Overcoming the challenges of maintaining models on a closed portfolio

Whistletree

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Agenda

Background

Monitoring

Calibration

Development

Forecasting

IRB Status

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Worked in many roles in Credit Risk for 7 years, mostly in model development

Currently working in the Whistletree book at TSB
Background

A closed book is considered to be a portfolio where assets cannot increase through further lending and that will keep decreasing until the portfolio ultimately disappears.

Types of Mortgages

- Residential
- Buy to Let
- Interest Only
- Repayment
- Lifetime
- Professional BTL

Considered immaterial

- Main focus

Not considered

- Redemption rates
- Attrition rates
- Interest rates
- Affordability
# Monitoring

<table>
<thead>
<tr>
<th>Sample</th>
<th>Stability</th>
<th>Predictability</th>
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</thead>
<tbody>
<tr>
<td>Small sample sizes due to shrinking book</td>
<td>Assess if model is still representative</td>
<td>Assess if model capability of predicting outcome</td>
</tr>
<tr>
<td>Increase observation window</td>
<td>Deterioration not in the same magnitude of open book but still possible</td>
<td>DTV might mask risk and shift predictability</td>
</tr>
<tr>
<td>OR</td>
<td>Variables like Repayment type and DTV an issue</td>
<td>Variables becoming overpredictive</td>
</tr>
<tr>
<td>Increase outcome window</td>
<td>Difficult to mitigate or solve issue without redevelopment</td>
<td>Self fulfilling prophecies present in some variables</td>
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Calibration

Updating parameters of the model is essential in any type of portfolio.

Type of models
- Regression
- Roll rates

Similar issues

Models will suffer from movement of accounts from segment to segment.

Low volume in some segments will cause calibration to not be robust.

Some of the problems, like the shift of risk within a segment might not be so noticeable within a regression model.
Model development alone can be a tricky process let alone in a closed portfolio.

**Sampling**
- 80% / 20%
- Out of time

**Overfitting**
Phenomenon that occurs when the model is really predictive of the specific sample but not representative of the portfolio. As long as the issues mentioned are under control, we ensure the model will be predictive for an increasing period of time.

**Forced Sale Discount models**
HPI can be problematic as it is an approximation of current valuation which assumes a range of properties within a region, however a closed book is an aging book.
Forecasting

Forecasting relies on past economic performance to infer future outcomes

<table>
<thead>
<tr>
<th>Recession</th>
<th>Stagnation</th>
<th>Economic growth</th>
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Probably not enough historic information to derive an accurate model. To forecast the book requires information from different parts of economic cycle.

Common to include HPI in models and as such the same issues as mentioned will occur.

Decrease HPI might not lead to increase in losses.

Important to rely on economic variables that show financial situation
Depending on the size of the portfolio, one might have to move from Standardised to IRB

- Limiting history
- Be conservative but potential that Capital will be higher than Standardized
- No downturn cycle

Best solution is to resort to benchmarking (internal or external)
Conclusion

HPI can be tricky to use

Be careful of attrition rates

Use benchmarking to confirm results

Careful monitoring is essential