

Lifetime mortgage products

Jim Cockburn and John Young provide an example of how to apply actuarial techniques to retail banking.

How did you get involved in lifetime mortgage products?

Our involvement in lifetime mortgages is part of a much wider remit to develop long-term pricing and profitability capability within the RBS retail bank. A new team of nine has been developed from scratch and now employs three actuaries – from a standing start of one actuary two years ago. The new team’s remit now covers all personal business from current accounts, loans, mortgages, credit cards, and savings. Lifetime mortgages have been chosen as a single example of how we have managed to get business buy-in for a new approach to pricing decisions.

What is a lifetime mortgage product?

These products allow asset rich and income poor to release equity in their homes by way of a type of a loan secured on their property. The amount borrowed compounds up until the person either repays the loan or until death or disability when the house is sold and the loan repaid. The bank assumes the combined longevity risk and house price inflation (HPI) risk by accepting any loss that occurs if the house value is lower than the repayment value of the loan. This is the ‘no negative equity guarantee’ (NNEG).

What was the banking problem to be solved?

We were initially asked to provide actuarial advice on the mortality and critical illness experience that should be used to calculate the cost of the NNEG.

We quickly recognised that a much wider and potentially larger risk arose due to HPI. This risk was completely missed by the bank’s current deterministic HPI model and assumptions. As a result we were asked to provide an improved understanding of the interaction of all the risks associated with the product.

How did you choose to look at the HPI risk?

The new work involved developing a stochastic model for HPI. It was felt that the obvious lognormal distribution would not:

- ◆ have a wide enough range of outcomes; or
- ◆ show the ‘boom and bust’ cycles prevalent in the UK housing market.

To get around these concerns two lognormal models were used, one representing our view of a booming housing market, the second representing a housing slowdown. We modelled the movement between these states in successive annual time periods by choosing from these lognormals based on transitions from a two-state Markov model. This is an approach used by Barrie & Hibbert to provide a ‘fatter tails’ model for the UK stockmarket.

The model was fitted to available HPI data, and used in stochastic simulation of future rates of HPI. Multiple runs were produced for a range of scenarios to investigate how the correlated risks of HPI mortality and customer behaviour affected the lifetime mortgage products.

This approach gave insight into the possible variability of the cost of the NNEG, and, although the mean cost was broadly consistent with previous studies, the distribution of NNEG cost was found to be very skewed. This has a potential impact on reserving and bottom line results volatility that was not previously appreciated, particularly in the case of income versions of the product as opposed to lump sum.

Two key customer behavioural risks that emerged with the increased ‘clumping’ seen in this HPI model were:

- ◆ customers may increase borrowings following a prolonged period of HPI which resets the guarantee and increases its expected costs; and
- ◆ there may be reduced early redemptions by customers if they get close to the point of the guarantee biting which extends the effective term in the event of adverse HPI.

Work thus far has concentrated on running the model for a single tranche of new business. However, we can examine the increasing balance-sheet risk of successive years of new business by running the model for multiple tranches sold within a few years of each other.

Who else was involved?

The retail markets credit risk area and marketing departments were both closely involved, the former being particularly involved in the development and ongoing maintenance of the stochastic model.

Going forward, the financial reporting teams will also be involved as we consider how to deal with future reporting of this product.

What lessons were learned?

Actuaries have a different view of both long-term risk and guarantees than many in retail banking, where focus has largely been on understanding and mitigating credit-related risks.

Actuaries can develop a push for their skills by helping to make the business aware of other risks and explaining these more fully.

Are actuaries a natural fit in banking?

Yes, but this is not yet as well recognised by a UK retail bank as it is in a life office or consulting environment.

Retail banks acknowledge that actuaries are able to ‘do clever things’, but it is up to the actuary to communicate these ideas in a non-technical language. In addition, any ideas must be shown to have immediate commercial value rather than being part of a long-term development. Any results must also be tied back to the retail banking view of the balance sheet and P&L.

What is the future for lifetime mortgage products?

Lifetime mortgages are one option to increase income by releasing capital tied up in a home. It may remain a ‘niche’ product as other options such as downsizing may provide better solutions to many people. However, the long-term persistency of this product means it will form a steadily growing proportion on mortgage balances even if sales remain a low percentage of all new mortgage sales. As a result, the need for banks to understand the HPI risks they are accumulating will increase in line with this rising exposure. This is likely to affect the pricing in the market as some players currently appear to be underpricing the NNEG risk – somewhat as insurance companies did with with-profits guarantees with the booming stockmarket of the late 1990s.

This article is one of a series promoted by the Action Group for Banking – see also p22.

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