

## Pricing a product for the first time

Jo Scott  
19th May 2003  
Warwick University

---

---

---

---

---

---

---

---

### Introduction

- 
- Scope – Pricing of ‘portfolio products’ using Multivariate analysis where possible and individual risk records.
  - Practicalities of pricing a product for the first time
  - Not about how to do a GLM
  - Based on experience in UK and Europe
  - Applicable to Commercial & Personal lines

---

---

---

---

---

---

---

---

### Contents

- 
- Understanding your product
  - Data
  - External environment
  - Communication with underwriting, claims, reinsurance and reserving
  - Implementing the new rates
  - Questions

*These are not mutually exclusive*

---

---

---

---

---

---

---

---

**Understanding your product**

---

- Essential before starting the data specification
- Very important in the modelling
- Will define the final solution

---

---

---

---

---

---

---

---

**Understanding your product**

---

- Consider
  - › The cover, is it compulsory?
  - › Who is covered?
  - › How is the product sold?
  - › How are claims administered?
  - › Have there been any major changes in the last few years?
  - › What are standard and non-standard policy endorsements?

---

---

---

---

---

---

---

---

**Understanding your product**

---

- Consider
  - › Is it a standard product?
  - › Has any work been done elsewhere in your organisation on similar products?
  - › Does it cover multiple risks?
  - › Is there a potential for latent claims, accumulation of risks?
  - › How is Reinsurance usually used?

---

---

---

---

---

---

---

---

**Data**

---

- Consider how you want to carry out the analysis and what you are trying to achieve
- Find out what is available internally and externally
- Start with what you would ideally like

---

---

---

---

---

---

---

---

**Data - Internal**

---

- Consider the scope of the extract
- What is available in theory and in practice?
- What are the rating factors - current & potential?
- What is the level of detail required?
- How easy will it be to extract?
- Do you need IS involvement?
- Has it ever been extracted before?

---

---

---

---

---

---

---

---

**Data - Internal**

---

- Does it all come from one system?
  - If not, is the data from multiple systems compatible?
- What are the likely volumes of data?
- Where will you store it?
- Relevance of old years

---

---

---

---

---

---

---

---

**Data - Quality**

---

- What is the quality of the data?
- Consider doing a quality audit first
- Spend time with the people who input the data
- Talk to staff who have been around a long time, understand how practices have changed
- Quality may affect the depth and scope of your analysis and the data you extract

---

---

---

---

---

---

---

---

**Data Quality - help from the underwriters**

---

- If the policy can have many sections how are you going to deal with this?
- Is data held on all aspects of the risk?
- When data comes from more than one system, will you be able to match information where necessary?
- Are there any issues caused by systems migrations?

---

---

---

---

---

---

---

---

**Data Quality - help from the underwriters**

---

- Are there any differences between past products and the current one?
- How are reinsurance details recorded on the system? What changes have there been?
- Can co-insured policies and block policies be identified?

---

---

---

---

---

---

---

---

**Data Quality - help from claims department**

---

- How can peril level payments be identified?
- Can claims be uniquely matched to the relevant exposure?
- Understand any industry agreements that may affect claims data
- Understand the practice of recording outstanding recoveries
- How are the claims reserves held on the system? At the peril level or at total claim level?

---

---

---

---

---

---

---

---

**Data Specification**

---

- Make sure that IS understand what it is you want. Talk with them.
- Talk the data extract spec through with the underwriters. Make sure you understand the product structure and the way that it is held on the system - particularly for more complex products.
- e.g. Commercial Property policy
  - Property Damage /Business Interruption/ Theft
  - Multiple Premises
  - Buildings and Contents

---

---

---

---

---

---

---

---

**Data Specification**

---

- Include all recorded risk and rating factors
- Ensure you can identify block policies and co-insured risks
- Consider whether you want policy and claims data separately or you want the IS extraction to merge. The former means more work for you, but is often far easier to obtain.

---

---

---

---

---

---

---

---

**Data cleaning**

---

- If data extract is very large request a sample prior to the full download
- First time extraction – data cleaning needs to be very thorough
- Be aware and make adjustments where necessary for any past systems migrations
- Carry out extensive data checks

---

---

---

---

---

---

---

---

**Data cleaning - data checks**

---

- Data fields contain the kinds of values expected - no extreme values
- Look at exposure across factor levels
- Multiple exposure on the same risk?
- Merging claims and policy – ensure don't multiply claims or exposures
- Claims causes consistent with perils covered

---

---

---

---

---

---

---

---

**Data**

---

- Data problems – consider the size of the problem and its materiality. Does it bias the data?

Example

Policies with claims have a far larger proportion of unknowns than those without.

Cause - incorrect method of extraction by IS.

Decision – Re-extract correcting the error.

---

---

---

---

---

---

---

---

**External Data- possible uses**

---

- No internal information e.g. building construction
- Supplement your information – e.g. postcode-related information
- As part of the rating structure using a ‘live’ link to an external database

---

---

---

---

---

---

---

---

**External Data- considerations**

---

- What is available?
- How easy is it to get?
- Cost?
- Ease of use?
- Potential added value

---

---

---

---

---

---

---

---

**External Data- practicalities**

---

- Ease of appending it to your data
- Cleanliness of your postcode information / Postcode versions
- Do you understand how the data has been created?
- Are there correlations with your existing rating factors?
- Multiple sources of external data– is the data correlated?
- How old is it? Relevance?

---

---

---

---

---

---

---

---

**External environment**

---

Important in order to

- Understand and interpret patterns you are seeing in your modelling
- Understand trends and changes in the past
- Predict future trends

---

---

---

---

---

---

---

---

**External environment**

---

Consider

- The effect of the economy  
e.g. Theft claims on Household policies, DMI
- Changes in legislation
- Changes in market practices
- Any recent landmark cases
- Public awareness of the product coverage, and changes in this
- Competitors activities

---

---

---

---

---

---

---

---

**Communication**

---

- Good communication and strong relationships with other departments lead to a smoother running of the project
- It is important to have regular communication with the underwriters, claims practitioners and IS throughout the project
- Other parties that it is important to involve at different stages of the work are the Finance and Reserving functions

---

---

---

---

---

---

---

---



**Communication**

---

- Explain the purpose of the exercise and what it is you are trying to achieve
- Gain buy-in at an early stage
- Ensure that there is full understanding from others of what it is that you want from them

---

---

---

---

---

---

---

---

**Communication**

---

Some examples of where communication is vital:

- Data extraction proves difficult if you have not fully understood the extent of the data requirements at the start of the project.
- Data cleaning always takes longer than expected. More involvement from underwriting and claims practitioners can help with the understanding. (Legacy migration problems lead to unknowns being populated with plausible but incorrect values.)

---

---

---

---

---

---

---

---

**Communication**

---

- Changes in claims practices – can lead to a misinterpretation of trends
- Important peculiarities in results dismissed or ignored due to a lack of understanding of the product and its underwriting criteria. Underwriter input into the interpretation of results is vital.
- New system implementation – not enough communication with IS developers means the 'two visions' are not in line

---

---

---

---

---

---

---

---

**Implementing your new rating structure**

---

- This needs to be thought about right at the beginning of the project and then borne in mind all the way through
- No point in coming up with a 'wonderful' new structure that can not be implemented
- Do you have a clean piece of paper or are you restricted by existing systems?
- Are there any plans to change the technology used as part of the rate engine?  
e.g. change to Ratabase or Productwriter

---

---

---

---

---

---

---

---

**Implementing your new rating structure**

---

- Will you be able to capture any more factors?
- Can all the factors that you have chosen to use be implemented?
- Can live links to new external datasets be implemented?
- Can you make any changes to the existing structure?  
e.g. building your new premium based on a peril by peril rating structure

---

---

---

---

---

---

---

---

**Implementing your new rating structure**

---

- Is there a limit on the number of rating factors or the way in which you can apply them?
- Do rating factors have to be applied in a particular order in the rating algorithm?
- Can you implement a component based pricing structure?
- Can you vary the contribution by risk or is it fixed?

---

---

---

---

---

---

---

---

**Implementing your new rating structure**

---

- If timescales are long, is there an interim solution?
- What new MI do you want with the new structure?
- How will you monitor the impact of the new rates?
- What are the training implications?

---

---

---

---

---

---

---

---

**Any questions?**

---

---

---

---

---

---

---

---

---