

# The value of embedding capital models



Capital modelling, when used across the organisation, can empower business users to make more informed decisions, says **Mr Hatim Maskawala** of **Badri Management Consultancy**.

“The rating agencies are coming in a few months’ time, let’s buy a capital model.”

I have heard this or similar phrases many times. In this part of the world, the general tendency is to buy a capital modelling software just because the rating agencies ask: do you have an internal model? What CEOs and COOs normally do not realise are the benefits that an internal capital model can bring.

Financial modelling can be done in a deterministic way where you would only get one scenario and can do some scenario testing by varying assumptions. Still, this generally results in few alternative future projections.

The second way is by undertaking stochastic modelling whereby using monte-carlo simulation techniques, one can generate, say, 10,000 different ways in which future can unfold, before studying the distribution of results to understand the average and extreme scenarios. Capital modelling entails using such simulation techniques to build financial models of either the full company or of a particular line of business or operation.

Solvency II talks about keeping capital which is sufficient for a 1-in-200 year event. Many argue that the market here is less than 50 years old. How can we have a 1-in-200 year scenario? It is not about the history but rather, probability and future scenarios. If there were 200 different ways in which next year could look, we need to survive 199 of those scenarios.

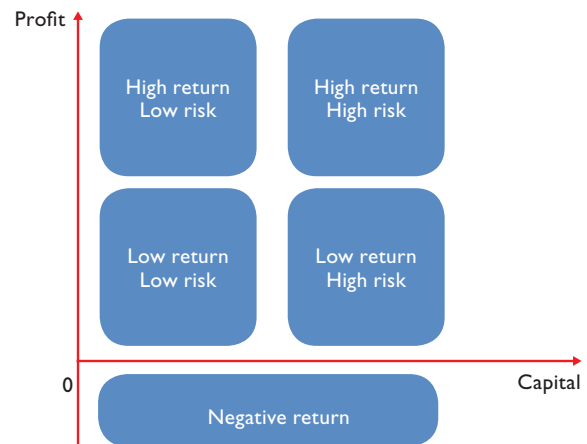
The general perception in this region is that capital modelling is a rating agency requirement and only concerned with actuarial or risk management departments. In reality, capital modelling can add value to decision making and when used across the organisation, it can empower business users to make more informed decisions.

## Budgeting and strategic planning process

When we undertake budgeting on a deterministic basis, we get one scenario. This could be the average scenario that a company expects. When we do budgeting via the capital model, we get the mean or average scenario plus a spread around that mean showing the profitability under alternative scenarios.

One benefit of this is that we can then plot each line of business or business unit on a risk return graph as shown in the diagram. This sort of measure is very common in investments where we look at return divided by standard deviation to determine the efficiency of an asset. On the insurance side, generally we are more interested in the return side only. When we start looking at lines of business on a risk-versus-return graph, our views might change as to which lines to expand and concentrate on.

One drawback of doing budgeting using a capital model is the level of granularity available. Normally, budgets are



prepared in monthly or quarterly time frames and apart from line of business, also include breakdown by branches and distribution channels. It is impractical to have this level of granularity in a capital model.

A practical approach would be to undertake budgeting as it is happening currently and simultaneously run the capital model and compare the results of the mean scenario with the budget. Theoretically, we are using the same assumptions on two different systems and should get the same mean results. Practically, there might be differences between the two and we then need to calibrate both to come closer. Once we do this, we would have the required output on a risk-return graph and also continue to have the granularity that we need from our budgeting exercise.

## Underwriting department involvement and pricing process

Input from underwriters is a key component of the capital model. Normally, what the actuary does is look at past data and estimate the averages and standard deviations for various lines of business. Within a line, the claims are normally segregated between attritional claims and large claims (and as the model evolves, CAT losses). For attritional claims, an aggregate amount for the year is generated while for large claims frequency is randomly generated and for each claim, the severity is then randomly generated. When I say generated, this refers to using monte-carlo simulation to generate the value. This generated value depends on the average and standard deviation entered.

While the actuary works out these values from historical data, the underwriter adds value by giving his expertise on the market and how things are changing. A typical conversation could be that the underwriter says: “The severity you have worked out is okay in historic terms but recently we have seen an increase in the court awards for these types of claims. Hence we need to increase the

severity.” Remember, capital modelling is about the future.

The second way in which capital models can add value is when they start influencing pricing of direct policies. Let’s say that an underwriter is looking at what price to charge for the top layer of a risk. Due to the probability of the claim being low many times, the higher layers attract a very small premium. However, they do have an impact when it comes to extreme events and should be priced not using the average but a higher percentile. This should be guided by the capital model.

Similarly, when we are pricing for those lines whose capital requirements are relatively higher than others, we should be building in an additional risk margin.

### Reinsurance purchasing

This is one of the most common uses of capital models. An insurance company’s job is to take on risk. In order to manage risk, it reinsures this risk. This is a basic textbook scenario. However, in this region, many companies, before accepting risks, check whether reinsurance is available or not. By default, everything needs to be reinsured and if they cannot reinsure it they decline the risk. Somewhere during the evolution process, we went from being risk takers to risk transferors.

When we start using capital models we can evaluate reinsurance decisions through it and determine whether a reinsurance cover reduces the capital and/ or increases profit or not. Different alternative covers could be plotted on a risk-return graph to determine whether it is better or worse off than the current situation. The graph would be similar to the diagram shown and instead of lines of businesses, it would contain a scatter plot for different alternatives.

### Strategic and tactical asset allocation

The capital model is also useful in undertaking asset liability matching for the insurance company. Initially we

can use the capital model to determine the strategic asset allocation. Again for this exercise, we would be comparing different asset mix alternatives and plotting them on a risk-versus-return graph. From that, we would determine the optimal asset mix at an asset class level which the company wants to maintain in the long term.

Once the strategic asset allocation is done, the company can run simulations within asset classes to determine the tactical asset allocation. The time horizon for the strategic asset allocation would be, say, three years, while that for tactical asset allocation would be 18 months.

This can be done independently by asset managers. However, when we are using the capital model, it allows us to match the asset cash flows with those of liabilities. While there are many capital modelling software which cover both assets and liabilities, it is not necessary to use the same software for both assets and liabilities.

### Adding value through embedding a capital model

Developing and implementing a capital model is not a quick process and generally takes

years. That said, even going through the process of implementing and embedding a capital model can add value. The integration process requires educating and engaging the business units which improves their awareness of the strategy of the company and how it links to the risks they are writing and the capital they hold against them. Just thinking about risk and return rather than return itself helps improve the risk culture of the organisation.

Therefore, while the end product is important, it is the process of embedding the capital model that really increases the enterprise value.■

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