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School of Social Sciences

THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA

BY

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DECLARATION

I, the undersigned, hereby declare that the Research Project Work (Thesis) entitled **"THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA"** is my original work which has been done by me under the supervision of academic counselor, Dugassa Mulugeta (PhD). This project work is submitted to the Indira Gandhi National Open University in partial fulfillment of the requirements for the award of the Degree of Master of Arts in Economics. I confirm that the thesis has not been submitted elsewhere and all sources of materials used for the thesis have been duly acknowledged.

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Signature _____

May, 2018

Addis Ababa, Ethiopia

CERTIFICATE

Certified that the Research Project Work (Thesis) entitled **"THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA"** submitted by **TAMERAYHU HAILEMARIAM AFEWORK** is his own work and has been done in the light of evaluator's comments under my supervision.

It is recommended that this Project be placed before the examiner for evaluation.

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Tamerayhu Hailemariam

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TABLE OF CONTENTS

CONTENTS **PAGE No.**

LIST OF TABLES

TABLES **PAGE No.**

LIST OF FIGURES

TABLES **PAGE No.**

ACRONYMS

AAA - American Academy of Actuaries

AAU - Addis Ababa University

CAA - Certified Actuarial Analyst

CBHI – Community Based Health Insurance

CERA - Chartered Enterprise Risk Analyst

CIA - Canadian Institute of Actuaries

CPD - Continuing Professional Development

EHIA - Ethiopian Health Insurance Agency

EIFS - Ethiopian Institute of Financial Studies

ERM - Enterprise Risk Management

FDRE - Federal Democratic Republic of Ethiopia

FQA - Fully Qualified Actuary

GDP – Gross Domestic Product

IAA - International Actuarial Association

IAIS - International Association of Insurance Supervisors

IAN - International Actuarial Note

ICA - International Congress of Actuaries

IFoA - Institute and Faculty of Actuaries

IFRS - International Financial Reporting Standard

ILO - International Labor Organization

IMF - International Monetary Fund

IOPS - International Organization of Pension Supervisors

IRA - Insurance Regulatory Authority of Kenya

ISAP - International Standard of Actuarial Practice

ISD - Insurance Supervision Directorate

ISSA – International Social Security Association

NBE - National Bank of Ethiopia

PESSA - Private Employees Social Security Agency

PMAC - Provisional Military Administration Council

PSSA - Public Servants Social Security Agency

SHI - Social Health Insurance

SOA - Society of Actuaries

TASK - The Actuarial Society of Kenya

TGE - Transitional Government of Ethiopia

UK - United Kingdom

USA- United States of America

ABSTRACT

Actuarial practice is concerned with the assessment of the economic consequences associated with phenomena that are subject to uncertainty. This practice requires an understanding of the principles underlying several fields, including statistics, economics and risk management, as well as the principles of modeling, valuation and risk classification. Accepted Actuarial Practice is a practice or practices that are generally recognized within the actuarial profession as appropriate to use in performing actuarial services within the scope of an international standard of actuarial practice or the applicable professional standards of practice. The main objective of the study is to analyze and determine the importance of actuarial practice in Ethiopia; and to give recommendations based on the findings. The study concentrated on the importance of actuarial practice as it applies to the Ethiopian insurance and financial sectors. The study mainly examines the importance of actuarial practice, the role of actuaries and actuarial firms, and the role of actuarial regulatory regime within the context of the Ethiopian insurance and financial sectors. The study is conducted within the framework of descriptive research. Both primary and secondary sources of data are used. The secondary data is collected by desk review and analysis of secondary data is used to produce theoretical findings that substantiate the research objectives. Primary data, on the other hand, is collected with mixed method involving both quantitative and qualitative methods. Survey method is applied with combination of structured questionnaire and semi structured key informants interview as tools of data collection. The findings derived from analysis of secondary data theoretically confirmed the importance of actuarial practice in Ethiopia. Similarly, the findings produced as the result of analyzing primary data practically validated the importance of actuarial practice in Ethiopia. Based on the findings of the study, actuarial practice is determined to be very important in Ethiopia. Actuarial practice is important in the Ethiopian insurance and financial sectors and contributes significantly to the development of the sectors. Actuaries, actuarial firms and the actuarial regulatory regime play an important role in promoting actuarial practice in the international domain. However, their limited roles in promoting the practice in Ethiopia resulted in a poor and underdeveloped actuarial practice observed in the country, which in turn become one of the major reasons behind the country's underdeveloped insurance and financial sectors.

Key Words *:* Actuarial Practice Ethiopia

CHAPTER ONE
INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Utilitarianism as a philosophy, and risk aversion as a feature of human psychology, lead to the evolution of financial security systems as a means of reducing the financial consequences of unfavorable events. Actuaries are those with a deep understanding of financial security systems, their reasons for being, their complexity, their mathematics, and the way they work. Actuarial practice identifies, analyzes and assists in the management of the outcomes including costs and benefits associated with events that involve risk and uncertainty. Understanding the principles underlying actuarial science enables actuaries to develop models of such events and other techniques to solve practical problems.

Actuarial practice is concerned with the assessment of the economic consequences associated with phenomena that are subject to uncertainty. This practice requires an understanding of the principles underlying several fields, including statistics, economics and risk management, as well as the principles of modeling, valuation and risk classification. Accepted Actuarial Practice is a practice or practices that are generally recognized within the actuarial profession as appropriate to use in performing actuarial services within the scope of an international standard of actuarial practice (ISAP) or the applicable professional standards of practice.

The profession of the actuary is one of the oldest in the financial world. In earlier days, most of those who thought of themselves as actuaries were employees of life insurance companies and hence part of the insurance industry. The formation in London in 1762 of the Society for Equitable Assurances on Lives and Survivorships as a mutual company, initiated a process that created a public purpose for actuaries. The birth of the actuarial profession can be conveniently fixed at 1848 when the Institute of Actuaries was organized in London. There are actuarial organizations in many parts of the world and, almost uniformly, they engage in the advancement and dissemination of knowledge, and influence the method of entry into the profession.

Actuaries are problem solvers, business analysts, consultants and financial risk assessors all rolled into one. Actuaries fulfill many roles in a broad range of environments, including insurance companies, health organizations, pension plans, risk management, government, regulatory regimes, and in other fields. They have a detailed understanding of economic, financial, demographic and insurance risks and expertise in: developing and using statistical and financial models to inform financial decisions; pricing, establishing the amount of liabilities, and setting capital requirements for uncertain future events. Actuaries also provide advice on the adequacy of risk assessment, reinsurance arrangements, investment policies, capital levels and stress testing of the future financial condition of a financial institution.

Actuarial guidance notes and standards of practice are important tools in ensuring that actuarial services are performed in a consistent and appropriate manner, to a high standard of quality. Actuaries that belong to a recognized actuarial society that is a full member of the IAA are bound by professional codes of conduct and actuarial standards of practice. In jurisdictions where these do not exist, or where actuarial services are performed by others, there is a need to provide professional guidance and standards to ensure consistency and quality. The International Actuarial Association (IAA) is an international actuarial regulatory body which is responsible to provide guidelines for its member associations in each country on issues such as educational system and requirements for membership, code of professional conduct, disciplinary process, and system for developing standards of actuarial practice. The IAA cannot control the use of the term "Actuary" but it can set professionalism guidelines for those who are members.

The role of a professional actuarial association varies from country to country. For example, in Kenya, The Actuarial Society of Kenya (TASK) is a full member of the IAA which brings together qualified and trainee actuaries in professional, educational and research organizations with an aim of promoting the actuarial profession in Kenya and East Africa. On the contrary, in Ethiopia there exists no full or associate member association of the IAA which is committed to promote the profession in the country. The country also suffers from lack of qualified actuaries and domestic actuarial service providers (actuarial firms). The need to introduce actuarial practice as an important factor which determines the development of the Ethiopian insurance and financial sectors initiated a descriptive research on the topic under study.

1.2. STATEMENT OF THE PROBLEM

Ethiopia is one of the fastest-growing economy in the world. The country's GDP is forecast to grow by 8.3%. IMF reported that the country's financial sector remains healthy characterized by an increase in banking, insurance and microfinance branches. Ethiopia's insurance industry is growing rapidly from a low base, propelled forwards by strong economic growth and a developing banking and financial services system, which is improving affordability and accessibility in the market. Both the non-life and smaller life insurance markets are recording double digit growth, however, the market continues to face significant headwinds including restrictions on foreign ownership and high levels of poverty.

The World Bank, however, reported that the Ethiopian insurance sector remains underdeveloped. Insurance premiums represent only about 0.47 percent of GDP for non-life insurance, and 0.03 percent of GDP for life insurance. Insurance Business in general and life assurance in particular is not well developed in Ethiopia. ISD also stated that the Ethiopian insurance industry is very young and underdeveloped and currently sailing against many odds. Some of the reasons behind the underdeveloped insurance industry include: lack of awareness by the public, unfair competition, underdeveloped domestic financial markets, lack of experience and insurance techniques, and absence of domestic actuaries and actuarial service providers.

The history of the Ethiopian actuarial practice is strictly associated with the country's insurance industry, mainly with valuation of the long-term insurance business. The Ethiopian insurance businesses as well as actuarial practice is regulated by Insurance Supervision Directorate (ISD) of the National Bank of Ethiopia (NBE) whose main responsibility is licensing and supervision of insurance business in the country. In April 1996, the NBE, pursuant to the authority vested in it by Article 41 of the Monetary and Banking Proclamation No. 83/1994 and by Article 25 of Licensing and Supervision of Insurance Business Proclamation No. 86/1994, issued Directive No. SIB/11/1996, "LICENSING OF INSURANCE ACTUARY", which provided a regulatory framework for licensing and supervising actuarial practice in Ethiopia. The directive marked a significant move towards the regulation of actuarial practice in Ethiopia for the last two decades stipulating regulatory framework for legal, educational, professional and financial requirements of licensing and supervising insurance actuaries in the country.

Despite the regulatory provisions of the Bank, the actuarial practice in Ethiopia is at its infancy; characterized by the absence of qualified actuaries and domestic actuarial firms actively operating in the country's insurance and financial market. Ever since the beginning of the insurance business in Ethiopia, actuarial service has been provided by foreign firms and expatriates. Nevertheless, following the issuance of Directive No. SIB/11/1996, one domestic actuarial firm, owned and managed by an Ethiopian actuary has been licensed by the bank and brought in to operation in the country's insurance and financial market. Currently, there is no domestic actuary or actuarial firm which provides actuarial service to the country's insurance and financial market. As the result, the value that could be gained or added from such service is lacking and this created a big gap in the country's insurance industry, especially in the long-term insurance business. Therefore, absence of domestic actuaries and actuarial service providers is one of the main reasons behind the underdeveloped insurance industry in Ethiopia. Moreover, the country is incurring loss of foreign currency due to the purchase of actuarial services from foreign firms.

On the other hand, IAA reported that there are no Fellow or Associate actuaries in Ethiopia. According to a survey made by IAA in 2015, there were only five Student Actuaries of the Institute and Faculty of Actuaries. These students are not yet qualified to engage in actuarial valuation business under the provisions of the Directive. Almost all Ethiopian insurance companies and financial institutions including the regulator (NBE) do not have a job title or job description for actuarial positions. They don't even have an in-house actuary or actuarial department (work unit) which is committed to perform actuarial valuation work. Most of the actuarial valuation work is done by outsourced actuarial service providers, mostly by foreign actuaries and actuarial firms. Except the state owned insurance company, most insurers and financial organizations do not provide actuarial educational schemes or scholarship programs to sponsor students for actuarial qualification routes. Moreover, Ethiopian universities and colleges do not provide actuarial science programs with a curriculum designed based on the prevailing educational guidelines and syllabus of the IAA. Shortage of actuarial science university programs, exam study materials, libraries, qualification incentives and scholarship support for actuarial students are some of the reasons behind the unavailability of graduate actuaries as well as qualified actuaries; which in turn, contributed for the poor and underdeveloped actuarial practice observed in the country.

To the other extreme, Ethiopia doesn't have any actuarial association or professional organization; which is a standing member of the IAA and dedicated to promote the profession through education, research and professional development. The country's actuarial regulatory framework is not supported by international standards of actuarial practice and guidance notes. Directive No. SIB/11/1996 is a regulatory tool available to license and supervise actuarial valuation business in Ethiopia. The directive is issued in 1996 and served for the last two decades where its regulatory provisions are relatively outdated and need to be revised based on the prevailing international actuarial practice regulatory framework and tools. In the meantime, many people, including those working in the insurance and financial sectors lack a clear understanding about the role of actuaries in the socio economic and business activities. This implies the need to conduct a descriptive research which creates awareness about actuaries, their classification, their practice areas, and their roles in the insurance and financial sectors of an economy. The research project is, therefore, aimed at analyzing the above mentioned problems to produce commendable findings.

1.3. OBJECTIVES OF THE STUDY

1.3.1. General Objective

The main objective (aim) of the study is to analyze and determine the importance of actuarial practice in Ethiopia; and to give recommendations based on the findings.

1.3.2. Specific Objectives

Based on the above general objective (aim), the study specifically attempts to:

a) identify how actuarial practice influence the Ethiopian insurance and financial sectors.
b) describe the role of actuaries and actuarial firms in promoting the practice in Ethiopia.
c) examine the role of the actuarial regulatory regime in promoting the practice in Ethiopia.

1.4. RESEARCH QUESTIONS

The study attempts to answer the following research questions:

a) How important is actuarial practice in the Ethiopian insurance and financial sectors?
b) How important is the role of actuaries and actuarial firms in promoting the practice in Ethiopia?
c) How important is the role of the actuarial regulatory regime in promoting the practice in Ethiopia?

1.5. RESEARCH METHODOLOGY

The study is conducted within the framework of descriptive research. The study describes the importance of actuarial practice in Ethiopia, especially, in the Ethiopian insurance and financial sectors. The study used both primary and secondary sources of data. The secondary data is collected by desk review from various publications and presented in the form of literature review. Analysis of secondary data is used to produce theoretical findings that substantiate the research objectives; and to describe the underling principles of actuarial practice, the role of actuaries and actuarial firms, as well as the actuarial regulatory regime in promoting the practice in Ethiopia. Primary data, on the other hand, is collected with mixed method involving both quantitative and qualitative methods in measurement scales, tools of data collection as well as analysis techniques. Mixed method is applied so as to offset the weaknesses inherent within one method with the strengths of the other method. Survey method is applied with both quantitative and qualitative tools of data collection where combination of structured questionnaire and semi structured key informants interview is used as tools of data collection. Non-random, purposive sampling method is used with a sample size of 30 individuals representing insurance and financial organizations that are considered to be influenced by actuarial practice. The study used both quantitative and qualitative methods of data analysis. The quantitative findings are generated from analysis of quantitative data collected by the survey questionnaire; and with the help of statistical softwares: SPSS and Excel. The qualitative findings are generated from analysis of qualitative data collected by the key informants interview. Constant comparative method with thematic manual analysis of notes is applied in analyzing the qualitative findings.

1.6. SCOPE AND LIMITATIONS OF THE STUDY

The study mainly focused on describing the importance of actuarial practice in the geographical area of the east African country, Federal Democratic Republic of Ethiopia. The study concentrated on the importance of actuarial practice as it applies to the current practice in Ethiopia. The study mainly examines the importance of actuarial practice, the role of actuaries and actuarial firms, and the role of actuarial regulatory regime within the context of the Ethiopian insurance and financial market. The study is subject to several limitations. The main limitations of the study is unavailability of sufficient data, especially, about the Ethiopian actuarial practice. Other limitations include absence of actuaries and actuarial firms and knowledge gap of the respondents.

1.7. SIGNIFICANCE OF THE STUDY

As to the best knowledge of the researcher, there is no academic or commissioned research conducted on the topic under study. The outcome of the study is expected to provide practical evidence on the importance of actuarial practice in Ethiopia. The study shall play a significant role in the formation of a well structured actuarial practice in Ethiopia which in turn uplift the country's underdeveloped insurance and financial sectors. Moreover, the study will have the following impacts on the stakeholders:

The general Public: the study will create awareness on how actuarial practice is important in the socio-economic and business activities of a society.

Practitioners: the study will provide concrete evidence on the need to promote actuarial practice in Ethiopia so that domestic actuaries and actuarial firms will emerge to contribute for the development of the practice as well as the country's insurance and financial sectors.

Regulator: the study will provide information on the international standards of actuarial practice regulatory framework so that the local regulatory body will be able to review its regulatory tools to provide a better actuarial practice and insurance business supervision in the country.

The Government: the study will influence the government's actions towards the promotion of actuarial practice in Ethiopia including: establishing a national actuarial association to become member of the IAA, availing actuarial science educational programs by Ethiopian universities and colleges, and initiating international organizations to promote the profession in the country.

Academics and Researchers: the study will serve as a stepping stone to further researches on actuarial practice and related topics.

1.8. ORGANIZATION OF THE PAPER

The paper is organized in five chapters. Chapter one introduces the research project, chapter two reviews related literature, chapter three presents the research methodology, and chapter four deals with data analysis and discussion of findings. Finally, summary of the findings, conclusions, and recommendations will be presented in chapter five.

CHAPTER TWO
LITERATURE REVIEW

2.1 THE CONCEPT OF ACTUARIAL PRACTICE

Utilitarianism as a philosophy, and risk aversion as a feature of human psychology, lead to the evolution of financial security systems as a means of reducing the financial consequences of unfavorable events. Actuaries are those with a deep understanding of financial security systems, their reasons for being, their complexity, their mathematics, and the way they work (Trowbridge, 1989). Actuarial practice identifies, analyzes and assists in the management of the outcomes including costs and benefits associated with events that involve risk and uncertainty. Understanding the principles underlying actuarial science enables actuaries to develop models of such events and other techniques to solve practical problems (Allaben et al, 2008).

The actuary depends on observation and wisdom gained through prior experience in order to gain insights about future possibilities. Actuaries use these observations and experience to construct, validate and apply models. Actuaries continually incorporate additional observations and insights into their models. This feedback cycle systematically addresses discrepancies between these models and observed reality. Actuarial practice, in turn, is concerned with the assessment of the economic consequences associated with phenomena that are subject to uncertainty. This practice requires an understanding of the principles underlying several fields, including statistics, economics and risk management, as well as the principles of modeling, valuation and risk classification.

Accepted Actuarial Practice is a practice or practices that are generally recognized within the actuarial profession as appropriate to use in performing actuarial services within the scope of an international standard of actuarial practice (ISAP) or the applicable professional standards of practice (IAA, 2017). Code of Professional Conduct, on the other hand, sets forth what it means for an actuary to act as a professional. It identifies the responsibilities that actuaries have to the public, to their clients and employers, and to the actuarial profession (AAA, 2009).

2.2 HISTORICAL BACKGROUND OF ACTUARIAL PRACTICE

In earlier days, most of those who thought of themselves as actuaries were employees of life insurance companies and hence part of the insurance industry. The few consulting actuaries providing actuarial services to the smaller companies were closely associated with the insurance industry (Trowbridge, 1989). The actuarial profession is a profession that serves a public purpose. Hence, the outline of the history of the actuarial practice must follow the public purposes served by actuaries in applying their basic science (Hickman, 2004).

2.2.1 The Origin of Actuarial Practice

The history of any profession relates to the history of the division of labor in society. This is generally true and can also be attributed to expertise in the financial world, a world which generates with increasing complexity growing numbers of specialists offering know-how and expertise. The profession of the actuary is one of the oldest in the financial world (Bühlmann, 1997).

Bühlmann (1997) stated that to understand what actuaries are is not possible without knowing where their roots lie. Actuarial organizations owe their existence to a unique service to society which originated in the second half of the 19th century. Actuaries of the second half of the 19th century managed to gain recognition for their mathematical doctrine from the entire life insurance industry worldwide. The essential elements of this doctrine had already been around for almost a century and in fact James Dodson formed the Equitable Life Assurance Society on its principles.

Hickman (2004), claims that the formation in London in 1762 of the Society for Equitable Assurances on Lives and Survivorships as a mutual company, initiated a process that created a public purpose for actuaries. Bühlmann (1997), also noted that Equitable managed to survive the fast disappearance of many life insurance companies in the second half of the 19th centaury and flourished during the period because of the scientific methods (actuarial methods) it employed. Other companies thus took over the insurance technique developed mainly by, its actuary, William Morgan to calculate reserves, create a technical balance sheet and develop mortality tables using statistical data. In the early years of the Equitable, the basic model had to be created, the information system to support the valuation established, and suitable approximations confirmed.

This professional know-how had already begun to spread by word of mouth beyond national boundaries. Legislative bodies in most industrial nations were thus able to adopt a tried and tested scientific and mathematical technique. What had once been only a competitive edge for some life insurance companies was suddenly the norm, and the pioneers of this technique became members of the leading industrial profession. It was this high status of actuaries which led to the formation of the first national actuarial bodies, the Institute of Actuaries in London in 1848, the Faculty of Actuaries in Edinburgh in 1856, and the Institut des Actuaires Franqais in 1889 (Bühlmann, 1997).

2.2.2 Professional Criteria for Actuarial Practice

Hickman (2004) discussed the professional criteria for a profession as listed by Gordon and Howell and their application in actuarial practice. According to Gordon and Howell (1959), first, the practice of a profession must rest on a systematic body of knowledge of substantial intellectual content and on the development of personal skill in the application of this knowledge to specific cases. Second, there must exist standards of professional conduct, which take precedence over the goal of personal gain, governing the professional man's relations with his clients and his fellow practitioners. The two derived criteria for a profession as stated by Gordon and Howell are, in general, satisfied by the actuarial profession. There are actuarial organizations in many parts of the world and, almost uniformly, they engage in the advancement and dissemination of knowledge, and influence the method of entry into the profession. The articulation and enforcement of standards is not a function of all of these organizations.

The process for gaining entry into the actuarial profession is through an educational portal that is the subject of continual discussion within the world's national actuarial organizations. The first of these organizations, the Institute of Actuaries, started a system of examinations in 1850, only two years after the founding of the Institute. The Actuarial Society of America was organized in 1889 and followed the lead of the Institute by starting an examination program in 1897. The Casualty Actuarial Society was founded in the United States in 1914 and within a few months started an examination system. In other nations, especially those in Western Continental Europe and Latin America, completing a university program became the path into the actuarial profession. The curriculum in these university programs was, to a varying extent influenced by the profession.

The actuarial profession in the United Kingdom, and in those countries with close cultural ties to the United Kingdom, by and large satisfies the Gordon and Howell definition. This is illustrated by developments in India. The Actuarial Society of India was founded in 1945. The stated objectives of the new organization centered on the first element of the Gordon and Howell definition. The growth of the Society was inhibited by the nationalization of Indian life insurance in 1956. Not until 2000 were private firms authorized to again enter the life insurance business. The regulations for the new industry required each company to designate an appointed actuary. The responsibilities of the appointed actuary were to safeguard defined public interests in insurance operations. This was modeled on a regulatory device introduced earlier in the UK.

2.2.3 The Development of Actuarial Professional Organizations

According to Hickman (2004), the birth of the actuarial profession can be conveniently fixed at 1848. In that year, the Institute of Actuaries was organized in London. The Faculty of Actuaries in Edinburgh followed in 1856. Victorian Great Britain provided a favorable environment for the development of professions. The idea of professional groups to protect public interest was in the air. In 1853, Great Britain started using competitive examinations for entry into the civil service. The objective in both the civil service and the private professions was to establish objective standards for entry and to improve and standardize the quality of the entrants.

The development of the actuarial profession in Canada and in the United States followed the path blazed by the Institute and Faculty. There were, however, deviations related to the adoption of elements from both the United Kingdom and from Western Continental European traditions. This development will be outlined in part because of the large size of professional organizations in Canada and the United States as well as the interesting blending of traditions. In 1889, the American Society of Actuaries was founded with members in both Canada and the United States. In 1909, the American Institute of Actuaries was organized. Its initial membership came largely from the west of the Appalachian Mountains. The motivation for the new organization was in part regional and in part a conflict over the suitability of preliminary term-valuation methods in life insurance. The Society and the American Institute merged in 1949 to form the Society of Actuaries (SOA).

In 1965, both the American Academy of Actuaries (AAA) and the Canadian Institute of Actuaries (CIA) were organized. The CIA was established by an Act of the Canadian Parliament. Fellowship

in the CIA was soon reorganized in federal and provincial insurance and pension legislation. The AAA had a somewhat different genesis. It was organized as a nonprofit corporation, an umbrella organization for actuaries in the United States. Its assignment was public interface, professional standards, and discipline. UK model influenced the organization of the actuarial profession throughout the Commonwealth. As previously indicated, the path in Western Continental Europe was somewhat different. For example, in Germany, starting as early as 1860, a group of mathematicians met regularly to discuss problems related to insurance.

The founding of national actuarial organizations are often associated with major political and economic events. The opening of Japan to world commerce in the nineteenth century is related to the founding of the Institute of Actuaries of Japan in 1899. The end of the Pacific phase of World War II helps create a foundation for the Korean Actuarial Association in 1963 and The Actuarial Society of Philippines in 1953. The end of the Cold War, in about 1990, was a political event of cosmic importance. It also created a shock wave in the actuarial organizations of the world. New national actuarial organizations were created in response to the practical requirement for people with technical skills to organize and manage private insurance companies.

The actuarial profession is fortunate in having in place a mechanism for creating a worldwide profession to serve worldwide business. The first International Congress of Actuaries (ICA) was held in Brussels in 1895. Such Congresses have been held, except for war-induced cancellations, periodically since then. The 2002 ICA was held in Cancun, Mexico. These Congresses are organized by the International Association of Actuaries (IAA). Originally, IAA had individual members and carried out activities to promote the actuarial profession, but the principal activity was promoting ICAs. In 1998, the IAA changed and became an international organization of national actuarial organizations. Periodic ICAs remain a function of IAA, but providing a platform for actuaries to be a force in the new global economy also became important. The platform might permit actuaries to be represented in activities of international economic organizations such as the International Monetary Fund or the World Bank. The creation of an international standard for basic actuarial education is another project of IAA.

2.3 DEFINITION AND CLASSIFICATION OF ACTUARIES

2.3.1 Actuary Defined

"ACTUARY" is a curious word by which to describe the profession to which it has become attached. There is no obvious connection between the meaning of the word and the professional duties which it signifies. The word actuary is derived from the Latin "Actuarius" for which, for example, Lewis and Short give the two meanings, a shorthand writer and one who writes out accounts. These definitions scarcely seem to do justice to the duties of the actuarius in the Senate, but there is no precise knowledge of what those duties were since they can only be inferred from the context in which the word was used in Roman times (Ogborn, 1956).

According to Wikipedia, the term "ACTUARY" means a business professional who deals with the measurement and management of risk and uncertainty (Wikipedia, 2017). Similarly, Encyclopædia Britannica defined the term "ACTUARY" as the one who calculates insurance risks and premiums. Actuaries compute the probability of the occurrence of various contingencies of human life, such as birth, marriage, sickness, unemployment, accidents, retirement, and death. They also evaluate the hazards of property damage or loss and the legal liability for the safety and well-being of others (Encyclopædia Britannica, 2011).

In Ethiopia, the term "ACTUARY" is legislatively defined by The Federal Negarit Gazeta of The Federal Democratic Republic of Ethiopia (FDRE), Insurance Business Proclamation No. 746/2012 (Article No.2). According to the proclamation, "ACTUARY" means a person who provides advice on financial questions and contingencies involving insurance in general and life insurance and pension schemes in particular. The definition given by the government of Ethiopia, however, is for statutory purpose, and as part of the insurance business supervision.

Although critical decisions may be made on the advice of an actuary, in many countries the word "ACTUARY" is not a reserved term; that is, it is not defined in legislation or statute, nor is it reserved for individuals who are professionally qualified. This is in contrast to some other professions (for example, lawyers, doctors, architects, and dentists) which have titles reserved by law for qualified members, to protect their users. While users of actuarial services are typically not

protected in that way, reliance on an actuary holding a designation granted by a professional actuarial association can provide similar reassurance (IAA, 2013).

The Institute and Faculty of Actuaries (IFoA) and the Society of Actuaries (SOA) are the two prominent international actuarial professional organizations. The IFoA is the UK's only chartered professional body dedicated to educating, developing and regulating actuaries based in the UK with more than 30,000 members worldwide (IFoA, 2017). Similarly, the SOA is the world's largest actuarial professional organization based in USA with more than 26,000 actuaries as members in more than 80 countries and 36,000 candidates working to achieve SOA credential in 112 countries (SOA, 2016).

According to the IFoA, "ACTUARIES" are experts in risk management. Actuaries use their mathematical skills to help measure the probability and risk of future events. This information is useful to many industries, including healthcare, pensions, insurance, banking and investments, where a single decision can have a major financial impact (IFoA, 2017). The SOA also defined "ACTUARIES" as professionals who measure and manage risk. Actuaries have a deep understanding of mathematics, statistics and business management. With this, they help businesses grow and provide value to their customers. Actuaries help leaders make strategic decisions and consumers prepare for their future (SOA, 2017).

2.3.2 Classification of Actuaries

The IFoA and SOA have classified actuaries in to various groups based on the level of academic achievements and professional qualifications.

STUDENT ACTUARY : These are actuarial students with numerate educational background but not yet achieved one of the internationally recognized professional qualification. Actuaries come from all different education backgrounds where their college majors vary in actuarial science, mathematics, statistics, economics, business, computer science or even liberal arts (SOA, 2017). To become a student member, students need to meet the entry standards set out in the Admission regulations (IFoA, 2017).

CERTIFIED ACTUARIAL ANALYST (CAA) : CAAs are professional technical and analytics experts who work in teams where the technical application of actuarial science is required. The

CAA is a valued qualification offered by the prestigious CAA Global, a joint venture of the IFoA and SOA (CAA Global, 2017).The generalist nature of the strong analytical skills developed by the CAA qualification, means that it can be used to open the door to a wide range of careers inside and outside the traditional actuarial sphere (IFoA, 2017).

ASSOCIATE ACTUARY : An Associate is a partially qualified actuary with a broad range of technical skills in a number of different financial services industries (IFoA, 2016). An Associate has demonstrated knowledge of the fundamental concepts and techniques for modeling and managing risk. The Associate has also learned the basic methods of applying those concepts and techniques to common problems involving uncertain future events, especially those with financial implications. The Associate has also completed a professionalism course covering the professional code of conduct and the importance of adherence to recognized standards of practice (SOA, 2017).

FELLOW ACTUARY : A Fellow is a fully qualified actuary with expert knowledge in a particular industry. At Fellowship actuaries study to a higher level, and are highly sought after in the global market (IFoA, 2016). A Fellow has demonstrated a knowledge of the business environments within which financial decisions concerning pensions, life insurance, health insurance, general insurance and investments are made including the application of mathematical concepts and other techniques to the various areas of actuarial practice. The Fellow has further demonstrated an in–depth knowledge of the application of appropriate techniques to a specific area of actuarial practice (SOA, 2017).

CHARTERED ENTERPRISE RISK ACTUARY (CERA) : It is a global risk management qualification and is one of the most comprehensive and rigorous enterprise risk management qualifications available. It aims to address the urgent need for highly-qualified risk management professionals worldwide, especially in the financial sector (IFoA, 2016). A Chartered Enterprise Risk Analyst (CERA) has demonstrated knowledge in the identification, measurement and management of risk within risk–bearing enterprises. The CERA has also completed a professionalism course covering the professional code of conduct and the importance of adherence to recognized standards of practice (SOA, 2017).

The International Actuarial Association (IAA) and International Association of Insurance Supervisors (IAIS), being international professional regulatory bodies, have further classified actuaries for regulatory purposes as follows;

ACTUARY : is an individual member of one of the member associations of the IAA.

QUALIFIED ACTUARY : is a professional trained in evaluating the current financial implications of future contingent events. She/he is an expert in understanding the underlying business dynamics, backed by training in economics, finance, demographics, statistics, and risk management (IAA, 2013).

APPOINTED ACTUARY : In some jurisdictions, an appointed actuary has to be formally designated by the insurers and approved by supervisors. Such appointed actuaries usually have a legal obligation to the supervisors to ensure that the interests of policyholders are protected. In addition to this, they may also provide professional advice to the board with regard to certain areas of risk management. In some jurisdictions where use is made of an actuary in the supervisory model, this use is referred to as an 'appointed actuary' or a 'responsible actuary' system. While this system may have variations, it is essentially based upon the mandated use of an actuary by insurers, with that actuary having specified reporting or certification responsibilities to both the insurer and the supervisor (IAIS, 2009).

The U.S. Bureau of Labor Statistics, on the other hand, classified actuaries in to various groups based on the areas of actuarial practice and their career prospects in the insurance and financial sectors of an economy (BLS, 2015).

HEALTH INSURANCE ACTUARIES : these are actuaries that help develop long-term care and health insurance policies by predicting expected costs of providing care under the terms of an insurance contract. Their predictions are based on numerous factors, including family history, geographic location, and occupation.

LIFE INSURANCE ACTUARIES : these actuaries help develop annuity and life insurance policies for individuals and groups by estimating, on the basis of risk factors such as age, gender, and tobacco use, how long someone is expected to live.

PROPERTY AND CASUALTY INSURANCE ACTUARIES : help develop insurance policies that insure policyholders against property loss and liability resulting from accidents, natural disasters, fires, and other events.

PENSION AND RETIREMENT BENEFITS ACTUARIES : design, test, and evaluate company pension plans to determine if the expected funds available in the future will be enough to ensure payment of future benefits. They must report the results of their evaluations to the federal government. Pension actuaries also help businesses develop other types of retirement plans, such as healthcare plans for retirees. In addition, they provide retirement planning advice to individuals.

ENTERPRISE RISK ACTUARIES : identify any risks, including economic, financial, and geopolitical risks that may affect a company's short-term or long-term objectives. They help top executives determine how much risk the business is willing to take, and they develop strategies to respond to these issues.

CONSULTING ACTUARIES: these actuaries audit the work of internal actuaries at insurance companies or handle actuarial duties for insurance companies that are not large enough to keep their own actuaries on staff.

Hans Bühlmann alternatively classified actuaries as *ACTUARIES OF THE FIRST KIND*: are those who emerged in the 17th century, focused on life insurance issues and tended to use deterministic methods; *ACTUARIES OF THE SECOND KIND*: are those who emerged in the early 20th century. They are casualty actuaries who used probabilistic approaches in dealing with workers compensation, automobile insurance, property insurance and similar risks; and *ACTUARIES OF THE THIRD KIND*: are those who work with the investment side of insurance. These are the investment actuaries applying stochastic processes, contingent claims and derivatives to assets and liabilities (D'arcy, 1989). The Bühlmann's classification of actuaries is further extended by Professor Paul Embrechts as *ACTUARIES OF THE FOURTH KIND*: referring to those actuaries working in the enterprise risk management (ERM) side (D'arcy, 2005). According to D'arcy (2005), it took 250 years for the actuaries of the second kind to emerge, 70 more years for actuaries of the third kind to develop, but less than three decades for the newest type of actuary to arise.

2.4 ACTUARIAL PRACTICE AREAS AND THE ROLE OF ACTUARIES IN INSURANCE AND FINANCIAL SECTORS

Actuaries are problem solvers, business analysts, consultants and financial risk assessors all rolled into one. Their skills are applied in the worlds of insurance, pensions, healthcare, banking, business management and risk assessment. Actuaries use mathematical and statistical knowledge and problem solving skills to help businesses and institutions evaluate the long term financial implications of decisions that they make (IGNOU, 2011). The IAA Role of the Actuary Task Force of the Executive Committee (EC) provided an appendix of the Roles (a non-exhaustive list) typically filled by actuaries. The appendix identifies roles currently undertaken by actuaries and highlights areas where actuaries could play a more prominent role in the future (IAA, 2013).

According to IAA (2013), actuaries, generally, fulfill many roles in a broad range of environments, including insurance companies, health organizations, pension plans, risk management, government, regulatory regimes, and in other fields. They have a detailed understanding of economic, financial, demographic and insurance risks and expertise in: developing and using statistical and financial models to inform financial decisions; pricing, establishing the amount of liabilities, and setting capital requirements for uncertain future events. Actuaries also provide advice on the adequacy of risk assessment, reinsurance arrangements, investment policies, capital levels and stress testing of the future financial condition of a financial institution. The term "financial institution" is used broadly to include pension plans and governmental systems, such as social insurance plans, as well as retail and investment banks.

One of the key skills of an actuary is the development and application of models to help solve complex financial problems. This skill is now being applied successfully in many areas of business beyond the financial sphere. Actuaries add value to the raw output of a software model by using their professional judgment to assess and explain the practical implications of the results and the limitations of the model. The roles that actuaries perform are likely to vary over time, by country, practice area, relationship to the financial institution, corporate structure and culture. The following are the main areas of actuarial practice in which actuaries play significant role in insurance and financial sectors of an economy (IFoA, 2016).

2.4.1 General Insurance

This is the fastest growing practice area for actuaries. The role of a general insurance actuary is incredibly varied, and has changed considerably over the years. Given the fast-moving dynamics of the industry, the ever-changing regulatory environment and the continuous development of actuarial skills, it's a safe bet that the role actuaries play in the insurance industry will continue to evolve. The four main areas include:

RESERVING: Insurance reserving is how much an insurance company needs to set aside to pay future claims, given how many policies it has sold in the past.

PRICING: Insurance pricing is how much an insurance company should charge customers for a new policy, given how much risk is involved.

CAPITAL MODELING: All insurers need to hold a certain amount of capital aside, in case claims turn out to be worse than expected or something else goes wrong. Actuaries build models to help them decide how much and what sort of capital to hold.

ENTERPRISE RISK MANAGEMENT: Actuaries get involved in monitoring and quantifying all risks facing an insurance company, and help devise strategies for dealing with and avoiding risks.

2.4.2 Life Insurance

Actuaries working in life insurance have a broad range of responsibilities, both in technical and client facing work, as well as in management. They play a leading role in the design and pricing of life insurance products, which are broadly divided into two categories: protection and investment. In addition to determining the price of life insurance contracts, actuaries are also responsible for the ongoing valuation of the business the company has sold, the investment of its assets and ensuring that it has enough money to meet its obligations to policyholders in the future

2.4.3 Health and Care Insurance

Health and care insurance issues such as critical illness, income protection and long-term care insurance are designed like long-term or short-term life insurance policies so actuarial roles are very similar to those described in the life insurance section. Although many of the roles and activities are the same as for these other types of insurance business, the inherent risks differ.

There is more emphasis on understanding the rates of becoming sick or disabled or needing medical treatment or rates of recovering from sickness, which are more complex than death rates.

2.4.4 Investment

Actuaries have been involved in the field of investment management for decades. They buy and sell assets and undertake investment analysis and portfolio management. An actuary's basic skills in forecasting and assessing risks are ideal for estimating whether a capital project (e.g. for a new hospital or a transport infrastructure project) is financially viable. The investment options for insurance companies are usually limited by regulation. Within the regulation, actuaries are often involved in determining the investment policy of an insurer. Combining their understanding of the characteristics of the insurance products with knowledge of investment alternatives, they are able to recommend which types of investments would be most suitable for various types of products. They can project future cash flows from the investment portfolio and assess the possible impact of changes in the investment environment on the value, liquidity, and returns on the assets. They may also be involved in the valuation of assets, for example, developing models that can be used to value complex structured products that are not traded in the investment markets (Hafeman, 2009).

2.4.5 Risk Management

There are many different areas of work that actuaries could be involved in, from capital models or analyzing specific risks, like operational risk. They could also be involved in investigating mathematical models of risk to see if they can be used within an organization. Hafeman, (2009), stated that actuaries also participate in managing the risks. For example, they may determine how much risk an insurer can afford to retain on each policy, design a reinsurance program to deal with excess amounts of risk, and negotiate the terms of reinsurance contracts with the reinsurers. In recent years, a growing number of companies in a wide range of businesses have appointed chief risk officers and adopted an approach known as enterprise risk management (ERM). In the insurance business, the chief risk officer is often an actuary.

2.4.6 Pensions

Actuarial calculations and reviews provide information that is often viewed as very crucial for risk management and governance of pension funds. As such, among other things, pension fund managers and/or trustees customarily use actuarial calculations and reviews in making funding and

investment decisions and in assessing risk exposure. Therefore, calculations and reviews play a significant role in the operation and, ordinarily, in the supervision of pension funds (IOPS, 2015). There are two main types of pension schemes; defined benefit and defined contribution. In a pensions consultancy it is likely that actuaries will be performing calculations to help estimate how much the employer and employee will have to pay and also advising clients on ways they can reduce the costs and risks associated with pension schemes (IFoA, 2016).

2.4.7 Social Security

From the very beginning of the operation of a social security scheme, the actuary plays a crucial role in analyzing its financial status and recommending appropriate action to ensure its viability. More specifically, the work of the actuary includes assessing the financial implications of establishing a new scheme, regularly following up its financial status and estimating the effect of various modifications that might have a bearing on the scheme during its existence (ILO, 2002). Actuarial activities such as preparing actuarial valuations of social security systems; work related to national accounts and national and/or international accounting reporting; assessing sustainability impacts of proposed changes; and performing actuarial calculations necessary for determination of benefit entitlements and funding measures. These tasks may include calculations of liabilities, projection of cash flows and determination of various actuarial factors and legislation or other regulations that require these tasks to be carried out by qualified actuaries (ISSA and ILO, 2016).

2.4.8 Insurance Supervision and Regulation

The application of actuarial expertise contributes significantly to the operation of insurers, insurance markets and supervisory authorities. Actuarial expertise includes skills to assess the risks inherent in assets and liabilities, establish capital adequacy, determine the adequacy of premiums and establish technical provisions for both life and non-life insurance and insurance-related business (IAIS, 2008).

IAIS (2008) stated that insurance supervisors benefit from actuarial work in general. In some jurisdictions, actuaries are legally obliged to report to the supervisor, such as in respect of actuarial reports and their whistle-blowing role. In addition, due to the more complex risk-taking activities of some insurance companies, especially within internationally active insurance groups, actuarial experience and knowledge are relevant to the day-to-day supervision of the insurance industry.

Therefore, regardless of legal and regulatory obligations, close communication between actuaries and insurance supervisors is encouraged. The supervisor may also initiate communication with the actuary to clarify matters relating to the work of the actuary and, for that reason, it is desirable that the actuary be accessible to the supervisor.

2.4.9 Emerging Markets and Microinsurance

In mature, conventional insurance markets, actuaries play important roles in product development, pricing, risk management and solvency, and provide needed expertise that supports regulatory goals of financial soundness and consumer protection. In emerging markets and Microinsurance programs, however, these functions and activities may not necessarily be performed by qualified actuaries (IAA, 2014). Nevertheless, as is necessary in the case with conventional insurance markets, Microinsurance also requires a vast amount of data to enable actuarial, underwriting and business decision-making. Data quality issues present unique and important complexities. In designing insurance products for any type of risk, insurers (both public and private) must understand the relevant statistical properties. This requires both credible long-term statistical information and actuarial models to define the relevant risk probabilities and to predict the likelihood of various events (IAIS, 2007).

2.4.10 Other Roles

The Role of the Actuary Task Force of the IAA noted that the opportunity for the potential application of actuarial skills is virtually unlimited. What is listed in the IAA's appendix includes some things that are done in some regions, but not others (IAA, 2013). Some of the general roles listed by the IAA include:

- Various support functions for different stakeholders, i.e. ministry of health, regulators, supervisors, expert witness services, hospitals, medical professions, etc.
- Providing advice to regulators and legislators
- Representing employer, employee groups or unions, or serving as an expert witness before court litigations
- IT-Development, establishment and management of datasets
- Energy pricing
- Interactions with rating agencies
- Education and Research

2.5 THE ACTUARIAL PRACTICE REGULATORY REGIME

The test of success for any profession is the extent to which the public is better served by the profession's presence. The actuarial profession is a unique field of knowledge grounded in ongoing research and education, a certification process for those who possess a mastery of the field of knowledge, a code of conduct that provides assurance of dedication to the public good and of skilled competence, an articulated set of practice standards that help ensure the proper use of appropriate methodology and practice, and an active professional or regulatory discipline process that provides motivation for compliance by individual practitioners, combined with a just route for appeal. The professional duty of actuaries has varied by tradition, mostly defined by national characteristics and governance structure. Variations encompass the credential granting or licensing, the promulgation of practice standards, and the regulation of the professional practice of actuaries (IAA, 2008).

2.5.1 International Regulation of Actuarial Practice

The international actuarial practice is regulated by the International Actuarial Association (IAA). The IAA is a unique international organization dedicated to the research, education, and development of the actuarial profession and associations. The IAA is the continuation of the Comité Permanent des Congrès d'Actuaires established in 1895, renamed as IAA in 1968, and restructured in 1998. The IAA's mission is to represent the actuarial profession and promote its role, reputation and recognition in the international domain and to promote professionalism, develop education standards and encourage research, with the active involvement of its member associations and sections, in order to address changing needs. The IAA is a worldwide association of professional actuarial associations with 68 Full member associations, 30 Associate member associations, and representing more than 63,000 actuaries in 112 plus countries all over the world (Campbell, 2016).

The IAA is an association of actuarial associations comprised of voting Full Members, non-voting Associate Members, and other non-voting membership categories. Actuarial associations may become Full Members or Associate Members, collectively referred to as "Member Associations". Actuarial associations that have satisfied the accreditation criteria as set out in the Internal Regulations may apply to the IAA's Council to be accepted as Full Members. Actuarial

associations that do not satisfy the accreditation criteria as set out in the Internal Regulations may apply to be accepted as Associate Members (IAA, Statutes, 2014).

According to the Role of the Actuary Task Force of the Executive Committee (IAA, 2014), the IAA provides guidelines for its member associations. To become recognized as full members of the IAA, associations need to demonstrate that each of the following meets IAA guidelines:

- their educational system and requirements for membership,
- their code of professional conduct,
- their disciplinary process, and
- their system for developing standards of actuarial practice (if they have one).

Once recognized as an IAA member, each association must continue to meet the IAA guidelines. These guidelines help assure that the individual actuaries who belong to full member associations also meet appropriate standards. The IAA cannot control the use of the term "actuary," but it can set professionalism guidelines for those who are members of IAA and is happy to assist both the local regulator and the local actuarial association wherever desired.

2.5.2 Tools for Regulating International Actuarial Practice

Actuarial guidance notes and standards of practice are important tools in ensuring that actuarial services are performed in a consistent and appropriate manner, to a high standard of quality. Actuaries that belong to a recognized actuarial society that is a full member of the IAA are bound by professional codes of conduct and actuarial standards of practice. In jurisdictions where these do not exist, or where actuarial services are performed by others, there is a need to provide professional guidance and standards to ensure consistency and quality (IAA, 2014).

The role of a professional actuarial association varies from country to country. However, most associations:

- create a credential that people in the actuarial field may earn, confirming that they have met high educational standards and are bound to high standards of professional conduct and practice,
- enforce professionalism requirements on qualified actuaries,
- further the science and art of actuarial practice,

- serve as the voice of the profession in the public interest when interacting with governments, the public, and other organizations,
- promote the profession to the public and users of actuarial services, both current and potential, and
- provide continuing professional development for their members.

2.5.2.1 International Standards of Actuarial Practice (ISAPs)

International Standards of Actuarial Practice are established to promote high quality actuarial practice globally (IAA, 2012). High quality actuarial practice helps serve the public interest by benefiting users of actuarial work, regulators, and participants and beneficiaries of financial products and services, including social security programs; and benefits actuarial associations and individual actuaries by enhancing the credibility of the actuarial profession. Characteristics of high quality actuarial practice include:

- Professionalism – providing work that is rigorous, objective, soundly-based, and reflective of current thinking and practices;
- Consistency – providing users of the actuarial work product with confidence that practice is consistent across clients subject to similar requirements;
- Usefulness – adding substantial value to financial and risk analysis; and
- Clarity – clearly articulated and understandable.

The Actuarial Standards Committee has a mandate to develop and maintain all ISAPs. ISAPs are model standards of practice which directly support the IAA's so3 to promote the development and issuance of actuarial standards in the jurisdictions of all Full Member Associations, and the global convergence of actuarial standards. To date, three ISAPs have been approved (IAA 2015).

- ISAP 1 – General Actuarial Practice (adopted on November 18, 2012, and reformatted on October 13, 2013, to move the definitions to a glossary)
- ISAP 2 – Financial Analysis of Social Security Programs (adopted on October 13, 2013)
- ISAP 3 – IAS 19 Employee Benefits (adopted on April 11, 2015)

2.5.2.2 International Actuarial Note (IAN)

International actuarial notes are educational and non-binding in nature. They show practices commonly used by actuaries and are not intended to define the practice or practices that would be adopted by all actuaries. Their purpose is to familiarize the actuary with approaches that might be taken in the practice area in question. They also serve to demonstrate to clients and other stakeholders, and to non-actuaries who carry out similar work, how the actuarial profession may approach the subject matter (IAA, 2017). IANs may be issued to assist actuaries in complying with an ISAP, for example by offering practical examples of ways in which actuaries might implement an ISAP or International Financial Reporting Standard (IFRS) in the course of their work, or to provide non-binding guidance on an actuarial topic for which the IAA has not developed an ISAP (IAA, 2012).

2.5.2.3 Education Guidelines

As part of the full membership requirements of the IAA, associations must have education requirements which are at least equivalent to the Syllabus (taken in conjunction with the Education Guidelines). The objective is that all students will have completed a compliant education syllabus on becoming full members. All associations are asked to ensure that all their fully qualified actuaries are admitted through education processes that meet the Education Syllabus and Guidelines (IAA Education Guidelines, 2013). The Education Syllabus has 10 subjects. Each subject contains a number of topics. The subjects are: Financial Mathematics, Probability and Mathematical Statistics, Economics, Accounting, Modelling, Statistical Methods, Actuarial Mathematics, Investment and Asset Analysis, Actuarial Risk Management, and Professionalism (IAA Education Syllabus, 2013).

2.5.2.4 Continuing Professional Development (CPD) Guidelines

Continuing Professional Development (CPD), also referred to as Continuing Education, may be defined as the development of knowledge and of technical, personal, professional, business and management skills and competencies throughout a person's working life. CPD is an important element of the actuary's lifelong process of learning and development within the profession. The initial qualification process is the first step in this journey. Thereafter, it is the responsibility of all actuaries to plan their own professional development program (IAA CPD, 2011).

2.5.2.5 Principles of Professionalism

Professionalism, for the actuarial profession, means the application of specialist actuarial knowledge and expertise, the demonstration of ethical behavior, especially in doing actuarial work; and the actuary's accountability to a professional actuarial association or similar professional oversight organization (IAA, Principle of Professionalism, 2012). This definition of professionalism is derived from the following high-level principles of professionalism:

- *Knowledge and expertise*: an actuary shall perform professional services only if the actuary is competent and appropriately experienced to do so.
- *Values and behavior*: an actuary shall act honestly, with integrity and competence, and in a manner that fulfils the profession's responsibility to the public and upholds the reputation of the actuarial profession.
- *Professional accountability*: an actuary shall be accountable to a professional actuarial association or a similar professional oversight organization.

2.5.3 The International Actuarial Association in Africa

The number of qualified actuaries in Africa is very low and insurers are known to regularly complain of the high fees demanded by actuaries. About 50% of regulatory authorities require the appointment of actuaries, although usually only for life business. Less than 10 countries require the appointment of actuaries for non-life insurance as well. Most often, the government or state does not supervise actuaries (AfricaRe, 2015). Actuaries in Africa are coming together to take a leading role in the continent's capacity building, and to accelerate access to financial services for more Africans. An African actuarial task force has been constituted to work towards developing more actuaries as financial professionals in the continent. In turn, they will give back by contributing to the development of their individual economies, thereby creating a sustainable and well-regulated financial services industry (The Actuary, 2017).

According to the Africa Sub-Committee of the IAA, there are 5 Full and 10 Associate Member Associations of the IAA in Africa (IAA,2016). Actuarial Society of South Africa is the first actuarial association in Africa incorporated in 1948 and admitted as a Full Member Association by the IAA in 1996. The association is also the largest actuarial association in Africa with more than 90% of the continent's fully qualified actuaries (1,249 FQAs) (AAA, 2017). According to the

survey made by the Africa Sub Committee in 2015, the total number of FQAs found all over the world was 67,430. However, only 1.7% were found in Africa while 56.1% found in Americas, 33.5% in Europe and 8.7% in Asia (IAA, 2016). On the other hand, most East African countries including Ethiopia don't have an actuarial association which is a full or associate member of the IAA. Moreover, there are no fully qualified actuaries in East African countries except in Kenya where a Full Member Association is found. The following table shows actuarial membership status of East African countries as of November 2016.

Table 2.1 Actuarial Membership Status of East African Countries

Country	IAA Membership Status	Number of Members		IFoA Membership Status				
		IFoA (UK)	SOA (USA)	Affiliate	Associate	Fellow	Student Analyst	Students
Ethiopia	No Association	5	0					5
Eritrea	No Association							
Sudan	No Association							2
Djibouti	No Association							
Somalia	No Association							
Kenya	Full Member	484	2	1	2	18	21	442
Uganda	Associate Member	23	0				9	14
Rwanda	No Association							4
Burundi	No Association							
Tanzania	Associate Member	21	0				8	15

Source : IAA, Africa Sub-committee 2016

As shown in the table, the majority of student actuaries are members of the IFoA (UK) and found in the British Commonwealth countries (Kenya, Uganda and Tanzania). This confirms the Hickman's argument that the UK model influenced the organization of the actuarial profession throughout the Commonwealth indicating the countries' economic and cultural ties with the UK.

The IAA regulatory guidelines state that actuarial standards, guidance and educational notes may be developed at an international level through the IAA, at a regional level through regional actuarial associations, or at the local level. IAA also stated that the role of a professional actuarial association also varies from country to country.

For example, in Kenya, The Actuarial Society of Kenya is a full member of the IAA which brings together qualified and trainee actuaries in professional, educational and research organizations with an aim of promoting the actuarial profession in Kenya and East Africa (Raichura, 2007). The TASK has its own code of professional conduct which applies to all members employed or practicing in Kenya. The Code of professional conduct sets out the minimum standards of professional conduct to be observed by Members of the Society (TASK, 2009). Furthermore, the Insurance Regulatory Authority of Kenya (IRA) has issued Guideline to the insurance industry on the "Actuarial Function" which aims to ensure that insurance and reinsurance companies have a robust actuarial function that is well positioned, properly authorized and staffed. The Appointed Actuary is also required to have the qualification of a Fellow of The Actuarial Society of Kenya, or equivalent (IRA, 2013).

The country, on the other hand, has many colleges and universities offering actuarial science programs which prepare students for actuarial qualification routes. This resulted in increased number of qualified actuaries in the country. In order to raise the standard of insurance business in Kenya, the regulator (IRA) has required all insurance firms to have an actuarial department. However, the industry has shortage of qualified actuaries that can take up the newly created actuarial positions in compliance with the IRA requirements. Hence, to increase the number of qualified actuaries in the industry, the regulator (IRA) has established an actuarial science scholarship program to qualifying students (The Actuaries, 2013).

In Kenya, there are considerable number of actuarial firms and practitioners providing actuarial services to the country as well as the neighboring east African countries including Ethiopia. Most of the actuarial practitioners are local and international consulting firms, the regulator (IRA), insurance companies, banks and other financial institutions. These actuarial practitioners have significantly contributed for the development of the country's insurance and financial sectors where the country's financial sector is regarded as one of the most developed in the region. Moreover, these practitioners have created employment opportunities for graduate and qualified actuaries. They provide benefit packages for their actuarial employees (financial support for actuarial exams, paid leave, salary rise when exams are passed, scholarship programs,…etc). As such, they promote the actuarial practice in the country as well as in East African countries.

2.6 ACTUARIAL PRACTICE IN ETHIOPIA

Ethiopia is the fastest-growing economy in 2017, according to the World Bank's latest edition of Global Economic Prospects. Ethiopia's GDP is forecast to grow by 8.3% far beyond the global growth rate of 2.7% (World Economic Forum, 2017). Ethiopia is the second-most populous country in Sub-Saharan Africa with population growth rate of 2.5% (World Bank, 2017). Ethiopia has achieved substantial progress in economic, social, and human development over the past decade (World Bank, 2016).

IMF (2016) reported that the Ethiopian financial sector remains healthy characterized by an increase in banking, insurance and microfinance branches. The NBE continues to promote greater access to finance and financial inclusion initiatives. The Ethiopian financial sector consists of one regulatory bank (NBE), two public and 16 private banks, 1 public and 16 private insurance companies, 33 MFIs, and five capital goods finance companies (World Bank, 2016). Ethiopia's insurance industry is growing rapidly from a low base, propelled forwards by strong economic growth and a developing banking and financial services system , which is improving affordability and accessibility in the market. Both the non-life and smaller life insurance markets are recording double digit growth, however, the market continues to face significant headwinds including restrictions on foreign ownership and high levels of poverty (BMI, 2017).

Despite the overall economic growth and improvements in the financial sectors of the economy, World Bank (2015) reported that the Ethiopian insurance sector remains underdeveloped. Because most insurance is targeted at the corporate market, focusing on general insurance, about 90 percent of the population does not have any type of formal insurance. Insurance premiums represent only about 0.47 percent of GDP for non-life insurance, and 0.03 percent of GDP for life insurance. Insurance Business in general and life assurance in particular is not well developed in Ethiopia. ISD (2016) also explained the Ethiopian insurance industry as very young and underdeveloped and currently sailing against many odds. Lack of awareness by the public about insurance, unfair competition in the market (under pricing), underdeveloped domestic financial markets, lack of experience and insurance technique, and absence of domestic actuarial service providers are some reasons behind it.

2.6.1 Historical Development of Insurance Business and Actuarial Practice in Ethiopia

Trowbridge (1998) emphasized that the history of the international actuarial practice is closely associated with the insurance industry, specially, with life insurance business. Bühlmann (1997) also noted that the roots of actuaries and actuarial profession lies under life insurance business. Similarly, the history and development of the Ethiopian actuarial practice is strictly associated with the country's insurance industry, mainly with valuation of the long-term insurance business. While actuarial science is most commonly applied to mortality analysis for life insurance, many of the same procedures are used for property, liability and other kinds of insurance (Menghistu, 2016)

The emergence of insurance business in Ethiopia was closely linked to expatriates and foreign insurance companies. In addition, expatriates and foreign companies operating in Ethiopia participated actively in the establishment of the first domestic insurance company (Zeleke, 2007). NBE (2012) stated that modern forms of insurance services, which were introduced in Ethiopia by Europeans, trace their origin as far back as 1905 when the Bank of Abyssinia began to transact fire and marine insurance as an agent of a foreign insurance company. According to a survey made in 1954, there were 9 insurance companies that were providing insurance service in the country. Except Imperial Insurance company that was established in 1951, the rest of the insurance companies were branches or agents of foreign companies. The number of insurance companies increased significantly and reached 33 in 1960. At that time insurance business like any business undertaking was classified as trade and was administered by the provisions of the commercial code. This was the only legislation in force in respect of insurance except the maritime code of Ethiopia that was issued to govern the operations of maritime business and marine insurance.

2.6.2 Insurance Business and Actuarial Practice During the Command Economy

Zeleke (2007) underlines that insurance provisions under the Commercial and Maritime Codes of 1960 were the only insurance laws applicable to the Ethiopian insurance industry during the 1960s. It seemed that the growth in the number of insurance companies and hence the expansion of insurance business in the country led to the enactment of an insurance legislation by the government. NBE (2012) also stated that the first remarkable event that the Ethiopian insurance market witnessed was the promulgation of proclamation No. 281/1970. This proclamation was issued to provide for the control & regulation of insurance business in Ethiopia. It is peculiar in

that it created an Insurance Council and an Insurance Controller's Office. The controller of insurance licensed 15 domestic insurance companies, 36 agents, 7 brokers, 3 actuaries & 11 assessors in accordance with the provisions of the proclamation immediately in the year after the issuance of the law. The number of actuaries increased to 5 in 1972 (Zeleke, 2007).

NBE (2012), on the other hand, stated that four years after the enactment of the proclamation, the military government that came to power in 1974 put an end to all private entrepreneurship. Then all insurance companies operating were nationalized and from January 1, 1975 onwards the government took over the ownership and control of these companies & merged them into a single unit called Ethiopian Insurance Corporation. In the years following nationalization, Ethiopian Insurance Corporation became the sole operator. In 1976, the Provisional Military Administration Council (PMAC) issued a new monetary and banking proclamation, Proclamation No. 99/1976 replacing the previous ones. In this proclamation the supervision and regulation of the insurance industry along with other financial institutions was given to the National Bank of Ethiopia (NBE), the country's central bank (Mihretu, 2015).

2.6.3 Insurance Business and Actuarial Practice During the Market Economy

Zeleke (2007) stated that the Ethiopian Insurance Corporation had been a monopoly in the Ethiopian insurance industry for 19 years, i.e. from 1976 to 1994 (until the issue of proclamation No 86/1994 which permitted the establishment of private insurance companies in the country). Following the collapse of the Marxist Regime in 1991, the economic policy of the country changed to a market economy. NBE (2012) added that after the change in the political environment in 1991, the proclamation for the licensing and supervision of insurance business heralded the beginning of a new era. After the enactment of the proclamation private insurance companies began to flourish.

In 1994, the Licensing and Supervision of Insurance Business Proclamation No. 86/1994 were proclaimed by the Transitional Government of Ethiopia (TGE) underlying the insurance business regulatory framework under the market economy. The proclamation, similar to the previous ones (281/1970 and 68/1975), contains provisions pertaining to: conditions to be fulfilled to establish an insurance company, type and issuance of shares, licensing of insurers and cancellation of licenses, statutory deposit and legal reserve requirements, reserve accounts (provisions), actuarial investigation and report, margin of solvency, insurance auxiliaries; restriction on loans and

advances, the manner in which reinsurance business may be transacted, and separation of accounts/funds-general and long-term insurance (Mihretu, 2015).

Zeleke (2007) underlined that the Proclamation requires insurers who carry on long-term insurance business to effect an investigation of the financial condition of the business by an actuary every year during the first five years after commencement of business. Such investigation also includes a valuation of the liabilities of the insurer pertaining to the long-term insurance policies. After the first five years, such actuarial investigation has to be conducted at least once in every three years. A summary of the actuary's report is to be submitted to the Supervisory body.

In April 1996, the NBE, pursuant to the authority vested in it by Article 41 of the Monetary and Banking Proclamation No. 83/1994 and by Article 25 of Licensing and Supervision of Insurance Business Proclamation No. 86/1994, issued Directive No. SIB/11/1996, "LICENSING OF INSURANCE ACTUARY", which provided a regulatory framework for licensing and supervising Insurance Actuaries in Ethiopia. The directive marked a significant move towards the regulation of the actuarial practice in Ethiopia for the last two decades (NBE, 1996).

Despite the regulatory provisions of the bank, there was only one domestic insurance actuary licensed and operating in the country's insurance market until the end of 2007. Gebru (2015), reported that there was one domestic Actuary licensed in the country by the end of 2014. Concerning the internationally accredited actuarial qualifications, Weilant (2011) reported that there were no credentialed (qualified) actuaries in Ethiopia by the time Milliman (a US based actuarial consultant) entered in to the Ethiopian market. In addition to that, with regard to domestic actuarial firms, Mohammed (2011) claims that domestic actuarial service providers (firms) are not available in Ethiopia. As a result, the value that could be gained or added from such service is lacking and this created a big gap in the country's insurance industry, especially in long-term insurance business. Kassahun and Asfaw (2014) also stressed that, in Ethiopia, till now, there are no licensed actuaries, for this reason Ethiopian insurance companies have been buying actuarial services from foreign (mainly Kenyan) actuaries. Therefore, it can be concluded that absence of domestic actuaries and actuarial service providers is one of the main reasons for the underdeveloped insurance and financial sectors in Ethiopia (ISD, 2012).

2.6.4 The Contemporary Insurance Business and Actuarial Practice

Proclamation No. 86/1994, was the basis for insurance business supervision in Ethiopia for almost two decades until the new Insurance Business Proclamation No. 746/2012 was proclaimed in August 2012. Currently, the Ethiopian insurance businesses as well as actuarial practice is supervised by Insurance Supervision Directorate (ISD) of the NBE whose main responsibility is licensing and supervision of insurance business in the country (ISD, 2016). The current Ethiopian insurance market is summarized in the following table;

Table 2.2 The Ethiopian Insurance Market and Regulatory Framework

Insurance Market Players Data		**Insurance Regulatory Framework**	
Insurers		**Insurance Regulatory Authority**	
State-owned insurer	1	The National Bank of Ethiopia (NBE), Insurance Supervision Directorate(ISD)	
Private insurers	16		
Domestic non-life insurers	8	**Scope of Insurance Regulation and Supervision: Selected provisions**	
Domestic composite insurers	9	Overarching principle in insurance supervision	Material supervision
Reinsures		Requirement for minimum insurance rates	No
Local	1	Cross-border insurance allowed	No
Foreign	2	**Licensing: Selected provisions**	
Insurance Professional Associations		Bancassurance is allowed	No
Association of Ethiopian Insurers	1	Allowed ownership structures	Stock companies
Society of Insurance Professionals	1	Foreign ownership restrictions	No
Auxiliaries and Actuaries		Minimum capital requirement	ETB 15mn –500mn
Actuaries	0	Minimum paid-up share capital	100%
Insurance Agents	1,950	Requirement for independent audits	Yes
Insurance Brokers	53	Requirement to appoint actuaries	Yes
Loss Adjusters	0	Premium rate approval needed	Yes
Loss Assessors	97	**On-going supervision: Selected provisions**	
Surveyors	2	Solvency referred to as the difference between assets and liabilities	Yes
Market data	**ETB Billion**	RBC (Risk-based capital) principles applied	No
Insurers Total Assets	11.3	Ceded reinsurance is regarded as a permissible asset	Yes
Insurers Total Capital	2.97	Compulsory reinsurance cessions	No
Insurers Investment	6.99	**Insurance companies in difficulties: Selected provisions**	
Insurers Gross premium	3.54	Established guarantee or policyholder protection fund	No
Number of Branches	*424*		

Source: ISD, 2016 and Africa Re, 2015

2.6.5 Overview of the Ethiopian Actuarial Practice Regulatory Framework

2.6.5.1 Directive No. SIB/11/1996 "LICENSING OF INSURANCE ACTUARY"

The Ethiopian actuarial practice regulatory framework is presented by Directive No. SIB/11/1996, "LICENSING OF INSURANCE ACTUARY" issued on April 5, 1996. The directive provided legal, educational, professional and financial requirements for licensing and supervising Insurance Actuaries in Ethiopia. The directive marked a significant move towards the regulation of actuarial practice in Ethiopia. Even though there were little or no actuaries or actuarial practitioners in the country's insurance and financial market, the directive remained the only regulatory framework for the last two decades. The main reason for the issuance of the directive is to license and supervise both domestic and foreign actuaries and actuarial firms interested and qualified to provide actuarial valuation service in Ethiopia. The main provisions of the directive include:

- An applicant for a license has to be an Ethiopian national;
- An applicant must not have been convicted of an offence involving dishonesty or fraud, whether in Ethiopia or elsewhere;
- An applicant should maintain a professional indemnity insurance cover or produce property guarantee or Birr100,000.00 (one hundred thousand Birr).
- An applicant should hold a degree/diploma from Institute of Actuaries (London); or Faculty of Actuaries (Scotland); or Society of Actuaries (U.S.A); or degree or diploma acquired from professional institution with similar status.
- An Actuary licensed outside Ethiopia may engage in actuarial valuation business provided he/she is authorized to do so by the Bank.
- A person applying for a license to be an Actuary shall pay investigation fee of Birr 300.00 (three hundred Birr) and initial license and subsequent annual renewal fee of Birr 250.00 (Two hundred fifty Birr).
- An applicant shall submit; name and occupation (including dates and addresses of previous employment); four passport size photographs; curriculum vitae and duly completed application form as prescribed by the Bank and enclosures specified therein.

2.6.5.2 Insurance Business Proclamation No. 746/2012

Proclamation No. 746/2012 provided a wider legal framework for actuarial practice in the country. The Proclamation mainly provided definition to the term "ACTUARY" (Article 2), and stated the role of an actuary in regulating insurance business in Ethiopia (Article 24-3, 32, 33-5-a, 4, 46, 47 and 53-1). The main actuarial regulatory provisions of the proclamation include:

Actuarial Investigation (Part Six, Article 32)

- Every insurer carrying on long-term insurance business shall appoint an actuary who possesses sufficient experience as shall be determined by directive.
- The frequency and the time limit an actuarial valuation should be carried out and reported to the National Bank shall be determined by directive.
- An actuary's valuation shall be conducted in accordance with generally accepted actuarial practice and as prescribed by directive.
- The actuary shall forthwith report in writing to the National Bank, on any transactions or conditions that have come to his attention which, in his opinion, could significantly and adversely impact the financial position of the insurer, whether or not those transactions or conditions are reflected in the financial statements or annual return of the insurer.
- The National Bank may appoint an actuary other than the actuary appointed by an insurer, carrying on long-term insurance business, to value the matters in respect of that insurer if, in its opinion, such appointment is necessary.
- The qualification criteria of an actuary, manner of conducting actuarial valuations and other similar matters shall be prescribed by directive.

Regulation of Insurance Actuaries (Part Nine, Article 43)

- No person may carry on the profession of actuary without having obtained license from the National Bank and the manner of licensing and the qualification criteria required of actuaries shall be prescribed by directive.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the research methodology which constitute the theoretical perspectives that guides research, tools and techniques of data collection and methods of data analysis. Descriptive research describes a situation, events or social systems. It aims to describe the state of affairs as it exists. Quantitative research and qualitative research are associated with different paradigms. Accordingly, approaches to social enquiry varies. Mixed methods by combining of at least one quantitative method and one qualitative method in measurement, collection or analysis of data is increasingly being used to strengthen the validity of research findings. Surveys and fact-finding enquiries of different kinds are part of descriptive research.

Descriptive research is applied in this study as a suitable research methodology to describe the principles underling actuarial practice and its importance to the Ethiopian insurance and financial sectors. The study describes the state of actuarial practice in Ethiopia and the role of actuaries, actuarial firms and the actuarial regulatory regime in promoting the practice in Ethiopia. The study used both primary and secondary sources of data. Mixed method is applied which involve quantitative and qualitative methods in measurement scales, tools of data collection as well as analysis techniques so as to offset the weaknesses inherent within one method with the strengths of the other method. The study applied survey method with both quantitative and qualitative methods of data collection where combination of structured questionnaire and semi structured key informants interview are used as tools of data collection.

3.1 RESEARCH DESIGN

Research design is the logical conceptual structure within which research is conducted. It is the blueprint for the collection, measurement and analysis of data. The research design applied in the study comprises of main components which include sampling design, statistical design and observational design: The sampling design describes the type of sampling method applied in the study. The statistical design explains the sample size and the method of drawing the sampling adopted in the study. The observational design details the instrument of data collection.

3.1.1 Sampling Design (Sampling Method)

The sampling method applied in the study is non-random sampling method. Purposive sampling is one of the non-random sampling techniques applied in the study as a suitable sampling method to select and draw the sample from the total population of all actuarial practitioners found in the Ethiopian insurance and financial sectors. A preliminary research is used to determine which organization to be included in the sample representing the country's insurance and financial market. Individual respondents representing the sampled organizations are purposely picked in consideration of their assumed knowledge about the actuarial practice in Ethiopia.

3.1.2 Statistical Design (Sample Size)

A sample has to be representative of the population from which it has been selected, if it is to be useful in arriving at conclusions about the parent population. A representative sample is one that contains the relevant characteristics of the population in the same proportion as in the population. According to U.S. Bureau of Labor Statistics (2015), more than 70% of actuarial practitioners are engaged in insurance and financial sectors of the economy. IFoA (2016) also noted that about 78% of actuarial practitioners are engaged in the top three insurance and financial sectors. Similarly, the Ethiopian actuarial practice is strictly associated with the country's insurance and financial sectors. The Ethiopian insurance sector is represented by commercial insurance organizations and market players; including actuary/actuarial firm, regulator, composite insurers (life and general), general insurers, reinsurers, insurance brokers, insurance associations, and micro insurers. On the other hand, the Ethiopian financial sector is represented by public financing agencies including social health insurers, pension and social security agencies, and investment banks (if exist). Other organizations involved in the promotion of actuarial practice in the country are included in the sample size. These organizations include academic institutions providing actuarial science related courses, and research and development organizations (non governmental organizations) providing support to the Ethiopian government in implementing social security programs. The sample size is designed to represent each organizations involvement in actuarial practice where more than 85% weight is given to organizations in the Ethiopian insurance and financial sectors. The total sample size is determined to be 30 organizations with their respective individual representatives. Details of the sample size representing the Ethiopian actuarial practice areas is presented in the following table.

Table 3.1 Sample Size of the Ethiopian Actuarial Practice areas (Organizations)

Type of sample	Size	Representation
Composite Insurers	6	*Life insurers licensed and operating in Ethiopia and two student actuaries working in the state owned composite insurer.*
General Insurers	4	*Non life insurers licensed and operating in Ethiopia.*
Regulator	2	*The National Bank of Ethiopia, Insurance supervision directorate.*
Actuaries and Actuarial Firms	1	*Actuary or actuarial firm licensed and operating in Ethiopia*
Reinsurers	2	*Reinsurance companies licensed and operating in Ethiopia*
Insurance Brokers	2	*Insurance Broker firms licensed and operating in Ethiopia*
Insurance Associations	2	*Association of Ethiopian Insurers & Society of Insurance Professionals*
Micro Insurers	2	*Micro insurance providers licensed and operating in Ethiopia*
Investment Banks	1	*Investment bank licensed and operating in Ethiopia*
Social Health Insurers	2	*Ethiopian Social Health Insurance Agency (CBHI & SHI)*
Pension and Social Security	2	*The Ethiopian Social Security Agency (PSSSA & POESSA)*
Research and Development	2	*Research Organizations and NGOs*
Academic Institutions	2	*Ethiopian Institute of Financial Studies (EIFS) and Addis Ababa University (AAU)*
Total Sample Size	**30**	**100 % of the total population (actuarial practitioners)**

3.1.3 Observational Design (Tools of Data Collection)

Collection of data is an essential part of the research process. Data can be primary or secondary. The study used both primary and secondary data and applied the appropriate tools of data collection suitably designed for the research project. Survey method is used to collect primary data and desk review is used to collect secondary data.

3.1.3.1 Tools of primary data collection

Data collected by a survey is primary. A survey is usually conducted by the canvassing of a questionnaire. The study applied a mixed method of data collection where both quantitative and qualitative tools of primary data collection are used. A survey is conducted by a questionnaire which contains both structured and open-ended questions. Key informants interview is also conducted with high officials in the organizations included in the sample.

The Questionnaire: The questionnaire is designed containing both quantitative and qualitative measurements of data (structured and open ended questions) together with various measurement scales and techniques. The questions are designed in consideration of the main measurement scales (nominal, ordinal and interval scales) so that the corresponding statistical techniques will be applied in analyzing the data. Both comparative as well as non comparative scaling techniques (Rank Order, Likert Type Scale and Single Category Scale) are applied in designing the questionnaire so as to exhaust all the possible ways of obtaining relevant data.

***The Key Informants Interview*:** The key informants interview is designed to obtain qualitative data. Semi structured interview is used with interview guide containing open ended questions that guide the respondents to freely explain their attitude towards each question by their own languages. The key informants interview is designed to have face-to-face interviews with high officials in the sampled organizations who are assumed to have good understanding of the actuarial practice in Ethiopia.

3.1.3.2 Tools of secondary data collection

The data already collected by some agency and available in some published form is secondary data. The study applied desk review for secondary data collection from various publications on actuarial practice. The researcher has reviewed various related literature from both local as well as international sources of secondary data. The study mainly used internet publications retrieved from websites of various international actuarial organizations, local regulatory bodies, professional institutions, academics and research organizations. The secondary data collected is used to provide conceptual framework and theoretical analysis on the importance of actuarial practice in Ethiopia which also served as the basis for defining the research problem, determining research objective, designing research questions, analyzing the findings and deriving conclusions.

3.1.3.3 Sources of data

The sources of primary data are individuals or organizations that are considered to have an actuarial practice in one or another way for their own business activities or providing actuarial services to other organizations. All individuals and organizations included in the sample are assumed to be influenced by actuarial practice or contribute for the development of the practice in Ethiopia. The main sources of secondary data are both international and local publications with

actuarial content. International sources include actuarial professional organizations and regulators (e.g. IAA, IFoA, SOA, IAIS); international financial organizations (e.g. IMF, WB, ILO, OECD). Local sources include; Ethiopian regulatory body's directives and governmental proclamations (e.g. NBE Directives and EFDRE Insurance Business Proclamations). Secondary sources also include other publications such as actuarial magazines, bulletins, books, internet articles, conference proceedings, presentations, research reports, periodic reports, professional brochures, code of professional conduct, governance notes, standards of practice...etc.

3.2 METHODS OF DATA COLLECTION AND ANALYSIS

Research methods refers to tools and techniques of data collection and data analysis. Broadly research methods are put under two categories: mono methods mixed methods. The combination of at least one qualitative and at least one quantitative component related to measurement scale, tools of data collection or data analysis technique in a single research study/project is known as mixed methods research. The rationale for mixed method design research is to take the best of qualitative and quantitative methods and combine them. The study applied mixed of data collection and analysis which involve both quantitative and qualitative methods in measurement scales, tools of data collection as well as analysis techniques so as to offset the weaknesses inherent within one method with the strengths of the other method. Quantitative data is collected by using survey method where questionnaire is distributed to the respondents and the data gathered is analyzed by using the appropriate quantitative technique of data analysis. Qualitative data is also collected by conducting key informants interview.

3.2.1 Quantitative Methods

The study applied quantitative methods of data collection by using survey as method of data collection and questionnaire as tool of data collection. The questionnaire contains the main quantitative measurement scales such as nominal scales, ordinal scales and interval scales. The questions are mainly designed to collect and analyze quantitative data even though some open ended qualitative questions are included. Nominal scale is applied to record data into categories without any order or structure. The nominal scale is used to categorize respondents and measure variables with yes/no type responses. Variables such as type of organization, work experience, positions in the organization, academic qualifications and other yes/no response questions are measured with nominal scale. Ordinal scale is used in the study to rank various opinions related to

absence of actuarial practice in the organizations under study. Interval scale is applied in the study to measure differences in the degree of order. Rating the current actuarial practice in Ethiopia, the importance of actuarial practice and the degree of importance is measured by interval scale with each containing five point scales.

The survey is conducted by distributing the questionnaire to all organizations included in the sample. Most of the respondents included in the survey are senior officials that have close connection with the organization's actuarial practice. The respondents are assumed to be familiar with the concept of actuarial practice and its importance to the Ethiopian insurance and financial sectors. All the questionnaires are collected from the respondents and coded according to their identification number and date of receipt. The data gathered by the survey is categorized, coded and tabulated for further analysis and interpretation.

3.2.2 Qualitative Methods

In qualitative research methods, interview is used often with unstructured and invariably open ended questions. This gives the respondent liberty to provide extensive answers. In a focused interview, the researcher and the respondent are engaged in face-to face or one to one conversation in which the researcher poses questions and the respondent provides detailed or precise answers. Talking to people or a specified group of people selected randomly, using an interview schedule, interview guide or a structured questionnaire is standard method of data collection.

The study applied qualitative methods of data collection where key informants interview is used as method of data collection and semi-structured interview as tool of data collection. Open ended questions are used to collect qualitative data allowing the respondents to freely discuss the importance of actuarial practice in Ethiopia. The open ended questions are intended to guide the respondents as to which information is relevant for the study and interpret the questions in their own languages so that the researcher grasps the idea of respondents from different perspectives. The researcher conducted the key informants interview with senior officials of ten organizations included in the sample. The researcher applied judgment sampling to take 10 samples from already sampled 30 organizations. The sampled respondents include representatives of an actuary, actuarial firm, regulatory body, composite insurer, reinsurer, broker, social health insurer, pension and

social security agency, NGO and academic institution. The researcher conducted a face to face interview with the respondents mainly at their own office or convenient location when required. The responses of each interviewee is recorded using digital audio recording devices and transcribed for further analysis. Interview questions were sent by e-mail and the responses are collected in a written format when face to face interview was difficult.

3.2.3 Methods of Data Analysis

The study used both quantitative and qualitative methods of data analysis. Data analysis involves a set of statistical techniques used in establishing relationships between the different variables and in evaluating the accuracy of the results. Analysis involves steps like categorization, coding, tabulation, etc. The principle for classification or categorization of data has to be based on the problem under study.

3.2.3.1 Quantitative Analysis

The quantitative data gathered by the survey is categorized according to the type of data. The data filled in the questionnaire is coded in to a statistical software. SPSS and Excel softwares are mainly used to analyze the quantitative data. Analysis and inference is usually aided by the application of different statistical techniques. The data collected by the survey questionnaire is first edited, coded, classified and tabulated to prepared it for further analysis. Descriptive statistics is used to analyze the data with simple analytical parameters such as frequencies and percentages. Nominal values are analyzed with statistical techniques such as cross tabulation. Charts and diagrams are used to present the analyzed data in figurative way.

3.2.3.2 Qualitative Analysis

Qualitative data analysis uses ‘constant comparative method’ which involves constant comparing and contrasting of notes. The data collected by the key informants interview is compiled and transcribed by rewriting the field notes and recorded narrations of each respondent. Thematic analysis is applied to capture the meaning of responses. Each theme is classified on the basis of open ended questions provided in the interview guide. Manual analysis is used with constant comparative method where comparing and contrasting of the respondents’ ideas is applied to produce summarized findings.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presents data analysis, findings and discussions on results. The discussion on analytical findings is presented in two parts as quantitative analysis and qualitative analysis. The quantitative analysis presents discussion on the findings from the survey questionnaire. The qualitative analysis presents discussion on the findings from the key informants interview.

4.1 ANALYSIS OF QUANTITATIVE DATA (QUESTIONNAIRE)

Surveys and fact-finding enquiries of different kinds are part of descriptive research. Survey methods of all kinds including comparative and correlation methods are used in descriptive research studies. The survey outcome is analyzed and presented in the form of tables and charts which elaborates the respondents' position regarding each question included in the questionnaire. The responses provided by respondents is individually discussed with its respective question. Descriptive statistics is mainly used to analyze quantitative data by using simple statistics such as percentages, simple frequency tables, or by calculating simple descriptive statistics.

The survey was conducted by a questionnaire designed for such purpose. The questionnaires were copied and distributed to all concerned individuals and organizations included in the sample. The researcher handed the questionnaires to the respondents and assisted the respondents during the filling process. Out of the 30 organizations included in the sample size, only 28 respondents were contacted because there were no respondents representing the two sampled organizations (The Society of Insurance Professionals and an Investment Bank). This is due to the fact that The Society of Insurance Professionals ceased its operation for the last three years (Source: former employees) and there is no Investment bank licensed and operating in Ethiopia (Source: Regulator). Hence, the data that could have been collected from these two organizations is not available for analysis. The quantitative analysis presented in the following sections is based on the responses gathered from 28 respondents and the discussion sections are classified by the type of questions raised in the questionnaire.

4.1.1 Analysis of General Information

The survey questionnaire includes some general questions which are designed to gather information about the respondents and organizations involved in the study. This include, name and type of organizations, the respondent's work experience and position in the organization, actuarial qualifications achieved (if any) by the respondent and name of the actuarial institution providing the qualification.

4.1.1.1 Name and Type of Organizations

The questionnaire requires the respondent to state the name and the type of the organization's business which she/he is representing. The question is intended to ensure the proper participation of the organizations included in the sample. The name of the organization is used to code the questionnaire identity number where the organizations' name is abbreviated to produce a code which help the researcher identify each organization during data categorization and analysis. The information regarding the type of the organization's business helps the researcher identify the type of actuarial practice in each organization. As shown in the following table, the majority (35.7%) of the actuarial practice is represented by insurance business. The table shows that except the two organizations which have been excluded, all organizations with actuarial practice have been represented by their respective respondents.

Table 4.1: Type of Organizations involved in the study

Type of Organization	Frequency	Percent
Actuary or Actuarial firm	1	3.6%
Regulator	2	7.1%
Composite Insurer (Life & General)	6	21.4%
General Insurer	4	14.3%
Reinsurer	2	7.1%
Insurance Broker	2	7.1%
Insurance Association	1	3.6%
Micro Insurer	2	7.1%
Social Health Insurer	2	7.1%
Pension and Social Security	2	7.1%
Academic Institution	2	7.1%
Research & Development	2	7.1%
Total	**28**	**100%**

4.1.1.2 Respondents' work experience and position

The work experience and position of the respondents is required to examine the respondents' capacity to represent their organization and to ensure their ability to comprehend the importance of actuarial practice in Ethiopia. The more experienced and senior the respondents are, the more knowledgeable they are considered to be in giving accurate information on the topic under study.

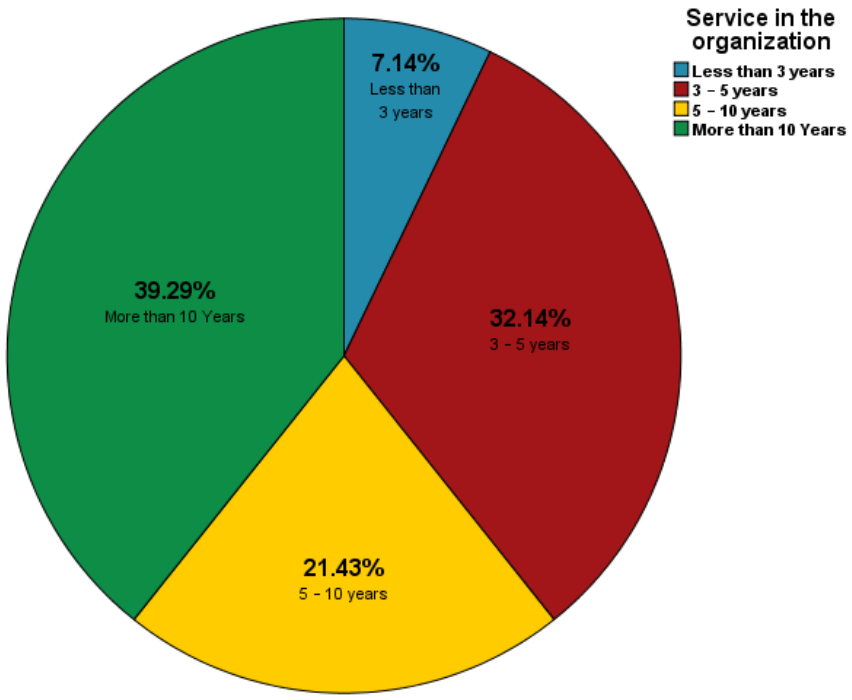

Fig. 4.1: Pie Chart –Respondents' work experience

Figure 4.1 shows that 39.29% of the respondents have more than 10 years and 21.43% have 5 to10 years of work experience in the organization which they are representing during the study. This shows that more than 60% of the respondents are senior officials who are capable of providing accurate information in the survey questionnaire.

The organizational positions held by the respondents reflect the appropriateness of the selected individuals to complete the survey questionnaire. Almost all of the respondents are selected by their relative knowledge regarding the importance of actuarial practice in Ethiopia. The positions held by respondents is detailed in Table 4.2.

Table 4.2: Respondents Organizational Positions (Representation)

Type of Organization	Representatives
Actuary or Actuarial firm	*Former Ethiopian actuary and actuarial firm owner*
Regulator	*Principal Examiner& Principal Insurance Supervisor*
Composite Insurer (Life & General)	*Life & Health Team Leader, Life & Health D/Manager, DCEO Life & Health, Life & Health DGM, Manager Life Branch (Student Actuary) & Life Branch Senior Officer (Student Actuary)*
General Insurer	*Operations DGM, Operations Manager, Risk and Compliance Manager, Operations Manager.*
Reinsurer	*Director, Ethiopia Office & Head, Finance Department*
Insurance Broker	*General Manager & Chief Executive Officer*
Insurance Association	*Secretary General*
Micro Insurer	*Manager, Microinsurance Department & Director, Microinsurance Programme*
Social Health Insurer	*Senior officers SHI &CBHI*
Pension and Social Security	*Director, Actuarial Directorate & Team Leader, Research and Actuarial*
Academic Institution	*Ass. Professor, Department of statistics & Training Director*
Research & Development	*Programme Specialist, Health Insurance & Programme Manager, CBHI Pilot*

Source: SPSS Survey Analysis

As shown in the above table, most of the respondents are high officials who held senior positions in the organization with executive and top management roles. The respondents have close connection with the actuarial practice in the organization.

4.1.1.3 Actuarial Qualification and Institutions

The study tries to find out if there are qualified actuaries (Associate or Fellow) in the Ethiopian insurance and financial market. Accordingly, respondents were asked to state their actuarial qualification, if they have one. Respondents were also asked which actuarial institution provided the qualification. This information helps the researcher to gather information as to which organization has workers with actuarial qualification and which international actuarial institution provides actuarial qualification routes in Ethiopia. Figure 4.2 and Table 4.3 show the actuarial qualification status of the respondents and their respective institution providing the qualifications.

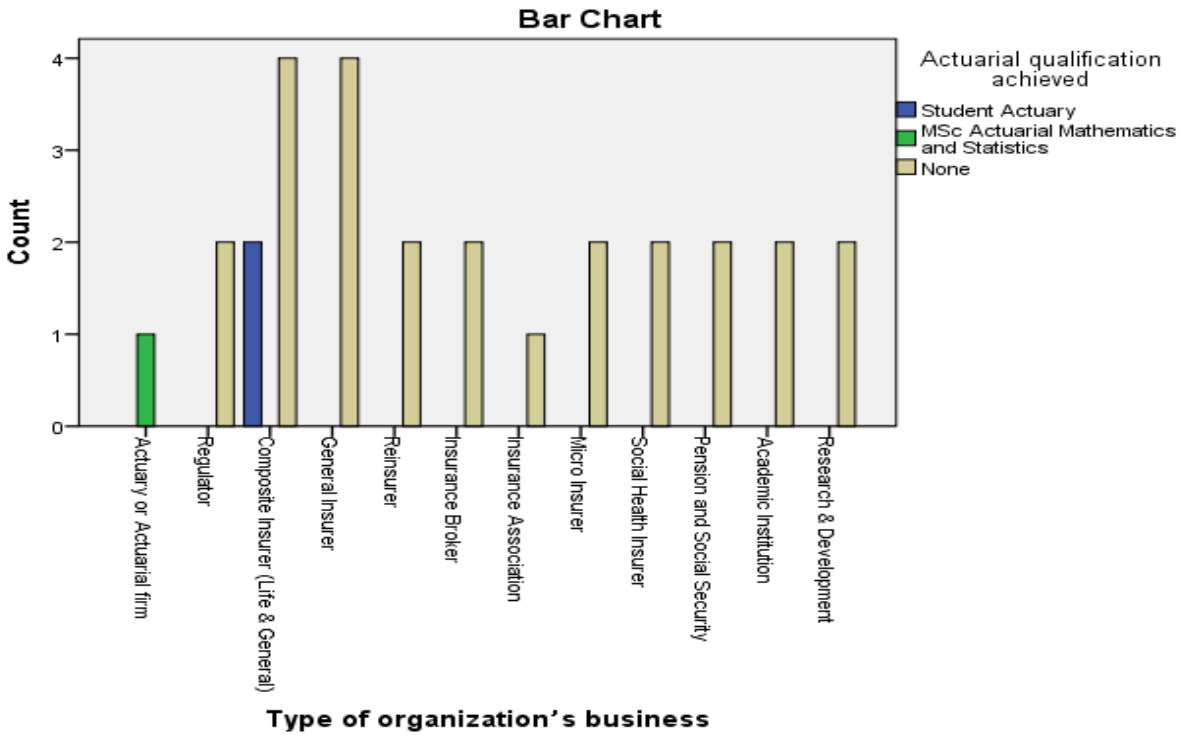

Fig. 4.2: Bar Chart - The respondents Actuarial Qualification

Figure 4.2 shows that there are three respondents with actuarial qualification achieved of which two are with student actuary designation, studying for accredited actuarial qualifications and one respondent with a master of science (MSc) degree in Actuarial Mathematics and Statistics. The two student actuaries work in one of the composite insurers. Other respondents representing those organizations involved in the study don't have any actuarial qualification. This implies that there are no credentialed (qualified) actuaries in Ethiopia actively working in the country's insurance and financial sectors.

Regarding the actuarial institution providing the qualifications, two institutions are mentioned; i.e. the Institute and Faculty of Actuaries IFoA, (UK) and Heriot-Watt University (UK). The two student actuaries are members of the IFoA. This shows that the IFoA is the only international actuarial institution which provides actuarial qualification system in Ethiopia. A cross tabulation analysis of actuarial qualifications and actuarial institutions is depicted in Table 4.3 below.

Table 4.3: Cross Tabulation- Actuarial Qualifications and Institutions

Name of the actuarial institution providing the qualification * Actuarial qualification achieved Cross tabulation					
		Actuarial qualification achieved			Total
		Student Actuary	MSc Actuarial Mathematics and Statistics	None	
Name of the actuarial institution providing the qualification	Institute and Faculty of Actuaries (UK)	2			2
	Heriot-Watt University (UK)		1		1
	NA			25	25
Total		2	1	25	28

Source: SPSS Survey Analysis

4.1.2 Analysis of the current actuarial practice in Ethiopia

Some of the questions included in the survey questionnaire are intended to gather information regarding the current actuarial practice in the Ethiopian insurance and financial sectors. The data is required to assess: i) the presence of actuarial educational schemes and scholarship programs to sponsor students for actuarial exams and qualification routes; ii) the existence of job title or job description for actuarial positions; iii) the presence of in-house actuaries and actuarial departments (work units) dedicated to perform actuarial valuation works; iv) the number of actuaries in the department and the role of actuaries in the department; v) the organizations' tendency to use outsourced actuarial services; vi) the types of actuarial services outsourced; and vii) the type of actuaries/actuarial firms outsourcing the service.

4.1.2.1 Actuarial educational scheme and scholarship program

Respondents were asked whether their organization have an actuarial educational scheme or a scholarship program to sponsor students for actuarial exams and qualification routes. Accordingly, only three respondents answered "Yes" and the remaining twenty five replied "No". These three respondents are employees of a state owned composite insurer. Two of the respondents are student members of the IFoA. This shows that only the state owned composite insurer provides actuarial educational scheme and scholarship program in Ethiopia. Other insurance companies and financial institutions including the regulator do not provide actuarial educational scheme or scholarship program to sponsor students for actuarial exams and qualification routes.

4.1.2.2 Job title and job description for actuarial positions

Respondents were asked whether their organization have a job title or job description for actuarial positions. Accordingly, only two respondents answered "Yes" and the remaining twenty six respondents replied "No". The two respondents are representatives of the Ethiopian Pension and Social Security sector. The responses regarding job title and job description for actuarial positions is presented in Figure 4.3 below.

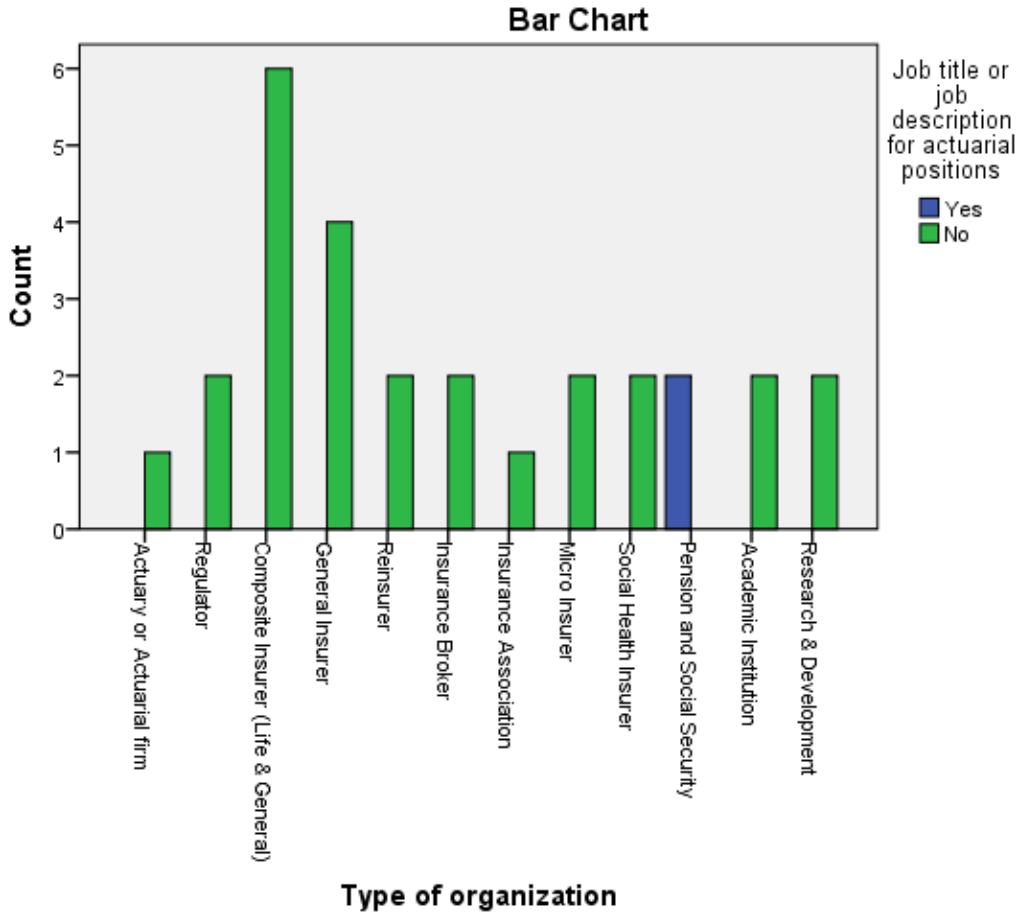

Fig. 4.3: Bar Chart - Job title and job description for actuarial positions

4.1.2.3 In-house actuary and actuarial department

Research questions regarding the existence of an in-house actuary and actuarial department were intended to find out which organization employs actuaries and establish actuarial department for actuarial valuation works. Hence respondents were asked whether they have an in-house actuary or actuarial department dedicated to perform actuarial valuation works. They were also requested to

state the number of actuaries in the department and the role of actuaries in the department. Accordingly, only two respondents representing pension and social security confirmed the presence of an in-house actuary and actuarial department. All other respondents including the regulator confirmed that they don't have an in-house actuary or actuarial department dedicated to perform actuarial valuation works in the organization. The presence of an in-house actuary and actuarial department is depicted in figure 4.4 below.

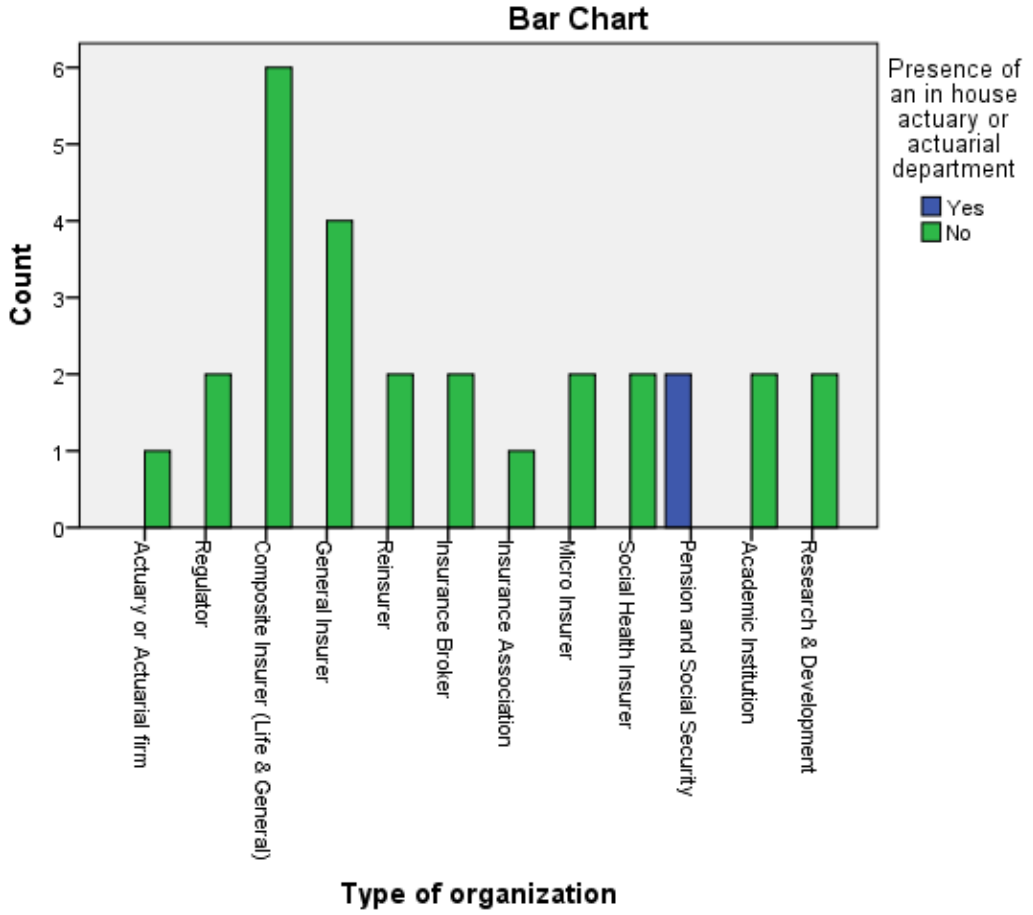

Fig. 4.4: Bar Chart - Presence of an in-house actuary and actuarial department

As shown in the above diagram, only respondents in the pension and social security sector have positively confirmed the presence of an in-house actuary and actuarial department in their organizations. The Ethiopian pension and social security sector is represented by the two agencies, namely, The Public Servants Social Security Agency and Private Employees Social Security Agency. The Public Servants Social Security Agency has established an actuarial department called "Social Security Development Excellence and Actuarial Center Directorate". The

directorate is established recently and has been in operation for about eight months. The directorate's operational manual requires the employment of an in-house actuary with job title and job description for actuarial positions. Despite the provisions of the manual, the directorate doesn't have an in-house actuary who performs the actuarial valuation work. The Private Employees Social Security Agency, on the other hand, doesn't have an actuarial department but there is an in-house actuary job title and job description. The actuary works under the supervision of research team leader whose main role is to prepare data for actuarial evaluation works. The periodic actuarial valuation works of all organizations under study is done by an external actuary acquired through a technical cooperation with International Labor Organization (ILO). In the case of the pension and social security sector in Ethiopia, the actuarial valuation service is provided by the International Financial and Actuarial Service, Social Protection Sector of the ILO. The role of actuary/actuarial department in the two social security agencies is a simple data analysis and preparation work for the periodic actuarial valuation conducted by ILO.

4.1.2.4 Outsourced Actuarial Services

Respondents were asked whether their organization outsources the actuarial valuation work to external actuary or actuarial firm. The responses is summarized in the diagram 4.5 below.

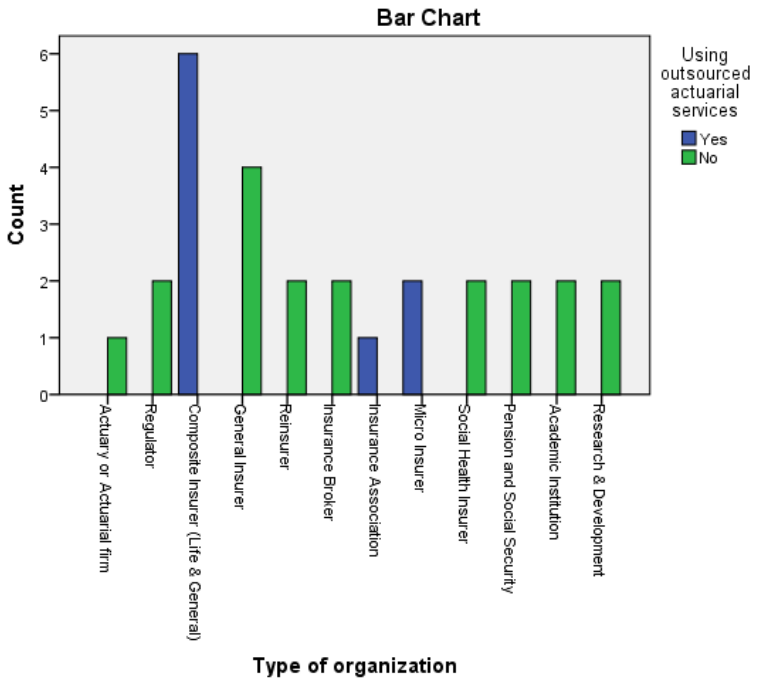

Fig. 4.5: Bar Chart – Outsourcing actuarial valuation work

Outsourcing refers to buying labor or parts from a source outside a company or business rather than using the company's staff. Figure 4.4 shows that, 9 respondents replied "Yes" and the remaining 19 respondents replied "No". Out of the 9 respondents who positively replied, 6 of them represent the composite insurers (life & general), 2 represent micro insurers and 1 represent the insurance association. This shows that actuarial practice is important in these organizations for their business activities; but due to various reasons they do not employ actuaries or establish actuarial department that can perform actuarial valuation works. They rather choose to buy actuarial services from external actuaries or actuarial firms. Most of the outsourced actuarial service is required by life insurers and for life insurance business valuation, pricing and product development purposes. Some micro insurers require outsourced actuarial services for micro insurance business development purposes. The insurers association also requires outsourced actuarial services for actuarial valuation of insurance business and to conduct research on the country's insurance market. Figure 4.5 presents the types of outsourced actuarial services.

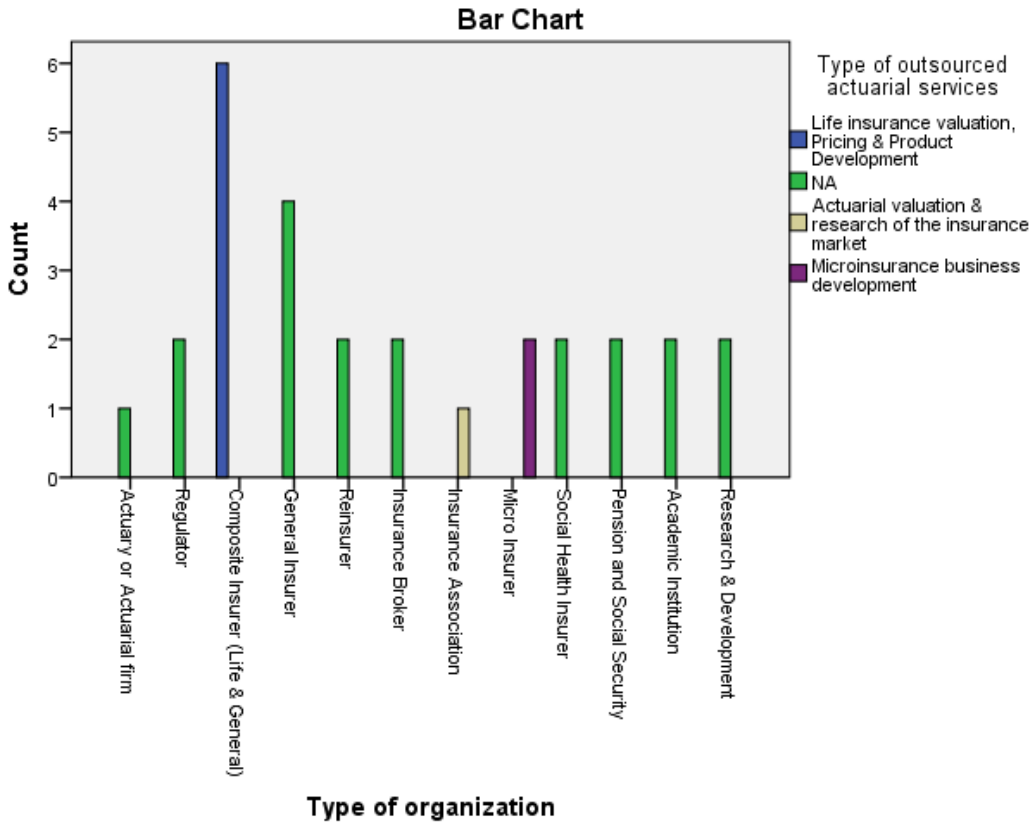

Fig. 4.6: Bar Chart – Type of outsourced actuarial services

Respondents were also asked to choose which actuarial service provider do they use most if their organization is outsourcing the actuarial service to external actuary/actuarial firm. Accordingly, all of the nine respondents representing organizations with outsourced actuarial services confirmed that they use foreign actuary/actuarial firm licensed outside Ethiopia. This shows that there is no Ethiopian actuary or actuarial firm licensed and operating in Ethiopia; or even a joint venture firm which provides outsourcing services to the Ethiopian insurance and financial market.

4.1.3 Rational Analysis on Absence of Actuarial Practice

The rational analysis on the absence of actuarial practice provides possible reasons contributing for the absence of actuarial practice in the organization under study as well as in Ethiopia. Respondents were provided with five statements that are considered to be possible reasons for not having an in-house actuary or actuarial department in most organizations. Accordingly, respondents ranked the reasons as 1st, 2nd, 3rd, 4th and 5th. The rank order is arranged as 1st representing major reason all the way to 5th representing minor reason. The responses obtained are presented in Table 4.4. below.

Table 4.4: Rational analysis on absence of actuarial practice

Reasons	Rank				
	1st	**2nd**	**3rd**	**4th**	**5th**
Absence of strict regulatory requirement to appoint an in house actuary.	14	4	4	1	5
Shortage of qualified actuaries that can perform the actuarial work.	11	7	6	3	1
Shortage of actuarial graduates to be employed in the organization.	1	15	9	1	2
Immaterial actuarial work to establish a department or employ actuarial staff.	2	2	2	17	5
Lack of financial resources to establish an actuarial department or employ staff.			7	6	15
Total	**28**	**28**	**28**	**28**	**28**

Source: SPSS Survey Analysis

Table 4.4 shows that absence of strict regulatory requirement to appoint an in house actuary and shortage of qualified actuaries that can perform the actuarial work are ranked as 1st reasons by majority of respondents with frequency values of 14 and 11 respectively. Shortage of actuarial graduates to be employed in the organization is ranked 2nd reason by most respondents with frequency value of 15 responses. Immaterial actuarial work to establish a department or employ actuarial staff is ranked 4th with frequency value of 17 responses. Lack of financial resources to

establish an actuarial department or employ staff is ranked 5th with frequency value of 15 responses. The following charts show the rational analysis on organizational basis.

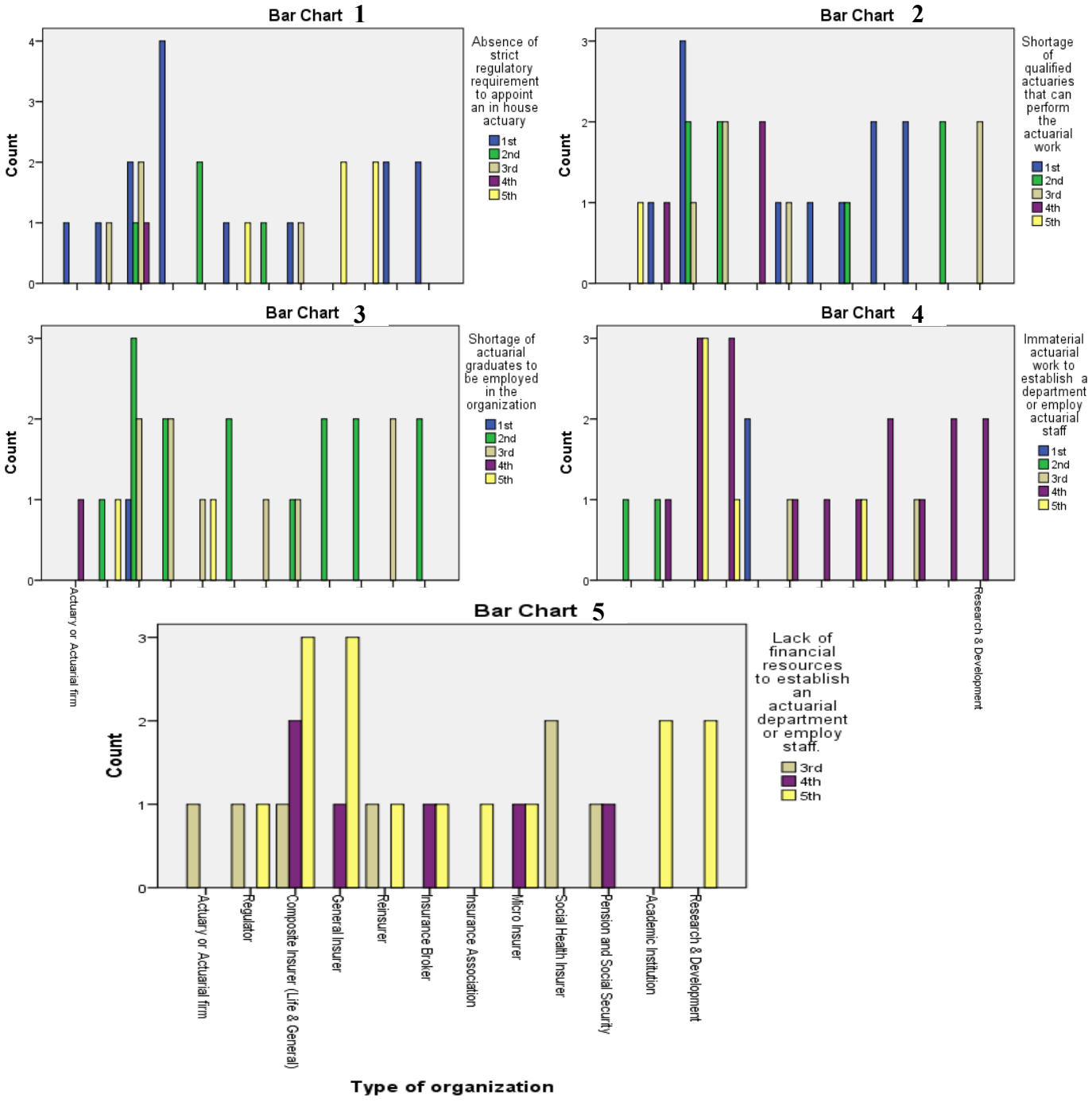

Fig. 4.7: Clustered Bar Charts – Rational analysis on absence of actuarial practice

Figure 4.6 presents clustered bar charts that are produced by cross tabulating the possible reasons for not having an in-house actuary or actuarial department in the organizations under study with the type of organization. Analysis of the clustered bar charts is discussed as follows;

Absence of strict regulatory requirement to appoint an in-house actuary: is ranked first by 14 respondents, most of them representing the commercial insurance sector. As shown in bar chart-1 of figure 4.6, respondents representing actuary, regulator, composite insurers, general insurers, insurance broker, micro insurers, academic institutions and research and development organizations ranked the reason as major reason. Other 4 respondents representing organizations such as reinsurers and insurance association ranked the reason as 2nd major. On the contrary, social health insurers and pension and social security organizations ranked the reason as a minor reason with 5th rank order. This implies that most commercial insurers and insurance market players require a strict regulatory requirement to appoint an in-house actuary and establish actuarial department. This reason insists the regulator to review its actuarial regulatory framework and enforce directives which require insurers to establish an actuarial department and appoint an in-house actuary.

Shortage of qualified actuaries that can perform the actuarial work: is also ranked as first by 11 respondents. As shown in bar chart-2 of figure 4.6, most of the respondents representing the regulator, composite insurers, insurance brokers, insurance association, micro insurers, social health insurers and pension and social security organizations ranked this reason as major reason. Other 7 respondents representing organizations such as general insurers and academic institutions ranked the reason as 2nd major reason. This implies that both commercial insurance market players as well as social and public financial organizations require the availability of qualified actuaries that can perform the actuarial work in their organization.

Shortage of actuarial graduates to be employed in the organization: is ranked as second major reason by 15 respondents. As shown in bar chart-3 of figure 4.6, most of the respondents representing the regulator, composite insurers, general insurers, insurance brokers, insurance association, micro insurers, social health insurers, pension and social security and research and development organizations ranked this reason as 2nd major reason. Nine respondents in

organizations such as composite insurers, general insurers and academic institutions ranked the reason as 3rd major reason. This implies that the Ethiopian insurance and financial sector is facing shortage of actuarial graduates to be employed. Most organizations in the commercial insurance and public financing market require the employment of actuarial graduates who can perform the actuarial work in those organizations.

Immaterial actuarial work to establish department or employ actuarial staff: is ranked fourth by 17 respondents. Bar chart-4 shows that more than 60% of the respondents agreed that this reason, in other words, is the 2nd minor reason. This implies that organizations in the Ethiopian insurance and financial sector have considerable actuarial work that can significantly materialize the establishment of an actuarial department leading to employment of actuarial staff. However, absence of regulatory requirement, shortage of qualified actuaries and shortage of actuarial graduates forced these organizations to outsource or acquire the actuarial valuation work from external actuarial service providers.

Lack of financial resources to establish actuarial department or employ staff: is ranked fifth by 15 respondents. Bar chart-5 of figure 4.6 shows that, unlike other reasons, this reason is ranked only 3rd 4th and 5th. In other words, the reason is the first among the minor reasons. More than 53% of the respondents ranked it as a minor reason for not having an in-house actuary or actuarial department in their organizations. This implies that almost all organizations involved in the study have no barriers with regard to financial resources to establish actuarial department or employ actuarial graduates as far as the regulator requires, qualified actuaries are available and actuarial graduates are produced in the Ethiopian insurance and financial market.

4.1.4 Analysis of the current actuarial practice in Ethiopia

The analysis of the current actuarial practice in Ethiopia is intended to examine the respondents' attitude towards the current practice in the country. Respondents were provided with ten statements which contain basic parameters that help to measure the current actuarial practice in Ethiopia. The rating of these parameters is against a corresponding values which measure the degree of goodness (favorable response) or badness (unfavorable response). The responses are measured with attributes of goodness scaled as Very Poor, Poor, Fair, Good and Very Good.

Accordingly, all of the 28 respondents have rated the statements and the responses obtained are summarized in table 4.5 below.

Table 4.5 : Respondents' Rating of the current actuarial practice in Ethiopia

Parameters	Frequency Count				
	Very Poor	Poor	Fair	Good	Very Good
The development of actuarial practice in Ethiopia	24	4			
The roles played by actuaries and actuarial firms in Ethiopia	19	9			
The actuarial practice regulatory framework in Ethiopia	13	14	1		
The availability of qualified actuaries in Ethiopia	24	4			
The availability of domestic actuarial firms in Ethiopia	25	3			
The availability of foreign actuarial firms in Ethiopia	19	6	3		
The availability of actuarial education and qualification system in Ethiopia	23	5			
The public awareness about actuarial practice and the role of actuaries	19	7	2		
The support provided by the Ethiopian government in promoting actuarial practice in the country	18	10			
The support provided by international actuarial organizations in promoting actuarial practice in Ethiopia	14	11	3		
TOTAL	**198**	**73**	**9**		

Source: SPSS Survey Analysis

Table 4.5 shows that most of the respondents unfavorably rated the current actuarial practice in Ethiopia as "Very Poor", "Poor" and "Fair" with a total frequency count of 280 responses. Out of the total frequency count of 280 responses, 198 responses (71%) fall under the "Very Poor" rating boxes, 73 responses (26%) fall under the "Poor" rating boxes, and 9 responses (3%) fall under the "Poor" rating boxes. On the contrary, none of the respondents favorably rated the current actuarial practice in Ethiopia as Good or Very good.

This indicates that almost all respondents are not satisfied with the current actuarial practice in Ethiopia. Generally, it can be concluded that the current actuarial practice in Ethiopia is substantially poor and underdeveloped. Some of the reasons for the underdeveloped actuarial practice in Ethiopia include; limited roles played by actuaries and actuarial firms, absence of good actuarial practice regulatory framework, absence of qualified actuaries and actuarial firms, limited participation of foreign actuarial firms, absence of good actuarial education and qualification system, lack of public awareness about actuarial practice and the role of actuaries, limited support

provided by the government in promoting the actuarial practice, and insufficient support provided by international actuarial organizations to promote the profession in Ethiopia.

Among the parameters used to measure the degree of poorness (underdevelopment), unavailability of domestic actuarial firms ranks first with 25 frequency count and 89% degree of extreme poorness followed by unavailability of qualified actuaries with 24 count and 86% degree of extreme poorness. The availability of actuarial education and qualification system is also one of the top statements ranked as very poor with 23 frequency count and 82% degree of extreme poorness. This implies that the above top three factors contributed much for the poorness and underdevelopment of actuarial practice in Ethiopia.

4.1.5 Analysis of the importance of actuarial practice in Ethiopia

Questions regarding the importance of actuarial practice in Ethiopia are the central theme of the survey questionnaire where various aspects of a good actuarial practice are examined in the light of parameters that can measure its importance to a country's economic development, mainly, the insurance and financial sectors. The questions are intended to examine the respondents' attitude towards the importance of actuarial practice in the country.

Likert type scale (Summated scale) is applied in the questionnaire containing ten statements that allow the respondents to express their attitude either favorably or unfavorably in terms of several degrees of agreement or disagreement. The degree of agreement to the statements is represented as: 1 = Strongly Disagree 2 = Disagree, 3 = Ambivalent, 4 = Agree and 5 = Strongly Agree. Accordingly, all of the respondents have expressed their attitudes towards the statements and the responses obtained are summarized in table 4.6 below.

Table 4.6 : Respondents' attitude towards the importance of actuarial practice in Ethiopia

No	Statements	Frequency Count				
		1	**2**	**3**	**4**	**5**
1	*Actuarial practice is important for the development of the insurance and financial sectors in Ethiopia.*				2	26
2	*Actuarial practice is important to design and develop quality insurance and financial products in Ethiopia.*				4	24
3	*It is important to establish a well structured and regulated actuarial practice in Ethiopia.*				6	22
4	*It is important to increase the number of qualified actuaries and domestic actuarial firms in Ethiopia.*				10	18
5	*It is important to create public awareness about actuaries and their role in the socioeconomic activities of the society.*			4	14	10
6	*It is important to revise the Ethiopian actuarial regulatory framework based on the international actuarial standards of practice.*			1	12	15
7	*It is important to establish a national actuarial association in Ethiopia which promotes actuarial practice through education, research, and professional development.*		1	2	8	17
8	*It is important to maintain an in house actuary and actuarial department for effective actuarial practice and insurance business regulation.*			2	8	18
9	*It is important to provide actuarial science academic programs by Ethiopian universities and colleges.*				5	23
10	*It is important to support actuarial students on their path to qualification so as to increase the number of qualified actuaries in Ethiopia.*				9	19
TOTAL			**1**	**9**	**78**	**192**

Source: SPSS Survey Analysis

Table 4.6, shows that most of the respondents replied favorably to the statements provided as measurement of the importance of actuarial practice in Ethiopia where 96% of the responses fall under the "Strongly Agree" (69%) and "Agree" (27%) measurement boxes. However, about 3.2% of the responses fall under the "Ambivalent" and nly 0.7% of the responses were unfavorably answered which fall under the "Disagree" measurement boxes. This shows that almost all of the respondents agree on the importance of actuarial practice in Ethiopia. Among the statements which have been strongly agreed by the majority of the respondents, the first statement ranks top with 26 frequency count and 92% degree of strong agreement followed by the second statement with 24 frequency count and 85% degree of strong agreement. This implies that actuarial practice is very

important for the development of the insurance and financial sectors in Ethiopia; and to design and develop quality insurance and financial products in Ethiopia as well. On the other hand, the seventh statement is the only disagreed statement even though it has been disagreed by a single respondent. It is also one of the ambivalent statements with 2 frequency count and 7% degree of disagreement. This implies that it is important to establish a national actuarial association in Ethiopia. But, it is not feasible or attainable in the near future because the country's current actuarial practice is very poor and underdeveloped. Moreover, the fifth statement ranks first from those ambivalently agreed statements with 4 count and 14% degree of ambivalence. This implies that it is important to create public awareness about actuaries and their role in the insurance and financial sectors. But, the public awareness creation should focus mainly on those people who are engaged in the insurance and financial sectors rather than expanding to the general public.

4.1.6 Analysis of the degree of importance

The final section of the survey questionnaire contains questions that measure the degree of importance of actuarial practice in Ethiopia. The questions were intended to ensure respondents' attitude towards the main research objective ("The importance of actuarial practice in Ethiopia") and answer the main research questions in a comprehensive way. The questions contain there statements that help to measure the degree of importance with corresponding measurement scale of a Likert type five point scale. The measurement scales measure the degree of importance as 1 = Unimportant 2 = Less Important, 3 = Important, 4 = Very Important and 5 = Critically Important. Accordingly all of the respondents have expressed their attitudes towards the statements and the responses obtained are summarized in table 4.7 below.

Table 4.7 : Respondents' attitude towards the degree of importance

	Statements	**Frequency Count**				
		1	**2**	**3**	**4**	**5**
1	*How important is actuarial practice to the Ethiopian insurance and financial sectors?*				7	21
2	*How important is the role of actuaries and actuarial firms in promoting actuarial practice in Ethiopia?*				19	9
3	*How important is the role of the regulatory regime in promoting actuarial practice in Ethiopia?*			3	11	14
TOTAL				**3**	**37**	**44**

Table 4.7 shows that the majority of the respondents responded positively to the statements provided as measurement of the degree of importance of actuarial practice in Ethiopia. Out of the total 84 responses, 44 responses (52%) fall under the "Critically Important" column and 37 responses (44%) fall under the "Very Important" column. Only 3 responses (4%) fall under "Important" column. On the contrary, no response fall under "Unimportant" and "Less Important" columns. Among the statements provided to measure the degree of importance, the importance of actuarial practice to the Ethiopian insurance and financial sectors is rated as critically important with 21 frequency count and 75% degree of importance. The role of actuaries and actuarial firms in promoting actuarial practice in Ethiopia is rated as very important with 19 frequency count and 68% degree of importance. The role of the regulatory regime in promoting actuarial practice in Ethiopia is rated as critically important with 14 frequency count and 50% degree of importance. Therefore, it can be deduced that actuarial practice is critically important in Ethiopia, particularly to the Ethiopian insurance and financial sectors. The role of actuaries, actuarial firms, and the regulatory regime is very important in promoting actuarial practice in Ethiopia.

4.2 ANALYSIS OF QUALITATIVE DATA (KEY INFORMANTS INTERVIEW)

Analysis of qualitative data presents the findings derived from analyzing the data collected by the key informants interview. The interview was conducted by the help of an interview guide containing 10 semi structured questions designed for such purpose. The interview guide is copied and distributed to all key informants in organizations included in the sample. The responses provided by each respondent is recorded by a digital audio device and transcribed to produce summary of findings. Summary of the findings is discussed thematically based on the interview questions and presented as follows;

1. **Could you tell me about your organization and your role in the organization?**

The first question in the key informants interview is intended to gather qualitative data regarding the organization which the respondents are representing as well as the role of the respondent in the organization. In response to the above question, respondents provided details about their organization and their role in the organization. The responses are summarized and presented in table 4.8 below;

Table 4.8 : Key Informant Interviewees' Organizations and Roles

About the organization	Role in the organization
BNG Actuarial and Financial Services PLC *was the first domestic actuarial consulting firm owned and managed by Ethiopian Actuary. The firm has been licensed by the National Bank of Ethiopia and provided actuarial consulting services to the Ethiopian insurance and financial market for several years since 2000. The firm provided the service in partnership with Alexander Forbes East Africa, a specialized actuarial consulting firm based in Nairobi, Kenya. BNG is not currently operating in the Ethiopian market due to various reasons. Alexander Forbes, however, is still the main actuarial service provider to the Ethiopian Insurance market, mainly, valuation of long term insurance business.*	*The respondent is the owner and founder of the firm. The respondent served as Managing Director of the firm and worked as an actuarial consultant to the Ethiopian insurance and financial market. Since the firm ceased its operation, the respondent is not currently managing the firm.*
Milliman *is among the world's largest providers of actuarial, risk management, and related technology and data solutions. The firm's consulting and advanced analytics capabilities encompass healthcare, property and casualty insurance, life insurance and financial services, and employee benefits. The firm has more than 3,500 employees and revenue of US$1 billion in 2017, the firm serves the full spectrum of business, financial, government, union, education, and nonprofit organizations. Founded in 1947, Milliman today has offices in principal cities worldwide, covering markets in North America, Latin America, Europe, Asia and the Pacific, the Middle East, and Africa. Milliman is owned and managed by approximately 460 principals who have been elected in recognition of their technical, professional, and business achievements.*	*The respondent is a Fellow of the Society of Actuaries (FSA) and Member of American Academy of Actuaries (MAAA). The respondent is a Principal and Consulting Actuary in Milliman Inc. The respondent is one of the 460 principals who has oversight of practices in Tampa, Florida as well as Indianapolis, Indiana, USA. The respondent has experience in the Ethiopian insurance market with Milliman's Micro Assist initiative which helped Ethiopian insurance organizations put in place actuarial standards for pricing Microinsurance products. Milliman undertook this project in cooperation with the Microinsurance Innovation Facility of the International Labor Organization (ILO). During the project the respondent provided an onsite training focusing on the actuarial aspects of Microinsurance..*

Insurance Supervision Directorate (ISD) of the National Bank of Ethiopia (NBE) *is the Ethiopian insurance market regulator The directorate is responsible to regulate insurance business as well as actuarial practice in Ethiopia. The directorate uses its regulatory tools (Directives) to license and supervise actuaries in Ethiopia.*	*The respondent is Director of the Insurance Supervision Directorate. The main role of the respondent is to direct and manage the Directorate's operational activities including licensing and supervising insurers and insurance market players in Ethiopia. The director is also involved in the supervision of actuarial practice in Ethiopia.*
Ethiopian Insurance Corporation (EIC) *is a state owned composite insurer. The corporation has been providing both life and non life insurance services to the Ethiopian market for more than 40 years. The corporation is the only financial institution in Ethiopia which provides actuarial qualification support.*	*The respondent is Director of Life Addis District, a life insurance department within the life insurance directorate of Ethiopian Insurance Corporation headquarters. The main role of the respondent is to direct and mange life insurance business in the district.*
African Reinsurance Corporation (Africa Re) *is a reinsurance company established in 1976 as Africa's first Continental Reinsurer. The company operates in 41 countries of the African Union. The Corporation's Ethiopia office provides reinsurance service to Ethiopian insurers. The office also provides technical and capacity building support to insurance and reinsurance professionals in Ethiopia.*	*The respondent is Director of Africa Re's Ethiopia Office. The main role of the respondent is to oversee the operational activities of the Corporation's Ethiopia office, mainly, risk management and underwriting reinsurance businesses in Ethiopia. The respondent also provides technical support and trainings on various insurance and risk management topics.*
Tega Insurance Broker *is one of the domestic insurance brokers with extensive experience in insurance brokerage and mediation business in Ethiopia.*	*The respondent is the General Manager of the brokerage firm with more than 35 years of experience in the insurance industry. The respondent also involves in insurance consulting business including training and rate making.*
The Ethiopian Health Insurance Agency *is established in 2010 as an autonomous federal organ with main responsibility of providing social health insurance to the Ethiopian people. The agency currently is providing Community Based Health Insurance (CBHI) as a pilot project and preparing to launch the Social Health Insurance (SHI) scheme.*	*The respondent is Director of the Members Enrolment and Contribution Affairs Directorate. The main role of the respondent is to direct and manage the Directorate's operational activities. The respondent is also responsible to review the financial sustainability analysis models and other actuarial models developed by external actuaries.*

The Public Servants Social Security Agency *is established in 1961 with the objective of strengthening and expanding social security programs in Ethiopia. The agency has the duty to cause periodical actuarial valuation and review the social security funds. For such purpose, the agency recently established an actuarial department.*	*The respondent is Director of the Social Security Development Excellence and Actuarial Center Directorate. The respondent is responsible to direct and manage the operational activities of the directorate including preparing data for periodic actuarial valuation.*
Addis Ababa University (AAU*), College of Natural Sciences, Department of Statistics is established to train middle and higher level statisticians to meet the demands of the socio-economic, business and development sectors in the country. The department offers an optional 3 credit hours Actuarial Statistics course.*	*The respondent is Ass. Professor and Head of the Department of statistics. The role of the respondent is to oversee the overall activities of the department including preparing course materials, conducting researches, lecturing and handling student affairs.*
Abt Associates Inc. *is a non governmental organization which implements the USAID Health Sector Financing Reform/Health Finance & Governance (HSFR/HFG) Project in Ethiopia. The organization provides technical support to the Ethiopian Health Insurance Agency.*	*The respondent is a Planning and Programme Specialist in Abt Associates Inc. The main role of the respondent is to provide technical support to the Ethiopian Health Insurance Agency including planning, research, monitoring, evaluation, and risk management. The respondent was member of the financial sustainability analytics team.*

2. How do you describe the importance of actuarial practice in Ethiopia?

All of the respondents described actuarial practice as a vital component of the Ethiopian insurance and financial sectors. Respondents representing actuarial firms (BNG and Milliman) described the actuarial practice as a central part of the Ethiopian insurance and financial sectors which supports the increasing need of pricing, risk management, funding, and financial reporting services. The firms also affirmed that actuarial skills have the ability to influence many aspects of all citizens through life, health, property, and pension insurance. The regulator (ISD) also stated that actuarial practice is a key component for insurance business regulation and supervision in Ethiopia. Respondents representing the composite insurer, reinsurer and insurance broker, on the other hand, described actuarial practice as a fundamental aspect of the commercial insurance business in Ethiopia. Respondents representing social health insurance, social security and pension, and development organizations described actuarial practice as a significant input for the public protection schemes without which the country's social security programs wouldn't have been

effectively implemented. Moreover, the respondent representing the academic sector reassured the importance of actuarial practice in Ethiopia.

3. **How does the actuarial practice influence the Ethiopian insurance and financial sectors?**

This question was intended to identify respondents' opinion regarding the impact of actuarial practice in the Ethiopian insurance and financial sectors. Most of the respondents replied that actuarial practice positively influences the country's insurance and financial sectors where the sectors are significantly dependent on the analytical inputs provided by actuaries and actuarial firms. The actuarial firms confirmed that actuarial skills can influence many aspects of the Ethiopian insurance and financial markets with a unique knowledge to use quantitative analysis and risk management skills to ensure correctly priced, reserved, and managed products. The regulator also affirmed that actuarial practice constructively influence the regulation and supervision of the Ethiopian insurance and financial market by availing scientific methods of supervision. Respondents representing the composite insurer, reinsurer and insurance broker stated that actuarial practice supportively influence the Ethiopian commercial insurance market by promoting fair competition, setting premium rate which is commensurate with the risk carried by insurers, supporting new product development, and applying scientific ways of risk assessment and management. Respondents representing social health insurance, social security and pension, and development organizations stated that actuarial practice helpfully influence the public financing programs of the country including health financing, pension scheme development, as well as developing and implementing public financing policies.

4. **What do you think is the role of the actuarial regulatory regime in promoting the actuarial practice in Ethiopia?**

Most of the respondents were hesitant to reply to this question as they were unaware of the existence of any actuarial regulatory regime that can play role in promoting the actuarial practice in Ethiopia. The respondents also criticized the existing actuarial regulatory framework in Ethiopia as an outdated and confined to licensing and supervising actuarial valuation business only. Some respondents (E.g. Milliman) recommended consultation of the International Actuarial Association

to provide assistance in establishing a regime and promoting the actuarial profession in the country. The respondents also stressed that a strong regulatory regime will help mandate the need for the profession and foster its development. The regulator (ISD) insisted the existence of qualified actuaries and actuarial firms that can influence the development of actuarial practice in the country so that both the local and international regulatory regime can play material role. The regulator, however, claims the issuance of directives which invites actuaries and actuarial firms to involve in actuarial valuation business and promote the practice in the country. Existence of very small and underdeveloped insurance market in the country hindered the regulator to mandate its supervisory tools. Respondents in the commercial insurance as well as social security sectors demanded the development of the country's actuarial practice for a regulatory regime to play relevant role in promoting the practice in Ethiopia.

5. **What are the roles played by actuaries and actuarial firms in promoting the actuarial practice in Ethiopia?**

This question is answered by most respondents doubtfully with higher degree of uncertainty about the existence of actuaries and actuarial firms that are capable of promoting the practice in Ethiopia. However, a respondent representing the domestic actuarial firm (BNG) claims that the firm has played a significant role in establishing the first Ethiopian actuarial service provider owned and managed by an Ethiopian actuary. As such, the firm contributed its part for the promotion of practice in Ethiopia. Moreover, as professional actuary with extensive experience, the respondent has served in various actuarial roles in the Ethiopian social security and insurance institutions; which he contributed in actuarial valuation, product development, and providing trainings. Milliman, On the other hand, being an international actuarial consultant played a considerable role in promoting the practice in Ethiopia. The Milliman's MicroAssist initiative project helped Ethiopian insurers put in place actuarial standards for pricing Microinsurance products. The respondent has provided an onsite training for executives and other high-level staff from Ethiopian insurance companies, microfinance institutions, and the government regulatory body, focusing on the actuarial aspects of Microinsurance: rating, data sources, and overall actuarial best practices. Milliman is also currently providing consulting services to Microinsurance projects in Ethiopia. The respondent, however, emphasized that actuaries and actuarial firms providing service with a limited interaction of consulting assignments and conducting training seminars in Ethiopia have

only a limited role in promoting the practice in the country. Apart from the claims made by the actuarial firms, other respondents representing the regulator, commercial insurance players and public financing agencies agree on the limited and insignificant role of actuaries and actuarial firms in promoting the practice in Ethiopia.

6. How do you describe the importance of actuarial practice in your organization?

Most respondents replied this question by relating the importance of actuarial practice to their business engagement and operational spheres. The respondent representing the domestic actuarial firm (BNG) asserted that actuarial practice is at the center of the firm as it was established to provide actuarial and financial services to the Ethiopian insurance and financial market. However, absence of a well developed actuarial practice in Ethiopia (absence of actuarial graduates, well organized data, actuarial modeling softwares, and mature insurance and financial market) forced the firm to look for a partnership from Kenya. The respondent representing the international actuarial firm (Milliman) claimed that the firm was founded by actuaries over 70 years ago and actuarial practice is at the core of what they do and what they are known for around the world. The firm is also one of the world's largest employers of actuaries.

The respondent representing the regulatory body (ISD) described actuarial practice as one of the critical skills required to supervise insurance business in Ethiopia. The regulator requires actuarial advice to license and examine the insurers' and auxiliaries' business activities in Ethiopia. This includes pre-licensing actuarial certification of insurers, mainly for long term insurance business; so as to confirm the proper arrangement of rates, terms and conditions for each product to be carried. The regulator also relies on actuarial advice, including; to conduct periodic evaluation of financial conditions of insurers, to ensure proper allocation of reserves, to asses investment portfolio, to review premium rates, to approve profit declaration, to approve new product development, to conduct researches and feasibility studies, to issue directives and to review the insurance business regulatory framework.

The respondent representing composite insurer described that actuarial practice is crucial in the organization's long term insurance business activities, especially for valuation of life insurance business, product development and setting premium rates (pricing). The respondent representing

the reinsurer (Africa Re) also confirmed that actuarial practice is vital for the organization's business activities. Having a well organized actuarial department in the headquarters (Lagos, Nigeria), the organization's Ethiopia office depends on actuarial advice to assess and underwrite reinsurance business in Ethiopia. The respondent representing the insurance broker described actuarial practice as an important tool for consulting customers as to the scientific way of risk management and to ensure prudent underwriting practices among insurers.

The respondent representing the social insurer (EHIA) regarded actuarial practice as a very important input for the development of social health insurance schemes in Ethiopia. The organization relied on the advise of foreign actuaries who designed models for the organization's financial sustainability analysis. The respondent remarked that actuarial inputs were very important to determine the amount of contribution in to the social insurance pool and forecast the adequacy of the insurance fund to meet its future liabilities. Similarly, the respondent representing the social security agency (PSSSA) affirmed that actuarial practice is the back bone of the organization to the extent that the organization established an actuarial department to carry out actuarial tasks internally. The organization relies on actuarial input to evaluate the country's pension fund available for retirement pay and periodically revise the amount of contribution. The organization also causes periodic actuarial evaluation of the pension fund in collaboration with international organizations such as ILO and ISSA. The importance of actuarial practice in the academic institution (AAU) and development organization (Abt) is not directly traceable to the operational activities of the organizations. Yet, the academic institution requires the existence of actuarial practice to design curriculum for actuarial science courses that can help to produce actuarial graduates. The development organization also applies actuarial inputs to provide technical advise in the process of modeling the financial sustainability analysis of the health insurance fund to support the Ethiopian Health Insurance Agency overcome its analytical challenges in designing and implementing health insurance schemes for the first time in Ethiopia.

7. How do you see the status and development of actuarial practice in Ethiopia?

This question is answered disapprovingly by most respondents involved in the interview. Almost all of the respondents described the Ethiopian actuarial practice as very poor and underdeveloped. Some respondents affirmed that the Ethiopian actuarial practice is at its infancy characterized by

the absence of domestic actuaries and actuarial firms. Others asserted the Ethiopian actuarial practice as underdeveloped by comparing it with neighboring countries like Kenya. Generally, all respondents agree that actuarial practice in Ethiopia is underdeveloped to extent that many Ethiopian organizations operating in the country's insurance and financial sectors seek actuarial service from other countries. Therefore, it can be deduced that, if there exists an actuarial practice in Ethiopia, it is being practiced by foreign practitioners not by Ethiopian actuaries or actuarial firms. This is confirmed by the respondents with instances: the regulator uses foreign actuarial service providers from Kenya, South Africa, UK and USA; the composite insurer outsources actuarial service to Kenyan firms; the reinsurer consults actuaries from its headquarters in Nigeria; the insurance broker consults pricing actuaries from UK; the health insurer acquired actuarial service from the World Bank; the social security agency obtains actuarial service from ILO; the development organization partnered with foreign actuaries; and the academic institution halted its actuarial course due to lack of Ethiopian scholars specializing in actuarial science.

8. What are the reasons behind the underdeveloped actuarial practice in Ethiopia?

Respondents pointed out some of the reasons behind the underdeveloped actuarial practice in Ethiopia. The main reasons stated by respondents include:

- *Lack of understanding about the actuarial profession and the role of actuaries among the Ethiopian insurance and financial market players as well as the general public;*
- *Absence of actuarial graduates, qualified actuaries and actuarial firms;*
- *Outdated and very narrow actuarial regulatory framework;*
- *The actuarial professional path is expensive, rigorous, time taking and non-rewarding in the Ethiopian context.*
- *Absence of Ethiopian academic institutions providing actuarial science courses and unavailability of actuarial science scholars.*
- *Absence of actuarial scholarship schemes and incentives by employers to sponsor their employees for actuarial exams and qualification routes.*
- *Low motivation to peruse actuarial science as a profession, employee turnover after qualification and brain drain to developed countries.*
- *Lack of sufficiently organized data and software for actuarial modeling and analysis.*

- *Existence of very small insurance and financial market requiring limited actuarial practice with limited employment opportunities.*

9. What possible solutions do you recommend to promote actuarial practice in Ethiopia?

In response to this questions respondents recommended the following possible solutions to promote actuarial practice in Ethiopia.

- *Increase public awareness, mainly in the insurance and financial sectors about the actuarial profession and the role of actuaries through education and research;*
- *Increase the number of qualified actuaries and actuarial firms in Ethiopia by availing educational and professional development opportunities to Ethiopian citizens;*
- *Review the Ethiopian actuarial regulatory framework allowing the academic and professional requirements to be more lenient to avoid entry barriers;*
- *Partner with actuarial professional organizations like IAA, SoA and IFoA to work on promoting actuarial practice as a needed profession in Ethiopia;*
- *Create awareness among the Ethiopian insurance and financial market players about the important skills that an actuary or actuarial firm brings to their business success;*
- *The regulator and other concerned parties should work with Ethiopian academic institutions to develop actuarial science curriculum;*
- *The regulator as well as other insurance and financial institutions should provide actuarial scholarship schemes and incentives to their employees;*
- *The regulatory, insurers and other financial institutions should promote actuarial practice by creating employment opportunities to Ethiopian professionals.*

10. Any other comments related to the study?

This question allows respondents to unreservedly forward their comments regarding the study. Some respondents left this question unanswered. Some others, yet, encouraged similar studies on the subject which may create public awareness and promote actuarial practice in Ethiopia.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents summary of findings, conclusions and recommendations. The summary of findings presents the findings derived from analysis of both primary and secondary data. The conclusions presents the main inferences drown from the findings in connection with the research objectives. Finally, the recommendations present suggestions on the possible ways of answering the questions that remain unanswered along with new areas for further research identified.

5.1 SUMMARY OF FINDINGS

The main objective of the study is to analyze and determine the importance of actuarial practice in Ethiopia. To achieve this objective, the study used both primary and secondary sources of data. The findings produced as the result of analyzing the primary and secondary data confirmed the importance of actuarial practice in Ethiopia theoretically as well as practically. Moreover, the study accomplished the specific objectives including: *identifying how actuarial practice influence the Ethiopian insurance and financial sectors*; *describing the role of actuaries and actuarial firms in promoting the practice in Ethiopia*; and *examining the role of the actuarial regulatory regime in promoting the practice in Ethiopia.*

The findings derived from analysis of secondary data confirmed the importance of actuarial practice in Ethiopia theoretically. Findings of secondary data is produced from analysis of different publications which has been collected by desk review and presented in the literature review. The secondary data produced theoretical arguments which briefly described the concept of actuarial practice, historical background of actuarial practice, definition and classification of actuaries, actuarial practice areas, the role of actuaries in the insurance and financial sectors, the actuarial practice regulatory regime, and the actuarial practice in Ethiopia. The secondary data is mainly used to substantiate the argument on the importance of actuarial practice in Ethiopia, especially in the context of the Ethiopian insurance and financial sectors.

The findings produced as the result of analyzing primary data practically validated the importance of actuarial practice in Ethiopia. Primary data is collected by applying both quantitative as well as qualitative techniques. The quantitative data is collected by using survey method with questionnaire as tool of data collection. The qualitative data, on the other hand, is collected using key informants interview with semi-structured interview as tool of data collection. The findings of the quantitative analysis show that actuarial practice is 100% important to the Ethiopian insurance and financial sectors where respondents rated its degree of importance as 52% critically important, 44% very important and 4% important. The quantitative analysis also measured the importance of actuarial practice in Ethiopia within the context of 10 statements that measured its practical importance with the corresponding areas of importance. As a result, 96% of the responses approved the importance of actuarial practice in Ethiopia with 67% strong agreement and 27% moderate agreement. The qualitative findings, alternatively, reassured the importance of actuarial practice in Ethiopia that all of the respondents included in the key informants interview described actuarial practice as a vital component of the Ethiopian insurance and financial sectors. Respondents also asserted the importance of actuarial practice in their own business engagements and operational spheres. Therefore, the primary data validated the importance of actuarial practice in Ethiopia.

With regard to *identifying how actuarial practice influence the Ethiopian insurance and financial sectors,* the secondary data detailing the historical background and current status of actuarial practice in Ethiopia produced findings on how actuarial practice influenced the Ethiopian insurance and financial sectors, mainly the long term insurance business. The comparative analysis of secondary data depicted the presence of poor actuarial practice in Ethiopia which is considered as one of the main causes for the country's underdeveloped insurance and financial market.

Findings on the primary data analysis demonstrated that actuarial practice positively influence the Ethiopian insurance and financial sectors. The quantitative analysis of the survey questionnaire shows that almost all of the respondents included in the sample are representatives of organizations operating within the Ethiopian insurance and financial sectors. This implies that actuarial practice, definitely influences the Ethiopian insurance and financial sectors; in such a way that these organizations require actuarial services for their operational activities; which they either establish a department or outsource to external actuarial service providers. Among these organizations, only the pension and social security agencies have a job title or job description for actuarial positions;

yet again, an in-house actuary and actuarial department; even though with a limited actuarial involvement. Organizations in the commercial insurance sector use outsourced actuarial services mainly for life insurance business valuation, pricing, product development, micro insurance business development, and to conduct research on the country's insurance market operations. These organizations obtain outsourced actuarial services from foreign actuary/actuarial firms licensed outside Ethiopia. This, again implies that the Ethiopian actuarial practice is poor and underdeveloped characterized by the absence of domestic actuaries and actuarial firms. The quantitative analysis justified the possible reasons for outsourcing actuarial services to external (foreign) actuaries. Among the reasons, absence of strict regulatory requirement to appoint an in house actuary and shortage of qualified actuaries that can perform the actuarial work are ranked as major reasons. The quantitative analysis further produced a concrete finding leading to a conclusion that the Ethiopian actuarial practice is substantially poor and underdeveloped. The finding show that the current actuarial practice in Ethiopia is rated as 97% poor with responses reflecting the degree of poorness as 71% very poor and 26% poor. The poor actuarial practice negatively influenced the Ethiopian insurance and financial sectors resulting in the existence of underdeveloped insurance and financial market in the country.

The qualitative analysis, on the other hand, produced findings which reflect the positive impact of actuarial practice in the Ethiopian insurance and financial sectors. Most respondents stated that actuarial practice positively influences the country's insurance and financial sectors where the sectors are significantly dependent on the analytical inputs provided by actuaries and actuarial firms. Actuarial skills can influence many aspects of the Ethiopian insurance and financial markets with a unique knowledge to use quantitative analysis and risk management skills to ensure correctly priced, reserved, and managed products. Actuarial practice constructively influence the regulation and supervision of the Ethiopian insurance and financial market by availing scientific methods of insurance and financial business supervision. Actuarial practice supportively influence the Ethiopian commercial insurance market by promoting fair competition, setting premium rate which is commensurate with the risk carried by insurers, assisting new products development, and applying scientific ways of risk assessment and management. Actuarial practice helpfully influence the public financing programs of the country including health financing, pension scheme development, as well as developing and implementing public financing policies.

In *describing the role of actuaries and actuarial firms in promoting the practice in Ethiopia*, the study, mainly relied on secondary sources of data where the role of actuaries and actuarial institutions is briefly described in the literature review. The secondary data illustrated the role of actuaries and actuarial firms in promoting the practice in the international domain; essentially in the insurance and financial sectors. The secondary data, however, show that actuaries and actuarial firms play limited role in promoting the practice in Ethiopia.

Findings from the analysis of primary data presents a simple quantitative analysis to measure the role of actuaries and actuarial firms in promoting actuarial practice in Ethiopia which is rated by respondents as very important with 68% degree of importance. The qualitative findings, on the other hand, complement the findings of the secondary data. As such, the role of actuaries and actuarial firms in promoting the practice in Ethiopia is very limited. It is emphasized that actuaries and actuarial firms providing service to the Ethiopian market, with a limited interaction of consulting assignments and conducting training seminars in Ethiopia have only a limited role to promote the practice in the country.

With regard to examining *the role of the actuarial regulatory regime in promoting the practice in Ethiopia*, the findings of secondary data analysis presented review of various publications on the international as well as the Ethiopian actuarial practice regulatory frameworks. The secondary data presented details on the requirements of a typical actuarial regulatory regime in promoting the practice in a country. The data presented details on membership requirement for a country's actuarial association as prescribed by the IAA, the role of the association, and the regulatory tools available for the association in promoting the practice in the country. Furthermore, the secondary data produced comparative analysis of the status and role of actuarial associations in east African countries with Ethiopia. Finally, the secondary data briefly discussed the Ethiopian actuarial practice regulatory framework. The findings derived from the secondary data analysis show that Ethiopia doesn't have an actuarial association which is a full or associate member of the IAA, and dedicated to promote the practice in the country. As such, there is no role the actuarial regulatory regime is playing in promoting the practice in Ethiopia. The role of the Ethiopian regulatory body (ISD) is limited to the issuance of supervisory directives and implementation of the insurance business proclamations.

The findings of the primary data presented simple quantitative analysis examining the importance of the role of the regulatory regime in promoting actuarial practice in Ethiopia which is rated by respondents as critically important with 50% degree of importance. The qualitative findings, on the other hand, substantiated the secondary data in confirming the absence of any role which the actuarial regulatory regime is currently playing to promote the Ethiopian actuarial practice. Respondents also criticized the existing actuarial regulatory framework in Ethiopia as outdated and confined to licensing and supervising actuarial valuation business only.

5.2 CONCLUSIONS

The aim of this research project is to analyze and determine the importance of actuarial practice in Ethiopia with three supplementary objectives encompassing the key areas of actuarial practice which the study tries to address within the context of the main objective. As a result, the findings demonstrated the successful accomplishment of the research objectives where the research questions are answered by the collection and analysis of primary as well as secondary data. The summary of findings illustrated how the research questions are answered within the framework of the research objectives. Therefore, based on the findings of the study, it can be determined that actuarial practice is very important in Ethiopia.

Actuarial practice is important in the Ethiopian insurance and financial sectors and contributes significantly to the development of the sectors. Actuarial practice is important to design and develop quality insurance and financial products in Ethiopia where actuaries with a unique knowledge to use quantitative analysis and risk management skills play important role in ensuring correctly priced, reserved, and managed products. Actuarial practice positively influences the Ethiopian insurance and financial sectors; and the sectors are significantly dependent on the analytical inputs provided by actuaries and actuarial firms. In spite of this, the current actuarial practice in Ethiopia is substantially poor and underdeveloped characterized by the absence of domestic actuaries and actuarial firms. Hence, it can be concluded that the poor actuarial practice is one of the major reasons behind the country's underdeveloped insurance and financial sectors.

The potential application of actuarial skills is virtually unlimited. Actuaries, generally, fulfill many roles in a broad range of environments, including insurance companies, health organizations, pension plans, risk management, government, regulatory regimes, and in other fields. As such,

actuaries and actuarial firms play important role in promoting a country's actuarial practice. However, the role of actuaries and actuarial firms in promoting the practice in Ethiopia is very limited. Consequently, it can be concluded that foreign actuaries and actuarial firms providing service to the Ethiopian market, with a limited interaction of consulting assignments and conducting training seminars have only a limited role to promote the practice in the country.

The role of the actuarial regulatory regime in promoting the practice in Ethiopia is critically important. The IAA being a unique international organization dedicated to the research, education, and development of the actuarial profession and associations internationally, provided regulatory guidelines allowing that actuarial standards, guidance and educational notes to be developed at an international level through the IAA, at a regional level through regional actuarial associations, or at the local level. In spite of the IAA regulatory provisions, Ethiopia doesn't have any actuarial association or professional organization; which is a full or associate member of the IAA, and dedicated to promote the practice through education, research and professional development in the country. As such, the role which should have been played by the actuarial regulatory regime in promoting the practice in Ethiopia is missed. Therefore, it can be concluded that, with the absence of an actuarial association, the role of the Ethiopian regulatory body (ISD) is limited and confined to licensing and supervising actuarial valuation business only.

5.3 RECOMMENDATIONS

The importance of actuarial practice in Ethiopia is unquestionably approved by the inferences drawn from the findings of a descriptive research. However, the findings, on the other hand, show some important areas which should be addressed by the stakeholders of a sound actuarial practice. In order to effectively materialize the role of actuaries, actuarial firms and actuarial regulatory regime in promoting the practice in Ethiopia, and thereby contributing for the development of the country's insurance and financial sectors, the following recommendations are suggested:

- Ethiopian as well as international stakeholders of actuarial practice should create public awareness about the importance of actuarial practice and the role of actuaries and actuarial firms in the socioeconomic activities of the society, especially in the insurance and financial sectors of the economy;

- The Ethiopian government as well as the regulator (ISD) should work hard to increase the number of domestic actuaries and actuarial firms in Ethiopia by availing educational, research and professional development opportunities to citizens;

- The Ethiopian government and the regulator (ISD) should work with international actuarial professional organizations like IAA, SoA and IFoA to review the actuarial regulatory frameworks and promote the practice in the country;

- The regulator as well as organizations involved in the insurance and financial sectors of the economy should promote actuarial practice in the country by availing job opportunities for actuarial positions, establishing actuarial departments and supporting actuarial students on their path to actuarial qualifications;

- The Ethiopian government should rigorously encourage academic institutions (universities and colleges) to develop actuarial science educational programs based on the prevailing educational guidelines of the IAA so as to produce actuarial graduates; who then with a relevant academic background, achieve international actuarial credentials. So that, the number of domestic actuaries and actuarial firms will increase to play a material role in promoting the practice in Ethiopia, thereby significantly contributing for the development of the country's insurance and financial sectors.

- Academic institutions and other concerned professional organizations should give due attention to the importance of actuarial practice in the Ethiopian insurance and financial sectors and extend further research projects which promote actuarial practice in the country and answer similar research questions beyond the scope of this study.

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APPENDIXES

APPENDIX – I : SURVEY QUESTIONNAIRE

THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA QUESTIONNAIRE

INDIRA GANDHI NATIONAL OPEN UNIVERSITY, ADDIS ABABA STUDY CENTRE

Dear Respondent,

I am a post graduate student at Indira Gandhi National Open University, School of Social Sciences, M.A. Economics Programme. I am currently undertaking a research project work titled "THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA" in partial fulfillment of the requirements for the award of the Degree – Master of Arts in Economics. Your organization is regarded as one of the information sources for the successful completion of the research project. Hence, your genuine and unreserved response to the questions will enable the study to come up with commendable findings. This research project is meant for academic purposes and the responses given will be treated with utmost confidentiality and for academic purposes only. I would like to thank you in advance for your kind cooperation in devoting your valuable time to fill the questionnaire and return it timely.

General Instructions

i. Do not write your name anywhere in the questionnaire.
ii. For closed-ended questions, encircle only the responses of your choice.
iii. For open-ended questions, write your responses on the space provided.
iv. Put a tick (√) mark in the box where the question requires box marking.

Questionnaire Identification Number : |_____|_____|_____|

Date : _____

Section I : General Information

1. Name of your organization_____

_____

2. Type of your organization's business?

a) Actuary or Actuarial firm
b) Regulator
c) Composite Insurer (Life & General)
d) General Insurer
e) Reinsurer
f) Insurance Broker
g) Insurance Association
h) Micro Insurer
i) Social Health Insurer
j) Pension and Social Security
k) Investment Banking
l) Academic Institution
m) Research & Development
n) Other _____

3. How long have you served in the organization?

a) Less than 3 years
b) 3 – 5 years
c) 5 – 10 years
d) More than 10 Years

4. What is your position in the organization? _____

_____

5. Actuarial qualification achieved, if any?

a) Student Actuary
b) Associate Actuary
c) Fellow Actuary
d) None

6. Name of the actuarial institution providing the qualification?_____

_____

7. Does your organization have an actuarial educational scheme or a scholarship program to sponsor students for actuarial exams and qualification routes?

   a) Yes b) No

8. Does your organization have a job title or job description for actuarial positions?

   a) Yes b) No

9. Does your organization have an in house actuary or actuarial department (work unit) dedicated to perform actuarial valuation works?

   a) Yes b) No

10. If your answer is "Yes" to question No. 9, please state the number of actuaries in the department_____, and the role of actuaries in the department _____

11. Does your organization use outsourced actuarial services?

    a) Yes b) No

12. If your answer is "Yes" to question No. 11, please state the types of actuarial services outsourced_____ _____

13. If your organization is outsourcing the actuarial service to external actuary/actuarial firm, which actuarial service provider do you use most?

    a) Ethiopian actuary/actuarial firm licensed and operating in Ethiopia.

    b) Foreign actuary/actuarial firm licensed outside Ethiopia.

    c) Joint venture actuarial firm.

Section II : Questions Related to the Importance of Actuarial Practice in Ethiopia

14. The following are considered to be the possible reasons for not having an in house actuary or actuarial department in most organizations. Please rank the reasons as 1st, 2nd, 3rd, 4th or 5th where 1st representing major all the way to 5th representing minor reason.

Reasons	Rank
Absence of strict regulatory requirement to appoint an in house actuary.	
Shortage of qualified actuaries that can perform the actuarial work.	
Shortage of actuarial graduates to be employed in the organization.	
Immaterial actuarial work to establish a department or employ actuarial staff.	
Lack of financial resources to establish an actuarial department or employ staff.	

15. How do you rate the current actuarial practice in Ethiopia ?

	Parameters	Very Poor	Poor	Fair	Good	Very Good
1	The development of actuarial practice in Ethiopia;					
2	The roles played by actuaries and actuarial firms in Ethiopia;					
3	The actuarial practice regulatory framework in Ethiopia;					
4	The availability of qualified actuaries in Ethiopia;					
5	The availability of domestic actuarial firms in Ethiopia;					
6	The availability of foreign actuarial firms in Ethiopia;					
7	The availability of actuarial education and qualification system in Ethiopia (actuarial science university programs, study materials, exam centers, libraries, scholarships, incentives…etc).					
8	The public awareness about actuarial practice and the role of actuaries.					
9	The support provided by the Ethiopian government in promoting actuarial practice in the country.					
10	The support provided by international actuarial organizations in promoting actuarial practice in Ethiopia.					

16. Please rate the importance of actuarial practice in Ethiopia based on the proposed statements where the degree of your agreement to the statements is represented as:

1 = Strongly Disagree 2 = Disagree 3 = Ambivalent 4 = Agree 5 = Strongly Agree

No	Statements	1	2	3	4	5
1	Actuarial practice is important for the development of the insurance and financial sectors in Ethiopia;					
2	Actuarial practice is important to design and develop quality insurance and financial products in Ethiopia;					
3	It is important to establish a well structured and regulated actuarial practice in Ethiopia;					
4	It is important to increase the number of qualified actuaries and domestic actuarial firms in Ethiopia;					
5	It is important to create public awareness about actuaries and their role in the socioeconomic activities of the society;					
6	It is important to revise the Ethiopian actuarial regulatory framework based on the international actuarial standards of practice;					
7	It is important to establish a national actuarial association in Ethiopia which promotes actuarial practice through education, research, and professional development;					
8	It is important to maintain an in house actuary and actuarial department for effective actuarial practice and insurance business regulation;					
9	It is important to provide actuarial science academic programs by Ethiopian universities and colleges.					
10	It is important to support actuarial students on their path to qualification so as to increase the number of qualified actuaries in Ethiopia.					

17. Please rate the degree of importance of the proposed statements with values as follows:

1= Unimportant 2= Less Important 3= Important 4= Highly Important 5= Critically Important

	Statements	1	2	3	4	5
1	How important is actuarial practice to the Ethiopian insurance and financial sectors?					
2	How important is the role of actuaries and actuarial firms in promoting actuarial practice in Ethiopia?					
3	How important is the role of the regulatory regime in promoting actuarial practice in Ethiopia?					

APPENDIX – II: INTERVIEW GUIDE

THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA

KEY INFORMANTS INTERVIEW

INDIRA GANDHI NATIONAL OPEN UNIVERSITY, ADDIS ABABA STUDY CENTER

Dear Respondent,

I am a post graduate student at Indira Gandhi National Open University, School of Social Sciences, M.A. Economics Programme. I am currently undertaking a research project titled "THE IMPORTANCE OF ACTUARIAL PRACTICE IN ETHIOPIA" in partial fulfillment of the requirements for the award of the Degree – Master of Arts in Economics. Your organization is regarded as one of the information sources for the successful completion of the research project. Hence, your genuine and unreserved response to my questions will enable the study to come up with commendable findings. This research project is meant for academic purposes; and the responses given will be treated with utmost confidentiality and for academic purposes only. This interview may take about 45 minutes. I would like to thank you in advance for your kind cooperation in devoting your valuable time to answer my questions.

1. Could you tell me about your organization and your role in the organization?
2. How do you describe the importance of actuarial practice in Ethiopia?
3. How does the actuarial practice influence the Ethiopian insurance and financial markets?
4. What do you think is the role of the actuarial regulatory regime in promoting the practice in Ethiopia?
5. What is the role of actuaries and actuarial firms in promoting the actuarial practice in Ethiopia?
6. How do you describe the importance of actuarial practice in your organization?
7. How do you see the status and development of actuarial practice in Ethiopia?
8. What are the reasons behind the underdeveloped actuarial practice in Ethiopia?
9. What possible solutions do you recommend to promote the actuarial practice in Ethiopia?
10. Any other comments related to the study?

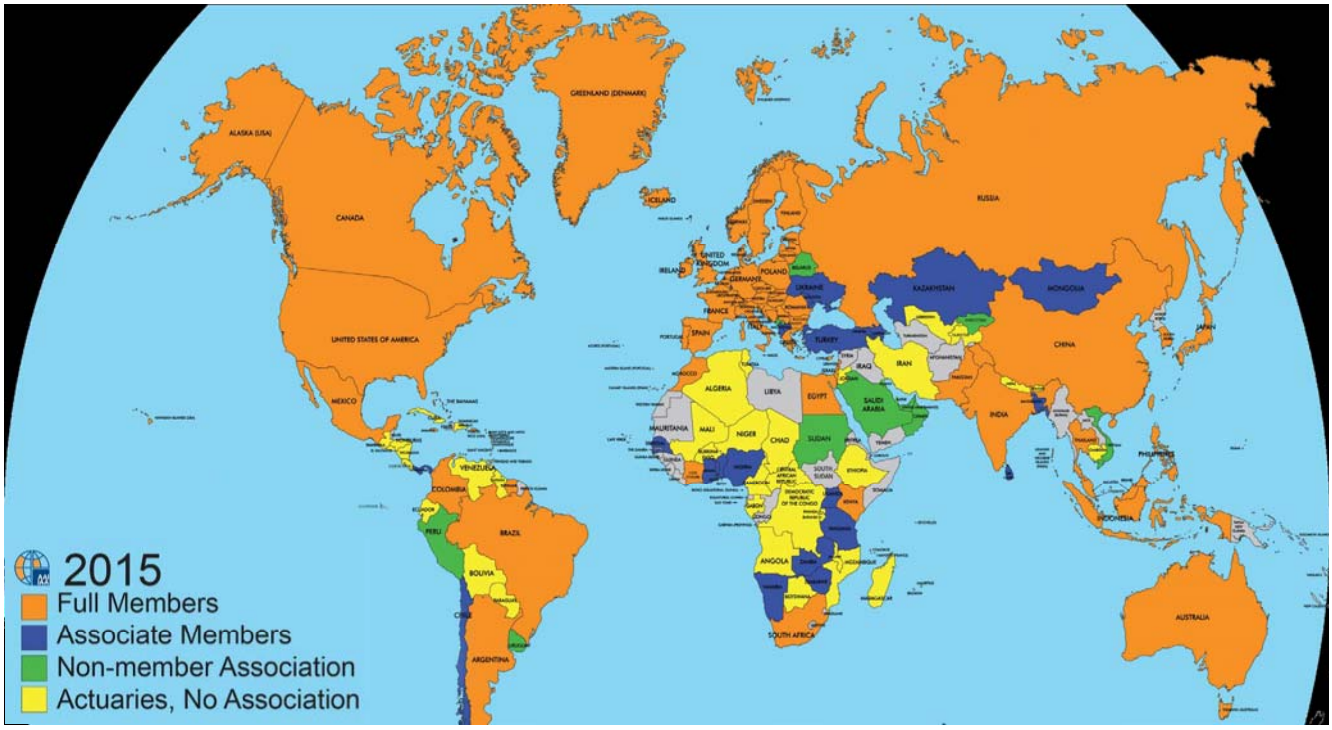
Thank you for your kind cooperation!!

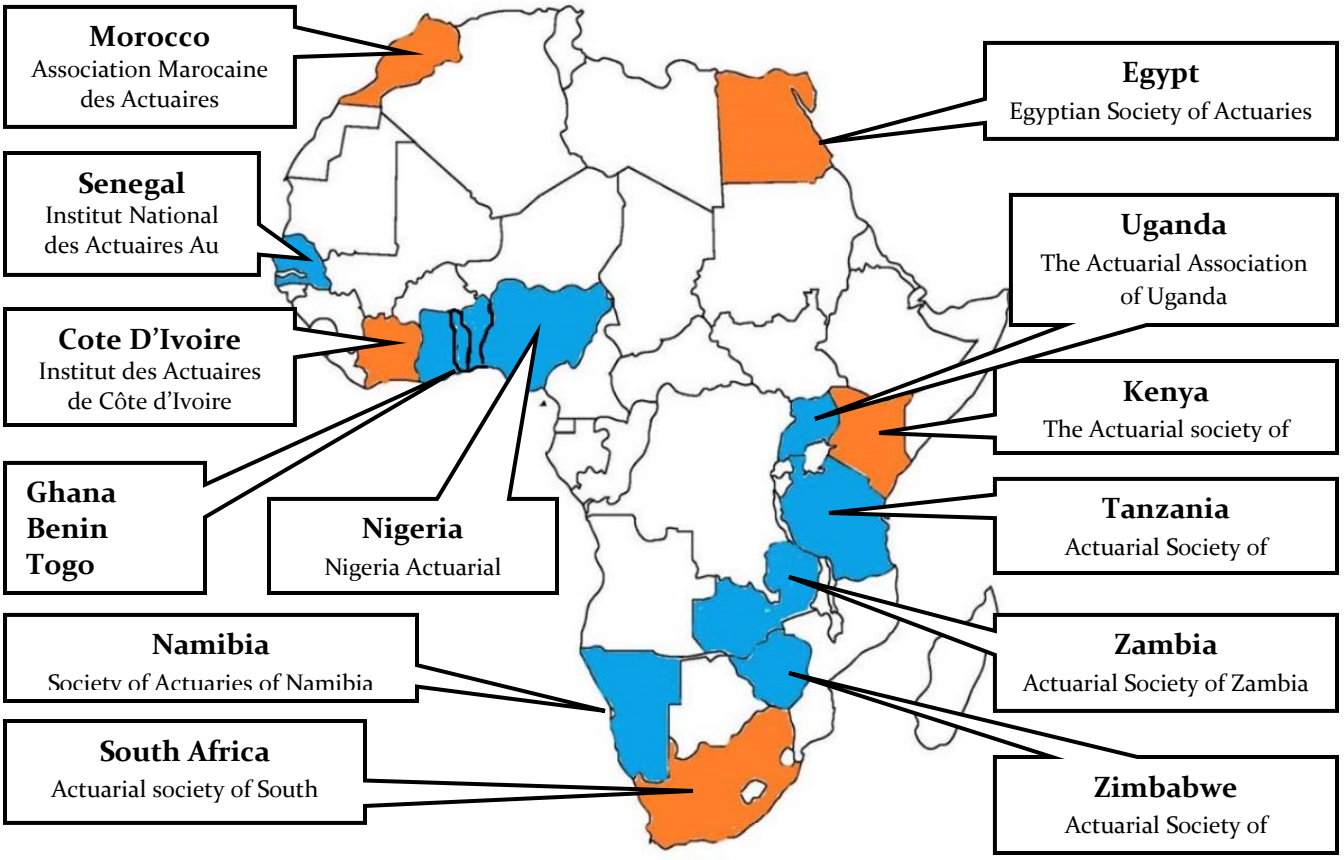
APPENDIX – III: IAA MEMBERSHIP STATUS OF COUNTRIES

Full Member Associations of the International Actuarial Association	
Caribbean Actuarial Association	Institute of Actuaries of India (India)
Consejo Profesional de Ciencias Económicas de la Ciudad Autónoma de Buenos Aires (Argentina)	Persatuan Aktuaris Indonesia (Indonesia)
Actuaries Institute Australia (Australia)	Society of Actuaries in Ireland (Ireland)
Aktuarvereinigung Österreichs (AVÖ) (Austria)	Israel Association of Actuaries (Israel)
Institut des Actuaires en Belgique (Belgique)	Istituto Italiano degli Attuari (Italy)
Aktuarsko Drustvo U Bosni I Hercegovini (Bosnia and Herzegovina)	Institute of Actuaries of Japan (Japan)
Instituto Brasileiro de Atuária (IBA) (Brazil)	Japanese Society of Certified Pension Actuaries (Japan)
Bulgarian Actuarial Society (Bulgaria)	The Actuarial Society of Kenya (Kenya)
Canadian Institute of Actuaries/Institut Canadien des Actuaires (Canada)	Latvijas Aktuaru Asociacija (Latvia)
China Association of Actuaries (China)	Lebanese Association of Actuaries (Lebanon)
Actuarial Institute of Chinese Taipei (Chinese Taipei)	Lietuvos Aktuaru Draugija (Lithuania)
Asociación Colombiana de Actuarios (Colombia)	Persatuan Aktuari Malaysia (Malaysia)
Institut des Actuaires de Côte d'Ivoire (Côte D`Ivoire)	Colegio Nacional de Actuarios A. C. (Mexico)
Hrvatsko Aktuarsko Drustvo (Croatia)	Association Marocaine des Actuaires (Morocco)
Cyprus Association of Actuaries (Cyprus)	Het Koninklijk Actuarieel Genootschap (Netherlands)
Ceská Spolecnost Aktuárù (Czech Republic)	New Zealand Society of Actuaries (New Zealand)
Den Danske Aktuarforening (Denmark)	Den Norske Aktuarforening (Norway)
Egyptian Society of Actuaries (Egypt)	Pakistan Society of Actuaries (Pakistan)
Eesti Aktuaaride Liit (Estonia)	Actuarial Society of the Philippines (Philippines)
Suomen Aktuaariyhdistys (Finland)	Polskie Stowarzyszenie Aktuariuszy (Poland)
Institut des Actuaires (France)	Instituto dos Actuários Portugueses (Portugal)
Deutsche Aktuarvereinigung e. V. (DAV) (Germany)	Asociatia Romana de Actuariat (Romania)
Hellenic Actuarial Society (Greece)	Russian Guild of Actuaries (Russia)
Actuarial Society of Hong Kong (Hong Kong)	Udruzenje Aktuara Srbije (Serbia)
Magyar Aktuárius Társaság (Hungary)	Singapore Actuarial Society (Singapore)

Associate Member Associations of the International Actuarial Association	
Channel Islands Actuarial Association	Macedonian Actuarial Association (Macedonia)
Albanian Actuarial Association (Albania)	Asociacion Mexicana de Actuarios, A.C. (Mexico)
Instituto Actuarial Argentino (Argentina)	Asociatia de Actuariat Din Moldova (Moldova)
Actuarial Society of Armenia (Armenia)	The Society of Actuaries of Mongolia (Mongolia)
Actuarial Association of Azerbaijan (Azerbaijan)	Society of Actuaries of Namibia (Namibia)
Actuarial Society of Bangladesh (Bangladesh)	Nigeria Actuarial Society (Nigeria)
Association des Actuaires Beninois (Benin)	Asociación de Actuarios de Panamá (Panama)
Actuarial Association of the Republic of Srpska (Bosnia-Herzegovina)	Institut National des Actuaires Au Sénégal (Senegal)
Instituto de Actuarios Matemáticos de Chile (Chile)	Actuarial Association of Sri Lanka (Sri Lanka)
Association of Actuaries and Financial Analysts (Georgia)	Actuarial Society of Tanzania (Tanzania)
Actuarial Society of Ghana (Ghana)	Association Actuarielle Au Togo (Togo)
Actuarial Society of Kazakhstan (Kazakhstan)	Actuarial Society of Turkey (Turkey)
Association Luxembourgeoise des Actuaires (Luxembourg)	The Actuarial Association of Uganda (Uganda)
	Society of Actuaries of Ukraine (Ukraine)
	Actuarial Society of Zambia (Zambia)
	Actuarial Society of Zimbabwe (Zimbabwe)

APPENDIX – IV: IAA MEMBERSHIP MAP





Source: IAA