The Actuarial Profession
making financial sense of the future

Life conference and exhibition 2010

Clayton Balkind, Yasmeen Husain,
Kuen Chik, Matthew Edwards

Learning from experience:

A report from the Policyholder Behaviour Working Party

7-9 November 2010

Welcome

Policyholder behaviour

Increasingly this is a subject attracting a lot of attention from different parties:

•Insurers seeking to gain competitive advantages and manage their risks

•Regulators looking to ensure that insurers are adequately protected (for example this is discussed in some detail in the QIS 5 specification on technical provisions)

The Policyholder Behaviour Working Party

The working party was established to answer the following questions:

•To investigate any evidence for policyholder behaviour changing in adverse market conditions in the UK as well as overseas;
•To consider the impact of non-investment related factors on policyholder behaviour, such as decisions to affect premium increases or to renew a policy following a premium review;
•To highlight calculations of liabilities and capital requirements that rely on assumptions about policyholder behaviour (in stress tests and stochastic calculations of liabilities);
•To highlight practical difficulties in modelling these and suggest potential approaches that might be reasonable;
•To suggest approaches to setting assumption, as well as varying assumptions, in situations where there is little or no experience data available; and
•To identify management information that companies should collect in order to improve their assumptions going forward.

Our recent survey is the first stage of this work

The vision (1/3)

Modelling policyholder behaviour in the future

Traditionally life insurers have modelled policyholder behaviour by:
- Measuring the rate at which a decrement has occurred in the past
- Assuming that this same rate will apply in the future

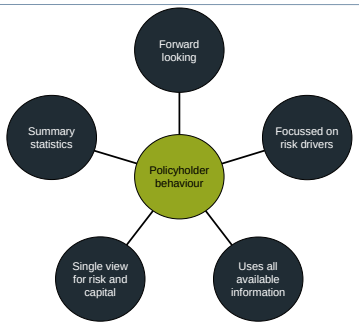
But developments in other fields may suggest ways in which this could change:

- General insurers price risks and reserve using a wide variety of risk factors to describe the risk exposures
- This is increasingly true for health insurers as well
- Banks have increasingly sophisticated models to develop credit scores which can be used for both approval and reserving.
- Prepayments can significantly influence the value of a traded mortgage portfolio.

Further, both CEIOPS and the IASB have included requirements for the modelling of policyholder behaviour in their Solvency II and IFRS Phase II proposals.

The vision (2/3)

Modelling policyholder behaviour in the future



The vision (3/3)

Modelling policyholder behaviour in the future

There are a number of actual and potential competitive benefits which a more pro-active approach to modelling policyholder behaviour delivers:

- Enhanced decision making
  - Better measurement of risk
  - More accurate pricing of risk
- Better customer service
  - Targetting of sales, servicing and retention activities
  - Better use of management time, effort and focus
- More efficient use of capital

Our survey: A look at current practice

- Our survey was designed to provide a comprehensive view of current practice in the UK market and covered the following:

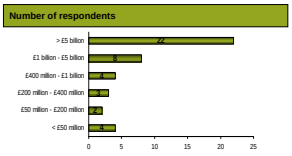
  1. Financial behaviours
  2. Non-financial behaviours
  3. Measurement and modelling
  4. The intended uses of information
  5. Future plans

- The survey was distributed electronically to all the actuarial function holders in the UK – for all types of life office – during March and April this year. In total we received 43 responses.

- This is a presentation of some of the highlights of what we have learned.

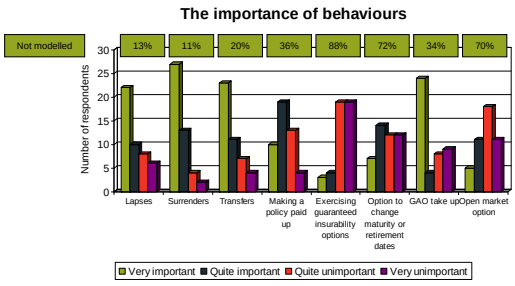
Survey participants

	Response Percent	Response Count
Mutual life office	37%	16
Proprietary life office	61%	26
Reinsurer	2%	1



- Our survey respondents provide a good mix of large and small companies of different types.
- Companies taking part included:
  - Aviva, AXA Sun Life, Canada Life, Clerical Medical, CIS, Eccelsiastical Life, Equitable Life, Friends Provident, Forester Life, Legal & General, Liverpool Victoria, Merchant Investors, Phoenix Group, Prudential, Reliance Mutual, Royal London, Save & Prosper, Sun Life Assurance of Canada, Skandia, Teachers Provident, Wesleyan Assurance, Zurich Financial Services

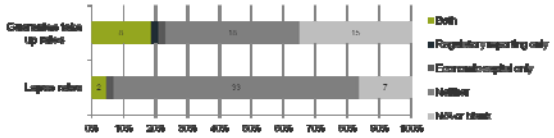
General attitudes to modelling policyholder behaviour



Modelling financial behaviours (1/5)

(i.e. those that trigger a monetary benefit for policyholders)

- Do you model guarantee take up rates/lapse rates dynamically for the purpose of regulatory reporting/economic capital?



- Organisations that do such modelling:
  - Split between mutuals and proprietaries
  - Almost entirely “large” (£5bn+)

Modelling financial behaviours (2/5)

(i.e. those that trigger a monetary benefit for policyholders)

- Why are guarantee take-up rates/lapse rates modelled dynamically?
  - Reflect accuracy/realism
  - Reflect "in the moneyness"
  - Realistic reserves only
  - Keep up with industry practice

To capture a more realistic value of the options/guarantees

Improve accuracy of reporting, keep up with industry practice

To reflect the impact of interest rates on the assumed take-up rate.

- Effect on management decisions/business strategy
  - Limited evidence

Modelling financial behaviours (3/5)

- Dynamic functions used for modelling guarantee take-up rates:
  - Rates vary with { value of guarantees *[4]* / long-term interest rates *[1]* } or
  - Binary function – assume take-up if in money *[4]*
  - Based on empirical evidence *[4]* or expert judgement *[5]*

Based on own experience and professional judgement

Modelling financial behaviours (4/5)

- Dynamic functions used for modelling lapse rates:
  - Rates vary with { value of guarantees *[2]* / economic scenarios *[1]* }
  - Based purely on expert judgement *[3]*

Lapse rates fall when guarantees are more in the money.

The function is a bespoke calculation that varies the level of lapses as a function of the economic scenario.

The dynamic rate is a function of the relative value of the guarantee to the asset share

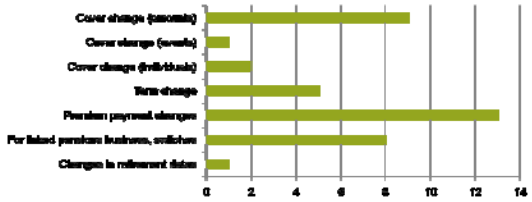
Modelling financial behaviours (5/5)

- Calibration of the guarantee take up rate and lapse rate stress test assumption in economic capital/ICA calculations

Modelling non-financial behaviours (1/2)

(i.e. those that trigger changes policy conditions)

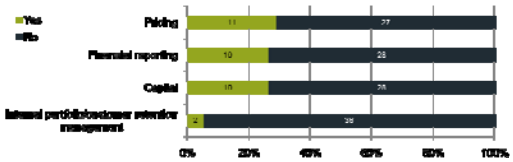
- Which behaviours are monitored?



Modelling non-financial behaviours (2/2)

(i.e. those that trigger changes policy conditions)

- Areas where non-financial behaviours are modelled other than (just) the actuarial calculations

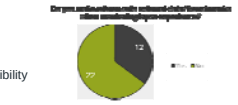


- Which behaviours?
  - Premium changes and switching most common

Measurement and modelling (1/5)

Challenges

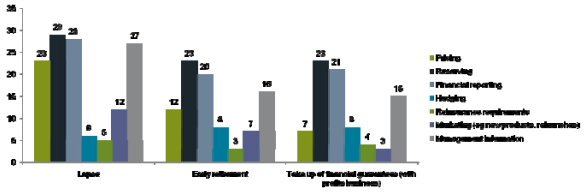
- Top Three Data Related Challenges:
  - Lapse Behaviours:
    - Volume of data available internally
    - Quality of data
    - Ability to demonstrate statistical credibility
  - Take up of Financial Options:
    - Volume of data available internally
    - Ability to demonstrate statistical credib
    - Completeness of data
- Other Challenges:
  - Time
  - Systems
  - Staff



Measurement and modelling (2/5)

Investigations

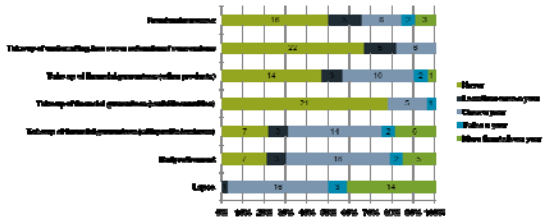
- **The Top Reasons for Monitoring Behaviours:**
  - **Reserving**
  - **Financial Reporting**
  - **Management Information**
  - **Pricing**
- **The Bottom Three Reasons for Monitoring Behaviours:**
  - **Marketing**
  - **Hedging**
  - **Reinsurance requirements**



Measurement and modelling (3/5)

Investigations

- Frequency of monitoring firm's experience as a result of the following behaviours



Measurement and modelling (4/5)

Techniques

- Lapse experience:
  - Drivers considered when modelling:
    - The two main drivers were Product type (32/33) and Duration in force (31/33)
    - Social groups, employments status, income, occupation and other products/services with the company were not selected as a driver in modelling by any of the respondents
  - Models:
    - Most used method was Traditional actuarial (retrospective, binomial or Poisson model) approaches - by policy (16/30)
    - Least used method was Predictive modelling / generalised linear modelling approaches (2/30)
  - Setting future lapse assumptions:
    - The dominant method was Using expert judgment in light of recent experience (ie subjective judgment) (25/33)
    - Only 1 respondent said they used Detailed assessment of underlying risk drivers
    - This response came from a large company (Over £5 billion in reserves)

Measurement and modelling (5/5)

Techniques

- Take up of financial options:
  - Drivers considered when modelling:
    - The main driver was Product type (21/23)
    - Social groups, employments status, income, occupation and other products/ services with the company were not selected as a driver in modelling by any of the respondents
  - Models:
    - The most used methods (with 8/23 responses each) were:
      - Simple ratio approaches using revenue account data
      - Traditional actuarial (retrospective, binomial or Poisson model) approaches - by policy
    - Least used method was Predictive modelling / generalised linear modelling approaches (1/23)

Uses of information

How do you rate your current usage of policyholder behaviour?

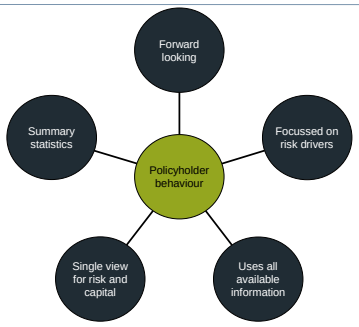
	Poor	Meets minimum expectations	Robust	Very good	Superior
Pricing	0	14	13	1	0
Product design	1	12	13	1	0
Reserving	0	11	19	2	0
ICA / capital modelling	0	13	17	1	0

How would more sophisticated models of policyholder behaviour improve results?

	A significant improvement	A slight improvement	No improvement
Pricing	3	22	4
Product design	2	23	4
Reserving	2	26	5
ICA / capital modelling	5	25	3

Next steps

A vision for modelling policyholder behaviour



Next steps

Firms future plans

NEEDS MUST

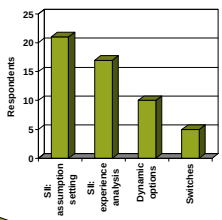
- In the short term the focus seems to be on Solvency II preparations:
  - 64% of respondents working to improve the setting of policyholder behavioural assumptions
  - 52% of respondents working to improve their analysis and process

LONGER TERM

- The focus is on structural changes to the modelling of behaviour:
  - Building in dynamic behaviour in relation to financial options
  - Linking switches and other non-financial behaviours to other variables / triggers

More sophisticated no-MVR take-up rates

What to do next?

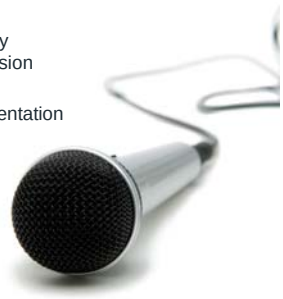


Extension of some modelling to include GLM

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



The Actuarial Profession
making financial sense of the future

Life conference and exhibition 2010

Clayton Balkind, Yasmeen Husain,
Kuen Chik, Matthew Edwards

Learning from experience:

A report from the Policyholder Behaviour Working Party

The Policyholder Behaviour Working Party is:

- Clayton Balkind
- Kuen Chik
- Matthew Edwards
- Yasmeen Husain
- Mark Paulson
- Simon Spencer

7-9 November 2010