Some observations of motor rating practices in Asia

By Verne Baker
Head of General Insurance Consulting, Asia-Pacific
Watson Wyatt Insurance Consulting Pte Ltd
Singapore

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Agenda

- **Less than optimal motor rating practices**
- **Overview of a successful rating strategy**
- **Some observations of key rating factors in Asia**
- **Key challenges in China**
- **Appendix – failings of One Way analysis**

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Less than optimal practices – actuarial valuation

- **Following valuation models blindly without performing reality checks**
  - **Loss ratio implications;**
- **Availability of only 2- 3 years reliable data whilst the company's business has been going for many more years**
  - **Usually systems changing with no history taken across**
- **Triangulation data only available for financial items such as premiums paid, claims paid and case reserves held. Lack of reliable claim numbers reported, settled or outstanding.**
  - **Limits models and ability to properly analyse trends**
  - **Limits ability to check the models adopted. Strange results can be often be explained when speeds of claim settlement or reporting can be measured.**
- **Difficulty in obtaining information regarding particular types of claim. Motor not splitting damage and injury, nor being able to split commercial and private risks**
  - **Difficulty when mix of business changes or new legislation introduced**
- **Projections on own data alone – no allowance for industry benchmarks**
  - **Particularly relevant when limited years' data is available**

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Pricing issues

- **Top line strategy: Writing to increase market share**
  - **Taking possible short term gains – cash flow in advance of claims. Combine this with inadequate reserving basis have possibility of a few years' profit before the losses emerge.**
- **Premium decisions based upon financial year results;**
  - **Not analysing the true loss cost on an underwriting/ accident year approach with appropriate allowance for claim development and effects of likely trends**
- **Not knowing the technical price of the various combinations of risk**
  - **Following market offering competitive discounts. Don't know what the overall result likely to be**
- **Not properly analysing the key risk factors**
  - **Many do one way analysis but get wrong results due to interactions and correlations amongst rating factors**
- **No culture towards collecting useful information**
  - **See records with good accuracy in financial measures but many missing records or errors in "non essential" rating factor fields**
  - **Very limited work done in keeping records of geographic location**

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Common approaches to Motor pricing across the region

- **No analysis**
- **One-way analysis**
  - **Look at loss ratios separately for each factor, e.g. age of driver, type of vehicle, age of vehicle**
  - **Simple to calculate**
  - **Results easy to understand**
- **Rates will become distorted when the business mix changes**
- **Does not allow for interactions amongst rating factors**
- **Does not identify which rating factors are better**
- **Rely on industry analysis**
- **Will not reflect the company's own particular underwriting or marketing practises**
- **Will not reflect the company's own claim handling approach**
- **The company cannot control the accuracy of the underlying data**

A company which has sufficient data should do its own analysis

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Critical success factors for insurers

- **Strategic and business planning**

  Underwriting, pricing and risk selection

- **Claims management**

- **Monitoring and managing information**

- **Sales management**

- **Brand and marketing**

- **Customer service**

- **Culture and organisation**

- **Business systems and processes**

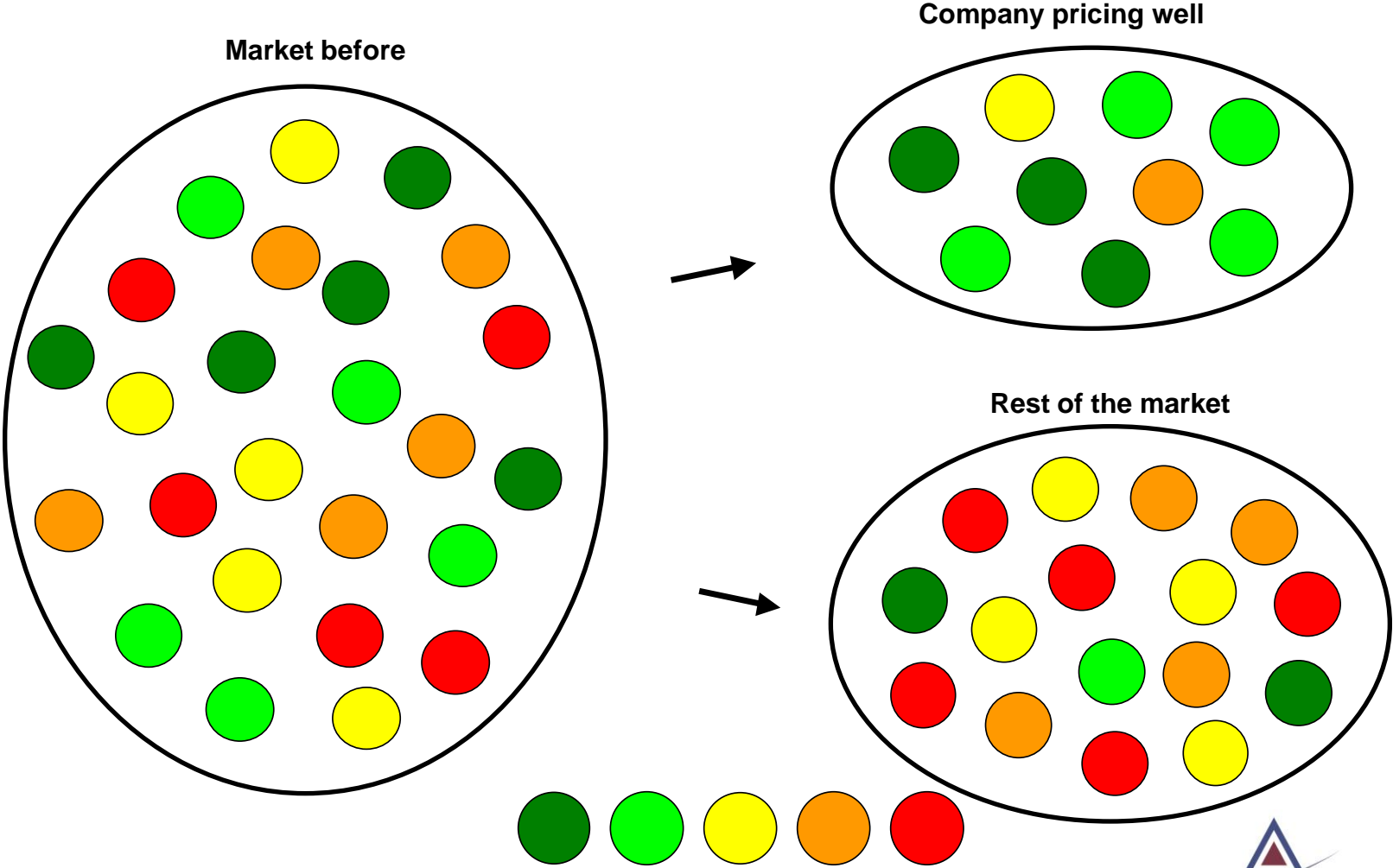Institute of Actuaries of Australia

Pricing is a 2 step process. Step 1 – an adequate overall premium and a basis for differentiating risk

- **The first part is mainly a reserving process. Require adequate overall premium to provide for ultimate cost of claims + expenses + profit margin**
- **Examine ultimate cost of claims in recent past years.**
  - ➤ **paid losses + reported outstanding losses + IBNR**
- **Allowance for direct and indirect costs of claim settlement**
- **Inflation adjust past years ultimate costs to current day values**
- **Express as a per policy cost**
- **Adjust for changes in policy conditions (e.g. changes in excess)**
- **Make a selection based on past trends and understanding of experience**
- **Allow for inflation and investment earnings over the period that new rates apply**

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Step 2 is the process of choosing the right customers

Market before

Company pricing well

Rest of the market

Profitable policy ➔ **Unprofitable policy**

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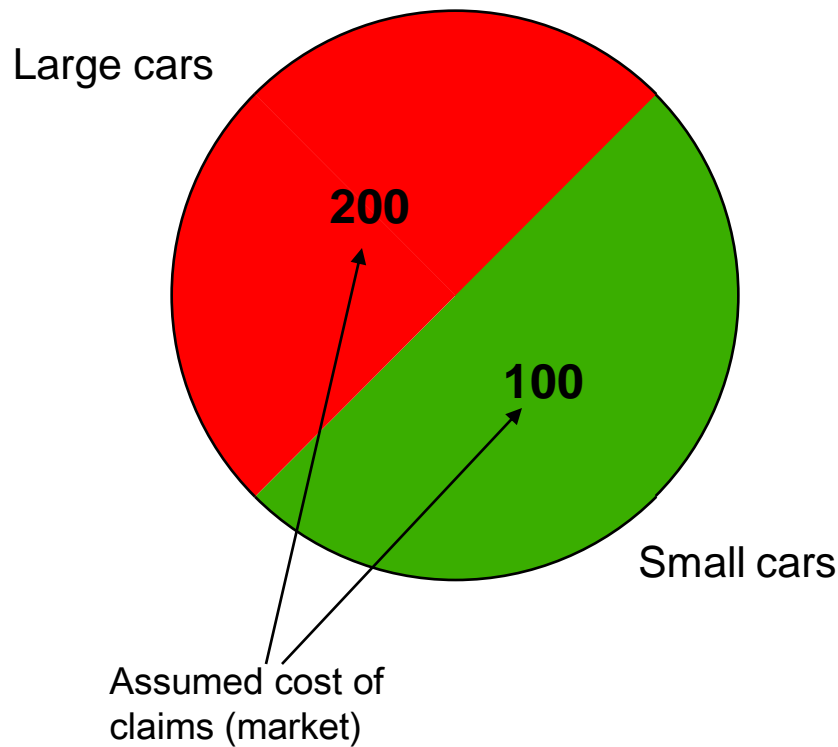# Financial year loss ratios for motor damage insurance in Malaysia in 2003
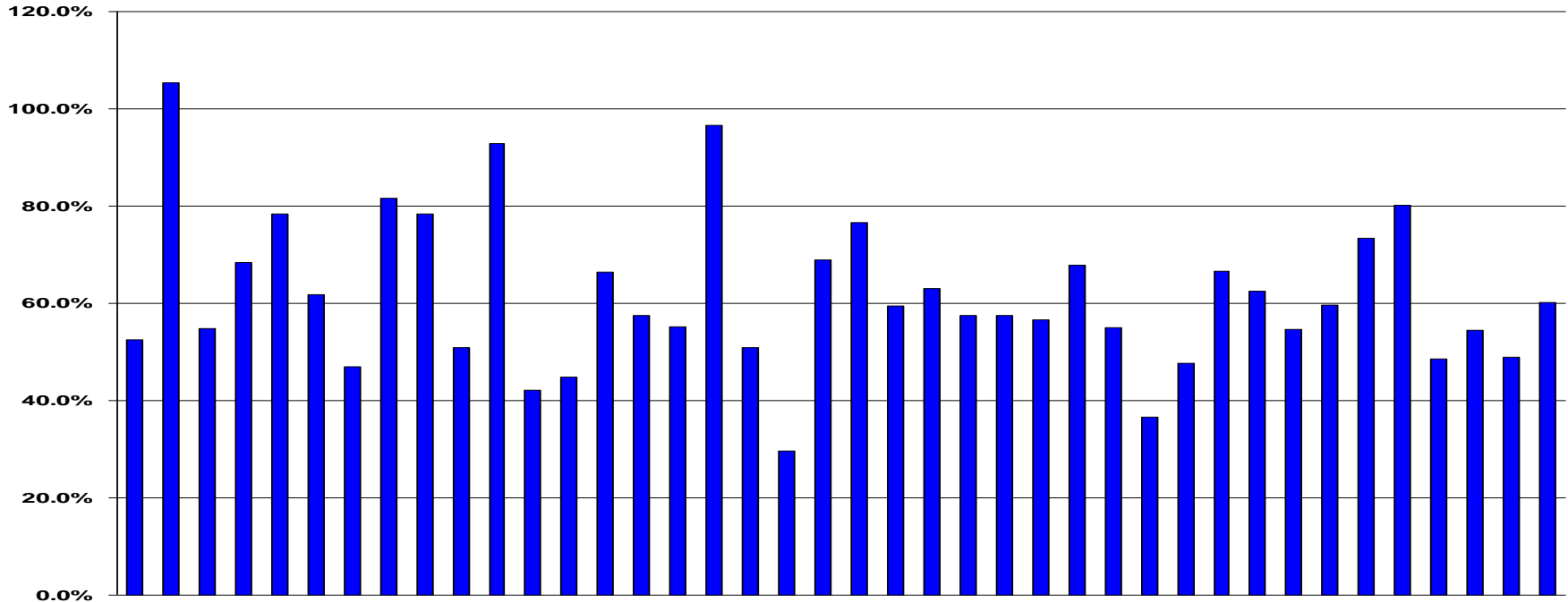
Mean gross loss ratio of 56% and Standard deviation of 16.5%. Why such variability in a strongly policed tariff market?

Likely caused by a number of factors: Underwriting, Claims handling, Technical reasons (Under/Over reserving, Financial Year Loss ratios)

Underwriting is expected to be a major influence

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Suppose the market consisted of the same number of large and small cars

Large cars

200

100

Small cars

Assumed cost of claims (market)

Market

	Premium	Profit
	210	10
	110	10

Average profit   10

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A company doing analysis identifies the true costs of the risks

Large new cars

Large old cars

Small new cars

Small old cars

220

180

105

95

Assumed cost of claims (market)

	Market	
Premium	**Profit**	
210	-10
210	30
110	5
110	15

Average profit 10

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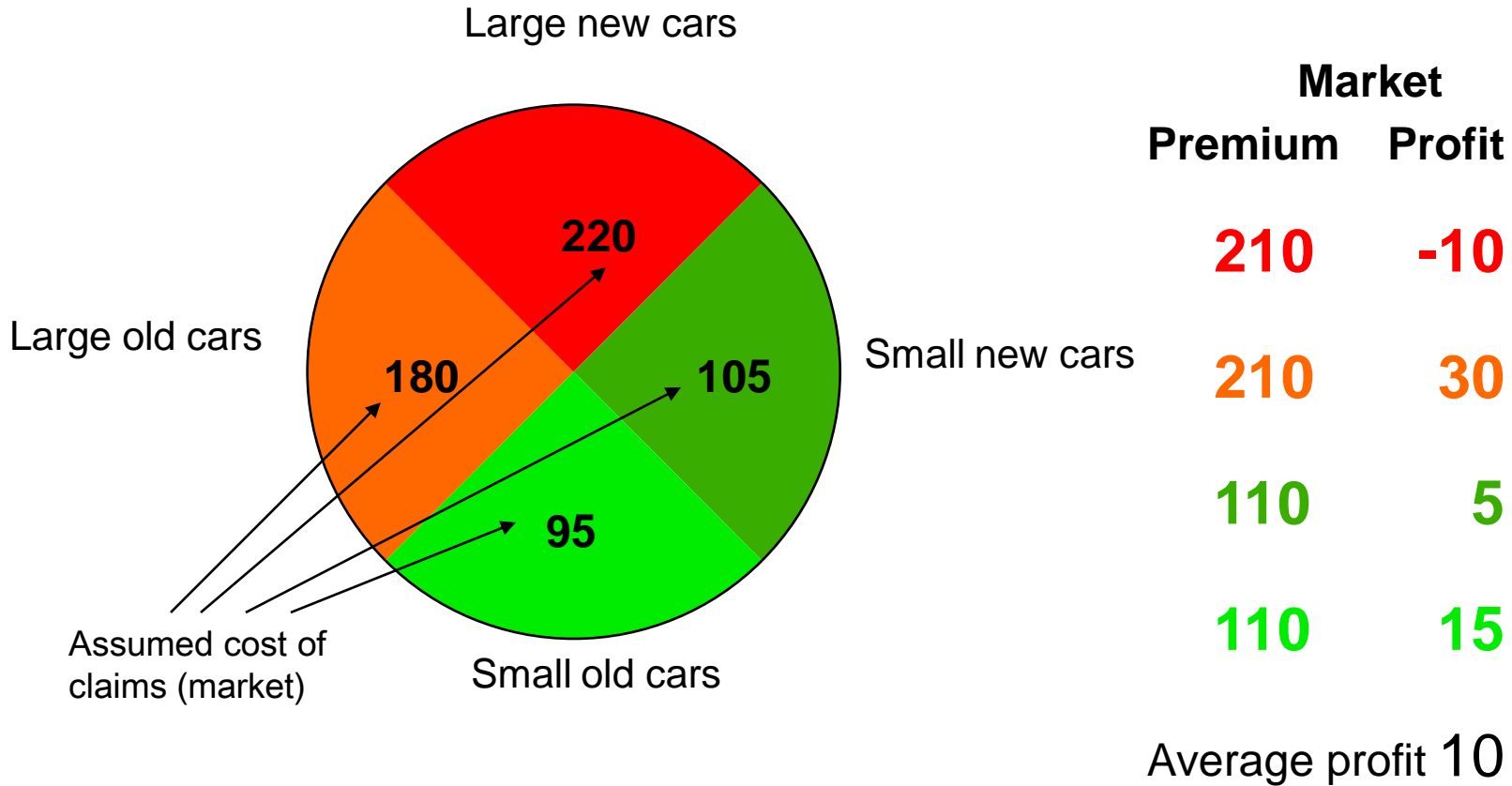
A company doing proper analysis identifies the true costs of the risks and targets the desired segments
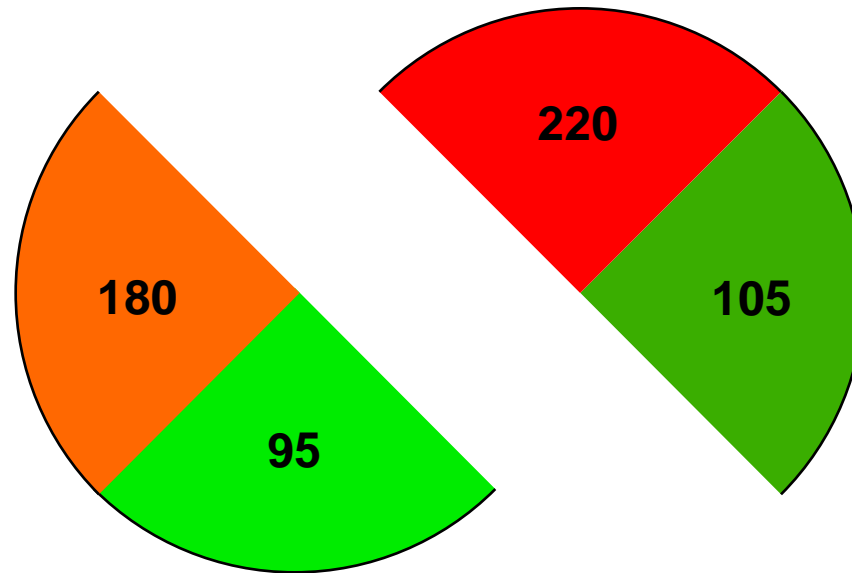
Large new cars

Large old cars

Small new cars

Small old cars

	Market Premium	Profit
	210	-10
	210	30
	110	5
	110	15

Average profit 10

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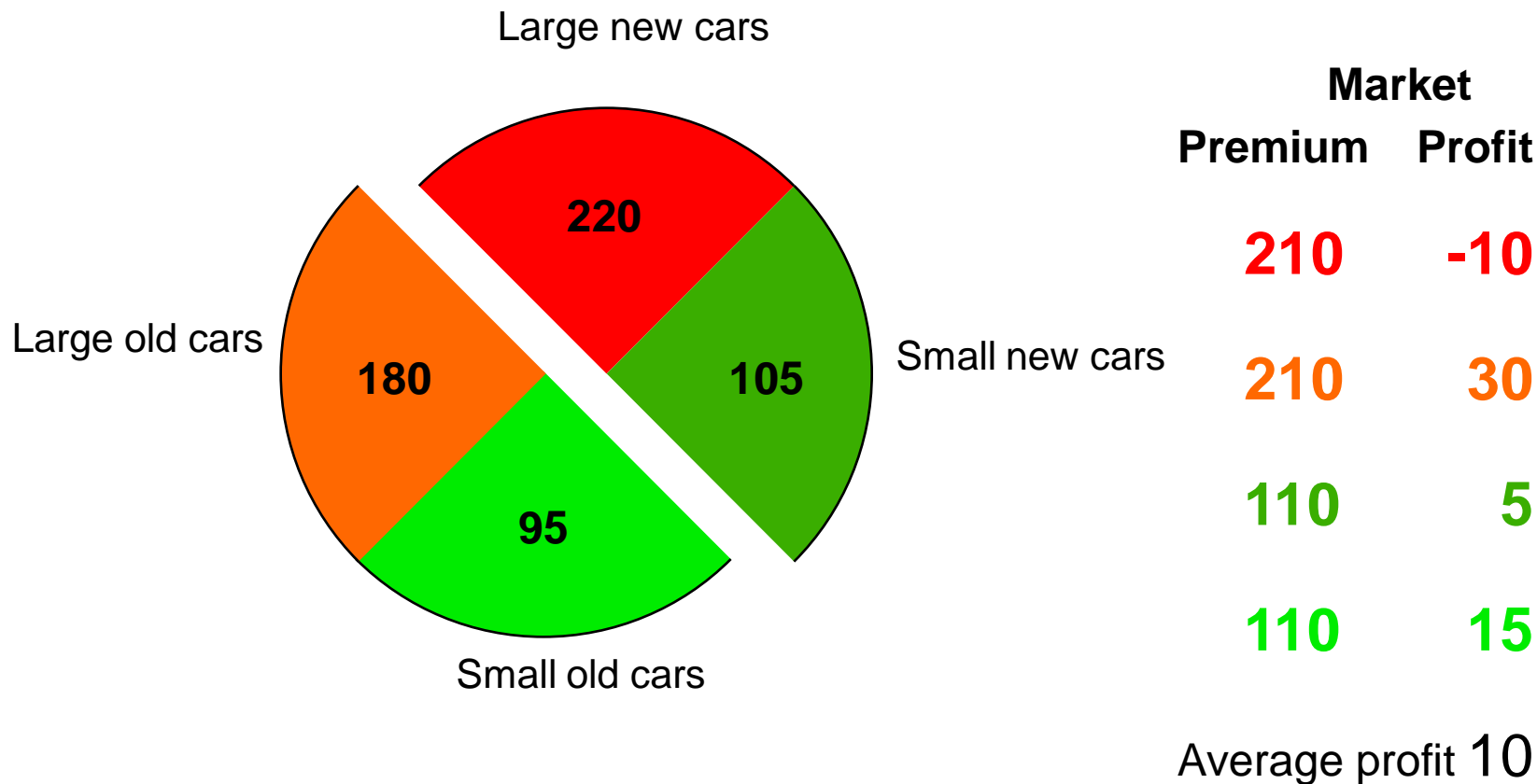
Importance of choosing the right customers

New company		
Premium	**Profit**	
250		
200	**20**	
110		
100	**5**	
Average profit	**12.5**	

Rest of market		
Premium	**Profit**	
210	**-10**	
210		
110	**5**	
110		
Average profit	**-2.5**	

Total average market profit reduced from 10 to 5

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In practice there are many more rating factors than just 2

- **Standard factors:**
  - Age
  - Sex
  - Vehicle Type
  - Geographical zone (area)
  - Excess
  - No Claim Discount (NCD)
  - Marital status
  - Age of licence
  - Occupation
  - Residency
  - Convictions
  - Home-owner?
  - Age of vehicle
  - Value of vehicle
  - Alarm/immobiliser
  - Modifications?
  - Garaged?
  - Use of vehicle
  - Mileage
  - Cover
  - Named drivers
  - Previous claims
  - Payment frequency
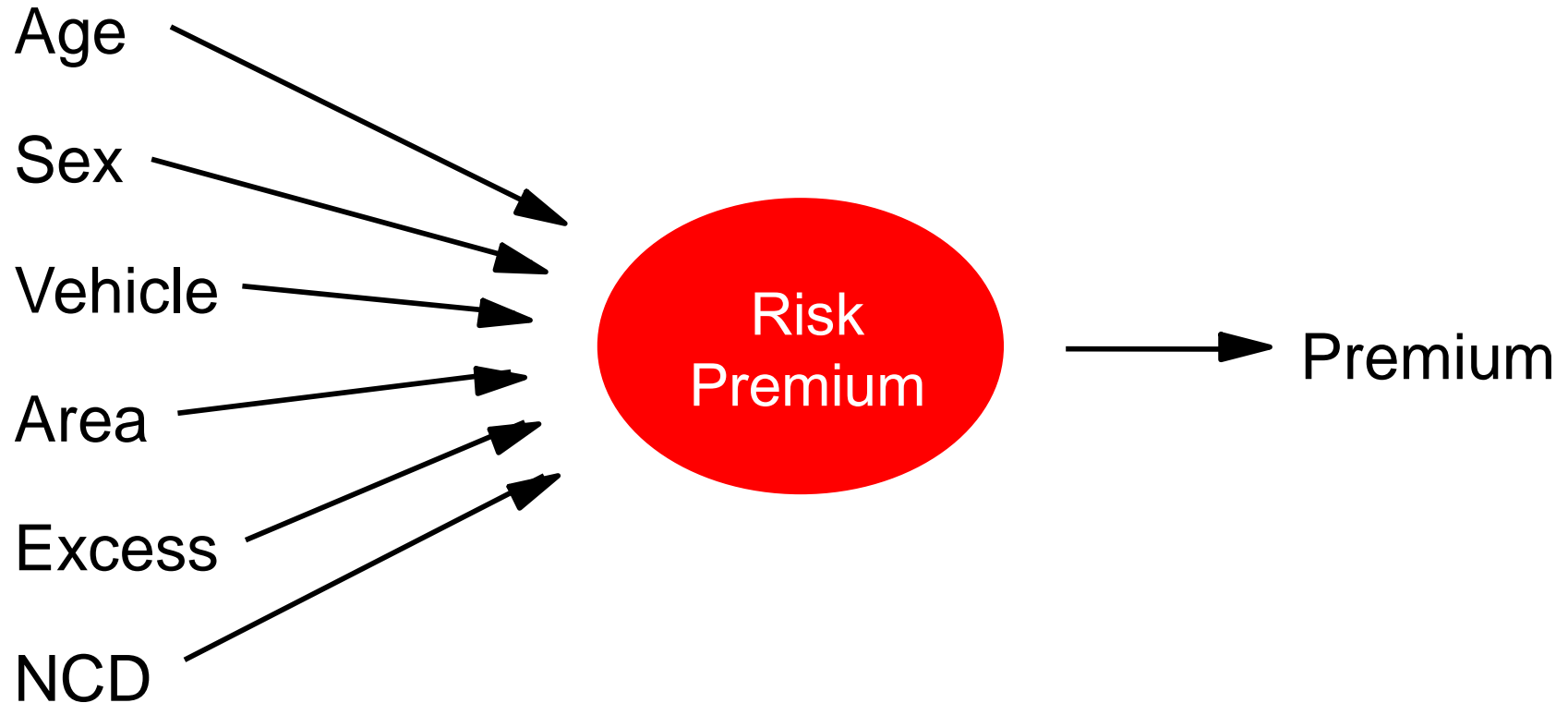 - Protected NCD?

- **External data:**
  - individual data
  - vehicle data
  - geo-demographic data
  - geophysical data

- **Data from other products:**
  - banking data
  - other insurance data

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The problem – which rating factors are significant? What loadings should apply?

Age

Sex

Vehicle

Area

Excess

NCD

Risk Premium → Premium

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Our approach is to use Generalised Linear Models ("GLM")

- **Sophisticated statistical model**
- **Separate models for claim frequency and claim size**
- **Consider all factors simultaneously (as opposed to one-way analysis)**
- **Able to cope with missing or incomplete data**
- **Robust and flexible**
- **Output is the estimated true effect of each rating factor after removing the distortions from the presence or absence of other factors**

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Significant rating factors – some observations in Asia

- **Age of policyholder**
  - Usually one of strongest factors. Loadings of over 120% observed for policyholders under 20 relative to those 45-55. Often see an increase after 55 due to policyholder's children driving family cars.
- **Make and model of vehicle**
  - See rate variations (up to around 40%) for various makes and models
- **No claim discount. (maximum discounts usually 50/60% after 5 claim free years)**
  - Malaysia see heavier discounts than the actual NCD scale due to harsh fall back rules. Singapore experience suggests lower discounts justifiable.
- **Geographical variation**
  - See variations of up to 50% according to broad geographic regions.
- **Sum insured**
  - Not used in all countries.
- **CC rating (engine capacity)**
  - Relativities seen to increase steady as cc rating increases. Variations of the order of 30%. Note highly correlated with make/model and sum insured.
- **Gender of driver**
  - Generally observed modest reductions (up to 10%) for females. Experience in Singapore shows higher rates for females.(Family cars insured in wife's name to get premium discount)

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Key challenges in China

- **Access to extensive, reliable and timely data**
  - **Requires a cultural determination to maintain quality data within the company**
  - **Difficulties in extracting data if systems are not fully centralised**
  - **No industry data warehouse in China**
- **Control of underwriting process and claim management**
  - **A Company's rating structure and policy conditions need to be implemented in practise**
  - **Getting distribution channels buy in**
- **Actuarial input into the reserving and pricing process.**
  - **Control cycle – rating needs to be monitored and adjusted when necessary**
  - **Process must not be manipulated by local management**

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Appendix
The failings of one way analysis

True risk * 2

	T	C
M	40%	20%
F	20%	10%

T- Town, C- Country

Claims

	T	C	Total
M	80	20	100
F	20	20	40
Total	100	40	140

Exposure

	T	C	Total
M	200	100	300
F	100	200	300
Total	300	300	600

One-way * 2.5

	Exp	Claims	Ratio
M	300	100	33.3%
F	300	40	13.3%
T	300	100	33.3%
C	300	40	13.3%

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