck measures. It tells you what earnings are generated from invested capital or assets (Öner Kaya, 2015).

2.1.6 Determinants of Motor Insurance Profitability

Loss Ratio

Cost of claim is also called loss ratio or claim to premium ratio. It is the ratio of total claim to the premium income. Hasibuan, A. F. P., Sadalia, I., & Muda, I. (2020), stated in their study that the claims ratio is considered the ratio that most influences the level of profitability. Their findings revealed that it has a negative significant effect on the profitability performance of insurance companies on the Indonesian stock exchange. Zanghieri, P., (2017), also concluded in his study on the business cycle and insurance profitability: evidence from Italy found claim cost and frequency are negatively affecting profitability. Ben Dhiab, L. (2021), also found in his study that the loss ratio has a negative significant effect on Saudi insurance companies. Malik, H. (2011) shows a negative relation between claim cost and profitability. Gofta (2020) reviled the existence of loss ratio and motor profitability.

Motor premium growth rate

Premium Growth is defined by a formula = (premium of current year- premium of prior year)/ premium of the prior year. It is the change in gross written premium (GWP) during the stated periods. Ben Dhiab, L. (2021), found in his study that the growth of premiums has a significant positive effect on Saudi Arabia's insurance market. Lire, A., & Tegegn, T. (2016), Wasike, W., & Ngoya also reached similar results.

Company Age

The age of the company is the time when the insurance firm started operation. The study of Morara & Sibindi (2021) concluded that age has shown a positive effect that supports positive relation between size and profitability.

Company Size

A firm size indicates that a bigger firm has the advantage of economies of scale in transactions and level of profits. Most past studies show that positive relationship between firm size and profitability. However, in some cases firm becomes very large, and firm size could hurt profitability. Because of this, firm size and profitability may not be uniform. Therefore, most studies use the logarithm to identify the possible non-linear relationship. Firm size is calculated by using the decimating logarithm of the total assets of the company (Kaya, 2015) as stated in Dawit, B. (2021). Most of the previous studies indicated that size has a positive effect on profitability. For example, Zebiba (2019) concluded that there was a positive effect on the profitability of motor insurance.

2.2 Empirical Reviews

In this section, empirical studies that are related to the research topic were reviewed. The structure of the review is arranged in chronological order. Previous studies relevant to the determinants of motor insurance profitability in the Ethiopian Insurance market are reviewed below herewith.

Ahmeti, Y., & Iseni, E. (2022), examined the effects of specific company factors, namely independent variables such as liquidity, company size, company age, tangible asset, leverage, company capital, and growth of the company, on profitability represented by return on assets (ROA) and net profit margin (NPM) as a dependent variable. The sample in this study includes eleven insurance companies for the period 2015 - 2020. The regression results indicate that the size, leverage, and age of the company, have significant effects on the ROA. Meanwhile in the NPM of insurance companies in Kosovo size of the company and firm growth have significant effects.

Dawit B., (2021) conducted a study on the factors that affect the profitability of Ethiopian Insurance Companies. Return on Assets was the dependent variable. Dawit (2021) considered around ten independent variables. These were firm size, leverage of the firm, investment ratio, commission expense, underwriting risk, reinsurance dependence, market share, diversification, real GDP, and inflation. The result of the study showed that company size was negatively and significantly affecting the profitability of the Ethiopian insurance companies. The results of other independent factors were not presented here. This was against the expected sign of the hypothesis of the study.

Ben Dhiab L., (2021) studied the determinants of insurance firms' profitability as an empirical study of the Saudi insurance market. Panel data were employed by taking twenty insurance firms' data for nine years. Panel regression was applied. The dependent

variable was ROA which indicates the assets profitability ratio. The independent variables were size, liquidity, premium growth rate, tangibility ratio, fixed asset ratio, loss ratio, liability ratio, insurance leverage ratio, and company age. The study revealed that the premium growth rate was positively and significantly affecting profitability. The size of the company was positively affecting but not significant. The loss ratio revealed a negative significant effect on ROA. The age of the company indicated a negative but insignificant effect on ROA.

Azmi F., Irawan T., & Sasongko H., (2020), studied the Indonesian general insurance companies' determinants of profitability. The study paper aimed to improve the profitability of general insurance through a random effect analysis of 40 general insurance companies. Data was collected for the period from 2013 to 2017. The data is time-series data and cross-section data. The data analysis used was Panel Data Regression Analysis. The findings showed that firm size, liquidity ratio, equity growth, underwriting result, return on investment, input cost, claim ratio, technical ratio, economic growth rates, and Bank Indonesia interest rate are significant factors that affect the profitability of general insurance companies.

Gofta A., (2020) studied the determinants of motor insurance profitability in the Ethiopian insurance market. The researcher considered population census, and the independent variables used were premium growth rate, reinsurance cost, claim cost or loss ratio, management efficiency, and acquisition cost. The dependent variable profitability was defined as return on asset (ROA). The study revealed that claim cost and acquisition cost had a negative significant effect on profitability. Multiple regression models were applied.

Zebiba A., (2019), studied the profitability determinants of motor insurance in Ethiopia. The independent variables incorporated were company size, the number of car accidents, age of the company, motor third party, inflation rate, and GDP rate. The dependent variables were ROA. Both Ordinary Least Square (OLS) and random effect models were used. The findings were motor third party and numbers of car accidents were positively

and significantly influenced motor profitability.

Hailye G., (2017) studied the assessment of the profitability of a motor business in the case of Berhan insurance. The researcher used both primary and secondary data (five-year data from 2011/12 to 2015/16). The study was descriptive and concluded that inefficient premiums, high claim cost, and low investment income were identified as the sources of the problem of profitability of motor insurance.

Habtamu D., (2017), studied an assessment of motor third-party compulsory insurance. The researcher assesses the challenges and practices by taking selected insurance companies against the Insurance Fund Administration Agency (IFAA). The researcher used both primary and secondary data and it was a descriptive type of study. The study revealed that the premium tariff collected by IFAA was high as compared to the payouts to the medical expenses.

A study conducted in 2018 in Germany titled Profitability and Growth in Motor Insurance Business: Empirical Evidence from Germany analyzed to what extent the characteristics of the companies can explain the premiums, the total claims costs, and the operating expenses per contract in the two main products of motor insurance: Motor third-party and own damage insurance. Panel data from 2002 to 2014 were used and different statistical tests with multi-linear regression models were applied. (Maichel-Guggemoos L. & Wagner J., 2018). Their findings revealed that mutual relates to lower premiums, lower total claims costs, and lower operating expenses per contract when compared to listed companies. In addition, direct insurance companies get along with lower premiums and lower operating expenses per contract compared to traditional companies selling via agents or brokers. Furthermore, the researchers found major differences related to the range of the product portfolio, the size of the motor business, the dominance of the motor business within the non-life business, and the calendar year (Maichel-Guggemoos L. & Wagner J., 2018).

In 2015, in a journal article named the Effects of Firm-Specific Factors on the

Profitability of Non-Life Insurance Companies in Turkey, profitability which was the dependent variable was measured by two different variables: technical profitability and sales profitability ratio. The independent variables considered were the size of the company, age of the company, loss ratio, current ratio, insurance leverage ratio, premium growth rate, and premium retention ratio (Emine Ö.K., 2015). Emine found the findings of the size of the company, age of the company, loss ratio, current ratio, and premium growth rate have affected the profitability of Turkish non-life insurance companies.

Summary and knowledge gap of the literatures

To summarize and identify the gaps; the following points were comprehended and discussed. There is much literature on the insurance industry as a general concept. Though the works of literature conducted in the insurance sector are minimal in our country, it is not even addressing the issue of motor insurance.

In Ethiopia, most works of literature were conducted based on either the case of life insurance or the case of general insurance (Ahmeti Y., & Iseni E., 2022), (Sylwester K., 2011) and (Maria V., 2017). Some works of literature were also conducted regarding motor but from a different perspective like motor and road safety (Edosa G., 2014), service quality and motor insurance (Girma T., 2019), insurance coverage dispute issues in the construction sector (Abel T., 2018). From this finding, the researcher understood that there were not enough works of literature conducted in the area of motor insurance profitability.

Related works of literature to this study were: First, by Gofta A., (2020) who studied the effects of motor profitability. Gofta A., (2020) used the OLS estimation technique. The researcher tried to use a different methodology (Generalized Least Square) and test whether to use simple OLS regression or Panel effect regression (fixed effect or random effect). So it could be said that there was a methodological gap concerning this specific work. Habtamu D., (2017), studied an assessment of motor third-party compulsory insurance. The researcher assesses the challenges and practices by taking selected

insurance companies. To sum up, the researcher found that the study area; determinants of motor insurance profitability was not well researched in our country as well and there were some methodological gaps among the conducted ones.

2.3 Conceptual Framework

Independent Variable **Dependent Variable**

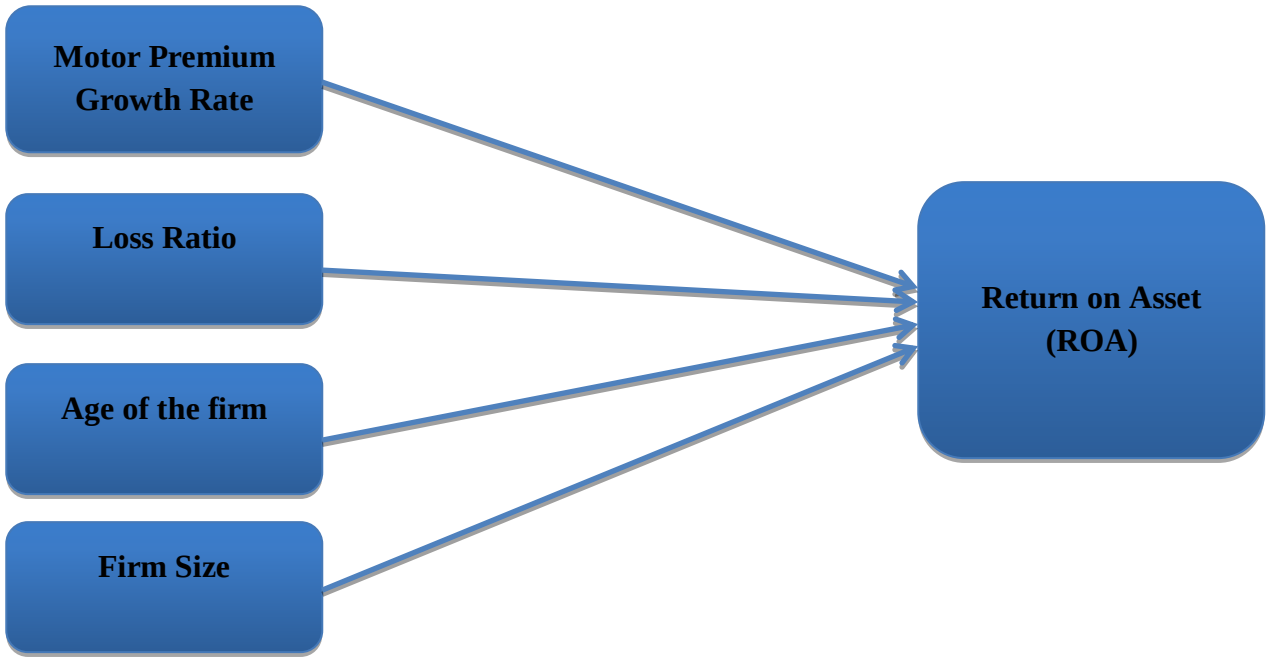

Figure 1: Conceptual framework

2.4. Hypothesis of the study

Based on the theories and concepts discussed and empirical evidence supported, the researcher set the following hypothesis. The independent variables are motor premium growth rate, loss ratio, age, and size of the firm. The dependent variable will be Return on Assets (ROA).

Therefore;

H1: Motor premium growth rate has a positive effect on motor profitability.

H2: Loss ratio has a negative effect on motor profitability

H3: Age of the firm has a positive effect on motor profitability

H4: Firm size has a positive effect on motor profitability

CHAPTER THREE

3. RESEARCH DESIGN & METHODOLOGY

Introduction

In this chapter data topics like the research approaches and design used are discussed here below. Population and sampling, data type and sources, econometric model specification, and defining the variables are also covered.

3.1 Research Approach

The study of the determinants of motor insurance profitability in the Ethiopian insurance industry was applied using a quantitative research approach. The study used a quantitative research approach because this approach is helpful to quantify the data into a meaningful output (John w. Creswell, 2014). Quantitative approaches are involved to generate data in a quantitative form which can be subjected to difficult quantitative analysis either in a formal or in a rigid way

3.2 Research Design

An explanatory research design was applied in the study. An explanatory research design is important when a researcher wants to know the causal relationship among the variables to be studied. The study wanted to determine the effect the independent variables put on the dependent variable. Hence, an explanatory research design can analyze the causal effect analysis (John w. Creswell, 2009). The researcher examined the effect of premium growth rate, claim cost (loss ratio), age, and size of the firm on motor insurance profitability.

3.3. Population and Sample Design of the Study

3.3.1 Population

The population of this study was 18 insurance companies that are operating in the Ethiopian Insurance Market. The total population of the study was the 18 insurance firms operating in Ethiopia. Of these; one is a public insurance firm and the rest seventeen are private firms. Ten of them are licensed to sell both life and non-life insurance business. And the rest eight are licensed to sell non-life insurance businesses only.

3.3.2 Sample and Sampling Technique

The researcher used purposive sampling and selects six insurance firms that had included separate motor insurance data on their audited financial reports and annual reports. Most of the insurance firms reported the aggregated non-life (general) insurance data in their audited annual reports. This implied that specific motor-related reports were not compiled in their annual reports. The other criterion for selection was the availability of full consecutive period annual reports. Hence, the researcher selected six insurance firms (Abay Insurance S.C, Lucy Insurance S.C, Tsehay Insurance S.C, United Insurance S.C, Lion Insurance S.C, and Birhan Insurance S.C) purposively and six years of data (2015/16-2020/21) was collected.

3.3.3 Sample Size

The researcher selected six insurance firms and collect relevant data for the period of six years i.e 2015/16 to 2020/21. So the sample size of the study is 36 observations. That is six- year period*six insurance firms.

3.4 Data Type and Source

The researcher collected quantitative information from secondary sources of six years of annual reports of six insurance firms. Periodic reports of the National Bank of Ethiopia were also referred to get the data. Secondary data collection methods were utilized. These

included using annual reports, audited financial statements, company websites, and periodic reports of the NBE.

3.5 Data Collection Technique

Secondary data were used for this study. The secondary data were collected using audited financial reports and annual reports of insurance firms, and periodic reports of the National Bank of Ethiopia.

3.6 Methods of Data Analysis

Both descriptive and inferential statistics were used to describe and infer the data respectively. STATA statistical package was applied for the analysis purpose. To estimate the parameters, the researcher followed the below here techniques and tests. First, the Hausman test was conducted which was important to select from fixed effect and random effect models (Dr. Vladimir, 1967). The Hausman test showed that random effect regression was appropriate because the null was failed to reject. Then, the researcher tried to assess the choice between simple OLS regression and random effect regression by using Breusch-pagan Lagrange Multiplier (LM) test(Gujarati, 2008). The result showed that the researcher fail to reject the null hypothesis and that using random effect regression was not appropriate. This implied simple OLS regression was selected to use. To avoid some of the problems like heteroskedasticity and autocorrelation, the method of Generalized Least Square (GLS) regression was applied which is then a transformed version of OLS.

3.7 Econometric Model Specification

The panel data regression model was specified as follows. A panel data regression has a double subscript. It is in this way that such a model differs either from cross-sectional or time series regression.

Econometric Model: ***Linear Panel Model:***

$$y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + \mathcal{E}_i + \mu_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 AGE_{it} + \beta_3 SIZE_{it} + \beta_4 MPGR_{it} + \mathcal{E}_i + \mu_{it}$$

Where:

i	=	refers to the index for groups in this case number of firms which is six
t	=	refers to the time index in this case number of a period which is six-year
ROA $_{it}$	=	Represents the dependent variable Return on Asset (ROA)
β_0	=	Represents the intercepts
βi	=	Represents the coefficients for each independent variables
LR	=	Represents the independent variable, Loss Ratio
AGE	=	Represents the independent variable, Age of the firm
SIZE	=	Represents the independent variable Size of the firm
MPGR	=	Represents the independent variable Motor Premium Growth Rate
$\mathcal{E}_i$	=	The unobservable individual-specific effect that is time-invariant
μ_{it}	=	Represents the regression error term

Source: Self-developed

3.8 Variables definition

Return on Asset (ROA)

Return on Asset (ROA) is a well-known profitability metric used in financial sectors. ROA is computed by dividing the Net profit before tax by its Total Assets (Nile Insurance s.c & Report, 2020). In this study, ROA is represented as a Dependent variable.

Loss Ratio (LR)

Loss ratio (LR) is the main important issue in the profitability of insurance firms. Those firms with a loss ratio are expected for better profits (Promislow, 2011). The loss ratio is computed as the Net claim incurred divided by the net premium earned. It is represented in the model as an independent variable. The National Bank of Ethiopia set a directive for the loss ratio of motor insurance class of business to not exceed 70% (Birritu, 2018)

Motor Premium Growth Rate (MPGR)

Motor Premium growth rate (MPGR) is another independent variable that indicates the growth rate of change in the amount of motor insurance premium collected by insurance firms. It is computed as the growth rate = (Xt-Xt-1)/Xt-1, where X is the motor premium amount and t and t-1 represented the period (Promislow, 2011).

3.9 Ethical Considerations

The researcher formally took a support letter from Addis Ababa University to collect the data from the insurance firms and the National Bank of Ethiopia. The researcher assures the data and information collected from the insurance firms were used to conduct this project work only.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS & DISCUSSION

4.1 Introduction

In this chapter, both descriptive statistics and regression analysis is computed. Hausman's test was conducted to choose either a fixed effect or a random effect. Again Preusch-Pagan Lagrange Multiplier (LM) test was conducted to select either simple OLS or Random effect Regression. Generalized Least Square Regression analysis is conducted by transforming the estimators of OLS regression to get BLUE estimators. Results and findings of the analysis would are also interpreted.

4.2 Descriptive Statistics

Descriptive Statistics shows the overall summary indication of basic statistics parameters. It gives a summary of the minimum and maximum value, mean, standard deviation, and the total number of observations. The following table gives the summary of the above-indicated values of the variable.

Table 1: Descriptive Statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	36	.0640752	.0390494	-.0637479	.1265565
Premium growth	35	.0875985	.2949962	-.5873015	.9806159
Loss Ratio	36	.652452	.1267574	.393038	.8762407
Size (millions)	36	640.00	410.00	113.00	1,810
Firm Age	36	13.66667	5.482439	9	25

Source: computed using STATA 15

Table 1 above is manipulated by using the six-year (from 2015/16 to 2020/21) data from six insurance firms. The total numbers of observations were 36.

Return on Assets (ROA)

As it is indicated in the table above the mean value of ROA was 0.064. This implies that on average a firm registered 6.4% of profit or return on asset for each additional unit of an asset. The minimum was –0.063 and the maximum was .127. These showed that firms that optimize the most return will get a profit of 126.6% and a firm with the least return will incur a loss of 6.3%. These figures showed there is too much disparity in the return on assets of firms.

Motor Premium Growth Rate

The motor insurance premium growth rate increases by 8.75%. The maximum growth rate was 98.06% and the minimum was a decrease by a rate of 58.30%. There is a fluctuation in the growth rate of motor insurance premium rate.

Loss Ratio or Claim Cost

The loss ratio was another independent variable considered in the summary table. A loss ratio is computed by dividing the net claim incurred by the net premium earned(Nile Insurance s.c & Report, 2020). On average the insurance firms pay out 65% of their premium income collection as claim settlement. This average loss ratio can be considered below the national bank benchmark though it is not encouraging (NBE, 2019). The motor loss ratio was skyrocketing with a maximum value of 87.6 and was very good at its lowest rate of 39.3%. A low loss ratio is an indication of good profitability (Promislow, 2011).

Age of the firm

In the study, the firms considered had a minimum of nine and a maximum age of 25. The age indicated the year of establishment of the firm. As it is indicated in the summary table, both infant and giant firms were included in the sample. The variation for the minimum and maximum figures may indicate such incorporation diversified mix of insurance firms.

Company Size

Lastly, the size of the firm was computed. The size of the firm was calculated as the total sum of assets (Lion annual report, 2019). The size of firms was also diversified as indicated in the table above. The minimum amount of assets was Birr 113 million registered by Lucy Insurance Company S.C and the maximum assets was Birr 1 billion 810 million registered by United Insurance Company S.C. Firms' size could be varied with the age of the company and the experience of the firms increased.

4.3 Model Specification Test

4.3.1 Hausman Test: Fixed Effects or Random Effects

According to Brooks, (2008) the financial sector applies two types of models which are relevant for the analysis of panel data. These panel effect regression models are Fixed Effect Models (FEM) and Random Effect Models (REM). These two techniques are very helpful to analyze the panel data. The fixed-effect model helps to explore the effect of the independent variables on the dependent variables within the firms. Here each firm may own its characteristics which may either affect or not the independent variable. FEM considers two assumptions. First, these individual characteristics should be controlled.

FEM removes the effects of those time-invariant characteristics so the net effect of the independent variables on the outcome variables could be assessed. Second, FEM assumes those time-invariant characteristics of firms are unique and should not be corrected with other firms. It should be different and no correlation between the error term and the constant. If the error terms are correlated FE will not be the preferred technique since it may lead to incorrect inference. In this case, REM will be preferred.

The advantage of RE is it can include time-invariant variables, but in the case of FE it would be absorbed by the intercept (Torres-Reyna, 2007). To sum up thanks to the technology, it is the Hausman test that could identify which the researcher should prefer based on the data at hand.

Table 2: Hausman Test: Fixed Effect or Random Effect

```
                 ---- Coefficients ---
-
               |      (b)          (B)            (b-B)     sqrt(diag(V_b-
V_B))
               |     fixed        random       Difference
S.E.

 ------------------------------------------------------------------------------
-
Premium growth |   -.0127612    -.0068065       -.0059547        .0117742
  Loss_Ratio   |   -.1330992    -.1309136       -.0021857        .0113265
 Size(millions)|    4.65e-11    -4.35e-13        4.69e-11        3.09e-11
      Firm age |   -.0000814     .0024499       -.0025312        .0017157
 ------------------------------------------------------------------------------
-
                          b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg
    Test:  Ho:  difference in coefficients not systematic
                  chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-
B)
                          =
3.35
                Prob>chi2 =      0.3409
                (V_b-V_B is not positive definite)
```

Source: computed using STATA 15

As it is indicated in the Hausman test above, the P-value is 0.3409, which is greater than the P-value of 0.05. If P-value < 0.05, it would have been significant. Hence, a Fixed Effect would be used. But in this study P-value >0.05, the researcher preferred Random Effects (Torres-Reyna, 2007)

4.3.2 Breusch-Pagan Lagrange multiplier (LM): Random Effects Regression or Simple OLS Regression

Using the Hausman test, a random effect was selected. The wants to reaffirm the Hausman test by using the Breusch-Pagan Lagrange multiplier (LM) test. This test helps to decide which one is preferred among Simple OLS regression and Random Effects Regression. Here, the null hypothesis is no panel effect. That is the variance across firms

is zero or in the other way, there is no significant difference across firms(Torres-Reyna, 2007). Below here with the LM test is tabulated.

Table 3: Breusch-Pagan Lagrange multiplier (LM) test: Random effect or simple OLS model

```
ROA [Year, t] = Xb + u[Year] + e[Year,t]
        Estimated results:
                        |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                     ROA |   .0014846       .0385305
                       e |   .0012799       .0357755
                       u |          0              0
        Test:   Var(u) = 0
                             chibar2(01) =     0.00
                          Prob > chibar2 =   1.0000
```

Source: computed using STATA 15

According to Torres-Reyna, (2007), if P>0.05, the null hypothesis will be failed to reject. If P-value < 0.05; the null would be rejected. Here the researcher failed to reject the null (i.e P-value =1, which is >0.05) and concluded that random effect was not appropriate. It is implied that there is no evidence of significant difference across firms. Therefore, since it is possible to run simple OLS regression, the researcher decided to run and apply simple OLS regression in the model specification of this study.

4.4 Tests for Assumptions

4.4.1 Ramsey RESET Test (Regression Model Specification Error Test)

During the regression analysis, the researcher should consider the assumptions of the econometric model set. Ramsey Reset test was widely used to check if there was an omitted variable/s in the model. Here the null is that there are no variables in the model. The alternative hypothesis is there are omitted variables indicating the existence of

specification error. The significant test P-value is a measure of the decision either to accept or reject the hypothesis(Ramsey, 1969). The Ramsey RESET Test is also a linearity test (Garson, 2012).

Table 4: Ramsey RESET Test (Regression Model Specification Error Test)

```
Ramsey RESET test using powers of the fitted values of ROA
       Ho:  model has no omitted variables
                   F(3, 27) =      1.48
                   Prob > F =      0.2416
```

Source: computed using STATA 15

In the Ramsey RESET test, the p-value is 0.2416 which is greater than the p-value of 0.05%. Therefore, the researcher accepts the null hypothesis and concluded that at a 5% level of significance the model is correctly specified, no omitted variable existed and is leaner.

4.4.2 Normality Test

In the normality assumption, it is the error term that normal distribution follows. Skew is the tilt or not in distribution. There are two types; right-skewed (positive skew) and left-skewed (negative skew). The right skew shows the tail to the right and the left skew points to the left. Skewness shows the measure of the asymmetry of the probability distribution of the residual or error term from its mean. On the other hand, Kurtosis shows the height or sharpness, or peakedness of a distribution (Garson, 2012)

Skewness/ Kurtosis tests for Normality were conducted using STATA. The null hypothesis is the data follows a normal distribution. The result showed that as P-value = 0.5776 which is greater than 0.05. Hence, the null hypothesis could not be rejected. This implied that the error term follows a normal distribution.

Table 5: Normality test

Skewness/Kurtosis tests for Normality				
				------ joint ------
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2) Prob>chi2
Residual	35	0.7250	0.3389	1.10 0.5776

Source: computed using STATA 15

4.4.2 Multicollineanrity Test

Multicollinearity is one of the assumptions of a classical linear regression model. The correlation among the independent variables is diagnosed by the multicollinearity test. When a correlation between independent variables is high, it is an indication of a multicollinearity problem. Variance Inflating Factor (VIF) is used to test for multicollinearity (Gujarati, 2003). VIF is reciprocal of the Tolerance value. A VIF value above 10 or a Tolerance value below 0.1 shows the existence of collinearity (Brooks, 2008).

Table 6: Multicollinearity test

Variable	VIF	1/VIF
Firm age	2.17	0.459875
Size	2.16	0.463138
Loss Ratio	1.08	0.923536
Premium growth	1.07	0.937256
Mean VIF	1.62	

Source: computed using STATA 15

As indicated in the above table VIF value for each independent variable is by far below 10 and the Tolerance value is not below 0.1. The highest VIF value was 2.17 and the lowest Tolerance value is 0.459. Hence, the researcher concluded that there is no

problem of Multicollinearity.

4.4.4 Heteroskedasticity Test

Preusch Pagan/ Cook-Weisberg test of heteroskedasticity was utilized for testing the existence of heteroskedasticity. Below herewith is the summary of the test result.

Table 7: Heteroskedasticity test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROA
         chi2(1)      =    10.32
         Prob > chi2  =   0.0013
```

Source: computed using STATA 15

As it is indicated above heteroskedasticity test is interpreted by P-value. The null hypothesis is that constant variance means homoscedasticity. If the p-value is < 0.05, the null hypothesis would be rejected. In this study, P-value is 0.013 (i.e < 0.05), which indicated the existence of Heteroskedasticity. The remedial for such a problem is to transform the estimates of OLS regression by using GLS. Heteroskedasticity is now solved by GLS regression. This will be discussed in the interpretation of the GLS regression result later on.

4.5 GLS Multiple Regression Analysis:

According to the OLS regression result, the coefficient of determination of the model, R2 is 25.89%. (P-value is < 0.023). The reason for choosing GLS is discussed as follows. From the Breusch-Pagan LM test, the researcher concluded to run simple OLS regression as discussed in prior parts. The reason was that OLS estimator βi is not the best estimator even though unbiased. The usual OLS estimation method does not consider the use of information collected from unequal observation. In OLS each observation is assigned equal weight. Bur a method Generalized Least Square (GLS) does take consideration of such weight and the estimators obtained from GLS are Best Leaner Unbiased (BLUE)

estimators. GLS is a process of transformation of the variables of the original model so that it would satisfy the assumptions of the Classical Model and use OLS. In Simple words, GLS means OLS but the variables are transformed to satisfy the assumptions of standard least squares (Gujarati, 2003). By relaxing the homogeneity and non-correlation assumption of the Classical Leaner Regression Model (CLRM), more robust GLS estimators could be produced (Muthama Musau, 2015). Therefore, the GLS estimators are BLUE.

Table 8: Cross-sectional time-series GLS regression

Coefficients: **generalized least squares**
Panels: **homoscedastic**
Correlation: **no autocorrelation**

Estimated covariance	=	1	Number of obs	= 35
Estimated autocorrelations	=	0	Number of groups	= 6
Estimated coefficients	=	4	Obs per group:	
			min	= 5
			avg	= 5.833333
			max	= 6
			Wald chi2(3)	= 9.53
Log likelihood	=	70.05755	**Prob > chi2**	**= 0.0230**

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Premium growth	-.0068065	.0196325	-0.35	0.729	-.0452854	.0316725
Loss Ratio	**-.1309136**	.0458215	-2.86	**0.004**	-.2207221	-.041105
Size	-4.35e-13	1.98e-11	-0.02	0.983	-3.93e-11	3.85e-11
Firm Age	.0024499	.0014884	1.65	**0.100**	-.0004674	.0053671
Cons	.1148641	.0316407	3.63	0.000	.0528495	.1768787

Source: computed using STATA 15

According to Torres-Reyna (2007), transforming the estimators of the OLS regression and using OLS regression; which is called GLS will; help to relax OLS assumptions of Homoscedasticity and Non - Autocorrelation. In our previous test of Heteroskedasticty, there was a problem with heteroskedasticity. However, in the results of GLS regression both the problems of heteroskedasticity and autocorrelation are avoided. From the GLS result, the p-value= 0.2030 for the overall model indicates that the overall model is

significant at a 5% level of significance

4.6 GLS Multiple Regression Analysis Results and Interpretation:

Loss Ratio

Ho: Loss ratio has a negative significant effect on motor profitability.

Motor Loss Ratio: From the result, it is indicated that the loss ratio has a negative significant effect on the return on an asset at a 5% level of significance. The p-value for loss ratio is significant (i.e p-value < 0.05). The coefficient of loss ratio is $\beta = -0.13$. So loss ratio has a negative significant effect on return on assets. It is expected that the loss ratio will have a negative effect because the loss ratio is the percentage of the claim cost from the collected underwriting premium. The coefficient $\beta = -0.13$ can be interpreted as for each unit of additional investment on assets by firms the return on assets (ROA) is decreased by 0.13 cents due to payment of claim cost.

The findings of loss ratio are similar to the theories formulated and the previous research works concluded. For example, Hasibuan, Sadalia & Muda (2020) stated in their study that the claims ratio is considered the ratio that most influences negatively the level of profitability. Their findings revealed that it has a negative significant effect on the profitability performance of insurance companies on the Indonesian stock exchange. Zanghieri (2017) also concluded his study of the business cycle and insurance profitability: evidence from Italy found claim cost and frequency are negatively affecting profitability. Ben Dhiab, L. (2021), also found in his study that the loss ratio has a negative significant effect on Saudi insurance companies. Malik (2011) showed the existence of a negative relation between loss ratio and profitability. Gofta (2020) reviled the existence of a negative significant effect of loss ratio on motor insurance profitability.

Motor Premium Growth Rate

Ho: Motor premium growth rate has a positive significant effect on motor profitability.

In the regression result above (table 8), the motor premium growth rate found an insignificant effect on the profitability of Motor insurance in Ethiopia. This finding is again in contrast with what previous research concluded. For example, Ben Dhiab (2021) found in his study that the growth of premiums has a significant positive effect on Saudi insurance companies. Gofta (2020) reviled the same result which was positive and significant by studying the Ethiopian insurance industry. Hailye G., (2017) studied the assessment of the profitability of a motor business in the case of Berhan insurance. The researcher concluded that inefficient premium was one of the sources of the problem of profitability of motor insurance. To conclude, it is well known that motor premium growth has a positive relationship with the profitability of insurance firms. However, the researcher considered the growth rate which was computed by subtracting the present period from the previous period premium and dividing by the previous period. The data were showing somehow a decreasing trend of growth in some companies during some periods. Such decreasing trend may lead to insignificant and negative effects.

Age of the Firm

Ho: Age of the firm has a positive significant effect on motor profitability.

The result of the GLS regression analysis showed that the age of the firm has a positive significant effect on motor insurance profitability at a 10% level of significance. However, it was found insignificant at a 5% level of significance. The coefficient of β = -0.0024, p-value= 1.00. The study of Ahmeti & Iseni (2022) reviled the effect of company age on profitability was positive and significant. Zebiba (2019) studied the profitability determinants of motor insurance in Ethiopia and concluded that the age of the company

had an insignificant effect on profitability.

Company Size

Ho: Company size has a positive significant effect on motor profitability.

In this study size of the company was found insignificant according to the results of the GLS regression analysis. This may be due to the selected sample firms' composition i.e, the majority of those selected sample firms have relatively small sizes. Due to the availability of motor-specific data on the annual reports of these firms, the researcher selected those small size insurance firms. Zebiba (2019) concluded that company size has a positive effect on the profitability of motor insurance. Ahmeti & Iseni (2022) found in their study a positive significant effect between company size and ROA. Azmi F., Irawan T., & Sasongko H., (2020), studied the Indonesian general insurance companies' determinants of profitability. The findings showed the existence of a positive significant effect between company size and profitability i.e ROA. Maichel-Guggemoos & Wagner (2018) studied the Profitability and Growth in Motor Insurance Business: Empirical Evidence from Germany. Their study reviled that size had also a positive significant effect on profitability.

4.7 Hypothesis Testing

It was recalled that the researcher had assumed four hypotheses by directing the effect each independent variable would assume on the dependent variable. Once the results of the Generalized Least Square regression are computed and summarized above, it is now the time to test the hypothesis.

H1: Motor premium growth rate was assumed to have a positive effect on profitability.

The result of GLS regression showed that it is not significant at a 5% level of significance. Therefore, the hypothesis is not accepted. This result is not similar to what previous researchers have reviled and theories postulated.

H2: Loss ratio was assumed to have a negative effect on profitability.

The result of the GLS regression report indicated that the Loss Ratio has a negative significant effect on motor profitability. The coefficient of loss ratio is $\beta = -0.13$. So loss ratio has a negative significant effect on return on assets. Therefore, the hypothesis is accepted at a 5% level of significance.

H3: Company size was assumed to have a positive effect on profitability.

In the GLS regression result, it is shown that firm size had a p-value of 0.983. This indicated that the firm size p-value is greater than the significance level i.e 0.05. Symbolically (0.983>0.05) which is the indication that firm size is not significant at a 95% confidence interval. Therefore, the hypothesis that the researcher set is not accepted.

H4: The age of the company was assumed to have a positive effect on motor profitability.

When the researcher compared this hypothesis with the result at hand in the GLS regression report, it was insignificant at a 5% level of significance. This is because the p-value in the GLS report was 0.10. Though firm size was not significant at a 5% significance level, it had a significant effect on motor insurance profitability at a 10% level of significance.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1 Summary of findings

The study of the determinants of Motor Insurance profitability in the Ethiopian Insurance Industry was conducted by taking the independent variables loss ratio, premium growth, age, and company size and the dependent variable profitability measured by ROA. The finding revealed in the descriptive statistics showed that the mean value of ROA was 0.64. This implied on average firms get a 6.4% profit or 0.64 cents return for each additional unit of Assets Investments.

The generalized Least Square (GLS) regression analysis findings revealed that it was the loss ratio that was found significant at a 5% level of significance. The loss ratio was negatively and significantly affecting the profitability of motor insurance. Company age was also significant at a 10% level of significance with a positive effect on the profitability of motor insurance.

5.2 Conclusion

This study was aimed at analyzing the determinants of motor insurance in the Ethiopian Insurance industry. Six-year time-series cross-section data (longitudinal panel data) were collected from six insurance firms. The panel data regression was conducted. Hausman test was run to select either from fixed effect or random effect. The random effect was appropriate. Then, a Breusch-Pagan Lagrange Multiplier (LM) test was used, to select from either Random effect or simple OLS Regression. On average, the firms could generate a profit of 6.4% from accumulated loss ratio, premium growth, total assets (size), and age.

On average, firms were incurring 87.6% of the total premium collected for claim payment i.e the loss ratio was 87.6%. This is a very major expense for insurance firms. The average total asset of a firm is estimated as Birr 640 million range with a minimum of Birr 113 million and a maximum of Birr Billion and 810 million which was achieved by United Insurance S.C.

The Generalized Least Square (GLS) regression analysis result indicated that only the loss ratio was a significant factor that negatively affects the Return on Assets (ROA). The β coefficient was -0.13 (P-value = 0.05) indicating that it is significant at a 5% level of confidence. The GLS result also avoided the problems of heteroskedasticity and autocorrelation.

5.3 Recommendations

Based on the findings of the study, the researcher forwarded the following points as a recommendation. First and foremost, the management of insurance firms should consider short-run and long-run strategies for devising remedies for the loss ratio of a motor class of business. As indicated in the summary there is a high claim cost incurred by insurance firms. The major cost among operational costs is claim cost.

There should be a close follow-up of the management for the claim service departments. If so, the claim service becomes more efficient, this is one way of controlling costs.

A high level of claim cost is related to a lack of prudent underwriting, moral hazard, adverse selection issues, and leakage in the claim service. If there is prudent underwriting during the inception of the policy, the claim cost will reduce. This is due to either misunderstanding the policy contract from the client-side or poor underwriting techniques that lead to extra and unnecessary claim costs by the insurance company.

Last but not least, the researcher recommended there should be an intensive risk management strategy. This will help the insurance firms to identify and assess risks that will adversely affect the company at glance, if not taken with due care.

5.4 Limitations and directions for further research

The study found that claim cost is very high. This factor was supported by most studies on the related topic; though few. The researcher believes that future researchers can assess the factors behind such a high level of claim cost. The challenges and practices of the motor claim process of insurance companies may also be another point of direction.

Both the viewpoints of the insurance firms and the viewpoint of clients regarding motor insurance rating, underwriting practices, characteristics of clients, moral hazards, and adverse selection natures may also be untouched areas of related topics. The researcher believes that the topic related to motor insurance profitability determinants is not well researched. Therefore, conducting with large sample size, longer period, and may be different methodology will help the development of the finance sector in general and the insurance industry in particular.

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