E6: Behavioural Finance for Actuaries
Kathy Byrne and Paul Cook
Members of the Behavioural Finance for Actuaries Working Party

26 September 2016
Agenda


The Research → Summary and Conclusions
Why Behavioural Finance?
Behavioural Finance is topical

Financial Conduct Authority

Occasional Paper No.1

Applying behavioural economics at the Financial Conduct Authority
April 2013

Kristine Erka, Stefan Hunt, Zanna Isomino, Will Brambley

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What is Behavioural Finance

A method of economic analysis that applies psychological insights into human behaviour to explain economic decision-making

Oxford English Dictionary

The field of behavioural finance looks at how a variety of mental biases and decision making errors affect financial decisions. It relates to the psychology that underlies and drives financial decision making behaviour.

ST5 Examiners report Q3 October 2012
Behavioural Finance for Actuaries Working Party
Working Party

- Kathy Byrne (Co-Chair)
- Iain Clacher (Co-Chair)
- Chandni Nakum
- Huw Withey
- Marcus Hurd
- Paul Cook
- Shai Harman
- Siddesh Ramasubramanian
- Simon Pearse
Behavioural Finance and Actuaries
IFoA Library Search

- Books
- Other Journals/Papers
- Conference Presentations
- The Actuary Articles
- Other Actuarial Journals
- SIAS Papers
- BAJ

Library catalogue search

Query form

Simple search
"behavioural finance" OR "behavioural economics"

Search electronic documents only
Search electronic documents on www.actuaries.org.uk only
Search journal articles only

Number of records per page: 100

Search | Reset

If you are looking for a specific title or author, or you want to combine terms, please use the advanced search

Advanced search

Retrieval software: DB/Text WebPublisher, provided by INMAGIC

This site is designed for use with Internet Explorer
The Research
Research Questions

• Do actuaries show the same biases as other people?
• Are actuaries more or less biased than other people?
Research Instrument

Five minute survey

During the month of March, you will see this article in all the IFoA newsletters. Please can you spare five minutes in order to complete a survey and to help an IFoA working party with some research? No technical expertise is required but you do need to be a member of the IFoA. The aim is for you to answer the questions as quickly as possible. The results from the survey will form part of a series of research papers that the working party is writing. Their intention is then to present their findings at relevant conferences. No answers will be attributed to any individual.

Take part in the survey
Research Sample

Survey Version

353
608

Survey 1
Survey 2

Age Profile

18 - 29: 237
30 - 39: 302
40 - 49: 196
50 - 59: 132
60 - 69: 59
70 - 79: 15
80 and over: 15
Missing: 15

Europe 10.1%
UK 76.7%

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Research Sample

Qualifications:
- Student Actuarial Analyst: 0.8%
- Student: 69.7%
- Associate: 26.1%
- Certified Actuarial Analyst: 0.1%
- Affiliate: 0.8%
- Fellow: 0.6%

Practice Area:
- Investment Banking
- IT
- Education
- Other Actuarial
- Health
- Other Non Actuarial
- Investment Management
- Retired
- Risk
- General Insurance
- Pensions
- Life

ST5:
- No, student not studied it yet: 24%
- No, did not study ST5: 21%
- Yes: 55%

Number of Practice Areas:
- Retired
- 1
- 2
- 3
- 4
- 5
- 10
- 3.3%
- 1.4%
- 0.4%
- 0.1%
- 13.3%
- 6.8%
- 74.9%

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Framing - Avian Flu Programmes

The UK is preparing for an outbreak of avian flu which is expected to kill 600 people. Two alternative programmes to combat the disease have been proposed.

<table>
<thead>
<tr>
<th>Survey 1</th>
<th>Survey 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programme A:</strong> 200 Saved</td>
<td><strong>Programme A:</strong> 400 Die</td>
</tr>
<tr>
<td><strong>Programme B:</strong> 1/3 probability that 600 people will be saved, 2/3 probability that no people will be saved</td>
<td></td>
</tr>
</tbody>
</table>

![Bar charts showing preference among Actuaries and Non-Actuaries for Programme A and B.](chart.png)

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Preference for Guarantees

If you had a choice between a guaranteed payment of £1,000 and a one in five chance of winning £10,000, which would you choose?

Certainty Bias

- Actuaries: 40% guaranteed £1,000, 60% 20% chance of winning £10,000
- FCA Spotlight: 60% guaranteed £1,000, 40% 20% chance of winning £10,000

A Guaranteed £1,000  B 20% chance of winning £10,000  C No Opinion/Don't know
Representativeness

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which is more probable?

A Linda works in a bank.

B Linda works in a bank and is active in the feminist movement.
Availability
Which causes more deaths in the UK amongst women aged 20 to 29?
A  Accidents
B  Cancer
C  Self inflicted injuries

Actuaries
Actual causes of death 2010

Accidents
Cancer
Self Inflicted
Anchoring

What do you think the rate you earn on your cash savings will be over the next year?

A  Less than 1%
B  1% to 2%
C  2% to 4%
D  over 4%
Overconfidence

What is the capital of Kentucky State in the USA?

A Princeton
B Springfield
C Don’t Know
Status Quo Bias

A great aunt has bequeathed to you a large sum of money. Questionnaire 1 simply offered a choice of 3 investment options. Questionnaire 2 said the money was invested in corporate bonds and gave an option to switch to cash or equities.
Mental Accounting

Imagine that you have decided to see a play where admission is £20 per ticket.
- As you enter the theatre you discover that you have lost a £20 note.
- As you enter the theatre you discover that you have lost the ticket.
Would you still pay £20 for a ticket to the play?
Present Bias

Which would you choose, receiving £1,000 today or £1,100 pounds in a year’s time?

![Present Bias Chart]

- A £1,000 now
- B £1,100 in one year
- C No Opinion/Don't know
Bias concept

Unbiased score

- Certainty Bias *(Utility)*
- Representativeness *(Probability)*
- Causes of death *(Probability)*
- Overconfidence *(Fact)*
- Present Bias *(Utility)*
Scores by Age

Unbias Score by Age Group

- 0 or 1
- 2
- 3
- 4 or 5
- Mean Score
Scores by Gender

Unbias Score by Gender

Female
- 0 or 1
- 2
- 3
- 4
- 5
- Mean Score

Male
- 0 or 1
- 2
- 3
- 4
- 5
- Mean Score

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Scores by Gender

Probability Score by Gender

- Female
- Male

- 0
- 1
- 2
- Mean Score

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Scores by Qualification

Unbias Score by Qualification

- Fellow
- Other

Legend:
- 0 or 1
- 2
- 3
- 4 or 5
- Mean Score
Scores by Studied ST5

Unbias Score by Studied ST5

- Not Studied ST5
- Studied ST5

- 0 or 1
- 2
- 3
- 4
- 5
- Mean Score

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Scores by Age

Unbias Score by Age Group

Studied ST5 26%  60%  11%
Actuarial Example: Cook’s Paradox

You are one of two beneficiaries of a trust that has been established with capital of £1m.

Beneficiary 1 and their descendants receive the income from the trust for the next 100 years.

Beneficiary 2 and their descendants receive the capital in 100 years’ time. The capital is invested in short dated gilts and cash with a guaranteed return of 3% p.a. The present value of a payment £1m in 100 years’ time is about £50,000.

How much is each Beneficiary’s share worth?
Actuarial Example: Survey Samples

Questionnaire 1: You and your descendants receive the capital in 100 years’ time.

Questionnaire 2: You and your descendants receive the income from the trust for the next 100 years.

- Each asked to value their own share
- Each then asked to value the other beneficiary’s share

<table>
<thead>
<tr>
<th></th>
<th>Capital Values</th>
<th>Income Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Less than £10,000</td>
<td>Less than £600,000</td>
</tr>
<tr>
<td>B</td>
<td>£10,000 to £25,000</td>
<td>£600,000 to £750,000</td>
</tr>
<tr>
<td>C</td>
<td>£25,000 to £49,999</td>
<td>£750,000 to £949,999</td>
</tr>
<tr>
<td>D</td>
<td>£50,000 exactly</td>
<td>£950,000 exactly</td>
</tr>
<tr>
<td>E</td>
<td>More than £50,000</td>
<td>More than £950,000</td>
</tr>
</tbody>
</table>
Actuarial Example: Capital Values

Questionnaire 1, Receive Capital
- A Less than £10k
- B £10k to £25k
- C £25k to £49k
- D £50k exact
- E More than £50k

Questionnaire 2, Receive Income
- A Less than £10k
- B £10k to £25k
- C £25k to £49k
- D £50k exact
- E More than £50k
Actuarial Example: Income Values

Questionnaire 1, Receive Capital
- A Less than £600k
- B £600k to £750k
- D £950k exact
- C £750k to £949k
- E More than £950k

Questionnaire 2, Receive Income
- A Less than £600k
- B £600k to £750k
- D £950k exact
- C £750k to £949k
- E More than £950k

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Cooks Paradox: Total Values

- Questionnaire 1, Receive Capital
- Questionnaire 2, Receive Income

- A Ranges less than £1m
- B Ranges including £1m
- C Ranges higher than £1m
Summary and Conclusions
Conclusions

- Actuaries do show the same biases as other people
- In some areas actuaries show less bias than other people
  - Probability and statistics
  - Overconfidence
  - BUT bias in a real life actuarial example
- Age, education and experience appear to be key factors in reducing the impact of bias
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