

Current issues in general insurance (CIGI)  
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## Better pricing needs better underwriting

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## Better pricing needs better underwriting

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### Our message:

**Improvements in technical pricing are both good and inevitable, however, with analytical power comes underwriting responsibility.**

## Better pricing needs better underwriting

### Agenda

- Introduction
- Distribution
- Bodily injury
- Other technical pricing advances
- Conclusion

## Introduction

### Better pricing needs better underwriting

- Recent years have seen advancements in pricing techniques and sophistication
- How has the role of underwriting changed and how does underwriting fit alongside pricing?



## Introduction

### Better pricing needs better underwriting

- Pricing definition
  - Setting prices to achieve target returns based on analysis of historic experience incorporating trending, risk knowledge and commercial expertise
- Underwriting definition
  - Ensuring risks written are consistent with the assumptions used in pricing
    - ....generic pricing assumptions include:
      - utmost good faith;
      - no fraudulent intent;
      - the past can be used as a guide to the future;
      - customer behaviour not changing overnight.

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## Introduction

For presentational effect we're working with mental caricatures:



**Underwriter**

(Noting that he's "playing blind"?)



**Pricer**

- Underwriting isn't the preserve of Underwriters; it's an activity that complements technical pricing
- What we now go on to describe as underwriting is delivered by actuaries, pricing teams and other insurance professionals as well as underwriters

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## Introduction

### Better pricing needs better underwriting

- Applicability
  - Considerations based on commodity business supported by statistical pricing (i.e. think personal motor)
  - But the underlying principles apply much more widely
- Approach for today's workshop
  - We'll consider:
    - Examples of better technical pricing
    - Associated assumptions
    - Underwriting response

## Better pricing needs better underwriting

### Agenda

- Introduction
- **Distribution**
- Bodily injury
- Other technical pricing advances
- Conclusion

## Distribution

### Pricing

- Elasticity modelling and price optimisation have become standard in recent years
- Price comparison sites have increased importance of a good understanding of customer behaviour
- Winners on PCS will have a low cost base and the best risk cost models
- Distribution changes the risk cost
- Pricing for the ultimate level of competition

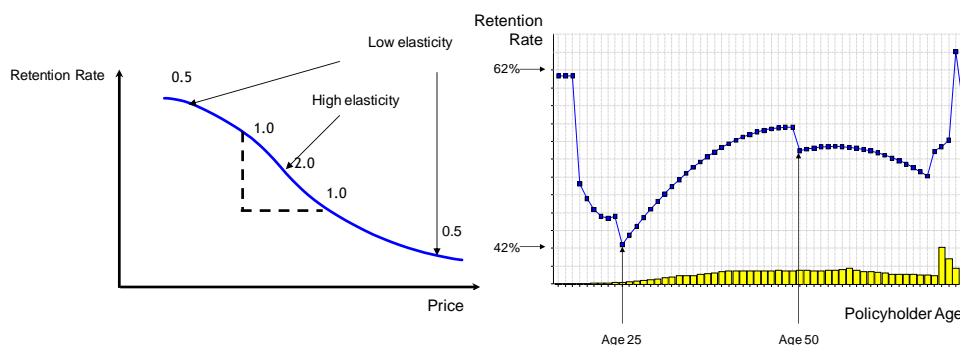
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## Distribution

### Pricing

- Elasticity modelling considers how demand changes with price



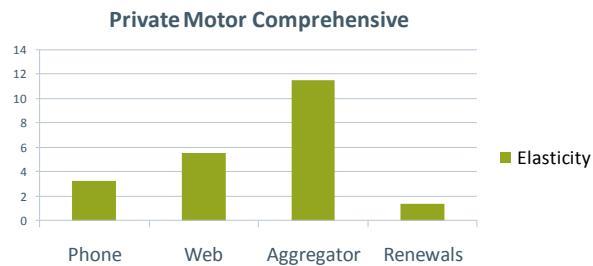
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## Distribution

### Pricing

- Different channels have different sensitivities to any change in price
- Elasticity = % Change in Demand / % Change in Price



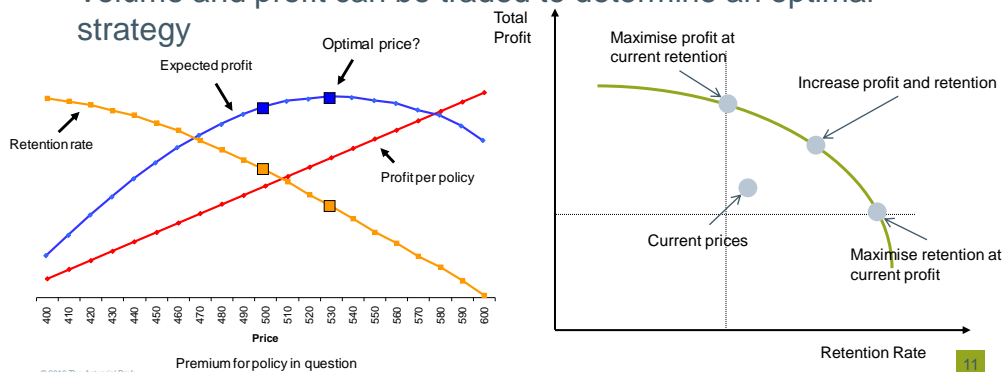
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## Distribution

### Pricing

- Price optimisation considers both profit and volume
- Volume and profit can be traded to determine an optimal strategy



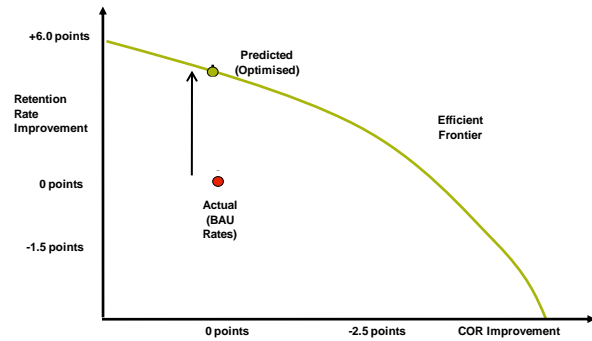
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## Distribution

### Pricing

- Optimisation has shown to deliver material benefits
- Motor renewal optimisation for direct channel
- Pilot implementation vs. “business as usual”



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## Distribution

### Pricing

- Distribution is causing pricing to cover more ground
  - More competitive, smaller margins, different objectives
- Modelling makes use of more than just risk factors
- Has to use external data effectively
- Optimisation needs quality inputs (GIGO)
  - risk premium models
  - cost models
  - elasticity and demand models

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## Distribution

### Pricing

- Continued improvement of risk cost modelling embracing
  - Structure
  - Data
  - Latest techniques
- Explicit risk and behaviour modelling of distribution characteristics
- Second and third order elements of risk cost models need increasingly to be used

## Distribution

### Assumptions

- Web customer transaction is the same as telephone transaction (70% by phone in 2006, up to 70% on web in 2010)
- Business models are the same as they were
- Pricing data mean the same thing today as pre-web
- The level of anti-selection hasn't changed
- Claims inflation is claims inflation



## The underwriting view: The nature of customer access has changed

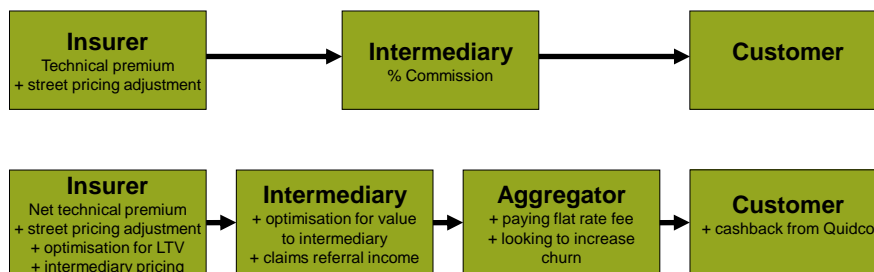
A sequence of quotes on an internet quote engine progressing from correct risk to deeply misrepresented and fronted.....saving 87% of premium

Quote	Driving	Age	Garaging	Claims	NCD	Postcode	Premium	% of correct premium	Notes
1	IOD	24	Road	1	0	SE18 1PT	£3,425	100%	Correct details
2	IOD	24	Road	0	0	SE18 1PT	£2,960	86%	Accident was on someone else's policy
4	2 Named	24/51	Road	0	0	SE18 1PT	£2,890	84%	Add parent as driver
3	IOD	24	Road	0	2	SE18 1PT	£2,168	63%	Named driver NCD(?)
5	2 Named	51/24	Road	0	5	SE18 1PT	£1,026	30%	Fronting
6	2 Named	51/24	Garaged	0	5	SE18 1PT	£926	27%	Fronted address has garage
7	2 Named	51/24	Garaged	0	5	NR13 5NN	£435	13%	Insure at fronting address

- Very significant threat: estimated 5-10% more premium on internet transactions lost to underwriting fraud compared to phone transactions
- Areas for motor underwriting fraud include: fronting, location, NCD, claims, mileage, garaging, use, driving restriction, claims, convictions
- Household underwriting fraud tends to focus on previous claims, NCD and underinsurance
- Underwriting needs to find a way of making quotation engines tamper-resistant

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## The underwriting view: Business models have changed:



- What does all this added complexity mean?
  - Distance between insurers and their customers has increased
  - Would expect reduced loyalty and increased willingness by customers to play games
  - Price paid by customer is only tenuously based on risk premium + distribution cost
  - Underwriting needs to reappraise wordings, acceptance criteria and underwriting rules

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## The underwriting view: Data doesn't mean the same as it did

### Distribution changes have to some degree compromised:

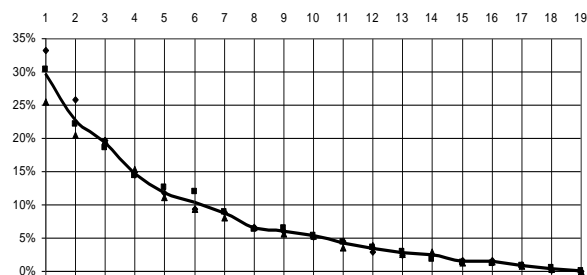
- Mileage
  - NCD and past claims
  - Occupation (Money Saving Expert advice on cheapest way to describe yourself)
  - Driving restrictions
  - Agent
- Underwriting needs to call the future trend on these and find improved means of validation where necessary

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## The underwriting view: The winner's curse has changed profitability

Motor: Margin Benefit by Panel Size



- The more competitors the lower the average price
- When an insurer is the cheapest of many, are they more likely to have a pricing error than when they're average?
- Underwriting can help to manage the extremes of pricing error by developing tighter underwriting and contributing to the pricing model on areas of unintentional overfitting

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## The underwriting view: When is claims inflation not claims inflation?

Adverse selection example where customers get better at spotting value for money:

	Risk type A	Risk type B	Risk type C		Risk type A	Risk type B	Risk type C
Time t-1				Time t			
Premium	£100	£100	£100	Premium	£100	£100	£100
Risk cost	£85	£70	£55	Risk cost	£85	£70	£55
Volume	5	3	2	Volume	7	2	1

Insurer's risk cost models and pricing doesn't differentiate risks A, B and C  
With increasing adverse selection risk type A sells better while risk types B and C sell worse

Results for period t-1			Results for period t		
Total premium	£1,000		Total premium	£1,000	
Total risk cost	£745		Total risk cost	£790	
Loss ratio	74.5%		Loss ratio	79.0%	

Actual claims inflation of 0% is measured at 6%

- Any unidentified increase in risk mix results in an increase in claims cost that will be misattributed to claims inflation
- Underwriting must be wise to this and ensure that the Claims Director isn't sacked for an element of claims inflation he has no control over
- Acid test is whether market claims costs increase in line with the high claims inflation rates identified by insurers

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## Better pricing needs better underwriting

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- Distribution
- **Bodily injury**
- Other technical pricing advances
- Conclusion

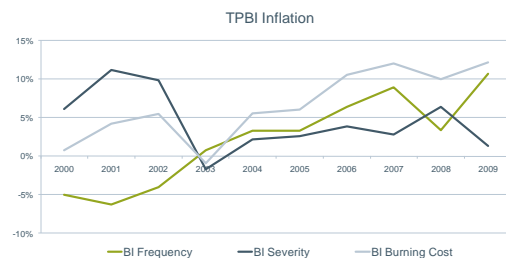
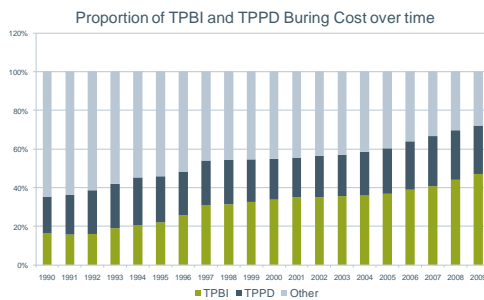
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## Bodily Injury

### Pricing

- Proportion of bodily injury has increased significantly
- Have modelling approaches adapted sufficiently?



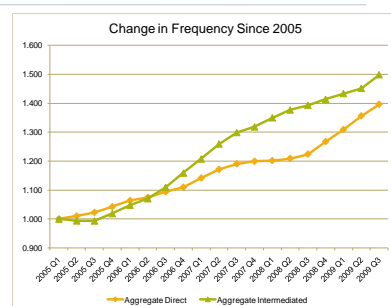
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## Bodily Injury

### Pricing

- Enhance risk models
  - Consider different model structures
    - Split by type of event: Rear shunt, Head-on, ...
    - Tiered capping levels: 0-10k, 10k – 25k, ...
    - Split by injury type: Whiplash vs other
    - Propensity for BI given TPPD
    - Inferences from AD & TPPD severity for BI frequency and severity
  - Reflect geographic and socio-demographic influences
    - Best use of external data
    - Up to date geographical classification



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## Bodily Injury

### Pricing

- Enhance risk models
  - Understand range of uncertainty in risk estimates
- Utilise available fraud data
  - Fraud models and fraud scoring
    - Policy underwriting and claims underwriting
  - Impact of any changes in fraud approach
    - How does increasing fraud screening impact claims cost?

## Bodily Injury

### Assumptions

- Assumptions
  - Fraud doesn't need to be considered because detected fraud has £0 cost and so excluded from cost models
  - BI fraud is an unpredictable, random occurrence perpetrated by unknown third parties, so fraud propensity in claim unrelated to first party characteristics (other than geography)
  - Number of injuries per accident is constant over time

## The underwriting view: Bodily Injury

- The expertise of Claims need to be brought into future pricing and underwriting
- Are underwriting rules, acceptance criteria, policy terms and conditions aligned with the preponderance of third party property damage and bodily injury claims? Many will target AD and theft risk.
- Are there policyholder characteristics that make bodily injury claims outcomes more likely – what should be done about them?
- The significance of Distribution on BI claim frequency – and what to do about it?
- Can lessons be taken from motor markets such as Texas where the injury rates are even higher than the North West?

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## The underwriting view: Bodily Injury and Fraud

- Critical for underwriting to understand changing fraud risk
- Claims expertise is a vital input
- Establish acceptable means for potential fraud to be identified
- Establish data requirements associated with fraud in order to better underwrite and mitigate it
- Underwriting must assist the BI claims function
- Establish the links between underwriting fraud and claims fraud
- Learn from the past – if fraud wasn't a major issue ten years ago what lessons can be learnt?
- Using fraud propensity scores in underwriting and claims handling

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## Better pricing needs better underwriting

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- Introduction
- Distribution
- Bodily injury
- **Other technical pricing advances**
- Conclusion

## Other technical pricing advances

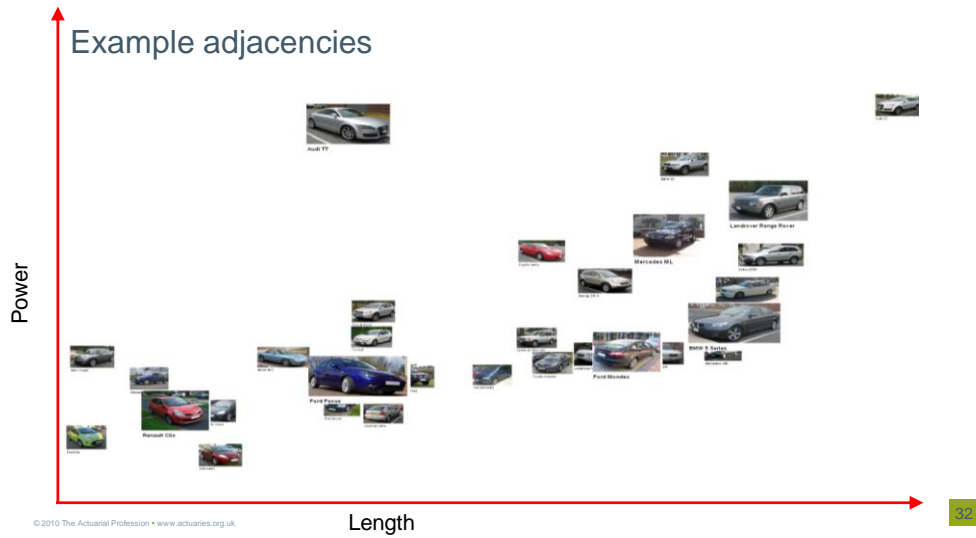
### Geographic classification using spatial smoothing

- Pricing
  - Spatial smoothing is common practice for geographical analysis
  - Best results enhance effect of external factors
  - Geographical effects change over time and need to be maintained

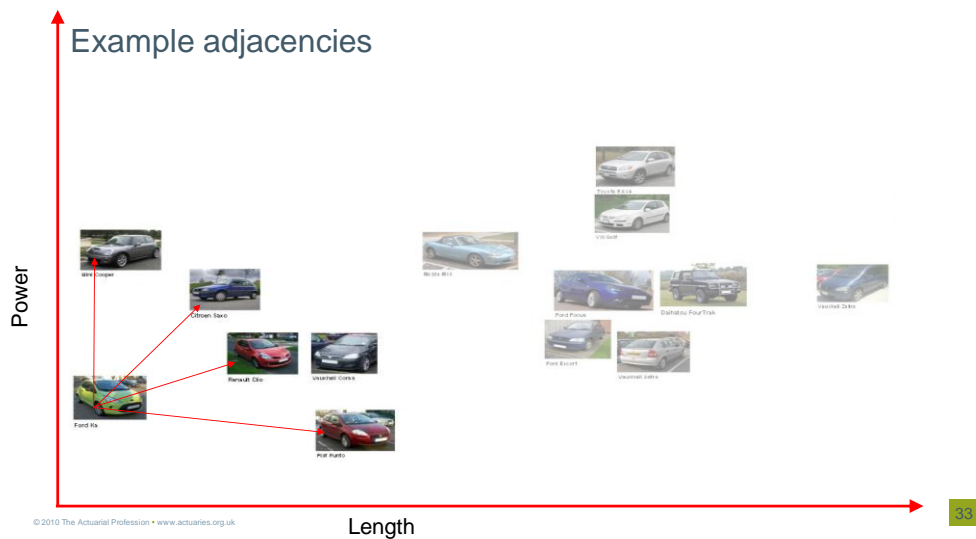




## Other technical pricing advances



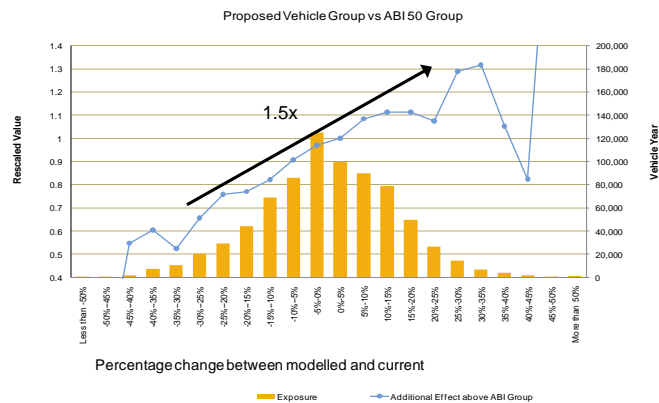
## Other technical pricing advances



## Other technical pricing advances

### Vehicle Smoothing

- Delivers material benefit



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## Other technical pricing advances

### Saddles

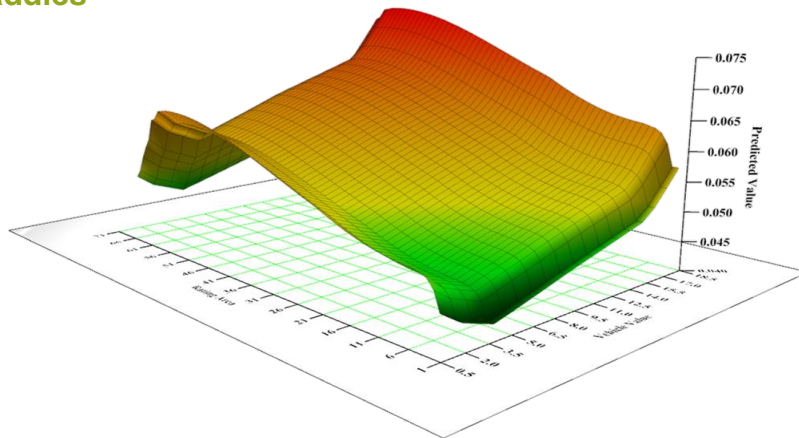
- Systematic review of interactions can be simplified into “saddle spotting”
- This can be designed to work equally well at 2, 3, 4, 5, ... dimensions without losing process efficiency
- Can rapidly build list of possible interactions for inclusion in models

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## Other technical pricing advances

### Saddles

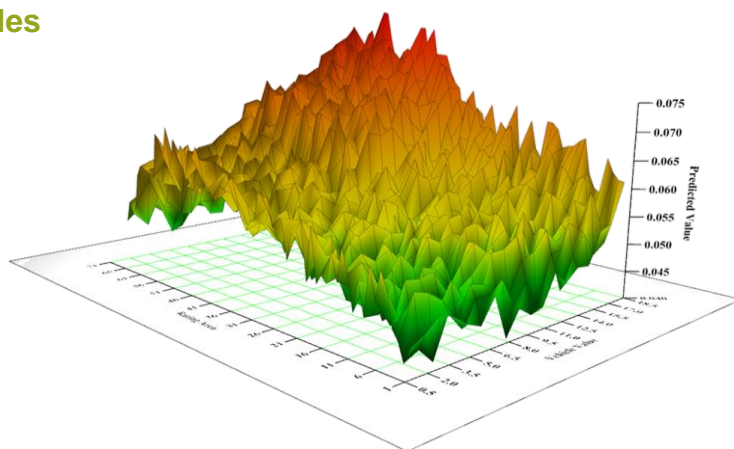


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## Other technical pricing advances

### Saddles

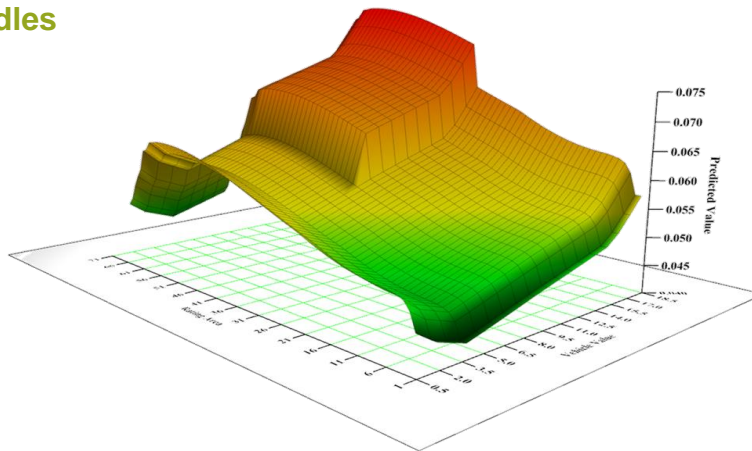


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## Other technical pricing advances

### Saddles

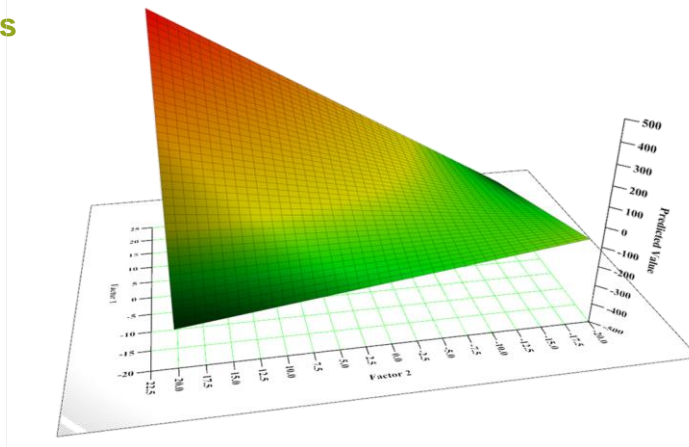


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## Other technical pricing advances

### Saddles

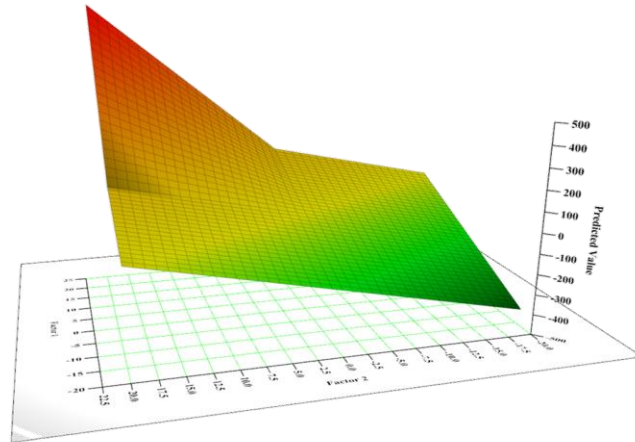


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## Other technical pricing advances

### Saddles

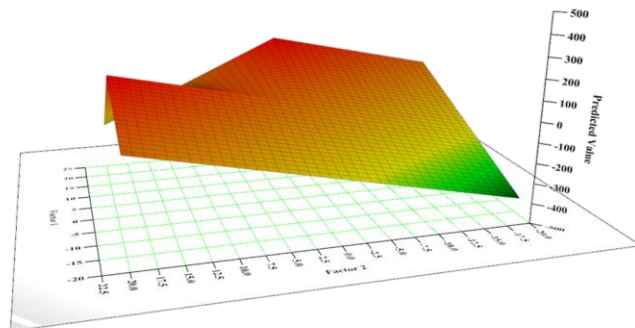


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## Other technical pricing advances

### Saddles

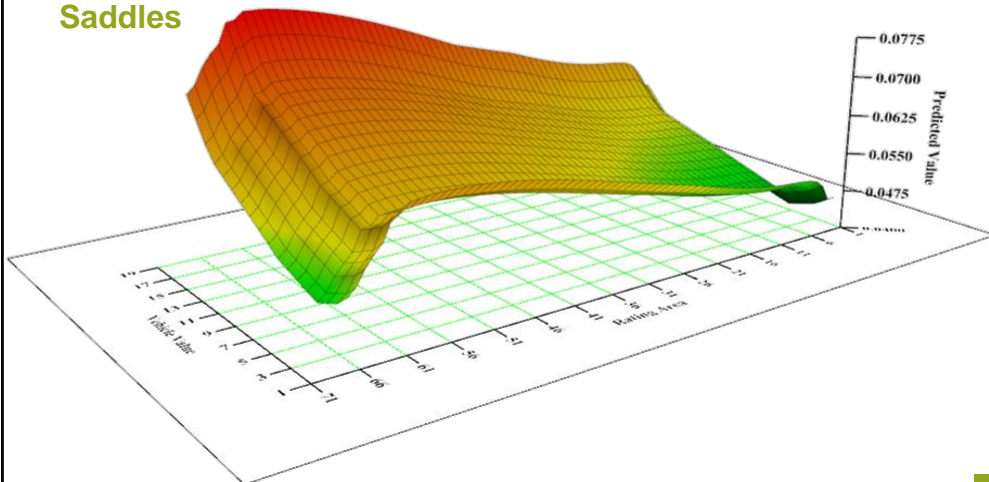


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## Other technical pricing advances

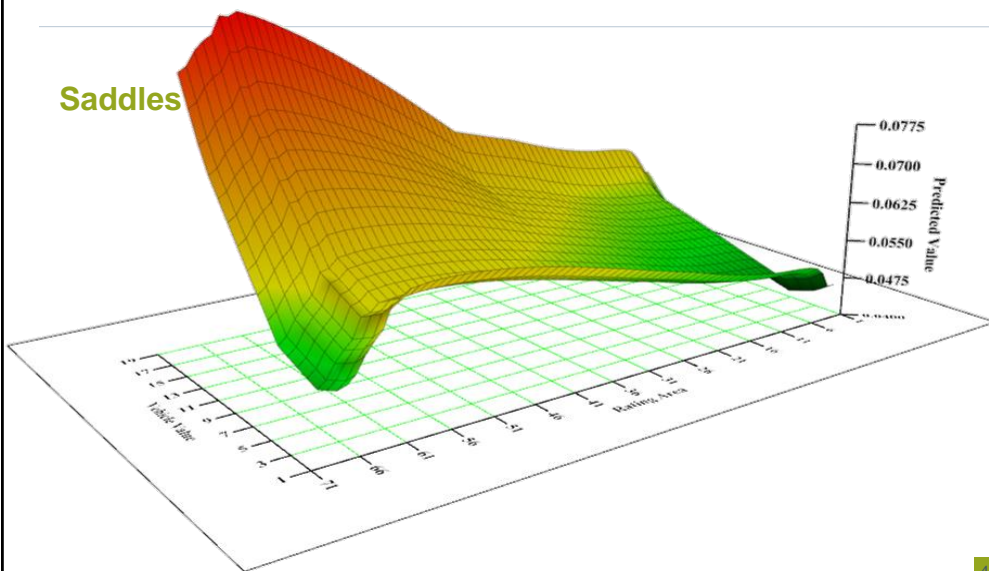
### Saddles



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## Other technical pricing advances

### Saddles



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## The underwriting view: Geographic Spatial Smoothing

- Which geographic elements should over-ride spatial smoothing?
  - Motorways
  - Rivers
  - Boundaries
- Predictable characteristics:
  - Theft near ports
  - Windscreen claims in broader East Anglia
- What to do without exposure
- What competitors are doing geographically and why

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## The underwriting view: Vehicle or Trade smoothing

- Virtual spatial smoothing is broadly equivalent to a traditional underwriting approach
- Risk is assessed in a broader, more holistic way with experience being developed more generally than on particular trades or vehicles
- The approach leans toward partial implementation in terms of underwriting rules
- Underwriting input will include:
  - What to do without exposure
  - What competitors are doing and why

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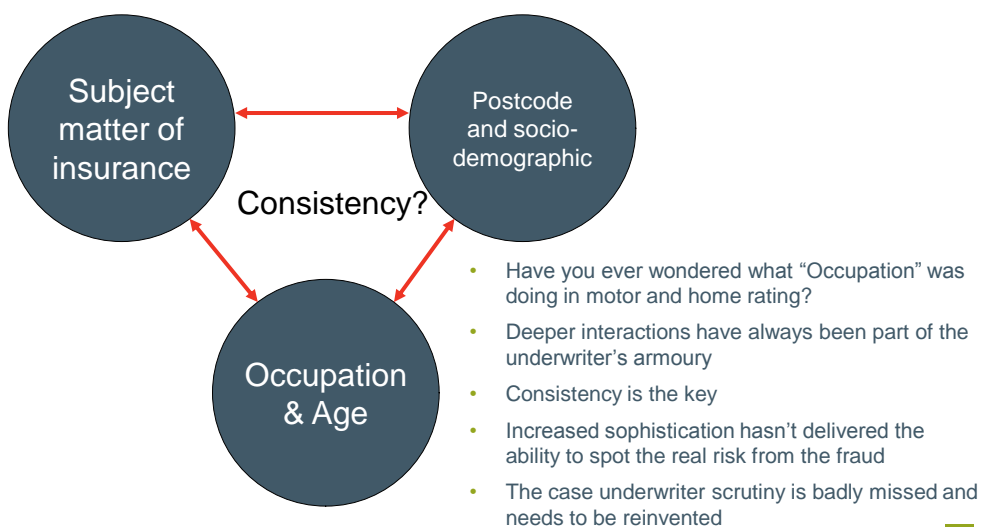
## The underwriting view: Saddles

- There should be an underwriting rationale for each interaction adopted into risk cost models
- Underwriting will propose deep interactions that appeal:
  - Teachers living in rural areas with more than one vehicle in the household doing a low mileage?
- Underwriting will manage the balance between pricing complexity and its ease of interpretation and maintenance

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## The underwriting view: Saddles ⇔ Deep interactions



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## Better pricing needs better underwriting

### Agenda

- Introduction
- Distribution
- Bodily Injury
- Technical pricing activities
- **Conclusion**

## Conclusion

### **We started off defining underwriting as ensuring risks are consistent with pricing assumptions**

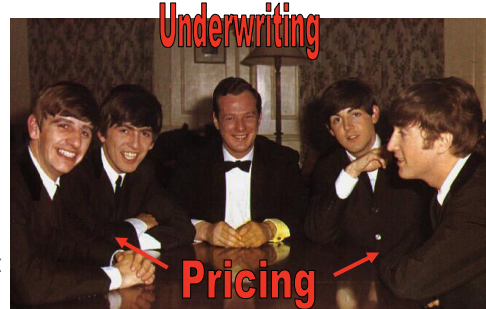
- Technical pricing development is vital to general insurance
- Technical pricing developments are rarely assumption free and generally add to the cumulative assumptions already in play
- We've shown lots of instances where pricing assumptions need to be supported by underwriting
- Underwriting provides a context that allows technical pricing development to be highly technical
- Insurers don't necessarily need Underwriters but they do need Underwriting
- What would our new underwriting world look like?

## Conclusion

### What does this new underwriting world look like?

- Commercial motivation
- Micro and macroeconomic insight
- Risk expertise
- Insurance expertise
- Numerate
- Legal skills and knowledge
- Lateral thinking
- Project and relationship management
- Worldly
- Pragmatic

An analogy from popular culture?



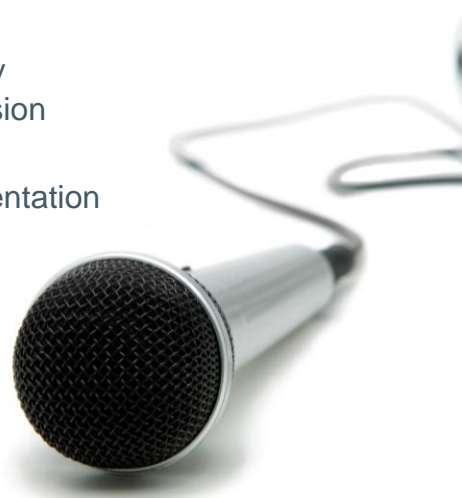
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