Applications of Mathematics and Statistics in Finance and Insurance Sectors in Sri Lanka

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Abstract

Regulations and general practices within the finance and insurance industries all over the world are continuously evolving. Best practices and regulatory guidelines are created to minimize risks involved in the markets, to ensure stability, and to maintain trust in the financial system. Complying with regulations and being consistent with industry practices in assessment, reporting and management of risks often require modeling of these risks associated with complex financial instruments.

The financial and insurance sectors in Sri Lanka can benefit greatly by adopting some of the best practices in risk management from developed markets. However, the Sri Lankan market is lagging behind due to several limitations. Lack of personnel with technical know-how and more importantly practical experience in financial modeling, prohibitive cost of sophisticated modeling software, lack of availability of financial instruments required to effectively manage risks are among the factors that contribute most. Although the local university system produces graduates with the required background, but need practical training and guidance to implement risk management initiatives. Working with limited financial instruments available for risk management applications also requires some creativity.

We will discuss a few examples from the Sri Lankan finance and insurance industries where risk management can improve with applications of mathematical and statistical modeling, especially in some key areas of national interest. These include stochastic modeling of insurance liabilities to understand the impact of adverse economic scenarios, thorough valuation of options and guarantees embedded in financial products, and asset liability management of funds backing retirement liabilities.

We will also discuss how we can overcome some of the limitations identified above through collaboration between universities and industries.