

08/08/2014

INSTITUTE OF ACTUARIES OF INDIA
5th Capacity Building Seminar in GI

Session1: Commercial Pricing & Rate Adequacy

Table of Contents

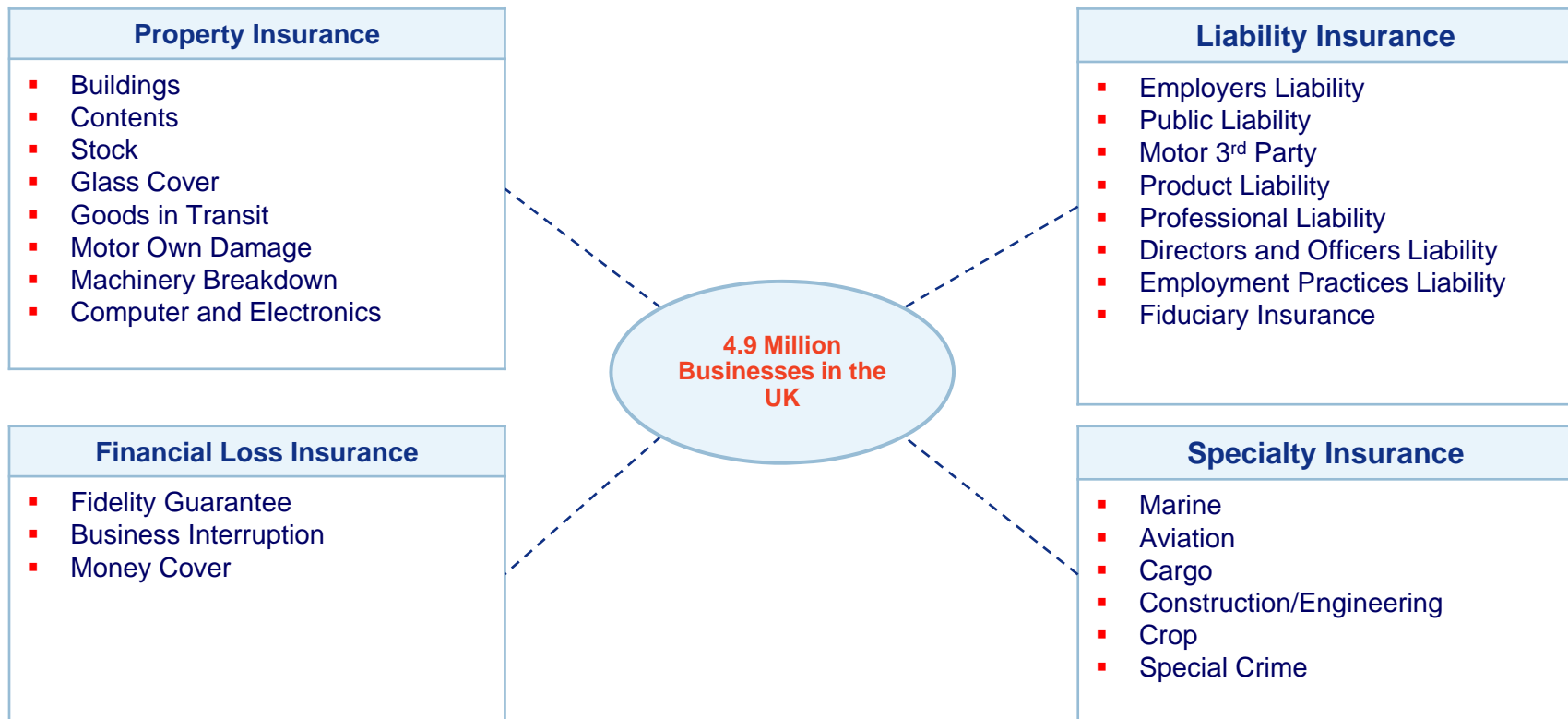
1. **What is Commercial Insurance?**
2. **SME and Large Enterprises**
3. **Characteristics of Commercial Policies**
4. **The Pricing Actuary**
5. **Key Roles in Commercial Pricing**
6. **How is a Commercial Lines Policy Priced?**
7. **Methodologies Used to Calculate Technical Premium**
8. **Methodologies Used to Check Rate Adequacy**
9. **What's Next For Actuaries?**

Contents

1.1 What is Commercial Insurance?

Commercial Insurance

- Refers to insurance policies sold to businesses



2.1 SME and Large Enterprises

Small-Medium Enterprise (SME)

- Employ fewer than 250 employees
- Annual turnover of less than €50m and/or Annual balance sheet less than €43m
- Accounts for 99.9% of all businesses in the UK
- Split further into Micro / Small / Medium

Large Enterprise

- Very large corporations such as the top 500 FTSE companies.

Note: The above definition applies to countries within the European Union. Non-EU countries will have different definitions or terminology.



3.1 Characteristics of Commercial Portfolios

A Large Number of Products/Covers

- Non-standard policy wordings and tailored products
- Policy exclusions are often applied

Heterogeneity

- A large number of different industries and occupations
- Big variation in the types of process performed by the insured
- Big variation in size of risk

Volatility

- High proportion of large claims
- Exposure to latent claims
- High deductibles (commercial entities are often prepared to retain some insurance risk)

Lack of Quantity and Quality of Data

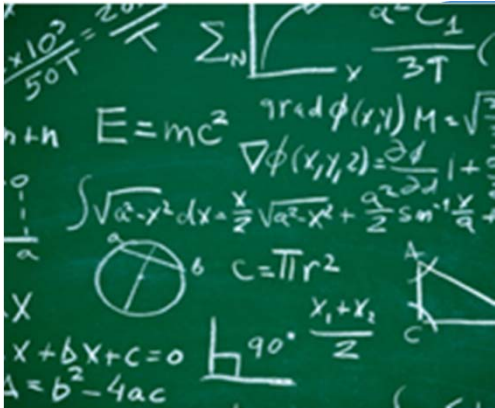
- Policies typically sold through Brokers who:
 - Want to reduce administrative costs
 - Try to limit inconvenience for their customers
 - Often provide bulk entered policies or claims
- Lack of structured data – data is often provided as free form text field.
- Limitations of insurance system to record all relevant risk information
- Lack of investment

A Large Number of Soft Factors

- Pricing is heavily influenced by the underwriting cycle
- Relationship with intermediaries
- Significant case underwriting
- Individual policies may also have a material impact on GWP volumes and expense ratio

4.1 The Pricing Actuary

The Personal Lines Pricing Actuary



- Over the last 20+ years, Personal Lines has been a very attractive area for pricing actuaries.
- The characteristics of these portfolios meet the requirements for statistical analysis
- This has enabled actuaries to add significant value through technical analysis

The Commercial Lines Pricing Actuary



- The role of actuaries within Commercial Lines is much less established
- Characteristics of these portfolios means that actuaries have found this area to be much less accessible
- Lack of investment in Actuaries within Commercial Lines.
- Is there an opportunity for actuaries to add value?

5.1 Key Roles in Commercial Pricing

The Portfolio Manager

Responsible for the whole portfolio of policies (e.g. a Commercial Fleet portfolio):

- Responsible for designing the product and coverage
- Develop and implement the overall strategy
- Issue underwriting guidelines and book rates

The Case Underwriter

Responsible for pricing / selling an individual policy:

- Makes a judgment on whether the level of risk is acceptable
- Determines an appropriate level of premium
- Negotiates final premium with the intermediary

The Pricing Actuary

Responsible for providing technical analysis and support to the Portfolio Manger:

- Calculating a technical premium
- Monitoring key performance indicators
- Provide an understanding of the impact of pricing changes

6.1 How is a Commercial Lines Policy Priced?

Premium is typically calculated by applying a *Rate* to a measure of *Exposure*:

$$\text{Premium} = \text{Rate} \times \text{Exposure}$$

Rate

Underwriters will often talk about premiums in terms of pence per £100 exposure:

- E.g. A policy was written at a rate of 3p
- Usually calculated subjectively

Exposure

The exposure measure used will depend on the type of policy:

- EL - Wage role
- PL - Turnover
- Property - Sum Insured
- Fleet - Number of vehicles

6.2 How is a Commercial Lines Policy Priced?

Technical Rate

- A specified or 'book' rate applied to exposure
 - For some products this may be based on as few as one or two rating factors
 - Others products may have a sophisticated pricing structure
- Based on technical analysis of historic performance

Experience Rate

- A rate is calculated based on a burning cost of the insured's own claim experience
- Assumptions are needed around:
 - Inflation
 - IBNR/IBNER Factors
 - Large Loss Loadings
 - Commissions / Expenses / Reinsurance / Profit

Underwriter Rate

- Underwriters may have the authority to apply loadings / discounts based on their own assessment of the risk
- They may use information gathered from on-site surveys performed by risk engineers

Final Rate

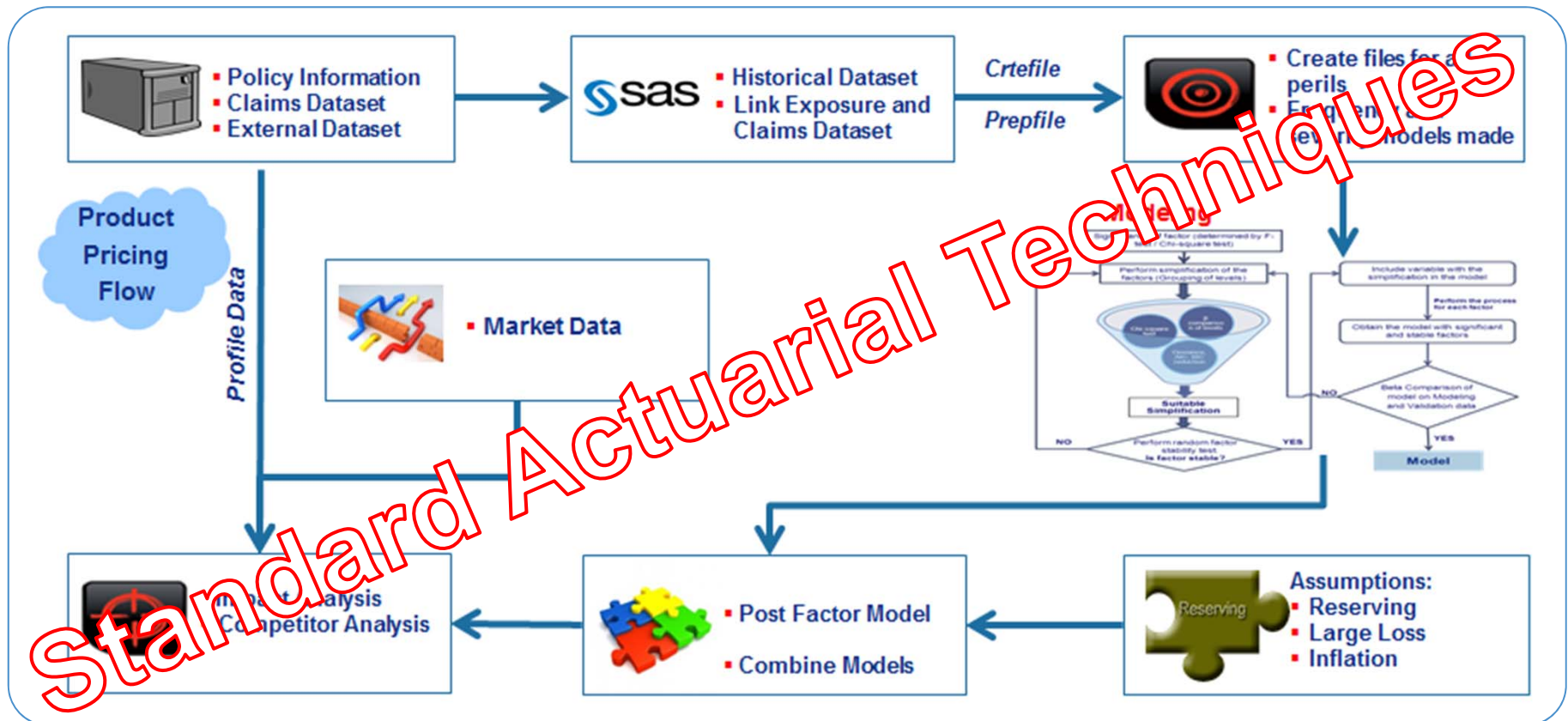
- In practice a blend of methods will be used depending on the class of business / individual insured / underwriter judgment
- For SME business the technical rate may be used without further consideration
 - Case underwriting is often uneconomic due to small average premium size
- For a large commercial risk the rate may be based entirely on the insured's own experience
 - There is no set rule for 'large', but there needs to be a meaningful claims pattern

7.1 Methodologies Used to Price Commercial Lines



Small and Medium Enterprise

- Characteristics tend to be closer to standard Personal Insurance portfolios
- Case underwriting is often uneconomic due to small average premium size
- Large portions of these portfolios are typically auto-rated using sophisticated pricing structures



7.2 Methodologies Used to Price Commercial Lines



Large Enterprise

- Characteristics of these portfolios are the least suitable for statistical analysis
- Each policy will be individually underwritten with the technical rate used as a reference point

Technical rate is typically derived from simply one-way or two-way analysis, along with underwriter judgment

8.1 Methodologies Used to Check Rate Adequacy



Overview

- For large commercial risks It is usually not possible to calculate a risk premium based on statistical analysis
- Instead a more 're-active' approach is taken to assess the adequacy of the rates charged on Commercial Lines portfolios

Useful Analysis

Rate Change

- Directly monitor the change in rate strength over time

Actual vs. Technical

- Monitor the actual premium charged against the technical price

Renewal / Conversion Rates

- Monitor renewal and conversion rates

Exposure Tracking

- Monitor exposure to certain segments of the book

Loss Ratio Monitoring

- Monitor the emerging loss ratio experience

Lapse vs. Renewals

- Monitor the performance of lapsed and renewed policies

GWP Volumes

- Directly monitor premium volumes

Note: Commercial policies are typically sold through intermediaries - this reduces pricing transparency within the market.

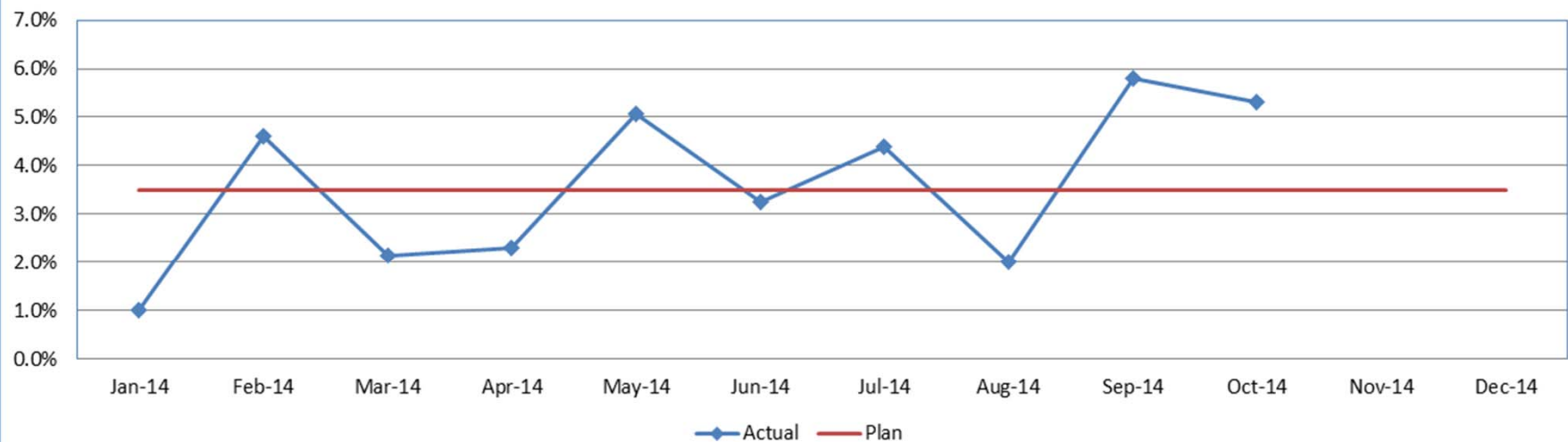
8.2 Method 1: Rate Change



Rate Change

- Directly monitor the change in rate over time
- Useful to track rate change against the financial plan
- Useful as information is available when risk is written rather than when claims start to emerge

Written Rate Increase (Month of)



Rate Increase	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Actual	1.0%	4.6%	2.1%	2.3%	5.1%	3.2%	4.4%	2.0%	5.8%	5.3%		
Plan	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%

8.2 Method 1: Rate Change



How to Calculate Rate Change?

Auto-rated Business

- If all business is auto-rated then you can simply apply the old and new rating structures against the portfolio

Renewals (non auto-rated)

- This is relatively straight forward as you have a previous state to compare the rate charged.
- The rate change can be crudely calculated by: $\text{Rate Change} = \text{Change in Premium} / \text{Change in Exposure} - 1$
- Need to be careful as exposure may not be completely correlated with risk.

New Business (non auto-rated)

- This is much harder as you are not looking at consistent risks - changes in business mix will distort the rate charged.
- Can look at changes in the book rate (Although these rates do not necessarily reflect the final premium charged)
- Can apply a GLM with
 - Rate as the response variable
 - A number of explanatory variables to remove effect of business mix (e.g trade, SI, etc.)
 - Time as an explanatory variable ← this will give you an view of how rate changes over time

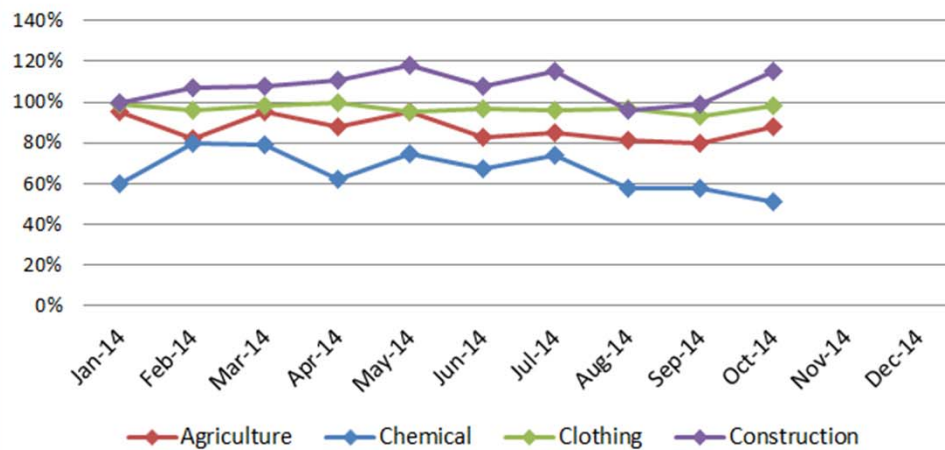
8.3 Method 2: Actual vs. Technical



Actual vs. Technical

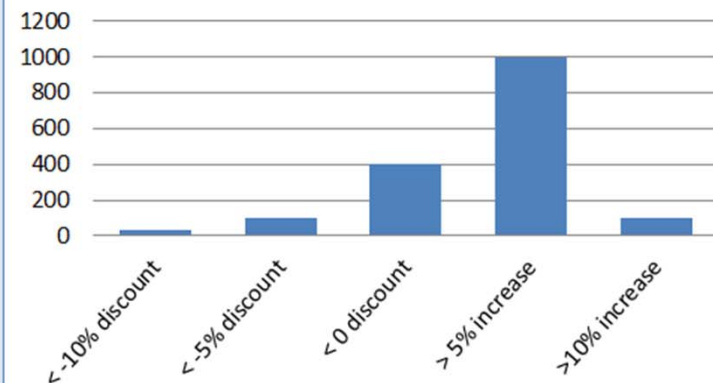
- Rate Index = actual premium / technical premium
- Monitors is there is any consistent over or under pricing of risks
- Can also be useful to look at the distribution of rate index to make sure a small number of large policies are not distorting the underlying trend.

Rate Index by Trade



Chemical

Policy Count by Rate Index



8.4 Method 3: Renewal and Conversion Rates



Renewal Rate

- = no. of renewals / no. of policies offered renewal
- A high renewal may suggest that the insurer's premiums are low relative to their competitors.

Conversion Rate

- = no. of policies converted / no. of quotes offered
- Conversion rates tend to react quicker than renewal rates as it is generally easier for intermediaries not to place new business than to move significant volumes of existing business.
- If the insurer is known to be overpriced in a particular segment, then intermediaries may not even request a quote. This may distort the conversion rate.

Notes

- The above assumes that price is the key driver of business volumes. It does not account for:
 - The strength of the relationship with the intermediary
 - Brand strength of the advertiser (e.g. advertising)
 - Attractiveness of the policy wording (e.g. certain covers included/excluded)

Trade Family	Quotes Offered	Policies Converted	Conversion Rate
Agriculture Forestry and Fishing	415	193	46.5%
Building Materials and Glass	491	174	35.5%
Chemical	701	4	0.5%
Clothing and Textiles	988	264	26.7%
Construction	122	51	41.9%
Health and Social Welfare	814	407	50.0%
Electrical and Optical	281	5	1.8%
Food and Drink	866	168	19.4%
Hotels and Catering	171	70	40.9%
Machinery and Equipment	358	118	32.9%
Metalworkers	911	191	20.9%
Mining and Quarrying	106	28	26.0%
Miscellaneous Goods	298	71	23.7%
Paper and Printers	666	314	47.2%
Personal and Community Services	963	329	34.2%
Plastics and Rubber	611	184	30.1%
Professional and Business Services	972	135	13.9%
Property Owners	724	111	15.3%
Public Authorities and Utilities	829	387	46.6%
Recreation and Leisure	721	220	30.4%
Transport Equipment	840	222	26.5%
Transport and Storage	149	1	0.8%
Wholesale Retail	587	238	40.5%
Wood	780	363	46.6%

8.5 Method 4: Exposure Tracking



Exposure Tracking

- Directly monitoring how exposure is changing over time
- This will give you an idea of how your business mix is changing over time
- Needs to be considered in conjunction with the LR performance in each segment.

Number of Policies by Sum Insured Band



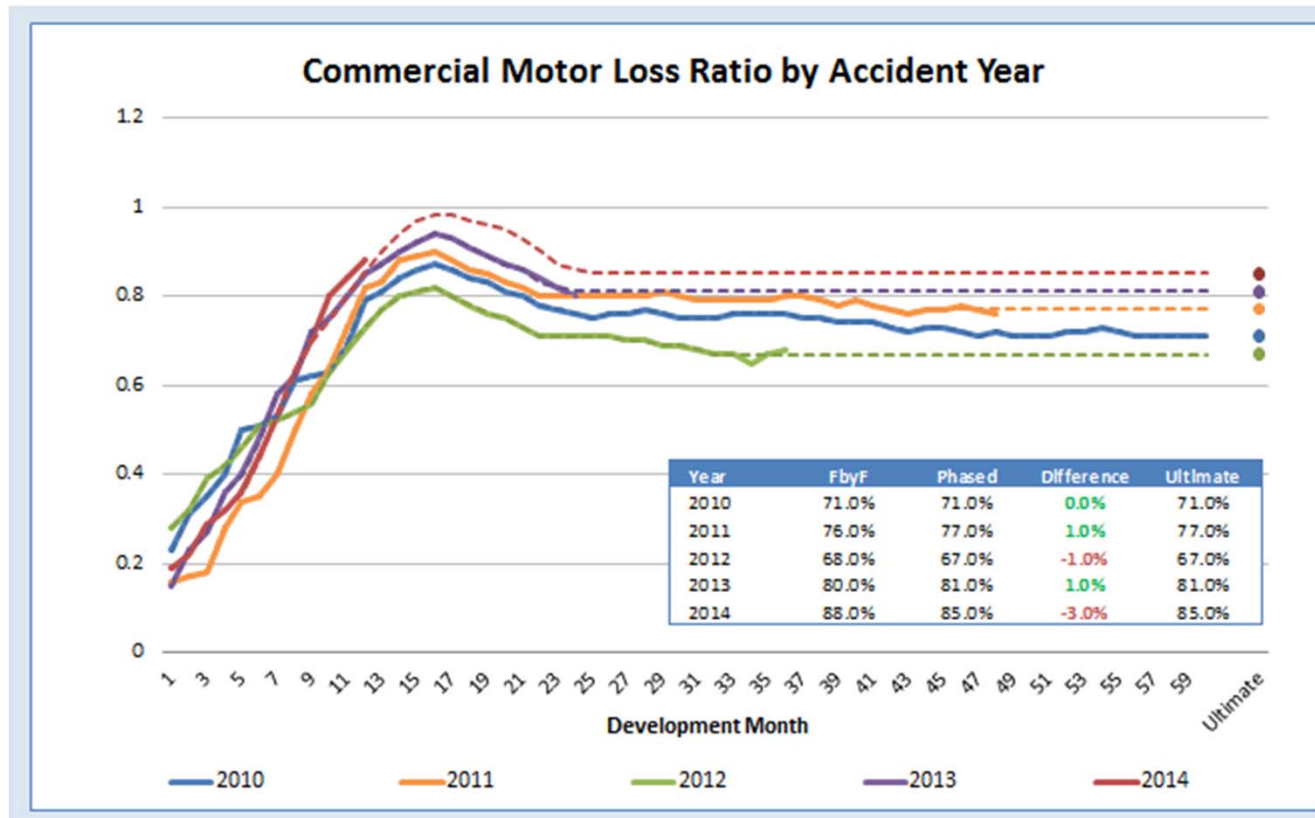
SI Value	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
£1 - £1000	315	405	548	1,042	520	1,002	910	943	1,024	730		
£1001 - £2000	2,709	2,719	2,139	2,139	2,254	2,917	2,901	2,738	2,799	2,280		
£2001 - £3000	2,792	2,400	2,169	2,873	2,542	2,012	2,117	2,737	2,455	2,174		
£3001 - £4000	2,047	2,819	2,882	2,000	2,088	2,835	2,075	2,036	2,200	3,054		
£4001 - £5000	2,501	2,368	2,009	2,259	2,149	2,453	2,322	2,802	2,196	2,612		
£5000+	1,265	934	979	1,400	1,515	2,716	3,253	3,794	4,251	4,717		

8.6 Method 5: Loss Ratio Monitoring



Loss Ratio Monitoring

- Monitor the emerging claims experience
- Usually ultimate loss ratios are provided by the reserving team
- Can assess whether past rates were adequate



8.7 Method 6: Lapse vs. Renewals



Lapse vs. Renewals

- Compare historic LR performance of lapsed and renewed business
- This will give you an idea of whether your renewed risks are a better risks than those that lapsed (i.e. mix of business)
- Not directly a measure of rate adequacy, but gives you an idea of whether the existing rate increases are adequate for the new mix of business.
- Needs to be considered in conjunction with rate strength.
e.g. It will be easier to achieve rate increase on poorly performing / underpriced risks. Therefore we may be achieving a 10% rate increase but retaining all the poor risks – this could actually reduce the loss ratio.

Trade Family	Lapsed Loss Ratio			Renewed Loss Ratio			Lapsed vs Renewed		
	1yr	3yr	5yr	1yr	3yr	5yr	1yr	3yr	5yr
Agriculture Forestry and Fishing	55.0%	54.5%	58.3%	40.0%	43.0%	33.0%	-15.0%	-11.5%	-25.3%
Building Materials and Glass	31.0%	30.4%	32.5%	49.0%	32.0%	58.0%	18.0%	1.6%	25.5%
Chemical	30.0%	27.6%	26.8%	53.0%	59.0%	39.0%	23.0%	31.4%	12.2%
Clothing and Textiles	59.0%	57.8%	60.1%	44.0%	44.0%	44.0%	-15.0%	-13.8%	-16.1%
Construction	62.0%	57.7%	53.0%	36.0%	34.0%	60.0%	-26.0%	-23.7%	7.0%
Health and Social Welfare	72.0%	77.0%	79.4%	41.0%	60.0%	54.0%	-31.0%	-17.0%	-25.4%
Electrical and Optical	30.0%	29.1%	28.2%	40.0%	34.0%	45.0%	10.0%	4.9%	16.8%
Food and Drink	43.0%	43.9%	45.2%	36.0%	46.0%	39.0%	-7.0%	2.1%	-6.2%
Hotels and Catering	70.0%	76.3%	76.3%	41.0%	47.0%	50.0%	-29.0%	-29.3%	-26.3%
Machinery and Equipment	34.0%	35.4%	37.1%	57.0%	33.0%	54.0%	23.0%	-2.4%	16.9%
Metalworkers	70.0%	74.2%	74.9%	33.0%	56.0%	44.0%	-37.0%	-18.2%	-30.9%
Mining and Quarrying	36.0%	33.5%	30.1%	35.0%	56.0%	40.0%	-1.0%	22.5%	9.9%
Paper and Printers	80.0%	72.8%	80.1%	39.0%	53.0%	43.0%	-41.0%	-19.8%	-37.1%
Personal and Community Services	46.0%	42.3%	42.7%	43.0%	31.0%	40.0%	-3.0%	-11.3%	-2.7%
Plastics and Rubber	48.0%	50.9%	53.9%	32.0%	37.0%	60.0%	-16.0%	-13.9%	6.1%

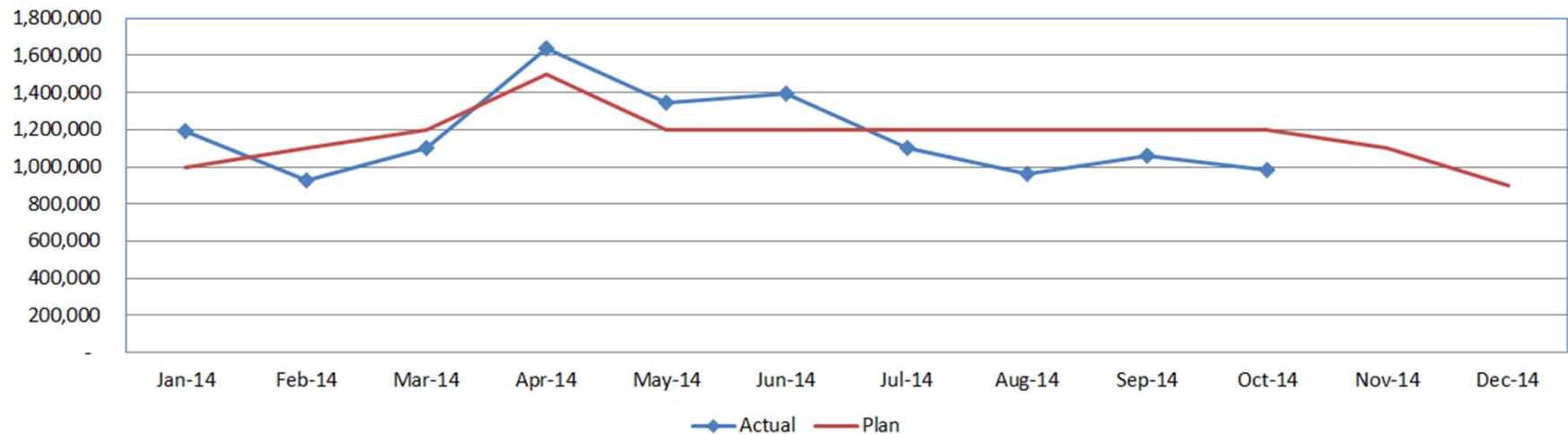
8.8 Method 7: Premium Volumes



Premium Volumes

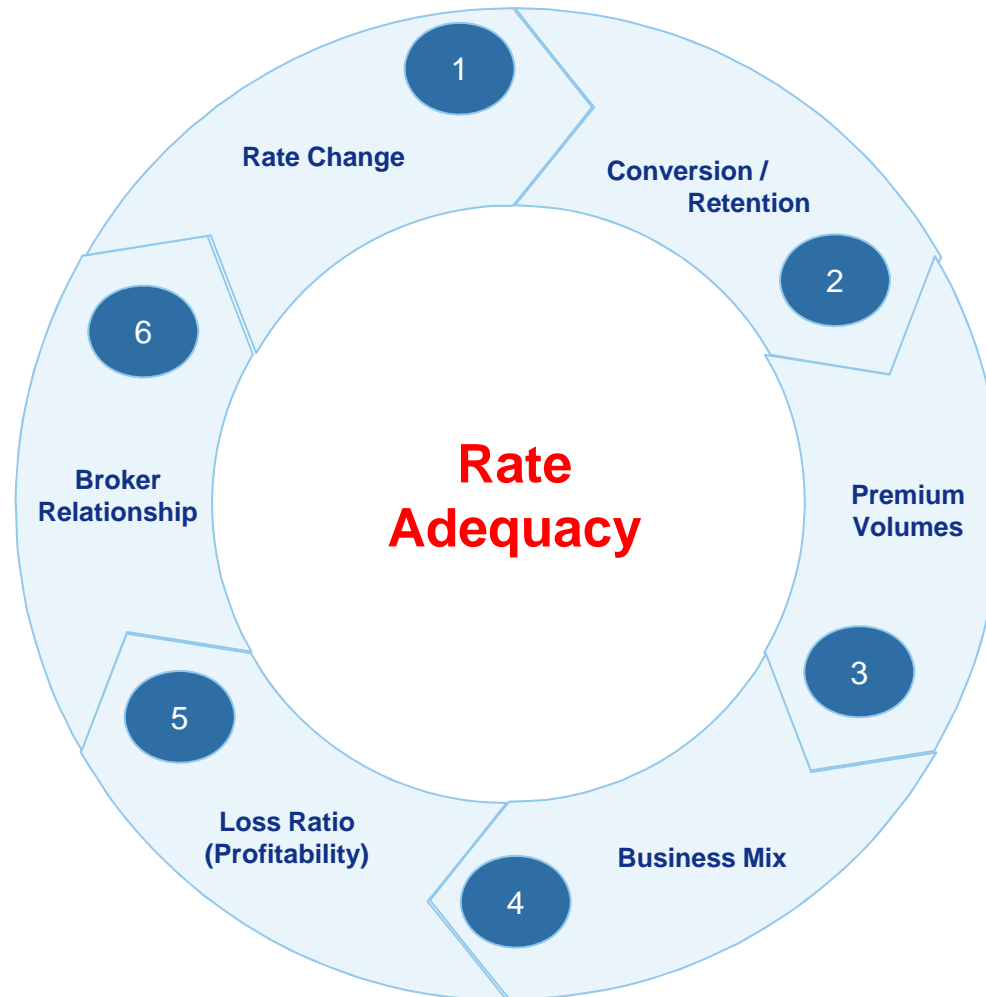
- Not directly a measure of rate but GWP volumes can give you an idea of your position in the market
- Again, this should be compared against the financial plan
- This is a key metric used by underwriters and often distracts from profitability.

Gross Written Premium (Month Of)



GWP	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Actual	1,190,000	924,000	1,104,000	1,635,000	1,344,000	1,392,000	1,104,000	960,000	1,056,000	984,000		
Plan	1,000,000	1,100,000	1,200,000	1,500,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,100,000	900,000

8.9 Keep The Big Picture In Mind



Confidential

9.1 What's Next For Actuaries?

- 1 Actuaries should research the area to ensure they understand the products and the risk drivers of the portfolios that they will work on (Read policy wordings, spend time with portfolio/case underwriters and claim managers)
- 2 Actuaries should look to initially work on SME (in particular micro business) as these portfolios fit well with an actuarial skill set and is a natural entry into Commercial Pricing.
- 3 Actuaries should develop a suite of reports to aid the portfolio underwriter understand the dynamics of their account.
- 4 Actuaries should understand that any analysis is not an exact science and understand and communicate any limitations and uncertainty
- 5 Actuaries should lead the way in Data. Encouraging investment in data by demonstrating the benefits it can bring and building support at executive level
- 6 Actuaries are relatively unestablished in this area and there is an opportunity for the profession to add value by technical analysis

Thank You