

GI Pricing Seminar  
Mark Rothwell

# Competition

## What does it do to your pricing models?

17<sup>th</sup> June 2010

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### To start....

#### A question that you won't know the answer to (I hope!):

- Before it started erupting, how high was the Eyjafjallajökull volcano?
  - (metres above mean sea level )
- Please write down your:
  - Point estimate
  - 90% confidence interval



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## ... and if you know a bit about your competitors...

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- Confer with one of your nearest neighbours (“competitors”)
- What is their point estimate?
- What is their 90% confidence interval?
- Update your estimate and confidence interval based on knowing what your “competitor” is estimating.

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## Any lessons from that?

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- Did you change your point estimate as a result of the discussion?
- Did you widen or narrow your confidence interval?

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## ... for a small prize

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- With the revised point estimate, who was closest?

Answer was: 1,666m



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## How robust were our confidence intervals?

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- How many had the right answer within their first guess confidence interval?
- How many had the right answer within their second guess?
- What conclusions can we draw?

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## Typical results

- **Wisdom of Crowds**
  - More will tend to have the answer in their second confidence interval than their first...
  - ... Despite narrower confidence intervals
- **Overconfidence**
  - Less than 90% of people will have the answer within their 90% confidence interval.
  - However, overconfidence reduces with competence (Dunning-Kruger Effect)

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## Dunning-Kruger Effect

**“People reach erroneous conclusions and make unfortunate choices but their incompetence robs them of the metacognitive ability to realize it.”**

– Dunning and Kruger, 1999

- The unskilled will rate their ability much higher than it actually is
- The highly skilled underrate their abilities

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## Some concepts

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- On average, how did we do?  
**Wisdom of Crowds**
- If this were a range of quotes...  
**Winner's Curse**
- How did the winner feel?  
**Utility of Winning**

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## Agenda

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- **Wisdom of Crowds**
- **Winner's Curse**
- **Psychological Effects**

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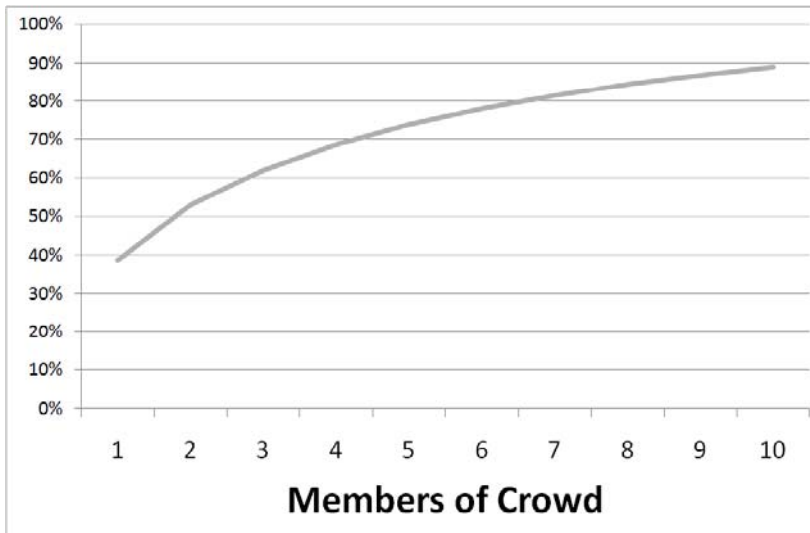
## Wisdom of the Crowd

**The theory that a larger group of diverse people can make better decisions, and display more intelligence than any smaller collection of experts**

## Simple Example

- Consider estimates of an amount  $x$ .
- .... And the estimates come from a distribution  $N(x,1)$
- .... Then approx. 38% of estimates are within 0.5 of the mean.
- ... If we take an average of 2 estimates then approx. 53% are within 0.5

## ... And Bigger Crowds



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## Wisdom of Crowds

- Different companies making different assessments
- Average price should usually be better than any individual price
- Does this mean that the market price is a good estimate?
- Where does it fall down?

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## The pit falls...

- Market price is not usually the market average
- Example
  - An underwriter complains about the pricing model you've given him.
  - It is "above the market price" 90% of the time.

**... well if there are 10 companies in his market...!!**

## Some more questions...

Who can provide the most accurate price for a risk?

- Claims Manager
- Accountant
- Underwriter
- Actuary
- Broker

**.... Or a collaboration of several of the above?**



## Unwise crowds

Common themes in “unwise” crowds:

- Too homogenous:
  - Similar professional backgrounds
  - Similar types of models
  - Similar source information

## A “wise” or “unwise” crowd?

Common themes in “unwise” crowds:

- Too homogenous
- Too centralised
  - Decisions taken by hierarchical bureaucracy

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## Question

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How often do you collaborate with competitors on your pricing?

I hope it's not very often – that would be anti-competitive!!!

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## A “wise” or “unwise” crowd?

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Common themes in “unwise” crowds:

- Too homogenous
- Too centralised
- Too divided
  - Information not shared between members of the crowd

## A Mozart Question

.... And the answer is...

1756



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## A “wise” or “unwise” crowd?

Common themes in “unwise” crowds:

- Too homogenous
- Too centralised
- Too divided
- Too imitative
  - Where members of the crowd are making decisions in sequence and can be tempted to copy

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## Question

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Who thinks England can win the World Cup?

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## A “wise” or “unwise” crowd?

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Common themes in “unwise” crowds:

- Too homogenous
- Too centralised
- Too divided
- Too imitative
- Too emotional
  - Peer Pressure
  - Herd Instinct
  - Collective Hysteria

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## Challenges for Pricing

- We are a fairly homogenous group
- We sit in separate silos
- We may be fed the same data
- Our underwriters may be imitative
- Peer pressure often exists
- Market prices often follow a herd instinct

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## Dilemma

### Pricing

- Pricing below market average
- Pricing close to market average
- Pricing above market average

### Implications

- Inadequate pricing
- Adequate price, but low conversion rate
- Over priced

**... and we start to revisit the “Winner’s Curse” issues discussed at last year’s GIRO**

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## Agenda

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- Wisdom of Crowds
- Winner's Curse..... a recap!
- Psychological Effects

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## A definition...

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### Winner's Curse

- The tendency for a **Common Value Auction** to be won by a bidder who has over-estimated the value.

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## Winner's Curse - Theory

- Capen, Clapp, and Campbell (1971)  
"Competitive Bidding in High-Risk Situations"
- Each bidder making best guess at uncertain cashflows using
  - Own knowledge of similar risks
  - Expert information
  - Developing pricing techniques and expertise
- Variation in bids much greater than variation in true value to different bidders
- Highest bid wins



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## Winner's Curse & Insurance

- "Competitive Bidding in High-Risk Situations"
- Each bidder making best guess at uncertain cashflows using
  - Own knowledge of similar risks
  - Expert information
  - Developing pricing techniques and expertise
- Variation in bids much greater than variation in true value to different bidders
- Lowest bid wins



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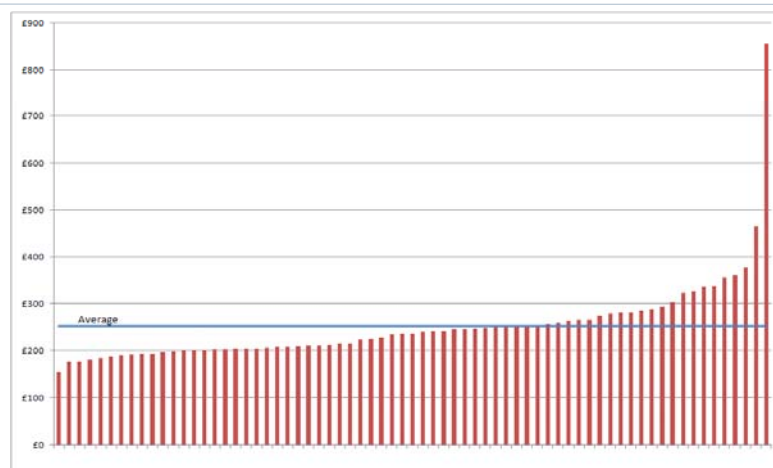
## GoSwitchTheBewilderedMongooseSupermarket.com

1	£154.88
2	£175.96
3	£176.60
4	£180.24
5	£184.10
...	...
69	£856.00
Mean	£252.87
Median	£237.38

- What's the right price for the risk?

Prices quoted are for a 37-year-old male member of the working party with an 11-year-old Mazda 323 and maximum NCD. Comprehensive cover and £500 excess were requested on the website of a well-known price comparison website. Prices were taken on the 26<sup>th</sup> September 2009.







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Mean Quote		£252.87
Median Quote		£237.38

- What's the right price for the risk?
- What influences the purchase decision?
  - Price?
  - Brand?
  - Other?

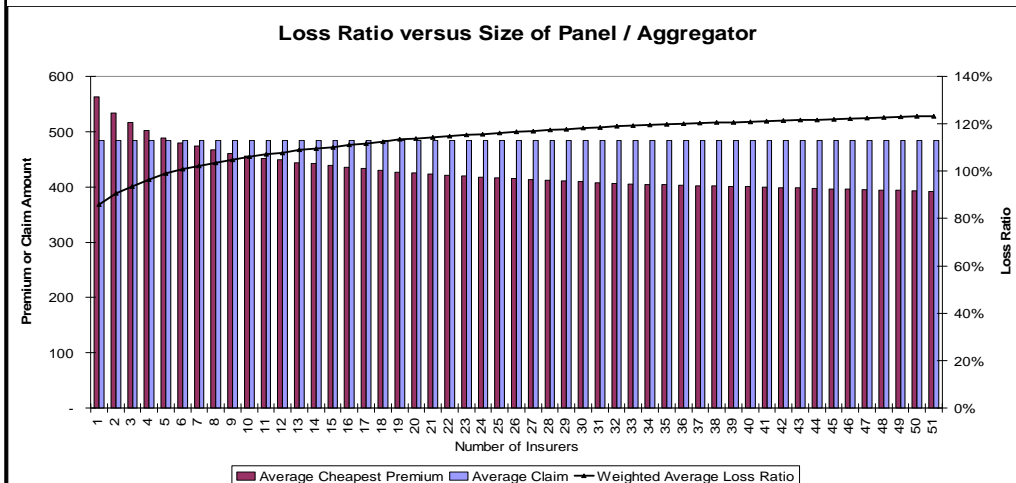
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## GoSwitchTheBewilderedMongooseSupermarket.com

Provider	Annual Premium	Monthly Premium	Total Excess	Legal Cover	Courtesy Car	Breakdown Cover	Personal Accident Cover	Windscreen Cover	Customer Reviews
	£154.88	£13.51 @ 10 months £30.98 deposit Total: £166.08	Compulsory £150.00 Voluntary £500.00 Total: £500.00	£19.99 extra	✓	£29.99 extra	✓	✓	★★★★★ <a href="#">1 review(s)</a>
	£175.96	£16.00 @ 10 months £33.56 deposit Total: £193.56	Compulsory £0.00 Voluntary £500.00 Total: £500.00	£24.99 extra	£17.99 extra	£34.99 extra	✓	✓	★★★★☆ <a href="#">186 review(s)</a>
	£176.60 Save with MultiCar	✓	Compulsory £0.00 Voluntary £500.00 Total: £500.00	✓	✓	✗	✓	✓	★★★★☆ <a href="#">102 review(s)</a>
	£180.24	£15.27 @ 11 months £36.05 deposit Total: £204.02	Compulsory £150.00 Voluntary £250.00 Total: £400.00	£19.37 extra	✓	£44.95 extra	✓	✓	★★★★☆ <a href="#">9 review(s)</a>
	£184.10 SALE NOW ON	£17.00 @ 11 months £15.33 deposit Total: £202.33	Compulsory £150.00 Voluntary £500.00 Total: £650.00	£26.99 extra	✓	£39.99 extra	✓	✓	★★★★☆ <a href="#">88 review(s)</a>

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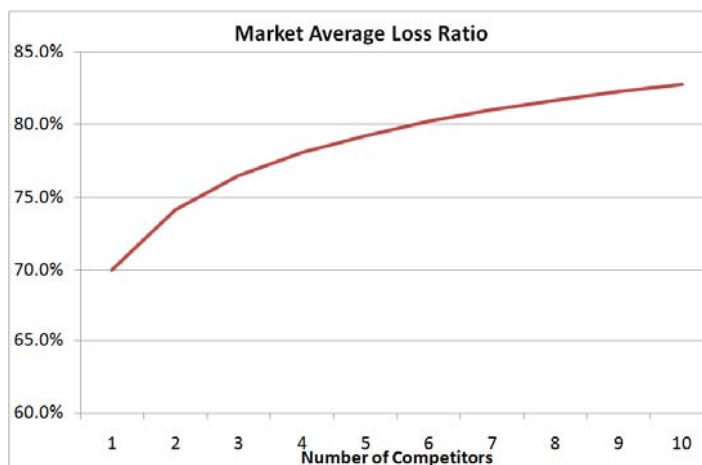
## Our Own Aggregator



## A Simple Model

- Normally distributed prices
- Up to 10 individual insurers with identically distributed prices
- Co-Efficient of Variation 10%
- Target loss ratio 70%

## Impact of Competition

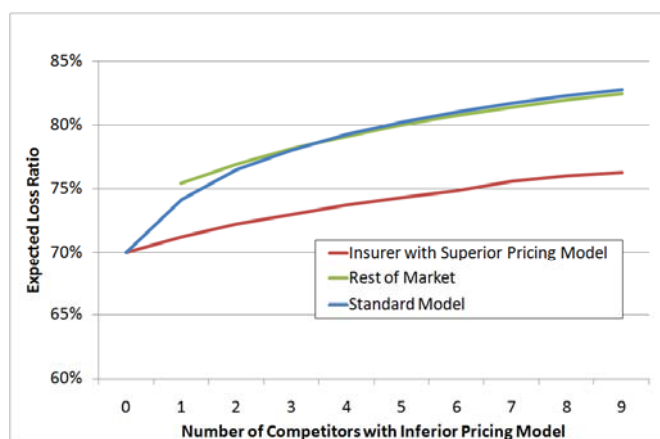


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## A more accurate model than your competitors

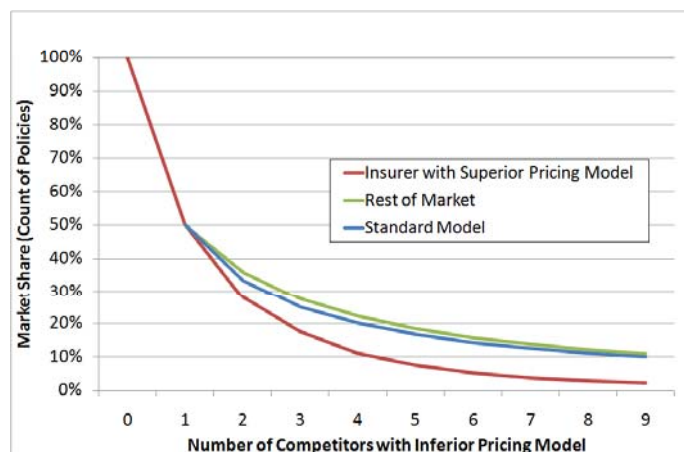
- One insurer has a co-efficient of variation of 5%



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## ... But less business



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So....

**Becomes an optimisation problem**

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## Pricing Implications

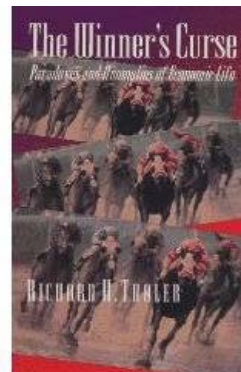
- Importance of good quality data & pricing sophistication
- Danger of panels/aggregators
- Opportunities in product differentiation and niches
- Importance of Cross Selling
- Importance of Cost Efficiency
- Value of strong brand
- Good reason to “talk up” the market
- Subscription markets/Best Terms/Vertical Pricing
- Danger of chasing market share as competition increases
- New broker opportunities (e.g. Reverse auctions)

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## For more information on Winner's Curse

- 2009 Working Party Paper
- 2009 GIRO presentations (plenary and workshop)
- 2009 Momentum presentation
- Extensive reading list included in the paper



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## Agenda

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- Wisdom of Crowds
- Winner's Curse
- Psychological Effects

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## “Win”

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- Synonyms
  - accomplish, achieve, attain, gain, success, triumph
- Antonyms
  - fail, forfeit, lose, miss, relinquish, suffer defeat

## Utility of Winning

- Winning feels good
- Psychological benefit from winning
- Risk of wrong reaction to competition

.... Related to other psychological effects

## Biases

- Anchoring
  - Over-reliance on one piece of information
- Status Quo
  - Bias towards existing price
- Recency
  - Placing more importance on recent events

Some interesting thoughts on “Cognitive Bias” in David Drury’s 2007 CArE presentation.

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## Conclusions

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**Think about your pricing in the context of your competitors' actions and reactions**

**- Game Theory**

**Beware of the psychological influences on your decisions**

**- Cognitive Bias**

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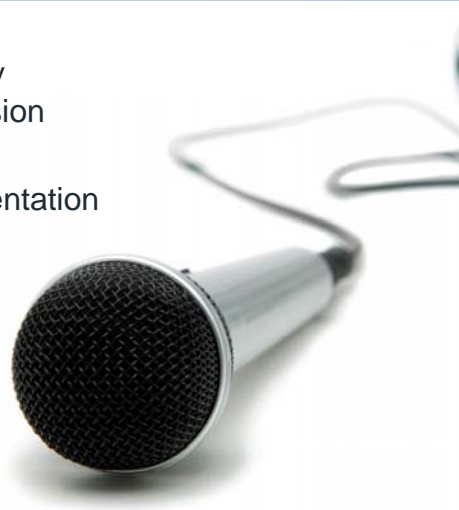
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## Questions or comments?

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The views expressed in this presentation are those of the presenter.



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