Strategic Fit and Potential Gains of Mergers and Acquisitions in Ethiopian Insurance Industry: An Emerging Market Perspective

by:

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A Thesis submitted to College of Business and Economics of Addis Ababa University in partial fulfillment of the requirements for Master of Business Administration (EMBA)

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May 2021

Addis Ababa, Ethiopia

Declaration

I , the undersigned declare that this is my original work and has not been submitted to any other college, institution or university other than Addis Ababa University for academic credit.

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The project has been presented for examination with my approval as the appointed advisor.

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Addis Ababa University

College of Business and Economics

Department of Management

EMBA Program

Strategic Fit and Potential Gins of Mergers and Acquisitions in Insurance: An emerging Perspective

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Acknowledgment

The success of this research was attributed to the ones who supported me in every step of the way.First and foremost, I take this opportunity to express my gratitude to the Almighty God,who gave me life,strength,health,knowledge and protection throughout my study.I am grateful to my advisor,Dr.YitbarekTakele,who took his timeto direct,guide and support me in writing this project.

My heartfelt gratitude goes to my wife YoditGenda and our children,Yohannes,Makeda and Nikodimos Solomon for the encouragement and understanding they have given me throughout this research. To all my friends who understood when I could not spend time with them as I worked on my research, I say thank you and I will make up for that.

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Abstract

The aim of this paper is to measure the efficiency of insurance companies in Ethiopia using data envelopment analysis (DEA), and to evaluate to determine the potential gains and strategic fit from potential insurance companies Mergers & Acquisitions. This study is crucial because the wave of liberalization and deregulation may cause an industry shock in the insurance industry sooner because of the ongoing economic reform in the country. It has been employed an Input-oriented Data Envelopment Analysis with both Constant Returns to Scale (CRS) and Variable Returns to Scale (VRS) model is adopted to analyze the potential gains. The data were taken from financial statements of 17 Local banks and 3 foreign insurance companies for the period from 2016 to 2020. Contextual variables are used based on insurance size and Ownership structure. To address this critical issue the research was guided by the following research question: identify the potential efficiency gains that would be formed in future Ethiopian insurance industry; identify the types of M&A that yield potential strategic fits in future Ethiopian insurance industry M&A; determine insurance size contribution for the success of strategic fit; determine ownership type contribution for the success of strategic fit and determine financial performance contribution for the success of strategic fit of the future M&As in the Ethiopian insurance industry. Stata 14 and Ms-Excel Solver Add in were used to organize and analyze the data captured from financial statement of identified samples. Descriptive statistics were used to explain the potential gain in the insurance industry in Ethiopia. Data envelopment analysis (DEA) was also used to calculate the efficiency measures. Finally, the results have shown that some local insurance companies would have been benefited with M&A activities in the study period. Though the identified foreign insurance industries were relatively efficient, it is expected further study to M&A activities. The researcher recommends local insurance companies merger and acquisitions between themselves instead with the foreigners; and that would provide efficiency gain by producing the insurance premium with the minimum operational and administration expenses.

Keywords: Data Envelopment Analysis (DEA), Insurance companies, Efficiency, Strategic fit, Mergers and Acquisitions (M&As).

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List of Abbreviations

AFCFTA:AfricanContinentalFreeTradeArea

AIC : Awash Insurance Company

AIICO :American International Insurance Company Limited

BCC : Banker, Charnes and Cooper

CCR :Charnes,Cooper and Rhodes

CRS : Constant Returns to Scale

DEA : Data Envelopment Analysis

DMU : Decision Making Unit

EIC : Ethiopia Insurance Corporation

ELiG :Ethio-Life and General Insurance Company

ETB : Ethiopian Birr

ETC : Ethiopian Telecommunication

EU : European Union

GDP : Gross Domestic Product

GTP : Growth and Transformation Plan

HR : Human Resource

ICT : Information Communication Technology

IRA : Individual Retirement Account

JUB : Jubilee Insurance

KPMG :Klynveld Peat Marwick Goerdeler

M&As : Mergers and Acquisitions

MNC : Multi-National Corporations

NICE : National Insurance Company of Ethiopia

NISCO :Nyala Insurance Company

ROA : Return on Asset

ROE : Return on Equity

SAM :Santam Insurance

UNIC : United Insurance Company

USD : United States Dollars

WTO : World Trade Organization

VRS : Variable Returns to Scale

Chapter One: Introduction

This chapter presents background of the study, statement of the problem, research questions, objectives of the study, research hypothesis,significance of the study, scope of the study and limitation and delimitation of the study.

1.1: Background of the study

AsAxco (2017) reported that in Ethiopia insurance transaction was first started as farback as 1905 when the bank of Abyssinia which was owned by the bank of Egypt beganto transact insurance (on to underwrite fireand marine insurance)as an agent of a foreign insurance company and foreigners were not owned a Company. As at June 30, 2020, in Ethiopia there are 17 private and one government owned insurance companies. These 17 insurance companies run total capital about 2.97 billion and total assets estimated 11.3 billion Birr. And as disclosed by the recent research findings these 17insurance companies has 0.5% market penetration; this is very low as compared with Kenya market penetration (i.e. 3.5%) and that is highly below the African average of 1.8 % in 2012.

M&A is the common experience throughout the world, because of business growth, expansion of ICT infrastructure and increase of customer basis. Mergers and acquisition is a process of consolidating or gaining all or part of another organization's property rights. An acquisition is the process of acquiring a company to build on strengths or weaknesses of the acquiring company. The overarching goal behind mergers and acquisitions is to create long-term shareholder value, obtain a larger market share, achieve greater efficiency and grow the business in a quicker and more profitable manner than normal organic growth would allow (Sheang, Hua, & Tai, 2000). Corporate expansion throughM&A has become an increasingly popular means of restructuring and repositioning in the global market; as such, M&A activity has become an important dynamic in the insurance landscape.

On the other hand all business sectors, including the insurance industry are under the influence of globalization in all developing countries. Besides its drawback, globalization also createsdifferent opportunities, like to createcompetitive domestic companies to grow profitably at a regular pace, companies across the globe have been aggressively trying to build new

competencies and capabilities and others if it is managed properly. Cross-border mergers and acquisitions (M&A)is a tool used by companies for the purpose of expanding their operations often aiming at an increase of their long term profitability and provides ample opportunities to enter the international market (Singla, Saini& Sharma, 2012). M&A is quite often considered as one of the best and quickest strategic methods to confront to the global competitive market.

It is clear that M&A have become one of the most important corporate level strategies in the new millennium (Hitt, et al., 2001). According todifferent research the driving force for M&A is lack of financial capacity, access to new technology, attract skilled manpower, international reputation and working culture. In Ethiopia, there is poor practice of M&A implementation in all sectors. As stated in literature, in 2000 two Ethiopian insurance companies, i.e. Lion and united insurance were merged with authorized capital of 28.95 Million Birr. After the merger Lion Insurance company was dissolved and its account's entered in to accounts of UNIC.

M&A are largelyexternal corporate strategic growth initiatives (Savović,2017). Several studies have been conducted using variety of financial measures (e.g. Profit, Stock price) and non-financial measures (e.g. firm's reputation) and time frame (e.g. pre-measurement and post measurement, initial market reaction etc.) to measure performance of the two parties before and after M&A implementation. These studies show that on average, M&As consistently benefit the target's shareholders, but not the acquirer's shareholders.

Insurance industry is one of the financial system component fostering economic growth and stability. And as any financial institutesthe insurance companies are easily exposed to the M&A activities. On the other hand, though no too much works were performed regarding implementation of M&A in Ethiopia, this does not mean that there is no pressure from renowned insurance companies in Africa and throughout the world. Hence the country has to respond with great care and based on research by employing proper fact finding techniques whether the two parties are fitting or not in different dimensions, like: technology, financial, HR and others.

1.2: Statementof the problem

The volume of investment for cross-borderM&A is getting increased from time to time. For instance global M&A transactions increased from $3.23 trillion U.S.D in 2014 (Čiegis&Andriuškevičius, 2015; Remanda, 2016) to $4.7 trillion U.S.D in 2015 (Remanda,2016). As the result of this cross-border M&A knock every door of company throughout the world. This indicates that cross-border M&A are extending its territory so that companies in the developing country like: Ethiopia soon faces its opportunities and threats.

Furthermore, in Ethiopia there are different effort to fulfill the pre-requisite of the M&A implementation in the country. For instance in 2018 - 2020 different actors of financial sectors were forced to increase their financial capacities and even NBE issue a directive in the month of April 2021 that obliged the Banking sectors to raise their paid up capital to 5 Billion for the next five years, foreign-owned company were granted to give license to start business operations to liberalizing the finance sector (Wilson, 2019), ratified the African Continental Free Trade Area (AfCFTA) (African Union, 2019), planned to launch the Stock market in 2020 (Yewondwossen, 2019) and resumed negotiations with WTO (World Trade Organization, 2020). Therefore, this indicate that every business in general and theinsurance sector in particular are under the external pressures from the government of Ethiopia, World Trade Organization (WTO), African Continental Free Trade Area (AfCFTA) and others to open up international market in the country.These may create industry shocks and start merger waves (Harford, 2005) in the sector.

Unfortunately, different researches have disclosed about the prevalence of high probability of failure of M&A implementation. For instance as a research conducted in members countries of EU has shown only 9 percent were completely successful in achievement of their objectives from identified 200 European mergers formed from 2007 to 2012 (Weber, Tarba&Yedidia, 2012). Actually, the failure rate varied from place to place and from sector to sector. Accordingto Naraločnik&Bertoncelj, 2016; Sedlacek&Valouch, 2018 M&A failure rateexceeds 50% and Hirsch (2015) found more than 83% of M&As failed to meet planned expectations.In general the problem of unsuccessful organizational integration of M&As can negatively affect companies'viability and competitiveness (Bansal, 2015). Therefore, the observed high

probability of failure requires big attention should be exerted otherwise the success could be unlikely.

Findings ofresearch have shown list of factorsthat associate with implementations of M&A failure. For some of them the failure is mainly caused by the improper attention paid to the integration process and a lack of rational tools for analysis. For others the failure is caused by overestimating the synergy effect and benefits as well as overlooking the risks involved in M&A.

Accordingly (Chui, 2011) there are four major challenges faced by many companies while doing M&A businesses, including limited research attention paid to pre-M&A analysis, inadequate emphasis on risk aspect in M&A, (Mittal, 2012 and Chui, 2011), lack of preparation for M&A critical time,(Chui, 2011)and lack of rational tools for M&A analysis to manage deals (Sathish, 2011, Clark, 2010 and Luban, 2010). In addition, historically, mergers have often failed to add significantly to the value of the acquiring firm's shares (King, et al., 2004).

Jemaneh (2008) only in insurance sector and Haben (2020) and Meseret (2019) in banking sector have been conducted on M&A implementation in Ethiopia. This shows that Ethiopia as a country lacks M&A implementations experience in the financial sector. Hence both banking and insurance sectors may lack to evaluate the cost and benefit of M&A deal by taking risks into account through Monte Carlo analysis for prioritization and managing the foreseeable risks and following the critical path, firms can even increase the efficiency and success rate of M&A.

In view of the above, this study has tried to fill the empirical gaps by investigatingthe strategic fit and potential gains from future mergers and acquisitions between Ethiopian insurance companies themselves, and Ethiopian insurance and Foreign insurance companies; and at the end to recommend how M&A will be implemented in between insurance companies of Ethiopia and propose prerequisites for minimizing potential risks in the implementation M&A.

Hence, to meet the research objectives and purposes, the following basic questions were posed.

1.3: Research questions

- In emerging markets,what types of efficiency gains are formed with mergers and acquisitions?

- What types of mergers and acquisitions yield strategic fits?
- Which factors (insurance size, ownership type, financial performance, etc.) significantly contributes for the increase in the success of strategic fit in insurance M&A transactions?

1.4: Objective of the study

1.4.1: General objective

The general objective of this study is to assess the strategic fit and potential gains from future mergers and acquisitions between Ethiopian insurances, and Ethiopian insurances and Foreign insurances.

1.4.2: Specific Objectives

To meet the general objective, the study focuses on the following specific objectives

- To identify the potential efficiency gains that would be formed in future Ethiopian insurance industry through M&A implementation.
- To identify the types of M&A that yield potential strategic fits in future Ethiopian insurance industry M&A.
- To determine insurance size contribution for the success of strategic fit of the future M&As in the Ethiopian insurance industry.
- To determine ownership type contribution for the success of strategic fit of the future M&As in the Ethiopian insurance industry.
- To determine financial performance contribution for the success of strategic fit of the future M&As in the Ethiopian insurance industry.

1.5: Research Hypothesis:

- H1: Foreign insurances are more efficient than Ethiopian Insurances
- H2: There are potential efficiency gains in M&As

a. H2a: There are potential overall efficiency gains in M&As

b. H2b: There are potential technical efficiency gains in M&As

c. H2c: There are potential pure merger efficiency gains in M&As

d. H2d: There are potential scope efficiency gains in M&As

e. H2e: There are no potential scale efficiency gains in M&As

- H3: The strategic fit for small private insurances is foreign insurances

- H4: The strategic fit for medium private insurances is foreign insurances
- H5: The strategic fit for large private insurances is foreign insurances
- H6: The strategic fit for state-owned insurance is foreign insurances
- H7: The strategic fit for foreign insurances is state-owned insurance

1.6: Significance of the study

This study is beneficial in assessing the potential efficiency gains that would be formed in future Ethiopian insurance industry through M&A implementation and identify factors that determine the success of strategic fit of the future M&As. Therefore the study pinpoints the efficient and inefficient insurance company in the country. And also identify potential efficiency gains insurance companies might get from potential M&As based on insurance size and ownership structure.

As the result of this, the study uses as an input forminimizing M&A failure rates by suggesting the strategic fit for potential M&As. And also the findings of this study will be of great importance to policy makers, insurers, investors, regulators, researchers and financial analyst who have vested interest in understanding the importance of insurance contribution and the extent of degree of insurance sector development on economic growth.

1.7: Scope

The study uses all seventeen insurance industry data ,that has been operated in the Ethiopian insurance industry, from 2015 to 2020. This is because the year2015 marks as the beginning of the second Growth and Transformation Plan (GTP) in all sectors of the country. Moreover the researcher have selected three African Insurance companies in three regions except the north, that have a potential and keen to enter in to the Ethiopian market at the time of liberalization.

Insurance company names included in this research are: Ethiopian Insurance Corporations (EIC), National Insurance companies of Ethiopia(NICE),Awash Insurance Company(AIC),United Insurance Company(UNIC),Africa Insurance Company (Africa), Nile Insurance Company(Nile), Nyala Insurance Company (NISCO),Nib Insurance Company(Nib),Lion Insurance Company(Lion), Ethio Life and General insurance Company(ELiG) ,Birhan Insurance Company(Birhan), Bunna Insurance Company(Bunna), Abay Insurance Company(Abay),

Oromia Insurance Company (Oromia),Tsehay Insurance Company (Tsehay), Lucy Insurance Company(Lucy); Foreign Insurance Companies: Santam(South Africa),Jubillee(Kenya) and AIICO(Nigeria).

The study is limited to assess the strategic fit and potential gains from future mergers and acquisitions between the above listed Ethiopian insurances, and Ethiopian insurances and foreign insurances; and limit itself onthe financial data collection issued by the respective companiesfor the last five yearsfinancial period (2015-2020), perform empirical data analysis and produce recommendation based on the findings.

1.8: Limitation and delimitation of the study

The first limitation of the study is the researcher wants to employonly an empirical data analysis technique. As the result, qualitative data will not collect. The second limitation of the study is the contextual variables selected for the regression analysis. The contextual variables selected are ownership structure, asset size and performance of the insurance. In this study, differences ofculture, organizational identity and human (behavioral) aspect of M&A are not considered in this study.

1.9: Methodology

Data collection: The study will collect financial statement from one government and 16 private owned insurance companies and three foreign companieson specified period (2015 -2020). As the result the study has animmense concentration on secondary data and performs empirical data analysis.

Data Analysis techniques and model specification:The gathered information shall be analyzed by descriptive and analytical analysis methods.Descriptive and explanatory type of research design is employed as a main research design to realize and meet the intended objective. Descriptive research design is most appropriate when the research focuses on detailed description of the characteristics and features of the issue under investigation (Howitt and Cramer, 2011).

In utilizing the empirical data analysis, modern frontier efficiency analysis measures firms' efficiency[1] relative to "best practice" frontiers, which are derived from the most efficient firms in the industry and Bootstrapped Tobit Regression[2]using Stata. Since the birth of this analysis method in the late 1970s (Aigner, Lovell, & Schmidt, 1997), there are two major estimation methods, econometric modeling[3] and mathematical programming,[4] have emerged as the standard methods for measuring the efficiency effects of M&A transactions. Thus, a bulk of the existing M&A literature makes use of these two approaches, which compare frontier efficiency estimates or the pre-merger and post-merger performance of firms using accounting data.

A data envelopment analysis(DEA) model with multiple outputs and inputs based efficiency measurement shall be used. Data Envelopment Analysis (DEA) is a method which is used to measure the efficiencies of decision making units(DMUs) with multiple inputs and outputs. It calculates weights to the inputs and outputs by assigning the maximum efficiency score for a DMU under evaluation. Due to its ability to handle the censored data, which are typically bound between 1 and 0.

1.10: Organization of the paper

The presentation of this study takes the following form: The first chapter is introductory which consists of general background, statement of the research problem, objective ofthe study,significance of the study, scope of the study, research methodology, and research limitation. The second chapter provides the related literature review on the merger and acquisitions process and findings of previous studies on performance measurement of before and after merger and also includes empirical researches in this area and conceptual framework. Sources of the data, the definition of the variables including the methodology employed are discussed in chapter three. chapter four is devoted to analysis of data and discussion based on data collected. Finally, chapter five concludes the study and provides relevant recommendation.

[1]Cost (calculate the minimum costs to produce the given output vector), production (assess the minimum inputs required to produce the given output vector), and revenue frontiers (measure the maximization of revenues).

[2]The most common approach used to investigate if a set of continuous variables may explain the variations inefficiency is to conduct a Tobit regression. Tobit regression is similar to ordinary regression analysis except that the noise term is truncated. This model is widely applied in DEA analysis.

[3]Stochastic frontier analysis, a parametric approach

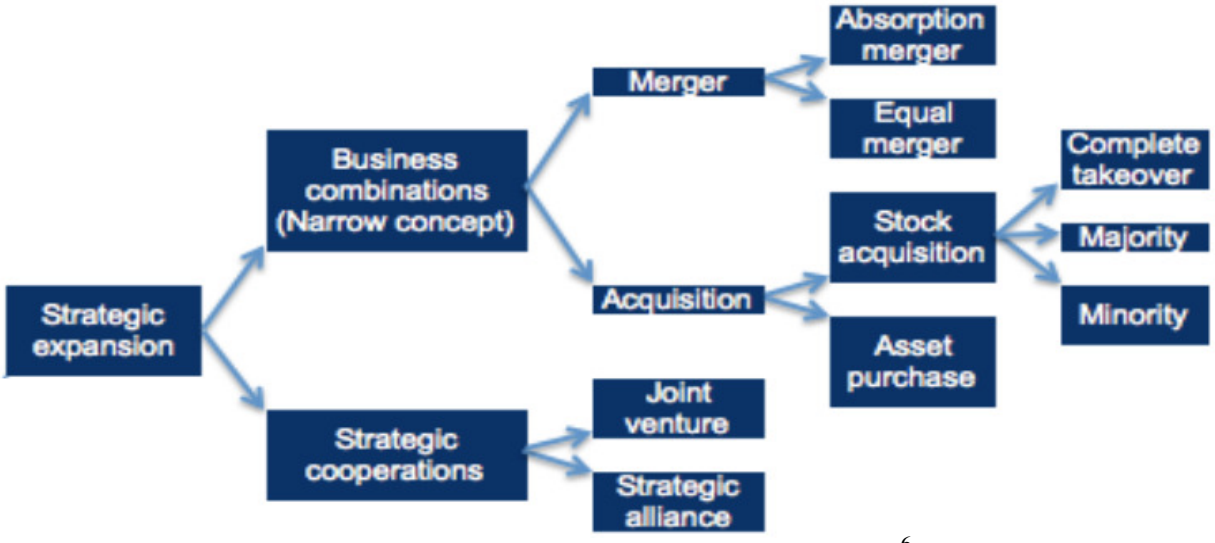
[4]Data envelopment analysis (DEA), a non-parametric approach

Chapter two: Literature Review

2.1: What is merger and acquisition?

Mergers and Acquisitions (M&As) is a process expanding a business activities by consolidating or buying another company in national and international market. For many of us, merger and acquisition are two overlapping words and used interchangeably although there is a slight difference between the two notions (Grinblatt, 2004). Let us see how it has been defined. An acquisition /takeover/ is the purchase of one business or company by another company or other business entity. This indicates that a larger or more resourceful firm absorbs a smaller or weaker one as acquiring.

Whereas a merger takes place when two or more firms combine to form a single enterprise, owned by a single set of stockholders to a single management staff. Meaning, a merger is "a situation in which two or more enterprises ceases to be distinct enterprises" (Parker, 1992). To sum up M&A are the combination of the assets and liabilities of two companies to form a single but larger business entity. The definition of OECD (1993), which characterizes a merger as "anamalgamation or joining of two or more firms into an existing firm or to form anew firm,"[5].For detail A&M types see diagram below.



Diagram[6]: **M&A in narrow sense**

[5]Gaughan (2002, p. 7) and Jagersma (2005, p.14). Weston, Mitchell, and Mulherin (2004, p. 6)
[6] Adapted from Copeland and Weston (1988, p. 677), Gaughan (2002, p. 7), Nakamura (2005, p. 18), and Wuebben (2007, p. 6)

Mergers is expected to increase profitability by reducing costs, improving cooperation, removing ineffective management or eliminating competition. Furthermore, acquiring companies may include new technology and systems expertise, as well as the ability to transfer products that they have developed in their home markets.As the result theoretically on one hand it is assumed that Mergers improve the performance of the company because of Synergy effect, increased market power, Operational economy, Financial Economy, Economy of Scales etc. This does not mean that all M&A transaction end up with success. As suggested by different scholars, the outcome of merger is necessary to measure the operating and financial performance of merged companies before and after merger to ensure success.

Global M&A transactions exceeded $4.7 trillion in 2015 (Remanda, 2016) and are expected to continue its growth over the next decade (Rebner&Yeganeh, 2019). But the failure rate is exceeding 50% (Sedlacek&Valouch, 2018). As the result Failure is taken as a common phenomenon in M&As.

In general, the terms mergers and acquisitions refer to the exchange of ownership control of a business enterprise. There are three types of Mergers and Acquisitions recognized by Weinberg and Blank (1979). These arehorizontal merger if it involves the joining together of two companies which are producing the same product or services, or products which compete directly with each other. A vertical merger is one between two companies producing different goods or services. A conglomerate merger involves the coming together of two companies in different industries i.e. the business of the two companies that are not related to each other horizontally or vertically ices for one specific finished product[7].

2.2: History of M&A Transaction

As stated by Wikipedia, the history of M&A begins at the beginning of 1900 that read as follows:

> The Great Merger Movement was a predominantly U.S. business phenomenon that happened from 1895 to 1905. During this time, small firms with little market share consolidated with similar firms to form large, powerful institutions that dominated their markets, such as the

[7] Weinberg, M., Blank M. and Greystoke ,A. (1979). *Take-overs and Mergers*. 4th ed.

> Standard Oil Company, which at its height controlled nearly 90% of the global oil refinery industry. It is estimated that more than 1,800 of these firms disappeared into consolidations, many of which acquired substantial shares of the markets in which they operated.

M&A also extends its geographic territory from US to all over the world through different M&A waves. For instance the second wave took place from 1919-1929 and it showed a very significant increase in vertical integration. The third wave of mergers was a period in which the conglomerate concept occurred and this was from 1955-1973. The fourth period brought about a successful hostile takeover occurring from 1974 to 1989. The fifth wave took place from 1993-2000 and it signifies an era of the mega-deal as companies of unprecedented size and global sweep were created on the assumption that size matters[8].

M&As continue to be a popular growth strategy among multinational corporations (MNCs) headquartered in every region of the world. The recent growth in M&A activity is driven in part by the increasing need for MNCs to expand beyond the developed markets of North America and Europe in search of larger customer bases along with related scale economies, improved access to raw materials or other location advantages, as well as greater opportunities to exploit current competitive advantages and develop new ones.

Global mergers and acquisitions actions are on the rise at remarkable rates rising from a value of $1.9 trillion in the year 2011 (Susan Cartwright & Schoenberg, 2006) to a record-breaking value of $4.35 trillion in 2014 (Reuters, 2010). Though the rate of M&A deals are increasing each year, different research results have shown that almost 50% of M&A deals could not realized its stated objective. Failure occurs, on average, in every sense: acquiring firm stock prices tend to slightly fall when mergers are announced; many acquired companies are later sold off; and profitability of the acquired firm is lower after the merger (relative to comparable no merged firms). Participants report a lot of conflict during the merger, resulting in high turnover. Participants express disappointment in the mergers‟ results, and surprise at how disappointed

[8]Lipton, M. (2006). Merger Waves in the 19th, 20th and 21st centuries. Available at http://scholar.google.co.za/scholar_url?url=http%3A%2F%2Fcornerstone- business.com%2 FMergerWaves TorontoLipton.pdf&hl=en&sa=T&oi=ggp&ct=res&cd=0&d=9269922370937957057&ei=KIF-W8-pLYjmmgHXrLX4BA&scisig =AAGBfm2UqAbQ111c1e4_bSOmNthA9AXELQ&nossl=1&ws=1024x599 [Accessed on 23 August 2017].

they are. Hence M&A lay trillions of dollars in value of dealings at risk each year, it is vital for scholars and experts to find means to control mergers and acquisitions failures.

2.3: Merger and acquisition in Insurance Industry

Like any other business, commercial insurance companies operate within a very competitive environment. The absolute indicator -the amount of total assets and relative indicators - return on assets (ROA) and return on equity (ROE) measure Profitability of the insurance company. The amount of total assets is also used as an indicator characterizing the size of the insurance company.

Owing to the influence of globalization and economic integration, all businesses in general and the finance industry in particular nowadays are exposed to a great deal of uncertainty and riskiness from both the internal competition and external threats.

Settnik[9] (2006) using a sample of 25 German insurance transactions involving 47 different insurers, Settnik assesses the overall success of these deals by calculating figures for growth, profit performance, and solvency. Overall, the author's results indicate that in the period between 1990 and 1998, only 8% of all acquiring insurance firms successfully achieved a favorable change in all three key figures for growth, profit performance, and solvency. Settnik draws conclusion that since the results indicate that acquirers exhibited positive long-term growth in terms of new business and recurring premium income in more than 90% of the transactions.

Shim[10] (2011b) uses accounting data to investigate the financial performance effects of US property-liability insurance acquisitions in the years 1989 to 2004. Shim combines various measures, such as the Z-score and total risk measured by earnings volatility, as well as the profitability ratios risk-adjusted return on assets (ROA) and return on equity (ROE), to proxy firms' performance. Investigating a final sample of 190 US property-liability insurance acquirers, and come up to conclusion that a negative relationship between M&A activity in the US property-liability insurance industry and acquirers' financial performance. As the result, local

[9]Settnik, U. 2006. *Mergers & acquisitions auf demDeutschenversicherungsmarkt – EineempirischeAnalyse*.DeutscherUniversitaets- Verlag.
[10]Shim, J. (2011b).Efficiency changes around mergers in the U.S. property liability insurance industry: A data envelopment analysis. *Journal of Business & Economic Studies*, *17*(2) 77–96.

insurance operators may prefer to collaborate with global insurance firms as they are perceived to be longer-term investors, and operating synergies that arise as a result of an acquisition or partnership may give the purchaser flexibility to pay a higher price than a non-strategic investor for the local insurer.

2.3.1: Merger and acquisition in Africa insurance industry

According to KPMG (2015) report, M&A opportunities in Africa are still in their infancy, and this brings a range of opportunities for international insurers and investors. In contrast to more developed markets, most international insurers have little or no presence in Africa. This helps to explain the fact that Africa's global market share in the insurance sector is roughly around 1.5%, and the continent's average insurance penetration rate is 2.9%, falling to 0.9% excluding South Africa[11].

Records from Securities and Exchange Commission of Nigeria show that the first mergers were experienced in the early 1980s and since then they grew drastically in various sectors of the economy such as, insurance, banking, textile, pharmaceutical, food & beverage, oil & gas and other conglomerates.

As Ernst & Young (2012), M&A deals in Africa from January 2003 to December 2012 were summarized as follows.

Target	Country	Number of deals	Deal value in Billion $ US	Percent
1	South Africa	1766	118.252	46.5
2	Egypt	360	49.503	19.5
3	Nigeria	189	25.093	9.9
4	Morocco	152	16.029	6.3
5	Mauritius	85	2.849	1.1
6	Zimbabwe	83	1.548	0.6
7	Namibia	69	1.374	0.5
8	Kenya	66	1.43	0.6
9	Tunisia	54	5.02	2
10	Mozambique	51	0.339	0.1
11	Others			12.9

Table 2.1: Top 10 M&A target nations (ranked by number of deals) 2003–2012.

[11]KPMG, Insurance in Africa 2015, 6/3/2015

East Africa's mergers and acquisitions have begun operating up as firms are considering means to defend their market share and guarantee good revenues for shareholders. A large number of mergers and acquisitions contracts are in the banking, communications, and health sectors. Experts say the area's altering financial treasures over the ten years have seen struggling companies look for new associates in a bid to increase new wealth, make synergies and build markets of scale to challenge growing struggle. As seen in Table--, Kenya was stood under ten top lists. That implies that the pressure M&A wave exist in east Africa, where Ethiopia is found.

As World Bank report (2017), based on some metrics, the economic and corporate governance climate appears to be generally favorable for the development of insurance products in Africa and for companies looking to invest there. GDP in sub-Saharan Africa has been growing, foreign direct investment has increased by 5% to $50 billion over the past 15 years, and research suggests that a growing middle class is emerging. This is encouraging environment for investing insurance industry[12].

Kenya, Nigeria and, in particular, South Africa currently dominate the insurance market in Africa and account for the vast majority of recent M&A transactions. As disclosed by different literatures that the M&A deals in Africa are increasing year after year. For instance in 2019 the total deal value of M&A transactions in Africa increased by 32%, which rose from USD 16 billion in 2018, to USD 21 billion in 2019. This statistics includes the M&A transaction of insurance industry in the content.

International investors and insurers are expecting to focus on nonlife insurance of Kenya, Nigeria, South Africa and Ghana due to their fast growing economies and relatively stable legal and regulatory environments when they think to invest in Africa. In contrast, conducting satisfactory jurisdictional, operational and historical due diligence, adopting stringent governance policies and obtaining appropriate contractual protections from a local partner should, give a way for a global insurer seeking to in Africa insurance business. It’s about time that global insurers realize that the Africa insurance market is a “giant waking up” and become a

[12]World Bank, Global Economic Forecast, June 2017.

part of its success story. Here is brief summary report which is taken from world Bank, Transparency International, IRA report (Dec 2017) about Kenya, Nigeria and South Africa insurance industry for the comparison.

CATEGORY	KENYA	NIGERIA	SOUTH AFRICA
Transparency International ranking (2016)	145/176	136/176	64/176
Population (millions)	48.46m	185.9m	55.9m
Life expectancy	62.13 years	53.05 years	57.44 years
GDP ($bn)	70.53bn	405.1bn	294.8bn
Insurance Penetration Rate (Premiums as % of GDP)	<3%	<0.5%	<14%
Total premiums—non-life insurance	$1.17bn	$1.3bn	$3.4bn
Total premiums—life insurance	$0.704bn	$457bn	Information not publicly available.
Market share—non-life insurance	Jubilee (11.58%) UAP (9.03%) APA (7.39%) CIC (6.91%) Britam (5.75%) Others (59.34%)	Leadway (12%) Custodian & Allied (6%) AIICO (5%) Others (77%)	Mutual and Federal Limited (R12.2bn) Outsurance Holdings Limited (R11.6bn) Santam Limited (R22.7bn) Zurich Insurance Company South Africa (R3bn)

Table 2.2: Selected Countries Insurance Penetration

2.3.2: Merger and acquisition in Ethiopia insurance industry

Although there is no regulatory framework supporting a cross-border insurance regime in East Africa, there are ongoing discussions within the East Africa Community trading block and cooperation among the member states geared towards having similar legal frameworks and combined regulatory supervision for cross-border transactions. Some steps have already been taken towards achieving this.

Recently, it is known that Ethiopian Telecommunication Corporation (ETC) is under M&A deal preparation process. Fortunately or unfortunately this act will be continuing to other sectors

soon, especially, in those who are involving in financial sector. As stated by Haben(2020), Jemaneh (2008) and Meseret (2019) pointed out there are very few M&A activities in Ethiopia financial sector.Furthermore, in Ethiopia's history the main M&A operations were conducted by government decisions.Jemaneh (2008) did an investigation on one case of M&A (i.e. Lion Insurance S.Co. and United Insurance merger). The study was made both by using the financial statements and the hypothesis testing that shown performance of firms after merger has not increased as compared to the performance of firms before merger, which was against the objective of merging. Nevertheless, the issue has not yet got researchers' attention in spite of the importance of the topic and it is an inescapable agenda for all country in Africa. Furthermore the majority of M&A deals end up with failure.

There are some indications of efforts by AfCFTA,WTO and of Ethiopian governments in the telecom and selected industries to realize some more M&As among Ethiopian companies or Ethiopian companies with the other foreign companies. Ethiopia has already taken the first steps towards by granting a license for a foreign-owned company to operate in the financial sector (Wilson, 2019). This act of liberalization will influence or cause shock for Ethiopian insurance industry in the sector. This means that foreign efficient insurance companiesfrom Kenya, South Africa and Nigeria or any insurance company throughout the world might be allowed to operate in the country. This action may significantly harm the insurance industry in the country if firms operating at national level had little or no preparedness for the issue.

2.4: Factors that contributing for success of M&A in Insurance Industry by different researchers

According to Buckmann (2012), one of the best approaches to measure the success of a merger is the microeconomic perspective. In this approach, one can interview managers and consultants to get their personal opinion of the success, the change before and after the merger; plus a more quantitative approach would be to examine the pre and post- merger financial statements, and for a company in the stock market, one can compare the stock prices before and after the merger (Spandau, 2010).

Several authors have dealt with identification of exogenous factors that affect the efficiency of insurance companies as well as determining the relationship between efficiency score of

insurance companies and other external factors. Yakobet. al (2014) used DEA models and the Tobit regression model to identify exogenous factors affecting the efficiency of insurance companies in Malaysia from 2003 to 2007.

Exogenous factors include also the size of the subject analysed. The impact of size of an insurance company on its efficiency has been studied by several authors. Yao et al. (2007) used the DEA method to assess the efficiency of 22 insurance companies in China. They tested the hypothesis that large insurance companies are more efficient than small insurance companies. This hypothesis was based on the fact that small insurance companies have cheaper services but large insurance companies are more resistant to insolvency. Yao et al. (2007) also tested the hypothesis that state-owned insurance companies are less efficient than insurance companies that are not owned by the state.

Some authors deal with the relationship between efficiency of insurance companies and selected indicators of profitability. Huang and Eling (2013) concluded a positive relationship between profitability measured by the return on equity ROE and efficiency. They point out a positive relationship between the ratio of equity capital and total assets and the efficiency score. They did not confirm the impact of the ratio of claims payments and premiums on efficiency.

Analysis by Markovics (2005) proposed to focus the researchers on human resource, communication process and strategic fit as factors for the success of a merger. Karami et al. (2008) have shown the human resource capability of the firm is a considerable resource that determines the competitive advantage of the firm in M&A process. On the other hand, as (Molaro, 2014) stated the communication process affects the employees, the adaptation of a new culture, the merger process itself, approaches to change, and the stress levels of the employees. As the result the success highly relay on human resource and communication process.

2.5: Strategic fit

Strategic fit is the third factor for Karami et al. (2008), that shows how well a potential merger is in line with common strategy of the two organizations (Robert, 2007). Managers at the pre-merger stage must map the synergies and incompatibilities between the two organizations so as to be able to design a strategic fit. Moreover Cartwright and Schoenberg (2006) contend that

strategic fit is concerned with the relation between strategic attributes and the performance of the combining organizations.

For concluding strategic fit M&A ,primary assessment have to made based on the gaps that the company needs to close the identified input and output gap; that could be resources (tangible resources: cash, securities and intangible resource: technology, HR, reputation, culture) and capabilities with the opportunities in the external environment. The strategic fit would refer to how well the potential acquisition fits with the planned direction (strategy) of the acquiring company. In order to justify growth through M&A transactions, the transaction should yield a better return than organic growth.[13]

Strategic fit is defined in different perspective, like: synergistic gains. As Shelton (1988) indicates, a strategic fit is present when two firms have created value that would not otherwise have been reached if they were trying to achieve a goal separately, or defined as a partnership's potential, i.e. the operational and relational matching questions that arise from a partnership, as presented by Ireland, Hitt and Vaidyanath (2002). The other approach to define strategic fit is the need of highly matching goals between the merging or target firms (Das &Teng, 2000).

A high degree of strategic fit may be the key to a successful merger, an efficient organization, synergy effects or cost reduction. It is a vital term and it should be taken into consideration when evaluating a company's strategy and opportunities. It can be done through a due diligence process, through identifying if there is a strategic fit, i.e. if the companies actually fit each other's goals etc., and if and how the partners can benefit from each other.

As stated by (Eun&Resnick, 2007) a matching or a fit should be present as a prerequisite for the merger or acquisition to be successful. If that is not the case the set goals could be hard to reach. To make it clear, firms are looking for synergistic gains; otherwise there would be no point in merging or acquiring.

[13]Ivey Management Services (1995) "A note on mergers and acquisitions and valuation", Ivey

2.6: M&A Transaction Theories

As stated by Leepsa& Mishra, 2016 there are several M&A theories that could reasons that companies are going for M&A transactions. These theories are highly related with motives for which companies went for M&A deals. For instance efficiency, synergy gains, diversification, strategic realignment, etc, are the major ones.

Economic Theory is related with potential benefits; Synergy Gain Theory are based on the added value to shareholders; efficiency theory bring up the level of efficiency of the acquired firm for providing both social and private gain, etc. Let us see these theories one by one.

Economic theory:thisis explained by (Le T. D., 2015) as M&As that can improve performance and efficiency of financial institution. This is the most frequently used theory in M&A transaction for empire building. Its potential benefits are extracted from economies of scale and scope, targeted redeployment of assets for empire building and synergy development, a transition of inventory management to better quality managers, and tacit labor contract renegotiation. This theory refers to the reduction in unit cost achieved by producing a large volume of a product. Horizontal mergers aim at achieving economies of scale. This phenomenon continues while the firm grows to its optimal size, after which a firm experiences diseconomies of scale.

Synergy gain theory,to achieve synergistic gains out of the combined firms, the combined firm's valuation is likely to be higher than the individual companies. These benefits are extracted from financial and operational synergies through economies of scale. It means that when the two firms combine, their fixed cost is distributed among the large scale of production leading to a lower fixed cost (Leepsa& Mishra, 2016) and (Küçükkocaoğlu&Bozkurt, 2018). This view is contested by (Asongu&Odhiambo, 2019) with research-backed up arguments that big banks worldwide are less efficient than small banks, they provide two arguments to explain these paradoxes.The first view argues that as big banks get bigger they tend to abuse their power by using monopolistic practices, the second view argues that beyond a certain threshold there will be diseconomies of scale as banks grow beyond a certain threshold making them inefficient.

Market Power Theorystates that M&A is carried out to increase the company's market shares. The new entity will gain more influence in the business with increased market shares. The market power theory suggests that market power is growing with the company's increase in size.

Efficiency Theory: it is enhanced by taking advantage of specialized skills or target's management, eliminating the idle resources, sharing expensive technologies between the acquirer and target, promoting products that are complementary to both companies, reducing transaction cost and re-allocating existing expenses. (Wolfe et al., 2011).Differential efficiency theory is the basis for horizontal merger. If firms carry out the business activities in a similar line of business, they become potential acquirers.

Actually, the motives behind each deal differ one from the other. Thus, a single theory is not enough to explain the motives for M&A practice

2.7: Empirical studies in merger and acquisition (DEA - Data Envelopment Analysis)

DEA models are quantitative models used to express relative efficiency score. They use linear programming to transform multiple inputs into multiple outputs. They construct a non-parametric data envelopment that is convex. The subjects analysed that are part of the data envelopment have an efficiency score equal to one or 100%. The subjects analysed that are not part of the data envelopment are inefficient. Their efficiency is expressed by the ratio of the efficiency score relative to the data envelopment.

The analysis examines efficiency and productivity change for acquirers and acquisition targets. There are several types of DEA models. CCR and BCC models are the basic types. CCR models are based on the assumption of constant returns to scale. BCC models are based on the assumption of variable returns to scale.

2.7.1: M&A studies based on CRS - Constant Returns to Scale

DEA model was published by Charnes, Cooper and Rhodes (1978). Since then, many studies evaluating efficiency of the commercial insurance companies using this model around the world. This model is also called the CCR by taking last names of the originators. Constant Returns to Scale DEA models assume that the DMUs are automatically working in their scale efficient size,

which implies that an efficiency frontier is a straight plane (Du &Sim, 2016). This model has been modified to analyze efficiency gains in Mergers and Acquisitions

The selection of inputs and outputs are very important for the correct specification of DEA models. The CCR ratio model calculates an overall efficiency for the unit in which both its pure technical efficiency and scale efficiency are aggregated in to a single value.

CCR – DEA model estimate

- For each DMU, formed by the virtual input and output by weight

  Virtual input = $v_1x_1 + v_2x_2 + \ldots$

  Virtual output = $u_1y_1 + u_2y_2 + \ldots$

Then we will determine the weight, using linear programming so as to maximize the ratio.

$$\text{DEA score} = \frac{\text{Virtual input}}{\text{Virtual output}}$$

- CCR – efficiency was defined, along with the reference set for inefficient DMU

2.7.2: M&A studies based on BCC - Variable Returns to Scale

This model is named BCC model using the last name of the originators' Banker, Charnes, and Cooper. Variable Returns to Scale DEA model assumes that the frontier is a convex curve and the DMUs could be achieving increasing returns to scale at low output levels compared with the observations on the frontier (Du &Sim, 2016). This model has been modified to analyze efficiency gains in Mergers and Acquisitions.

The use of DEA model in measuring efficiency of decision making units requires selection of appropriate input and output variables. However, there is no consensus as to the selection of the inputs and outputs of institutions in general and the insurance companies in particular in the efficiency measurement and analysis literature. In empirical works, selection of inputs and output for financial institutions is mainly based upon two different approaches – intermediation approach and production approach.

The selection of inputs and outputs is similar to CRS DEA models as most insurance efficiency researchers use the production approach for input and output selection. The BCC model distinguish between technical and scale inefficiency by

- Estimating pure technical efficiency at a given scale of operation
- Identifying whether increasing, decreasing or constant return to scale possible are present for future exploitation

2.8: Conceptual Framework

In this paper, we adopt the efficient frontier approach, using the Malmquistproductivity index based on DEA.

The Malmquist productivity index allows for changes in productivity to be broken down into changes in technical efficiency and changes in technological efficiency.

To set the scene for our productivity measurement, we adopt the framework presented in Figure 1 below, which shows two observations of the input (x) and output (y) bundles used by a firm in an industry at time t and t +1. The aim is to measure theproductivity growth between t and t + 1 in terms of the change from input–output bundle z(t) to input–output bundle z(t + 1).

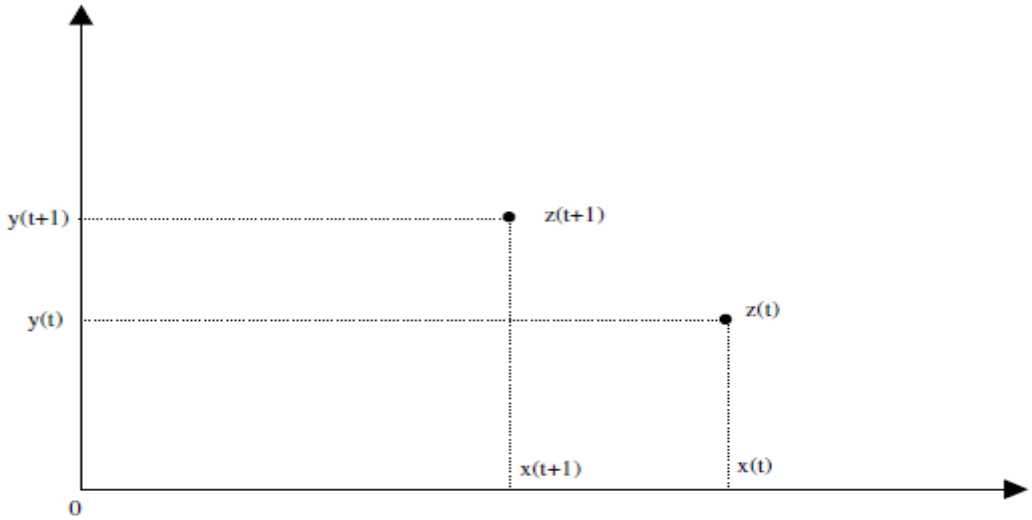


Figure 1. Input-output observations over time.

Productivity is measured through the potential production frontier that is imposed on the production bundle in Figure 2. The production frontier represents the efficient levels of

maximum output (y) that can be produced from a given level of input (x). If the firm is technically efficient in period t, it produces along the frontier the maximum output attainable, y(t). Point z(t) = [x(t),y(t)] corresponds to a technically inefficient firm, which uses more than the minimal amount of input to produce a given level of output. The input x(t) should be multiplied by the horizontal distance ratio, ON/OS, in order to make production of y(t) technically efficient. By analogy, and assuming frontier t as reference, the input x(tþ1) should be multiplied by the horizontal distance ratio, OQ/OR, in order to achieve technical efficiency in the production of output y(tþ1), that is bundle z(tþ1). Since the frontier has shifted in the meantime, z(t +1) is technically inefficient in t +1. In order for the firm to be efficient in period t +1, input x(t +1) must be reduced by the horizontal distance ratio, OP/OQ, resulting in bundle z0(tþ1). Globally, the input ratio inefficiency in t+ 1 is OP/OR.

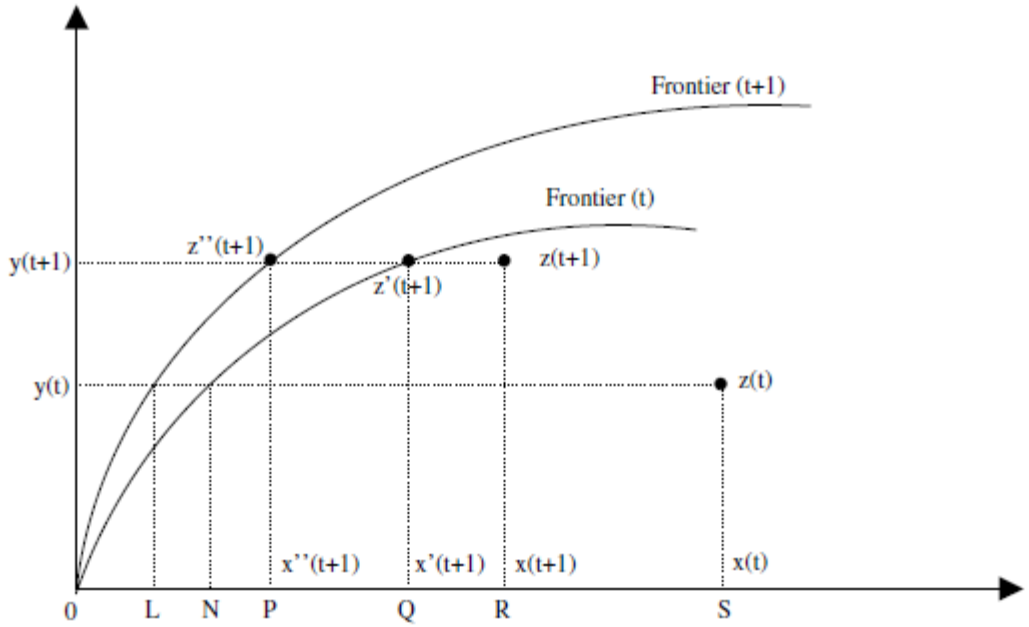


Figure 2. Malmquist index and productivity changes over time.

DEA model for M&A: Consider the case where each of n Decision-Making Units (DMUs), i∈I={1,2,…,n} transforms p inputs to q outputs. Let $x^i = (x^i_1,\ldots\ldots, x^i_p) \in R_0^p$ be the inputs consumed and $y^i = (y^i_1, \ldots\ldots, y^i_p) \in R_0^q$ the outputs produced in DMU^i, i ∈I. Also, let T be the production possibility set.

$$T=\{(x,y) \in R_0^{p+q} \mid x \text{ can produce } y\}$$

And let $x \rightarrow P(x)$ and $y \rightarrow L(y)$ be the associated production & consumption correspondences

$$P(x)=\{y|(x,y) \in T\} \qquad L(y)=\{x|(x,y) \in T\}$$

According to (Bogetoft& Otto, 2011) the basic DEA models mainly differ in the assumptions that they make about the technology T. The most important assumptions are

A1 Free disposability: Any extra inputs or outputs can be dispensed; that is, $(x, y) \in T$, $x^{i} \geq x$ and $y' \geq y \Rightarrow (x^{i}, y^{i}) \in T$

A2 Convexity: Any weighted average of feasible production plans is feasible as well: $(x, y) \in T$, $(x', y') \in T$, $\propto \in [0,1] \Rightarrow \propto (x, y) + (1-\propto)(x', y') \in T$

A3 γ-returns to scale: Production can be scaled with any of a given set of factors: $(x, y) \in T$, $k \in (\gamma) \Rightarrow k* (x, y) \in T$

A4 Additivity, replicability. The sum of any two feasible production plans is feasible as well: $(x, y) \in T$, $(x', y') \in T \Rightarrow (x + x', y + y') \in T$

Where for γ= CRS, DRS, IRS or VRS and where the sets of possible scaling factors

Given a technology, efficiency has to do with the ability to reduce inputs without affecting outputs or to increase outputs without requiring more inputs. In the case of multiple inputs and outputs, theefficiency of DMU measures:

$$E^{i}= \text{Min}\{E \in R_0|(Ex^{i}, y^{i}) \in T\} \quad \text{or} \quad F^{i}= \text{Max}\{F \in R_0|(x^{i}, Fy^{i}) \in T\}$$

Where $E^{i}$is the maximal contraction of all inputs and $F^{i}$is the maximal expansion of all outputs that are feasible in T.

Chapter Three: Research Methods

The objective of this study is to analyze and assess whether potential M&A's among Ethiopia insurance industry or between foreign insurers and would be able to identify strategic fit and potential gains of M&A' activities in the sector. This chapter focuses on the methodological approach that encompasses research design, sources of data, sample and sampling techniques, and the like. The details are presented as follows:

3.1: Research Approach

In order to conduct a DEA - analysis estimation, inputs and outputs need to be defined. There are four main approaches (intermediation, production, asset and profit approach) that have been developed to define the input – output relationship in financial institution behavior. This research adopted production approach which assumes that the insurance industry main aim is to transform labour and capital into investment income.

An examination of the efficiency of the marketing distribution channel and organizational structure for insurance companies is presented from a framework that views the insurer as a financial intermediary rather than as a "production entity" which produces "value added" through loss payments. Within this financial intermediary approach, solvency can be a primary concern for regulators of insurance companies, claims-paying ability can be a primary concern for policyholders, and return on investment can be a primary concern for investors. These three variables (solvency, financial return, and claims-paying ability) are considered as outputs of the insurance firm.

Monetary inputs and outputs used in this research are converted to and expressed in USD to makedifferent currency units' uniform. These monetary units were converted using the rates from exchangerates.In addition to these inputs and outputs, it should be noted that contextual variables, too. Let uslook into the variables in detail:

1) **Inputs variables**
   a) **Labour:**
   b) **Capital:**
   c) **Operational Expenses**:

2) **Output**

a) **Premium:**

b) **Investment Income:**

3) **Contextual Variables**

a) **Foreign insurance:** A dummy variable designating the foreign banks which are Insurance

Santam insurance (SAN) from South Africa,

Jubilee Insurance (JUB) from Kenya and

AIICO Insurance (AIICO) from Nigeria

Foreign Insurance(1=yes/ 0=no),

There are other insurance companies in Morocco and Egypt that could be potential for Ethiopia market too; but these identified insurance companies are more unlikely to be entered in the Ethiopia market than others due to cultural and economic reason. And also these four selected companies had economically powerful in east, southern and central Africa. Furthermore, the participation of these three countries in establishing East Africa Community is considerably high. Hence these four could be representative and potential insurer that can be enter in the Ethiopia insurance industry.

b) **State-Owned Insurance:** A dummy variable designating the state-owned insurance; Ethiopian Insurance Corporation (EIC)

State-Owned Insurance (1=yes/ 0=no),

c) **Large Insurance:** A dummy variable designating a large bank which is located at the third quartile (75th percentile) based on their respective asset size.

Large Private Insurance (1=yes/ 0=no),

d) **Medium Insurance:** A dummy variable designating a medium insurance which is located between the third quartile (75th percentile) and first quartile (25th percentile) based on their respective asset size.

Medium Insurance (1=yes/ 0=no)

e) **Small Insurance:** A dummy variable designating a small insurance companies that is located at the firstquartile (25th percentile) based on their respective asset size.

Small Private Insurance (1=yes/ 0=no) are also collected

3.2: Research Design /Methods/

To achieve the objectives of the study, descriptive survey research design will be employed as an appropriate research method. This is because descriptive research method is found to be worth importance in describing and explaining the exact and actual situation of the issue under investigation (Best and Kahn, 1999).

In implementing this method, quantitative research methodologies are employed using panel data. The research uses secondary sources of data obtained from the financial statement of the selected insurances both for domestic and international insurance companies. In line with this, the study uses Input Oriented Data Envelopment Analysis with both Constant Returns to Scale and Variable returns to scale assumptions.

3.3: Sample and sampling Method

This study target population would be all insurance companies that are operational in the country at June 2020 and selected foreign insurers representing east,south and west Africa regions that might be interested entering in to the Ethiopian market. Currently, in Ethiopia, there is one state-owned insurance bank and seventeen private insurance companies that are operating throughout the country. Among those insurers ,Zemen insurance will be excluded from the study because of lack of 5 years company data .And all 16 insurance companies are the researcher target for the studyand not owned by the foreigners nor foreign insurers. These are:

Awash Insurance Company (AIC);
United Insurance Company (UNIC);
Africa Insurance Company (Africa);
Nile Insurance Company (Nile);
Nyala Insurance Company (NISCO);
Nib Insurance Company (Nib);
Lion Insurance Company (Lion);
Ethio Life and General Insurance Company (ELiG);
Birhan Insurance Company (Birhan);
Bunna Insurance Company (Bunna);
Abay Insurance Company (Abay);
Oromia Insurance Company (Oromia);

Tsehay Insurance Company (Tsehay) and
Lucy Insurance Company (Lucy).

Regarding the foreign insurance companies selected for the study, there are a lot of potential foreign insurance companies that are interested in entering the Ethiopian market,four representatives are chosen from four regions of Africa. These selected insurance companies are: Santam and Hollard Insurance which are headquartered in South Africa, Jubilee Insurance in Kenya and AIICO in Nigeria. The researcher believes that these four foreign insurance companies could be representative of potential insurance companies from Africa that can enter in the Ethiopian insurance market.

3.4: Sources of Data

The major source of data is the secondary financial information obtained from 16 private and one government owned insurance companies operating in Ethiopia and four selected foreign insurance companies from South, East and North Africa countries who were potentially enter in Ethiopia insurance industry. A five year financial data (starting 15/16 to 19/20) will be collected from the financial institutions' regulator, National Bank of Ethiopia, and the respective insurance company's financial statement and serve as the source of data.

3.5: Model Specification

The efficiency of insurance companies is a major theme in contemporary research[14]. Among the benchmarking techniques, Data Envelopment Analysis (DEA), a nonparametric technique, has been the most commonly used method in previous research into insurance. In this paper, we analyze the comparative efficiency of major Ethiopian insurance companies, assessing the sector's efficiency by using a variety of metrics to measure inputs and outputs that combine financial, as well as operational, dimensions. Moreover, we evaluate total productivity with the Malmquist index.

[14] viz. Cummins and Weiss (1993); Cummins et al. (1996); Cummins and Zi (1998); Katrischen and Scordis (1998); Rai (1996).

Contemporary research in the field of insurance employs frontier models. Two contemporary scientific methods used to analyze efficiency quantitatively are the econometric frontier approach and DEA. Both have their advantages and drawbacks. Unlike the econometric stochastic frontier approach, DEA permits the use of multiple inputs and outputs and does not impose any functional form on the data, nor does it make any distributional assumptions for the inefficiency term. Both methods assume that the production function of the fully efficient decision-making unit is known. In practice, this is not the case, and the efficient isquant must be estimated from the sample data.

3.5.1: Data Envelopment Analysis

DEA models are quantitative models used to express relative efficiency score. They use linear programming to transform multiple inputs into multiple outputs. They construct a non-parametric data envelopment that is convex. The subjects analyzed that are part of the data envelopment have an efficiency score equal to one or 100%. The subjects analyzed that are not part of the data envelopment are inefficient. Their efficiency is expressed by the ratio of the efficiency score relative to the data envelopment. In this method, first, with the aid of the actual observations of the firm, a production possibility set is created, in this set, it is possible to check whether there is a better point under consideration than theDecision-Making Units (DMU). If there is a better point, the unit will be inefficient, otherwise, it will be efficient (Lotfi, Ebrahimnejad, Vaez-Ghasemi, &Moghaddas, 2020)

3.5.2: Measures of Potential Merger Gains

When assessing merged entities, the same rationale is applied in evaluating individual entities (Bogetoft& Otto, 2011). The larger the distance to the efficient frontier, the more inefficient merged firm, being inefficient also implies a potential for improvement. Thus, leading to the corporate synergy which occurs as firms may generate more services with a given set of resources or create a given set of services with fewer resources. Synergies from a merger can be captures by the increases in improvement potential as the firms move from independent to joint operations.

3.6: Bootstrapped Tobit Regression

A Tobit regression with the three efficiency scores regressed in terms of financial ratios, characteristics of the insurance companies, national dummies and year dummies. The general conclusion is that efficiency scores are U-shaped, with both small and large insurers appearing to have higher efficiency scores. Mutual companies display higher levels of efficiency than stock insurers. The most efficient insurers are those that specialize in particular market sectors. Solvency ratios are associated with a higher level of technical efficiency.

In this boot strapped Tobit model, the researcher will examine the overall efficiency gains because of variation in Contextual Variables, such as foreign insurance, State-Owned Insurance, Small Insurance, Medium Insurance and Large Insurance.

Chapter Four: Data Presentation, Analysis and Interpretation

This section presented and discussed the findings from data analysis under taken in line withthe objectives of the study mention under chapter one. The data used were collected from National Bank of Ethiopia for those insurance companies working at national level from 2016 to 2020. And also for three foreign insurance companies, the data has been drawn from their annual reports. The investigator has selected the performance of all 17 insurance companies (both from government and private) which were operating for the last 10 years in the country and three African insurance companies representing East, West and Southern Africa that can make potential M&A with insurance companies operating in the country.

4.1: Contextual Variables

The contextual variables are defined based on size and ownership structure. Accordingly in this study there are five variables namely Foreigninsurance, State-Owned local insurance, Small Private local insurance, Medium Private local insurance, and Large Private local insurance. The local private insurance was categorized based on their asset size. This category were done if the insurance company above 75^{th} percentile based on their asset size are designated as a Large Private insurance company, the insurance company lower than 25^{th} percentile based on their asset size are designated as a Small Private insurance while the remaining insurancecompany between 25^{th} to $75^{th}$are designated as a Medium Private insurance.

Position of private insurances with respect to 25th and 75th percentile

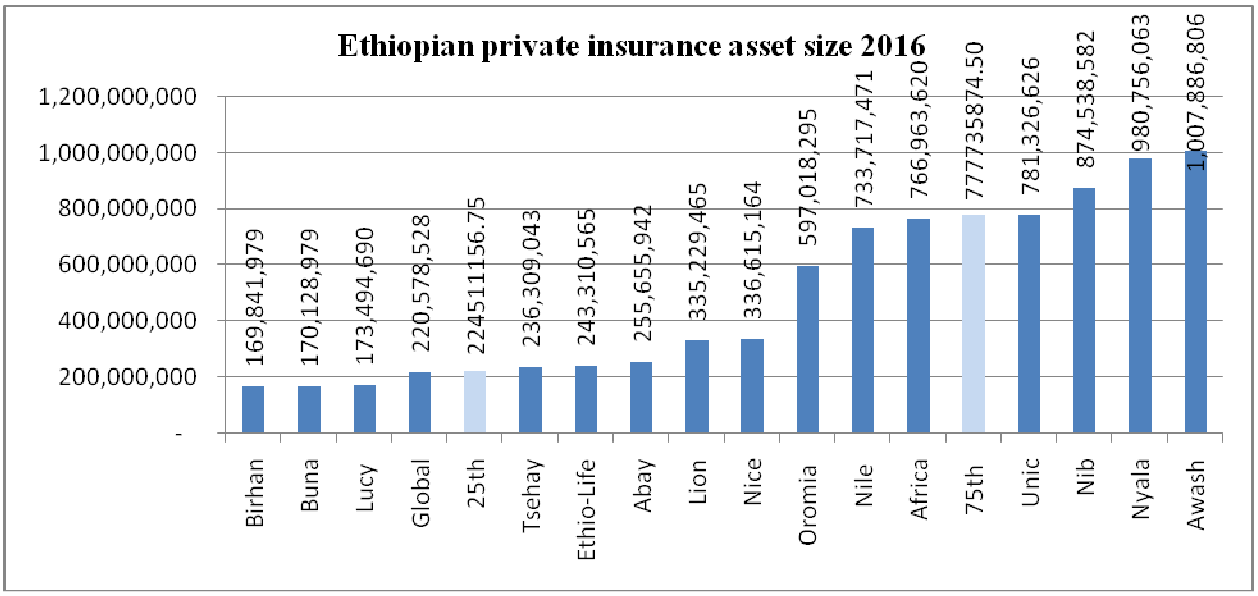


Figure 4.1: Asset size of Ethiopian Private Insurance in ETB for 2016 with 75th and 25th Percentiles

As shown in figure 4.1, the private local insurance companies were categorized with respect to 25th and 75th percentile score of asset size. As the result of the asset of2016 the 75thpercentile was ETB 777,735,874.5 and those insurance companies that had asset sizes higher than the 75th percentile is considered as large local insurance companies. These companies that categorized as large were United (ETB 781,326,626), Nib(ETB874,538,582), Nyala (ETB980,756,063) and Awash (ETB1,007,886,806).

The 25th percentile score of 2016 was ETB 224,511,156.75and those insurance companies that had asset sizes lower than the 25th percentile is considered as small local insurance companies. These companies that categorized as small were Birhan (ETB 169,841,979), Buna (ETB 170,128,979), Lucy (ETB 173,494,690) and Global (ETB 220,578,528). The 3rd category is named as medium, where the asset size of the insurance company lay in between the 25th percentile (ETB 224,511,156.75) and 75th percentile (ETB 777,735,874.5). And those local insurance company that were designated as medium were Tsehay (ETB 236,309,043), Ethio-life (ETB 243,310,565), Abay

(ETB 255,655,942), Lion(ETB 335,229,465), Nice (ETB 336,615,164), Oromia (ETB 597,018,295), Nile (ETB 733,717,471) and Africa (ETB 766,963,620).

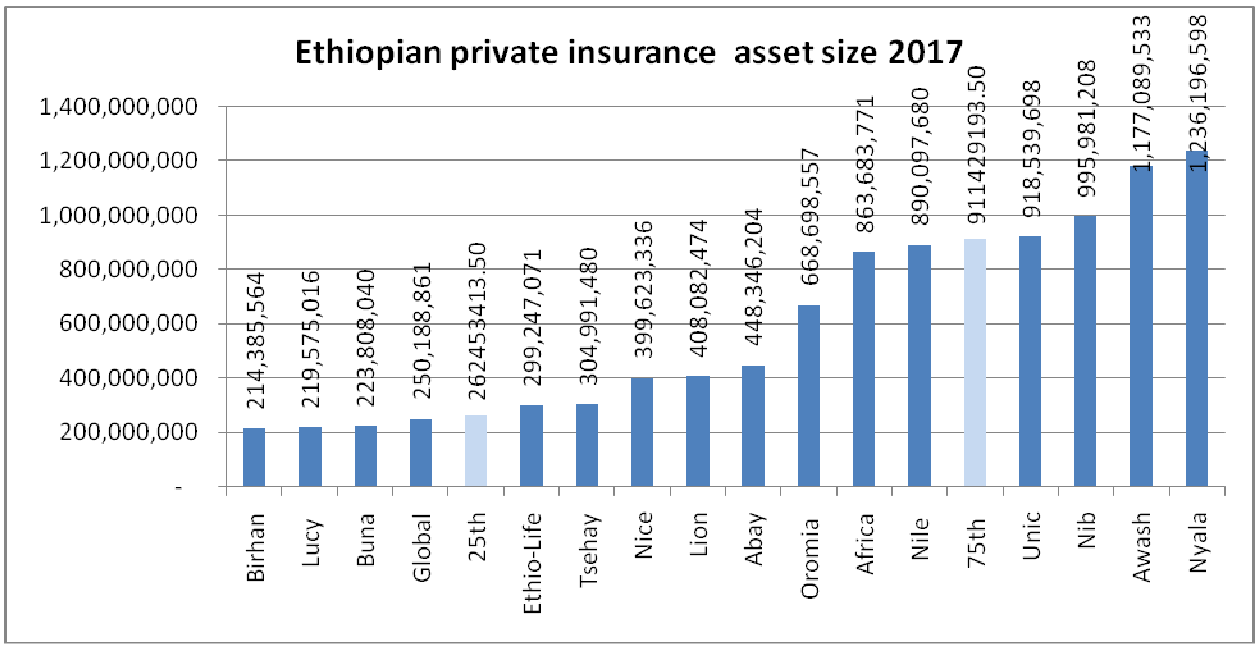


Figure 4.2: Asset size of Ethiopian Private Insurance in ETB for 2017 with 75th and 25th Percentiles

As shown in figure 4.2, the private local insurance companies were categorized in to three categories with respect to 25th and 75th percentile score of asset size. As the result of the asset of2017 the 75thpercentile was ETB 911,429,193.5. Similarly local private insurance companies were designated as Large when the insurance company asset size score was greater than the 75th percentile. . These companies that categorized as large were United (ETB 918,539,698), Nib(ETB 995,981,208), Awash (ETB 1,177,089,533)and Nyala (ETB 1,236,196,598).

The 25th percentile score based on 2017 asset size of local private insurance was 262,453,413.50. Hence those companies scored lower than the 25th percentile were designated as small insurance companies. Insurance companies included under this category were Birhan (ETB214,385,564), Lucy (ETB 219,575,016), Buna (ETB 223,808,040) and Global (ETB 250,188,861). The rest eight companies were designated as medium local private insurance, because their asset size lay in between the 25th and 75th percentile. These were considered as medium local –private insurance were Ethio-life (ETB 299,247,071), Tsehay (ETB 304,991,480), Nice (ETB 399,623,336), Lion (ETB 408,082,474), Abay (ETB 448,346,204), Oromia (ETB 668,698,557), Africa (ETB 863,683,771)and Nile (ETB 890,097,680).

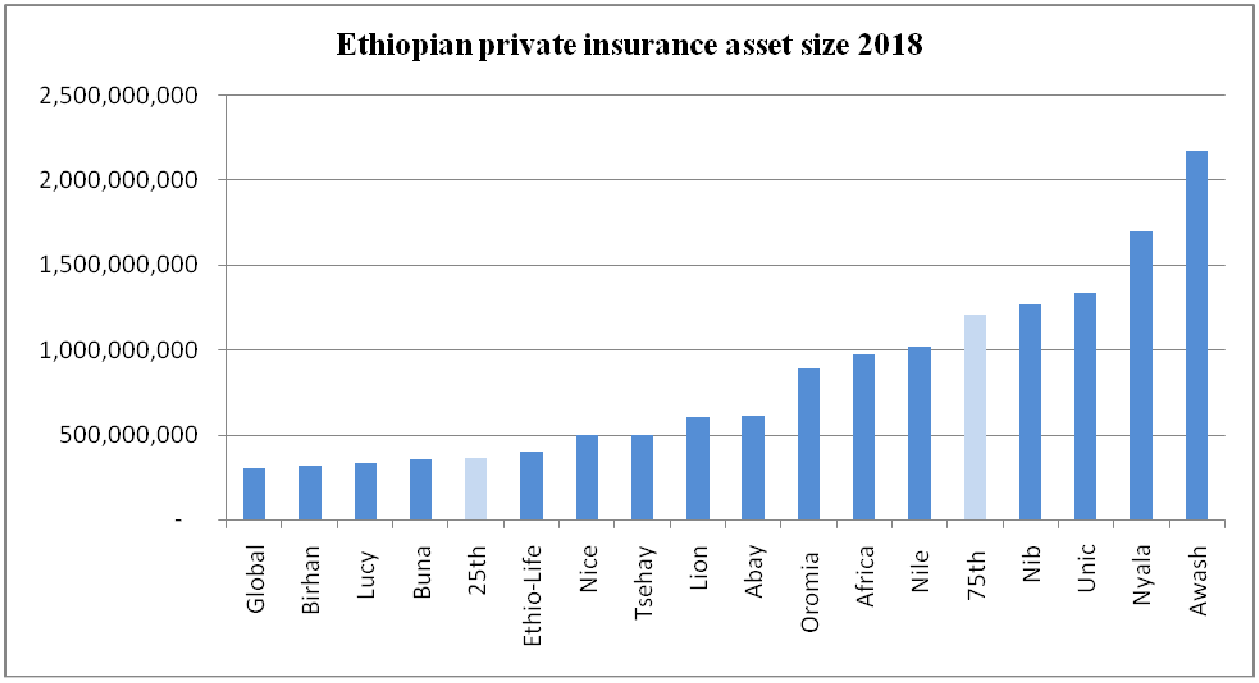


Figure 4.3: Asset size of Ethiopian Private Insurance in ETB for 2018 with 75th and 25th Percentiles

As shown in figure 4.3, in 2018, similarly the local private insurance companies were also categorized in to three categories based on their asset size score. The cutoff point for designating an insurance company as large was when its score was above 75th percentile. These insurance companies that were designated as large were NIB (ETB 1,268,711,000), United (ETB 1,336,837,000), Nyala (ETB 1,700,792,910) and Awash (ETB 2,175,114,000)

As shown in figure 4.3, Global, Birhan, Lucy and Buna were designated as small local insurance companies with (ETB 303,230,000)(ETB 316,228,000)(ETB330,262,000)(ETB351,584,000) asset size score respectively, because the asset size of these insurance companies were less than the 25th percentile. The other eight insurance companies (Ethio-life, Nice, Thehay, Lion, Abay, Oromia, Africa and Nile) were considered as medium local private insurance because the asset size score lay in between the 25th and 75th score.

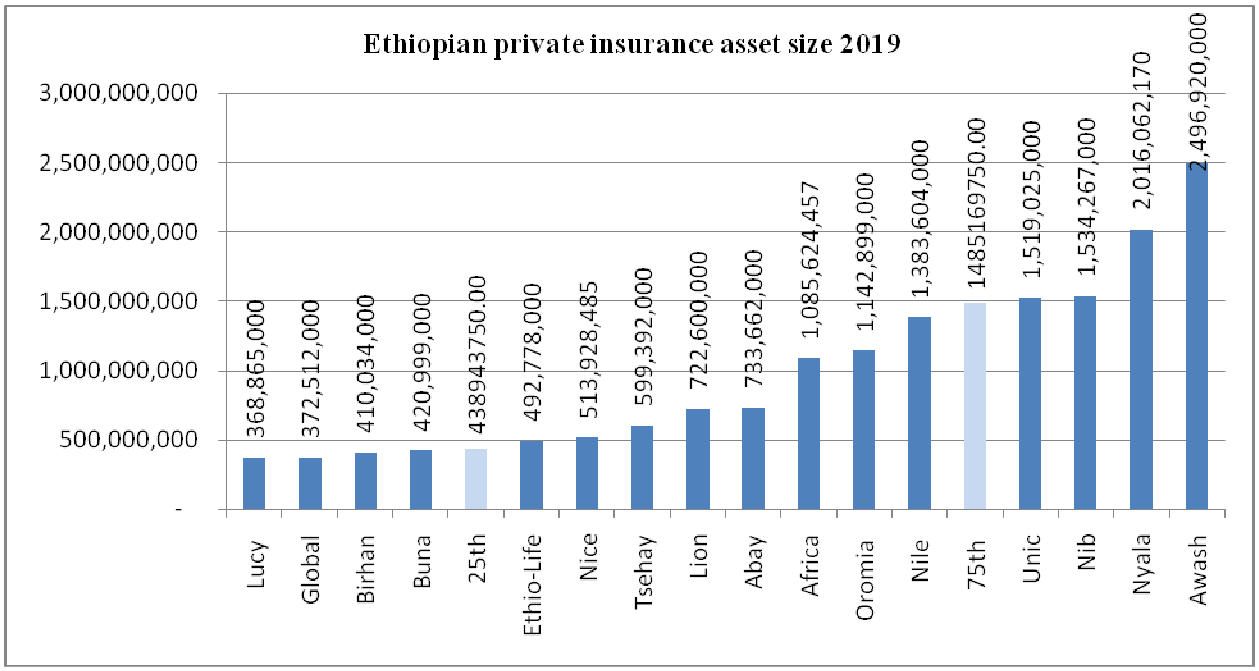


Figure 4.4: Asset size of Ethiopian Private Insurance in ETB for 2019 with 75th and 25th Percentiles

As shown in figure 4.4, in 2019, local private insurance companies were categorized in to three categories based on their asset size score. Private Insurance companies that were designated as large in 2019 were United (ETB 1,519,025,000), NIB (ETB1,534,267,000) ,Nyala (ETB2,016,062,170) and Awash (ETB 2,496,920,000), because the asset size score were above 75th percentile.

In contrary Lucy, Global, Birhan and Buna were designated as small local insurance companies with (ETB368,865,000)(ETB372,512,000)(ETB410,034,000)(ETB 420,999,000) asset size score respectively, because the asset size of these insurance companies were less than the 25th percentile. The other eight insurance companies (Ethio-life, Nice, Thehay, Lion, Abay, Africa, Oromia and Nile) were considered as medium local private insurance because the asset size score lay in between the 25th and 75th score.

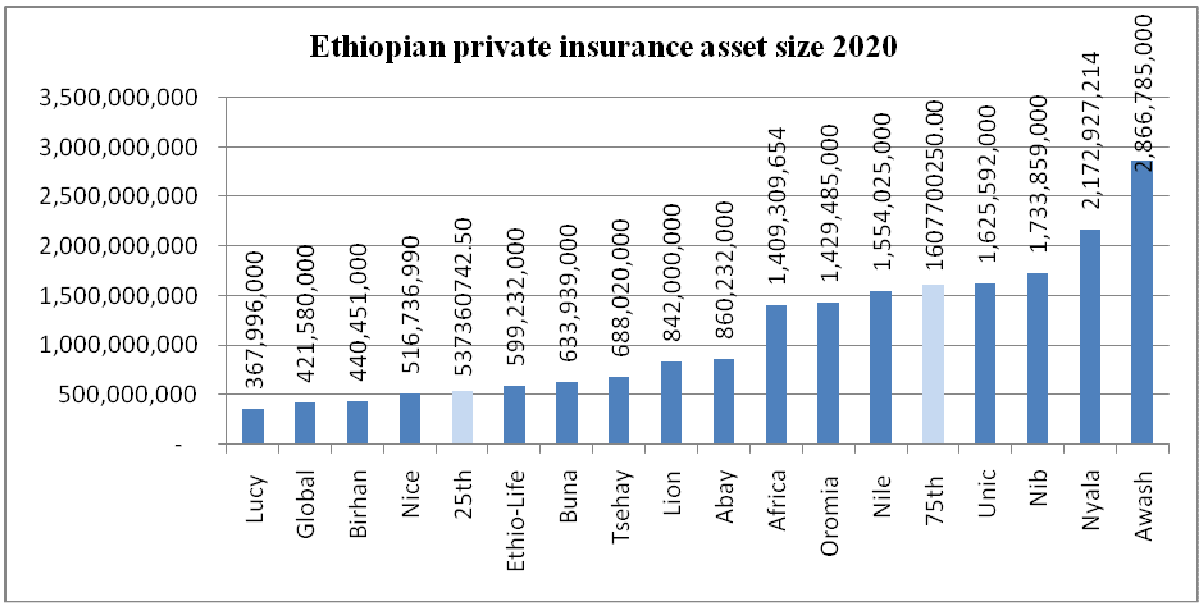


Figure 4.5: Asset size of Ethiopian Private Insurance in ETB for 2020 with 75th and 25th Percentiles

Based on asset size of 2020, similarly local private insurance companies were categorized in three categories using the 25th and 75th percentile score. In this respect Lucy, Global, Birhan and Nice were assigned as small, because these insurance companies' asset size were lower than the 25th percentile score. Whereas Ethio-Life, Buna, Tsehay, Lion, Abay, Africa, Oromia and Nile were taken as medium private insurance companies since the companies asset size lay in between the 25th and 75th score.

Finally, as Figure 4.5 United, Nib, Nyala and Awash were taken as large private insurance companies because these insurance companies' asset size were above the 75th percentile score.

In general the survey were made on one local government insurance company, four small local private company, eight medium local private companies, four large local private companies and three foreign insurance companies that could have potential request of MAs in the local insurance market of the country.

4.2:Correlation matrix between input and output variables

This section was intending to examine the relationship between input and output variables using two-tailed Pearson Correlation to investigate the relationship. The result of the analysis provides correlation coefficients to indicate the strength and direction of the relationship. Correlation analysis as a hypothesis testing procedure starts by writing hypothesis. Here is the null hypothesis:

H_0 : "there is no significant relationship between input and output variables"

According to Huck (2012), a positive correlation coefficient (r) indicates that positive and direct relationship; and a negative correlation coefficient (r) indicates negative and an indirect relationship. According to Somwkh and Lewin (2005) if correlation coefficient /r/ is below 0.33 it is considered to be a weak relationship; if correlation coefficient /r/ is between 0.34 and 0.66 it indicates a medium strength relationship; and if correlation coefficient /r/ is greater than 0.67 indicates a strong relationship.

Correlations

		Investment	premium	Capital	Expenses	salary
Investment	Pearson Correlation	1	.812**	.919**	.341	.792**
	Sig. (2-tailed)		.000	.000	.130	.000
	N	21	21	21	21	21
Premium	Pearson Correlation	.812**	1	.842**	.616**	.891**
	Sig. (2-tailed)	.000		.000	.003	.000
	N	21	21	21	21	21
Capital	Pearson Correlation	.919**	.842**	1	.198	.761**
	Sig. (2-tailed)	.000	.000		.390	.000
	N	21	21	21	21	21
Expenses	Pearson Correlation	.341	.616**	.198	1	.612**
	Sig. (2-tailed)	.130	.003	.390		.003
	N	21	21	21	21	21
Salary	Pearson Correlation	.792**	.891**	.761**	.612**	1
	Sig. (2-tailed)	.000	.000	.000	.003	
	N	21	21	21	21	21

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

Table 4.1: Bivariate correlation between input and output variables

As shown in Table 4.1, it was found that investment (output variable) hadstrong positive relationship withcapital (r=0.919, p = 0.000< .05); with Premium(r=0.812,p=0.000<.05) and salary (r=0.792, p = 0.000< .05). However, it was found that there was no significant relationship between investment and expenses (r=0.341, p = 0.130> .05). On the other hand, premium (the 2nd output variable) had a strong positive relationship with salary(r=0.891, p = 0.000< .05) and capital(r=0.842, p = 0.000< .05) while medium strength relationship exists with operating expenses (r=0.616,p=0.003<0.05).

In general the input and output variables had significant relationship. This implies that the input variable had the power of determining the output variables.

4.3: Data Envelopment Analysis

Data Envelopment Analysis (DEA) approaches was used to measure the efficiencies of the insurance companies.

4.3.1: Preliminary requirements of DEA

As any statistical analysis, DEA has its own requirements that could be checked and fulfilled before the analysis. These requirements are minimum number of DMUs, homogeneity of data, input and output relationship "isotonic assumption" and applied among companies that have similar objectives and same market conditions (Golany, Roll 1989). First, the decision-making units (DMUs) of a DEA analysis must fulfill the homogeneity.

4.3.1.1: Minimum number of DMUs

According to Golany and Roll (1989), the number of DMUs should be at least twice thenumber of input and output factors. In this study, there are 20 DMUs and this satisfies therequirement for the minimum number of DEA, because in this study there are 3 input variables (labour, capital and operational expenses) and two output variables (premium and investment income) and no intermediation variable. So the minimum expected DMUs are 10 =(2 * (3 +2)). In actual term the number of DMUs is 20 which is greater than 10.

4.3.1.2: Homogeneity of data

All 20 DMUs analyzed in this study are working for similar objectives, rendering insuranceservices and same market conditions i.e. competitive. This indicates that homogenous group assumption also met.

The DEA analysis requires "isotonic" assumption, meaning that input and outputfactors should have positive correlation (Golany, Roll 1989). More specifically, a proportionalincrease in an input variable should result in a proportional increase in an outputvariable. Based on the Spearman's correlation test reported in Table 4.1 significantpositive relationships exist between the input and output factors. This result satisfies theisotonic assumption. Thus, the developed DEA framework is considered to hold highconstruct validity.

4.3.2: Result and interpretation of DEA

4.3.2.1: Efficiency Scores using CRS and VRS

			Average input oriented efficiency score		
	DMU Name	DMU Category	DEA- VRS	DEA-CRS	SCALE
1	EIC	State owned	1	0.86523	0.86523
2	Awash	Large –private	0.829735	0.63042	0.523082
3	Global	Small –private	0.809254	0.42622	0.34492
4	Nile	Medium –private	0.676487	0.61455	0.415735
5	Nice	Medium –private	0.870183	0.83411	0.725828
6	Africa	Medium –private	1	1	1
7	Nib	Large –private	0.824106	0.70143	0.578053
8	Nyala	Large –private	0.762435	0.50338	0.383795
9	Ethio-Life	Medium –private	0.753247	0.51328	0.386627
10	Unic	Large –private	0.768909	0.74575	0.573414
11	Oromia	Medium –private	0.89388	0.86078	0.769434
12	Lion	Medium –private	1	0.99559	0.99559
13	Abay	Medium –private	0.843689	0.67630	0.570587
14	Birhan	Small –private	1	0.64964	0.64964
15	Tsehay	Medium –private	1	0.98185	0.98185
16	Lucy	Small –private	0.796081	0.47971	0.381888
17	Buna	Small –private	0.844309	0.62484	0.527558
18	Santam	Foreign	1	1	1
19	Allico	Foreign	1	1	1
20	Jubillee	Foreign	1	1	1
	Average		0.883616	0.75515	0.68366159

Table 4.2: DMU average efficiency score

Note

- The DEA model is to measure the performance of a DMU (in the current study, an insurance company) relative to the best observed practice.
- The overall technical efficiency indicates the quantity of inputs that could be reduced without affecting the output levels of a decision making unit, the insurance companies in the current context. The overall technical efficiency of the insurance companies is measured using the Charnes, Cooper and Rhode (CCR) DEA model which takes the constant return to scale (CRS) assumption into account.
- The results obtained from the input VRS-DEA model reveal that the average pure technical efficiency. The first component is caused to pure efficiency (DEA-VRS) and expresses the percentage of total technical efficiency that is purely due to technical efficiency, as indicates by its name.
- The second one is provided by scale efficiency and reflects the part of total technical efficiency explained by the compatibility of the production scale at which the company operates. Scale efficiency expresses whether a firm is operating at it's "optimal size." If it is not, then using further comparisons of DEA outputs (using increasing or decreasing returns to scale) it is possible to see whether the firm is too large or too small. However, it's possible to conclude that a firm operating at constant return scale for long period is operating at it's optimal size?
- The table above shows Technical Efficiency (CRS-TE), Pure Technical Efficiency (VRS-TE) and Scale Efficiency (SCALE). CRE-TE = VRS-TE * SCALE.

As shown in Table 4.2, three private insurance companies were scored relatively low efficiency. These three insurance companies are two from small and one from medium insurance companies. Global (small insurance), Ethio-life (medium insurance) and Tsehay (small insurance) are the potential for M&A activities in Ethiopia insurance industry at the time of study.

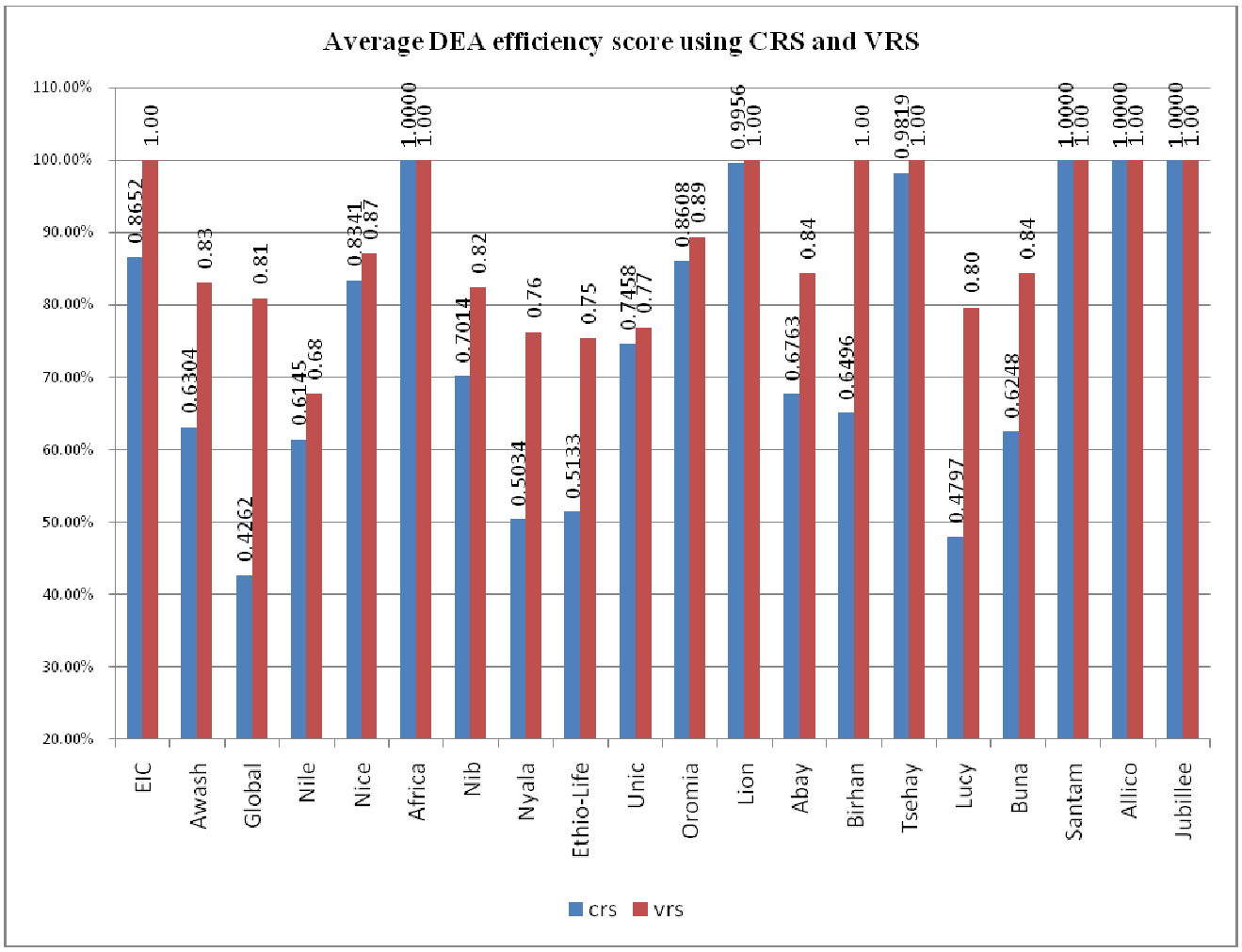


Figure 4.6: Average DEA efficiency score using CRS and VRS

An operational efficiency range from 0 to 1, where a value of 1 indicates the decision making unit is, relatively mentioning, the most efficient. Its value less than 1 is indicative of the inefficient operation of the decision making unit.

In the case of DEA-VRS, the scores vary between 0.676 (lower) and 1 (highest). The average pure efficiencyscore is 0.884. As for the case of DEA-CRS, the scores are bounded by 0.426 (lower) and 1 (upper). And theaverage total efficiency score is 0.755. Hence, in both cases local insurance companies would benefit with M&A.

Table 4.2 is shown the current efficiency score of the insurance companies under discussion. Based on DEA-VRS data seven companies were efficient, namely EIC, Africa, Lion, Birhan,

Tsehay from local insurances and all three foreign insurances (Santam, Allico and Jubillee), but it is possible to note that only Africa Insurance Company from local companies and the whole three foreign insurance companies were efficient in the models based on DEA-CRS result.

4.3.2.2: CRS and VRS score distribution

The insurance companies on the frontier (score = 1) were all three foreign insurance companies and one local private company, which was designated as medium local private company (Africa insurance). In contrary some individual efficiency scores were weak precisely Global, Lucy, Nyala and Ethio-Life insurance companies; and the reason was utilizing excessive inputs as compared to the output expected to generate. Practically these companies were invested more capital from shareholders equity, paid a huge salary for employees and incurred exorbitant operating expenses and in return could generated lower premium production and investment income.

Based on CRS eleven (55%) local companies and on VRS Five (25%) local companies were operating below 80% efficiency score for the period under consideration.

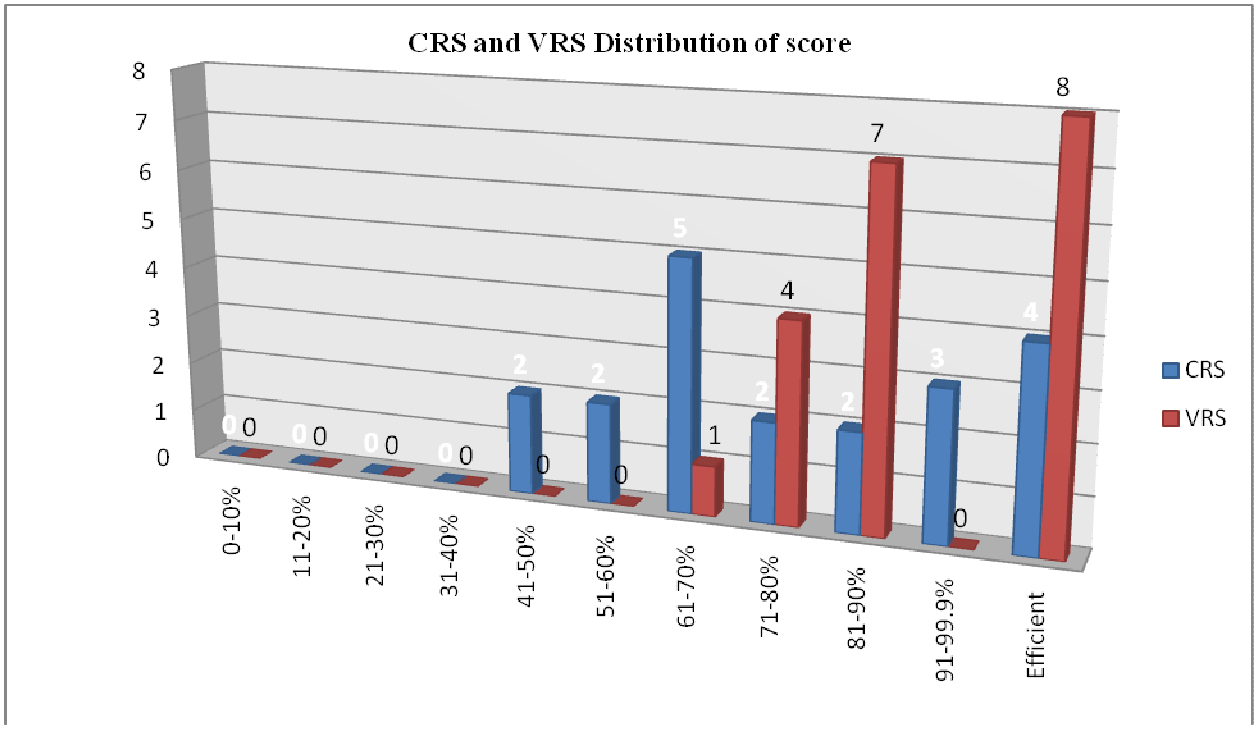
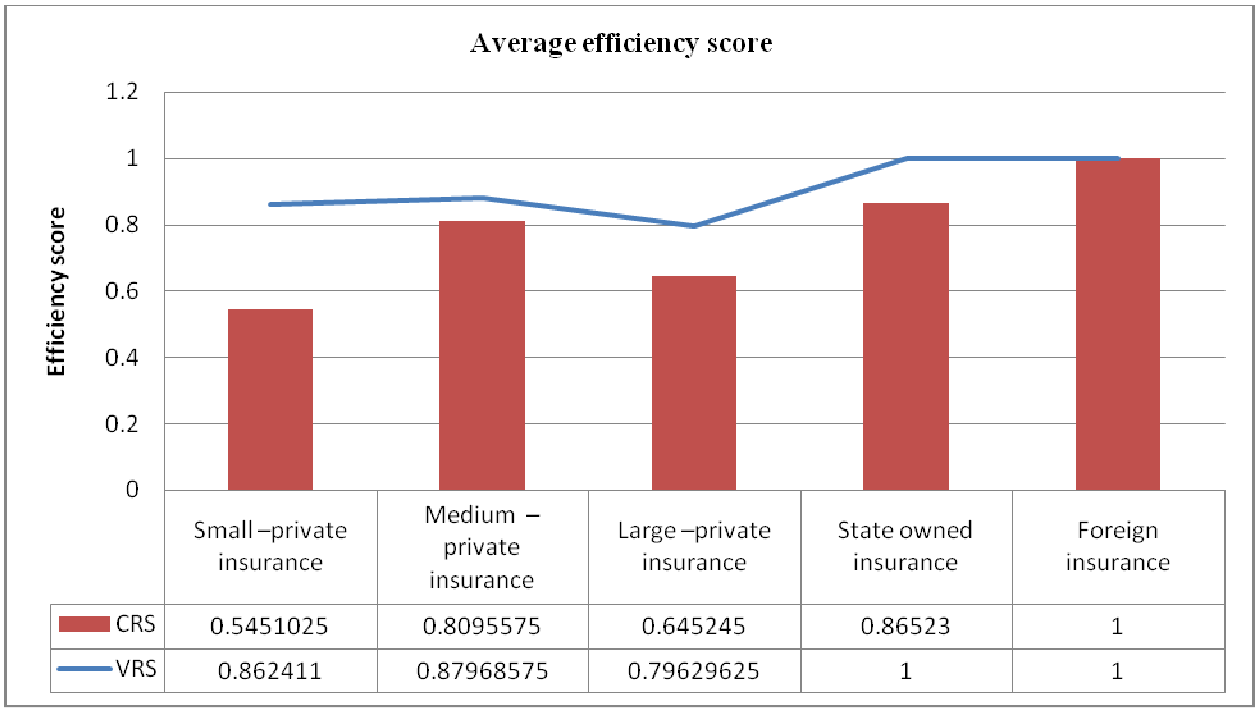


Figure 4.7: CRS and VRS distribution score

4.3.2.3: Average Efficiency Score

Figure 4.8 shown that different insurance companies based on their asset size have different efficiency score. Furthermore VRS score was higher than CRS that confirm with the theoretical background. And also the estimated mean values of the overall technical efficiency score for small, medium, large, state owned and foreign companies are 0.54, 0.81, 0.64, 0.86 and 1 per cent respectively under CRS DEA frontier; and 0.86, 0.88, 0.79,1 and 1 percent under VRS DEA frontier. Thus, the results of DEA analysis clearly reveals that substantial inefficiencies were placed in the Ethiopian insurance industry.



	Small –private insurance	Medium – private insurance	Large –private insurance	State owned insurance	Foreign insurance
CRS	0.5451025	0.8095575	0.645245	0.86523	1
VRS	0.862411	0.87968575	0.79629625	1	1

Figure 4.8: Average efficiency score per the asset category of DMU

Per the above illustration the foreign insurance companies were more efficient than the local companies and also it is possible to conclude that the state owned insurance company was more efficient than private insurance companies. Surprisingly, large private insurance companies' average efficiency score was relatively lower than the average medium insurance companies efficiency score and this imply that these large companies had an inefficient large size. This means that the values of output are lesser than the given values of input.

4.4: Tobit Model

The tobit model, also called a censored regression model, is designed to estimate linear relationships between variables when there is either left- or right-censoring in the dependent variable (also known as censoring from below and above, respectively). It has traditionally been used to evaluate the factors affecting the productive or efficiency.

Tobit regressions are suitable for settings in which the dependent variable is bounded at one of the extremes, presents positive mass of observations at that extreme, and is unbounded otherwise. If the variable is bounded between 0 and 1 inclusive; it cannot take values greater than one or less than zero.

4.5: Explanatory variables affecting efficiency

Tobit regression is used to determine the relationship between the technical efficiency score of insurance companies and other factors. As observed in Appendix 2, all explanatory variables (capital, expenses and salary) individually contributed (P value < 0.05) for the efficiency the two dependent variables (investment and premium). Hence the analysis went further to investigate between the categories of insurance companies, which is small, medium, large, state owned and foreign.

As shown in Appendix 3, capital was significant contributing to the efficiency of investment in all categories of insurances (small, medium, large, state owned and foreign) while the expense was not significantly related to investments. On the other hand salary was played significant role in small and large private companies only.

Appendix 3 also examined also the significant or insignificant contribution of the factors for efficiency of premium. At this point, all expenses three explanatory variables have played significant role for efficiency premium in all five categories insurance companies except salary and expenses in large insurance companies.

4.6: Discussion

To achieve the general objective, the research needs to answer the research questions. To answer these research questions, seven hypotheses have been put forward. Based on the outputs and analysis presented in the previous section, this section will answer the research hypothesis and the research questions. The first section answers the research hypothesis

H1: Foreign insurance companies are more efficient than Ethiopian insurances

As referred in table 4.2 under the CRS estimation, the average Ethiopian insurance companies efficiency was 0.717 (71.7%) while the average foreign insurance companies' efficiency was 1 (100%); and also under the VRS estimation, the average Ethiopian insurance companies' efficiency is 0.863 (86.3%) while the average Foreign banks' efficiency is 1 (100%). This implies that foreign insurances have been in more competitive markets than the Ethiopian counter parts, thereby foreign insurance are forcing them to increase their efficiency.

H2: There are potential efficiency gains in M&As

This is the ultimate aim of M&As. To analyze the potential efficiency gain, let us examine the scenario in detail in to five sub-hypotheses.

H2a: There are potential overall efficiency gains in M&As

76.67% or the majority of the efficiency scores under the CRS estimationof Ethiopian insurance companies were less than one which shows that there are gains from mergers. Similarly under the VRS assumption, (55.56%) DMUs merger efficiency scores are less than one which shows that there are gains from mergers.

H2b: There are potential technical efficiency gains in M&As

As stated in H2a, most of the hypothetical DMU's technical efficiency scores were less than one. This implies that the existence of potential technical improvements for the merged entities under Ethiopian insurance companies. You can measure the level of inefficiency as (1-efficiency score), for example in this example the average DEA CSR efficiency score of Ethiopian insurance companies was 0.7119 (71.19%) and this implies that 28.81% technical

inefficiency(CRS) were observed.It can be said that there exist high technical inefficiency. This implies the need for M&A.

H2c: There are potential pure merger efficiency gains in M&As

Same with the technical efficiency, Ethiopian Insurance companies were inefficient ,in average, by 13.7%with a measurement under pure efficiency; and Merger and Acquisition transaction would fill such gap.Only 5 local insurance companies were efficient for the period under this research and the rest seven companies would benefited with M&A.

H2d: There are potential Scope efficiency gains in M&As

The potential influence on the structural changes due to diversification can be carefully conceptualized based on the decomposition of average technical efficiency gains into scope[15] efficiency gains and scale[16] efficiency gains. A similar trend of increasing efficiency gains due to scopediversification. The harmony efficiency favors mergers as most of the hypothetical mergers' efficiency scores are less than one which is in line with (Shi, Li, Emrouznejad, Xie, & Liang, 2017) and (Bogetoft& Wang, 2005).

H2e: There are no potential Scale efficiency gains in M&As between small insurance companies

To answer this question, the researcher has evaluated the Asset size of the private insurance companies in comparison with the state owned and foreign insurance companies. For instance when two Ethiopian private insurances merge, they will not be as large as the state-owned insurance or the foreign insurance. This indicates that how the Ethiopian insurance companies produce more by putting their effort together and private insurance companies shall struggle to increase their Asset size.

H3: The strategic fit for Small private insurance with Foreign insurance

As observed in table 4.2, under the CRS assumption, the largest efficiency i.e. both technical efficiency gains and pure merger efficiency gains are formed when Small private insurance

[15]Scope is a way to get to large volume by adding variety to the mix. Scope means doing a lot of things that are different by share some aspects.

[16]Scale is to produce to the same thing in larger and larger volumes. It's doing the same thing over and over again a lot. There's little variety, just volume.

companies merge with Foreigninsurance. For instance under CRS estimation the average technical efficiency of Small private insurances was 0.5451 (54.51%), which is smallest efficiency; and the highest average technical efficiency score were the Foreign Insurances, which was 1 but this doesn't necessitate full merger. The gain from a pure merger is small as compared to the technical efficiency gain.This suggests that the strategic fits for Small private insurances areForeignInsurances.

Under the VRS assumption, there was less than 14% technical efficiency gain and very low scope efficiency gains from mergers with Foreign Insurance companies. This suggests that the strategic fit for Small private insurancecould not be with the Foreign insurance companies. This is in line with efficiency theory (Leepsa& Mishra, 2016) and economic theory where mergers should form between two businesses with differentstrengths and weaknesses and (Le T. D., 2015) where potential benefits are gained from scope and scale economies. This is also in line with (Wanke, Maredza, & Gupta, 2017) where the focus should be on merging Insurances with local origins.

H4: The strategic fit for Medium Private Insurances with Foreign insurances

Under the CRS estimation, technical efficiency gains of Medium Private Insurance (1 - 0.8095), which is 0.1905 (19%) and pure technical efficiency was very small as compared to the technical efficiency gain. This suggests that the strategic fit for Medium private insuranceswith the Foreign Insurances.

Under the VRS estimation, there was a 12% technical efficiency gain from mergers these two identified groups with low scope efficiency gains,low scale efficiency and relatively tolerable pure merger efficiency gain This suggests that the strategic fit for Medium private insurances are Foreigninsurance in both assumptions. This is in line with efficiency theory (Leepsa& Mishra, 2016) and economic theory where mergers should form between two businesses with different strengths and weaknesses and (Le T. D., 2015) where potential benefits are gained from scope and scale economies. This is also in line with (Wanke, Maredza, & Gupta, 2017) where the focus should be on merging banks with local origins.

H5: The strategic fit for Large Private insurances with Foreign insurances

Under the CRS estimation, technical efficiency gains of Large Private Insurance (1 - 0.6452), which is 0.3548 (35.48%) and pure technical efficiency was very small as compared to the technical efficiency gain. This suggests that the strategic fit for LargePrivate Insuranceswith the Foreign Insurances.

Under the VRS estimation, there was a 0.2038 (20.38%) technical efficiency gain from mergers these two identified groups with low scope efficiency gains,low scale efficiency and relatively tolerable pure merger efficiency gain. Pure merger efficiency results are all greater than one which means that all mergers will be costly, meaning that there is no strategic fit for state owned Insurances. This is against the findings of (Wanke, Barros, Azad, &Constantino, 2016) which claimed efficient M&As emerge when foreign and state-owned banks are merged.

H6: The strategic fit for Small and Medium Ethiopian insurance companies

As observed in section 4.2, under CRS estimation the average technical efficiency of Small private insurances was 0.5451 (54.51%), which is smallest efficiency; and the average technical efficiency score of Medium Private insurance technical efficiency were 0.8095 (80.95). The gain from a pure merger is small as compared to the technical efficiency gain.This suggests that the strategic fits for Small private insurances are Medium private Insurances.

Under the VRS assumption, the largest gain in efficiency is 14% from technical efficiency gains from mergers between these two identified two groups. This suggests that the strategic fit for Large Private Insurances areForeigninsurance in both assumptions. This is in line with efficiency theory (Leepsa& Mishra, 2016) and economic theory where mergers should form between two businesses with different strengths and weaknesses and (Le T. D., 2015) where potential benefits are gained from scope and scale economies. This is also in line with (Wanke, Maredza, & Gupta, 2017) where the focus should be on merging insurance companies with local origins.

H7: The strategic fit for Medium and Large Ethiopian Insurance Companies

Under the CRS estimation, technical efficiency gains of Large Private Insurance (1 -0.6452), which is 0.35 (19%) and pure technical efficiency was very small as compared to the technical efficiency gain. This suggests that the strategic fit for LargePrivate Insuranceswith the Foreign Insurances.

Under the VRS estimation, there was a (1 - 0.7963) which is (20.37%) technical efficiency gain from mergers these two identified groups with low scope efficiency gains,low scale efficiency and relatively tolerable pure merger efficiency gain. Pure merger efficiency results are all greater than one which means that all mergers will be costly, meaning that there is no strategic fit for state owned Insurances. This is against the findings of (Wanke, Barros, Azad, &Constantino, 2016) which claimed efficient M&As emerge when foreign and state-owned banks are merged.

The section below answers the research questions:

1. **What types of efficiency gains are formed with mergers and acquisitions in emerging Insurance markets?**

Instead of pure efficiency gain insurance companies would more benefited with technical efficiency gain as a result of Mergers and Acquisitions transactions thus it does not necessitate full scale mergers. If insurance companies learn best technical knowledge from the acquiring companies ,they would be more efficient which leaves pure merger efficiency, a combination of size or scale efficiency, and harmony or scope efficiency.

2. **What types of mergers and acquisitions yield strategic fits?**

M&As with Strategic fits are mergers that provide either scope efficiency gains and size scale efficiency gains. These efficiency gains are combined to form pure merger efficiency gains. Pure merger efficiency gain has been used to measure if there are strategic fits for mergers. To gauge the strategic fit of mergers hypotheses three to seven have been put forward. Results clearly show that there is a strategic fit when only Ethiopian private insurance companies merge between themselves. This finding is in line with (Wanke, Maredza, & Gupta, 2017) which states that merging insurances focusing on their local origin should be given greater emphasis. When the asset size of the insurance companies increase there are lower gains in pure merger efficiency, which gives support to the (Reda, 2013), (Wang & Zhang, 2018) and (Boetoft& Wang, 2005) that

insurance size works against mergers. This is further elaborated by (Asongu&Odhiambo, 2019) that beyond a certain threshold there will be diseconomies of scale, this inhibits the development of the insurances and will result in inefficiencies.

3. **Which factors (insurance size, ownership type, financial performance, etc.) significantly contributes for the increase in the success of strategic fit in insurance M&A transactions.**

Insurance company size does matter when it comes to gains in pure merger efficiency i.e strategic fit. As shown in the previous section and the hypotheses as the insurance companies size increased, the gain in pure merger efficiency decreased, completely becoming inefficient.
This may be due to as the size of insurance company increased, the risk of each insurance also increased which in turn decreases net profit and gross written premium. This view is supported by (Asongu&Odhiambo, 2019), (Reda, 2013), (Wang & Zhang, 2018) and (Boetoft& Wang, 2005).

In this research we categorized companies based on their size in three ways, State-owned insurance companies, local private insurance companies, and foreign insurance companies. Based on the research, insurance ownership structure does matter in the strategic fit of mergers and acquisitions. Accordingly the state-owned insurance and foreign insurance companies are far larger than local private companies which might be the reason that scale efficiency gains are found in mergers between the local private insurance companies. There have also been more scope gains from mergers within the local private insurance companies which shows that these insurances also have different strengths and weaknesses which make them the right candidate for mergers according to the efficiency gain theory (Leepsa& Mishra, 2016).

Chapter Five: Conclusions and Recommendations

5.1: Conclusions

This paper examines the strategic fit and potential gains of mergers and acquisitions (M&As) in the Ethiopian insurance industry during the period 2006 -2020. During this period there was no M&A transaction in the financial industry even before there was only one M&A between the former Lion and United Insurance Company ,but it will be expected in the near future because of deregulation and WTO accession process .We analyze also the potential gain provided to the merging and acquiring companies.Among many available methods of measuring operational efficiency ranging from parametric models, the DEA model employed in this study is a very superior method of measuring relative operational efficiency.Data were obtained from financial statement of insurance companies. Three input variables (Labor/Salary,Operating Expenses and Capital) and two output variables (gross written premium and investment income) were used in data envelopment analysis model. Correlation analysis, over all technical efficiency (CRS), pure technical efficiency (VRS) and scale efficiency were used to measure the relative efficiency of each insurance company. Tobit regression model was also used to identify an efficient company merging with an inefficient one inorder to provide efficiency gain.Based on the result there was strong and positive significant correlation between input and output variables which was essential requirement for DEA.

Most of the gains in efficiency come from technical efficiency gains which don't necessitate full mergers. Second, only the local private insurance companies (Small, Medium, and Large) have pure merger efficiency gains, gains that occur due to full mergers. Third, there are no strategic-fit to start M&A in state-owned and foreign banks.Consequently, focus on future M&As should be between the local private insurances and foreign insurances too as economies of scope and economies of scales are attained from M&As between them.

5.2: Recommendations

The study recommends the need for companies to establish a list of the most popular benefits enjoyed by most companies. This will help a company to map out effective strategies that will help the success of strategic mergers, which eventually will help in building a competitive advantage that can be sustained in the long run.

The study also recommends the local insurance companies to increase their asset size. Anincrease in asset size might make the local insurance companies more competitive before the potential entry of foreign insurances. Moreover recommends to the localinsurance companies to

work together before swallowing by the foreign companies with M&As; and thus increasing capital, decreasing operating expenses by producing more premium and would have enough admitted asset which enables companies to invest in a greater income generating investment areasparticularly in a real estate business.

The study acknowledges the need for additional studies that focuses on insurance companies mergers and acquisitions benefit and its success factors between Ethiopian insurance companies and also focusing on the details of merger process. Additionally more studies need to be carried out on other forms of integration that are separate from strategic mergers and acquisitions.

Appendix

Appendix 1: DEA score Measures

DMU No.	DMU Name	Input-Oriented CRS Efficiency 2016	2017	2018	2019	2020	Average
1	EIC	0.89567	0.63367	0.79681	1	1	0.86523
2	Awash	0.59236	0.61990	0.54636	0.64580	0.74768	0.63042
3	Global	0.54282	0.47133	0.37354	0.37042	0.37300	0.42622
4	Nile	0.64749	0.74173	0.67198	0.48545	0.52609	0.61455
5	Nice	0.91430	0.81771	0.74762	0.79570	0.89523	0.83411
6	Africa	1	1	1	1	1	1
7	Nib	0.72085	0.75617	0.69598	0.65131	0.68281	0.70143
8	Nyala	0.58950	0.51649	0.54004	0.43931	0.43157	0.50338
9	Ethio-Life	0.42869	0.47897	0.46596	0.53215	0.66065	0.51328
10	Unic	0.54034	0.51245	0.67597	1	1	0.74575
11	Oromia	1	0.85874	0.71316	0.82151	0.91051	0.86078
12	Lion	1	1	1	1	0.97795	0.99559
13	Abay	0.91457	0.75317	0.69586	0.51165	0.50624	0.67630
14	Birhan	0.54600	0.70425	0.69270	0.60940	0.69584	0.64964
15	Tsehay	1	1	0.94293	1	0.96633	0.98185
16	Lucy	0.39698	0.43616	0.45784	0.54081	0.56676	0.47971
17	Buna	0.55635	0.60314	0.58498	0.63969	0.74001	0.62484
18	Santam	1	1	1	1	1	1
19	Allico	1	1	1	1	1	1
20	Jubillee	1	1	1	1	1	1

Table 6.1: DEA CRS Score Measures

DMU No.	*DMU Name*	*Input-Oriented VRS Efficiency 2016*	*2017*	*2018*	*2019*	*2020*	*Average*
1	EIC	1	1	1	1	1	1
2	Awash	0.66191	0.95556	1	0.70402	0.82718	0.82973
3	Global	0.75849	0.69793	0.70363	0.88623	1	0.80925
4	Nile	0.69885	0.85745	0.74549	0.50935	0.57129	0.67649
5	Nice	0.96778	0.82173	0.77390	0.80716	0.98035	0.87018
6	Africa	1	1	1	1	1	1
7	Nib	0.78157	1	0.93882	0.68802	0.71213	0.82411
8	Nyala	0.80319	1	1	0.54209	0.46690	0.76244
9	Ethio-Life	0.75082	0.76277	0.76584	0.68744	0.79936	0.75325
10	Unic	0.54141	0.51404	0.78910	1	1	0.76891
11	Oromia	1	0.87082	0.74562	0.87261	0.98036	0.89388
12	Lion	1	1	1	1	1	1
13	Abay	1	0.85456	0.83951	0.74234	0.78203	0.84369
14	Birhan	1	1	1	1	1	1
15	Tsehay	1	1	1	1	1	1
16	Lucy	0.86800	0.70447	0.67199	0.75050	0.98544	0.79608
17	Buna	1	0.89009	0.75174	0.71121	0.86851	0.84431
18	Santam	1	1	1	1	1	1

19	Allico	1	1	1	1	1	1
20	Jubillee	1	1	1	1	1	1

Table 6.2: DEA VRS Score Measures

Appendix 2: Tobit regression model (Stata output)

```
Tobit regression                                      Number of obs   =       100
                                                      LR chi2(3)      =    176.25
                                                      Prob> chi2      =    0.0000
Log likelihood = -39.122364                           Pseudo R2       =    0.6925
ln_invest       Coef.   Std. Err.      t    P>t     [95% Conf. Interval]
ln_capital     .8536049   .0895299     9.53   0.000     .6759128    1.031297
ln_expenses    .3677924   .0623903     5.90   0.000     .2439649    .4916199
ln_salary      -.4006066  .1349487    -2.97   0.004    -.6684425   -.1327708
_cons          1.958494   .7606942     2.57   0.012     .4487268    3.468262
/sigma         .3543349   .0252552                      .3042104    .4044594
Obs. summary:         1  left-censored observation  at ln_invest<=15.862288
99     uncensored observations
0 right-censored observations


tobitln_premiumln_capitalln_expensesln_salary, ll
Tobit regression                                      Number of obs   =       100
                                        LR chi2(3)    =    177.94
                                        Prob> chi2    =    0.0000
Log likelihood = -47.486877                           Pseudo R2       =    0.6520
------------------------------------------------------------------------------
ln_premium |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ln_capital |      .4718672   .0974181     4.84   0.000     .2785192    .6652151
ln_expenses |     .1799851   .0679068     2.65   0.009     .045209    .3147612
ln_salary |       .344313    .146868     2.34   0.021     .0528207    .6358052
      _cons |     1.494915   .8270776     1.81   0.074    -.1466057    3.136435
-------------+----------------------------------------------------------------
     /sigma |     .3856257   .0274839                      .3310777    .4401737
------------------------------------------------------------------------------
 Obs. summary:         1  left-censored observation  at ln_premium<=18.205208
                      99     uncensored observations
                       0 right-censored observations
```

Appendix 3: Tobit analysis within each insurance company categories

```
      bydmu_category, sort : tobitln_investln_capitalln_expensesln_salary, ll

->dmu_category = Small Private insurance companies
```

Tobit regression — Number of obs = 20
LR chi2(3) = 28.97
Prob> chi2 = 0.0000
Log likelihood = 2.4419833 — Pseudo R2 = 1.2028

ln_investCoef.		Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	.510568	.290203	1.76	0.097	-.1017069	1.122843
ln_expenses	-.0769351	.1587585	-0.48	0.634	-.4118862	.258016
ln_salary	.710656	.2623976	2.71	0.015	.1570455	1.264267
_cons	-3.512974	3.05536	-1.15	0.266	-9.959221	2.933272
/sigma	.2015116	.0330569			.1317677	.2712555

Obs. summary: 1 left-censored observation at ln_invest<=15.862288
19 uncensored observations
0 right-censored observations

->dmu_category = Medium Private Insurance companies
Tobit regression — Number of obs = 40
LR chi2(3) = 66.62
Prob> chi2 = 0.0000
Log likelihood = -5.9169552 — Pseudo R2 = 0.8492

ln_investCoef.		Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	1.044278	.1174551	8.89	0.000	.8062916	1.282265
ln_expenses	-.1053182	.2154807	-0.49	0.628	-.5419236	.3312871
ln_salary	.1051981	.2700903	0.39	0.699	-.4420569	.652453
_cons	-2.71182	1.913905	-1.42	0.165	-6.58976	1.16612
/sigma	.2723567	.0310612			.2094207	.3352926

Obs. summary: 1 left-censored observation at ln_invest<=16.107
39 uncensored observations
0 right-censored observations

->dmu_category= Large Private insurance Companies
Tobit regression — Number of obs = 20
LR chi2(3) = 23.09
Prob> chi2 = 0.0000
Log likelihood = -3.0401343 — Pseudo R2 = 0.7915

ln_investCoef.		Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	.5444362	.1969392	2.76	0.013	.1289307	.9599416
ln_expenses	-.6940189	.4241301	-1.64	0.120	-1.588855	.2008175
ln_salary	1.282227	.598073	2.14	0.047	.020403	2.544051
_cons	-3.871992	3.374234	-1.15	0.267	-10.991	3.247019
/sigma	.2649253	.0436521			.1728273	.3570232

Obs. summary: 1 left-censored observation at ln_invest<=17.395506
19 uncensored observations
0 right-censored observations

->dmu_category = State owned Insurance company
insufficient observations

->dmu_category = Foreign insurance companies

Tobit regression — Number of obs = 15; LR chi2(3) = 35.77; Prob> chi2 = 0.0000

Log likelihood = 1.8566496 — Pseudo R2 = 1.1158

ln_investCoef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	.7288832	.3081787	2.37	0.036	.0574195	1.400347
ln_expenses	.1655554	.3918627	0.42	0.680	-.6882401	1.019351
ln_salary	-.3425064	.2239257	-1.53	0.152	-.8303986	.1453859
_cons	7.072851	1.821782	3.88	0.002	3.103529	11.04217
/sigma	.2074964	.0388949			.1227517	.2922412

Obs. summary: 1 left-censored observation at ln_invest<=16.990353
14 uncensored observations
0 right-censored observations

bydmu_category, sort : tobitln_premiumln_capitalln_expensesln_salary, ll

->dmu_category = Small Private insurance companies

Tobit regression — Number of obs = 20; LR chi2(3) = 24.00; Prob> chi2 = 0.0000

Log likelihood = 7.960731 — Pseudo R2 = 2.9698

ln_premiumCoef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	-.5657519	.2072702	-2.73	0.014	-1.003054	-.12845
ln_expenses	.3358361	.1159046	2.90	0.010	.0912987	.5803735
ln_salary	.7179829	.1910731	3.76	0.002	.3148539	1.121112
_cons	11.77977	2.172839	5.42	0.000	7.195479	16.36406
/sigma	.1471996	.0243003			.0959304	.1984689

Obs. summary: 1 left-censored observation at ln_premium<=18.205208
19 uncensored observations
0 right-censored observations

->dmu_category = Medium Private insurance companies

Tobit regression — Number of obs = 40; LR chi2(3) = 35.39; Prob> chi2 = 0.0000

Log likelihood = -12.845265 — Pseudo R2 = 0.5794

ln_premiumCoef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	.6780481	.1400042	4.84	0.000	.3943727	.9617236
ln_expenses	-.6406286	.2571147	-2.49	0.017	-1.161592	-.1196648
ln_salary	.7048041	.3225802	2.18	0.035	.0511946	1.358414
_cons	4.695561	2.283133	2.06	0.047	.0694931	9.321628
/sigma	.3248177	.0370635			.24972	.3999154

Obs. summary: 1 left-censored observation at ln_premium<=18.222229
39 uncensored observations

0 right-censored observations

->dmu_category = Large Private insurance companies

Tobit regression — Number of obs = 20; LR chi2(3) = 27.67; Prob> chi2 = 0.0000

Log likelihood = 10.589353 — Pseudo R2 = 4.2634

ln_premium	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	.5749011	.0967879	5.94	0.000	.3706964	.7791058
ln_expenses	.1762229	.208445	0.85	0.410	-.2635577	.6160035
ln_salary	-.1887989	.2939956	-0.64	0.529	-.8090754	.4314777
_cons	8.830222	1.660905	5.32	0.000	5.326017	12.33443
/sigma	.1301992	.0214024			.085044	.1753544

Obs. summary: 1 left-censored observation at ln_premium<=19.658558
19 uncensored observations
0 right-censored observations

->dmu_category = State owned insurance company
insufficient observations

->dmu_category = Foreign insurance companies

Tobit regression — Number of obs = 15; LR chi2(3) = 90.82; Prob> chi2 = 0.0000

Log likelihood = 20.172604 — Pseudo R2 = 1.7993

ln_premium	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ln_capital	-.1458031	.0737626	-1.98	0.072	-.306518	.0149118
ln_expenses	.4200335	.0968223	4.34	0.001	.2090758	.6309911
ln_salary	.6675911	.0567294	11.77	0.000	.5439884	.7911938
_cons	3.400458	.4268524	7.97	0.000	2.470426	4.330489
/sigma	.0528829	.0101788			.0307051	.0750607

Obs. summary: 1 left-censored observation at ln_premium<=18.307615
14 uncensored observations
0 right-censored observations

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