17TH EAST ASIAN ACTUARIAL CONFERENCE
15 -18 October 2013
Resorts World Sentosa, Singapore

Behavioural Economics

Singapore Actuarial Society

EAAC

Agenda

- Background (Lawrence)
  - What is Behavioural Economics?
  - Insights from Behavioural Economics and Implications for Insurance and Actuaries
- Applications (Na)
  - Direct Marketing of Insurance and Behavioural Economics
  - From Behavioural Economics to a Hypothesis for Insurance Marketing

Singapore Actuarial Society

EAAC

Finally, some answers…

- Why are profit margins on Accident products so high?
- Why do people buy Return of Premium products?
- Why don't people buy Immediate Annuities?
- Why is Credit Life easier to sell than ordinary Life Insurance?
- Why do Product Exclusions hurt sales?
- Why does it make sense to add more conditions to a Critical Illness product that already covers 40 conditions?

Background

- **Behavioural Economics** studies the effects of social, emotional and psychological factors on the economic decisions of individuals and institutions
- Originates from psychology and sociology (now backed up by neuroscientific research) and the observation that people often do not behave in the purely rational, profit-maximising way implied by many economic models

Some Insights

- (Not) Understanding Probability
  - Availability bias
  - Probability and plausibility
  - Denominator neglect
- Risk Aversion
  - Relativity and Asymmetry of Utility
  - "Fourfold" pattern – Possibility and Certainty effects
  - Framing
- Anchoring, Defaults and Conformity
  - Anchoring
  - Default Options and Conformity with Social Norms
- Honesty
  - Reminders of being watched
  - Pledges and signatures

(Not) Understanding Probability

- What is more probable?
  - Death from an accident or from a stroke?
  - Death from an accident or from diabetes?
  - Death from an accident or from a disease?
  - Death from a fire or from asthma?
- Which is more likely?
  - A massive flood somewhere in North America next year, in which more than 1,000 people drown
  - An earthquake in California sometime next year, causing a flood in which more than 1,000 people drown
- Which is more deadly?
  - Disease 1 kills 1,286 out of every 10,000.
  - Disease 2 kills 24.14% of the population

(Not) Understanding Probability

- Availability bias
  - Perceptions of probability are shaped by people's ability to recall similar stories from memory
  - Frequency, prominence, vividness and strength of emotional response increases perception of probability
  - More plausible and vivid descriptions are perceived as more probable than more generic statements
  - People focus on headline numbers
- Examples from the Insurance Industry
  - Accidental Death Plans
  - Double/Triple Indemnity for Transport Accidents, Plane Crashes, Terrorism, Earthquakes

Risk Aversion

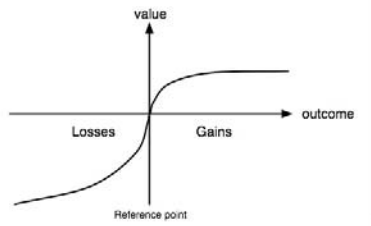
- You are given $1,000, plus a choice of:
  - (a) receiving $500 more for sure, or
  - (b) 50% chance of winning $1,000 more (and 50% chance of winning nothing more)?
- You are given $2,000, plus a choice of:
  - (a) losing $500 for sure, or
  - (b) 50% chance of losing $1,000 more (and 50% chance of losing nothing)?

Risk Aversion

- How much would you pay to increase your chance of winning $100…
  - from 0% to 1%?
  - from 50% to 51%?
  - from 99% to 100%?
- Which treatment for lung cancer would you recommend?
  - For Treatment A, the 1-month survival rate is 90%
  - For Treatment B, 10% of patients die in the first month

Risk Aversion

- Risk averse for gains but risk seeking for losses



- The Fourfold Pattern

	GAINS	LOSSES
HIGH PROBABILITY (Certainty Effect)	95% chance to win $1,000 Fear Disappointment RISK AVERSE (eg Competitive Auctions)	95% chance to lose $1,000 Hope to Avoid Loss RISK SEEKING (eg Double or Nothing)
LOW PROBABILITY (Possibility Effect)	5% chance to win $1,000 Hope of Large Gain RISK SEEKING (eg Lottery Tickets)	5% chance to lose $1,000 Fear of Large Loss RISK AVERSE (eg Insurance Policies)

Anchoring and Defaults

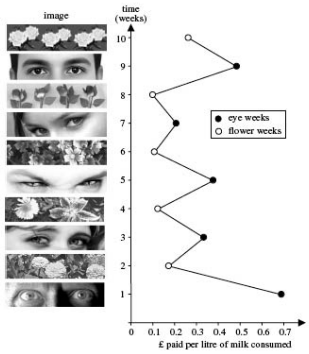
- Write down the last 2 digits of your phone number
  - How much would you pay for a new actuarial textbook?
- Can you explain this discrepancy?
  - 12% of Germans are organ donors
  - 99% of Austrians are organ donors
- Which of the following statements makes you most disposed towards complying with your tax obligations
  - Your taxes go towards worthy causes like education and policing
  - You face fines and potential imprisonment if you fail to comply
  - We will give you whatever assistance you need to comply
  - 90%+ of your fellow citizens comply in full with their obligations

Anchoring and Defaults

- Implications for Insurers and Actuaries
  - Is independent peer review really unbiased?
  - Benefit Illustrations, Suggested and Minimum Income / Benefit Multiples can have a significant influence on decision-making
  - Default and opt-out marketing is potentially very powerful and needs to be used responsibility (or else will be regulated away)
  - Once established, default increases (eg CPI indexation, Save More Tomorrow) tend to be persist over time
  - Humans have a tendency to follow the herd – momentum is self-sustaining and popular choices become more popular

Honesty

- You are being watched



- Reminders, pledges and signatures
  - Should we sign at the top rather than at the bottom?

Agenda

- Background (Lawrence)
  - What is Behavioural Economics?
  - Insights from Behavioural Economics and Implications for Insurance and Actuaries
- Applications (Na)
  - Direct Marketing of Insurance and Behavioural Economics
  - From Behavioural Economics to a Hypothesis for Insurance Marketing

Direct Marketing of Insurance and Behavioural Economics

- Various aspects of behavioural economics are already observed quite frequently in the insurance industry.
- However, there are also other examples of apparently irrational behaviour in the insurance industry, some of which are well known but which cannot be explained by classical economics.

Why do customers always respond better when premiums are charged in monthly mode rather than annual or semi-annual mode?

- Response rate is severely affected if the default premium option is annual instead of monthly. The same still holds even if an attractive premium discount is offered for annual payment mode.
  - people just focus on the headline premium without considering the impact of monthly versus annual payment
  - in order to avoid a low probability of large potential future loss , the individual is willing to pay a small premium (bottom right quadrant in Fourfold Pattern.). The lower the premium, the more worthwhile the insurance benefit seems to feel and the pain of paying a larger annual premium outweighs any pleasure from the modal discount that might be received.
  - A further explanation is that monthly premiums fits much better with the budgeting needs of customers and their internal mental accounts that allocate a limited amount of money to specific needs.

Why do people respond better when insurance materials are presented in a plain envelope than a more clearly labelled envelope?

- Option A: Free insurance offer letter with envelope indicating free offer inside
- Option B: Free insurance offer letter with plain envelope

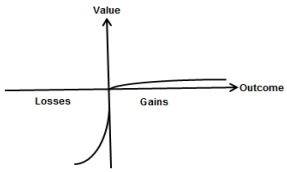
- A pre-conditioned adverse response to insurance and/or marketing material is likely to be a large part of the explanation. Various behavioural economics experiments have shown the general population to be instinctively distrustful of anything labelled as free.
- Other experiments have shown that US consumers are inherently distrustful of virtually any sort of marketing material.

Why are Return of Premium (ROP) products so popular among certain customers?

An Example of ROP Product : Annual Premium Rate
Juvenile Critical Illness To Age 13
Male, Age 4 last, Premium payment duration: 8 years

	ROP CI	Pure CI Protection
Sum Assured	1,000	1,000
Annual Premium	50.35	1.39

- In the Fourfold Pattern, the top left quadrant indicates that people are willing to pay a premium to lock in with certainty in an already high-probability context and bottom right quadrant indicates that people are willing to pay a premium to avoid a potential low-probability large loss.
- So why do people still want ROP products then? In order to avoid any pain, little gain is obtained instead.
- Utility curve – extremely steep loss curve and flat gain curve



- Thoughts?
  - the concept of insurance and benefit is not fully underst
  - such products are mis-represented or mis-sold ?

From Behavioural Economics to a Hypothesis for Insurance Marketing

- Since the birth of individual insurance products, many have held the belief that the reason why people don't buy insurance is because the right product has not been offered.
- Another somewhat contradictory notion is that insurance is "sold, not bought" and that people are not buying insurance because it has not been sold to them properly.
- Various tools have been developed to enhance the accuracy of our sales and marketing success – Propensity modelling and customer profiling. However these tools face some practical difficulties.
- Meanwhile, some paradoxes continue to be observed, which should encourage us to rethink many commonly held beliefs in insurance marketing, especially in the context of behaviour economics.

Why are customers who have previously bought an insurance product more likely buy the same insurance product again?

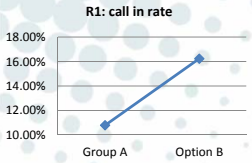
- In direct marketing, it is well known that regardless of the products marketed or the delivery channels utilised, it is always a similar group of customers who respond best. This does present an immediate challenge to the value of profiling and clustering models.
- policyholders who already have a PA rider are more likely to purchase another identical PA rider, compared to policyholders without a PA rider.
- This really challenges the traditional "needs-based" theory of insurance sales. Surely customers who already have a PA rider have less need for another near-identical rider than customers without a PA rider.
- Is it possible that customers who already purchased a PA rider demonstrate a different attitude or understanding of insurance compared to other customers?

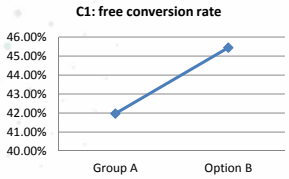
Lucky draw vs. insurance

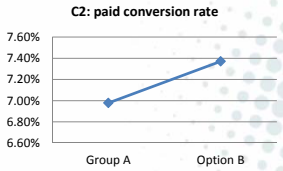
- Group A: customers were sent a letter, offering them Free Insurance. They needed to call in to enrol for the free insurance. Once they called in and confirmed their enrolment, an offer of paid insurance was made during the same phone call
- Group B: customers were sent a letter, offering them 10 out of 100,000 chances to win an iPad. Similarly, they needed to call in to enrol for the lucky draw. Once they called in to confirm their entry in the lucky draw, the same offer of paid insurance (as in Group A) was made during the same phone call

Three indicators were observed,

- R1: call in rate
- C1: free conversion rate,
- C2: paid conversion rate,







Singapore Actuarial Society

EAAC

Lucky draw vs. insurance

- While the preference for the lucky draw can be explained, the difference in paid conversion rate is much more difficult to explain. It also contradicts normal direct marketing principles.
- Affinity is normally a very prominent contributor to the response rate. Free to paid conversion should be a more natural transition than lucky draw to paid insurance.
- Is it possible that these customers have a different attitude to uncertainty?

Singapore Actuarial Society

EAAC

Hypothesis on those who actually purchase insurance

For any given customer, the risk-reward decision (ie not the decision to help out an insurance agent friend or the decision to anti-select and non-disclose) to purchase voluntary insurance depends on the relationship between the following three items:

1) Immediate loss with certainty: to pay premium in certain frequency.
2) Future gain with certainty: return of premium or maturity or surrender values.
3) Future gain with uncertainty: a claim event and benefit payment

The perceived value of (2) and (3) must exceed the perceived cost of (1) for people to decide to buy insurance. The perceived value/cost for an individual is determined by

(a) the nature of the risk,

(b) the relativity measured in monetary terms between benefit and cost and

(c) how an individual values "certainty" versus "probability".

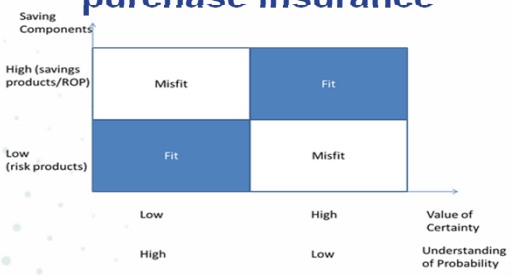
(a) and (b) are the natural domain of the actuarial profession and familiar territory. However we suspect that factor (c) often has a lot to do with why people buy insurance and tends to be more neglected by the actuarial profession.

Hypothesis on those who actually purchase insurance

For instance, if someone's utility curve with respect to loss/gain is similar to the diagram illustrated earlier (steep loss curve and flat gain curve). this means the value of a certain loss (paying premium) is valued much more highly than an uncertain gain (a claim event). Such a person will not naturally buy protection insurance, with a mindset more suitable for ROP products and savings plans with limited protection.

Factor (c) may also be related to the individual's relative wealth and personal situation such as family and financial responsibilities. However, another part of the equation may also be how well the customer truly understands probability and uncertainty.

Hypothesis on those who actually purchase insurance



- Propensity modelling - identity people in bottom left box with a high degree of accuracy, but left with smaller customer universe
- But the much more difficult question is how to convince the people in the bottom right box to actually buy true protection insurance?
- Are ever more interesting (and complicated) products, in the process pushing the limits of insurable risk the answer.
- Others have also tried to utilise profiling tools by segmenting the customer base and trying to match each segment with perceived customer needs and affordable products.
- However over and over, somewhat to our frustration, we often discover that it is the same group of people who keep buying insurance, while others simply don't.

How to influence people to purchase insurance?

For a profession and an industry that is built to large extent on the objectivity of probability and utility theory, actuaries and the insurance industry actually need to better understand the mass market's *lack of* comprehension of probability. Efforts should also be made to encourage better understanding or educate customers on the fact of uncertainty. Some of the implications are as follows:

- Better frame and describe risk and uncertainty in a way that helps customers to understand.
- Powerful personal examples can be very effective.
- Conformity. People's desire to conform with societal norms and inertia in the face of default recommendations, if utilised with intelligence and benevolence, could be very effective.
- Last but not least, as mentioned, some of the negative perceptions with which the insurance industry is regarded. The fact that insurance is less exciting than a chance of winning an iPad. With the rise of social media and the collective shortening of attention spans, insurance industry need to evolve and become more interactive and interesting engagement and education of customers, in order to remain relevant.