Actuarial software for Takaful

Over the last several years a new type of actuarial software, Mo.net, has been used in modelling Takaful operations. This modelling has been used for pricing as well as for financial and statutory reporting and business projections, in a variety of markets and structures. HASSAN SCOTT ODIERNO looks at the role of actuarial software in developing the Takaful industry.

ACTUARY

By Hassan Scott Odierno

A key challenge in Takaful is its diversity. Takaful generally has a much more diverse set of operational structures as compared to conventional insurance. In Malaysia for instance the Mudarabah (profit sharing model) had been used exclusively for many years before moving over to a Wakalah (agency) model.

When modelling then, both of these structures must be catered to. Even within the current Wakalah model some arrangements have a layer of Mudarabah sharing of investment profit whereas others have fees as a percentage of the net asset value of the fund. The percentage sharing of investment profit can vary by product so the software needs to cater for this. Surplus sharing is allowed in Malaysia and is generally 50% to the operator and 50% to participants, but this percentage does change occasionally. For some product types it is very difficult from a practical point of view to share surplus so in this case all surplus remains in the risk fund. The modelling software thus needs to allow for differing funds and methodology. Even when the surplus distribution methodology is the same, the particulars of the surplus distribution might vary. Within the savings fund (PA fund) there can be a variety of investment fees so the differing sub-funds will also require segmentation. Outside Malaysia there are an even greater number of permutations and combinations. Thus the modelling software needs to cater for this incredible diversity.

In addition to the increased diversity in Takaful there are also Takaful-specific features which must be accounted for. In Takaful there are a variety of funds as we need to carefully split the risks inherent in Takaful. For instance, there is a risk fund in which the various benefit risks reside, a savings fund with the investment risks and an operators fund with the expense risks. When there is a deficit in the risk fund an interest free loan, Qard, is given from the operator's fund. The treatment of Qard can vary by operator and must be modelled accordingly.

Mo.net has proven adept at handling the diversity described above. With a modelling structure which can separate different funds into individual sub-models, checking of cash flows and understanding of their interactions is easy. In this regard the ability to merge and aggregate cash flows ensures the Takaful models of Mo.net resemble the Solvency II models used in Mo.net for use in Europe.

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Related to this, one thing which makes Mo.net particularly useful is the transparency. Since it runs on visual basic coding it is extremely easy to get familiar with programming in Mo.net. Combined with the very transparent nature of Mo.net itself in terms of the layout, a new user can quickly get up to speed to use the model. This is important in Takaful as Takaful is less mature relative to conventional insurance. Takaful companies tend to be significantly smaller and with fewer resources so

having a large team of programmers around is not feasible, so it is vital that the actuarial modelling tools used be easy to learn. Additionally, there are two versions of licences, a runtime license and a developer licence. This allows certain levels of staff to be able to run the program and change assumptions but not change the underlying coding. This is important in ensuring audit control and minimizing errors. Takaful itself is still developing in terms of its operational model, so the program used for modelling must also be flexible enough to allow for future developments.

All of these aspects ensure exciting times for actuaries, as actuaries are key drivers in product development and pricing. An actuary with a dynamic flexible modelling tool will be able to test and experiment with differing model types and structures. Without such a tool, innovation in product development is likely to be limited and more creative product structures may be excluded or adopted without a proper understanding.

Related to this is the role of actuaries in risk management. In risk management, quantification wherever possible is the key to success. With actuarial software which accurately models the various liabilities and risks of the operations risk management in Takaful can provide the details needed to ensure management understands the risks it is taking on.

In traditional asset liability management the liabilities of the company are set first and then assets are allocated with the desired trade-off between a matching position and mismatches to enhance return. In Takaful there is an acute lack of suitable assets. Thus either a mismatch position must be accepted or the liability characteristics be altered. This process can be done through an understanding of the liability characteristics, which requires the liabilities be modelled in sufficient detail.

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