Department Of Actuarial Science And Insurance

Bsc (Hons) Project Proposal

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Project Title : Determination Of Term Insurance Premium Rate In A Life Office Of An Insurance Company

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PROJECT PROPOSAL

1.1 **Background of Study**

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-insurace (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 using Leadway as a case study

1.2 **Problem Statement**

The result of proper data analysis provide actionable insights which can help insurance companies to accurately assgin or charge premium to its client and avoid unanticipated losses.

The company under consideration do not have large amount of historical data on the amount of claims to expect for a given type of policy hence does not have sufficient data to rate premiums accurately.

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

1.4 **Research Question**

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

- To what extent does insurer calculate effective premium rating?
- Does insurer consider experience rating in calculating premium for a policy holder?
- Is premium rate in the life office varying with that of the non-life?

1.5 **Significance Of The Study**

This research will go a long way to provide different method of rating premium and how premiums are determined using this rates including how this rate charged on premium apply to the different classes of insurance.

1.6 **Scope And Limitation Of The Study**

Research of his nature always encounter a number of limitations (problems). The limitations encountered by the researcher 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.

1.7 **Methodology**

This study would calculate the premium effectively and efficiently both at the moment of death and at the end of the year of death and also determine premium using a datascience approach (Predictive analytics) .In gathering data and information for the study, we make use of the following:

- Secondary data from the archive of ... Insurance plc
- Term insurance techniques payable at the moment of death and at the end of the year of death written as:

$$E(Z) = \overline{A}_{\overline{x:\overline{n}|}}^{1} = \int_0^n b_t \nu^t {}_t p_x \mu(x+t) dt$$

References:

Wang S. , 1995. Insurance pricing and increased limits ratemaking by proportional hazards transforms. Insurance: Mathetatics and Economics 17, 43–54.

Buhlmann H. , 1980. An Economic Premium Principle. ASTIN Bulletin 11 (1), 52–60.

Deprez O. Gerber, 1985. On convex principles of premium calculation. Insurance: Mathematics and Economics 4 (3), 179–189.

Furman E. Zitikis R. , 2008 a. Weighted premium calculation principles. Insurance: Mathematics and Economics 42 (1), 459–465.

Marcel B. Finan (2011) A Reading of the Theory of Life Contingency Models, Russellville, Arkansas, pp 287

Madina Movsarovna Magomadova, Methods for Calculating Life Insurance Rates, Chechen State University, Grozny, Russia,

Rate Making: How Insurance Premiums Are Set, available at: https://thismatter.com/money/insurance/rate-making.htm

Henry Siegel (a life actuary), How does insurance companies determine premiums? Available at: https://www.quora.com/How-does-insurance-companies-determine-premiums