Milliman

ST. JAMES'S PLACE
Wealth Management

Lapses in Concentration

4th November 2016

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Agenda

- Overview of St James's Place
- Why we want to model lapse rates and associated challenges
- Predicting lapse rates – why and the challenges
- Setting lapse rates – alternative approaches
- Drivers of Lapses
- Summary
- Questions

Overview of St James's Place

Overview of St James's Place

- Wealth manager
- Advisor driven business
- Range of financial solutions
- Target the 'mass affluent'
- Strong levels of retention

Predicting Lapse Rates

Why we need to and the associated challenges

The challenges

Past trends are not always indicative of future experience (including ENIDs)

People are not robots and behave irrationally, sometimes conversely to logic

It’s difficult to understand the drivers of lapses, because they change over time. The change can be gradual or very sudden

It’s difficult to tell when and where the underlying system changes

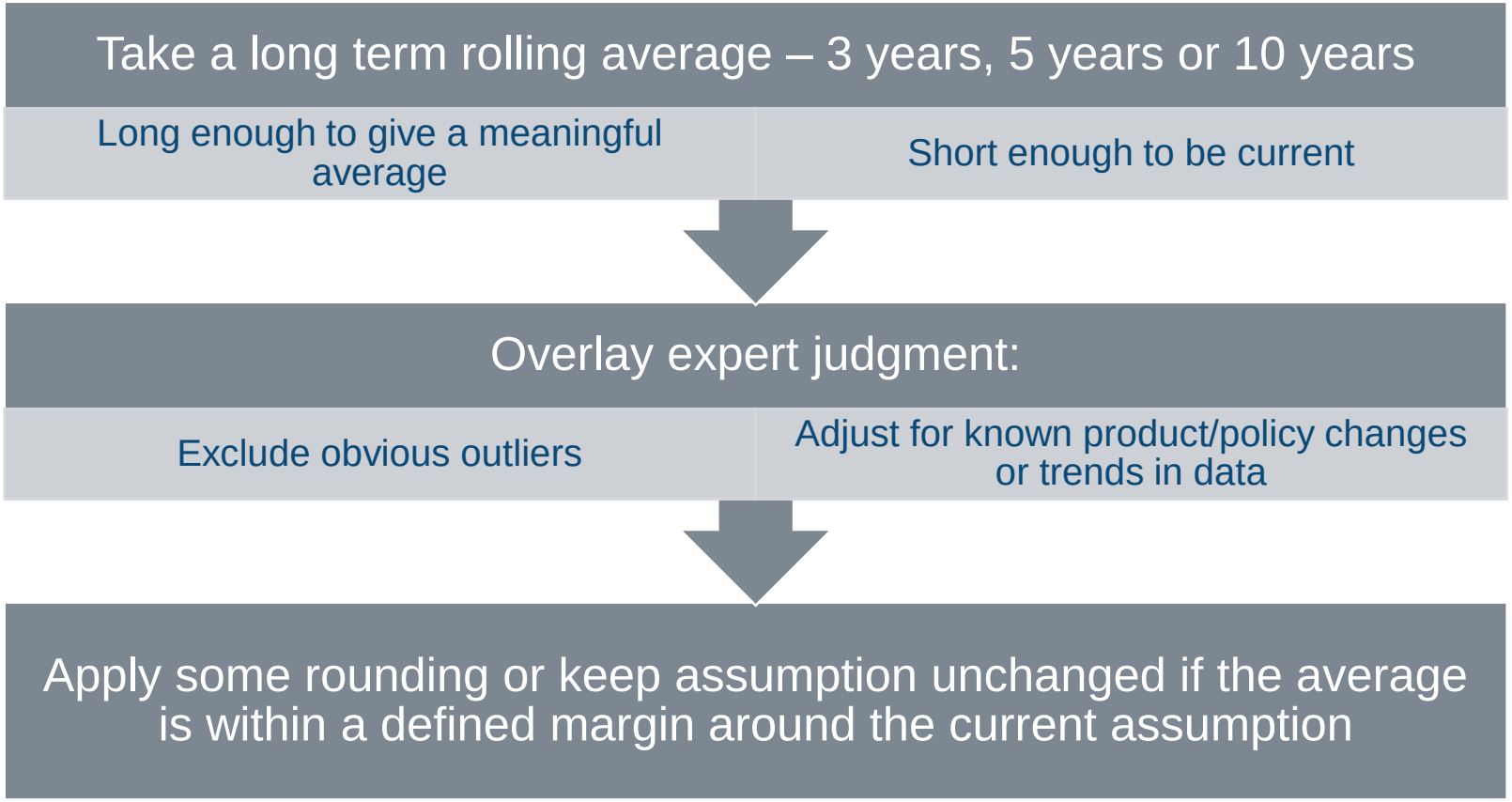
There is lots of lapse data available but it is difficult to analyse

Setting lapse rates

Alternative approaches

Setting Lapse Rates – Idea 1

- There are no consistent strong drivers for lapse rates - we don't know specifically what drives them



What does Solvency II say?

Assumptions shall only be considered to be realistic for the purposes of Article 77(2) of Directive 2009/138/EC where they meet all of the following conditions:

(a) insurance and reinsurance undertakings are able to explain and justify each of the assumptions used, taking into account the significance of the assumption, the uncertainty involved in the assumption as well as relevant alternative assumptions

(b) the circumstances under which the assumptions would be considered false can be clearly identified

(c) unless otherwise provided in this Chapter, the assumptions are based on the characteristics of the portfolio of insurance and reinsurance obligations, where possible regardless of the insurance or reinsurance undertaking holding the portfolio

(d) insurance and reinsurance undertakings use the assumptions consistently over time and within homogeneous risk groups and lines of business, without arbitrary changes;

(e) the assumptions adequately reflect any uncertainty underlying the cash flows.

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Setting Lapse Rates – Idea 2

- We're going to assume that lapse rates follow a random distribution.

- This distribution needs to be:
  - Consistent with our beliefs about the world
  - Consistent with the experience data
  - Sufficiently simple
  - Intuitive
  - Practical

- Set the best estimate lapse rate as the mean of this distribution

Which Distribution?

Lots of possible worlds from which our data could have come from. There's no definitive right answer but here are a few options that could be used and here's some of the criteria we thought needed to be taken into account:

- Binomial: we have n clients each with probability of Θ of lapsing. So this must be a Binomial distribution.

- For a large number of trials this can be approximated by a normal distribution.

So this gives us a framework that is easily communicated and which can be easily applied in a hypothesis test.

Which Distribution?

Our real uncertainty is not what the outcome from the defined distribution is, but how that distribution is parameterised.

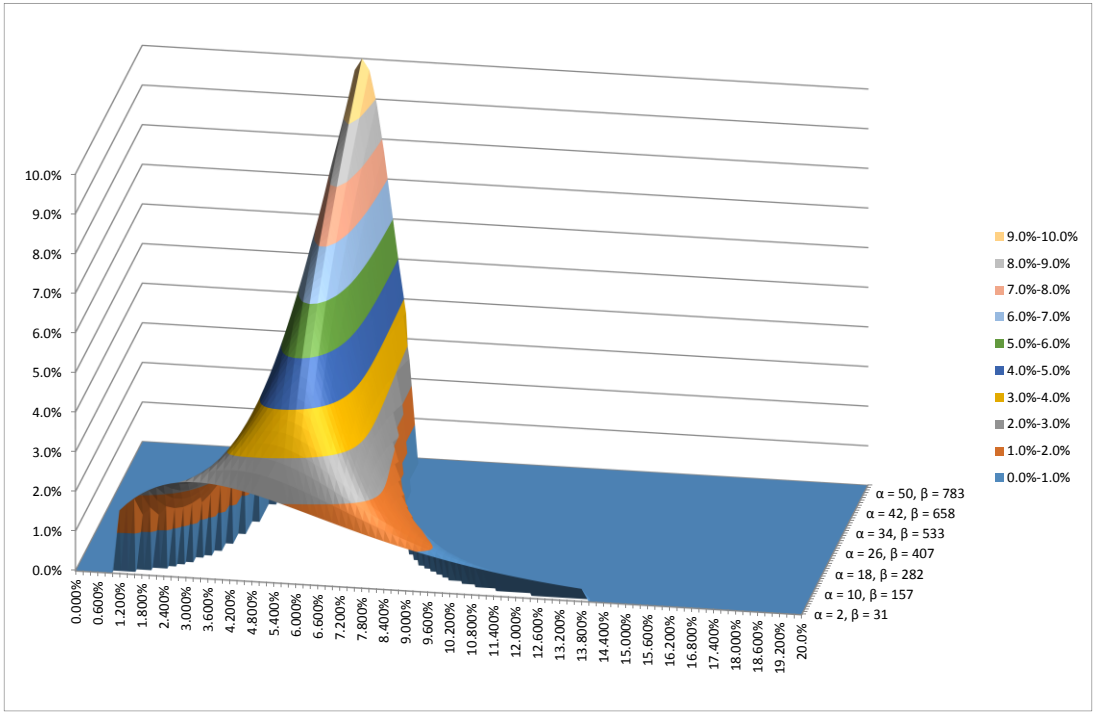
In other words, if lapse experience over the defined period is Binomial(n,Θ), what is the distribution of Θ?

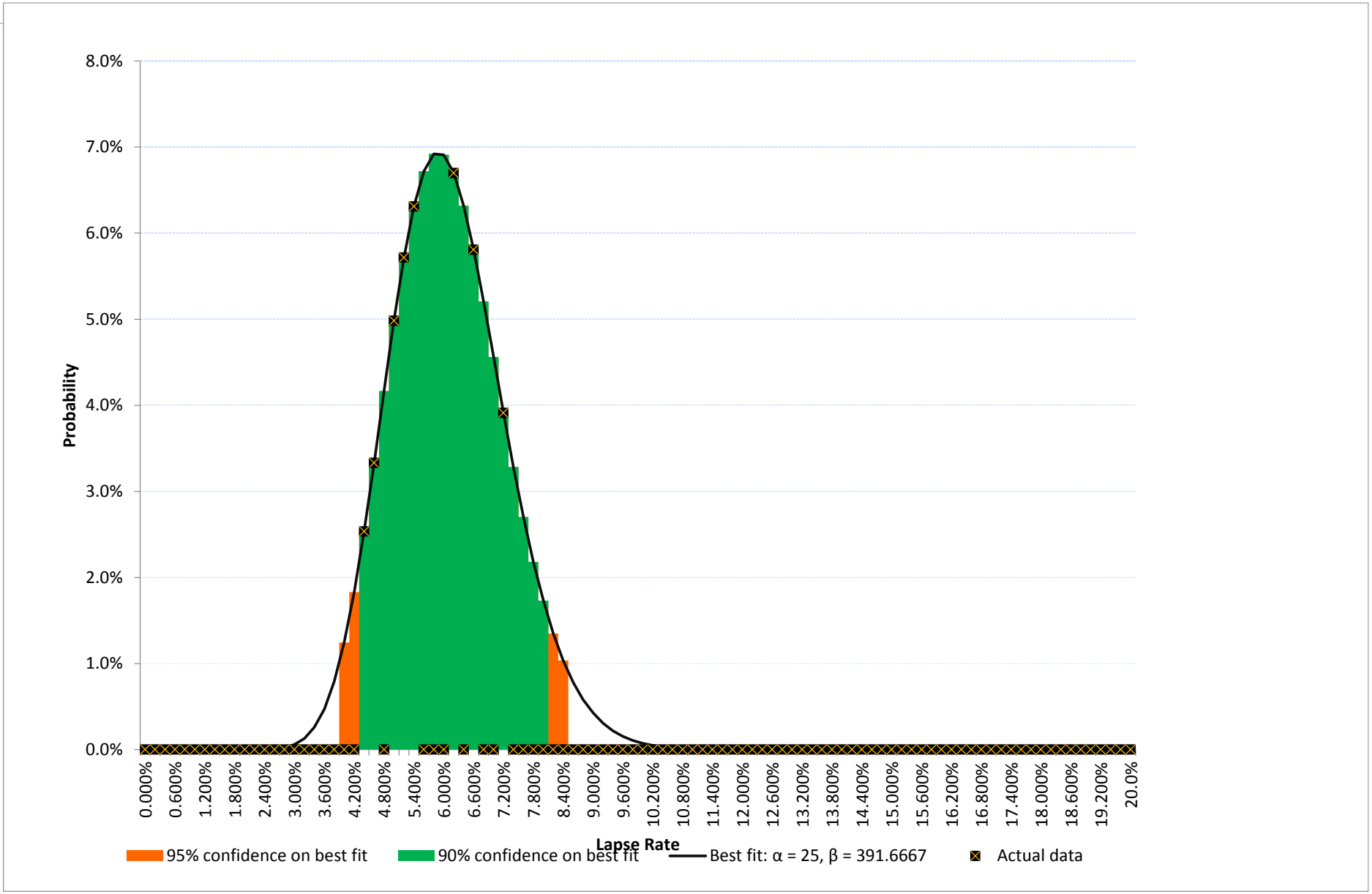
We should have a view on the key attributes of this distribution.

Beta – Binomial model

- If we have Lapses ~ Binomial(n,Θ), then assume Θ ~ Beta(α, β).
  - E[Θ] = α/(α + β)

- A range of possible Beta distributions and parameterisations that could be used:




8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
Probability
0.000%
0.600%
1.200%
1.800%
2.400%
3.000%
3.600%
4.200%
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15.600%
16.200%
16.800%
17.400%
18.000%
18.600%
19.200%
20.0%
Lapse Rate
95% confidence on best fit
90% confidence on best fit
Best fit: α = 25, β = 391.6667
Actual data

Example - How the Hypothesis Test Might Work

- Propose that we set the null hypothesis at the 5% level i.e. this is the level at which we would identify the assumption as being wrong (per Article 22 of the Delegated Acts).

- Would additionally consider failure at the 10% level as a signal for further analysis and validation of the assumption. Additional monitoring and application of expert judgement expected at this stage.

- At higher confidence levels, and in the absence of any evidence to reject the null hypothesis, we would give precedent to the requirement that assumptions are kept consistent over time (also Article 22 of the Delegated Acts).

Summary (so far!)

- A beta distribution seems to have the basic properties that might be expected from a lapse distribution *if you have no knowledge of other dependent factors or variables affecting the system.*

- It's a very practical approach giving a framework that is easy to apply and which can easily be used to satisfy the Solvency II rules

BUT:

- We've not really thought about what could happen in the tails of the distribution and it's therefore less useful for scenario testing

- Can we do more to better understand the system?

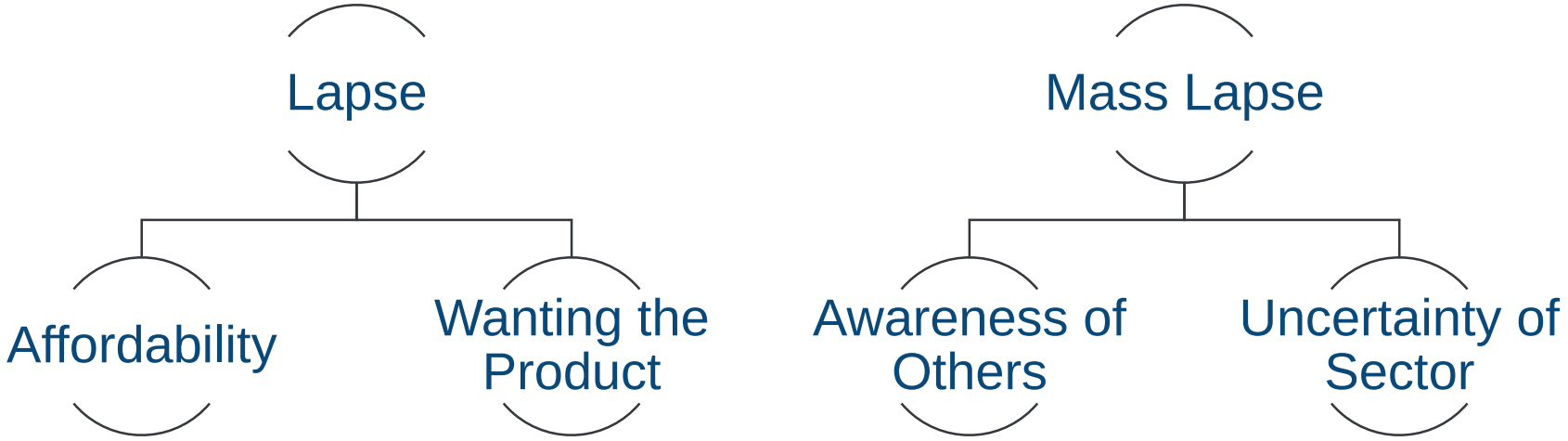
- Is it possible to predict when lapse behaviour is about to change before it happens?

Drivers of Lapses

Getting Started

Context

- In 2015, Milliman did a project with a different client, to model lapse and mass lapse rates.
- The project discovered the drivers of lapses were:



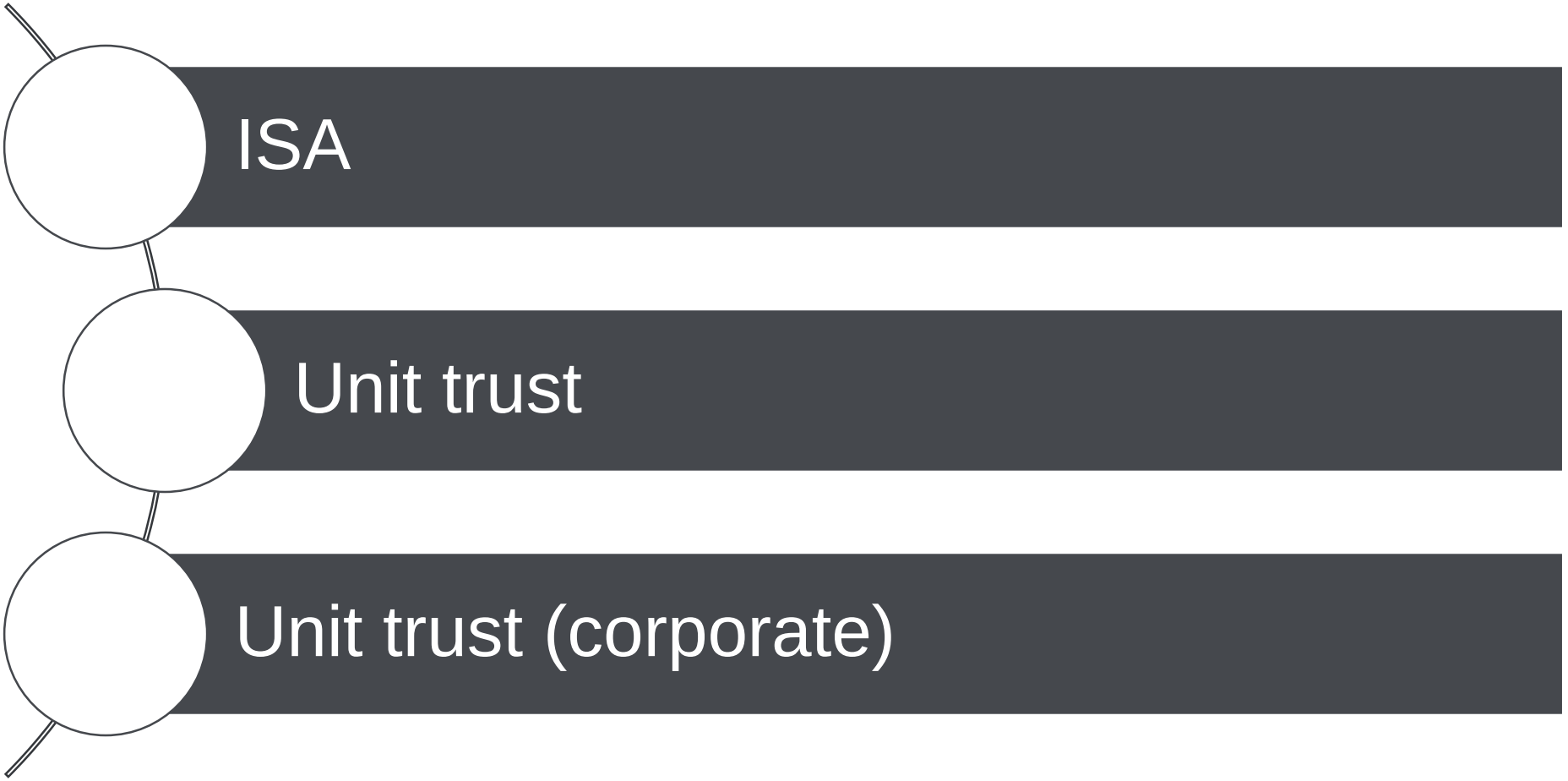
- **What if the drivers of lapse rates also varied by product and over time?**

Research Project Aims

- To determine how lapse experience might change dependent on the current:
  - Dynamics of the business;
  - Industrial indicators; and
  - Global financial system.

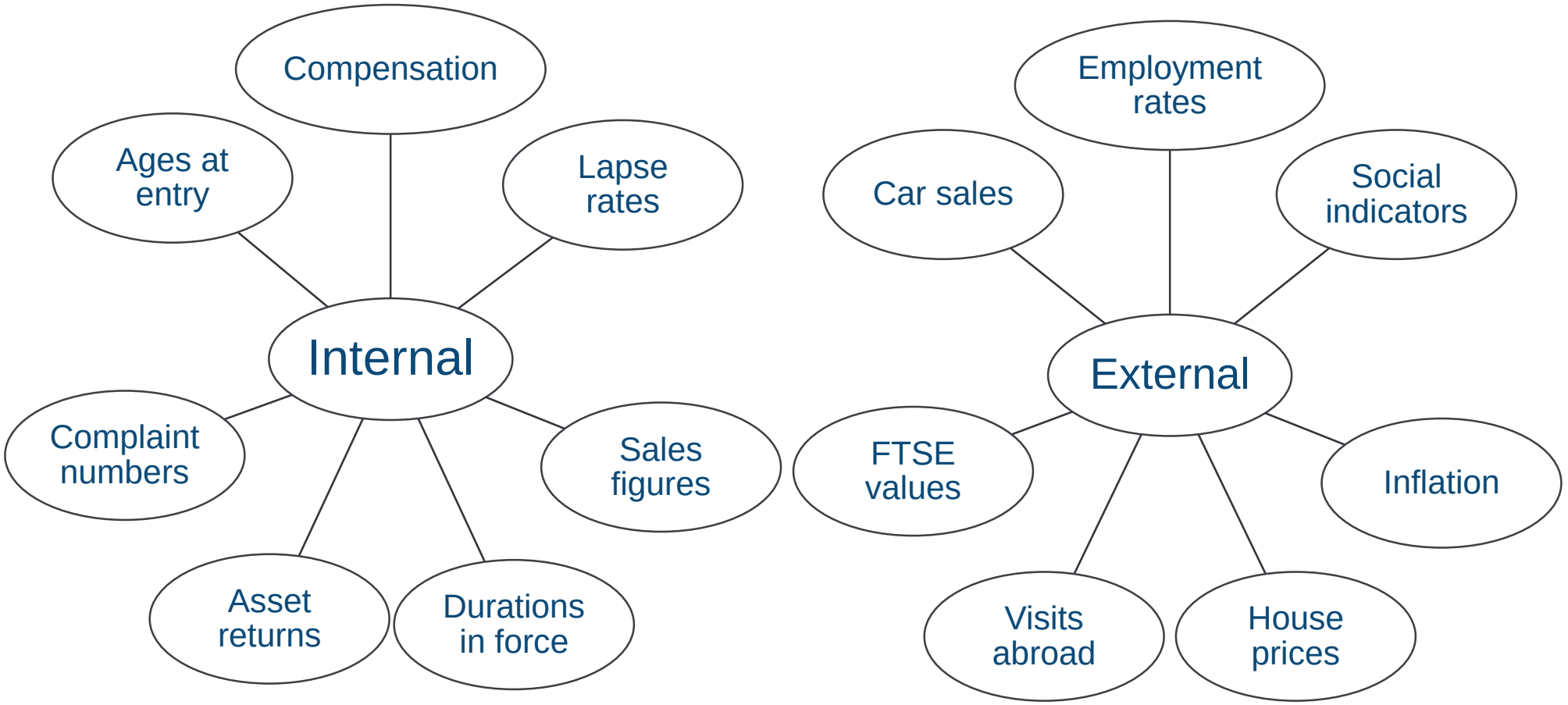
- What that tells us about the future development of the portfolio.

Business Lines



Data

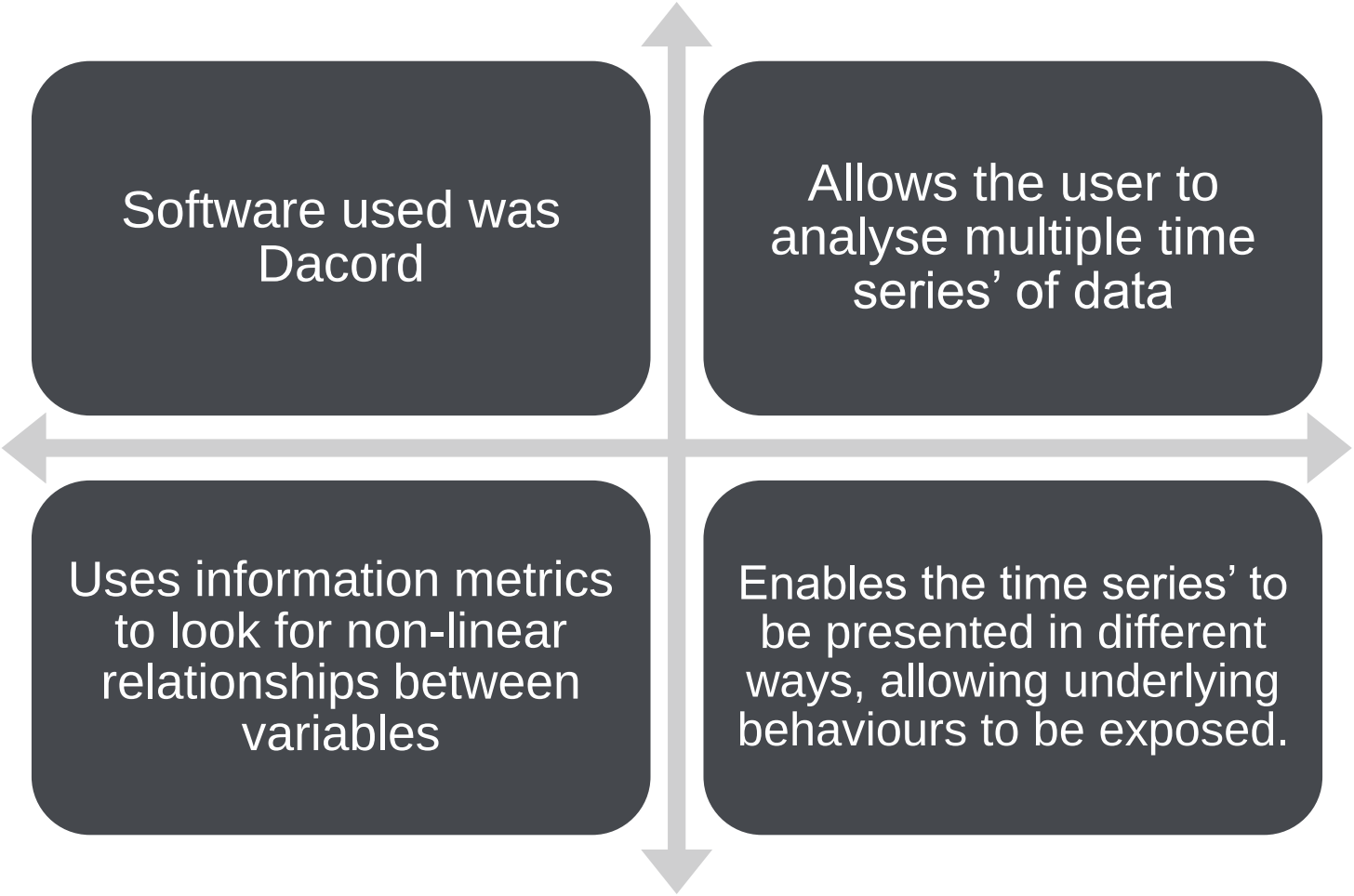
Data Fields


Compensation
Ages at entry
Lapse rates
Internal
Complaint numbers
Sales figures
Asset returns
Durations in force
Employment rates
Car sales
Social indicators
External
FTSE values
Inflation
Visits abroad
House prices

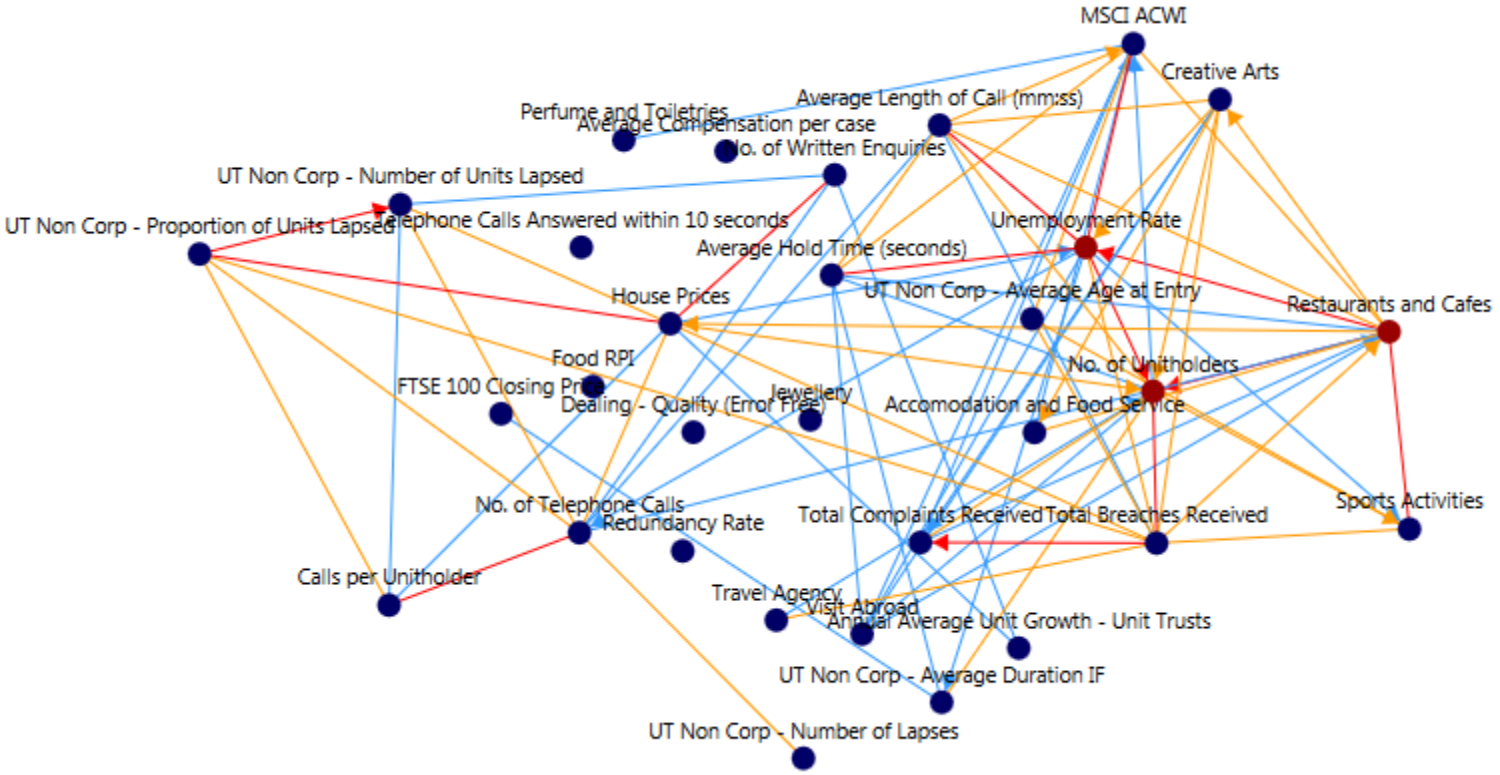
Drivers of Lapses

Analysis

Software


Software used was Dacord
Allows the user to analyse multiple time series' of data
Uses information metrics to look for non-linear relationships between variables
Enables the time series' to be presented in different ways, allowing underlying behaviours to be exposed.

Illustrative Overview of Connectivity Graph



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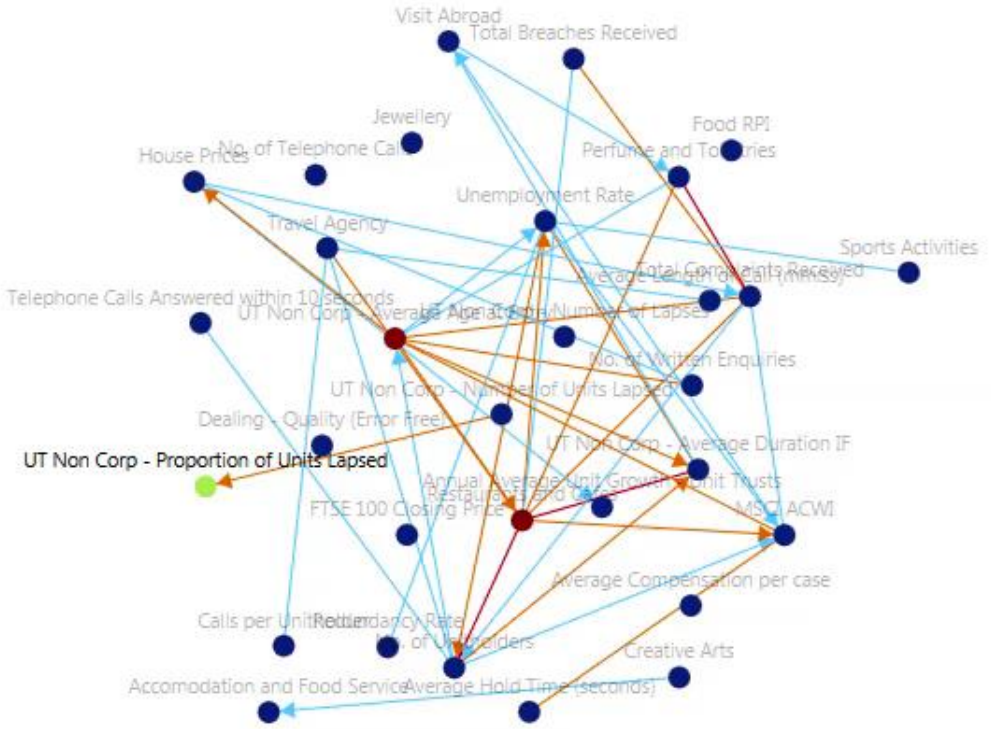


Lagging the Data

We also ran the analysis lagging some of the data fields by either 1 month or 3 months

We felt the outcome of certain drivers might not be visible straight away in the lagged data, for example:

- Service standards
- Market indices
- Inflation

Drivers of Lapses

Findings

Findings – Between Lines of Business

ISA

Very few links to any drivers at all.

This suggests customers withdraw their money for more personal reasons.

Unit Trust

Drivers were primarily service driven.

Examples include calls per unitholder, number of written enquiries and unemployment.

Unit Trust (Corporate)

Drivers were primarily index driven.

Examples include the FTSE 100, redundancy rates and house price indices.

Findings – Lagged Data

ISA

- Very few links to any drivers at all.
- This suggests customers withdraw their money for more personal reasons.
- Lagged drivers were also inconclusive.

Unit Trust

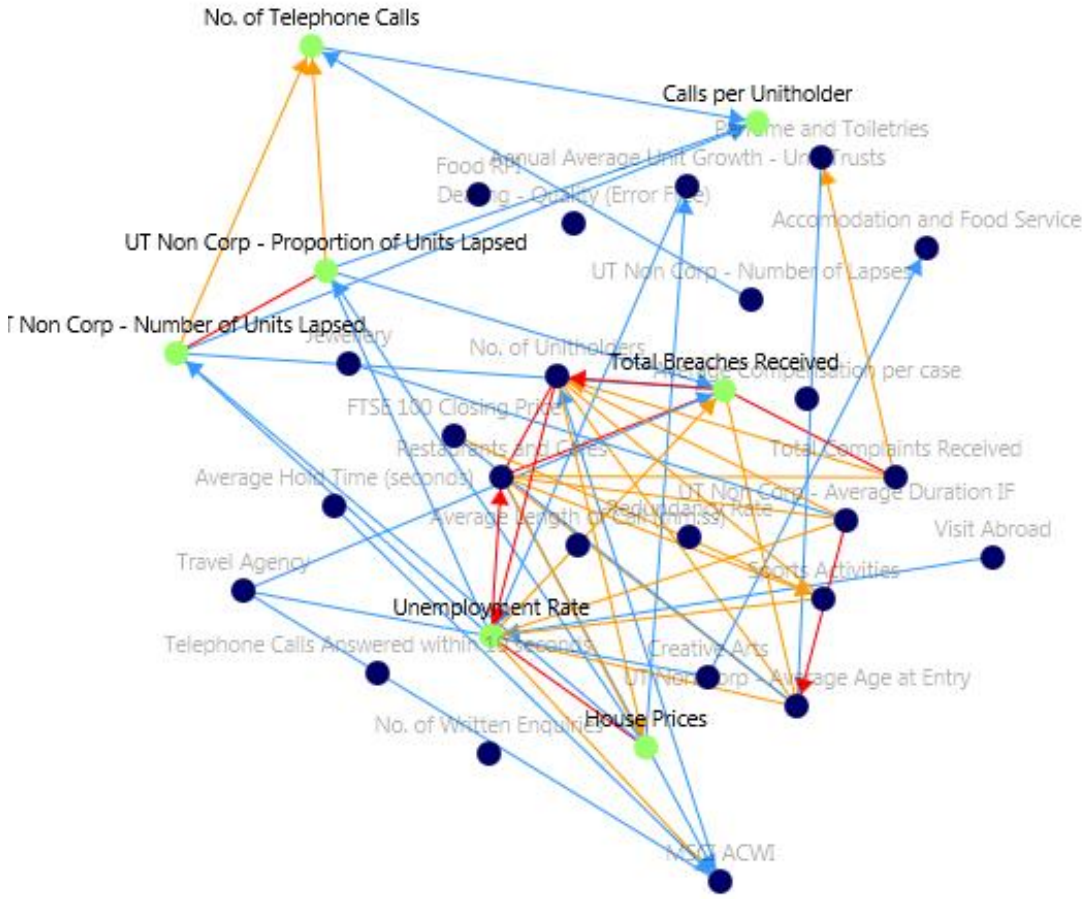
- Drivers were primarily service driven.
- Examples include calls per unitholder, number of written enquiries and unemployment.
- Lagged drivers include links to number of written enquiries, complaints and compensation paid.

Unit Trust (Corporate)

- Drivers were primarily index driven.
- Examples include the FTSE 100, redundancy rates and house price indices.
- Lagged drivers include social indicators and some service indices.

Findings – Lagged Data

Unit Trust – June 2014, No Lag

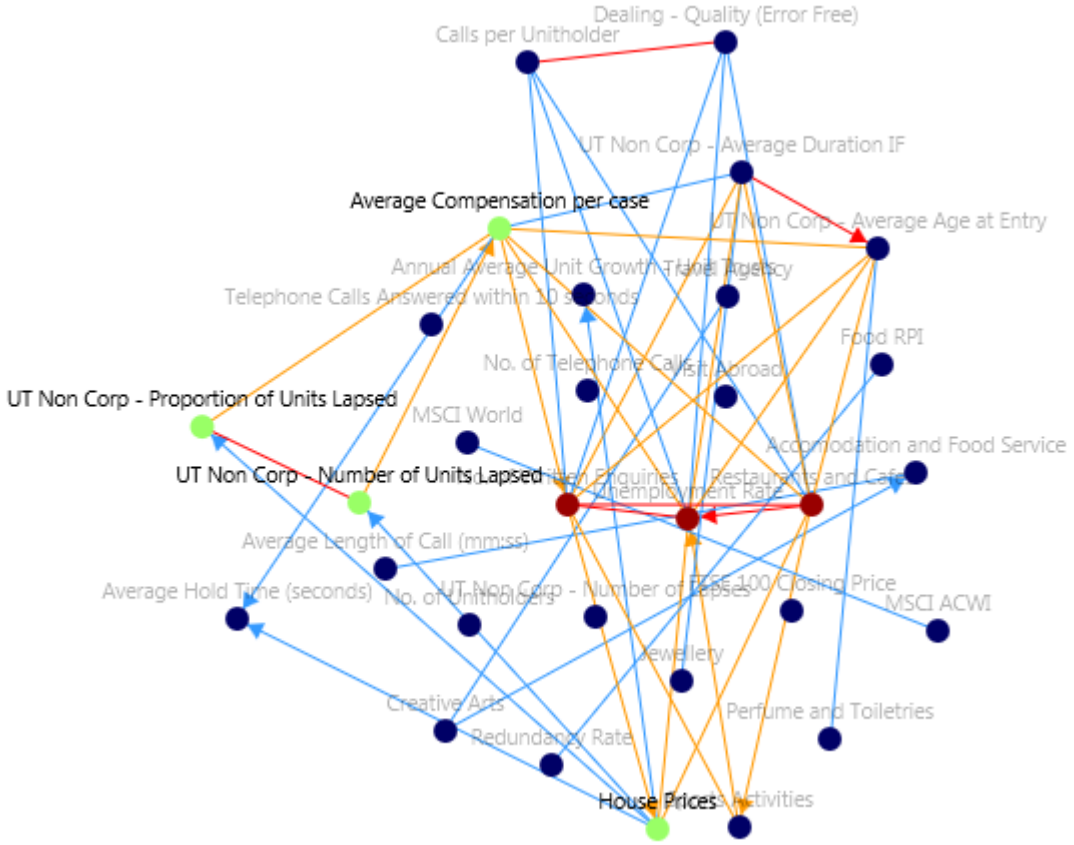


Links

- Telephone calls
- Calls per unitholder
- Time to investment
- House prices
- Unemployment

Findings – Lagged Data

Unit Trust – June 2014, 1 Month Lag

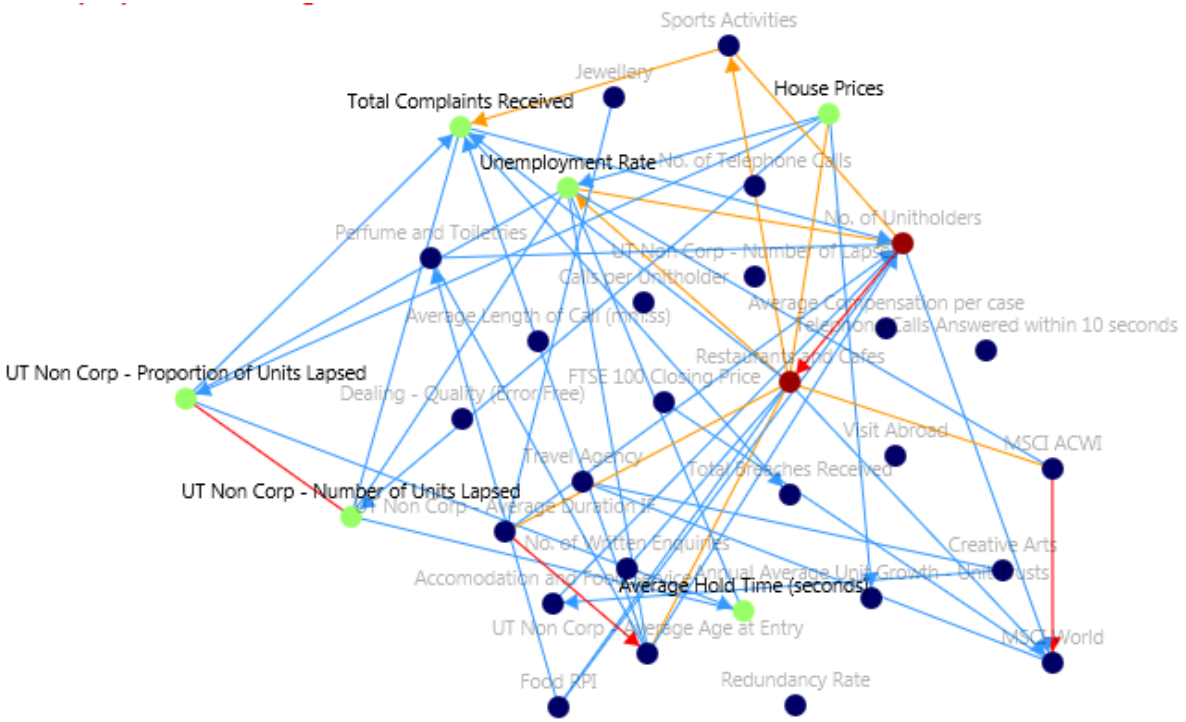


Links

- Telephone calls
- Calls per unitholder
- Time to investment
- House prices
- Unemployment
- Average compensation paid per policyholder

Findings – Lagged Data

Unit Trust – June 2014, 3 Month Lag

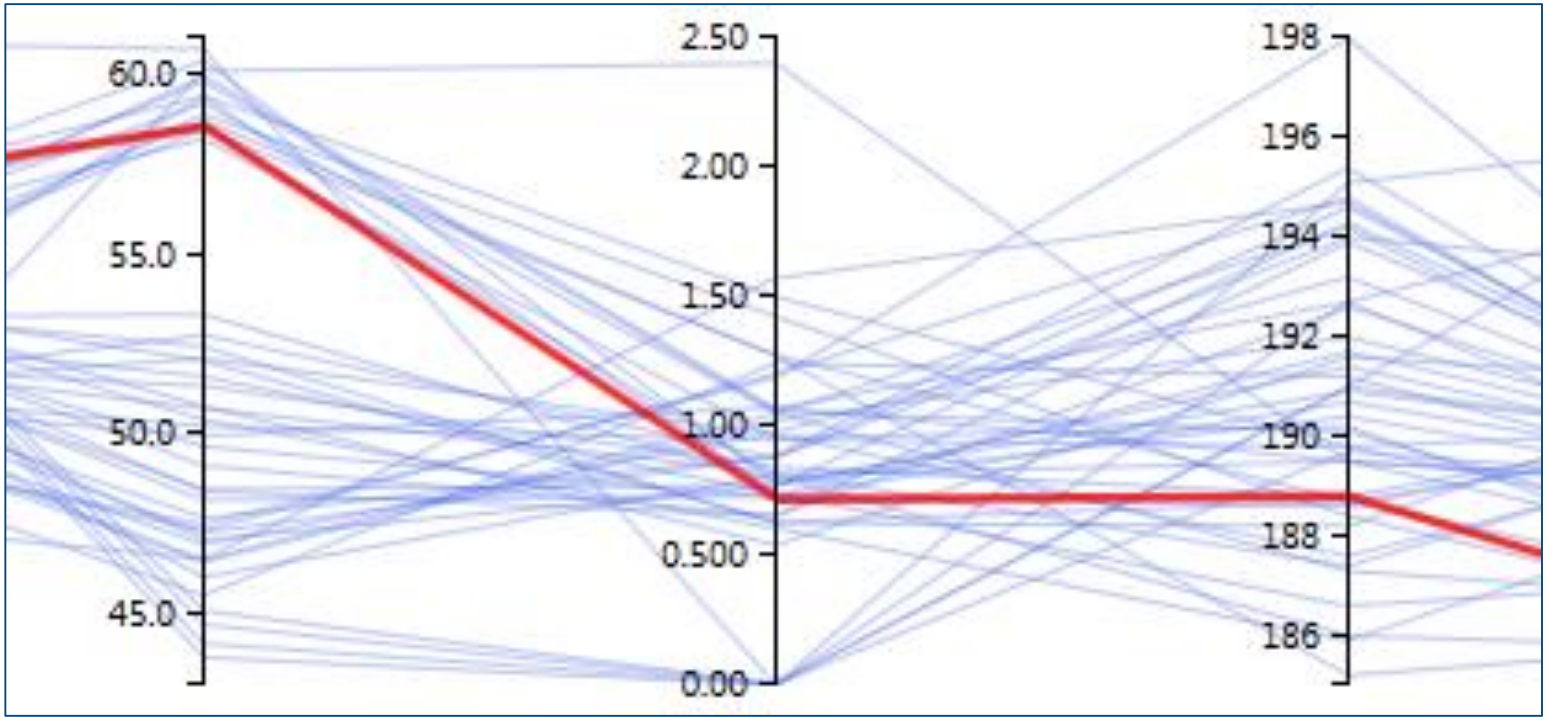


Links

- Telephone calls
- Calls per unitholder
- Time to investment
- House prices
- Unemployment
- Average compensation paid per policyholder
- Complaints
- Call hold time

Findings – What We Didn't Find

- Some 'traditional' drivers of lapses were not particularly prominent in our analysis, for example duration in force and inflation.

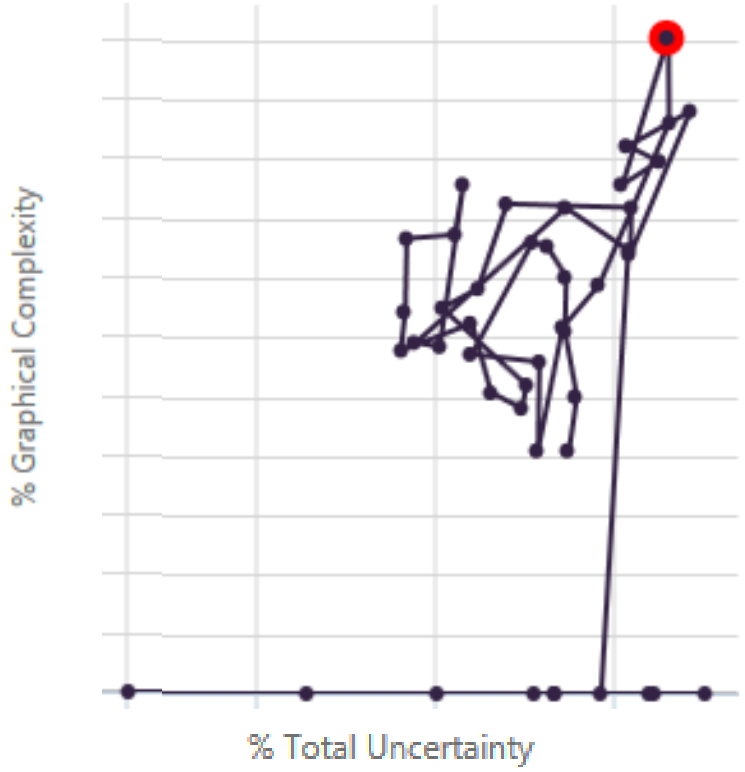


Findings – Drivers Changed Over Time

Unit Trust (Corporate)

Sep 2012 – Jan 2013	Feb 2013 – Jul 2013	Aug 2014 – Sep 2014
• No significant Links	• FTSE 100 • Redundancy rates • Social indices	• Social indices • Unemployment • Complaints • Written enquiries

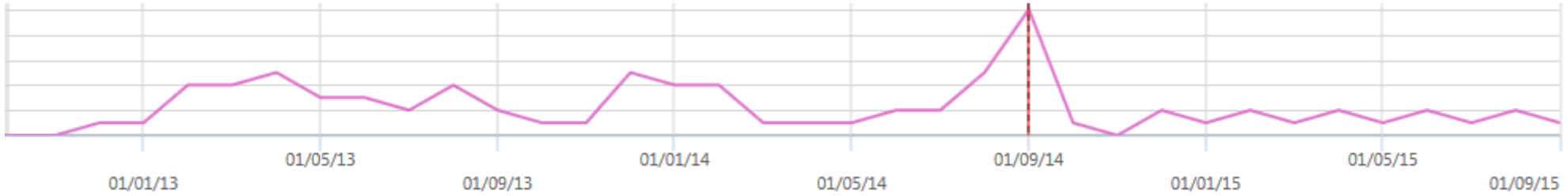
Findings – September 2014 Tipping Point



- The greater the uncertainty in a system, the greater the levels of unpredictability in that system
- The greater the levels of complexity in a system, the greater the potential for a system to collapse
- Complexity combined with uncertainty means something in the system is about to change
- This point matches with the highest number of links to lapses, which then suddenly break the next month

Findings – September 2014 Tipping Point

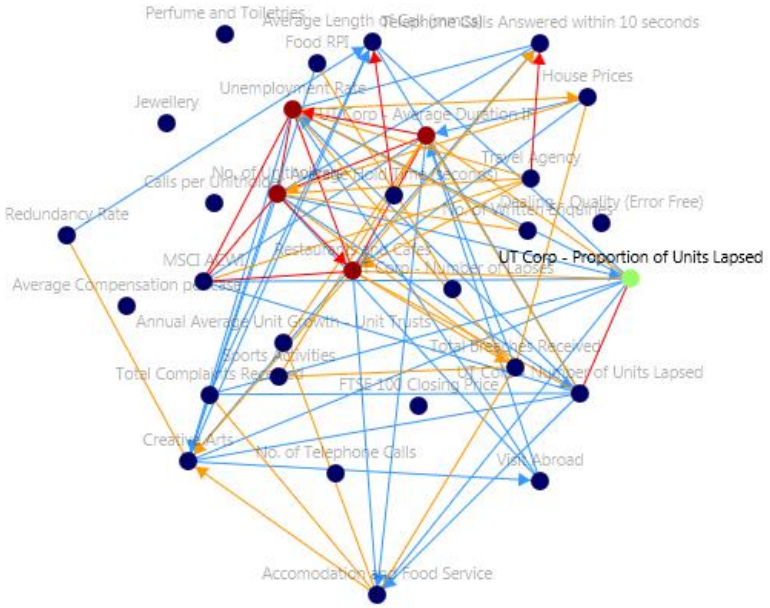
Unit Trust (Corporate)



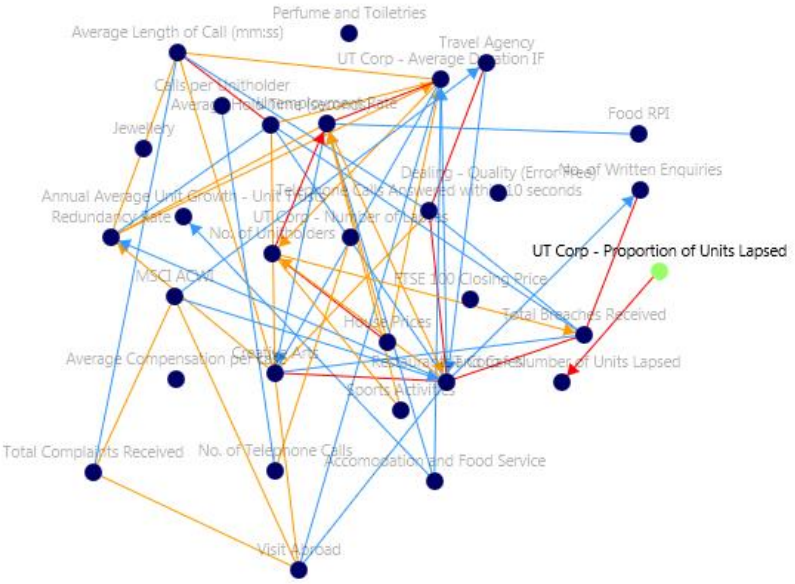
- The graph shows the number of links the lapse rates have to the system
- This decoupled in September 2014 – i.e. the underlying drivers of lapses changed

Findings – September 2014 Tipping Point

Unit Trust (Corporate)



September 2014



October 2014

Findings – September 2014 Tipping Point

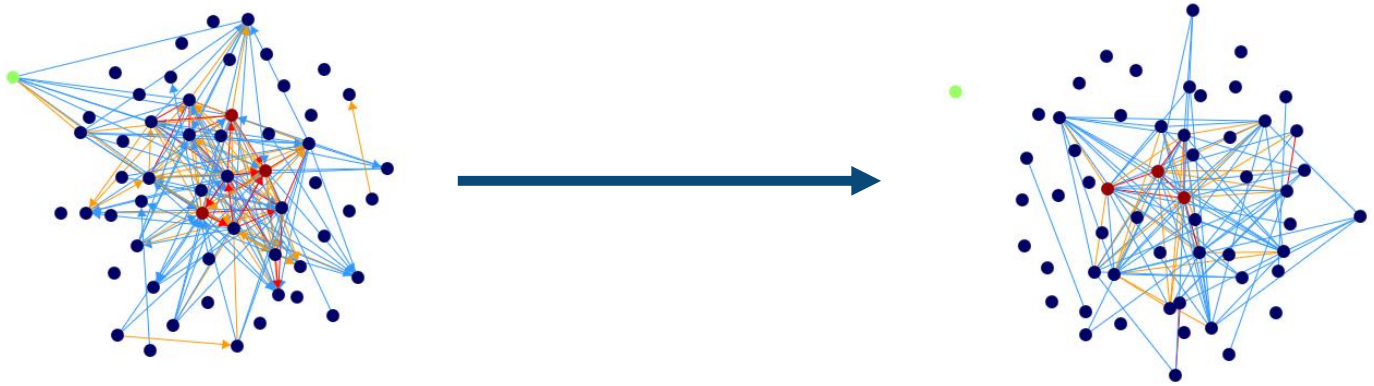
Unit Trust (Corporate)

Why did this happen?

At present: still under investigation!

However in another investigation we saw the same behaviour:

- Mis-selling scandal
- Compensation awarded
- People held onto their policy hoping for more



Further Investigations

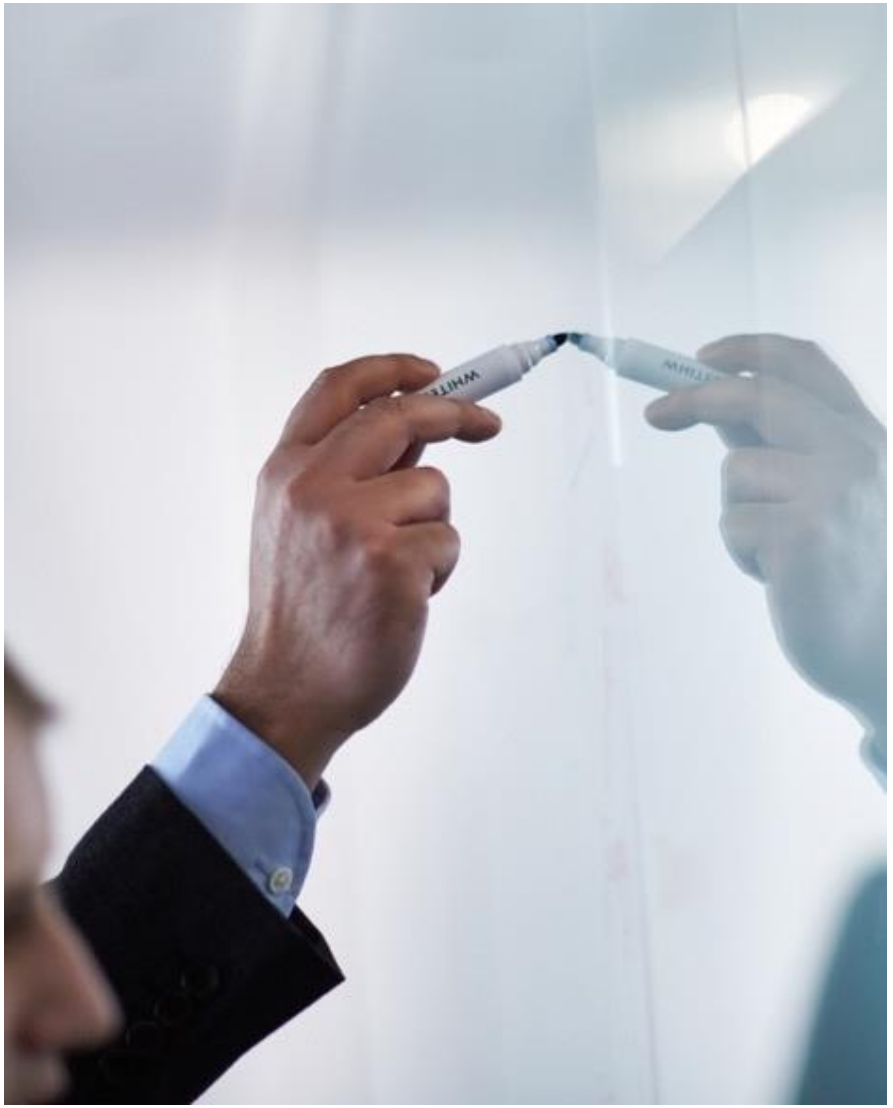
Continue to monitor the data, and re-run the analysis in the future

Talk to advisors about their experiences with policyholders lapsing

Lag the data by further time periods

Investigate what policyholders did with their lapsed policy

See if other, more complicated, metrics could be added to the analysis such as competition and reputation



Using the Findings

Monitor analysis going forward and look for more ‘tipping points’

Update lapse modelling to reflect the new position

Anticipate periods of high lapses and work on customer relationships ahead of these

Amend the product design to be more resistant to the findings

Research other policyholder behaviours

Summary

Summary

Understanding the behaviours of lapse rates is complex but possible

This method can analyse vast volumes of data to help to determine underlying drivers of policyholder behaviour

It’s important to understand that the systems underpinning lapse rates are bespoke and vary by product, type of lapse and point in time.

Gaining this understanding can help to improve retention levels and other performance metrics

Milliman

Any questions?

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