



Changing Dynamics of Actuarial Modelling

Introduction

Long gone are the days when actuaries were only considered to be the number crunchers and were confined to only scientific calculators and excel spreadsheets. With the emergence of advanced technology in terms of big data tools, machine learning and artificial intelligence, the need for a more detailed and informative actuarial model has become a prime need for most of the companies. This has become more critical with the ever-changing dynamic insurance landscape - complex product designs, detailed requirements by clients/management, new regulatory requirements- IFRS 17 and RBC.

The companies have started to look to replace the current single dimension calculation models/engines with a more modern platform with better data management and automation. This will enable them to remove manual processes needed at various stages of input & output preparation and automate the feeding of these outputs to the reporting system.

Journey of Actuarial Modelling

Back in 14th century, after the great Plague, the city of London started recording deaths and produced regular statistics of mortality and this responsibility were primarily laid with churches. These raw data were later converted into life tables which showed that there were predictable patterns of longevity and mortality which could be used to calculate the amount of contribution which can be made to a common fund to cover financial loss on a person's death. This gave rise to an analysis process –



Today, life insurance actuarial modelling follows a similar analysis process.

The role of the actuary continues to evolve along with the tools used to perform actuarial work. There have been many developments in actuarial practice since the days when assumption setting relied solely on company's own data. Using big data, the companies have started to explore and investigate additional patterns of behaviour that can drive the risk being insured and the manner of its delivery and servicing.

Big data and artificial intelligence (AI) are having a tremendous impact on the business model of insurance with respect to the design, marketing, regulation, and servicing of insurance products. Some impacts are relatively minor and incremental in nature, while other impacts are transformational with major implications. As we look into the future, forward-looking, real-time, and efficient reporting processes & systems will be the must have for ongoing success of the businesses and will be something which will be the requirement of various stakeholders.

The way forward

Most of the insurers across the globe are still using Microsoft Excel or the data system inbuilt in their actuarial modelling system for processing & management of data. However, in the new reporting regimes like those of IFRS 17; the limitation of these traditional softwares in terms of their data processing speed, difficulty in integration with other system and the inability to handle large volume of data will mean these may no longer be the go-to solution.

Data management is going to play a prominent role in the end-to-end modelling and reporting process which was historically been undermined and no considerable efforts were ever made by the companies towards it.

The new age data management technologies are often enterprise-level solutions wherein the data infrastructure/solution will be built at a more exhaustive level. This will allow different verticals within the organization to access this single source of data solution and thereby reducing the need for specific teams to build and maintain individual data processes. This will enable the insurers to reduce cost, ensure better data standards and maintain large level of data.

Technologies, such as cloud services, will enable companies to store a much larger amount of data and that too at a lower cost. The availability of the additional data is also allowing the companies to undertake more complex and real time actuarial modelling. However, working with large amount of complex data poses a greater threat to data security and privacy issues to the companies and will require specialized knowledge and greater utilization of IT resources.

Insurers have also started thinking about reporting with additional levels of granularity, financial reporting periods and frequency. These KPIs aims to cover earnings analysis, real-time forecasting, product and customer performance management, capital and asset liability management, investment management, and risk and shareholder value.

In the past, actuaries have handled many of the reporting requirements manually using the actuarial model reporting interfaces and supporting tools, such as spreadsheets. Recently though, similar to the trends in modelling, companies are gravitating towards a more structured and centralized reporting toolkit. Actuarial vendor capabilities have also evolved and become more robust.

Tools like Tableau, Power BI aims to convert the processed actuarial data into a very easily understandable and informative format by using visual elements like charts, graphs, and maps. Apart from offering a more comprehensive end-to-end functionality, some of these modern solutions like those of Python, R-Studio are also freeware and are open-licensed programs. The integration & development of these programs is much easier and more accessible in terms of resources available in the market thereby reducing the need to rely on a single set of expertise.

Conclusion

Due to changes in demographics and reporting standards, adoption of technologies like artificial intelligence/machine learning, cloud computing and data visualization is of paramount importance for the actuaries.

One of the best ways for data management and actuarial models to work as one single integrated solution is to design them together when the models are converted or initially built, as opposed to the practice of building the complete model first and then trying to build a data management solution around the model. This is particularly important with some of the emerging regulatory requirements wherein creation of disclosures requires tight coordination with data elements made available from both the actuarial modelling system and upstream finance systems as well.

Apart from the above, there are several other technical advantages from conversion of these legacy models. They include auditing current models and processes, creation of a comprehensive view of all those processes, streamlining procedures, review of model governance structures and filling in the gaps, reviewing and revising materiality limits, retiring or merging unnecessary models and discovering latent model risks.

Author: Sunny Aggarwal, Consulting Actuary & Director, WeDapt.

<https://www.linkedin.com/in/sunny-aggarwal-750ab222>

This content is for general information purposes only and should not be used as a substitute for consultation with professional advisors. © 2023 WeDapt. All rights reserved.