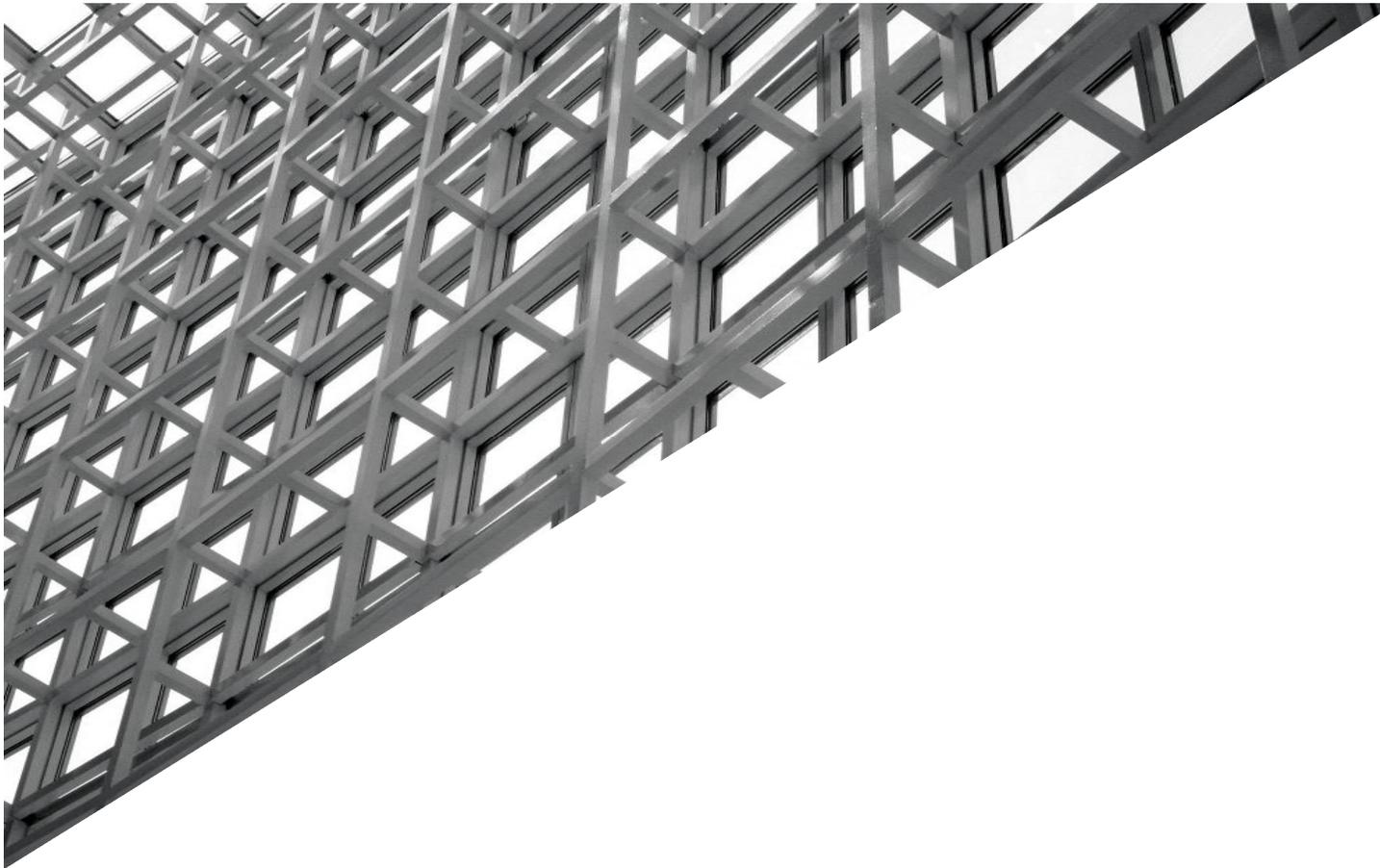


Confidential

Non life discussion

Pricing and Reserving

November 2008



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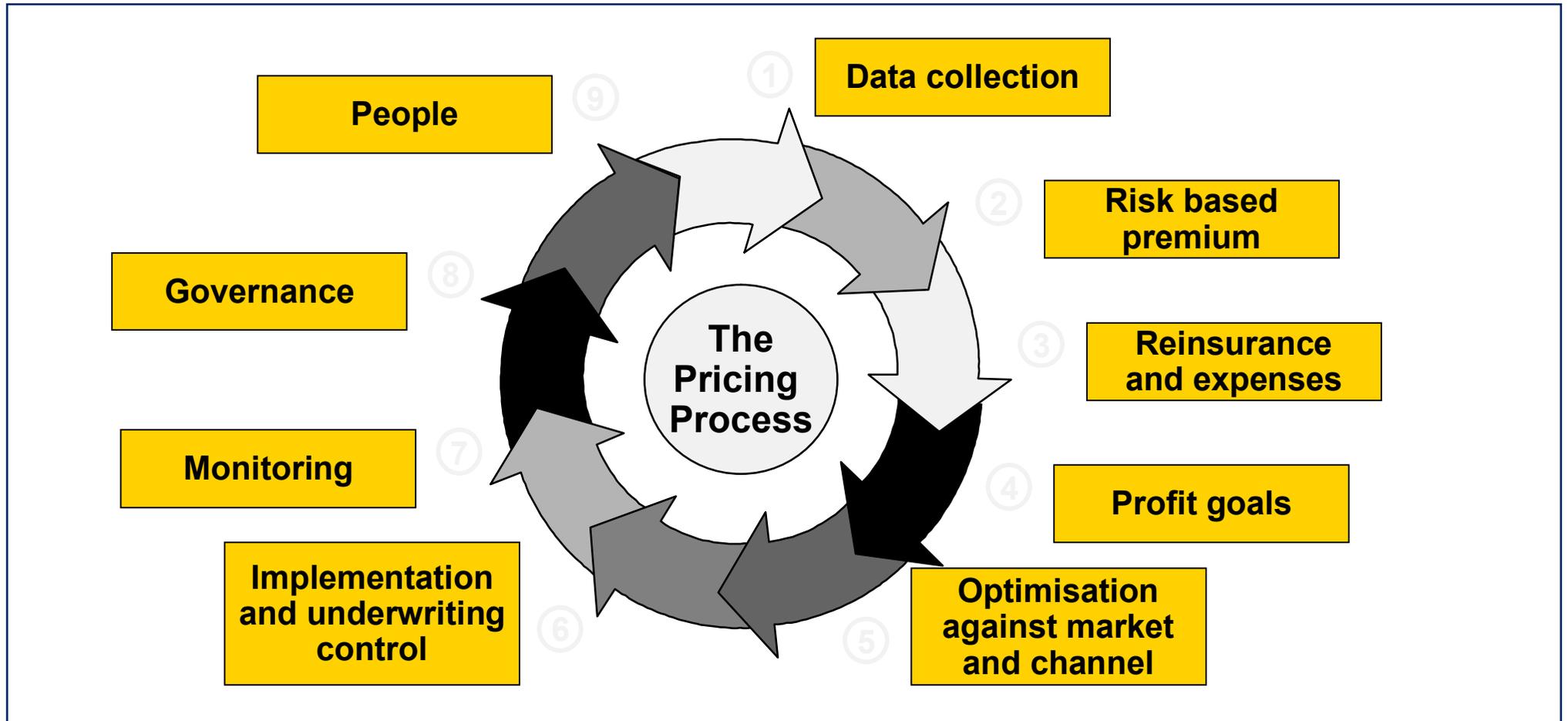
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Section 1

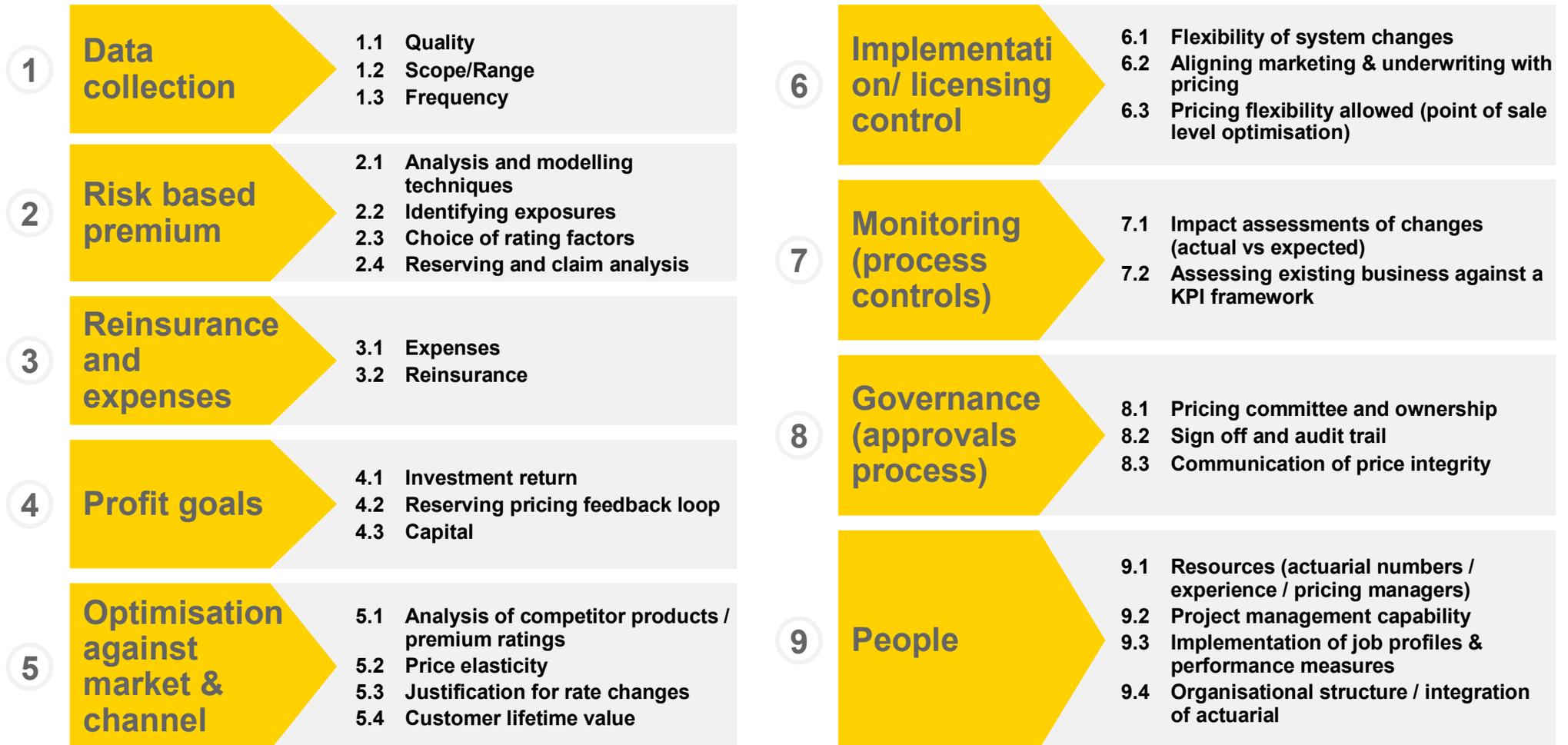
Non life pricing

A proven Framework - The Pricing Wheel

The Pricing Wheel provides a framework to help improve pricing capability



The pricing wheel in detail



Technical Pricing in different Rating Environments

		◀ Actuarial Role ▶
		Level of sophistication
		Low High
Tariff	<ul style="list-style-type: none"> ▶ Rates are set by regulator, or rates not to be filed with regulator ▶ Less sophisticated markets / products ▶ Key objective seems to avoid discrimination 	
Qualitative	<ul style="list-style-type: none"> ▶ Using blend of quantitative and qualitative data ▶ Numerical data not available, incomplete, imperfect, sparse or where risk perception is a key factor ▶ Actuaries and underwriters work closely together 	
Cost Plus	<ul style="list-style-type: none"> ▶ Numeric data used for defining a suitable cost price ▶ Best suitable in "steady state" or minimal competitive markets ▶ Actuaries work closely together with statisticians 	
Distribution	<ul style="list-style-type: none"> ▶ Sensitivity of customers to price changes is also considered ▶ Consider deal discounts, special offers, provision of add-on products, customer incentives ▶ Actuaries work together with marketing – communication and negotiation skills needed 	
Industrial	<ul style="list-style-type: none"> ▶ Applied by large personal lines companies with multiple products / brands / distribution channels ▶ Process and operation oriented – efficiency and effectiveness / economies of scale ▶ Clear management function of pricing – increased communication with stakeholders 	

Section 2

Non life reserving

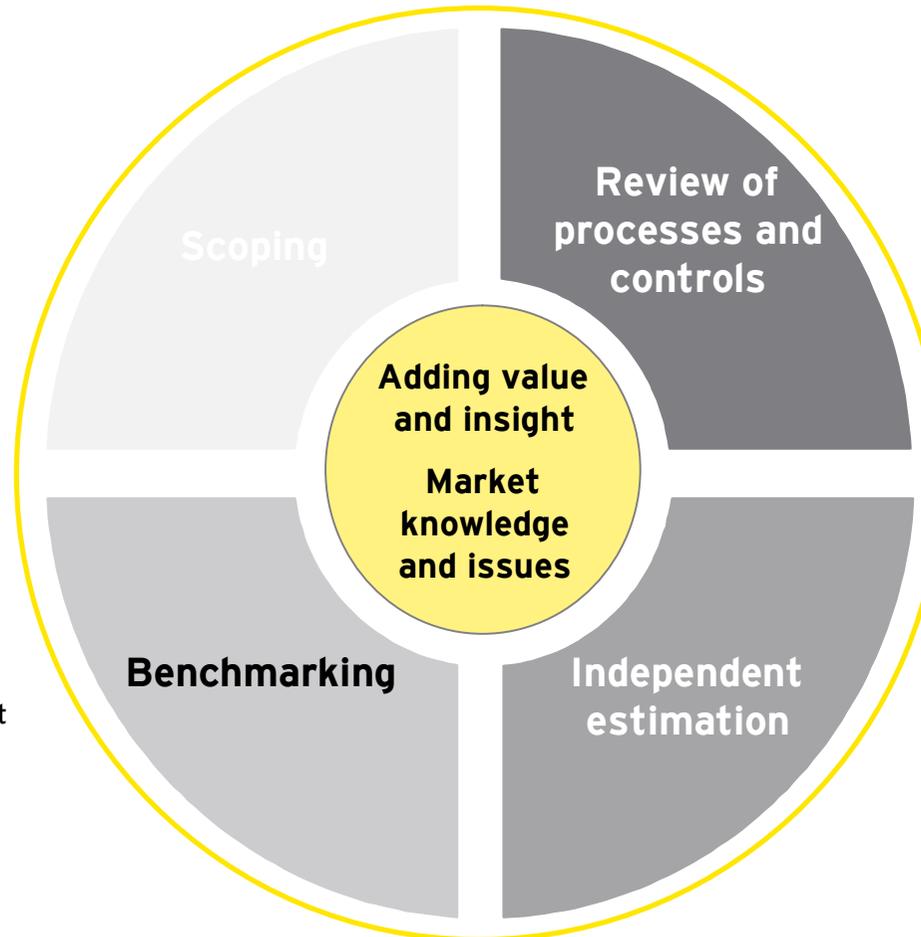
Reserving - Our Approach

High level approach

Our approach ensures we cover the breadth of work needed to meet our professional standards, making sure we take a comprehensive overview of the whole process as well as performing detailed reviews on key issues to add value and insight to you

- ▶ Initial meetings with actuarial, underwriting, claims and other staff
- ▶ Review of previous internal and external actuarial reports to identify key risk areas
- ▶ Build good working relationships in order to avoid inefficiencies later in the project
- ▶ Co-develop deliverables
- ▶ Use your data feeds wherever possible to enhance efficiency
- ▶ Work with you to minimise disruption and reduce management time

- ▶ Benchmark key assumptions for all classes of business to derive first cut estimates
- ▶ Compare ultimate loss ratios and claims patterns across classes against the market
- ▶ Identify any material discrepancies to internal estimates



- ▶ Understand the format and structure of the data available
- ▶ Review of the reserving process including roll forward restatement and AvsE
- ▶ Understanding of controls around data, projections and sign off
- ▶ Review of the rate monitoring process

- ▶ We will agree key classes for further review based upon the following criteria:
 - issues where you would like additional insight
 - material classes
 - classes that trigger material discrepancies from the benchmarking review
- ▶ Review of unusual policies/classes where non standard methods/more judgement required
- ▶ Special claims issues (e.g. WTC, KRW etc)

Reserving - Our Approach

What our clients want

Independent and
objective reserve
review

People who
understand your
business

People you can
work with

Communication

Flexibility

Deliver on time

No surprises

Co develop
deliverables

Value added

Sharing market
insights and best
practice

Robust challenge
– particularly
during the soft
cycle

Assurance to the
Board and the
Audit committee

Reserving - Our Software

WinRes® - main features

- ▶ **Storage facilities** - standard framework on which to store premium, claim, expense and number of claims run-off triangle data. The system can also save exposure data and a priori estimates of ultimate. Data can be provided on a yearly, half yearly, quarterly or monthly basis, entered cumulatively or incrementally.
- ▶ **Extrapolation methods** - Possibility to 'roll forward' data to the end of the last development period with either user defined or system calculated factors by origin period. All results can be shown at the original or extrapolated date.
- ▶ **Different actuarial projections techniques, flexible analysis:**
 - ▶ **Chain ladder** - Various possible ways to select development profiles over any number of origin periods, exclusion of anomalous experience from the averaging process, populating own values for development factors, smoothing development ratios with geometric means, curve fitting to estimate tail factors, etc.
 - ▶ **BF and ELR** - chain ladder estimates can be blended with underwriter or market views on profitability to incorporate factors not apparent in the data.
 - ▶ **Average cost capability using 2 different methods**
- ▶ **Diagnostic tools** - A range of tools including residual plots and sensitivity analysis
- ▶ **Extensive graphical capabilities**
- ▶ **Clear summaries** - Possibility to summarise your analysis showing all relevant data, results and a comparison of each estimate of ultimate. The flexible file linking system which allows you to combine results of projections from many data sets, and produce you own customised summary sheet in Excel.
- ▶ **Audit trail** - A notes facility enabling the user to keep a record of their analysis.
- ▶ **Ease of navigation** - An easy to use 'Navigator' allowing the user to move through the screens associated with the data file quickly and easily.

Reserving - Our Software

WinRes® - Ranges tool

Bootstrapping is a general form of statistical inference, which allows estimation of properties of an estimator

Process:

- ▶ Data - sample size n
- ▶ Re-sample from the sample with replacement n times to create a new sample
- ▶ Repeat this re-sampling process many times (e.g. 10,000)
- ▶ Consider the distribution of the desired property of the estimator

Advantages:

- ▶ Simplicity
- ▶ It is easy to construct estimates of standard errors and confidence intervals for complex estimators
- ▶ May not be possible to use analytical techniques to perform the statistical inference
- ▶ Do not need to know population distribution

Section 3

Selected credentials

Selected Credentials – Pricing & Reserving

- ▶ **Rating structure analysis** : A motor insurance client wanted to understand how its premium rating structure compared to its key competitors. By fitting generalised linear model and other mathematical models to a large data set of premium rates and policy data we were able to reverse engineer the rating structures so that comparisons could be made. The analysis identified several key areas where the client was out of line with its competitors.
- ▶ **Pricing Methodology** : We have analysed the pricing methodology of individual risks of a large UK insurer and have helped develop pricing tools that assist the underwriters. There was a very limited infrastructure within the company which affected the analysis we could provide and the underwriters were initially sceptical about the idea of changing their current processes. During the course of the project, the client benefited from a better understanding of the risks it wrote and the underwriters started being convinced that their risk assessment processes could be improved significantly.
- ▶ **Renewal model** : For a leading Insurance broker we were asked to review their current renewal model for motor insurance. After discovering several flaws in the process, we redesigned the data acquisition needs and implemented an appropriate generalized linear model for renewal. In comparing new and old predictions we were able to demonstrate a drastic improvement over the previous approach, with great satisfaction for the client.

- ▶ **Operations transformation** : Ernst & Young have advised a major European insurer in streamlining its reserving function through a detailed independent review of the company's actuarial reserving processes. Our review resulted in significant improvement to levels of efficiency, reducing timescales for the reserve estimation process from 4 months to 1 month. The company has implemented many of our recommendations, resulting in improved communication between actuaries/underwriters/claims/senior management and more effective use of management information
- ▶ **Start up assistance** : We have supported a large international insurance company enter into the European insurance market through the setup of its offices in Switzerland. We are now implementing a consistent reserving methodology across all global divisions of the company encompassing diverse classes of business. This methodology involves the application of our market benchmark information in developing claim development profiles and ultimate loss ratios for different territories.
- ▶ **Reserve adequacy** : We have assisted a large insurance company by providing worldwide solutions for their clients to evaluate the level of reserves in various different countries. Our team included people from many different Ernst & Young locations, including the US, UK, Germany, Switzerland and France. During the course of this engagement, we analysed loss development patterns in 20 different countries. We also analysed the controls around the actuarial process, covering pricing, reserving and management information.

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