CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDIES

Insurance companies underwrite the risks of potential future losses, and in return they receive a fixed payment of premiums. In actuarial practice, these premiums are calculated according to certain rules called premium principles, which assigns some risk loading to the net premium in order to stabilize the cashflow and increase the expected surplus of insurance companies. Essentially, by attaching a premium to each risk insurers are ordering the risks (Wang, 1995)

In insurance practice, however, it is likely that premiums not only depend on the risk itself, but also on many other factors such as general economic conditions, the insurer's and reinsurer's capital positions etc (Buhlmann, 1980; Deprez and Gerber 1985; Furman and Zitikis, 2009)

Insurance is defined as a social device providing financial compensation for the effects of misfortune, the payments being made from the accumulated contribution of all parties participating in the scheme thus, it can be seen as a kind of fund, into which all who are insured will pay an assessed contribution (called a premium) (Ajzen, 1991). In return, those insured will have the right to call on the fund for any appropriate payment should the insured event occur.

The insurer, in accepting a risk should consider the level of deductible, the type of cover to be provided, the class of business, the estimated premium income and the underlying re-insurance (if any) before arriving at an appropriate premium rate (olashore 2006). The premuim rate arrived at should meets all required objectives; to cover losses and expenses, and to earn some profit. Hence this research project is meant to examine the determination of term insurance premium rate in the life office of an insurance company.

1.2 PROBLEM STATEMENT

This study aims at addressing the problem of fixing premium:

1. In the absense of sufficient data (using conventional actuarial formulas)
2. When there is sufficient data (using predictive analytics).

   When there is sufficient data, these data are usually:

   i. Large and cannot be analysed manually

   ii. Laying dormant and not being utilized as a result of the gap between the insurance industry and the technology industry (the data science field to be precise)

1.3 PURPOSE OF THE STUDY

The difference between the selling price for insurance and the selling price for other products is that the actual cost of providing the insurance is unknown until the policy period has lapsed. Therefore, insurance rates must be based on predictions rather than actual costs, hence the purpose of this study is:

1. To know the actuarial analysis of premium rating so that a fair premium can be fixed which will be enough to cover future claims
2. The primary purpose of the study is to determine the lowest premium that meets all required objectives : to cover losses and expenses, and to earn some profit.
3. To understand the correlation between the result of a proper survey by the underwriters on the proposed risk and the premium-rate fixed by the actuary

Using predictive analytics to predict premium charges, this study also aims at addressing the problem of data utilization in the insurance industry.

1.4 RESEARCH QUESTION

The following research questions shall be answered at the end of the study

- To what extent does insurers calculate effective premium rating?
- Does insurers consider experience rating in calculating premium for a policy holder?
- Which method is more efficient or effective; using conventional actuarial formulas or using predictive analytics?

1.5 SCOPE AND LIMITATION OF THE STUDY

Research of his nature always encounter a number of limitations. The limitations encountered are outlined below:

- The company under consideration was reluctant to release all the necessary data (or information) relevant to this study as such data were seen as confidential data which should not be shared with the public
- Personal constraint - the attitude of the employees in the life office towards research questions and data collection
- Unable to access relevant journals from some private forums on the internet due to being a non-member of such forums. Hence a fee is usually required.

1.6 SIGNIFICANCE OF THE STUDY

This research will go a long way to provide different method of rating premium and how premium is determined using this rates.

It also goes futher by determining insurance premuim using predictive analytics (multiple linear regression). Therefore contributing to bridging the gap between the insurance industry and the world of Information Technology.

1.7 DEFINITIONS OF TERMS

Predictive Analytics: Predictive Analytics which involves the use of predictive model (multiple linear regression model) and data analysis techniques on large data sets (of informations gotten from past and existing policy holders) to discover predictive patterns and relationships for use in determining premium.

Premium: An amount paid periodically to the insurer by the insured for covering his risk

Rate: The price per unit of insurance for each exposure unit

Life Office: A company that sells life insurance

Term Insurance: A type of life insurance policy that provide coverage for a certain period of time