EVALUATION OF OPERATIONAL EFFICIENCY AND FINANCIAL HEALTH OF NON-LIFE INSURANCE COMPANIES IN SOUTH AFRICA

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(21958492)

A RESEARCH DISSERTATION SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTER OF ACCOUNTING DEGREE IN THE DEPARTMENT OF COST AND MANAGEMENT ACCOUNTING, FACULTY OF ACCOUNTING AND INFORMATICS, DURBAN UNIVERSITY OF TECHNOLOGY

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ABSTRACT

For some time, operational efficiency has been a great challenge confronting insurance companies; the pressure of low investment returns, pressure to change to the digital age to be relevant to modern technology, and lack of performance to standard and strategic vision are the primary challenges to future transformation efforts. This study examined the operational efficiency and financial health of non-life insurance in South Africa. Since Operational efficiency is the primary medium to measure financial health, there is a need to identify and discuss the microeconomics and macroeconomics variables and understand the financial health of non-life insurance companies. A descriptive research design was adopted to achieve the objective of this study. In this study, panel data from 2008- 2019 was used. This panel data gives more informative data as it consists of both the cross-sectional information, which captures individual inconsistency, and the time-series information, which captures active modification. 2008 was chosen because insurance industries were distressed due to the 2008. This study used secondary data from S&P Capitall Q and Refinitiv Eikon, well-known databases with readily available data. They provide data reliability, in-depth financial information on companies, equities, fixed income, industry reports, SEC filings, interest rates, commodities, and screening for stocks and mutual funds.

The study employed Profitability TLA as a function of financial health and other variables like the company's size, leverage ratio, premium growth rate, liquidity, inflation rate, and Gross domestic product (GDP) growth rate using a panel data regression approach. The result shows that of all the predictors, only LY and LV have a significant (positive) effect on the dependent variable financial health (TLA). The correlation analysis results show the relationships between some of the observed parameters. In particular, the result reveals that liquidity, size of the company, leverage, profit After Tax, operational efficiency, and Return on Asset all have a significant positive correlation with financial health. At the same time, Total Assets correlate negatively with TLA. The study contribute insight into the operational efficiency of non-life insurance companies and show profitability as an efficiency index. The study recommends improving premium growth. Insurance management should focus on reviewing their product prices since some common factors can affect insurance premiums, like gender, age, smoking status, lifestyle, occupation, and income, to improve the premium growth of non-life insurance companies, this study will also be helpful to monitoring authorities in articulating comprehensive and practical strategies to ensure financial development and steadiness of the non-life insurance In the Republic of South Africa.

Keyword: Operational, efficiency, financial, health, profitability, South Africa

DECLARATION

In conception and execution, I Omonike Ope Ige-Gbadeyan, declare that this dissertation reflects my work. This dissertation reflects academic work carried out by me and has not been submitted to any university or higher institution of learning in any way for another degree. All information from other published or unpublished works has been duly acknowledged/referenced.

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DEDICATION

I dedicate this work to Almighty God, the author, and finisher of my faith. And to my beloved husband, Dr. Oluwatoyin Joseph Gbadeyan, and our lovely children for your support and prayers throughout this project.

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To my blessed children, Bethel, Peace and Praise, Nations shall come to your light, and your lots are preserved in Jesus name, amen. To my in-laws, the Gbadeyans, your support is exceptionally cherished. Special thanks to Dr. Odunayo Magret Olarewaju, Mr Msomi M.A, Dr. Timilehin Akoya, Sister Blessing Adenola Aderonke, Mr. Sunday Adebiyi, Mr & Dr David Alabi, Dr & Dr Olusegun Afolabi, Pst & Mrs Tope Obafemi, Mr. and Mrs. Adedeji Faloyo, Dr and Dr Toye Ajadi, Dr & Dr Ayeni, Dr & (Mrs) Sunday Soogun, Pst & Pst (Mrs) Gabriel Adejimi, Prof & Mrs Bakare, Dr & (Mrs) Oyesola Okelola, Engr.& Barrister(Mrs) Emeka, Engr & Dr John Olusanya and Rccg New wine Parish and everyone whose contributions have enhanced this program's success in record time. May you all be richly blessed beyond your mind, amen.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: INTRODUCTION

1.0 Background to the study

The non-life insurance market consists of the general insurance market which is grouped into motor, property, liability and other insurance. The other component is made up of non-life insurance products which include health, travel and accident cover, amongst others (Baranauskas 2021). One of the imperative aims of a business is to maximize the present and the future operational efficiency and financial health of the business because of its impact on the market price and the wealth of the shareholders (Al Breiki and Nobanee 2019; Hirdinis 2019; Sari and Sedana 2020). Since insurers are under more pressure than ever to effectively manage their existing operational costs, a pattern that has persisted for more than a decade has resulted in a decline in their operational efficiency. Improving operational efficiency has a direct impact on a company's profit margins and efficiency, showing that companies are cost-effective (Cappa *et al.* 2021; De Giovanni and Cariola 2021). The operational efficiency aspect of any company is vital and must be considered in order to sustain financial health.

Operational efficiency is perceived as the uncommon means and procedures used to reach the important goal of providing quality goods and services to clients in the most cost-effective and favourable way (Abd-Elmageed and Abdel Megeid 2020). Moreover, General insurance companies are crucial to the survival of any economy and the failure of insurance companies may disturb the financial business as a whole (Caporale, Cerrato and Zhang 2017). For insurance companies to achieve their objectives, namely:- to offer the best financial health when loss or damages occur; to lessen financial pressure when there is an emergency occurrence; to establish a foreseeable and level return for money; and also provide fair returns for the risk, the company must be reliable, safe, stable and financially sound (Lashetew 2020a; Kamaruddin 2021b; Shukla 2022). Insurance companies play a significant role in the economic such as offering a healthy financial service that increases, economic growth and progress (Asongu and Odhiambo 2020; Jonckie and KMPG 2021). Additionally, it promotes the financial market's ability to depend on and feel secure about its resources; it gives economic institutions a sense of cohesion that is long-lasting; and results in value and profit for a number of shareholders (Ahmad 2017; Gomez-Trujillo, Gonzalez-Perez and Baena-Rojas 2023). Furthermore, its advantages—including protecting consumers' finances, assisting businesses in risk management, safeguarding personnel, and funding economic development initiatives—cannot be overstated (Robinson 2018; Iyodo *et al.* 2020).

The absence of insurance companies would overwhelm the penalties on the economy (Alam *et al.* 2019). Insurance companies are essential for the steadiness of an economic organization, mainly because they have large savers in the financial market and play a link between insurers, banks and individuals (Ahmad 2017; Devarakonda and Chittineni 2019; Kamaruddin 2021a). Heal (2017) state that the world is full of uncertainties and risks Trades, families, assets and individuals are vulnerable to different dangers (Palm *et al.* 2019). Insurance companies are the only financial service that reduces the loss caused by these uncertainties and risks (Dalhaus, Musshoff and Finger 2018). Generally,

insurance companies cover losses and put in a position as if no loss occurred (Merkin 2020). Moreover, insurers make social life easy for the society by reducing anxiety and doubt, and influencing job creation (Ali and Tausif 2019).

(Blake *et al.* 2019). Pension funds and insurers are significant stockholders in the economic marketplaces. They are a basis for stabilizing monetary needs, according to ((Duijm and Steins Bisschop 2018). Moreover, insurers help protect household stability and professional equilibrium by protecting their risks. They have the following potential to move the market: the size of their investment portfolios, rationalizations of funds, or the unwinding of positions (Leitner 2018). Insurers and pension funds are managed and supervised (Park and Stańko 2017).

South African insurance companies contributed to the short- and long-term economy. Money and capital market insurance, 23% of the financial assets, were accounted for in South Africa (van Wyk and Wesson 2021). In 2015, R18 billion (bn) was contributed to the country's revenue (Van Rensburg and Krygsman 2019). Short-term insurance's gross premium came to over R100bn, and R42bn dues were paid out. Moreover, 3% of the overall Gross Domestic Profit (GDP) was contributed by the Short-term market (Du Toit 2019).

However, (Rajapathirana and Hui 2018) state that it is noteworthy for insurance companies to sustain their operational efficiency to maintain effectiveness despite challenging market conditions. Moreover, it is crucial to provide quick access to data and prompt client communication, which enhances transparency and the truth (Losada-Otálora and Alkire 2019a, 2019b).There are devices that are newly introduced, novelties to smooth end-to-end digitization, advanced working efficiency, strengthened cybersecurity, and enhanced customer experience (International 2021). The economic health of the assurance area has added rank over the ages, particularly after the 2008 – 2009 economic recession (Gazel and Schwienbacher 2019). Stakeholders are concerned about keeping the insurance sector financially healthy and stable, according to (Ali and Tausif 2019). To determine the financial health of non-life insurance companies, there is need to critically look at the current state and calculate its net worth and figure out where it stands. From previous study gaps, it was recommended that non-life insurance needs to improve on financial health, as doing this will enhance a high net premium.

According to a survey conducted by KPMG and ACORD, it is clear that the majority of the surveyed insurance companies are behind and need to work on their operational efficiency to increase profitability and services (Research and Markets 2020). Operational efficiency and the financial health of the non-life insurance companies can be defined as modern challenges, which are cyber risk, trust issues, market competition, economic instability, climate change and high costs of advertisements, which are the biggest challenges facing insurance companies (Odemo 2022; Willis South Africa 2022). For insurance companies to take full advantage of their financial health, it is important for the sector to function competently (Mazviona, Dube and Sakahuhwa 2017).

In recent years, a number of researchers aiming to pinpoint certain facets of the performance of South African general insurance companies has increased (Sognon 2019b; Babuna *et al.* 2020; Olarewaju and Msomi 2021; Abdulraheem-Saheed 2022). However, there is limited empirical research conducted

in South Africa where the question of whether there is a relationship between operational efficiency and financial health of non-life insurance has been answered. Thus, this study purposes to critically scrutinize the operational efficiency and financial health of non-life insurance companies in South Africa.

1.2 Problem Statement

Operational efficiency has been a challenge that insurance companies are confronted with according to the insurer worldwide recognize the challenges in achieving their operational efficiency goals which are lack of clarity on key objectives (Markopoulou 2021) and an inability to agree on strategic decisions combined with an overall resistance to change across the business, scarcity of qualified resources, especially those with a combination of technological expertise and insurance fundamentals, Sheer number and complexity of obsolete legacy systems and processes combined with a lack of experience in improving IT processes and implementing newer technologies (Adler 2019; Dambra, Bilge and Balzarotti 2020). The pressure of low investment returns; pressure to change to the digital age to be relevant and compatible with modern technology; and the lack of performance to the standard and strategic vision are the primary challenges to further the transformation effort. In this regard, several studies have been focusing on checking the financial health of a company by scrutinizing how a company resources are used to achieve operational efficiency and productivity. Since insurers are under more pressure than ever to effectively manage their existing operational costs, a pattern that has persisted for more than a decade has resulted in a decline in their operational efficiency. Since Operational efficiency is the primary medium to measure financial health, there is a need to identify and discuss the micro- and macro- economic variables, as well as understanding the financial health of non-life insurance companies. This study's focus is on evaluating the financial health, which represents companies' operational efficiency and productivity in using companies' resources as they are the primary tools used to enhance economic condition. However, there is limited empirical research in South Africa on the question of whether there is relationship between operational efficiency and productivities, profitability of non-life insurance, which has not been answered (Alhassan and Biekpe 2018; Boakye 2018). Therefore, this study is aimed at critically scrutinizing the operational efficiency and financial health of non-life insurance companies in South Africa.

1.3 Research objectives

1.3.1. Primary objectives

The primary objective of this study is to evaluate the operational efficiency and financial health of non-life insurance companies in South Africa.

1.3.2. Secondary Objectives

To achieve the primary objective, the following secondary objectives have been formulated:

A. Theoretical objectives:

i. To evaluate economic efficiency theory to determine the operational efficiency of non-life insurance companies in South Africa.

ii. To examine the financial performance to measure the financial health of non-life insurance companies in South Africa; and

iii. To determine the operational efficiency and financial health measures of non-life insurance companies in South Africa.

B. Empirical objectives:

i. To empirically examine the determinants of the operational efficiency of non-life insurance companies in South Africa.

ii. To determine the effect of operational efficiency on the financial health of non-life insurance companies; and

iii. To analyse the statistical relationship similarities between operational efficiency and financial health of non-life insurance companies in South Africa.

1.4 Scope of the study

This study was conducted in South Africa. Specifically, it focuses on non-life insurance companies, ` covering the period of 2008 – 2019. The study was limited to this period due to the company impact of Covid-19, which affected all the insurance companies based on gross domestic product and unemployment, resulting in a 15 percent fall in total gross domestics' pool, which is predicted to return to pre-pandemic stages by 2024 as illustrated in Figure 1.1.

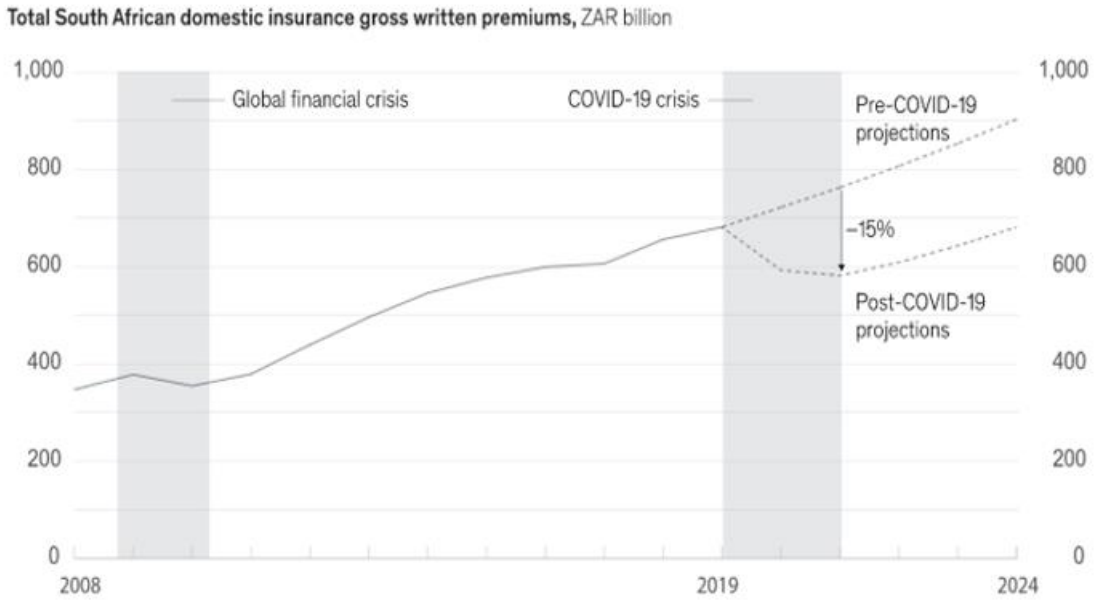

FIGURE 1.1 TOTAL GROSS DOMESTIC PROFIT EXPECTED TO FALL BY 15 PERCENT BY THE YEAR 2024
Source: (Umar et al. 2020)

Choice of these years is since South Africa's Insurance sector has been overwhelmed since the 2008 worldwide monetary calamity. The international monetary calamity has had a severe influence on South Africa. In 2008–09, the global monetary system experienced its first collapse in 19 years. Only in 2009

alone, there was a loss of about a million jobs, and the unemployment rate remained high at 25% (Msoni 2014; Rena and Msoni 2014). There are 56 company profiles, including those of established companies like Old Mutual and Sanlam as well as re-insurers like GIC Re, Hannover Re and Africa-Re, as well as government agencies like Eskom's Escap and Sasria (Markets.com 2020). This study will pay attention to 32 South African non-life insurance companies because insurers with a less than R38167 million (M) turnover in 2019 would not be included in the data analysis (Magazine, 2020). The choice of the period of examination is hinged on both the progressive dynamics in non-life insurance in South Africa and the paucity of information on the subject under consideration. According to Abdulraheem-Saheed (2022), Insurance companies have reliable data regarding the penetration rate as a function of non-life premiums to gross domestic profit (Abdulraheem-Saheed 2022). Furthermore, it is essential to remember that the South African economy fells by 0.2% of the Gross Domestic Profit (Africa/statistics 2020). Since operational efficiency is not a one-and-done ideal, it requires combined energy from people, technology and money (Iryna 2021). Therefore, all the variables of the operational efficiency aspect must be examined in order to determine the relationship between non-insurance operational efficiency and financial health.

1.5 Justification for the study

Accounting instruments to gauge efficiency include, but are not limited to, net profit margin, accounts receivable turnover, payable accounts turnover, current liquidity ratios, and inventory turnover (Boakye 2018). The study's goal was to increase the understanding of previously conducted studies on evaluating the financial health of South African non-life insurance companies to include operational efficiency. Being the first in South Africa, this study aimed to examine the operational efficiency and financial health of the 32 non-life insurance companies with well-known database on S&P Capitall Q and Refinitiv Eikon. Operational efficiency is represented by total cost over total income. Financial health is represented by total liabilities over total assets. The determination of operational efficiency and financial health will provide a point for excellence argument between academicians, policymakers and professionals, and provides a basis for further research on South African Non-life insurance performance. The study will be a useful guide to credible investors for easier monitoring of companies whose operational efficiency is uncertain, thus making intelligent investment decisions. It will also help highlight the various importance of these factors, besides operational efficiency, that could affect the financial health of non-life insurance companies in South Africa. Hence, investors can take advantage on the investment openings available when these variables swing. The discoveries of this study will be useful to policymakers and regulators in the area of parameter and management, and it will guide the government on how certain operational efficiency and financial health factors influence a company’s performance and hence contributes in the development of policy-making. It will offer beneficial inputs to advise the review of the procedure and authorized frameworks and impact operative inventions of economic strategies by government statutory bodies guiding the operations of companies**.**

The Accounting approach to measure efficiency is characterized by net profit margin, accounts receivable turnover, payable account turnover, current liquidity ratio, and inventory turnover. It will also reveal to the insurance companies some basic methods of combining their resources effectively

and efficiently to avoid wastage, especially now that South Africa has started experiencing load shedding , rationing of electricity (Muller 2023). Likewise, insurance company clients will also benefit from this study by enlightening them on detecting if an insurance company is efficient so that they will not be deceived by vast amounts of profit declared at the end of the financial year. In other words, this understanding will help insurance clients know how to deal with them, especially those with substantial premium payments.

However, there has been no study on the promotion of South African insurance companies on operational efficiency and financial health. Most studies on operational efficiency was focused on parts of Africa such as Ghana, Nigeria, Zimbabwe, Ethiopia, Egypt, and the Middle East (Tesfyae 2020; Ashiagbor *et al.* 2023). This study will connect the break and contribute to the current literature. It will also benefit investors, shareholders, policyholders, regulators, accounting professionals, and other academicians. Finally, the conclusions and outcomes of this study will help and be useful for researchers, academicians, and students.

1.6 Structure of the study

The research work contains of five (5) chapters:

Chapter One: This part introduces the study's history, problem statement, research aim and objectives, justification for the investigation, its scope, and finally, its organizational framework.

Chapter Two: This is the literature review section. The researcher uses other people's work to back the study and show that there is a need to conduct the research. This section outlines conceptual, theoretical and empirical reviews. The researcher discusses variables and theories relating to the study and provides evidence of other similar studies.

Chapter Three: This chapter will explain the research methodology engaged in carrying out the research tools and methodology employed to carry out this research and shows how data is analysed. The explanation of the research design in this study helps to identify valid company-specified variables that could influence South African non-life insurance companies' operational efficiency and financial health.

Chapter Four: This section will detail the research findings using secondary data. This chapter will offer data analysis and a discussion of the results.

Chapter five: The researcher concludes and summarizes the work, discusses conclusions in line with the sector's existing condition, and makes suggestions to the insurance companies for South African policymakers, administrations, and insurance companies. Additionally, it will accomplish and recommend possible parts for additional studies on the insurance market dynamics in SA.

1.7 Chapter Summary

Due to its significance in economic growth, the non-life insurance sector is important in the financial services industry. Given that it promotes economic growth, it is also pertinent to the financial services industry. One of the imperatives aims of a business is to maximize the present and the future operational efficiency and financial health because of its impact on the market price and shareholders' wealth. It was noted that there was a lack of information in this field of subject in South Africa, and this founded one of the problems of attention of the study, and as such, it was imperative to provide detailed information that covers this knowledge gap. According to the secondary data sourced, S&P Capitall Q and Refinitiv Eikon will be dynamic in providing vital evidence that could enhance a better understanding of the non-life insurance companies, which will be applicable for research and therefore guide marketing and the development of operational efficiency strategies for non-life insurance companies and supervising authorities in the Republic of South Africa.

The next chapter is Chapter Two, which focuses on the literature review section. The researcher uses other people's work to back the study and show that there is a need to conduct the research. This section outlines conceptual, theoretical, and empirical reviews. The researcher discusses variables and theories relating to the study and provides evidence of other similar studies.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter is divided into four sub-sections: conceptual review, conceptual framework, theoretical review, and empirical review on capital on the operational efficiency and financial health of non-life insurance companies. The conceptual review broadens the knowledge of operational efficiency and financial health knowledge by explaining the two concepts' meanings. The conceptual framework shows the pictorial nexus between the two variables of interest. The theoretical review discusses various theories on the subject, concentrating on the more relevant ones. Empirical literature presents a review of quantitative studies and summarizes the discoveries of former researchers on the issue. This review is particularly important for the identification of gaps in previous research. This chapter gives a brief insight into South African non-life insurance companies.

2.1 Conceptual review

2.1.1 Operational efficiency and Insurance companies

Operational efficiency is when an organization can reduce the waste in time, effort and materials as much as possible while creating a first-class service or product (Rahman, Laosirihongthong and Sohal 2010). Working competence is a metric that deals with the proficiency of revenue received for working costs (Hayes 2020). The bigger the operational competence, the more money a company generates, or assets. The asset/ investment market can be likened to general business practices for adequate competence (Suryanto, Haseeb and Hartani 2018).

As a result, the company can produce more income or returns for the same or less money than a substitute. When expenditures and fees are lowered, a company can operate more efficiently (Ranieri *et al.* 2018). Internally efficient markets and operationally efficient markets are two terms that can be used interchangeably. The ratio between the input needed to keep an organization running and its output is what is known as operational efficiency in terms of economics (Bagdadioglu, Price and Weyman-Jones 1996). The information denotes what is placed into a professional to function correctly, such as time, cost, and employees. In contrast, work means what is placed out, such as fast growth times, revenue, customer acquisition, customer retention, and quality (Gillis, 2021(Wanke *et al.* 2019)).

Operational efficiency can never be overemphasised in any organization, whether business-minded or non-profit (Aboramadan 2018; Nicholas Barr 2020). Significantly, in a time like this the rise of new technologies has assisted countless companies in tightening and advancing many aspects of their business instead of depending on ancient working patterns (i.e., manual effort, paperwork, and enormous administrative overhead). Many organizations have employed various modern methods through software and artificial intelligence (AI) tools that streamline business processes, reduce costs and render better products and services (Aboramadan 2018). The boundary between the organization adapting to modern working and those that have not is becoming clearer. Before this year, only 15% of organizations were entirely digitized, while the other 85% likely had to spend additional effort and cost to keep up with the new standard (covid-19 era) rate of change (PrimePay 2022).

Efficiency can be defined as how a decision-making unit (DMU) can progress its productivity without increasing its input or reducing its production (Puertas *et al.* 2022). Operational efficiency has become a challenge that has begun to gather a new level of attention in the insurance industry as effectiveness helps recognize well-organized and unproductive companies. For insurers to earn the trust of policy-holders, the capacity to yield a given set of productivities via the use of efforts efficiency is required (Jaloudi 2019a)

Operational efficiency is an association's aptitude to accomplish its capital in numerous capacities to advance a benefit. This implies that the operating efficiency of insurance companies can be measured by financial fitness, which relatively measures the achievement of a business. One of the purposes of any business is to make profit (Bryant, Jones and Widener 2004; Alhassan and Biekpe 2018). It is an essential condition for competitiveness according to Mazviona et al., 2017 (Kajwang 2022)

Given that the invention activities of insurance are distinct from those of any other industry, insurance businesses' operational proficiency differs from that of other business subdivisions (Kajwang 2022). The effective utilization of the premium money is what determines how well the insurance market works(Naushad and Faisal 2020) and the improvement of advertising events (Cheramin 2021; Maxwell 2021). Then, the operational effectiveness of insurance companies stands on two pillars, namely. (i) Advertising activities (Păvăloaia, Anastasiei and Fotache 2020) and (ii) Asset activities, even though the features that regulate the operational effectiveness of insurance companies are surrounded by other organizational activities that involve assets in several possessions to the output achievement (Mohammad 2020).

According to the KPMG and ACORD 2019 survey, insurers' obstacles and chances enlighten their operational competence. The report indicated more than 60 life, P$C, composite and re-insurance carriers worldwide, with payments ranging from less than US$1 billion to more than US$10 billion. According to results shown by the survey, 94 percent of carriers state that they are vigorously working on refining operational effectiveness, and 55 percent are behind the goal. Furthermore, most respondents reported only limited the integration of their technology stages across functions, including underwriting, distribution, product operation, and valuable areas essential to achieving operational efficiency (Adler 2019).

Moreover, operational efficiency is vital because it measures how well an organization can transform resources, labour and wealth into services and products that produce revenue (Experts 2021).To generate and preserve working competence, operation administrators must endlessly supervise procedures to regulate which roles are unproductive or out of fashion (Byrnes 2022). The advantage of operational efficiency for management is usually straightforward. An operational efficiency approach aims to reduce the sum of time employees spend on non-value-added events or inefficient processes (Cury and Saraiva 2018). By maximizing the amount of value-added work employees do, a working competence activity can make a business much more modest and money-making (Abass, Dansu and Oyetayo 2021). The more operational efficiency a facility is operating with, the less waste (Abass, Dansu and Oyetayo 2021). This means that there is a rise in profit, which will help corporate owners,

shareholders and the organizational team (Rampton 2020) states that while the organizational team is directly responsible for recognizing and executing efficiency upgrading strategies, it is almost always the front-line employees who must put it into practice (Rampton 2020). Operational efficiency helps eradicate waste (Caiado *et al.* 2018), which are the activities that add costs without creating value for customers (Mohsin, Ai- Bayati and Oleiwi 2021). Figure 2.1 represents the definition of waste, considering two types of waste activities.

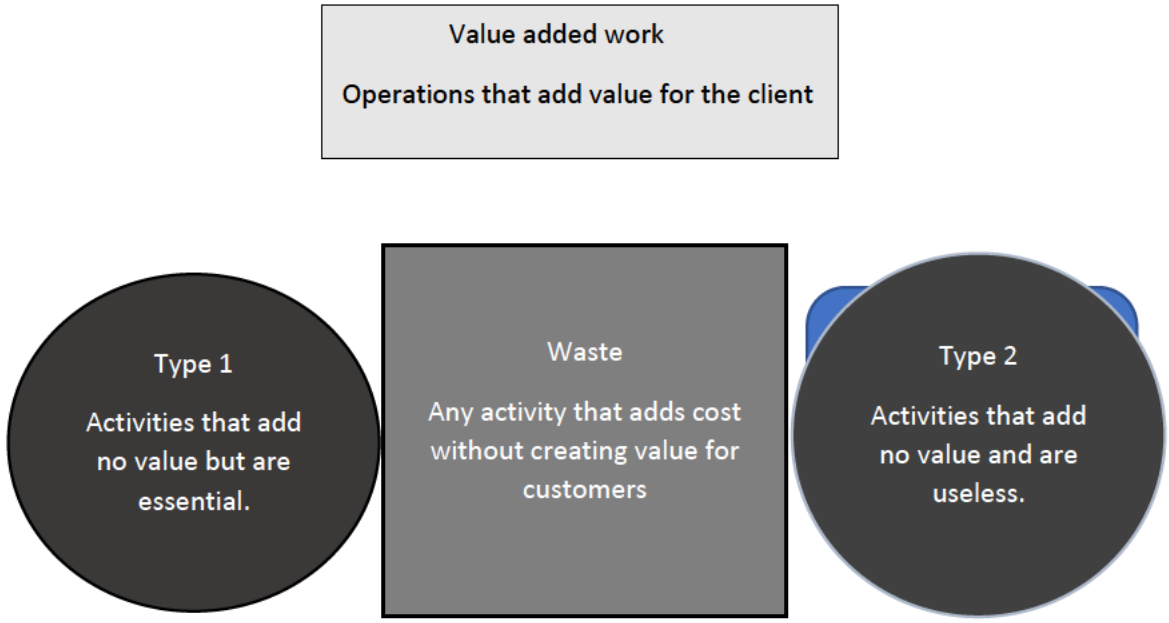

FIGURE 2.1: WASTE DEFINITION
Source: (Abass, Dansu and Oyetayo 2021).

Figure 2.1 shows how waste can affect the operational efficiency of companies without adding meaningful value to the client and the entire companies. To eliminate this kind of waste, it is essential to eradicate type 2 to be operationally effective and efficient, leading to workflow optimization. However, the Lean Management concept can be used to achieve workflow optimization. "Lean management aims to modernize workflow such that the flow of items that institute services and products regularly delivers what customers need, in careful numbers, when wanted, and where essential, at the lowest possible cost. It seeks to quickly satisfy demand while maintaining optimal quality and eliminating waste" (Gao and Gurd 2019).A recent example is a small insurance company that started a package to train lean Six Sigma Green Belts through the company, causing client-centric, efficient, and focused quality. It has helped private and public organizations cut excess, improve resource use, decrease charges, and grow healthier products and services (Gray 2021). According to a previous study, lean management and Six Sigma could solve any company's struggle with operational efficiency (Alkunsol *et al.* 2019). However, neither researchers nor practitioners have found an efficient way to combine lean six signals in life or non-life insurance companies (Sandner *et al.* 2020a)Employing Lean Six Sigma in any course where excess and faults exist initiates them to provide less than expected products and services and

cuts into the business's bottom line (Antony, Vinodh and Gijo 2017; Sandner *et al.* 2020b). However, the goal is competence and a client-focused method that marks in improved goods and services (Setyabudhi and Sipahutar 2019; Sandner *et al.* 2020b; Dairy 2021; Sigmadaily 2021).

2.1.2 Improving the Operational Efficiency of Non-life Insurance Companies

Operational efficiency can boost sales, income and turnover margins (Osazefua 2019; Nariswari and Nugraha 2020; Arsyad *et al.* 2021). The following steps would help to improve operational efficiency in the business environment a deep understanding of all the aspects of business operations of non-life insurance. Even though repetitive duties may appear tedious, walking through by the manager can help rapidly identify inefficient processes (Brajer-Marczak 2016). However, arranging check-ups by conducting internal audits would eliminate inefficiency and boost business operations (Zou 2019). Staff training will boost operational efficiency by using the placement of cheat sheets (Niati, Siregar and Prayoga 2021), standard operating procedures (SOP), and procedure reports at every workplace. Every staff must attend training regularly whenever the organization calls for it, which will enhance business performance (Milliman and Clair 2017). Ranking of best staff through teaching and enticements or incentives encourages employee retention and fulfilment not to leave an organization whenever they like (Velmurugan and Sankar 2017). For staff to be more focused on their duty to achieve operational efficiency and output, businesses could create a standard key performance indicator to identify workers who perform well for top positioning (Richins *et al.* 2017; Agarwal 2021). As a business expands and accepts order capacities, processes must have appropriate and adequate resources to meet the moving demands (Manavalan and Jayakrishna 2019). Businesses could create an environment that encourages picker performance, productivity and efficiency from repetitive maintenance to implementation (Porter and Kramer 2018). Client service improvement is a process that efficiently achieves orders and handles customer concerns by reducing back-end operations, such as vendor relationships and compliance (Reinkemeyer 2020; Springer 2020). Non-life insurance companies should perform process analysis to track problems that lag the overall performance and identify opportunities for enhancements (Ribeiro *et al.* 2019). Pareto charts help uncover extremes and determine where to make changes. This is not a “set-and-forget” approach, but a continuing process (Eyckerman *et al.* 2020). After developments have been put in place, new ideals should be located to encourage competence and output. Businesses should increase expectations to improve workflow rather than using extreme dealings, which can engulf workers (Ghosh 2017; Wanke *et al.* 2019).

2.2 Recent Regulatory Development of Insurance Companies in South Africa

In South Africa, the Financial Sector Conduct Authority (FSCA) regulates insurance and re-insurance companies and operations, while the Prudential Authority oversees the governing body of insurance companies. However, the PA operates as a juristic person under the supervision of the South African Reserve Bank (SARB) in relation to the Financial Sector Regulation Act (FSR) as of April 1, 2018, and was well-known for doing so. The P.A is accountable to:

“Encourage and enhance the safety and dependability of financial institutions, as well as the safety and dependability of market structures, in order to protect financial customers from the risk that these institutions may not fulfil their obligations and to help maintain financial stability.

On April 1, 2018, the Financial Sector Conduct Authority (FSCA) was created. Its responsibilities include carrying out market regulation of financial institutions that offer financial products and services; financial institutions that are accredited under a legislation governing the financial sector (including banks, insurers, retirement funds, and managers); and market structures. They are accountable for improving and sustaining the effectiveness and integrity of financial markets, protecting the interests of financial clients, and contributing to the maintenance of monetary stability.

The Financial Sector Regulation (FSR) Act, however, gives the Prudential Authority, the Financial Sector Conduct Authority (FSCA) and the South African Reserve Bank (SARB) the authority to issue monitoring tools, such as directives, direction notes, understanding rulings, and morals that deal with specific prudential or market conduct supervisory issues. The powers of the Prudential Authority and the Financial Sector Conduct Authority (FSCA) include:

“Demanding evidence or papers in writing from a managed entity on an ad hoc basis should there be doubt of a breach of a monetary division law; Demanding supervisory on-site inspections to check agreement with a monetary sector law; Examining if there is a suspicion that a financial sector law has been contravened; Delivering written orders to monetary institutions or critical people convincing them to take actual act; Ability to levy administrative penalties; and Toward the inside enforceable undertakings with financial institutions binding contractually to rectify a breaking of a financial sector law notably, when considering the regulation of insurance in South Africa, as the "Twin Peaks" perfect of rule that was introduced in 2018 through the declaration of the Financial Sector Regulation Act 9 of 2017 (the FSR Act).”

The Twin Peaks model shifted from the previous fragmented regulatory approach followed in South Africa through different regulatory bodies for different financial institutions to a more collaborative model of financial institutions through two centralized authorities, which differentiates between prudential regulation and market conduct regulation. The Prudential Authority and the Financial Sector Conduct Authority are the two organizations recognized in the FSR Act as the "Twin Peaks." (FSCA) (Andrew Godwin 2017; Godwin, Howse and Ramsey 2017).

The Financial Sector Regulation (FSR) Act assigns a distinct set of subject matters to the Prudential Authority and the FSCA respectively, in that the Prudential Authority will regulate matters that distress the prudential regulation of financial institutions and the FSCA will regulate market conduct considerations of financial institutions. Various financial sector laws furthermore regulate the activities of insurers and reinsurers. The following primary legislation forms the basis of the insurance and reinsurance regulatory framework:

The Short-term Insurance Act 53 of 1998 (the "STI Act") deals primarily with market behaviour considerations appropriate to short-term insurance companies (now called non-life insurance companies). The Financial Intelligence Centre Act, 38 of 2001 (FICA), deals with combating currency

laundering events and financing terrorist and associated activities in South Africa by accountable institutions, such as insurers. The Insurance Act, 18 of 2017 (the "Insurance Act"), deals with prudential regulation and the governance of insurance companies and insurance groups.

The burden has been put on the South Africa regulation board as part of the G20 members to endure a valuation every five years, and more frequent peer assessments. The market has been soundly controlled and supervised, with no significant emergencies in recent years (Boulle 2010; Godwin, Howse and Ramsey 2017).

2.3 Non - life insurance policy

Non-life insurance gives peace of mind because it protects against expected or unexpected risks, or victims that suffered from a specific monetary event are rewarded. These victims can be caused due to numerous factors like coincidences, diseases, fire, natural or false mishaps. Samples of non-life insurance policies explain the term's meaning entirely. Landowners, auto and marine insurance, injury coverage from fire, disasters, theft, and travel insurance, as well as any cybersecurity-related online hacking incidence, are examples of general insurance policies. It is complicated to determine the sum of harm caused by online events as the probability of occurrence of these risks is tremendously challenging. However, these can be protected with the help of a non-life insurance policy.

The policies include the following: - The strategy period of a non-life insurance plan is primarily short for example, one year. The period can be longer depending on the kind of insurance; prior to the insurance company issuing the coverage, the premium is paid (Breyer *et al.* 2022),. Since the insurance company does not totally carry any entitlements, when the company receives an insurance application, they evaluate the risk involved based on the type of coverage necessary. Additionally, the policyholder is required to pay a small sum known as a deductible. If no payments are made under an overall insurance policy, the policyholder receives a no-claim bonus discount. The amount of this cumulative discount on the plan premium increases until it reaches a certain level (Feng 2023).

The advantages of a non-life insurance policy are that health insurance provides financial assistance during a health emergency; It is compulsory by rule to buy a third-party motor insurance policy (Van de Ven and Schut 2008). This compensation is paid to the third party in case of property injury; Home insurance covers the policy-holder's housing property against many unanticipated events, like fire, break in natural calamities, un-rests (Van de Ven and Schut 2008); Travel insurance plans offer insurance attention to senior residents, and children as well. These help with matters like loss of luggage, coincidences, and loss of documents while traveling to another overseas land; Commercial insurance assists businesses with employee benefits insurance, shopkeeper’s insurance, assets, and naval insurance (Wamwara, Spillan and Onchoke 2023).

2.4 Types of non-life insurance policy

Non-life insurance is any kind of insurance other than life insurance. Non-life insurance might protect people, assets, or legal liabilities. These include the following: Motor-powered insurance, etc. Car Insurance, two-wheeler insurance, commercial vehicle; fitness, transport, coincidence, catastrophe

(fire, flood, earthquake), credit, Asset, and more **Figure** 2.3 represents the services of non-life insurance companies.

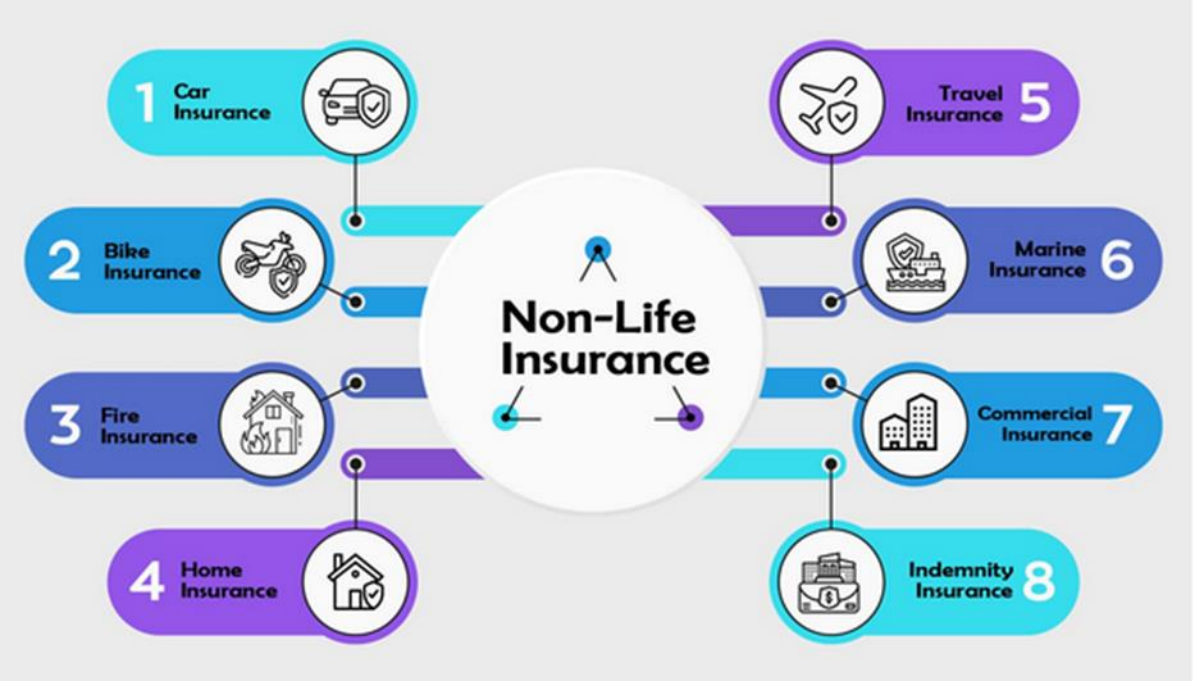

Figure 2.3: Services of non-life insurance companies
Source: (Policybachat 2023)

Often, non-life insurance companies are disregarded by people not looking for precise coverage, although they guard against the unforeseen and can be used as savings in the future. Subscription of insurance in Africa is a reasonably common exclusion of South Africa (Asongu 2020).

2.5 Factors Affecting South African Non-Life Insurance Companies

Due to the financial ramifications of uninsured losses, risk tolerance is dropping, and unpredictability is increasing. The high frequency of natural catastrophes makes re-insurance markets difficult. The re-insurance market is still challenging, which eventually has an impact on the broader market. Rate rises have been brought on by Corona's numerous claims, significant natural disaster losses, and poor investment performance. Prices for excess-of-loss treaties increased across all important reinsurance business lines and geographical regions (Aon South Africa 2021; Kirikkaleli *et al.* 2022)**.**

Capacity is decreasing: Insurers continue to withdraw from low-performing classes and refocus their strategies, particularly on difficult situations like those in the mining industry, heavy industry, textiles, food industry, and any exposure related to cold storage, as well as from low-performing classes like D&O, Skilled Indemnity, Fatality, Cyber, natural calamity unprotected, and significant limit assets (Pierre- Ignace Bernard 2020). Based on acceptable claims performance, property premiums have been rising for the past three years and are anticipated to continue doing so, maybe by as much as 30% (Nguyen 2021; Tien 2021). Tenants, capital, and real estate are all subject to increased

competition Climate change is causing an increase in weather disasters and the losses that result from them (Franzke 2017). Consumer behaviour shifts and investor assurances that businesses have identified and put in place plans to reduce climate change risks have already given it a high prominence (Pierce 2022). The South African economy increased for a second year in a row, increasing by 2.0% between 2021 and 2022, from R4.50 trillion to R4.60 trillion. Despite the fact that GDP in 2022 hit an all-time high, the economy only grew by 0.3% from the pre-pandemic reading of R4.58 trillion in 2019 (Sa 2022) Credit rating downgrades, however, will cause more instability in the financial system. Deadly societal unrest is expected to be fuelled by a high unemployment rate, failing infrastructure, and service delivery. Significant hazards to the effectiveness of corporate operations include inadequate infrastructure, poor administrative service, and energy shortages (Retief 2021).

2.6 Financial Health of Non-life Insurance Companies

Financial health is everyday activities in the business world nowadays. Just as individuals should have their money in order, professionals must regulate their financial health. If finance is not managed correctly, it is easy to fail financially, which has a lot of adverse effects, for instant business failure will lead to liquidation or closure. In that aspect, a business needs to be financially healthy to survive in the long-term. Ways to measure financial health include the amount of savings and income spent on secure or non-flexible expenses. Financial health studies the capacities of money coming in against money going out (Maverick 2022) . It also studies other aspects, such as debts, creditors, and expenses. Ideally, a business should keep its liabilities in check, according to (Sweeney 2023). It should also ensure the proper management of expenses to avoid loss. Profits will decline if the business is managed poorly for a long time (lister 2022, 2023). Therefore, every business should be well managed to achieve optimal profitability. Financial experts have design guides to help individual financial indicators since situations differ. Because of this, it is worthwhile to develop a financial plan to ensure that one goal is achieved, and this will help not to put oneself at undue financial risk if the unforeseen happens. It is crucial to evaluate the ability to handle financial needs and wants. Financial health is a state where current and future monetary obligations are secure (Fernando Fridson and Alvarez 2022; Kaga 2022).

2.6.1 Importance of Financial Health of Non–life Insurance Companies

Financial health is vital because it affects non-life insurance companies' capacity to generate profits and grow (Pjanić *et al.* 2018). Non–life insurance companies need to be profitable to continue in the long-term (Gabor 2021). An unprofitable non-life insurance company is not sustainable. Similarly, since amounts of money play a large part in business, managing them is paramount to success. Non-life insurance companies should be financially stable to engage in business with world-class non-life insurance companies (Kataria 2021) . Financial companies is essential as it reflects a sound financial system, which is significant as it strengthens truth in the system and prevents running into banks, which can weaken an economy (Kirikkaleli *et al.* 2022).

Furthermore, a healthy financial system signals to the public that their money is well managed and invested in a way that will not unduly jeopardize (Meier, Gonzalez and Kunze 2021). No one wants to invest in a dicey business (Abbass *et al.* 2022; S.A 2022). Finance is possibly the utmost determinate feature of a business (Kwashie, Baidoo and Ayesu 2022).

2.6.2 Determining Non- Life Insurance Company's Financial Health and Operational Efficiency

To govern the stability and financial health of an insurance company, important factors must be considered. Net income, the combined ratio and policy-holder surplus all have an impact. The overall revenue of a business is its net income. It is figured by deducting total outlays from total receipts. Profit exists if the number is positive. If the number is negative, there is a loss. Insurance companies use the combined ratio as a metric to assess profitability. The ratio is determined by adding up all losses and expenses, dividing them by the premium, and then calculating the result. One hundred percent, for instance, signifies that the business is profitable from underwriting.

A ratio exceeding 10%, in contrast, indicates that the company is paying out more in claims than it is collecting in premiums. A company's policy-holder surplus is the difference between its assets and liabilities. It is an insurance company's net worth, put simply (Kagan 2023).

2.7 Determining non-life Insurance Company's operational efficiency and financial health.

These are the variables to be evaluated a number of financial ratios can be used to assess a company's overall financial health and determine whether it would remain a going concern. The main indicator of financial health is whether it gets better over time. The following criteria should be used to appropriately assess a company's long-term viability and financial health:

2.7.1 Liquidity: **-** It is crucial in evaluating a company's elementary financial health. Liquidity is the sum of cash that can be effortlessly convertible to cash assets, i.e., An asset that can be placed on an excellent economic base on the benefit that would be derived from the good (economic value) of a company owns to accomplish its short-term debt responsibilities (Jensen 2001). Before a business can grow in the long-term, firstly, it is essential to survive in short-term businesses. There are two standard metrics to quantity liquidity: the current and quick ratios, also known as the acid tests. A quick ratio more than 1 means that company has enough liquid assets to be converted into cash to meet its current obligations. A perfect quick ratio is 1:1, which means that a business has R1 in current assets for every R1 in current liabilities. What happens when the quick ratio falls below one? A quick ratio less than one shows that the company does not have enough assets (Abebe and Abera 2019; Quickbook 2022) . A company's lowest line profit boundary best indicates its financial health and long-term capability. A profit boundary is one of the most used profitability ratios to measure the step by which a company makes currency. It signifies the proportion of sales that have become income, according to (Segal 2021).

2.7.2 Solvency: Through this technique, a business can understand its continuous debt obligations rather than just those that are due for a short while. It determines a company's long-term debt in relation to its assets. It gauges how much a company relies on debt as opposed to entirely internal resources to fund its operations. The debt-to-equity ratio, which measures a company's financial leverage, is determined by dividing its total liabilities by the value of its equity held by shareholders (Fernando Fridson and Alvarez 2022), it displays the capacity of shareholder equity to pay off all existing debt during a downturn in corporate operations. Reduced debt Equity indicates that stakeholders, as opposed to creditors, fund a greater percentage of a company's operations. It also deals with investor confidence in a corporation, which is advantageous for a business because stakeholders do not charge

interest on the cash contributed. The amount of equity debt varies depending on the institution. However, a long-term decline in the debt-to-equity ratio suggests that the company is financially sound.

2.7.3 Operational Efficiency: **-** It arises when the correct grouping of individuals, processes, and experts agree to improve the output and value of any corporate operation while reducing the cost of processes to a particular level. A company's operational efficiency is critical to its financial success and profit effectiveness as a function of operating cost, namely the maintenance and administration of everyday activities. A company or investment is more advantageous the better the operational efficiency. This is so that the organization can generate profits at a cheaper cost. The financial market is crucial to smooth capitalist economy operation. The financial market is where the exchange of securities occurs, including the stock market, forex market, and bond market. Operational efficiency occurs when business costs and charges are reduced. An operational efficiency market is also known as an internally efficient market (Hayes 2022). Benefits of operational efficiency are it reduces lead time, cost, and rate of odds of mistakes. It makes customers and the workforce happier; it gives more clarity to the team about how the business operates; and it helps to comply with new business challenges and opportunities (Chen *et al.* 2022)

Operational efficiency bottlenecks could be the following (Cezarino *et al.* 2021): lack of concentration on establishing the necessities. Operational challenges usually develop gradually and covertly as businesses expand, relying haphazardly on new workers, equipment, and procedures, and lacking conscious planning. Managers regularly engage in firefighting. This is where the company's leaders are starting to become dog-tired from regularly fighting fires (Baskett 2020). They are barraged with complex needs, altering customer desires, or workers are stressed with continuous daily disruptions. These leaders spend all their time being responsive and not adding worth by proactively averting difficulties before they occur (Cezarino *et al.* 2021). Operational bottlenecks make it more challenging to improve the output of value of any corporate operation.

2.7.4 Profitability: **-** The net profit margin (sales exceed cost) is possibly the ratio that investors deliberate on most. It deals with the efficiency of a business and creates profits. Higher margins and bottom lines are positive. Partaking in a low margin does not automatically mean poor performance. A company's bottom line refers to earnings, profit, net income, or earnings per share (EPS). Companies can survive for a few years without profit while functioning on the goodwill of creditors and stakeholders. For long time sustainability, a company must attain and sustain profitability for a long-run operation. Below is the shortfall of profit after tax, mainly because of non-payment on credit, increase in net dues, calamities, and

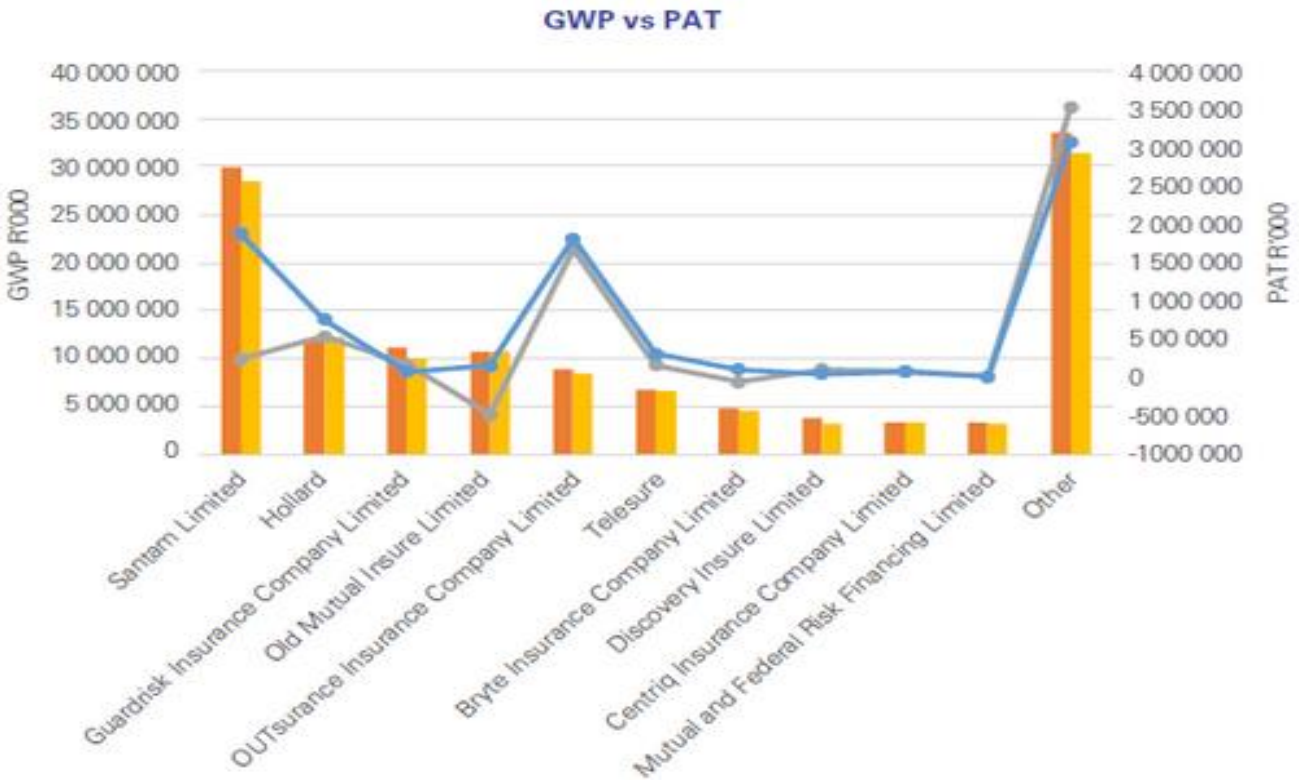

FIGURE 2.4: TOP 10 MOST SIGNIFICANT OUT OF 40 NON-LIFE INSURANCE COMPANIES (BECHARD 2021) **.**

Santam's PAT dropped from R1.8billion (bn) to R239 million (m) due to a break in business claims. Santam paid out R3bn privileges on net underwriting apart from R1 billion (bn) already settled in August 2021. Looking at the Old Mutual sector from the graph. It also noted a significant loss of 483 million (m) after muted year-to-year growth in gross written premiums after tax. The top-line presentation was worsened by premium release dealings and its agronomic crop occupational discontinuation during 2020 (Bechard 2021).

2.8 Measures that improve insurance companies' operational efficiency (Sharma 2021)

2.8.1 Automation and Engine Learning in the back office

All the newest and old insurers are in the progress of developing technologies to improve competence. This is primarily true in the back office, where automation brought about by computing gives considerable operational gains. For instance, the year has enormous peaks, renewals, and troughs. Human mistake may occur as a result of assignment's pitfalls, and the procedure is also costly due to staff overtime expenditures. On the other hand, adopting Robotic Process Automation (RPA) tools speeds up work while reducing expenses and errors. Tools for machine learning are being employed for claims more frequently as well. For claims with lesser values, this is especially true. One of three loads—reimbursement, do not pay, or refer—can be chosen by an engine learning claim after it has evaluated the dues that were received.

An operational strategy would be to provide the engine learning tool with a ton of historical data to analyse and resolve, and then compare those findings to those already presented by human underwriters (Banu 2022). By making any necessary adjustments, the technique should soon be

consistent with how people make decisions. Once such is the case, it can handle dues considerably quicker, more competently, and on a far larger scale than a person can, freeing up valuable resources for other obligations.

2.8.2 Front office speed and Efficiency

The use of Chatbots, which can retrieve data and give customers estimates whether the contact is made online or through an app, is growing in the front line of client interaction. By giving the support agent a single user advantage and significantly lowering the amount of keying and re-keying required, innovative solutions like Appian boost speed and competency in the contact centre. Together, all of the digital solutions improve the consumer experience. In contact centres, insurers may issue quotes that are more precise, pay bills more quickly, and respond to customer requests more quickly. This adaptability contributes to the creation of a new competitive control in an era where the customer experience is everything (Chege, Wang and Suntu 2020).

2.8.3 Dealing with the Heritage/Legacy

The emerging technologies are insufficient for traditional insurers if they save pace with technology and evolution from the old, policy-based approach to one motivated by customer involvement. These companies must also deal with their legacy systems to make the necessary operational leap forward. There is no point in building a notable front end if what sits behind it remains outdated and silo-ed (Krishnakanthan 2019).

While simultaneously developing a new technology stack, the majority of insurers continue to struggle with the simplification and consolidation of outdated systems. If propositions are to offer the customized, adaptable experience that customers increasingly demand based on their interactions with Google, Amazon, and other companies, these new stacks are required (Gazel and Schwienbacher 2021).

Whether the heritage structures were created by developing several variations of the same systems for various brands in the company portfolio or whether they were the outcome of unions and successes, they need to be addressed. Then, one continues to see instances when a client's family has been abducted, along with his car and keys, only for him to be instructed that he must make solitary calls to retrieve his home and vehicle. This is not exactly ideal in the midst of anxiety and distress. Heritage buildings incur numerous running costs due to the increased demand for their services and the noticeably longer lead times required to introduce new items, adjust prices, or comply with new governing regulations. They drastically reduce organizational alertness and are an important effort component (Diaz-Andreu 2017).

One method is to collapse r heritage structures into just one structure for each line of business. Because they are built on monumental architecture, making changes can be long and challenging. Mandatory testing safeguards a change to one part of the structure and does not make knock-on problems elsewhere.

2.8.4 Keeping Pace with the Disrupters

Connect this to the emerging breed of cloud-based, micro-services-based software companies like Netflix and Google that enable quick and affordable change. Assume that one of the major computer

companies chose to enter the insurance industry. Then, with traditional insurers under pressure to keep up, they might make significant progress and attract large volumes of new business. In the meantime, more savvy insurers are already tapping into traditional clientele. Insurance businesses are facing a terrible situation where it is necessary that they future-proof themselves against both major and little digital disrupters (Woetzel 2019) .

2.9 Factors Affecting Operational Efficiency

Furthermore, the fiscal performance of insurance businesses can be affected by internal and external factors. The following are external and internal factors of an insurance company, including solvency ratio, premium growth, company size, underwriting risk, reinsurance dependence, the growing rate of gross domestic profit (GDP), interest rate and inflation as the independent variable, and fiscal performance on return on asset (ROA) as dependent variable (Deyganto and Alemu, 2019).

Meanwhile, external factors of insurance companies and management are beyond their control or influence. These factors include inflation, market share, and gross domestic product growth rate (Berhe and Kaur, 2017). The impact of internal and external factors on the financial performance of an insurance company is significant to several stakeholders, including agents, policyholders, and policymakers (Batool and Sahi, 2019).

The followings are the definitions of the variables: -

2.9.1 Premium growth

The gross written premium is one of the main ways that insurance companies make money off of their operations. An increase in the premium growth rate indicates that the company is expanding. Because internally produced resources can no longer be able to provide all the funds required for asset opportunities, rising organizations typically look for external funding to maintain their growth position. Since growth is partly a function of managers' risk tolerance, it is expected that a larger company will be more likely to spot unusual patterns of movement that point to improved financial performance (profitability and returns). Hence, normally, the premium growth rate, measured as the ratio of changes in gross written premium, should be connected to the financial performance of the company (Ben Dhiab 2021).

2.9.2 Profitability (ROA)

There is a need to define profit and profitability because the two terms are used interchangeably, which does not mean the same thing. Profit and profitability are accounting terms used to analyse an organization's financial health, To determine whether an organization is financially sound or poised for progress, an investor must recognize what distinguishes its profit from its profitability (Ahmad 2017; Alarussi and Alhaderi 2018; Ahmeti and Iseni 2022).

Profit is the entire amount determined by income over and above a company's costs (Gebauer *et al.* 2020; Kataria 2021). It displays a company's financial statement and is thought of as total income less total expenses. The goal of any business, regardless of its size, scope or sector of operation, is to turn a profit (Mwaura 2017; Horton 2021).

Profitability and profit are closely related, but there is one key distinction. Productivity is a relative term while turnover is an overall number It is the metric used to control how much a company makes in relation to the size of its enterprise (Del Prete, Di Maio and Rahman 2023) Profitability depends on competency and, ultimately, on whether it succeeds or fails. Success can also be defined as a company's capacity to generate a return on an asset based on its resources relative to another asset. A corporation may make a profit, but state that this does not necessarily imply that it is profitable (Alarussi and Alhaderi 2018).

Profitability is the capability to make revenue from all commercial events. The profitability of the insurance corporation is vital to its survival, growth, and competitiveness. It displays how a professional organization creates profit by utilizing all available resources (Ahmeti and Iseni 2022) . Insurance cannot survive and will not be attractive to prospective investors if it is not meeting its objectives (profit). Return on Assets (ROA) is the primary ratio that shows a company's financial performance. It is a pointer of an establishment's money-making compared to its real asset. It deals with the capacity of the company's organization to make revenue by applying corporation properties at their removal (Batchimeg 2017).

Moreover, return on assets is a profitability proportion that measures how far a company is making money concerning its assets (Fauzan, Ayu and Nurharjanti 2019). ROA is a ratio of Net income before tax to Total assets. This ratio discloses how fine a company practices its resources to make income for the stakeholder It is a vital pointer of the general output of the company and displays the proportion of income the company earns compared to its entire income. This profitability ratio displays the organization's competence and rate of return. It further shows the competence of a business organization in creating net income from all the organization's incomes (Abd-Elmageed and Abdel Megeid 2020; Quist 2021). A bad ROA implies that a business is not correctly applying its wealth and may have doubtful organization. A company with undesirable ROA means it is capitalizing a high amount of capital into its production and instantaneously getting little revenue (Sondakh 2019).

2.9.3 Income

Depending on the circumstance, there are several ways to define income, such as when defining tax policy, financial inquiry, or monetary accounting. Income typically refers to the value or sum received in exchange for one's labour and items for people and dealings (Strathern 2023). People typically consider their gross income to be the sum of their compensation in wages and salaries, the interest they receive on their savings and asset sales, and other receipts. Their gross income less the expenses incurred in generating the money equals their net income (Endri *et al.* 2020). Additionally, businesses often classify their overall revenue from services and goods as gross income, as well as any interest and payments related to their financial records and reserves. Businesses' net income is calculated by deducting their expenses from their gross income. The phrase "income" typically refers to the sum of money, assets, and other value transfers that people or organizations receive over a predetermined time period as compensation for services rendered, costs incurred for commodities, returns on reserves, annuity distributions, gifts, other uncountable value transfers. There is no standard definition of income; instead, its definition and amount depend on the context in which the concept is utilized (P.Scott 2023) . Another

crucial factor in determining an insurer's profitability is the income from investments (Patel and Patel 2020). The investment income in the insurance sector comes from interest, dividends, capital gains composed upon the sale of assets, and other revenue made with an investment (Kanakriyah 2020).

2.9.4 Size of Company

The bigger the insurance companies the more it positively affects economic performance in various ways. Big-size insurance organizations can easily employ talented employees with professional knowledge and have financial prudence of measure in terms of labour cost. Therefore, it is more well-organized than small businesses. Big insurers regularly have more capacity to deal with contrary market instabilities than smaller ones, and insurers with large sizes can benefit from financial prudence of scale in terms of labour cost (Hemrit 2020). However, it isn't easy to measure insurance companies' size precisely before the total assets' logarithm is used as a directive for insurers (Berhe and Kaur 2017; Ali and Tausif 2019; Deyganto and Alemu 2019; Kimathi 2022).

2.9.5 Leverage

Leverage provides a detailed insight of each organization's short- and long-term debt strategy by comparing total liabilities to total assets. The debt-to-equity ratio is how insurance companies often define leverage. The amount of liabilities that was used to fund the assets of a specific company is expressed. A significant debt to equity ratio indicates high leverage for an insurance company. In contrast to the ratio of long-term debt, the ratio of total debt to total assets is more vulnerable to financial crises. Profitability is anticipated to be significantly impacted by the leverage ratio. An insurer's risk could increase if its debt is increased (Alarussi and Alhaderi 2018) . Leverage reveals the capacity of insurance companies to manage the experience of unforeseen losses (Ahmeti and Iseni 2022).

2.9 6 Liquidity

Liquidity is a procedure that allows the insurer to take care of its immediate obligations when they arise. It is also the capacity of an insurance to convert its assets into money as rapidly as is conceivable. When using outside resources is not as convenient, an insurer can fund its events and reserves using liquid resources (Waswa, Mukras and Oima 2018). Additionally, the ability of insurers to meet their immediate obligations to other insurers without having to recoup losses through contributions and investing activities is known as liquidity. An insurer's inability to satisfy its interim obligations is indicated by a low liquidity ratio. The insurer may, however, own idle funds that could have generated income by being invested in a profitable enterprise if the liquidity ratio were to be extremely high. There is no connection between the liquidity ratio and financial performance, according to (Berhe and Kaur 2017).

2.9.7 The growth rate of gross domestic product

The proportion of change in intangible assets or the proportion of change in rewards are two ways that insurance companies gauge their development. Its positive correlation with production was a foregone conclusion. It is typically one of the most important external measures used to assess financial health. The supremacy of the finance portfolio would be compromised by unfavourable monetary conditions. A rise in the gross domestic product would, however, increase the likelihood of marketing insurance methods, and insurers would probably gain from this in the form of higher earnings. The rate of market

saturation is gauged by premium development (Endri *et al.* 2020). A country's financial activity and rate of growth during a certain time period are modelled by the real gross domestic product growth rate (Lashetew 2020b).

2.9.8 Inflation rate

Inflation is a process in which both goods and services prices are increasing. Inflation can affect the actual value of cost and income. However, it can positively or negatively affect profitability, depending on whether inflation is expected. Inflation is regularly defined as a state where “too sufficient currency is chasing after insufficient goods (Cochrane 2022) . Whenever inflation occurs, currency losses purchasing power (Ehiogu and Eze 2018).

2.10 Empirical review

2.10 .1 International Evidence

Generally, insurance companies and any other goal-oriented organization cannot overemphasize efficiency to get oriented results. For an insurer to earn the trust of policy-holders, the ability to yield a given set of productions via involvements efficiency is required (Li, Li and Long 2020).

(Jaloudi 2019b) used the Data Envelopment Analysis (DEA) Slacks, and Logit Model to analyse the determinants and the effectiveness of Jordan Insurance companies. 22 insurance companies that were active in Jordan between 2000 and 2016 are used in the study. The author evaluates the technical competency scores using data envelopment analysis and examines the efficacy components using logit models and slacks-based models. The findings showed that among the crucial internal variables of a company's efficiency, operating costs, and technological provision is its owners' equity. Size, kind, return on assets, and efficiency are significantly correlated with the external characteristics the logit model discovered.

Furthermore, (Ali and Tausif 2019) state that the profitability and expansion of the insurance sector in Saudi Arabia were evaluated using monetary and material indicators: The study examined financial information from insurance companies and documented internal analysis for Saudi Arabia for the years 2013–2017; data from 2010–2015 were used for external analysis. This study demonstrated the negative impact on working efficiency. Additionally, it discovers an unbroken decline in the internal obligations of stakeholder equity. Additionally, insurance policies do not fully protect all potential customers.

Moreover, (Wanke *et al.* 2019) investigated financial indicators in a dynamic network DEA model to account for an instance of effectiveness in MENA baking. Information retrieved from the Bank Scope database between 2006 and 2014. The study's sample size was 15 nations, out of the 20 currently included in the World Bank database. Because of their ongoing conflicts, shaky economies, or lack of data, the remaining nations were eliminated. This study found that whether it was conventional or Islamic banking, MENA banks demonstrated an advantage in their operations. The current loan movement is less leveraged for Islamic banks than for other banks, which results in higher "financial health ratios" performance. Comparing Islamic banks to foreign banks, it's possible that adhering to Sharia norms does not result in a higher rate of capital growth and equity formation ("balance sheet

efficiency"). Banks are much more involved in asset building and equity formation as a result of Islamic banking practices' impact on interest-free loans. Conversely, nations with fewer foreign economic institutions typically display greater efficiency levels on their "financial health indicators" sub-structure, indicating a negative impact as a result of the implementation of stricter regulatory policies against foreign businesses.

Likewise, Pakistan's insurance (Taib, Ashraf and Razimi 2018) examined technical and scale efficiency are non-parametric approaches to Pakistan's insurance and Takaful industries. The efficiency was calculated using the data envelopment analysis (DEA) method. Data were collected from 19 companies in the insurance industry, of which 14 were from predictable and five from Takaful. Data from these 19 companies comprise the yearly reports of the concerned companies, the Government Bank of Pakistan's statements, and the Securities and Exchange Commission of Pakistan from 2008 to 2016. The results indicated a low level of overall competence. The primary source of incompetence was gauge competence rather than practical and pure practical competence. Furthermore, the companies perform with increasing the return to scale, reflecting a tendency to increase their effectiveness and scope to attain the optimum output level.

Additionally, (Ilyas and Rajasekaran 2019) conducted empirical research on India's non-life insurance market's productivity and efficiency. An examination of data envelopment in two stages is used in the study. In the initial stage, bias-corrected competency scores are determined using the DEA bootstrap method. The second step employs the condensed bootstrapped regression to identify the impact of company-level factors on the effectiveness of insurers.

Furthermore, the bootstrapped Malmquist index also looks at efficiency growth between 2005 and 2016. According to the bootstrapped DEA results, the Indian non-life insurance market has a modest level of applicability, allocative efficiency, scale, and cost, and there is a significant potential for growth(Haroon and Siddiqui 2019). The results also show that general underwriters outperform private insurers in terms of cost-efficiency. It is also clear that, regardless of size and asset class, all insurers operate under expanding returns to scale. Results from the Malmquist Index show that insurer inefficiency is increasing, which is due to the use of the best technologies, the effectiveness and output of the Indian non-life insurance business have not been significantly impacted by the global financial crisis of 2008, according to bootstrapped DEA and bootstrapped Malmquist index data. The shortened regression findings show a statistically significant negative association between size and reinsurance and efficiency. Furthermore, it displays a statistically significant positive. The relationship between age competence and productivity also suggests that the 2008 global financial crisis did not have a significant impact on the effectiveness and productivity of the Indian non-life insurance business. The shortened regression findings show a statistically significant negative association between size and reinsurance and effectiveness. Additionally, it demonstrates a statistically significant beneficial age efficiency link.

Moreover, (Cummins, Rubio-Misas and Vencappa 2017) investigated the effectiveness, competition, and stability of the European life insurance markets. The post-regulation period, which stretched from 1999 to 2011, was used to analyse 10 European Union (EU) life insurance markets. Insurer solvency

in the EU life insurance market is aided by insurer competition, which the study found to be an effective way of fostering dependability and efficiency. Furthermore, weaker insurers benefit more from competition than stronger ones do. Cummins, Rubio-Misas and Vencappa (2017) studied the UK's evidence on the macroeconomic variables' role in a company's performance: the total sample and five of six industries. The selection revealed that macroeconomic circumstances should be combined when forecasting company performance. The study also shows which macroeconomic variables have considerable analytical skills in forecasting the connection.

2.11 Local evidence

(Musah, Kong and Mensah 2019) investigated the relationship between the Ghana Stock Exchange's (GSE) non-financial enterprises and their operational effectiveness. The purpose of the study was to establish a connection between working efficiency and the businesses' economic performance as measured by ROA, to observe the joining between working efficiency and the businesses' financial performance as measured by ROE, and to determine the connection between working efficiency and the businesses' financial performance as measured by ROCE. Information was gathered from published and audit reports of fifteen (15) listed non-financial corporations from 2008 to 2017. Working efficiency was examined using the Pearson product-moment correlation coefficient, which had a negligibly different connection from the companies' economic performance as determined by ROCE. Working efficiency was negatively associated with the company's financial performance measured by ROA.

Moreover, (Mwaura 2017) studied the affiliation among companies' financial performance and investment structure in the Nairobi Securities Exchange. It was decided to do descriptive research. 47 non-financial enterprises registered on the NSE were the study's sample. Software called SPSS was used to analyse the data. Operating effectiveness, Leverage, Profitability, and Size were utilized as the study's four independent variables. It found that among non-financial enterprises listed on the NSE, the investment structure changed by 4.4%. The size of the non-financial listed companies and economic success are positively correlated. Productivity and financial performance are positively correlated, and there is a logical positive relationship between leverage and corporate financial performance.

Furthermore, (Mitra and Adhikary 2017) examined the textile division's Dhaka Stock Exchange (DSE) economic performance. The study reveals that factors such as profit margin (PM) and asset turnover (ATO) have meaningfully inspired a company's ROA, whereas cash holding, leverage, and age deter the same. In contrast, ROA has no correction with capital, expenditure, sponsor shareholding, and size. (Deyganto and Alemu 2019) studied the factors distressing insurance businesses' financial performance in Hawassa city management, Ethiopia. The study used 17 insurance companies functioning in Ethiopia. Out of the seventeen insurance companies, 6 public insurance businesses were selected with 10 years of inspected financial statements from 2008 to 2018. The study revealed that out of 8 descriptive variables incorporated in the model, five variables, such as premium, underwriting, inflation, solvency ratio, and the growth rate of the gross domestic product, significantly affect the economic performance of the insurance companies. The study reveals that insurance businesses are averagely generating positive ROA.

Moreover, (Ayuba *et al.* 2019) studied the effects of asset structure and company Size on organizations' value and financial performance of insurance businesses in Nigeria. The study enclosed six years period from 2012 – 2017. The study commends that policyholders of insurance businesses in Nigeria should only use short debt in their assets to improve companies' worth and that insurance businesses should cease using long-term debt. It decreases the company's weight and reduces the stockholders' equity volume.

2.12 Evidence for each of the variables used.

This table is to get a better understanding of the variables used and their findings.

Table 2.1: Premium Growth Rate

No	Authors	Year	Country	Findings
1.	Shawar and Siddiqui	2019	Pakistan	The result discovered that the gross written premium significantly affects all three profitability measures (Shawar and Siddiqui 2019).
2.	KO Deyganto and Alemu	2019	Ethiopia	The research revealed that Premium has a major impact on the financial health of insurance providers doing business with Hawassa city Administration (Deyganto and Alemu 2019).
3.	(Kusi *et al.* 2020)	2019	Ghana	The result revealed Premiums have an irrelevant effect on insurer profitability (Kusi *et al.* 2020).
4.	Guendouz and Ouassaf	2018	Saudi Arabia	The regression results show that the profitability of insurance Takaful companies is greatly impacted by the written premium growth rate (Guendouz and Ouassaf 2018).
5.	N Ishtiaq and Siddiqui	2019	Pakistan	The findings of this study indicate that net premium has a negligible or adverse relationship on Pakistani Life Insurance Company's financial success (Ishtiaq and Siddiqui 2019).
6.	(Jibran *et al.* 2016)	2016	Pakistan	The results show that premium growth is critical in determining the companies' profitability (Jibran *et al.* 2016).
7.	(Kristanti, Nur Syafia and Aripin 2021)	2021	Indonesia	The result shows that premium growth significantly negatively affects the life insurance company (Kristanti, Nur Syafia and Aripin 2021).

No	Author	year	country	Findings
8.	O Adurrahman and E Cankal	2020	Turkey	The result shows there is a negative premium growth rate In Turkey non -life insurer profitability (Abdurrahman and ÇANKAL 2021)
9.	(Zainudin, Ahmad Mahdzan and Leong 2018)	2018	Asia	The study shows that premium growth is an insignificant predictor of the profitability performance of insurance companies (Zainudin, Ahmad Mahdzan and Leong 2018).
10.	(Tarsono, Ardheta and Amriyani 2020)	2020	Indonesia	The study revealed that Net Premium Growth does not significantly influence financial performance (Tarsono, Ardheta and Amriyani 2020).
11.	K Ortynski	2016	Poland	The study confirmed a statistically significant and favourable association between the macroeconomic variable (rate of GDP) and the favourable effect of the motor gross written premiums ratio variable on the profitability ratio of technical activity (Ortyński 2016).
12.	Ullah,Faisal and Zuhra	2016	Bangladesh	The study revealed that premium growth has a significant impact on ROA (Ullah, Faisal and Zuhra 2016).
13.	Dweiand Mahfudz	2016	Indonesia	The study shows that the premium growth ratio does not significantly affect the insurance company's financial distress (Dewi and Mahfudz 2016).
14.	M Negash, K venugopal & S Asmare	2018	Ethiopia	The finding shows that most factors strongly correlate to non-life insurance gross premium developing country perspective (Negash, Venugopal and Asmare 2018).

The summary of the premium growth rate from the (Table 2.1) revealed that the premium growth rate significantly affects the financial performance of non-life insurance companies in Pakistan, Ethiopia, Saudi Arabia, Indonesia, Poland, and Bangladesh. This effect could be attributable to a rise in premium growth rate, which indicates that the company is expanding. When internal resources are no longer sufficient to cover all the costs associated with asset potential, rising organizations typically look for outside funding to maintain their growth position. The premium growth rate, however, has no discernible

impact in Ghana, Pakistan, Indonesia, or Asia, suggesting that business rates have declined in those nations.

Table 2.2: Profitability (ROA)

No	Authors	Year	Country	Findings
1.	Oyetayo and Olufemi Adebowale Abass	2021	Nigeria	The study discovered that underwriting capacity variables (reserves, reinsurance utilization, and shareholders' funds) jointly significantly impact the financial performance of non-life insurance. However, the individual check of the variables showed reserve has no significant influence on financial performance (Abass, Dansu and Oyetayo 2021).
2.	WI Kusumastuti and Alam	2019	Indonesia	The results of this study indicate that the operating cost of operation income variable significantly affects ROA (Kusumastuti and Alam 2019).
3.	MK Sihotang and U Hasanah	2022	Indonesia	The study's findings show that, at a significance level of 0.628, inflation as an external factor has no discernible impact on the profitability of Islamic Commercial Banks as evaluated by the Return on Assets (ROA) ratio, however the money supply considerably influences ROA. (Sihotang, Hasanah and Hayati 2022).

No	Author	Year	Country	Findings
4.	TP Kramaric ,I Pavic and M Miletic	2019	Croatia	The analytical results for both models show that market share is a statistically significant predictor of the performance of the insurance industry, having a negative impact on performance. Additionally, insurance density has a statistically significant and advantageous impact on technical activity performance as determined by the profitability ratio (Kramaric, Pavic and Miletic 2019).
5.	Anshori, Fasila and Muttaqiin	2020	Indonesia	The results show that three variables— such as Loan to Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and Net Interest Margin (NIM)— have a positive effect on Return on Assets (ROA). On the contrary, the two variables, such as Non-Performing Loans (NPL) and Operational Efficiency Ratio (BOPO) do not affect Return on Assets (ROA) (Anshori, Fasila and Muttaqiin 2020).
6.	F Weqar, AM Khaa, M.A Raushan and S.M Imamul Haque	2020	India	The results reveal an insignificant association with profitability. In the case of productivity, all the components of intellectual capital have an insignificant effect on the financial companies of India (Weqar *et al.* 2021).

No	Author	Year	Country	Findings
7.	O EL-Ansary and H AL-Gazzar	2021	Egypt	Using ROA as a proxy for profitability, the findings show that Net Working Capital levels had a nonlinear impact on profitability. When ROE was used as a proxy for profitability, however, the results were not significant. Results also indicate that there are no interactions between Net Working Capital, cash levels, and profitability proxies (El-Ansary and Al-Gazzar 2021).
8.	J Caby, Y Ziane and E Lamarque	2022	France	According to the research, banks' profitability is significantly and favourably impacted by the carbon disclosure project score and board interest. This shows that effective climate change management and transparency have a positive impact on the board of directors' ex-post justification of the subject's importance and overall profitability. (Caby, Ziane and Lamarque 2022).
9.	F Owusa-Sekyere	2019	Ghana	It discovered that monetary assets and company size positively affect returns (ROA and ROE) whilst debt and fixed assets negatively affect returns. Comparing monetary assets and size, the size contributed more to profitability(Owusu-Sekyere 2019).

No	Author	Year	Country	Findings
10.	AFP Hasibuan, I Sadalia and I Muda	2020	Indonesia	It was found that the operating expense and claim ratios have negative and significant influence on profitability. On the other hand, the retention rate has a beneficial but negligible impact on profitability. Retention rate, operational expenditure ratio, and claim ratio all have a big impact on a company's profitability (Hasibuan, Sadalia and Muda 2020).
NO	**Author**	**Year**	**Country**	**findings**
11.	FU Ansari	2020	Indian	Each independent variable was shown to be significant and to contribute to the variation in the ROE in this study. As profitability is positively associated, highly impactful, and contributes to a significant amount of variation in the ROE, it is the primary factor that determines how profitable an IT company is. Additionally, the association between a company's leverage and efficiency and ROE is both positive and considerable, whereas the relationship between liquidity and ROE is notably negative. In general, a company's ROE might vary depending on its profitability, leverage, efficiency, and liquidity (Ansari 2020).

12.	Hussanie and BA joo	2019	Indian	The findings show that factors like as liquidity, loss ratio, investment performance, operating margin, premium growth, and tangibility play an important role in determining the profitability of Indian life insurers as determined by ROA. Leverage, commission ratio, and scale, on the other hand, have no bearing on explaining profitability as determined by ROA (Ansari 2020).
13.	S Nurlaela, B Mursito and E Kustiyah	2019	Indonesia	The findings of the t-test demonstrate a substantial relationship between financial performance (return on assets) and the capital structure variables debt to equity ratio (DER), liquidity current ratio (CR), and asset turnover (TATO) (Nurlaela *et al.* 2019).
14.	MA Ali, M Shuib and AM Nor	2021	Malaysia	According to the study's results, Islamic banks' asset quality and operational effectiveness have a big impact on their financial performance as measured by ROA and ROE. In light of this, the study's results demonstrate the significance of good management techniques for safeguarding Islamic banks' wealth and their financial performance (Ali, Shuib and Nor 2021).

A summary of the Profitability (ROA) from Table 2.2 revealed that profitability is significant to the financial performance of non-life insurance in Indonesia, Croatia, France, Ghana, and Malaysia, which

means that the profitability of the non-insurance corporation is vital to its survival, growth, and competitiveness. It displays how the countries' non-life insurance creates profit by utilizing all available resources. Nigeria, Indonesia, India, and Egypt do not have significate to profitability (ROA) implies that a business is not correctly applying its wealth and may have doubtful organization. A company with undesirable ROA is capitalizing a lot of capital into its production and instantaneously getting little revenue.

TABLE 2.3: SIZE OF THE COMPANY

A summary of the size of the company (Table 2.3) revealed that the size of a company is significant to its performance in the following countries Indonesian, Indian, Pakistan, Northern Macedonia, Ethiopian, Canada, Saudi Arabian, Asian Kenya, Nigeria, and Zimbabwe which means the more its positively affects economic performance in various ways. Big-size insurance organizations can easily employ talented employees with professional knowledge. At the same time, in some countries like Pakistan and Ethiopia, the company's size does not significantly affect its performance. However, it isn't easy to measure insurance companies' size precisely before the total assets' logarithm is used as a directive for insurers companies.

TABLE 2.4: LEVERAGES

No	Author	Year	Country	Findings
1.	AS Alarussi, SM Alhaderi	2018	Malaysia	The result shows a negative relationship with profitability (Alarussi and Alhaderi 2018) .
2.	PH Nguyen, JF Tsai and VT Nguyen	2020	Vietnamese	The results showed that leverage ratios significantly impact retail companies' financial performance(NGUYEN *et al.* 2020).
3.	CF Egbunike and CU Okerekeoti	2018	Nigeria	The study revealed that leverage was significant in financial performance (Egbunike and Okerekeoti 2018).
4.	C Dioha, NA Mohammed, J Okpanachi	2018	Nigeria	The results show that leverage significantly affects profitability (Dioha, Mohammed and Okpanachi 2018).
5.	YN Elshabasy	2018	Egypt	The findings found an insignificant relationship with companies leverage(Elshabasy 2018).
6.	M Umar, G Sun	2018	China	The findings revealed that leverage is a significant determinant of non-profit loans in Chinese (Umar and Sun 2018).
7.	BW Mazviona, M Dube and T Sakahuhwa	2017	Zimbabwe	The findings revealed that leverage positively affects insurance companies' performance (Mazviona, Dube and Sakahuhwa 2017).

No	Author	Year	Country	Findings
8.	TS Msomi	2022	South Africa	Leverage and financial performance were found to have a weakly negative relationship, according to the study (Msomi 2022) .
9.	FO Sporta	2018	Keyan	The study showed a strong correlation between leverage and operational effectiveness on financial performance, with operational effectiveness being the most important factor in determining financial hardship on the financial performance of commercial banks in Kenya (Sporta 2018).
10.	AO Efuntade and AO Akinsola	2020	Nigeria	The study revealed that Leverage) was strongly and significantly associated with the dependent variable (Return on Asset) (Efuntade and Akinola 2020).
11.	CF Egbunike and CU Okerekeoti	2018	Nigeria	The finding revealed that significant effect on inflation of the financial performance of a companies in Nigeria (Egbunike and Okerekeoti 2018).
12.	N Ishtiaq and DA Siddiqui	2019	Pakistan	The results of this study demonstrate that the financial performance of Pakistani Life Insurance Company is not significantly or even negatively correlated with insurance leverage. (Ishtiaq and Siddiqui 2019).
13.	A Derbali and L Jamel	2018	Tunisia	The study shows that leverage does not affect Tunisian insurance companies' performance (Derbali and Jamel 2018).
14.	RG Ng'ang'a	2018	Keyan	The study revealed that leverage had a positive and significant relationship with the financial performance of insurance companies (Ng'ang'a 2018).
15.	P Acharya	2021	Nepal	It is found that the leverage ratio significantly impacts profitability (ROE). Whereas leverage ratio significantly negatively impacts profitability (ROA)(Acharya 2021).
16.	O Adurrahman and E Cankal	2020	Turkey	The study revealed a negative relationship between Turkey's leverage ratio and non-life insurer profitability (Abdurrahman and ÇANKAL 2021).

No	Author	Year	Country	Findings
17.	A Nusantara, D Priantinah	2021	Indonesian	The study shows that Leverage does not positively affect established insurance companies' profitability. Leverage does not positively affect Islamic insurance companies' profitability (Nusantara and Priantinah 2021).
18.	M Birhan	2017	Ethiopia	The result shows leverage is a significant determinant of profitability(Birhan 2017).
19.	AM Burca	2014	Romania	The study demonstrates that insurance financial leverage has a negative impact on the financial performance of insurers and can indicate the possible impact of technical reserves' deficiency on equity in the event of unexpected losses (Burca and Batrinca 2014).
20.	LW Mwangi, MS Makau and G Kosimbei	2014	Kenya	The study results revealed that financial leverage had a statistically significant negative association with performance as measured by return on assets (ROA) and return on equity (ROE)

Summary of the Leverage (Table 2.4) showed that leverage had a big impact on how well Vietnam, Nigeria, China, Zimbabwe, Kenya, Nepal, Ethiopia, and Romania did financially. The ratio of total debt to total assets is shown to be significantly more vulnerable to financial crises than the ratio of long-term debt, indicating that the amount of liabilities used to finance the assets of a specific organization with appreciably more debt than equity is highly leveraged. Malesia, Egypt, South Africa, Pakistan, Tunisia, Turkey, and Indonesia are among the nations where profitability is predicted to suffer due to the leverage ratio. But if an insurer increases its debt, its risk might increase.

TABLE 2.5: LIQUIDITY

No	Author	Year	Country	Findings
1.	A Batool and Asahi	2019	Pakistan	The findings discovered that it positively affects the financial performance in UK&USA(Batool and Sahi 2019).
2.	R Zainudin, NS Ahmad Mahdzan	2018	Asian	Liquidity is an insignificant predictor of the profitability performance of insurance companies
3.	AS Alarussi, SM Alhaderi	2018	Malaysia	Liquidity has no significant relationship with profitability(Alarussi and Alhaderi 2018) .

No	Author	Year	Country	Findings
4.	CF Egbunike and CU Okerekeoti	2018	Nigeria	The study revealed that liquidity has a significant effect on financial performance (Egbunike and Okerekeoti 2018)
5.	C Dioha, NA Mohammed, J Okpanachi	2018	Nigeria	According to the study, liquidity had little to no effect on the profitability of Nigerian consumer product companies that were publicly traded (Dioha, Mohammed and Okpanachi 2018).
6.	BW Mazviona, M Dube and T Sakahuhwa	2017	Zimbabwe	The study revealed that liquidity affects performance positively (Mazviona, Dube and Sakahuhwa 2017).
7.	TS Msomi	2022	South Africa	The study revealed that there is a positive association between liquidity and financial performance (Msomi 2022).
8.	FO Sporta	2018	Kenyan	The study revealed a significant relationship between liquidity and capital adequacy as financial distress factors on financial performance, with operational efficiency being the most significant determinant of financial distress on the financial performance of commercial banks in Kenya (Sporta 2018).
9.	AO Efuntade and AO akinsola	2020	Nigeria	The study shows that liquidity was significantly associated with the dependent variable (Return on Asset). (Efuntade and Akinola 2020).
10.	T Chandran, AT Junaedi, S Suharti and E Wijaya	2019	China	The finding founds that liquidity has no significant effect on profitability and stock returns (Chandra *et al.* 2019).
11.	D Hapsoro and ZN Falih	2020	Indonesia	The study showed that companies liquidity positively and significantly affected companies (Hapsoro and Falih 2020).

	Author	Year	Country	Findings
12.	N Ishtiaq and DA Siddiqui	2019	Pakistan	The study shows that independent variables such as liquidity are positively and significantly related to life insurance companies in Pakistan (Ishtiaq and Siddiqui 2019).
13.	A Derbali and L Jamel	2018	Tunisia	The study shows that liquidity does not affect Tunisian insurance companies' performance (Derbali and Jamel 2018).
14.	FT Kristanti, NM NurSyafia, Z A ripin	2021	Indonesia	The study shows that Liquidity did not significantly affect the probability of a company's financial distress (Kristanti, Nur Syafia and Aripin 2021).
15.	IA Mugetha	2019	Kenyan	The study found a positive and significant relationship between liquidity and the financial performance of financial and non-financial companies (Mugetha 2019).
16.	P Acharya	2021	Nepal	The study found a weak positive but insignificant relationship between liquidity and ROE, whereas there is a weak negative but insignificant relationship between liquidity and ROA (Acharya 2021).
17.	O Adurrahman and E Cankal	2020	Turkey	The result shows that liquidity is statistically significantly positive with Turkey's profitability (Abdurrahman and ÇANKAL 2021).
18.	M Birhan	2017	Ethiopia	The result shows that Liquidity has medium significant profitability determinants (Birhan 2017).
19.	Kimathi A. G	2022	Kenya	The study revealed that liquidity has a negative and marginally significant effect on the performance of general insurers in Kenya (Kimathi 2022).
20.	TA Berhe and JKaur	2017	Ethiopia	The study found that one of the key elements that has a substantial impact on insurance businesses' profitability is the liquidity ratio (Berhe and Kaur 2017).

A summary of the studies on Liquidity (Table 2.5) revealed that liquidity is significant in these countries Pakistan, Ethiopia, Nigeria, Zimbabwe, South Africa, Kenya, Indonesia, and Turkey means that the insurer can meet its short-term responsibilities when needed and also can change its resources into currency as quickly as thinkable. In contrast, the countries like Asia, Malaysia, chain, Tunisia, Indonesia, Nigeria, and Nepal with insignificant means a low liquidity ratio indicates an insurer's difficulties meeting its temporary responsibilities. On the other hand, a tremendously high liquidity proportion might mean that the insurer owns idle money that could have produced revenue by investing in a money-making venture.

TABLE 2.6: GROSS DOMESTIC PRODUCT

No	Author	Year	Country	Findings
1.	Shawar and Siddiqui	2019	Pakistan	This study revealed that GDP is insignificant (Shawar and Siddiqui 2019).
2.	KO Deyganto and AA Alemu	2019	Ethiopia	The study revealed that GDP significantly affects financial performance (Deyganto and Alemu 2019).
3.	SA Asongu and NM Odhiambo	2020	South Africa	According to the findings, GDP must reach a certain level in order for non-life insurance to have an impact on the economy (Asongu and Odhiambo 2020) positively.
4.	MH Kantakji, andB Abdul Hamid	2020	Takaful	The study finds that gross domestic product per capita is a statistically significant determinant of financial performance, whereas gross domestic product is negatively related to performance (Lin *et al.* 2019).
5	T Shanko, MA Timbula, T Mengesha	2019	Ethiopia	The study showed that gross domestic product has a statistically significant and positive relationship with banks' profitability(Shanko, Timbula and Mengesha 2019).
6	KO Deyganto and AA Alemu	2019	Ethiopia	The finding revealed that GDP significantly affects the financial performance of insurance companies (Deyganto and Alemu 2019).

No	Author	Year	Country	Findings
7	M Umar, G Sun	2018	Chain	The study revealed that gross domestic product is a significant determinant of non-profit loans in Chinese banks (Umar and Sun 2018).
8	CF Egbunike and CU Okerekeoti	2018	Nigeria	The study revealed a significant effect on the gross domestic product on return on financial asset performance (Egbunike and Okerekeoti 2018).
9	M Meko, K Lemie and A Worku	2019	Ethiopia	The study revealed that GDP per capita has an insignificant effect on life insurance demand in Ethiopia (Meko, Lemie and Worku 2019).
10	N Ishtiaq and DA Siddiqui	2019	Pakistan	The findings of this study indicate that GDP is either not significantly correlated with Pakistani Life Insurance Company's financial success or that it is negatively correlated (Ishtiaq and Siddiqui 2019).
11	O Adurrahman and E Cankal	2020	Turkey	The result statistically shows a significant positive with Turkey's GDP growth rate (Abdurrahman and ÇANKAL 2021).
12	F Nyamu	2016	Kenya	The study found that GDP is an insignificant positive relationship with the financial performance of insurance companies(Nyamu 2016).
13	N Data	2016	Philippines	The study has no evidence found in the Gross Domestic Product (GDP) on profitability in ROA(Datu 2016).
14	I Ahmad	2017	Pakistan	The study revealed a significant positive association with GDP in the financial performance of non-life.

The summary of the study on Gross Domestic Product (Table 2.6) revealed in these countries like Ethiopia, South Africa, Takaful, Chain, Nigeria, and Pakistan is significant to their financial performance means that there is a proportion change in intangible assets or a proportion change in rewards, which is predictable to be positively linked to productivity. Generally, it is one of the primary external indicators used to measure financial health. At the same time, in the countries like Pakistan, Kenya, and the Philippines, their Gross domestic product is not significant in financial performance, which implies that poor monetary conditions would deteriorate the superiority of the finance portfolio. However, if the gross domestic product produces, the probability of marketing insurance strategies would also increase, and insurers are likely to benefit from that in the form of increased profits (Ahmad 2017) .

TABLE 2.7: INFLATION

No	Author	Year	Country	Findings
1.	KO Deyganto and AA Alemu	2019	Ethiopia	The findings revealed that the inflation rate has a significant effect on the financial performance of insurance companies (Deyganto and Alemu 2019)
2.	M Balcilar, R Gupta and CC Lee	2020	China	The findings show that inflation lowers insurance premiums(Balcilar *et al.* 2020).
3.	CF Egbunike and CU Okerekeoti	2018	Nigeria	The finding revealed a significant effect on the inflation of a companies' financial performance in Nigeria (Egbunike and Okerekeoti 2018).
4.	N Ishtiaq and DA Siddiqui	2019	Pakistan	The study revealed that independent variable such as inflation is positively and significantly related to insurance companies in Pakistan (Ishtiaq and Siddiqui 2019).
5.	CF Egbunike and CU Okerekeoti	2018	Nigeria	The finding revealed that significant effect on inflation of the financial performance of a companies in Nigeria (Egbunike and Okerekeoti 2018)
6.	F Nyamu	2016	Kenya	The study found that inflation is an insignificant negative relationship between the financial performance of insurance companies (Nyamu 2016)
7.	N Data	2016	Philippines	The study revealed no evidence found in the inflation rate on profitability in both ROA (Datu 2016).

No	Author	year	Country	Findings
8.	I Ahmad	2017	Pakistan	According to the study, inflation has a negative impact on financial performance, but only unemployment has a statistically meaningful impact.
9.	WJ Daare	2016	India	The study revealed that inflation found statistically significant factors determining insurance companies` profitability in India (Daare 2016; Ahmad 2017).
10.	MNA Siddik,ME Hosen, MF Miah and S Kabiraj	2022	Bangladesh	The study revealed that inflation remarkably adversely influences profitability (Siddik *et al.* 2022).
11.	TA Berhe and JKaur	2017	Ethiopia	The study revealed that the inflation rate had an insignificant effect on insurance companies' profitability (Berhe and Kaur 2017).

The summary of the Inflation (Table 2.7) revealed that inflation is significant to the financial health of these countries like Ethiopia, Nigeria, Pakistan, and India, implying that it can positively or negatively affect profitability, depending on whether or not inflation is expected. Inflation is regularly defined as a state where “too sufficient currency is chasing after insufficient goods.” Whenever inflation occurs, currency losses purchasing power like these counties Pakistan, Kenya, and the Philippines.

2.13 Theoretical framework

This study was guided by the Economic Efficiency theory and Financial Performance theory,

2.13.1 The Economic Efficiency

The economic efficiency states that companies should achieve their output at the lowest possible cost per unit produced (Taylor 2023). This idea states that economies of scale can be used to produce optimal production. Because of this, in the near term, optimum operational efficiency is obtained at the level of output where all available economies of scale are utilizing such efficiency (Barr 2020). Increasing the capacity of current systems can, in the long run, boost their maximum degree of productive efficiency. An organization in which non-life insurance are not excluded is, therefore, economically efficient if firstly, no additional output can be obtained without increasing the amount of input and secondly, if the production proceeds at the lowest possible cost per unit (Barr 2020).

Economic efficiency theory has two different points of view, including allocative or price efficiency, which contends that all non-life insurance products must have optimal prices in order for them to operate at an efficient level (Ndlovu 2021).

Using economic efficiency theory provides a structured framework for assessing the operational efficiency and financial health of non-life insurance companies in South Africa, enabling stakeholders to make informed decisions and promote the efficient allocation of resources within the industry.

2.13.2 Financial Performance Theory

Financial performance is a gauge of how effectively a company uses the resources from its main line of business to create revenue (Kenton 2022) . If a corporation is using its assets better than its peers or competitors, it might be judged to be performing well from the standpoint of financial performance, which is defined as a subjective judgment of how well an organization uses assets to earn and accumulate revenues (Morara and Sibindi 2021). Financial performance can be measured in several fundamental ways. These can be expressed as financial ratios that are used to evaluate performance by concentrating on the financial statement of the organization. (Kliestik *et al.* 2020); the cash flow, balance sheet, and income statement The main measures used in such an assessment are the estimated returns on equity (ROE) and return on assets (ROA) (Collins 2022).

Why financial performance theory in this study, it is because its emphasizes the importance of profitability as a key indicator of a company's financial health. By analysing metrics such as return on equity (ROE), return on assets (ROA), and underwriting profitability ratios, analysts can assess how effectively non-life insurance companies in South Africa are generating profits from their operations. Higher profitability indicates efficient underwriting practices, effective cost management, and sound investment strategies.

2.11 Conceptual Framework

A conceptual framework is a chart that shows how variables are connected in this study. The conceptual framework of both internal and external variables is presented below

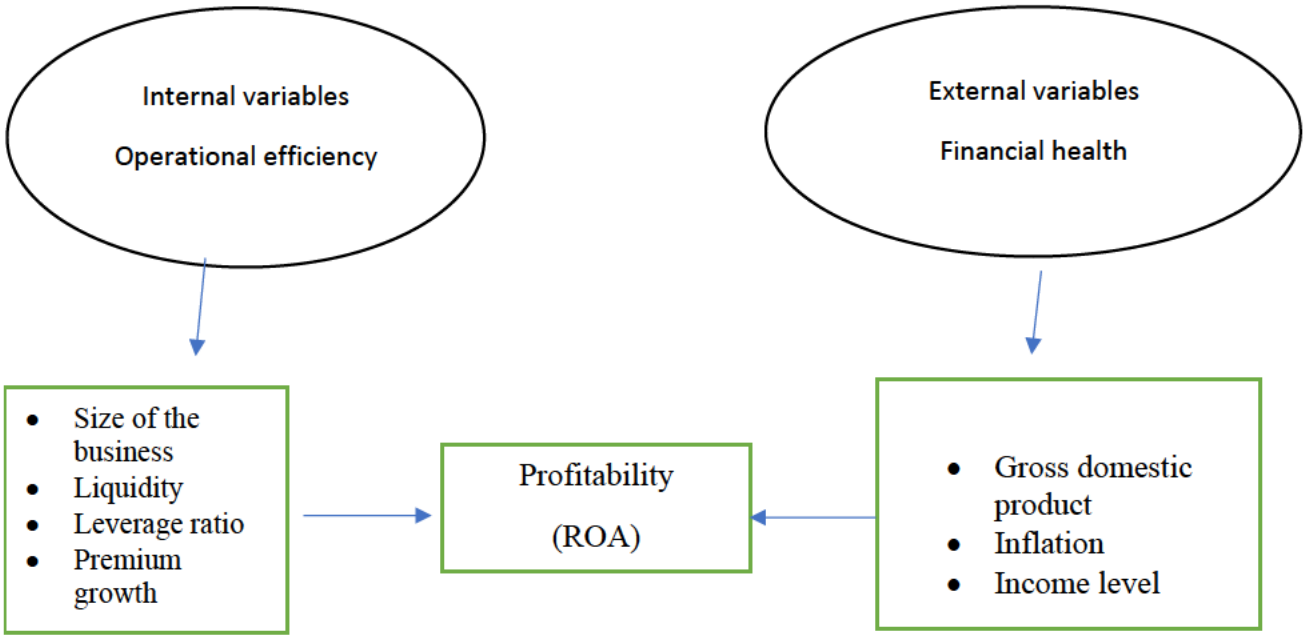

FIGURE 2.5: **A CONCEPTUAL FRAMEWORK IS A CHART THAT SHOWS HOW VARIABLES ARE CONNECTED**

Source:(Painter 2019).

2.12 Summary of Literature Review

This chapter started by exploring the concept of operational efficiency and the link between operational efficiency and financial health. The theoretical survey indicated that operational efficiency is one of the determinants of non-life insurance companies. It's important to note that the success of insurance companies is influenced by a combination of factors, and different experts or stakeholders might prioritize different elements. While operational efficiency is undoubtedly important, other factors like underwriting expertise, risk management, investment performance, customer service, and regulatory compliance also play critical roles. Its effect on operational efficiency showed that few studies had been conducted on these issues in developing countries, especially in South Africa. Most of these studies identified factors such as inflation, size, leverage, gross domestic product, and liquidity structure as significant determinants of financial performance. However, it was observed that most existing studies focused only on the developed economy using the econometric parametric approach, including thick frontier, distribution-free approach, stochastic frontier analysis, non-parametric approaches, free disposable hull analysis, and DEA. While Stochastic Frontier Analysis (SFA), Data Envelopment Analysis (DEA), and CARAMEL are the most popular for measuring operational efficiency in insurance companies (Abidin and Cabanda 2011; Ghimire 2013). Many studies have not focused on the operational efficiency of non-life insurance companies unlike non-life insurance companies in developing countries.

The linear link between the dependent and independent variables method has clearly been overlooked, according to a review of the literature on the financial performance and effectiveness of non-life insurance in different economies. This method was only occasionally used in investigations (Kozak 2011; Ghimire 2013; Msomi 2023). Efficient operations result in cost savings, quicker response times, and improved customer satisfaction. Implementing advanced technologies, such as automation and data analytics, can further enhance operational efficiency by reducing manual errors and increasing productivity. And financial health encompasses various factors, including profitability, liquidity, solvency, and risk management. Profitability measures, such as return on equity and underwriting profitability ratios, indicate the company's ability to generate profits from its core operations. Adequate liquidity ensures that the company can meet short-term obligations, such as claims payments and operating expenses. Solvency measures assess the company's ability to absorb losses and maintain financial stability over the long term. Effective risk management practices mitigate various risks, including underwriting, investment, and operational risks, safeguarding the company's financial health.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter deals with the validity of the research instrument, an explanation of how each objective of this study will be achieved, measurement of variables, data analysis techniques, specification of the models and the result expectation of the explanatory variables**.**

3.1 Research Design

The goal of this study was accomplished by using a descriptive research approach. Panel data from 2008 to 2019 was used for this study. This panel data provides more insightful data because it combines cross-sectional and time-series information, which both capture individual inconsistency and active modification. As a result of how badly the 2008 Global Financial Crisis affected the insurance industries, 2008 was chosen (Kotz 2009). On December 31, 2019, Wuhan City in China's Hubei Province reported many instances of pneumonia. A week later, Chinese authorities said that they had discovered a brand-new virus, which they are currently referring to as the 2019 Novel Coronavirus. The infection has spread across 114 countries, leading to a global shutdown that affected all areas of human life, which is the reason that this study's panel data stopped at the year 2019 (Sharma, Sharma and Singh 2020).

3.2 Data Source and Collection Methods

This study used secondary data from S&P CapitalIQ and Refinitiv Eikon, well-known databases with readily available data. They provide data reliability, in-depth financial information on companies, equities, fixed income, industry reports, SEC filings, interest rates, commodities, and screening for stocks and mutual funds. The data sources include publications: S&P Analysts Handbook, S&P Bond Guide, S&P Corporation Records, S&P Stock Reports, Stovall Sectors, and provide sophisticated retrieval tools to create reports (Intelligence 2023)

3.3 Sampling Design

This study involves all the non-life insurance companies in South Africa as the study population. However, insurers with a less than R38167 million turnover in 2019 were not included in the data analysis (Magazine 2020). In this light, the sample of this study focuses on 32 non-life insurance companies with measurable markets of the 57 domestic non-life insurance providers in South Africa(SAIA South Africa 2021). These companies form the basis of the data to analyse South African insurance companies' operational efficiency and financial stability. The year 2008 was chosen because insurance industries were distressed due to the 2008 global financial crisis. The choice of these years is founded on South Africa's insurance sector being overwhelmed since the 2008 worldwide monetary calamity, which has had a severe influence on South Africa. The international monetary collapsed in 2008/09 for the first time in 19 years (Rena 2017). Approximately a million occupations were lost in 2009 alone, and the joblessness rate remained high at 25%. The study covers 2008 and stops in 2019 because of the infection that started in 2019, called coronavirus. Before the so-called Covid-19, South African insurance companies were already dealing with an economic recession and a rating downgrade.

3.4 Model specification

The study was founded on the theories of Financial Performance and Economic Efficiency. According to the Economic Efficiency Theory, businesses should create their goods and services for the least amount of money per unit (Taylor 2023). According to this theory, economies of scale can be used to produce optimal output. Therefore, in the short-term, the production level at which all available economies of scale are utilizing such efficiency results in the highest operational efficiency (Barr 2020). The optimal degree of service efficiency can eventually be increased by expanding the capacity of current systems. Therefore, a non-life insurance-exempt organization is economically effective if, firstly, no extra output can be achieved without increasing the amount of input; and secondly, if production proceeds at the lowest possible cost per unit (Barr 2020).

How effectively a company can utilise resources from its major business mode and generate income can be measured subjectively by its financial performance. (Kenton 2022) states that if a corporation is using its assets better than its peers or competitors, it might be regarded to be performing well from a financial performance standpoint. This is specified as a subjective evaluation of how successfully an organization uses assets to produce and accumulate revenues (Morara and Sibindi 2021). The important indicators used in such an evaluation are estimates of return on equity (ROE) and return on assets (ROA) (Collins 2022).

There are two perspectives of Economic Efficiency theory, namely allocative or price efficiency, which states that for non-life Insurance to operate efficiently, all non-life insurance products must be priced optimally (Ndlovu 2021).

For this investigation, there are two model requirements. The first is the mode for the operational efficiency factors from the chosen non-life insurance businesses. The financial performance hypothesis, which is the second, is simultaneously specified as financial health.

3.4.1 Determinants of operational efficiency of non-life Insurance companies

The following model was specified to measure the factors that determine operational efficiency.

To achieve **Objective One**:

$$Yit=\beta 0+\beta_1 X_{it}.....+\beta nXnt+\varepsilon_{it} \text{ ----------(1)}$$

Where Y = is the value of the dependent variable; β0 − n = are the coefficients; X = are the independent variables; εit = is the residual error of the regression; i = the total number of companies in the data set and t is the period.

Hence, the model is as follows:

$$TLA_{it}= \alpha_0+ \beta_1 PR_{it} + \beta_2 LY_{it} + \beta_3 SE_{it} + \beta_4 LV_{it} + \beta_5 OE_{it} + \epsilon_{it} \text{ ---------- (2)}$$

TLA stands for financial health; PR stands for profitability; LY stands for liquidity; SE stands for Size; LV stands for the leverage ratio, and OE stands for operational efficiency.

TLA = Total liabilities/ total assets, PR = profitability measured by ROA, LY = total loans/ Total deposit

SE = Size, LV = Leverage ratio, OE = Total cost/ Total Income, Є = the stochastic error term.

This model was specified to test for the effect of operational efficiency and financial health of non-life Insurance companies.

A priori expectation:

$\beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5 > 0$ but $\beta_6 < 0$

A prior expectation follows the studies of various researchers (Li *et al.* 2020; Mahardika and Ismiyanti 2021; Olulu-Briggs 2023).

3.4.2 Operational Efficiency and financial health

This model was specified to test for the second and third hypotheses of the study.

To achieve objectives 2 and 3:

$Y_{it} = \alpha + \beta_{1x\ it} + \beta_2\ x_{it} + \beta_3\ x_{it} + \beta_4\ x_{it} + \beta_5\ x_{it} + Є_{it}$ ----------(3)

$TLA_{it} = \alpha + \beta_1\ OE_{it} + \beta_2\ SE_{it} + \beta_3\ PG_{it} + \beta_4\ GDP_{it} + \beta_5\ IF_{it} + Є_{it}$ ----------(4)

Where:

TLA = Dependent variable, which is financial health financial performance = Operational efficiencies =Size of companies; Natural log of Total Assets = premium growth, GDP = GDP growth domestics profit, IF = Inflation rate, Є = is the error component or the company I at time t assumed to have to mean zero E [Є it] = 0, α= Constant or interpretation of the parameters, β= 1, 2, 3...8 are the slop of the coefficient or parameters that were estimated.

Y is the proxy of the financial health measured by the operational efficiency ratio using the accounting approach of the measure of financial health, and X is the proxy of the independent variables measured by financial health ($X_1\ X_2\ X_3\ X_4$).

A Priori Expectation:

$\beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5 > 0$

Where $X_{1(\text{ Operational efficiency}),}$ X_2 (Premium growth), $X_{3\ (\text{ Inflation}),\ \text{and}}$ X_4 (Gross Domestic Product) are the proxies of financial health, on a priori, the coefficients of $X_1\ X_2\ X_3$ and X_4 (financial health) are expected to be positive, the credit invested is required positive gross on their financial health. According to (Barua, Barua and Rana 2018; Fernando Fridson and Alvarez 2022), operative management of modernization competence helps to deliver more effective innovations outcomes to generate better performance (Fernando Fridson and Alvarez 2022). A few of the factors impeding the expansion of the Ukrainian insurance market are inefficiency, which is exacerbated not only by a lack of resources but also by a low level of management. The companies' financial situation worries the finance administrators (Pikus, Prykaziuk and Balytska 2018).

A positive relationship is also expected between operational efficiency and financial health, based on the theory of Economic Efficiency and financial performance theory. According to the Economic Efficiency theory, economies of scale can achieve optimal production. Maximum operational efficiency is therefore obtained in the short-run at the output level where all available economies of scale are utilizing such efficiency. (Barr 2020) states that increasing the capacity of current systems will eventually result in a higher degree of service efficiency.

3.5 Approach to research objectives

This section discusses the approaches adopted, from which the research objectives stated earlier were achieved.

Objective One: To examine the significant determinants of non-life operational efficiency. The first approach involves the use of descriptive statistics and a correlation matrix. Specifically, a correlation matrix was used to measure the degree of association between different variables under consideration. However, the researcher moved to the second approach because correlations will not allow one to identify causes from consequences. This involves the use of regression analysis. The regression analysis entails the specification of the functional relationship between operational efficiency and its determinants; parameter estimates were made, and the Hausman test was used as the post-estimation test to justify the estimated model's reliability.

Objective Two: To determine the effect of operational efficiency and financial health of non-life insurance companies in South Africa. To achieve this objective, regression analysis was followed in order to estimate the effect of operational efficiency and financial health. The regression analysis specifies the functional relationship between operational efficiency and financial health. This allows for efficiently considering the endogeneity of independent variables and past realizations of the dependent variable used.

Objective Three: To evaluate the similarity between operational efficiency and the financial health of non-life Insurance companies.

To achieve this objective, static and regression analysis was used to estimate the operational efficiency of non-life insurance companies. Specifically, the fixed effect, a random approach to regression that allows considering the past realizations of dependent variables efficiently, was used.

3.6 Selection and measurement of variables

Accounting ratios have been used to measure variables in studies that examined dependent variables (Susanti, Latifa and Sunarsi 2020). These variables include the profitability performance used to measure the profitability of businesses' performance (Alarussi and Alhaderi 2018; Alsharari and Alhmoud 2019; Dalal and Thaker 2019; Musleh Alsartawi 2020), for instance, return on equity (ROE), return on asset (ROA), and net interest margin (NIM). In terms of being explained by the independent factors for the financial institution, ROA looks to be the dependent variable that is most appropriate (Nwaogwugwu 2020). According to the research, ROA is the best way to measure how effective insurance businesses are at what they do (Abeyrathna and Lakshan 2020; Orazalin and Baydauletov

2020; Tarsono, Ardheta and Amriyani 2020). A financial ratio known as ROE compares the amount of investor stock invested to the profit a company makes (Luo and Lusmeida 2019; Bordeianu and Radu 2020; Purbawangsa *et al.* 2020). As a result, higher ROE demonstrates management's excellent use of shareholders' money (Anik, Chariri and Isgiyarta 2021).

ROA, a profitability measurement, reflects the operational efficiency of the business's management (Kwon and Lee 2019; Pham, Nguyen and Nguyen 2020). In contrast, standard metrics for evaluating the performance of non-life insurance companies include net premiums earned, profitability from annual turnover, underwriting activities, ROE, and return on investment (Njeru 2018; Camino-Mogro and Bermúdez-Barrezueta 2019). These measures can be categorized as investment performance measures and profit performance measures (Kyere and Ausloos 2021). Additionally, ROA has been used to assess the financial health of small-scale enterprises and other non-financial industries to determine their profitability.

3.6.1 Variables measurement

$$\text{TLA (financial health)} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

$$\text{PR = Profitability measured by ROA} = \frac{\text{Profit after tax}}{\text{Total Asset}}$$

$$\text{LY = Liquidity} = \frac{\text{Total Deposit}}{\text{Total Equity}}$$

$$\text{LV = Leverage} = \frac{\text{Total debt}}{\text{Total Equity}}$$

$$\text{OE = Operational efficiency} = \frac{\text{Total cost}}{\text{Total Income}}$$

SIZ= the natural logarithm of total asset for the purpose of the first objective.

GDP= the natural logarithm of total GDP at constant basic price

INF= the yearly rate of inflation

ϵ = Error terms

β_0 = unknown intercept

β_i = Estimated coefficient of independent/control variables

3.7 Data Analysis Techniques

In both correlation and regression analyses, where time series and cross-sectional observations are integrated, the study calls for the use of panel data. However, in analyzing the data to be used for this study, descriptive and inferential statistics were used. The inferential statistics focused on multivariate regression analysis, both static and dynamic approaches. Then, standard error, t-test, and probability

value tests were carried out to test for the estimated parameters' significance and various post-estimation tests.

3.7.1 Regression Estimation Techniques

Four estimation approaches were adopted under regression analysis, namely static, General least square, Fixed effect approach, Random effect approach, and the Hausman to justify the result.

3.7.2 Generalized lease square

This involves the use of models that can be written as:

$Y_{it} = \propto + X_{it}{}'\beta_{it} + \delta_I + \gamma_t + \epsilon_{it}$ …… (5)

Where Y_{it} is the dependent variable, and X_{it} is an m-vector of regressors and ϵ_{it} is the error terms.

for *i*=1, 2…, K cross-sectional units observed for dated periods. t=1, 2…, N.

The $\propto$ parameter represents the overall constant in the model, while the δ_I and γ_t represent cross-section or time-specific effects (random and fixed). Identification obviously requires that the β coefficients have restrictions placed upon them. They may be divided into sets of standards (across cross-section and periods), cross-section and time-specific regressor parameters.

One may view these data as a set of cross-section-specific regressions so that one has K cross-sectional equations, each with N observations stacked on top of one another, as that is the primary characteristic of pooled regression:

$Y_i = \propto I_N + X_i{}'\beta_{it} + \delta_I I_N + I_N\gamma + \epsilon_i$ …… (6)

For I =1…. K where I_N is an N-element unit vector, I_N is the N-element identity matrix and is γ a vector containing all of the periodic effects, γ, = (γ_1, γ_2, ……, γ_N)

3.7.3 Fixed Effect Method

This method considers a model with a single explanatory variable; for each *i*,

$Y_{it} = \beta X_{it} + a_i + \mu_{it}$, ……(7)

t = 1, 2…, N

i=1, 2…, K

Now, for each *i*, average this equation over time. One gets

$\bar{y}_t = \beta_1 \bar{x}_i + a_i + \mu_{I,}$ ……(8)

Where $\bar{y}_{it} = N^{-1} \sum_{t=1}^{N} y_{it,}$ and so, because a_i is fixed over time, it appears in both (7) and (8). If we subtract (8) from (7) for each t, one ends up with:

$\ddot{y}_{it} = \beta_1 \ddot{X}_{it} + \ddot{\mu}_{it,}$ ……...(9)

t = 1, 2……, N

i = 1,2,……,K

Where $\ddot{y}_{it}$ = y_{it} - $\bar{y}_I$ is the time demeaned data on y and similarly for $\ddot{X}_{it}$ and $\ddot{\mu}_{it}$. The fixed effect transformation is also known as the within transformation. The critical thing about equation (10) is that the unobserved effect, a_i has disappeared. This suggests the utilization of estimate (9) by GLS. A GLS estimator based on the time-demeaned variables is called the fixed effect estimator or the within estimator. The latter name comes from the fact that GLS on (9) uses the time variation in y and x within each cross-sectional observation.

The between estimator (random regression) seems biased when a_i is correlated with $x_{i.}$ If one thinks that a_I is uncorrelated x_{it}, it is better to use the random effects estimator (though it all depends on the post-estimation test, that is, Hausman test). The between estimator will be obtained as the GLS estimator on the cross-sectional equation (9) [where we included an intercept, β_0]. The between estimator (random regression) ignores essential information on how the variables change over time. The original model is:

$$\ddot{y}_{it} = \beta_1\ddot{X}_{it1} + \beta_2\ddot{X}_{it2} + \ldots + \beta_k\ddot{X}_{itk} + a_i + \ddot{\mu}_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (10)$$

t = 1, 2,…, N

This study used the time demeaning on each explanatory variable and then did a GLS regression using all time-demeaned variables.

The general time-demeaned equation for each I is

$$\ddot{y}_{it} = \beta_1\ddot{X}_{it1} + \beta_2\ddot{X}_{it2} + \ldots + \beta_k\ddot{X}_{itk} + \ddot{\mu}_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (11)$$

t = 1, 2…, N

which is estimated by GLS.

Under a strict exogeneity assumption on the explanatory variables, the fixed effects estimator is unbiased: roughly, the idiosyncratic error μ_{it} should be uncorrelated with each explanatory variable across all periods. The fixed effects estimators allow for arbitrary correlation between a_i and the explanatory variables in any period, just as with first differencing. As a result of this, any explanatory variable that is constant over time for all i gets swept away by the fixed effects transformation: $\ddot{X}_{it}$ = 0 for all i and t. if x_{it} is constant across t.

3.7.4 Random-Effects Method

In contrast to the fixed effects model, the variation between entities is assumed in the random effects model to be random and uncorrelated (independent) with the predictors or independent variables included in the model. According to (Demiral, Akça and Tekin 2021). Instead of whether or not these effects are stochastic, the key distinction between fixed and random effects is whether or not the model incorporates the unobserved individual effect embedded elements that are linked with the regressors. Random effects are the most suitable if there is a guarantee that variations between entities have some impact on the dependent variable.

Random effects have the benefit of allowing the model to incorporate time-invariant factors like gender. These variables are taken up by the intercept in the model with fixed effects. Described below is the random effects model:

$Y_{it} = \alpha + \beta_i X_{it} + u_{it} + \varepsilon_{it}$ ..... (12)

t = 1, 2,…, N

i=1,2,……, K

Y_{it} = the dependent variable

X_{it} = this represents the independent variables

β_i = the coefficient of the independent variables

α = the unknown intercept for each K specific entity

μ_{it} = this represents between-entity error

ε_{it} = this represents the within-entity error

Random effect assumes no correlation between the entity's error term and the predictors. This implies that time-invariant variables are allowed to play an essential role as explanatory variables. In random effects, it is necessary to identify the particular traits that might or might not have an impact on the predictor variables. The model becomes biased as a result of the issues with missing variables that may or may not be available. We can extrapolate the conclusions from the model's sample by using the model, as well. To choose the best model for the data set, use the Hausman test.

3.8 Summary of the Methodology

This chapter examined the following components: the methodology, the data source, the sample design, the model definition, the factors influencing operational effectiveness, the approaches to the research objectives, the methods for measuring the variables, and the regression estimation techniques employed in this study. The next chapter presents that data analysis for the study.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.0 Introduction

This chapter deals with presenting, analyzing, and interpreting data collected to achieve the study's objectives. To this end, the chapter is divided into the descriptive analysis, determinants of the operational efficiency of non-life insurance companies with secondary data evidence, and the last section will discuss findings from the analyses conducted and their implications.

4.1 Statistical analysis

The variables used for examining the factors that determine operational efficiency are observed in the descriptive analysis for this section. The table represents the average TAL, LY, SE, LV, PAT, OE, and ROE pooled observations at 161, 114 47.5, 407, 278, 45.6, and 6.78, accordingly, for the research period and cross-sectional unit covered. The mean, standard deviation, minimum value and maximum number are all provided in Table 4.1.

Table 1: - Descriptive characteristics of variables

Variable	Obj	Mean	Std.Dev	Min	Max
TLA	315	161	417	.530	279
LY	315	114	254	0.60	129
SE	315	47.5	115	-33.2	137
LV	315	407	101	15.7	548
PAT	315	278	769	24.4	422
OE	315	45.6	11 5	2.12	136
ROA	315	6.78	26.2	.000	342
Asset -Total	315	332	628	0	479

Note that Obj stands for the number of observations, Std. Dev stands for standard deviation, Min for minimum values, and Max for Maximum. TLA is the financial health, LY is the liquidity, SE is the Size of the company, LV stands for Leverage, OE stands for Operational efficiency, and ROE stands for Profitability.

The descriptive statistics of all the variables examined to determine the operational efficiency and financial health of non-life insurance companies in South Africa are presented in Table 4.1 above. The average values for TLA, LY, SE, LV, PAT, OE, ROA and Asset -Total are shown in the table. In that order, the numbers are 161, 114, 407, 769, 115.2, 26.2 and 628 respectively. As shown in table 4.1 Maximum and minimal values. Specifically, there are 0.530 and 279,0.06 and 129, -33.2 and 137, 15.7 and 548 and 422, 2.12 and 136, and.0.00 and 342. The standard deviations measure variable result of 417, 254, 115. 101 115., and 26.2 had standard deviations that showed how much they varied from the expected ratios for financial health, liquidity, company size, leverage, efficiency of operations, and profitability. Table 4.1 reported the results reported.

4.2 Descriptive analysis of the variables

4.2.1 Correlation Analysis

In order to demonstrate the direction of the existing relationship between the variables used in the model and corresponding to Objective One, this section displays the correlation coefficients of the relationship between paired variables used in the study.

The relationship between operational efficiency and its determinants is displayed in Table 4.2 below. The table demonstrates a positive link between operational efficiency as measured by TLA and variables like liquidity (LY), size of the company (SE), leverage (LV), profit after tax (PAT), operational efficiency (OE), and return on assets (ROA). Asset total also has an unfavourable connection with TLA. This implies that the variables LY, SE, LV, PAT, OE, and ROA move in the same direction with operational efficiency. From the Table 1. it can be seen that some variables, such as liquidity, company size, leverage, profit after taxes, operational efficiency, and return on asset, move in the same direction as operational efficiency, meaning they rise or fall along with operational efficiency; while other variables, such as total assets, move in the opposite direction to operational efficiency. In other words, it changes as operational efficiency changes, either increasing or decreasing. The positive association between liquidity and other factors including business size, leverage, profit after tax, operational efficiency, and return on asset is also seen in Table 4.2. The association with the overall Assets, however, is adverse. A weak linear link between Asset total and other variables is revealed by the extent of the correlation between operational efficiency and other determinants.

The correlation analysis described above, without a doubt, merely provided information on the direction of the association between the pair of variables included in the model that corresponds to Objective One, without making any mention of the causal-effect relationship between the variables. As a result, Table 4.2 states that positive and negative correlation coefficients only show the direction and/or strength of a linear relationship between two sets of variables. Although all of the observed variables will be used in the model, the final overview of the Pearson correlation coefficient shows no sign or chance of a multi-collinearity issue.

TABLE 4.2: CORRELATION MATRIX MODEL 1

	TLA	LY	SE	LV	PAT	OE	ROA	Assets - Total
TLA	1							
LY	.696**	1						
SE	.226**	.354**	1					
LV	.834**	.509**	.063	1				
PAT	.971**	.652**	.210**	.882**	1			
OE	.226**	.354**	.999**	.063	.210**	1		
ROA	.440**	.281**	.060	.556**	.461**	.059	1	
Assets – Total	-.108*	-.088	-.073	-.161**	-.104*	-.072	-.121*	1

4.2.1 Liquidity

Based on Pearson in Table 4.2 above, liquidity has a significant positive effect on the operational efficiency of non-life insurance companies. A quick ratio of more than 1 means that the company has enough liquid assets to be converted into cash to meet its current obligations. However, there is no information about quick ratios of non-life insurance companies of South Africa. Nevertheless, the table revealed that liquidity is significant and able to meet up with its obligations. Consistent with the finding (Maverick 2022; Olowokudejo 2022) in Nigeria, the liquidity ratio significantly positively affects measuring financial performance and long-term goals. This result aligns with the research in Indonesia, Kenya and Bangladesh (Bari, Ghosh and Kabir 2021). For non-life insurance companies to maintain liquidity in South Africa, it is recommended to avoid sales, profit variation, and excess of the break-even point, and be familiar with the maximum benefit of economies of scale and minimum cost related to development.

4.2.2 Size of the company

According to this study, the result revealed that company Size has a positive significance on operational efficiency. Consistent with the finding (Mani, Jabbour and Mani 2020) in Asia, a company's Size and investment are positively linked to the performance of the focal company's suppliers, customers and supply chain (Yameen, Farhan and Tabash 2019; Li, Li and Long 2021; Tortorella *et al.* 2021), whilst in Indian Banks, size, number of branches, and operational efficiency positively impact ROA (Zeyede 2018; Li, Li and Long 2021).

4.2.3 Leverage

According to this study, leverage significantly affects the operational efficiency of non-life insurance companies, implying that non-life insurance companies display the level of liability used to finance assets. The ratio of total debt to total assets is more sensitive to financial health than the ratio of long-

term debt. The significant percentage of leverage means that non-life insurance companies could manage unforeseen losses. This is consistent with the study (Sognon 2019a; da Silveira Pereira and de Mello 2021; Shakil 2021; Sari, Nabella and Fadlilah 2022; Yu, Khan and Umar 2022)

4.2.4 Return on Asset

According to the study, Profitability (ROA) has a positive correction with the operational efficiency of non-life insurance companies of South Africa. This implies that non-life insurance companies in South Africa use all commercial events to make revenue. It also shows the level of professionalism (Abidin *et al.* 2021; Kusuma 2021; Rajindra 2021)

4.3 Fixed Effects Analysis

The results of the analysis using a fixed effect model for multiple regression are shown below. Only LY and LV have a substantial (positive) impact on the dependent variable TLA, according to the outcome of the study. As evidenced by the R2-value of 0.8585, the predictors are responsible for 85.9% of the variance in the dependent variable as a whole. The model is viable, as shown by the F-value of 59.49, which is significant at 1% (p = 0.0000).

Table 4.3: Fixed Effect Analysis

```
. xtreg TLA LY SE LV OE ROA, fe

Fixed-effects (within) regression               Number of obs      =       315
Group variable: ID                              Number of groups   =        30

R-sq:  within  = 0.5151                         Obs per group: min =         4
       between = 0.8860                                        avg =      10.5
       overall = 0.8585                                        max =        12

                                                F(5,280)           =     59.49
corr(u_i, Xb)  = 0.7778                         Prob > F           =    0.0000
```

TLA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LY	5.963183	.4930114	12.10	0.000	4.992703	6.933662
SE	-4.194378	94.4422	-0.04	0.965	-190.1013	181.7125
LV	1.212714	.5840898	2.08	0.039	.0629496	2.362479
OE	-32.81634	94.52666	-0.35	0.729	-218.8895	153.2568
ROA	24.51186	23.06294	1.06	0.289	-20.8869	69.91062
_cons	9169.973	2413.256	3.80	0.000	4419.546	13920.4
sigma_u	23957.243					
sigma_e	7769.1953					
rho	.90484084	(fraction of variance due to u_i)				

F test that all u_i=0: F(29, 280) = 27.45 Prob > F = 0.0000

The model's potential subject and/or time heterogeneity/uniqueness is recognized by the fixed effect estimator. As a result, the model includes this heterogeneity effect as an intercept term for each relevant subject unit and/or time period. The fixed effect estimation result is shown in Table 4.3, along with the intercept term (heterogeneity effect) corresponding to each insurance provider and the coefficient of each determinant variable.

4.3.1 Liquidity

It has a significant positive effect on the operational efficiency of non-life insurance companies. Consistent with the finding (Ng'ang'a 2018; Olowokudejo and AJIJOLA 2022) in Nigeria, the liquidity ratio significantly positively affects measuring financial performance on long-term goals. This result aligns with the research in Indonesia, Kenya and Bangladesh (Waswa, Mukras and Oima 2018; Bari, Ghosh and Kabir 2021). For non-life insurance companies to maintain liquidity in South Africa, it is recommended to avoid sales, profit variation, and excess of the break-even point, as well as to be familiar with the maximum benefit of economies of scale and minimum cost related to development.

4.3.2 Leverage

According to this study, leverage significantly affects the operational efficiency of non-life insurance companies, implying that non-life insurance companies display the level of liability used to finance assets. The ratio of total debt to total assets is more sensitive to financial health than the ratio of long-term debt. The significant percentage of leverage means that non-life insurance companies could manage unforeseen losses. This is consistent with the study (da Silveira Pereira and de Mello 2021; Shakil 2021; Sari, Nabella and Fadlilah 2022; Yu, Khan and Umar 2022)

According to Table 4.3, the operational efficiency of non-life insurance companies is affected positively by liquidity, (LY) leverage and (ROA) return on asset, whereas operational efficiency of the company's size and operational efficiency are negatively impacted.

Table 4.3 further shows that factors like liquidity and leverage, which are crucial factors in the context of South African insurers, have significant effects on the operational efficiency of non-life insurance companies. It is important to note that several of the determinants do not match the earlier predictions. In the context of South African insurers, these factors are significant determinants of operational efficiency for non-life insurance companies. It is important to note that several of the factors differ from the earlier predictions. For instance, characteristics like the company's size and operational efficiency defy the a priori expectation by having a different impact on return on assets and exerting a negative rather than a positive influence on operational efficiency.

This disparity could fill in the blanks as to why brokers and other non-life insurance companies have been having so many issues. Numerous under-utilized political and socio-economic institutions, cyber risk, trust concerns (failure to pay claims), market rivalry, poor administration, an unstable economy, and unskilled labour are agents (Odemo 2020). This necessitated numerous sector-wide upgrades and bailout plans over time.

Additionally, Table 4.3 reports the dependent variable's entire variance as explained by the predictors to the tune of 85.9%, as indicated by the R2-value of 0.8585. The model is workable since the F-value = 59.49 is significant at 1% (p=0.0000). Thus, it suggests that differences in variables like (LY) can account for 59% of the systematic variance in the operational efficiency of non-life insurance companies. The operational efficiency of non-life insurance companies in South Africa was significantly and jointly determined by (LY) liquidity and (LV) leverage, which included explanatory variables.

4.4 The Random Effect Model 1 of the GLS Regression

The random effect model assumes that the heterogeneity is random rather than fixed and that the random effect is incorporated into the error term, resulting in a composite error term, in order to address the shortcomings of the fixed effect model, including the loss of a degree of freedom as more dummy variables are included, the potential for multi-collinearity, and the inability to track the effects of time-invariant variables.

According to the results of the random effect estimation shown in Table 4.4, factors like operational efficiency and the size of the company have a negative effect on operational efficiency. However, for non-life insurance companies, liquidity and leverage have a beneficial impact on operational effectiveness. The result shows that determinants of liquidity and leverage significantly influence the operational efficiency of non-life insurance companies. The direction of influence in the company's size and operational efficiency does not contradict the priori expectation. The justifications given in the preceding estimate (fixed effect estimates) can be used to explain the direction of the observed causal-effect relationship between operational efficiency and the aforementioned determinants.

As reported in Table 4.4, the R^2-value = 0.8662 shows that the predictors account for 86.6% of the total variance of the dependent variable. The Wald Chi^2 = 611.92 is significant at 1% (p=0.0000). Thus, the result shows that about 87% of the systematic variation in operational efficiency as proxied by the liquidity can be explained by variations in determinants such as leverage. According to the probability value, the operational efficiency model is highly influenced by all of the model's included determinants.

TABLE 4.4. RANDOM EFFECT GLS REGRESSION MODEL 1

The results of the analysis using a random effect model for multiple regression are shown below. Only LY and LV have a substantial (positive) impact on the dependent variable TLA, according to the outcome of the study. The predictors are responsible for 86.6% of the dependent variable's overall variance, as indicated by the R2-value of 0.8662. The Wald Chi2 value of 611.92 is significant at 1% (p=0.0000), demonstrating the viability of the model.

Testing the Post-Estimation in order to confirm that the Hausman test, as opposed to other estimators such as the fixed effect estimator and the random effect estimator, is the most reliable and effective, post-estimation tests were carried out.

```
. xtreg TLA LY SE LV OE ROA, re

Random-effects GLS regression                   Number of obs      =       315
Group variable: ID                              Number of groups   =        30

R-sq:  within  = 0.4996                         Obs per group: min =         4
       between = 0.8767                                        avg =      10.5
       overall = 0.8662                                        max =        12

                                                Wald chi2(5)       =    611.92
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

TLA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LY	6.860468	.4734883	14.49	0.000	5.932448	7.788488
SE	-11.80409	101.1794	-0.12	0.907	-210.112	186.5038
LV	2.68846	.2151056	12.50	0.000	2.266861	3.110059
OE	-18.46209	101.262	-0.18	0.855	-216.9319	180.0077
ROA	22.83327	24.35976	0.94	0.349	-24.91098	70.57751
_cons	1389.663	2219.643	0.63	0.531	-2960.758	5740.084
sigma_u	10134.383					
sigma_e	7769.1953					
rho	.62984097	(fraction of variance due to u_i)				

4.5. The Hausman Test

The Hausman test is used to assess whether there is a significant difference between the estimates of the fixed effect estimator and those of the random effect estimator in an effort to establish which estimate is more reliable between the fixed effect estimator and the random effect estimator. The fixed effect and random effect estimates do not differ significantly, according to the test's null hypothesis. Notably, an asymptotic chi-square distribution can be seen in Hausman's test statistics. Table 4.5 The result below indicates that Chi2 = 58.01 (p = 0.0000), stating that there is enough data to rule out the hull hypothesis and that there is no discernible difference between fixed effect and random effect estimates, which is the null hypothesis. This rejection may be caused by the possibility of a correlation between the random effect included in the composite error term and one or more of the regressors. The fixed effect estimation is favoured and also appropriate because it tends to be more appropriate because of its established consistency and efficiency. As a result, the random effect estimate becomes inconsistent.

From the foregoing, it follows that random effect estimates are shown in Table 4 amongst the two estimators (fixed effect and random effect estimators) used for static analysis looking at key factors affecting non-life insurance businesses' operational efficiency in South Africa. The pivot point for the investigation of operational efficiency indicators will be in Table 4.4.

TABLE 4.5: HAUSMAN TEST

```
. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re          Difference          S.E.
-------------+------------------------------------------------------------
          LY |    5.963183     6.860468       -.8972853        .1373644
          SE |   -4.194378    -11.80409         7.60971               .
          LV |    1.212714      2.68846       -1.475746        .5430381
          OE |   -32.81634    -18.46209       -14.35425               .
         ROA |    24.51186     22.83327        1.678592               .
------------------------------------------------------------------------------
                           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(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       58.01
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

4. 6 Descriptive analysis: Objective 2

This part covers the descriptive analysis of the combined observations of the variables used to investigate the main factors affecting financial health. The mean, median, standard deviation, lowest and maximum values, as well as other descriptive properties, are considered.

The impact of operational efficiency on the financial stability of non-life insurance businesses in South Africa is depicted statistically in Table 4.6 below. The table shows that for a given period, the average values for OE, SE, PG, GDP, and IF were 45.6, 47.5, 296, 1.54, and 5.72 respectively. The minimum and maximum values of OE 2.12 and 136, SE -33.2 and 137 PG 75.0 and 602., GDP -2.00 and 3.28, and IF 4.06 and 10.06 are all reported in Table 4.6. The variables' standard deviations were OE 115, SE 115 and PG. The following values: OE 115, SE 115, PG 205, GDP 1.37 and IF1.60. However. The variable used to accomplish objective two was just briefly described in Table 4.6.

TABLE 4.6: DESCRIPTIVE ANALYSIS

Variables	obj	Mean	Std. Deviation	Min	Max
TLA	368	.488	.555	.000	.446
OE	368	45.6	115.	2.12	136
SE	368	47.5	115.2	-33.2	137
PG	368	296.	205.	75.0	602.
GDP	368	1.54	1.37	-2.00	3.28
IF	368	5.72	1.60	4.06	10.0

Note that Obj stands for the number of observations, Std.Dev stands for standard deviation, Min for minimum values, and Max for Maximum. OE, operational efficiency, SE, Size of the company, PG premium growth, GDP, gross domestic product, IF, Inflation.

4.7 Analysis of correlation

In order to demonstrate the direction of the relationship between the variables used in the model that corresponds to objective two, this part displays the correlation coefficients of the relationship between pairs of variables used in the study. The relationship between operational effectiveness and the financial health of non-life insurance companies, as well as its factors including TLA, OE, SE, GDP and IF, is described in Table 4.7 below. Only other PGs, however, have an unhealthy connection with TLA (financial health). This implies that those variables—OE, SE, GDP, and IF—move in the same direction as the operational efficiency on the financial health of non-life insurance companies, increasing or decreasing together with it. They fluctuate depending on operational efficiency on financial health decreases and/or increases.

Additionally, Table 4.7 shows correlations for (TLA) Financial health (OE) operational efficiency, (SE) company size, (GDP) gross domestic product, and (IF) inflation, while (PG) has an inverse linear association. Due to the weak and extremely weak correlations between operational efficiency, company size, gross domestic product, and inflation, the magnitude of these correlations does not support the existence of multi-collinearity. The correlation analysis's findings, which illustrate how some of the measured parameters are currently related to one another, are shown below. Particularly, the outcome demonstrates that of all the variables, only PG significantly correlates (negatively correlates) with TLA with objective 2.

TABLE 4.7CORRELATION MATRIX MODEL 2

	TLA	**OE**	**SE**	**PG**	**GDP**	**IF**
TLA	1					
OE	-.047	1				
SE	-.047	.999**	1			
PG	-.109*	-.210**	-.208**	1		
GDP	-.006	-.112*	-.112*	.007	1	
IF	-.005	-.026	-.024	-.017	.055	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed)

Table 4.8: Regression Analysis Fixed-Effect (Within)

```
. xtreg TLA OE SE PG GDP IF, fe

Fixed-effects (within) regression               Number of obs      =       368
Group variable: ID                              Number of groups   =        31

R-sq:  within  = 0.0132                         Obs per group: min =         8
       between = 0.0261                                        avg =      11.9
       overall = 0.0063                                        max =        12

                                                F(5,332)           =      0.89
corr(u_i, Xb)  = -0.3787                        Prob > F           =    0.4882
```

TLA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
OE	.000193	.0003958	0.49	0.626	-.0005856	.0009716
SE	-.0001921	.0003955	-0.49	0.628	-.0009701	.000586
PG	.000067	.0000413	1.63	0.105	-.0000141	.0001482
GDP	-.0008363	.0012546	-0.67	0.505	-.0033043	.0016317
IF	.0014171	.0010732	1.32	0.188	-.0006942	.0035283
_cons	.0196466	.0147226	1.33	0.183	-.0093148	.0486079
sigma_u	.05659004					
sigma_e	.03259262					
rho	.75091423	(fraction of variance due to u_i)				

F test that all u_i=0: F(30, 332) = 22.51 Prob > F = 0.0000

The multiple regression analysis using a fixed effect model is displayed in Table 4.8. The outcome demonstrates that the dependent variable TLA is not significantly impacted by any of the variables. Only 0.63% of the variance of the dependent variable is accounted for by the predictors, according to the R2-value of 0.0063. At 5%, the F-value of 0.89 is not noteworthy (p = 0.4882).

A fixed-effect estimator detects any potential uniqueness in the model. As a result, the model includes an intercept term for each relevant subject unit and/or time period to account for this heterogeneity effect. In this investigation, a fixed-effect estimator was used. As a result, the model identifies and develops ways to track any subjective traits that might develop over time in any insurance company.

The outcome of fixed effect estimate is shown in Table 4.8, along with the intercept term (heterogeneity effect) corresponding to each non-life insurance company and the coefficient of each determinant variable. According to Table 4.8, there is no statistically significant correlation between operational efficiency and the financial health of non-life insurance companies and any of the factors, including company size, premium growth, gross domestic product, and inflation. It is important to note that none of the determinants support the a priori expectation. For instance, factors like operational effectiveness, company size, premium increase, gross domestic product and inflation go against the a priori anticipation by having the opposite effect of what was anticipated on financial health.

This discrepancy might fill in the blank to explain why non-life insurance companies have been dealing with a variety of issues, including poor financial management, insufficient disclosure and transparency, and financial condition (Alhadhrami and Nobanee 2019).

TABLE 4.9: REGRESSION ANALYSIS RANDOM EFFECT

```
. xtreg TLA OE SE PG GDP IF, re

Random-effects GLS regression                   Number of obs      =       368
Group variable: ID                              Number of groups   =        31

R-sq:  within  = 0.0008                         Obs per group: min =         8
       between = 0.0258                                        avg =      11.9
       overall = 0.0102                                        max =        12

                                                Wald chi2(5)       =      2.22
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.8175
```

TLA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
OE	.0001718	.0004775	0.36	0.719	-.0007642	.0011078
SE	-.0001787	.0004772	-0.37	0.708	-.001114	.0007565
PG	-.0000211	.0000196	-1.07	0.283	-.0000595	.0000174
GDP	-.0010595	.0015259	-0.69	0.487	-.0040502	.0019313
IF	.0008541	.0012993	0.66	0.511	-.0016926	.0034008
_cons	.052134	.0109142	4.78	0.000	.0307426	.0735253
sigma_u	.01691751					
sigma_e	.03259262					
rho	.21224034	(fraction of variance due to u_i)				

The outcome demonstrates that no predictor significantly affects the dependent variable TLA. According to the R2-value of 0.0102, only 1.02% of the total variation of the dependent variable can be attributed to the predictors. The outcome demonstrates that the variation has no significant effect on the variable at1.02% of the systematic variation. In the effect of operational efficiency on financial health as proxied by the ratio of company size, premium growth, gross domestic product, operational efficiency, and inflation. The Wald Chi2 = 2.22 is not significant at 5% (p=0.8175), which suggests that none of the model's factors have a meaningful impact on the relationship between operational efficiency and the financial well-being of the non-life insurance companies.

4.7.1 Operational efficiency (OE)

Operational efficiency considerably improves the TLA financial health of non-life insurance businesses in South Africa, as shown in Table 4.9. This demonstrated the importance of operational efficiency for the financial health of non-life insurance companies. As a function of operating costs, i.e., maintenance and administration of daily operations, the operational efficiency of a South African non-life insurance company is essential to its financial performance and profit efficiency. A company or investment is more advantageous the better the operational efficiency. This is so that the organization can generate profits at a cheaper cost. The financial market, which includes the stock market, currency market, and bond market, is essential to the efficient operation of the capitalist economy because it is where securities are traded. When business costs and fees are decreased, operational efficiency occurs. According to Hayes (2022), an internally efficient market is another name for a market with high operational efficiency.

As a function of operating costs, i.e., the upkeep and management of routine activities, a company's operational efficiency is essential to its financial performance and profit effectiveness. A company or

investment is more advantageous the better the operational efficiency. This is so that the entity can generate returns for less money. The financial market, which includes the stock market, currency market, and bond market, is essential to the efficient operation of the capitalist economy because it is where securities are traded. Reducing corporate expenses and fees results in operational efficiency. Internally efficient markets are another name for operational efficiency markets. Operational effectiveness improves financial performance in times of insurer insolvency, according to a study conducted in India (Joo 2013). Additionally, they correlate favorably with financial achievement.

The outcome showed that the relationship between the TLA financial health of non-life insurance companies and the size of the business is negative and insignificant. The results are in line with those from Pakistan, Takaful, Ethiopia, Nigeria and Egypt (Batool and Sahi 2019; Lin et al. 2019). However, the company's size has little impact on how well it performs. Before the total asset's logarithm is used as a guide for insurers, it is difficult to determine the exact size of insurance companies. However, big insurance companies may readily hire smart people who have experience in their field.

4.7.2 Premium growth (PG)

The result revealed that the premium is negative and is not statistically significant for TLA's financial health with non-life insurance companies in South Africa. Consistent with the findings In Russian, it was revealed that premium growth has a negative relationship with return on assets (Tsvetkova *et al.,* 2021). According to Sharis Insurance, registered at OJK, Premiums have no significant effect on the profitability of Islamic general insurance companies listed in the OJK (Fadah *et al.,* 2021). It was revealed on the Indonesian stock exchange that premium income significantly retards the profit growth of insurance companies (Sudirman and Anthoni 2021). It was also revealed that if profitability can be sustained, premium growth can be accelerated (Olarewaju and Msomi 2022). In Turkey, the result shows a negative premium growth rate. In Turkey, non-life insurer profitability (Abdurrahman and Ankal 2021).

4.7.3 Gross domestic product (GDP)

The result revealed that gross domestic product is statistically negative with respect to the financial health of non-life insurance companies. Consistent with the study in Takaful, which finds that gross domestic product per capita is a statistically significant determinant of financial performance, gross domestic product is negatively related to performance (Lin *et al.* 2019). In Kenya, the study found that GDP has an insignificant positive relationship with the financial performance of insurance companies (Nyamu 2016). At the same time, in countries like Pakistan, Kenya and the Philippines, their gross domestic product is not significantly related to their financial performance, which implies that poor monetary conditions would deteriorate the superiority of the financial portfolio. However, if the gross domestic product increases, the probability of marketing insurance strategies would also increase, and insurers are likely to benefit from that in the form of increased profits.

4.7.3. Inflation (IF)

The result revealed that inflation is positive and statistically significant for the financial health of non-life insurance companies (Marjan 2020). A negative inflation rate can be detrimental to capital accumulation. Moreover, capital accumulation motivates the pursuit of profit, involving the investment of money with the goal of growing initial monetary value. According to Senzu (2020), this confirmed that a regular price shift of -0.46 of South Africa's price with the US dollar at the open market will cause a proportional level of change in inflation in a normal economic system when all other influences remain constant. Naftaly revealed a shock inflation that affected 7 of 9 countries, which were Japan, Canada, Australia, Greece, France, the US, and the UK (Naftaly and Kaboro 2019) is significant because inflation amongst EAC countries reduces the exchange rate with the region (Urom *et al.* 2019) Reject the null hypotheses that there is a linear relationship between inflation and growth and that an increase in the inflation rate above the threshold of 10.2% has a statistically detrimental effect. By keeping inflation below the level needed to draw in both domestic and foreign investors and enforcing fiscal restraint as a means of reducing inflationary pressure, the government can promote stable economic growth (Omarzai *et al.,* 2021). Inflation rates are negative but have a significant impact on insurance companies' financial health. Implying that it can positively or negatively affect profitability, depending on whether or not inflation is expected. Inflation is regularly defined as a state where "too much currency is chasing after insufficient goods (Kolodko 2021) Whenever inflation occurs, currencies lose purchasing power, like in these countries. Pakistan, Kenya, and the Philippines (Berhe and Kaur 2017).

4.8 Post-Estimation Test

A post-estimation test was conducted to verify which of the estimators is relatively consistent and efficient amidst the likes of fixed effect estimators and random effect estimators, which is the Hausman test.

4.8.1 Hausman Test

The Hausman test is used to determine whether there is a significant difference between the estimates of the fixed effect estimator and those of the random effect estimator to determine which estimate is more reliable between the two tests. The test is designed to determine whether fixed effect estimates, and random effect estimates differ significantly. Notably, Hausman created test statistics with an asymptotic chi-square distribution. Table 4.10 below reveals the value Chi2 = 4.41 along with a probability (p = 0.4921). In other words, there is no correlation between the random effect incorporated into the composed error term and one or two estimators (fixed effect estimator and random effect estimator) used for static analysis examining key determinants of operational efficiency on the financial health of non-life insurance companies. The result indicates that there is insufficient evidence to reject the null hypothesis of no substantial difference between fixed effect and random effect estimates. Therefore, the result of the random effect estimate presented in Table 4.10 will be the pivot upon which the examination of the determinant of the effect of operational efficiency on financial health will be hinged.

Table 4.10: HAUSMAN TEST

```
. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re          Difference          S.E.
-------------+------------------------------------------------------------
          OE |     .000193     .0001718        .0000212               .
          SE |   -.0001921    -.0001787       -.0000133               .
          PG |     .000067    -.0000211        .0000881        .0000363
         GDP |   -.0008363    -.0010595        .0002232               .
          IF |    .0014171     .0008541        .0005629               .
------------------------------------------------------------------------------
                           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(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         4.41
                Prob>chi2 =       0.4921
                (V_b-V_B is not positive definite)
```

Table 4.10 shows the results of the Hausman test to determine the appropriate model for the data set. The result shows that Chi 2= 4.41 (p = 0.4921), which implies that the study accepts the null hypothesis that the random effect model is appropriate for the data. At the same time, the study rejects the alternative hypothesis that the fixed effect model is appropriate. It is possible to emphasize that the random effect model estimation was efficient and trustworthy with a valid instrument. There is no over-specification of the instrument utilized in the operational efficiency and financial health of non-life insurance companies in South Africa. The result of the study leads to the rejection of the fixed effect model.

4.9 Objective 3; Relationship that exist between Operational efficiency and financial health

Table 4.11 Showing that relationships exist between operational efficiency and financial health of non-life insurance companies in South Africa

Variables	Operational efficiency	Financial health
Size of the company	According to this study, the result revealed that company size positively affects operational efficiency. Consistent with the finding (Mani, Jabbour and Mani 2020). The success of suppliers, customers, and the focal company's supply chain are positively correlated with a company's size and investment, according to in	This study's findings indicated that business size had a favorable impact on operational effectiveness. In line with the discovery (Mani, Jabbour and Mani 2020). in Asia contend that a company's size and investment are closely related to the success of the main company's suppliers, clients, and supply chain.(Yameen, Farhan and

	Asia. (Yameen, Farhan and Tabash 2019; Tortorella *et al.* 2021) in Indian Bank size, the number of branches and operational efficiency positively impact ROA.	Tabash 2019; Tortorella *et al.* 2021) in Indian Bank size, the number of branches and operational efficiency positively impact ROA.
Operational efficiency		Consistent with the findings (Kweh, Lu and Wang 2014b, 2014a). Although in this study's identified approaches, the significance of operational efficiency in assessing the financial health of South Africa's non-life insurance companies was disclosed. Its review from Table 4.2.6 shows that it is weak and still has existing relationships with the financial health of South Africa. The analysis result displayed above company the findings of (Ujunwa and Modebe 2011) in Nigeria's insurance industries that the sector's operational efficiency has not been performing as it ought to be. Also the South African non-life insurer operates with about 50% inefficiency (Alhassan and Biekpe 2015). According to (Rana et al. 2022), operational Inefficiency means a lack of governance, inefficient training of major employees, and poor data quality. Furthermore, it became clear that general insurance businesses still needed to improve and had not yet fulfilled their potential.

		Regulating costs that have an impact on daily operations and forward-moving activities is required. (Abdin *et al.* 2022). Operational inefficiencies affect the value of a company's services and increase its overhead expenditures(Pillay and Njenga 2021).

4.10 Discussion of Findings and Implication

Several analyses were conducted using secondary data sources to empirically investigate the operational efficiency and financial health of non-life insurance companies in South Africa, with an emphasis on identifying critical determinants of operational efficiency and ascertaining the factors affecting operational efficiency. However, the critical determinant of operational efficiency is Liquidity (LY), size of the company (SE), leverage (LV), Profit after tax (PAT), Premium growth (PG), Return on asset (ROA), and Operational efficiency (OE). It was discovered that only premium growth is negative with the operational efficiency of non-life insurance companies. Thus, it implies that a negative premium in determining operational efficiency doesn't mean that the non-life insurance companies in South Africa are Insolvent. Although there is a belief that an insurance company is financially healthy when it keeps a positive net premium written, it is also significant to recall that having a negative net premium doesn't mean that the company is bankrupt and is incapable of providing the profits undertaken. The nature and effectiveness of protection and other businesses can lead to negative net premiums written, but this is likely to be impermanent.

4.11 Summary of Data presentation, Analysis and Interpretation

This chapter summaries the data presentation, analysis and interpretation of the data collected to achieve the objectives of this study. The statistical analysis examined the operational efficiency with mean, standard deviation, minimum and Maximum value that gave a glance description of the variables used. Moreover, correlation analysis was used to demonstrate the existing relationship between the variables used in the model. The result of the fixed effect model regression only shows that leverage and liquidity have positive impacts on the financial health of non-life insurance companies in South Africa. The next chapter concludes the study.

CHAPTER FIVE - SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes the significant findings, recommendations, and conclusions on issues discovered on the operational efficiency and financial health of non-life insurance companies in South Africa. The contribution of this study to existing knowledge, limitations, and possible areas for further research are also mentioned.

5.1 Summary of Findings

South Africa's non-life insurance sector witnessed a shortfall of 28% profit after tax (PAT), mainly because of non-payment on credit, increased net dues and a higher dues ratio, as well as weather-related calamities (Jonckie and KMPG 2021) .

The term Operational efficiency is when an organization can reduce the waste of time, effort, and materials as much as possible while still creating a first-class service or product (Yadav *et al.* 2019). Economically, operational efficiency can be defined as the proportion of the input required to keep the organization going and its output (Kaydos 2020) . The information denotes what is placed into a professional to function correctly, such as time, cost and employees. In contrast, work means what is placed out, such as fast growth times, revenue, customer acquisition, customer retention, and quality.

Despite the concentration of the researcher on evaluating the operational efficiency and financial health of non-life insurance companies, the focus of this study is solely based on operational efficiency and financial health using 32 non-life insurance companies, narrowed down to the fact that there are 56 companies' profiles, including the traditional players such as Old Mutual, Sanlam, re-insurers such as GIC Re, Hannover Re, Africa- Re and Public entities such as Eskom's Escap and Sasria (Markets.com 2020) because insurers with less than R38167 turnover in 2019 were not included in the data analysis (Magazine, 2020).

Specifically, the study examined the determinants of the operational efficiency of non-life insurance companies in South Africa. The study aimed to examine the determinants of operational efficiency, the effect of operational efficiency on financial health, and to examine similarities between operational efficiency and the financial health of insurance companies in South Africa. To achieve those objectives above, data from 32 insurance companies were used. S&P Capitall Q and Refinitiv Eikon are well-known databases with readily available data. SPSS 20 was used to achieve those objectives.

Chapter One was an expository of the background of this study, which emphasizes the operational efficiency of the most critical challenges faced by non-life insurance companies in South Africa. The previous study on competition and efficiency in the insurance market in South Africa shows that Company size, diversification, age, re-insurance, risk, and leverage are control variables, which suggests that life insurers have a high-cost efficiency level and low efficiency in profit. There is therefore a need to explore operational efficiency as a measure of non-life insurance companies in South Africa and examine their financial health.

Chapter Two focused on reviewing the literature to explain the study's variables by defining the various concepts of insurance's operational efficiency and financial health. These include the general meaning of operational efficiency and financial health of non-life insurance, factors influencing operational efficiency and financial health, determination of operational efficiency and financial health of non-life insurances, judgmental approach to operational efficiency and financial health, prudential regulations and requirements and measures that can improve the operational efficiency of non-life insurance companies in South Africa. Reviewing the existing literature reveals that there is limited literature in examining the financial health of non-life insurance companies in South African and it was discovered that this study is first in South Africa. Theories were also explored, and this study was hinged on the operational efficiency theory, which was guided by the Economic Efficiency and Financial Performance theory.

Chapter Three explained the methodology used to achieve the objectives of the study. The sample features and data sources were also provided in this chapter. Moreover, the research instrument, its administration, and its validity were made known. Furthermore, models were specified to examine the various determinants of operational efficiency and to analyze financial health and factors affecting operational efficiency. Finally, the measurements of all variables of interest in the study and data analysis technique for all econometric approaches were well defined.

Chapter Four involves the presentation, analysis and interpretation of data collected on determinants of operational efficiency and the effect of operational efficiency on financial health. Here, each objective was analyzed using various descriptive and regression statistics.

The descriptive analysis conducted, amongst other things, reveals that the value of Table 4.2 presents the descriptive statistics of all the variables used to examine the determinants of the operational efficiency and financial health of non-life insurance companies in South Africa.

The table reveals the average TLA, LY, SE, LV, PAT, OE and ROE values, which are 161, 114, 47.5, 407, 769, 115 and 26.20 respectively.

Financial health, liquidity, size of the company, leverage, operational efficiency, and profitability were Minimum and maximum .530 and 279, .060 and 129, -33.2 and 137, 15.7 and 548, 24.4 and 422, 2.12 and 136 and .000 and 342 respectively. The standard deviation of the variables ratio of 417,254, 115., 101, 115., and 26.2 revealed the rate at which the financial health, liquidity, size of the company, leverage, operational efficiency, and profitability deviated from their respectively. Correlation analyses conducted in the study revealed no indication of multi-co-linearity problems amongst the variables used in the study model. Paragraph 4.2.I presents the correlation coefficients of relationships between paired variables used in the study, in an attempt to show the relationship between variables employed in the model corresponding to Objective One.

Table 4.2 shows that there is a positive correlation between operational efficiency as proxied by TLA and variables like Liquidity (LY), Size of the company (SE), Leverage (LV), Profit After Tax (PAT), operational efficiency (OE) and Return on Asset (ROA). At the same time, asset total has a negative correlation with TLA. This connotes that those variables (LY, SE, LV, PAT, OE, and ROA) move in the same direction with operational efficiency, meaning they increase and/or decrease as operational efficiency decreases and /or increases. From the preceding, there is an indication that variables like liquidity, size of the company, leverage, Profit after tax, operational efficiency, and return on asset move in the same direction with operational efficiency, meaning that they increase and/or decrease alongside operational efficiency, while variables like total assets move in the opposite direction to operational efficiency. It increases and/or decreases as operational efficiency decrease and/or increases. The results reveal the positive correlation between Liquidity and other determinants like the company's size, leverage, Profit after tax, Operational efficiency, and Return on Asset. In contrast, the correlation with the Asset total is negative. The magnitude of the correlation between operational efficiency and other determinants reveals a weak linear relationship between operational efficiency and other determinants.

Thus, the negative/positive correlation coefficients reported in Table 4.2 only depict the direction of the linear relationship between pairs of variables and/or the degree of such linear relationship. However, the concluding overview of the correlation coefficient reveals no indication or possibility of a multi-co-linearity problem in the model where all the observed variables will be employed.

5.2 Recommendations

From the findings of this study and the conclusions drawn, the study put forward the following recommendations to ensure a better interrelationship between operational efficiency and financial health of non-life insurance companies in South Africa. For insurance companies to make the best use of their financial health base, it is paramount for the sector to operate efficiently.

The study's main objective was to evaluate the operational efficiency and financial health of non-life insurance companies. It identifies how well a company generates revenue and its assets, liabilities, and the financial interest of its investors and shareholders. Based on that, the world is growing fast and needs to increase knowledge and information in all sectors. Only a company that can foresee ahead of others can recognize its financial health and grow it.

The study provides a clear understanding of these components (operational efficiency, size of the company, premium growth, gross domestic product, and inflation) in South Africa using the operational efficiency coefficient model of 2008 -2019.

The estimation of the model is explicit enough to conclude this study. Thus, there is a direct and significant effect on the previous financial performance of non-life insurance companies in South Africa. Running an insurance company comes with a lot of responsibilities in handling the financial aspect of it. The following can accomplish this: it is recommended that:

i. Marketing strategy (investing in advertisements on Facebook and Instagram is a go-to marketing strategy that has billions of audiences, posting engaging content on the company's website that can draw your audience in), which is the critical ingredient to attract customers into the insurance company's product, and it will have a positive effect on the financial health(T 2021).

ii. To improve the financial health of insurance companies in South Africa, more focus factors should be given to different payment options, provided that the options will cater to a more significant number of customers, resulting in more purchases of insurance products that could increase premiums, preferably more suitable and practical it would be to introduce new one.

iii. Managers and insurers should focus on factors that can maximize the financial health structure of the non-life insurance companies in South Africa. Some of the structures are technology information facilities; an open system that is open to employees and outsiders can be received; and enforcement of regulation. Implementing these will boost financial health and attract new valuable customers and local and international investors.

iv. Avoiding unnecessary costs can be achieved by employing experts in all key areas of non -life insurance companies in South Africa to stay healthy financially.

Therefore, it is concluded that all the null hypotheses in this study are rejected. For non-life insurance companies in South Africa, previous financial performance significantly affects the financial health of non-life insurance companies. Thus, a U-shaped relationship exists between operational efficiency and the financial health of non-life insurance companies. Consequently, policymakers and insurers' managers should note that previous financial performance significantly sprouts on financial health with urgent attention and management performance since previous financial health is significant to the financial health of non-life insurance companies. Competent and operative operational efficiency management will spur financial health because insurers are massive investors in the monetary market.

5.3 Conclusion

Premised on the finding of the study, the following conclusions were drawn:

Determinants such as liquidity and leverage significantly impact the operational efficiency of non-life insurance companies. They can be considered vital determinants of operational efficiency in the context of South African insurers. It is worth noting that some of the determinants do not agree with the prior expectations by sign. For instance, determinants such as the size of the company and operational efficiency contradict the a priori expectation by exerting a negative effect on operational efficiency instead of a positive effect and show that there is a difference in the return on Assets of insurance companies, although could be a measure of profitability.

However, the critical determinant of operational efficiency is Liquidity (LY), size of the company (SE), leverage (LV), Profit after tax (PAT), Premium growth (PG), Return on asset (ROA), and Operational efficiency (OE). It was discovered that only premium growth is negative with the operational efficiency of non-life insurance companies.

Thus, it implies that a negative premium in determining operational efficiency does not mean that the non-life insurance companies in South Africa are Insolvent. Although there is a belief that an insurance company is financially healthy when it keeps a positive net premium written, it is also significant to recall that having a negative net premium does not mean that the company is bankrupt and is not proficient in providing the profits undertaken. The nature and effectiveness of protection and other businesses can lead to negative net premiums written, but this is likely to be temporary.

5.4 Contribution to Knowledge

This study has contributed to knowledge in four main ways. Firstly, it has provided insight into operational efficiency as a measure of non-life insurance companies and shows that profitability is just an efficiency index. Secondly, this study is the first empirical evaluation of the Operational efficiency and financial health of non-life insurance companies in South Africa, making it relevant in appreciating the ability of insurance frontlines to reduce and improve investment premiums and income. Thirdly, the study has contributed to the body of knowledge by analysing the variables and determinants of operational efficiency and financial health. It also contributed to the non-life insurance companies in

South Africa. No known study has examined the determinate of operational efficiency in South Africa. Lastly, the study has contributed to knowledge by employing secondary data to analyze the various determinants of operational efficiency. This study contributed to the non-life insurance literature. Lastly, the study has contributed to knowledge by developing a conceptual framework for the operational efficiency and financial health of non-life insurance companies in South Africa. The study has also contributed to the body of knowledge by developing a conceptual framework for operational efficiency and financial health of non-life insurance.

5.5 Limitations of the Study

This study used secondary data sourced from S&P Capitall Q and Refinitiv Eikon. Unlike primary data, secondary data may not be error-free and thus may be inaccurate. Moreover, the small sample size may generalize the study results statistically incorrectly. Furthermore, this study is limited to an evaluation of operational and financial health of non- life Insurance companies. Therefore, fresh studies are require to determine the operational efficiency and financial health of other financial institutions, including life insurance companies and commercial banks.

5.6 Suggestions for further research

Further research should consider other financial institutions, most notably life insurance companies in South Africa, and they should evaluate the operational efficiency of these life insurance companies in South Africa.

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Appendices

Appendix 1 Regression Analysis

OBJECTIVE 1

Below is the result of the multiple regression analysis with fixed effect model. The result shows that of all the predictors, only LY and LV have significant (positive) effect on the dependent variable TLA. The R^2-value = 0.8585 shows that the predictors account for 85.9% of the total variance of the dependent variable. The F-value = 59.49 is significant at 1% (p=0.0000), which indicates that the model is feasible.

```
. xtreg TLA LY SE LV OE ROA, fe

Fixed-effects (within) regression               Number of obs      =       315
Group variable: ID                              Number of groups   =        30

R-sq:  within  = 0.5151                         Obs per group: min =         4
       between = 0.8860                                        avg =      10.5
       overall = 0.8585                                        max =        12

                                                F(5,280)           =     59.49
corr(u_i, Xb)  = 0.7778                         Prob > F           =    0.0000
```

TLA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LY	5.963183	.4930114	12.10	0.000	4.992703	6.933662
SE	-4.194378	94.4422	-0.04	0.965	-190.1013	181.7125
LV	1.212714	.5840898	2.08	0.039	.0629496	2.362479
OE	-32.81634	94.52666	-0.35	0.729	-218.8895	153.2568
ROA	24.51186	23.06294	1.06	0.289	-20.8869	69.91062
_cons	9169.973	2413.256	3.80	0.000	4419.546	13920.4
sigma_u	23957.243					
sigma_e	7769.1953					
rho	.90484084	(fraction of variance due to u_i)				

F test that all u_i=0: F(29, 280) = 27.45 Prob > F = 0.0000

Below is the result of the multiple regression analysis with random effect model. The result shows that of all the predictors, only LY and LV have significant (positive) effect on the dependent variable TLA. The R^2-value = 0.8662 shows that the predictors account for 86.6% of the total variance of the dependent variable. The Wald Chi^2 = 611.92 is significant at 1% (p=0.0000), which indicates that the model is feasible.

```
. xtreg TLA LY SE LV OE ROA, re

Random-effects GLS regression                   Number of obs      =       315
Group variable: ID                              Number of groups   =        30

R-sq:  within  = 0.4996                         Obs per group: min =         4
       between = 0.8767                                        avg =      10.5
       overall = 0.8662                                        max =        12

                                                Wald chi2(5)       =    611.92
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

TLA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LY	6.860468	.4734883	14.49	0.000	5.932448	7.788488
SE	-11.80409	101.1794	-0.12	0.907	-210.112	186.5038
LV	2.68846	.2151056	12.50	0.000	2.266861	3.110059
OE	-18.46209	101.262	-0.18	0.855	-216.9319	180.0077
ROA	22.83327	24.35976	0.94	0.349	-24.91098	70.57751
_cons	1389.663	2219.643	0.63	0.531	-2960.758	5740.084
sigma_u	10134.383					
sigma_e	7769.1953					
rho	.62984097	(fraction of variance due to u_i)				

The table below is the result of the Hausman test to determine the appropriate model for the data set. The result shows that the value $Chi^2 = 58.01$ (p=0.0000), which implies that we reject the null hypothesis that random effect model is appropriate while we accept the alternative hypothesis that fixed effect model is appropriate for the data set.

```
. hausman fe re
```

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LY	5.963183	6.860468	-.8972853	.1373644
SE	-4.194378	-11.80409	7.60971	.
LV	1.212714	2.68846	-1.475746	.5430381
OE	-32.81634	-18.46209	-14.35425	.
ROA	24.51186	22.83327	1.678592	.

```
                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(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =       58.01
            Prob>chi2 =      0.0000
            (V_b-V_B is not positive definite)
```

OBJECTIVE 2

Below is the result of the multiple regression analysis with fixed effect model. The result shows that none of the predictors has significant effect on the dependent variable TLA. The R^2-value = 0.0063 shows that the predictors only account for 0.63% of the total variance of the dependent variable. The F-value = 0.89 is not significant at 5% (p=0.4882).

```
. xtreg TLA OE SE PG GDP IF, fe

Fixed-effects (within) regression               Number of obs      =       368
Group variable: ID                              Number of groups   =        31

R-sq:  within  = 0.0132                         Obs per group: min =         8
       between = 0.0261                                        avg =      11.9
       overall = 0.0063                                        max =        12

                                                F(5,332)           =      0.89
corr(u_i, Xb)  = -0.3787                        Prob > F           =    0.4882
```

TLA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
OE	.000193	.0003958	0.49	0.626	-.0005856	.0009716
SE	-.0001921	.0003955	-0.49	0.628	-.0009701	.000586
PG	.000067	.0000413	1.63	0.105	-.0000141	.0001482
GDP	-.0008363	.0012546	-0.67	0.505	-.0033043	.0016317
IF	.0014171	.0010732	1.32	0.188	-.0006942	.0035283
_cons	.0196466	.0147226	1.33	0.183	-.0093148	.0486079
sigma_u	.05659004					
sigma_e	.03259262					
rho	.75091423	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(30, 332) =    22.51                 Prob > F = 0.0000
```

Below is the result of the multiple regression analysis with random effect model. The result shows that none of the predictors has significant effect on the dependent variable TLA. The R^2-value = 0.0102 shows that the predictors only account for 1.02% of the total variance of the dependent variable. The Wald Chi^2 = 2.22 is not significant at 5% (p=0.8175).

```
. xtreg TLA OE SE PG GDP IF, re

Random-effects GLS regression                   Number of obs      =       368
Group variable: ID                              Number of groups   =        31

R-sq:  within  = 0.0008                         Obs per group: min =         8
       between = 0.0258                                        avg =      11.9
       overall = 0.0102                                        max =        12

                                                Wald chi2(5)       =      2.22
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.8175
```

TLA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
OE	.0001718	.0004775	0.36	0.719	-.0007642	.0011078
SE	-.0001787	.0004772	-0.37	0.708	-.001114	.0007565
PG	-.0000211	.0000196	-1.07	0.283	-.0000595	.0000174
GDP	-.0010595	.0015259	-0.69	0.487	-.0040502	.0019313
IF	.0008541	.0012993	0.66	0.511	-.0016926	.0034008
_cons	.052134	.0109142	4.78	0.000	.0307426	.0735253
sigma_u	.01691751					
sigma_e	.03259262					
rho	.21224034	(fraction of variance due to u_i)				

The table below is the result of the Hausman test to determine the appropriate model for the data set. The result shows that the value Chi^2 = 4.41 (p=0.4921), which implies that we accept the null hypothesis that random effect model is appropriate for the data while we reject the alternative hypothesis that fixed effect model is appropriate.

```
. hausman fe re

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                  fe           re          Difference          S.E.
-------------------------------------------------------------------------------
          OE    .000193     .0001718        .0000212                .
          SE   -.0001921    -.0001787       -.0000133                .
          PG    .000067    -.0000211        .0000881          .0000363
         GDP   -.0008363    -.0010595        .0002232                .
          IF    .0014171     .0008541        .0005629                .
-------------------------------------------------------------------------------
              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(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          4.41
                Prob>chi2 =        0.4921
                (V_b-V_B is not positive definite)
```

CORRELATION ANALYSIS

The table below is the result of the correlation analysis showing the existing relationships between some of the observed parameters. In particular, the result reveals that LY, SE, LV, PAT, OE and ROA all have significant positive correlation with TLA while Total Assets correlates negatively with TLA.

	TLA	LY	SE	LV	PAT	OE	ROA	Assets - Total
TLA	1							
LY	.696**	1						
SE	.226**	.354**	1					
LV	.834**	.509**	.063	1				
PAT	.971**	.652**	.210**	.882**	1			
OE	.226**	.354**	.999**	.063	.210**	1		
ROA	.440**	.281**	.060	.556**	.461**	.059	1	
Assets - Total	-.108*	-.088	-.073	-.161**	-.104*	-.072	-.121*	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The table below is the result of the correlation analysis showing the existing relationships between some of the observed parameters. In particular, the result reveals that of all the variables only PG correlates significantly (negative correlation) with TLA.

	TLA	OE	SE	PG	GDP	IF
TLA	1					
OE	-.047	1				
SE	-.047	.999**	1			
PG	-.109*	-.210**	-.208**	1		
GDP	-.006	-.112*	-.112*	.007	1	
IF	-.005	-.026	-.024	-.017	.055	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

DESCRIPTIVE STATISTICS

FIRST DATA SET

ID		TLA	LY	SE	LV	PAT	OE	ROA	Assets - Total
ID 1	Mean	111.1350	20.3100	41.994614	72.9917	189.5250	43.831292	.036620	5530.247000
	Std. Deviation	43.29594	5.62691	19.0384556	25.77419	51.09068	18.4954569	.014857	1556.1132772
	Std. Error of Mean	12.49846	1.62435	5.4959287	7.44037	14.74861	5.3391785	.004292	449.2112097
	Minimum	35.06	12.19	11.2774	30.48	114.97	9.7189	.0241	3115.4930
	Maximum	165.52	25.73	70.8819	120.50	257.00	68.2465	.0659	7579.0000
ID 2	Mean	57.1508	18.1475	47.460455	49.1883	174.9008	45.474409	.320250	17439.324000
	Std. Deviation	43.60316	7.39487	125.0926320	19.47433	53.66198	124.9123195	.6143425	14058.7885706
	Std. Error of Mean	12.58715	2.13471	36.1111324	5.62175	15.49088	36.0590806	.1773454	4058.4226829
	Minimum	6.51	2.88	5.5247	22.14	73.03	3.2754	.0036	132.9260
	Maximum	165.28	26.30	444.3793	84.11	258.35	441.8336	1.6499	37646.0000
ID 3	Mean	639.5117	36.1350	24.276489	208.4691	913.9567	27.334673	.011674	76114.725000

	Std. Deviation	430.12559	113.74392	19.3835691	68.79591	808.42864	7.2397561	.0097085	13815.9925428
	Std. Error of Mean	124.16656	32.83504	5.5955544	20.74275	233.37325	2.0899376	.0028026	3988.3335069
	Minimum	213.07	2.97	-33.2842	93.20	327.93	15.1962	.0065	46312.7000
	Maximum	1791.79	397.32	48.4192	274.77	3355.18	45.7423	.0415	89999.0000
	Mean	3344.4350	1049.4008	17.002535	4121.9300	8139.1783	14.218420	1.236305	52636.741667
	Std. Deviation	545.84544	150.68558	1.6015938	550.09677	915.33385	1.5407702	1.4632537	61954.8226609
ID 4	Std. Error of Mean	157.57201	43.49918	.4623403	194.48858	264.23412	.4447821	.4224050	17884.8167704
	Minimum	2330.60	702.29	13.0456	3425.05	5854.01	10.5084	.0511	2156.8000
	Maximum	4074.27	1358.07	19.4724	4829.02	9212.58	16.5675	4.0559	180149.0000
	Mean	1037.2483	44.2642	83.985568	433.5658	1472.5458	81.641309	.104474	51791.558333
	Std. Deviation	406.63722	2.77500	40.0507514	127.54930	499.52192	39.8876107	.0864285	54938.4863353
ID 5	Std. Error of Mean	117.38605	.80107	11.5616560	36.82031	144.19956	11.5145614	.0249498	15859.3749373

	Minimum	332.89	40.04	44.5922	223.68	439.88	42.4131	.0058	7161.0000
	Maximum	1512.77	48.47	184.9462	705.92	1926.25	182.3113	.2237	152994.0000
	Mean	57.2633	18.2400	26.045025	51.3258	89.7167	22.725088	.002846	31326.583333
	Std. Deviation	14.38098	1.14226	8.6012122	14.11346	24.22454	8.2857026	.0004851	5939.7316355
ID 6	Std. Error of Mean	4.15143	.32974	2.4829561	4.07420	6.99302	2.3918763	.0001400	1714.6528293
	Minimum	30.66	16.50	20.5712	34.35	47.13	17.3248	.0022	18144.0000
	Maximum	86.49	19.97	44.4589	80.26	131.18	40.6436	.0038	38121.0000
	Mean	210.9558	22.7075	36.081844	107.1192	319.9833	33.459996	.012174	32901.075000
	Std. Deviation	73.48469	14.65320	4.9034956	41.33332	102.80935	4.9185293	.0060519	17134.3169027
ID 7	Std. Error of Mean	21.21320	4.23001	1.4155172	11.93190	29.67850	1.4198571	.0017470	4946.2512381
	Minimum	118.56	16.97	30.3273	44.27	178.28	27.8203	.0040	12567.5000
	Maximum	341.87	69.06	44.8192	172.88	496.92	42.2457	.0220	62915.5000
ID 8	Mean	161.2550	233.2408	9.097038	185.5338	768.4333	7.306069	.036261	40997.691667

	Std. Deviation	164.70369	161.48860	3.9070248	81.71815	931.22183	3.7924891	.0327765	38075.7426758
	Std. Error of Mean	47.54586	46.61774	1.1278609	28.89173	268.82059	1.0947973	.0098825	10991.5201417
	Minimum	39.92	9.79	4.6194	116.40	241.02	3.6499	.0034	.0000
	Maximum	637.60	356.17	17.8928	345.68	3343.44	16.5187	.0852	95045.6000
	Mean	248.4475	58.6567	35.293828	223.8533	450.9017	32.567243	.021843	38401.825000
	Std. Deviation	67.34589	31.20941	58.6556714	23.97973	51.53762	58.6069752	.0209622	23685.1208990
ID 9	Std. Error of Mean	19.44109	9.00938	16.9324338	9.78968	14.87763	16.9183765	.0060513	6837.3054634
	Minimum	128.06	11.14	15.3913	194.33	345.66	12.9961	.0070	6561.3000
	Maximum	333.16	113.41	221.4918	248.78	530.06	218.6227	.0627	76202.0000
	Mean	128198.9717	10171.0450	381.623172	5628.3483	208874.8900	379.863299	18.563235	24716.166667
	Std. Deviation	44583.54876	2487.94408	494.4288538	753.98032	73411.02291	494.4099735	12.2288889	30265.6646949
ID 10	Std. Error of Mean	12870.16194	718.20759	142.7293159	217.65537	21191.93692	142.7238656	3.5301762	8736.9448294

	Minimum	53508.65	5343.00	33.5800	4600.45	61475.99	31.9790	2.8888	6643.0000
	Maximum	171877.59	12901.87	1370.1844	7512.20	302212.51	1368.4667	37.0677	86858.0000
	Mean	28562.7883	624.9425	50.284828	3196.7117	31642.7125	48.167771	15.512696	7718.445167
	Std. Deviation	4018.00290	277.36240	9.0450965	423.86723	3939.87979	9.0194537	23.3348067	5560.5663383
ID 11	Std. Error of Mean	1159.89753	80.06763	2.6110944	122.35993	1137.34533	2.6036920	6.7361785	1605.1972361
	Minimum	20557.59	354.76	43.7014	2533.88	22560.72	41.6654	1.9355	403.7290
	Maximum	33934.57	1079.47	77.7800	3727.61	36347.64	75.6274	73.6500	15725.6660
	Mean	40692.9108	112.6858	53.939465	3892.2338	51557.9667	51.974820	2.071795	26036.416667
	Std. Deviation	8082.16674	289.52494	22.039 8256	550.66700	8224.23328	22.068893 5	.47290 99	6877.2750478
ID 12	Std. Error of Mean	2333.12057	83.57865	6.3623496	194.69018	2374.13165	6.3707408	.13651 73	1985.2983001
	Minimum	23624.24	.06	35.8692	3133.52	33867.56	33.8531	1.3102	16728.0000
	Maximum	52003.97	959.71	110.7352	4778.56	64335.62	108.7939	2.9780	37435.0000
ID 13	Mean	8113.1667	7433.0000			17385.2500		1.164054	25520.991667

	Std. Deviation	2400.91395	1547.38583			8070.09378		1.5469388	9165.3023005
	Std. Error of Mean	693.08416	446.69181			2329.63541		.4465628	2645.7948752
	Minimum	6291.00	6358.00			10484.00		.3336	7130.8000
	Maximum	13050.00	10747.00			33735.00		4.5647	33026.0000
ID 14	Mean	1037.2483	44.2642	83.985568	433.5658	1472.5458	81.641309	.109626	13520.958333
	Std. Deviation	406.63722	2.77500	40.0507514	127.54930	499.52192	39.8876107	.0367615	2494.4268547
	Std. Error of Mean	117.38605	.80107	11.5616560	36.82031	144.19956	11.5145614	.0106121	720.0790080
	Minimum	332.89	40.04	44.5922	223.68	439.88	42.4131	.0326	10436.2000
	Maximum	1512.77	48.47	184.9462	705.92	1926.25	182.3113	.1575	19744.0000
ID 15	Mean	2263.8020		100.130198		3711.5580	98.281813	.179085	21484.970000
	Std. Deviation	578.64351		123.2905055		463.74099	123.2767802	.0450672	3820.4000012
	Std. Error of Mean	182.98314		38.9878811		146.64778	38.98354008	.0142515	1208.1165577

	Minimum	1396.33		6.1296		2902.00	4.8158	.1292	15965.4000
	Maximum	2811.58		337.0221		4644.18	335.2348	.2521	25914.1000
	Mean	32205.4583	2912.96667	121.633277	5231.8333	45862.3750	119.730552	1.474223	30892.500000
	Std. Deviation	11516.04918	584.04584	42.3278534	1262.06323	14359.92183	42.3122300	.3705132	4883.9537914
ID 16	Std. Error of Mean	3324.39705	168.59951	12.2189988	364.32627	4145.35237	12.2144887	.1069580	1409.8760181
	Minimum	15606.50	1841.60	51.1549	3589.00	26427.50	49.2775	.9753	23640.0000
	Maximum	51962.00	4009.00	169.9823	7299.00	70130.00	168.0407	2.1437	40733.0000
	Mean	3299.5342	995.2900	17.433101	4221.4843	7747.1967	14.609072	.678313	33429.791667
	Std. Deviation	649.20033	241.17772	1.0356201	510.42892	1658.38383	1.0213272	.7835969	21234.6609457
ID 17	Std. Error of Mean	187.40799	69.62201	.2989578	192.92400	478.73418	.2948318	.2262049	6129.9186066
	Minimum	1791.79	397.32	15.8556	3425.05	3355.18	13.1777	.0762	4226.8000
	Maximum	4074.27	1358.07	19.4724	4829.02	9212.58	16.5675	2.0653	52844.0000
ID 18	Mean	223.6433	23.4425	22.620666	223.1725	411.6433	20.283911	.072055	5654.050000

	Std. Deviation	127.57778	9.50610	6.5566658	68.38236	158.15740	6.4299408	.0200332	1169.4786402
	Std. Error of Mean	36.82853	2.74418	1.8927464	34.19118	45.65611	1.8561640	.0057831	337.5994039
	Minimum	92.94	12.72	10.9690	129.32	243.85	8.7511	.0413	3678.6000
	Maximum	457.35	34.64	30.3261	292.76	690.24	27.8588	.1063	8034.0000
	Mean	155.9292	54.4833	21.418742	79.4300	268.0983	19.478438	.016180	35188.100000
	Std. Deviation	24.14585	15.10060	4.3830423	5.42176	30.06078	4.2935204	.0118181	29808.9175674
ID 19	Std. Error of Mean	6.97031	4.35917	1.2652753	1.56513	8.67780	1.2394326	.0034116	8605.0932909
	Minimum	112.50	39.07	12.8438	73.38	204.52	11.1327	.0035	8846.3000
	Maximum	191.65	70.13	27.4086	91.45	300.79	25.4211	.0340	80428.0000
	Mean	37.0333	9.9708	14.674699	29.7833	77.4125	12.715090	.000403	224086.416667
	Std. Deviation	6.21858	3.41035	6.1572280	3.94794	13.34865	6.1135358	.0001445	103601.7057121
ID 20	Std. Error of Mean	1.79515	.98448	1.7774386	1.13967	3.85342	1.7648258	.0000417	29907.2363407

	Minimum	27.08	5.34	7.4969	25.21	62.87	5.5963	.0002	102802.0000
	Maximum	47.81	14.32	23.4511	36.80	105.24	21.5439	.0006	398939.0000
	Mean	37.0333	481.1500	5.712486	148.3637	589.5792	4.215856	.083861	149676.250000
	Std. Deviation	59.67386	400.66060	1.4597056	73.16949	420.68235	1.1614704	.0785407	214259.6791594
ID 21	Std. Error of Mean	17.22636	115.66075	.4213807	25.86932	121.44053	.3352876	.0226727	61851.4417196
	Minimum	.53	121.00	3.6403	68.62	164.82	2.7442	.0004	3549.0000
	Maximum	214.11	1076.95	8.4497	265.77	1146.97	6.2941	.1952	479162.0000
	Mean	274.1608	55.1467	21.769525	151.1250	485.0217	19.717530	.037519	13842.666667
	Std. Deviation	132.30546	18.04010	9.1024120	89.94992	150.96857	9.2327559	.0119699	3878.2680843
ID 22	Std. Error of Mean	38.19330	5.20773	2.6276400	25.96631	43.58087	2.6652670	.0034554	1119.5595612
	Minimum	33.40	2.15	15.4599	24.87	111.04	13.0911	.0050	8256.0000
	Maximum	421.25	69.46	49.7675	315.10	665.81	48.1967	.0476	22275.0000
ID 23	Mean	9.2658	15.8508	4.515497	22.4800	33.9358	2.584224	.010903	8014.598583

	Std. Deviation	2.65416	4.62126	.3736908	4.45064	5.23388	.3160424	.0071692	9535.7327704
	Std. Error of Mean	.76619	1.33404	.1078753	1.28479	1.51089	.0912336	.0020696	2752.7289410
	Minimum	6.41	8.33	3.9751	15.78	24.42	2.1241	.0014	1787.4980
	Maximum	14.47	22.07	5.0382	30.31	42.71	3.1753	.0194	24178.0000
ID 24	Mean	3344.4350	1049.4008	17.002535	4121.9300	8139.1783	14.218420	.967348	8653.342250
	Std. Deviation	545.84544	150.68558	1.6015938	550.09677	915.33385	1.5407702	.1806065	1818.1736355
	Std. Error of Mean	157.57201	43.49918	.4623403	194.48858	264.23412	.4447821	.0521366	524.8615189
	Minimum	2330.60	702.29	13.0456	3425.05	5854.01	10.5084	.5723	7326.0000
	Maximum	4074.27	1358.07	19.4724	4829.02	9212.58	16.5675	1.2065	14081.0000
	Mean	246.7892	64.8550	14.616502	132.5775	370.2342	12.196098	.018645	20984.666667
	Std. Deviation	125.41696	29.83248	1.0195998	54.66315	187.10258	1.0744176	.0119151	6500.7620859
ID 25	Std. Error of Mean	36.20476	8.61190	.2943331	15.77989	54.01186	.3101576	.0034396	1876.6083701

	Minimum	82.68	25.96	12.8752	47.91	120.60	10.2976	.0080	13276.0000
	Maximum	383.41	104.28	16.1009	189.35	576.05	13.7662	.0422	30829.0000
	Mean	24494.8942	2899.8825	15.693659	14581.3617	42402.8883	12.661574	91.774479	924.078750
	Std. Deviation	3133.12895	698.27119	.7913695	2838.83638	4707.55018	.8460917	96.8390223	642.0796639
ID 26	Std. Error of Mean	904.45642	201.57353	.2284487	819.50147	1358.95268	.2442456	27.9550178	185.3524334
	Minimum	17990.73	1763.00	14.6117	9162.34	33731.66	11.7311	16.8091	116.7240
	Maximum	29025.00	3740.00	16.8355	18434.00	50748.00	13.9148	342.9886	2039.4080
	Mean	34367.2300	165.9567	128.881660	11285.5017	54101.5983	126.808211	13.115046	4542.255500
	Std. Deviation	3610.88688	17.13002	21.4653587	940.35777	4293.70312	21.466860 3	4.4214241	1394.6761773
ID 27	Std. Error of Mean	1042.37326	4.94501	6.1965153	271.45791	1239.48533	6.1969488	1.2763552	402.6083332
	Minimum	28920.96	140.28	96.3061	9554.49	47041.32	94.2306	7.7418	2104.8810
	Maximum	40393.67	190.45	190.1999	12718.08	62096.49	188.1313	22.3487	6818.8270
ID 28	Mean	196774.3333	5887.3333	44.905774	51685.0000	389714.0000	43.143556	66.815551	6199.829917

	Std. Deviation	31495.13741	4240.72936	22.6919970	2110.89417	25493.85486	22.5806323	18.1089653	1619.2816267
	Std. Error of Mean	9091.86303	1224.19312	6.5506153	609.36266	7359.44198	6.5184671	5.2276080	467.4463415
	Minimum	173843.00	1162.00	33.2285	49114.00	327944.00	31.5301	42.5226	4151.2000
	Maximum	279245.00	11630.00	115.7749	54849.00	422065.00	113.6927	97.9305	9517.0000
	Mean	9.2658	15.8508	4.515497	22.4800	33.9358	2.584224	.001653	27090.962667
	Std. Deviation	2.65416	4.62126	.3736908	4.45064	5.23388	.3160424	.0012286	11000.5538610
ID 29	Std. Error of Mean	.76619	1.33404	.1078753	1.28479	1.51089	.0912336	.0003547	3175.5863665
	Minimum	6.41	8.33	3.9751	15.78	24.42	2.1241	.0009	6671.6480
	Maximum	14.47	22.07	5.0382	30.31	42.71	3.1753	.0044	40618.0000
	Mean	3344.4350	1049.4008	17.002535	4121.9300	8139.1783	14.218420	.911539	9304.886000
	Std. Deviation	545.84544	150.68558	1.6015938	550.09677	915.33385	1.5407702	.2299928	1924.7238586
ID 30	Std. Error of Mean	157.57201	43.49918	.4623403	194.48858	264.23412	.4447821	.0663932	555.6199189

	Minimum	2330.60	702.29	13.0456	3425.05	5854.01	10.5084	.6168	7290.8220
	Maximum	4074.27	1358.07	19.4724	4829.02	9212.58	16.5675	1.2467	13065.0000
	Mean	246.7892	64.8550	14.616502	132.5775	370.2342	12.196098	.086584	15125.969750
	Std. Deviation	125.41696	29.83248	1.0195998	54.66315	187.10258	1.0744176	.1268731	9224.7716063
ID 31	Std. Error of Mean	36.20476	8.61190	.2943331	15.77989	54.01186	.3101576	.0366251	2662.9621851
	Minimum	82.68	25.96	12.8752	47.91	120.60	10.2976	.0064	1724.8640
	Maximum	383.41	104.28	16.1009	189.35	576.05	13.7662	.3268	24436.0000
	Mean	9.2658	15.8508	4.515497	22.4800	33.9358	2.584224	.009975	3623.803167
	Std. Deviation	2.65416	4.62126	.3736908	4.45064	5.23388	.3160424	.0034293	855.9077130
ID 32	Std. Error of Mean	.76619	1.33404	.1078753	1.28479	1.51089	.0912336	.0009900	247.0792742
	Minimum	6.41	8.33	3.9751	15.78	24.42	2.1241	.0066	2499.6200
	Maximum	14.47	22.07	5.0382	30.31	42.71	3.1753	.0168	5078.0110
Total	Mean	16128.9577	1149.9589	47.547257	4072.8104	27811.2854	45.601710	6.785019	33291.865741

	Std. Deviation	41710.39908	2542.53964	115.2882135	10168.40681	76920.32579	115.2625254	26.2081408	62805.7089527
	Std. Error of Mean	2134.08967	131.82454	5.9935488	572.01757	3935.58624	5.9922134	1.3426837	3213.4196188
	Minimum	.53	.06	-33.2842	15.78	24.42	2.1241	.0002	.0000
	Maximum	279245.00	12901.87	1370.1844	54849.00	422065.00	1368.4667	342.9886	479162.0000

YEAR		TLA	LY	SE	LV	PAT	OE	ROA
Year 2008	Mean	15953.4161	1199.7094	35.801269	3824.4191	24014.9603	33.504255	3.532299
	Std. Deviation	47970.19677	2731.19665	37.6903970	10962.12185	68279.03417	37.5737170	11.3925532
	Std. Error of Mean	8615.70168	490.53740	6.8812936	2285.76041	12263.27655	6.8599908	2.0461630
	Minimum	10.25	.07	4.6122	22.39	38.08	2.8360	.0006
	Maximum	242251.00	10270.27	146.9847	51894.00	327944.00	144.2052	58.9512
Year 2009	Mean	19266.8016	1380.1865	52.050332	4172.8848	28287.1219	49.750587	5.933677
	Std. Deviation	56867.85951	3145.87034	63.9839000	10873.58207	79521.87743	63.8942336	17.0723533
	Std. Error of Mean	10213.76908	565.01499	11.6818085	2174.71641	14282.55081	11.6654377	3.1169710
	Minimum	12.70	.09	5.0270	16.44	33.20	3.0493	.0005
	Maximum	279245.00	12561.18	221.4918	53817.00	369202.00	218.6227	73.6500
Year 2010	Mean	16975.7641	1396.5632	27.380824	4098.5496	29769.8522	25.153450	5.044505
	Std. Deviation	44558.07783	3206.43674	26.2373757	10675.68255	83164.22590	26.2560631	14.1608814
	Std. Error of Mean	7876.82975	575.89304	4.7123718	2226.03369	14701.49702	4.7157281	2.5033138
	Minimum	14.47	.15	5.0382	20.10	35.74	3.1753	.0004
	Maximum	189761.00	12901.87	125.1388	49965.00	375623.00	122.9785	60.0921

	Mean	15862.6050	1318.8242	31.236602	4316.8218	28477.7253	30.598445	5.370493
	Std. Deviation	41403.20291	2930.00706	31.1667724	11208.67591	79824.89123	31.8708086	13.1130218
Year 2011	Std. Error of Mean	7319.12138	526.24480	5.5977176	2389.69773	14111.18047	5.7241662	2.3180767
	Minimum	6.51	.12	4.2927	25.23	37.41	2.4242	.0005
	Maximum	189967.00	12141.02	120.0188	50200.00	386971.00	117.9355	53.8825
	Mean	17133.6650	1254.4632	32.946203	4404.0804	29604.1769	30.736294	5.063009
	Std. Deviation	43604.20562	2709.09847	31.9704237	11492.76964	82019.71616	32.0473700	13.3826969
Year 2012	Std. Error of Mean	7708.20737	486.56845	5.7420576	2345.95178	14499.17437	5.7558776	2.3657489
	Minimum	6.75	.08	4.0868	26.49	42.71	2.3291	.0005
	Maximum	188223.00	11595.29	130.5365	53977.00	408831.00	128.4504	58.0691
	Mean	17214.3606	1159.3000	31.094477	4471.0474	29407.4284	28.821424	6.512631
	Std. Deviation	43709.72897	2521.43310	30.4439696	10937.14950	82399.27768	30.5185110	19.5880022
Year 2013	Std. Error of Mean	7726.86144	452.86275	5.4678984	2104.85540	14566.27200	5.4812864	3.4627023
	Minimum	6.97	.07	3.9751	25.94	38.52	2.1241	.0005
	Maximum	189757.00	11172.04	129.5559	54849.00	415053.00	127.4714	94.1249
	Mean	16776.6119	1091.6600	34.933556	4077.6103	28581.1247	32.616060	6.593872
	Std. Deviation	42387.96014	2383.66710	36.0396655	10438.49777	80309.64921	36.1456175	20.3877544
Year 2014	Std. Error of Mean	7493.20351	428.11925	6.4729150	1938.38037	14196.87439	6.4919445	3.6040798
	Minimum	7.38	.06	4.1825	25.12	33.42	2.3335	.0004
	Maximum	187413.00	10722.36	159.9325	54781.00	406529.00	158.0073	97.9305
	Mean	15347.7863	1022.4471	33.800275	3856.8734	26544.7938	31.480074	6.286515
	Std. Deviation	38784.85051	2164.95197	32.5615844	9710.61992	74621.13057	32.6634595	19.1846254
Year 2015	Std. Error of Mean	6856.25770	388.83685	5.8482332	1803.21685	13191.27686	5.8665305	3.3913947
	Minimum	8.18	.06	4.4518	30.31	35.25	2.5499	.0004
	Maximum	173843.00	9448.46	145.0086	50998.00	381972.00	143.0781	89.3794
	Mean	15939.6222	1006.4923	75.104921	4004.7043	27708.2997	72.816964	6.556829
	Std. Deviation	39303.14382	2147.16549	242.5341113	9755.85608	75750.19222	242.6451103	19.5095923
Year 2016	Std. Error of Mean	6947.87988	385.64231	43.5604123	1843.68350	13390.86865	43.5803483	3.4488413
	Minimum	9.12	.07	4.6194	19.12	24.42	2.6029	.0002
	Maximum	174589.00	9428.09	1370.1844	50615.00	382348.00	1368.4667	81.1463
	Mean	14595.3138	1001.6061	65.079093	3898.9269	31238.9919	62.820962	7.849218

Year 2017	Std. Deviation	35534.94389	2341.70347	175.0780560	9359.06428	84740.17122	175.2604372	25.1615149
	Std. Error of Mean	6281.74995	420.58236	31.4449471	1737.93461	14980.08743	31.4777038	4.4479695
	Minimum	.68	.08	4.1461	15.78	26.36	2.6665	.0002
	Maximum	185694.00	11045.94	990.5798	49114.00	422065.00	989.2555	126.6597
	Mean	13898.0612	959.8026	69.735235	3820.8124	24491.5009	69.771647	9.450165
Year 2018	Std. Deviation	33428.62374	2143.49242	174.3309870	9429.40861	70798.57184	173.4547362	39.1906940
	Std. Error of Mean	5909.40163	384.98260	31.3107696	1750.99722	12515.53756	31.1533903	6.9280014
	Minimum	.57	3.30	-33.2842	18.83	29.68	2.2794	.0002
	Maximum	175224.00	10647.00	938.0774	49485.00	395342.00	936.0149	218.6223
	Mean	14676.0563	1008.4526	81.170650	4034.5432	25505.6831	78.893947	13.072157
Year 2019	Std. Deviation	35558.18192	2164.42335	166.8129855	9770.50649	72638.78868	166.8381543	60.6919422
	Std. Error of Mean	6285.85789	388.74191	29.9604966	1846.45217	12840.84501	29.9650171	10.7289210
	Minimum	.53	2.15	3.6403	24.01	32.44	2.6406	.0002
	Maximum	185325.00	10747.00	818.5706	50525.00	404688.00	816.4290	342.9886
	Mean	16128.9577	1149.9589	47.547257	4072.8104	27811.2854	45.601710	6.785019
Total	Std. Deviation	41710.39908	2542.53964	115.2882135	10168.40681	76920.32579	115.2625254	26.2081408
	Std. Error of Mean	2134.08967	131.82454	5.9935488	572.01757	3935.58624	5.9922134	1.3426837
	Minimum	.53	.06	-33.2842	15.78	24.42	2.1241	.0002
	Maximum	279245.00	12901.87	1370.1844	54849.00	422065.00	1368.4667	342.9886

SECOND DATA SET

ID		TLA	OE	SE	PG	GDP	IF
ID 1	Mean	.040486	43.831292	41.994614	91.218549	1.5000	5.7450
	Std. Deviation	.0241293	18.4954569	19.0384556	17.0173571	1.53426	1.68378
	Std. Error of Mean	.0069655	5.3391785	5.4959287	4.9124879	.44290	.48607
	Minimum	.0238	9.7189	11.2774	75.0230	-2.00	4.06
	Maximum	.1123	68.2465	70.8819	135.3150	3.28	10.06
ID 2	Mean	.053972	45.474409	47.460455	91.991847	1.5383	5.7450
	Std. Deviation	.0472518	124.9123195	125.0926320	16.6704220	1.44183	1.68378
	Std. Error of Mean	.0136404	36.0590806	36.1111324	4.8123363	.41622	.48607
	Minimum	.0172	3.2754	5.5247	75.0230	-1.54	4.06
	Maximum	.1561	441.8336	444.3793	135.3150	3.28	10.06
ID 3	Mean	.041606	27.334673	24.276489	93.937514	1.5383	5.7450
	Std. Deviation	.0096395	7.2397561	19.3835691	15.7623037	1.44183	1.68378
	Std. Error of Mean	.0027827	2.0899376	5.5955544	4.5501851	.41622	.48607

ID 4	Minimum	.0332	15.1962	-33.2842	75.0230	-1.54	4.06
	Maximum	.0627	45.7423	48.4192	135.3150	3.28	10.06
	Mean	.040911	14.218420	17.002535	94.393577	1.5383	5.7450
	Std. Deviation	.0101635	1.5407702	1.6015938	15.7932716	1.44183	1.68378
	Std. Error of Mean	.0029340	.4447821	.4623403	4.5591248	.41622	.48607
ID 5	Minimum	.0248	10.5084	13.0456	75.0230	-1.54	4.06
	Maximum	.0689	16.5675	19.4724	135.3150	3.28	10.06
	Mean	.036420	81.641309	83.985568	98.126097	1.5383	5.7450
	Std. Deviation	.0152723	39.8876107	40.0507514	19.7960640	1.44183	1.68378
	Std. Error of Mean	.0044087	11.5145614	11.5616560	5.7146314	.41622	.48607
ID 6	Minimum	.0010	42.4131	44.5922	75.0230	-1.54	4.06
	Maximum	.0576	182.3113	184.9462	135.3150	3.28	10.06
	Mean	.037729	22.725088	26.045025	91.218549	1.5383	5.7450
	Std. Deviation	.0131749	8.2857026	8.6012122	17.0173571	1.44183	1.68378
	Std. Error of Mean	.0038033	2.3918763	2.4829561	4.9124879	.41622	.48607

ID 7	Minimum	.0211	17.3248	20.5712	75.0230	-1.54	4.06
	Maximum	.0617	40.6436	44.4589	135.3150	3.28	10.06
	Mean	.091685	33.459996	36.081844	91.991847	1.5383	5.7450
	Std. Deviation	.0167624	4.9185293	4.9034956	16.6704220	1.44183	1.68378
	Std. Error of Mean	.0048389	1.4198571	1.4155172	4.8123363	.41622	.48607
ID 8	Minimum	.0514	27.8203	30.3273	75.0230	-1.54	4.06
	Maximum	.1178	42.2457	44.8192	135.3150	3.28	10.06
	Mean	.089029	7.306069	9.097038	93.937514	1.5383	5.7450
	Std. Deviation	.0889944	3.7924891	3.9070248	15.7623037	1.44183	1.68378
	Std. Error of Mean	.0256905	1.0947973	1.1278609	4.5501851	.41622	.48607
ID 9	Minimum	.0016	3.6499	4.6194	75.0230	-1.54	4.06
	Maximum	.3175	16.5187	17.8928	135.3150	3.28	10.06
	Mean	.031947	32.567243	35.293828	94.393577	1.5383	5.7450
	Std. Deviation	.0157057	58.6069752	58.6556714	15.7932716	1.44183	1.68378
	Std. Error of Mean	.0045338	16.9183765	16.9324338	4.5591248	.41622	.48607

ID 10	Minimum	.0040	12.9961	15.3913	75.0230	-1.54	4.06
	Maximum	.0573	218.6227	221.4918	135.3150	3.28	10.06
	Mean	.007142	379.863299	381.623172	98.126097	1.5383	5.7450
	Std. Deviation	.0041271	494.4099735	494.4288538	19.7960640	1.44183	1.68378
	Std. Error of Mean	.0011914	142.7238656	142.7293159	5.7146314	.41622	.48607
ID 11	Minimum	.0018	31.9790	33.5800	75.0230	-1.54	4.06
	Maximum	.0151	1368.4667	1370.1844	135.3150	3.28	10.06
	Mean	.014550	48.167771	50.284828	91.218549	1.5383	5.7450
	Std. Deviation	.0050307	9.0194537	9.0450965	17.0173571	1.44183	1.68378
	Std. Error of Mean	.0014522	2.6036920	2.6110944	4.9124879	.41622	.48607
ID 12	Minimum	.0050	41.6654	43.7014	75.0230	-1.54	4.06
	Maximum	.0221	75.6274	77.7800	135.3150	3.28	10.06
	Mean	.020700	51.974820	53.939465	91.991847	1.5383	5.7450
	Std. Deviation	.0035485	22.0688935	22.0398256	16.6704220	1.44183	1.68378
	Std. Error of Mean	.0010244	6.3707408	6.3623496	4.8123363	.41622	.48607

ID 13	Minimum	.0119	33.8531	35.8692	75.0230	-1.54	4.06
	Maximum	.0257	108.7939	110.7352	135.3150	3.28	10.06
	Mean	.096744			93.937514	1.5383	5.7450
	Std. Deviation	.0232042			15.7623037	1.44183	1.68378
	Std. Error of Mean	.0066985			4.5501851	.41622	.48607
ID 14	Minimum	.0578			75.0230	-1.54	4.06
	Maximum	.1281			135.3150	3.28	10.06
	Mean	.033111	81.667539	83.979638	94.408086	1.5383	5.7450
	Std. Deviation	.0184635	39.8762660	40.0533269	15.7947871	1.44183	1.68378
	Std. Error of Mean	.0053300	11.5112864	11.5623995	4.5595623	.41622	.48607
ID 15	Minimum	.0000	42.4131	44.5922	75.0230	-1.54	4.06
	Maximum	.0576	182.3113	184.9462	135.3150	3.28	10.06
	Mean	.293634	98.281813	100.130198	93.243428	1.6810	5.1620
	Std. Deviation	.0809881	123.2767802	123.2905055	19.6720972	1.07806	.87388
	Std. Error of Mean	.0256107	38.9835408	38.9878811	6.9551367	.34091	.27634

ID 16	Minimum	.1701	4.8158	6.1296	75.0230	.15	4.06
	Maximum	.4461	335.2348	337.0221	135.3150	3.28	6.59
	Mean	.010962	119.730552	121.633277	94.393577	1.5383	5.7450
	Std. Deviation	.0034454	42.3122300	42.3278534	15.7932716	1.44183	1.68378
	Std. Error of Mean	.0009946	12.2144887	12.2189988	4.5591248	.41622	.48607
ID 17	Minimum	.0071	49.2775	51.1549	75.0230	-1.54	4.06
	Maximum	.0187	168.0407	169.9823	135.3150	3.28	10.06
	Mean	.040563	14.609072	17.433101	435.165435	1.5383	5.7450
	Std. Deviation	.0102185	1.0213272	1.0356201	153.4202107	1.44183	1.68378
	Std. Error of Mean	.0029498	.2948318	.2989578	44.2886000	.41622	.48607
ID 18	Minimum	.0248	13.1777	15.8556	102.8630	-1.54	4.06
	Maximum	.0689	16.5675	19.4724	602.5140	3.28	10.06
	Mean	.039847	20.283911	22.620666	493.955750	1.5383	5.7450
	Std. Deviation	.0296673	6.4299408	6.5566658	43.8698116	1.44183	1.68378
	Std. Error of Mean	.0085642	1.8561640	1.8927464	12.6641238	.41622	.48607

ID 19	Minimum	.0097	8.7511	10.9690	445.5927	-1.54	4.06
	Maximum	.1117	27.8588	30.3261	602.5140	3.28	10.06
	Mean	.055727	19.478438	21.418742	492.539854	1.5383	5.7450
	Std. Deviation	.0322254	4.2935204	4.3830423	43.4776691	1.44183	1.68378
	Std. Error of Mean	.0093027	1.2394326	1.2652753	12.5509220	.41622	.48607
ID 20	Minimum	.0124	11.1327	12.8438	445.5927	-1.54	4.06
	Maximum	.1168	25.4211	27.4086	602.5140	3.28	10.06
	Mean	.070224	12.715090	14.674699	498.473386	1.5383	5.7450
	Std. Deviation	.0344345	6.1135358	6.1572280	41.2836672	1.44183	1.68378
	Std. Error of Mean	.0099404	1.7648258	1.7774386	11.9175682	.41622	.48607
ID 21	Minimum	.0257	5.5963	7.4969	445.5927	-1.54	4.06
	Maximum	.1386	21.5439	23.4511	602.5140	3.28	10.06
	Mean	.065783	4.215856	5.712486	496.384307	1.5383	5.7450
	Std. Deviation	.0510009	1.1614704	1.4597056	41.6579014	1.44183	1.68378
	Std. Error of Mean	.0147227	.3352876	.4213807	12.0256003	.41622	.48607

ID 22	Minimum	.0071	2.7442	3.6403	445.5927	-1.54	4.06
	Maximum	.1345	6.2941	8.4497	602.5140	3.28	10.06
	Mean	.040565	19.717530	21.769525	510.550311	1.5383	5.7450
	Std. Deviation	.0877332	9.2327559	9.1024120	51.7342594	1.44183	1.68378
	Std. Error of Mean	.0253264	2.6652670	2.6276400	14.9343943	.41622	.48607
ID 23	Minimum	.0028	13.0911	15.4599	445.5927	-1.54	4.06
	Maximum	.3166	48.1967	49.7675	602.5140	3.28	10.06
	Mean	.055670	2.584224	4.515497	493.955750	1.5383	5.7450
	Std. Deviation	.0231967	.3160424	.3736908	43.8698116	1.44183	1.68378
	Std. Error of Mean	.0066963	.0912336	.1078753	12.6641238	.41622	.48607
ID 24	Minimum	.0244	2.1241	3.9751	445.5927	-1.54	4.06
	Maximum	.1004	3.1753	5.0382	602.5140	3.28	10.06
	Mean	.040911	14.218420	17.002535	492.539854	1.5383	5.7450
	Std. Deviation	.0101635	1.5407702	1.6015938	43.4776691	1.44183	1.68378
	Std. Error of Mean	.0029340	.4447821	.4623403	12.5509220	.41622	.48607

ID 25	Minimum	.0248	10.5084	13.0456	445.5927	-1.54	4.06
	Maximum	.0689	16.5675	19.4724	602.5140	3.28	10.06
	Mean	.032256	12.196098	14.616502	498.473386	1.5383	5.7450
	Std. Deviation	.0192343	1.0744176	1.0195998	41.2836672	1.44183	1.68378
	Std. Error of Mean	.0055525	.3101576	.2943331	11.9175682	.41622	.48607
ID 26	Minimum	.0059	10.2976	12.8752	445.5927	-1.54	4.06
	Maximum	.0608	13.7662	16.1009	602.5140	3.28	10.06
	Mean	.021077	12.661574	15.693659	496.384307	1.5383	5.7450
	Std. Deviation	.0114903	.8460917	.7913695	41.6579014	1.44183	1.68378
	Std. Error of Mean	.0033170	.2442456	.2284487	12.0256003	.41622	.48607
ID 27	Minimum	.0052	11.7311	14.6117	445.5927	-1.54	4.06
	Maximum	.0420	13.9148	16.8355	602.5140	3.28	10.06
	Mean	.008295	126.808211	128.881660	510.550311	1.5383	5.7450
	Std. Deviation	.0032815	21.4668603	21.4653587	51.7342594	1.44183	1.68378
	Std. Error of Mean	.0009473	6.1969488	6.1965153	14.9343943	.41622	.48607

ID 28	Minimum	.0003	94.2306	96.3061	445.5927	-1.54	4.06
	Maximum	.0131	188.1313	190.1999	602.5140	3.28	10.06
	Mean	.008977	43.143556	44.905774	493.955750	1.5383	5.7450
	Std. Deviation	.0015927	22.5806323	22.6919970	43.8698116	1.44183	1.68378
	Std. Error of Mean	.0004598	6.5184671	6.5506153	12.6641238	.41622	.48607
ID 29	Minimum	.0048	31.5301	33.2285	445.5927	-1.54	4.06
	Maximum	.0107	113.6927	115.7749	602.5140	3.28	10.06
	Mean	.055670	2.584224	4.515497	492.539854	1.5383	5.7450
	Std. Deviation	.0231967	.3160424	.3736908	43.4776691	1.44183	1.68378
	Std. Error of Mean	.0066963	.0912336	.1078753	12.5509220	.41622	.48607
ID 30	Minimum	.0244	2.1241	3.9751	445.5927	-1.54	4.06
	Maximum	.1004	3.1753	5.0382	602.5140	3.28	10.06
	Mean	.040911	14.218420	17.002535	498.473386	1.5383	5.7450
	Std. Deviation	.0101635	1.5407702	1.6015938	41.2836672	1.44183	1.68378
	Std. Error of Mean	.0029340	.4447821	.4623403	11.9175682	.41622	.48607

ID 31	Minimum	.0248	10.5084	13.0456	445.5927	-1.54	4.06
	Maximum	.0689	16.5675	19.4724	602.5140	3.28	10.06
	Mean	.032256	12.196098	14.616502	496.384307	1.5383	5.7450
	Std. Deviation	.0192343	1.0744176	1.0195998	41.6579014	1.44183	1.68378
	Std. Error of Mean	.0055525	.3101576	.2943331	12.0256003	.41622	.48607
ID 32	Minimum	.0059	10.2976	12.8752	445.5927	-1.54	4.06
	Maximum	.0608	13.7662	16.1009	602.5140	3.28	10.06
	Mean	.055670	2.584224	4.515497	510.550311	1.5383	5.7450
	Std. Deviation	.0231967	.3160424	.3736908	51.7342594	1.44183	1.68378
	Std. Error of Mean	.0066963	.0912336	.1078753	14.9343943	.41622	.48607
Total	Minimum	.0244	2.1241	3.9751	445.5927	-1.54	4.06
	Maximum	.1004	3.1753	5.0382	602.5140	3.28	10.06
	Mean	.048882	45.602560	47.547064	296.157577	1.5409	5.7297
	Std. Deviation	.0558964	115.2626752	115.2881792	205.1153724	1.37717	1.60131
	Std. Error of Mean	.0028599	5.9922212	5.9935470	10.5221966	.07046	.08193

	Minimum	.0000	2.1241	-33.2842	75.0230	-2.00	4.06
	Maximum	.4461	1368.4667	1370.1844	602.5140	3.28	10.06

YEAR		TLA	OE	SE	PG	GDP	IF
2008	Mean	.050761	33.504255	35.801269	288.045419	3.1900	10.0600
	Std. Deviation	.0418385	37.5737170	37.6903970	208.9119849	.00000	.00000
	Std. Error of Mean	.0075144	6.8599908	6.8812936	37.5217001	.00000	.00000
	Minimum	.0040	2.8360	4.6122	75.1690	3.19	10.06
	Maximum	.1561	144.2052	146.9847	540.2825	3.19	10.06
2009	Mean	.050013	49.750587	52.050332	291.400223	-1.5548	7.2600
	Std. Deviation	.0385388	63.8942336	63.9839000	206.9792154	.08262	.00000
	Std. Error of Mean	.0069218	11.6654377	11.6818085	37.1745645	.01484	.00000
	Minimum	.0022	3.0493	5.0270	75.0230	-2.00	7.26
	Maximum	.1483	218.6227	221.4918	602.5140	-1.54	7.26
2010	Mean	.051223	25.153450	27.380824	301.749993	3.0400	4.0600
	Std. Deviation	.0595485	26.2560631	26.2373757	208.3094996	.00000	.00000
	Std. Error of Mean	.0105268	4.7157281	4.7123718	37.4134906	.00000	.00000
	Minimum	.0057	3.1753	5.0382	75.1690	3.04	4.06
	Maximum	.3175	122.9785	125.1388	540.2825	3.04	4.06
2011	Mean	.043583	30.598445	31.236602	304.571927	3.2800	5.0200
	Std. Deviation	.0521283	31.8708086	31.1667724	203.5992029	.00000	.00000
	Std. Error of Mean	.0092151	5.7241662	5.5977176	36.5674963	.00000	.00000
	Minimum	.0010	2.4242	4.2927	75.0230	3.28	5.02
	Maximum	.2672	117.9355	120.0188	602.5140	3.28	5.02

	Mean	.051312	30.736294	32.946203	294.152362	2.2100	5.7200
	Std. Deviation	.0411852	32.0473700	31.9704237	207.6697856	.00000	.00000
2012							
	Std. Error of Mean	.0072806	5.7558776	5.7420576	36.7111784	.00000	.00000
	Minimum	.0094	2.3291	4.0868	75.1690	2.21	5.72
	Maximum	.1701	128.4504	130.5365	540.2825	2.21	5.72
	Mean	.051341	28.821424	31.094477	297.253782	2.4900	5.7800
	Std. Deviation	.0516776	30.5185110	30.4439696	205.0801446	.00000	.00000
2013							
	Std. Error of Mean	.0091354	5.4812864	5.4678984	36.2533902	.00000	.00000
	Minimum	.0052	2.1241	3.9751	75.0230	2.49	5.78
	Maximum	.2816	127.4714	129.5559	602.5140	2.49	5.78
	Mean	.048118	32.616060	34.933556	293.352650	1.8500	6.1400
	Std. Deviation	.0571475	36.1456175	36.0396655	209.6801723	.00000	.00000
2014							
	Std. Error of Mean	.0101023	6.4919445	6.4729150	37.0665679	.00000	.00000
	Minimum	.0088	2.3335	4.1825	75.1690	1.85	6.14
	Maximum	.3329	158.0073	159.9325	540.2825	1.85	6.14
	Mean	.050503	31.480074	33.800275	297.248599	1.1900	4.5100
	Std. Deviation	.0665968	32.6634595	32.5615844	208.0763096	.00000	.00000
2015							
	Std. Error of Mean	.0117728	5.8665305	5.8482332	36.7830424	.00000	.00000
	Minimum	.0003	2.5499	4.4518	75.0230	1.19	4.51
	Maximum	.3660	143.0781	145.0086	602.5140	1.19	4.51
	Mean	.042787	72.816964	75.104921	293.835354	.4000	6.5900
	Std. Deviation	.0565381	242.6451103	242.5341113	209.5760513	.00000	.00000
2016							
	Std. Error of Mean	.0099946	43.5803483	43.5604123	37.0481618	.00000	.00000
	Minimum	.0016	2.6029	4.6194	75.1690	.40	6.59
	Maximum	.3200	1368.4667	1370.1844	540.2825	.40	6.59
2017	Mean	.044319	62.820962	65.079093	296.831080	1.4100	5.1800

	Std. Deviation	.0552703	175.2604372	175.0780560	206.5334004	.00000	.00000
	Std. Error of Mean	.0097705	31.4777038	31.4449471	36.5102920	.00000	.00000
	Minimum	.0023	2.6665	4.1461	75.0230	1.41	5.18
	Maximum	.3037	989.2555	990.5798	602.5140	1.41	5.18
	Mean	.042961	69.781801	69.732939	295.613894	.7900	4.5000
	Std. Deviation	.0497302	173.4544983	174.3310101	210.6012689	.00000	.00000
2018							
	Std. Error of Mean	.0087911	31.1533476	31.3107737	37.2293963	.00000	.00000
	Minimum	.0000	2.2794	-33.2842	75.1690	.79	4.50
	Maximum	.2598	936.0149	938.0774	540.2825	.79	4.50
	Mean	.059762	78.893947	81.170650	299.871185	.1500	4.1200
	Std. Deviation	.0891049	166.8381543	166.8129855	212.0416200	.00000	.00000
2019							
	Std. Error of Mean	.0157517	29.9650171	29.9604966	37.4840169	.00000	.00000
	Minimum	.0082	2.6406	3.6403	75.0230	.15	4.12
	Maximum	.4461	816.4290	818.5706	602.5140	.15	4.12
	Mean	.048882	45.602560	47.547064	296.157577	1.5409	5.7297
	Std. Deviation	.0558964	115.2626752	115.2881792	205.1153724	1.37717	1.60131
Total							
	Std. Error of Mean	.0028599	5.9922212	5.9935470	10.5221966	.07046	.08193
	Minimum	.0000	2.1241	-33.2842	75.0230	-2.00	4.06
	Maximum	.4461	1368.4667	1370.1844	602.5140	3.28	10.06

Appendix 2 Editors Letter

EDITOR'S LETTER

Researchers Beyond-Borders (PTY) LTD
Umhlanga, Durban
South Africa
3 July 2023

To whom it may concern

Editing of Masters (MBA) Dissertation: **Omonike Ope Ige-Gbadeyan** (Student number-21958492)

Title: Evaluation of Operational Efficiency and Financial Health of Non- life insurance companies in South Africa

This letter serves as confirmation that the aforementioned dissertation has been language edited. Any queries may be directed to the author of this letter.

Regards

Maleni Pillay
Researchers Beyond-Borders
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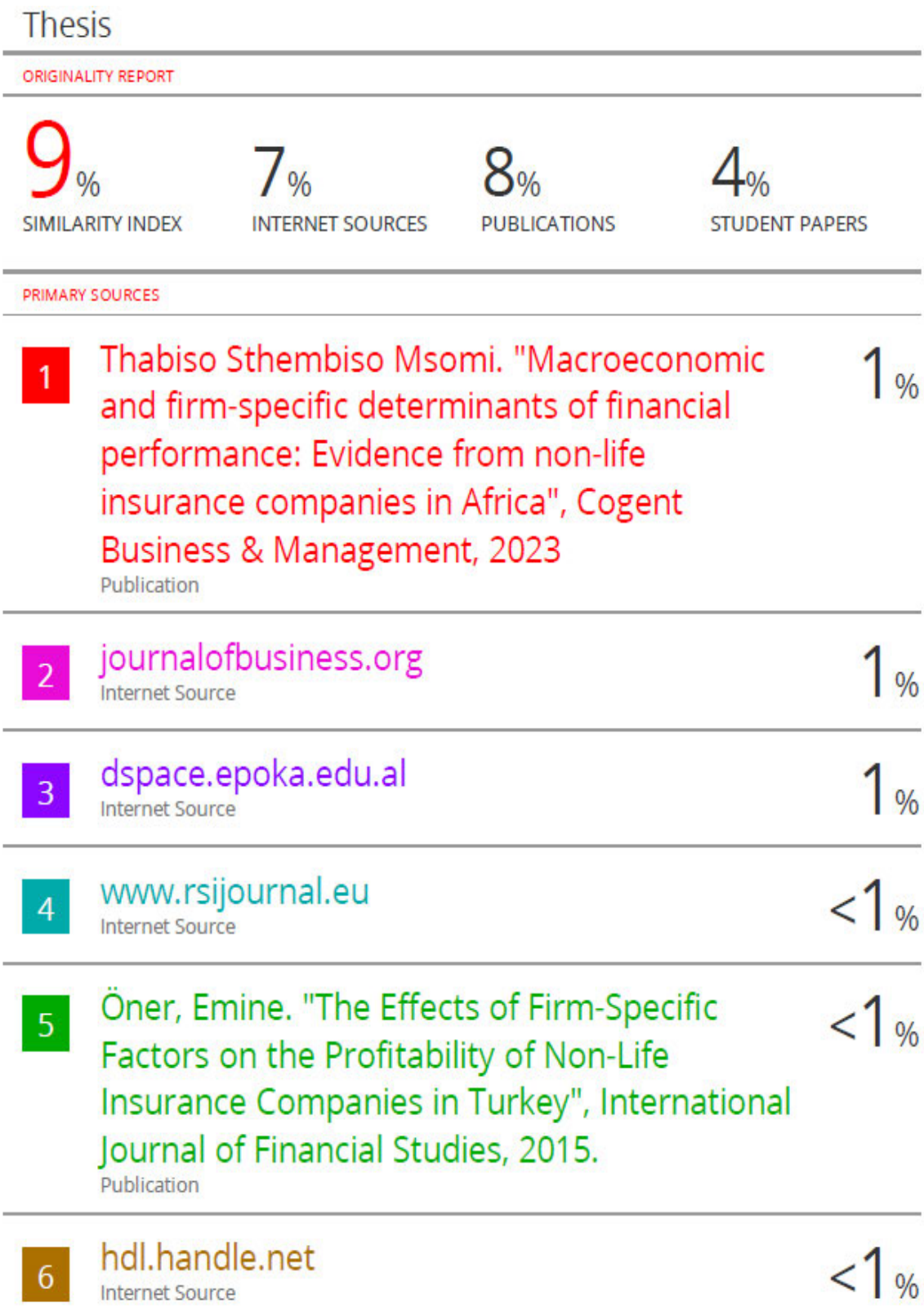
Appendix 3 Turnitin Report



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