



The Actuarial Profession

making financial sense of the future

Predictive Modelling

Peter Yeates

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Agenda/Contents

- What is Predictive Modelling
- Insurance Applications
- What can you do

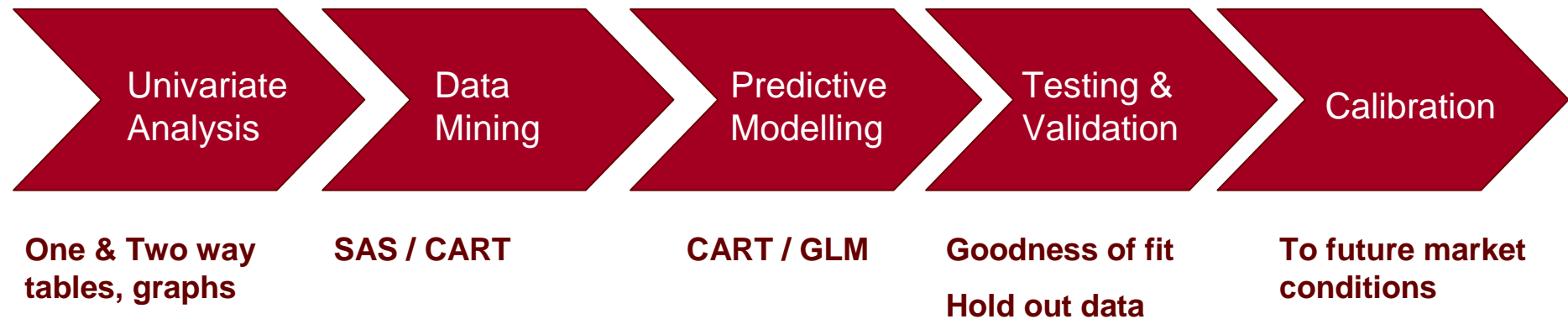
Predictive Modelling

It's about getting the data to talk to you ...

Predictive modelling is:

- Predictive modelling attempts to predict the probability of an outcome or outcomes
- It does this by building a statistical model based on a sample of data with known outcomes
- The model can then be applied to similar data for which the outcomes are not yet known

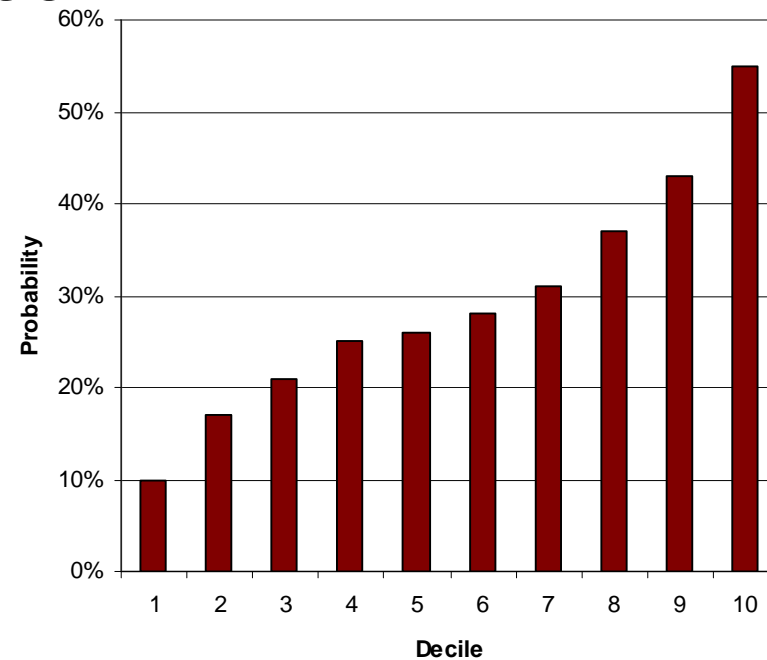
Data Mining – Predictive Modelling Continuum



Predictive Modelling

Two sides of the same coin

- Prediction
- Segmentation



Predictive Modelling

It's more widespread, but not new ...

Fair Issacs – credit scores

Tesco Club Card

... and many others



Insurance Applications

- Personal Lines Pricing
- Commercial Lines Pricing
- Marketing & Retention
- Claims Modelling & Reserving

Personal Lines Pricing

Predictive modelling is well established in calculating the premium rates for personal lines policies

- High levels of direct sales
- Large amounts of data
- Commodity market
- Policyholders who shop on price

Commercial Lines Pricing

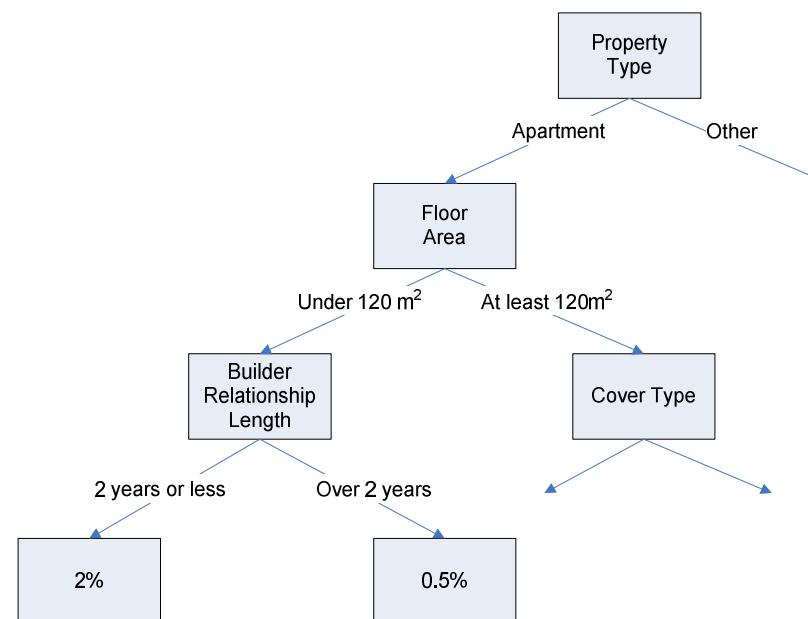
Has lagged behind Personal Lines due to greater diversity in customers and policies and data issues.

Best opportunities seen in small commercial packages

- Better identify target segments
- More sophisticated rating structures
- Enhanced auto-rating rules – less manual input

Using data mining for builders warranty business

Decision trees are useful for handling data with many categories and data which is sparse



Predicting claim frequency for building warranty

Exploratory work with builders warranty claims data highlighted a number of key business issues:

- High levels of claims from new risks
- Lower frequency from larger properties, partially offset by higher claim costs

Marketing & Retention

Aiming to combine

- Customer segmentation
- Customer behaviour
- Customer profitability

Customer segmentation

- Widely used for marketing (Experian's 40+ named demographics)
- Responding to promotional material
- Product design

Customer Behaviour

- Purchase of additional products
- Retention rates
- Price sensitivity

Customer profitability

- Don't want to acquire and retain unprofitable customers

Retention – Personal Lines

- Policy mix matters!
- Retention
- Expenses
- Claims experience
- 10-20% of those with house policies didn't hold a contents policy

Policies Held	Retention Rate
Third Party Only	60%
Motor	80%
Motor + 2nd Car	90%
Motor + House	90%
Motor + Contents	85%
Motor + H + C	95%

Example: Possible effect of policy mix on 12 month retention

Claims Modelling & Reserving

Claims processes

- Data mining to understand and quantify changes in process
- Identify key drivers
- Long-tail classes

Periodic payments

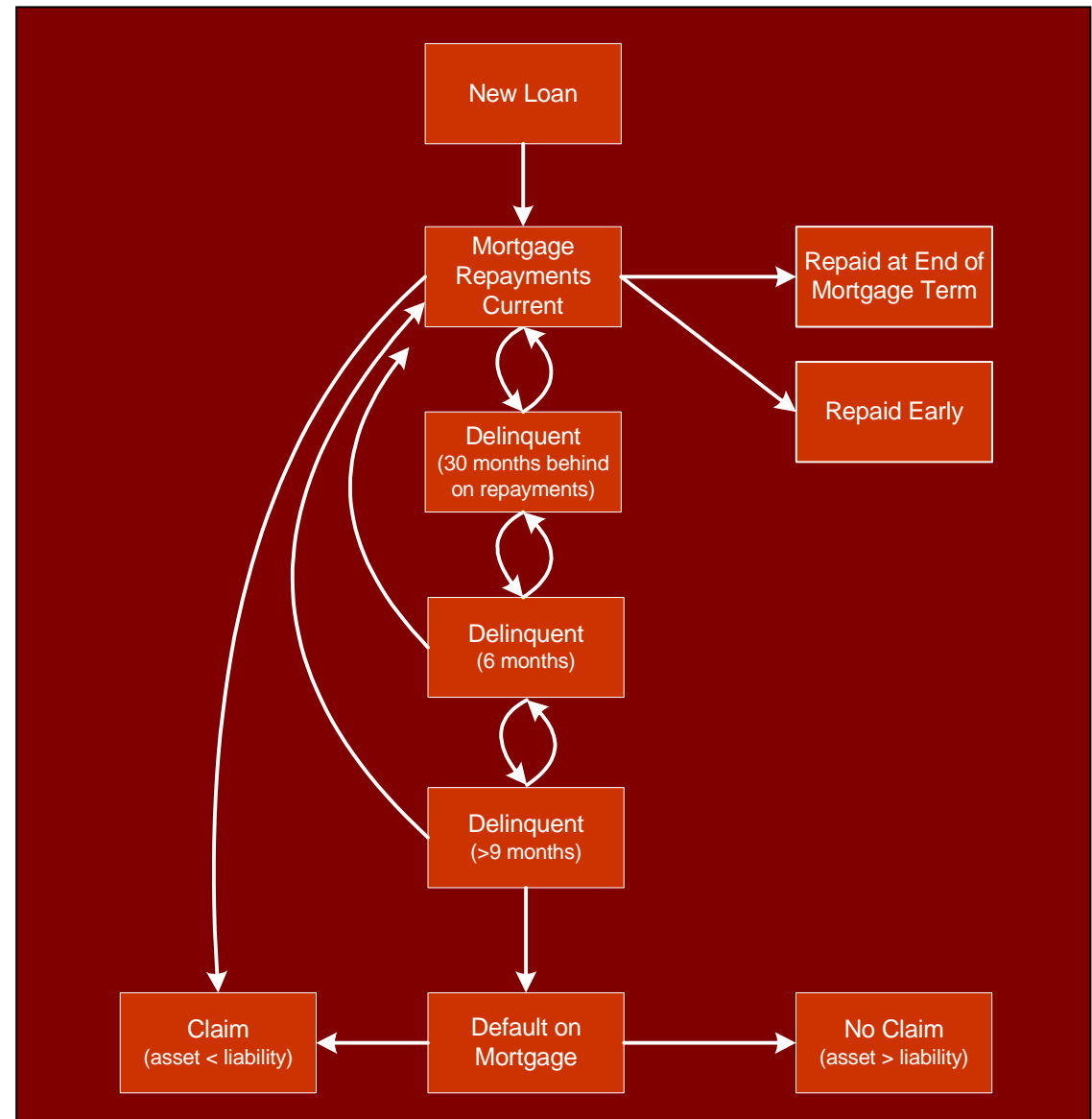
- Assist in setting accurate and up-to-date case estimates
- Large amounts of data
- Larger claims

Example – Mortgage Guarantee Insurance

- States are aligned with bank's systems and thought processes.
- States are observable
- Transition rates relate to processes the bank is interested in

BUT

- Key drivers are macro-economic



- Aligned model to bank's processes.
- Micro-event are significant predictors
- Still have macro factors, but they don't destroy usefulness



What Can You Do?

- Use of predictive modelling driven by
 - Increasing data availability
 - Better modelling tools
 - Competition
- Find data already gathered – and put to new uses
- Pick easy goals first
- Tools – GLMs / Decision Trees

Questions / Discussion

