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## Consumer Risk Metrics Working Party

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10 October 2016

### Pre-Workshop Guide

- Material contained in this workshop is highly subjective!
- There is no wrong answer.
- Your views are most welcome!
- We will regularly pause to allow discussion



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## Challenges Faced By Consumers

- Quotes from the “Consumer understanding of financial risk” consumer research

“All I look at are the stats, but I don’t really know what they relate to”

“Very little attention in many respects because they tend to be printed as a small print adjunct to the main document”

“They usually show you a scale, but you are believing what that is; you don’t know whether that’s right or wrong really”

“People should be aware of it. A lot of people sign up for things that they don’t understand and they can lose their collateral”

“I wouldn’t say they have any idea of risk” (quote from a financial adviser)



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## Challenges Faced By Consumers

- “Half of the UK working population have a reading age of 11-years-old or younger” - Ref: style.ons.gov.uk

“I wouldn’t say they have any idea of risk” (quote from a financial adviser)



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## Audience Interaction 1

- Joe is a 30 year old engineering contractor and has just started to think about his pension and how he might fund his retirement.
- At the moment the following products are available to address Joe's perceived need:
  - A pure endowment product with a fixed benefit at retirement from Insurer A
  - Unitised pension investing in a managed fund with Insurer B
  - Unitised pension investing in a managed fund with Insurer A
  - Unitised pension investing in bonds with a minimum guaranteed benefit at retirement from Insurer B
- **If you were Joe, how would you assess the relative riskiness of each of the options available and decide which product to select?**



## Introduction – Working Party Objective

- *To provide the consumer with a simple measure that facilitates the comparison of various products that are designed to meet the same need. The comparison will be based on the risk of not meeting the desired outcome.*
- *The comparison will not aim to do the following:*
  - *Guide a consumer to the needs for which they may choose to seek a product.*
  - *Measure the value provided by a particular product, other than through the indication of risk.*
- As an example of a metric – representative APR has been introduced in the consumer credit market (can be used even if not understood)



## Introduction - Scope

- Out of scope:
  - Customer’s risk appetite and time horizon
  - Underlying product distributions
  
- Links to other working parties:
  - Risk and Customer Outcomes Working Party
  - F&I WP Communicating Investment Returns in the Retail Customer Journey



## Current Consumer Risk Metric Landscape

- Investment and retirement product risk is measured using prescribed COBS rules on a low, medium and high projection rate
- Life protection?
- Non-life insurance protection?
- PRIIPs

Years to Retirement	Initial Gross Monthly Contribution	£100		
40 Years		Growth Rate		
		Lower -0.8%	Middle 2.1%	Higher 5.1%
	Final Year Gross Contribution*	£261.94		
	Projected Yearly Taxable Pension	£1,170	£2,800	£6,980

Term in years	Retirement Age	Growth rate -0.5% per annum			Growth rate 2.4% per annum			Growth rate 5.4% per annum		
		Account value after charges (£)	25% tax free cash taken (£)	Taxable annual Pension (£)	Account value after charges (£)	25% tax free cash taken (£)	Taxable annual Pension (£)	Account value after charges (£)	25% tax free cash taken (£)	Taxable annual Pension (£)
25	55	35,600	8,910	721	52,800	13,200	1,530	81,800	20,400	3,190
35	65	40,500	10,100	1,080	71,600	17,900	2,540	137,000	34,300	6,200
45	75	42,400	10,600	1,640	90,200	22,500	4,300	218,000	54,500	12,400

No level of certainty is attached to each projection rate



## Desired Features of a Risk Metric

### Practical considerations

- Communication to consumers
- Consistent measurement of risk for all product types
- Ease of implementation
- Complexity of calculation

### Mathematical considerations

- Positive Homogeneity
- Translation Invariance
- Monotonicity
- Sub-additivity
- Convexity



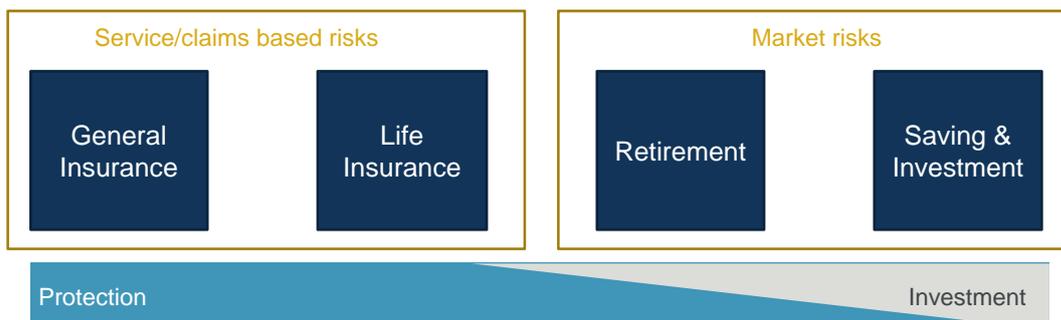
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## Product Risk Spectrum

- Consumer's are exposed to different risks depending on the type of product they purchase. We break these down into the following 4 types:



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## Audience Interaction 2

### How would you communicate risk?

- A: Imagery, using charts etc
- B: Numerically/Statistically, using a key statistic like VaR, Expected loss etc
- C: Risk Rankings, the riskiness of the product is indicated through a number/colour
- D: Through text, the risks are only contextualised and not quantified
- E: Through a conversation, the risk are contextualised and questioning can take place to ascertain suitability

- Another way? Please share your thoughts!

## Risk Metric Overview



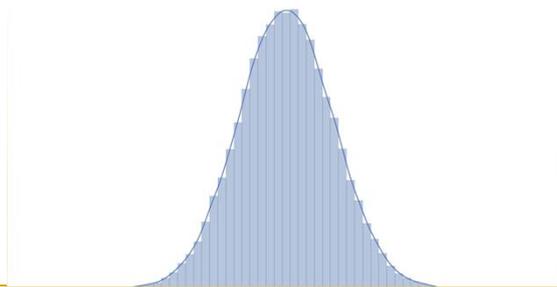
How can we describe the distribution?

## Audience Interaction 3

What metric(s) do you think might work?

What is your preferred metric?

What metric(s) would be a bad idea?

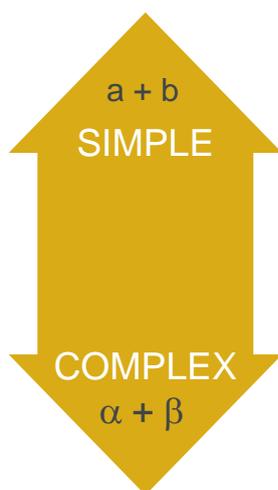


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## “Explainable” Metrics



### Mean

What is the most I can lose? (i.e. minimum)

Mean below the Mean

Lower Quartile (or Inter-quartile Range?)

Expected Shortfall (@X%)

At what level?

Value at Risk (@X%)

Standard Deviation

Spectral Risk Measure

**+ many others**



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## What's in a name? Can we pick "simpler" names?

Mean below the Mean: Average below the average

Lower Quartile:

Expected Shortfall (@25%): Average of Bottom Quarter

Value at Risk (@X%):

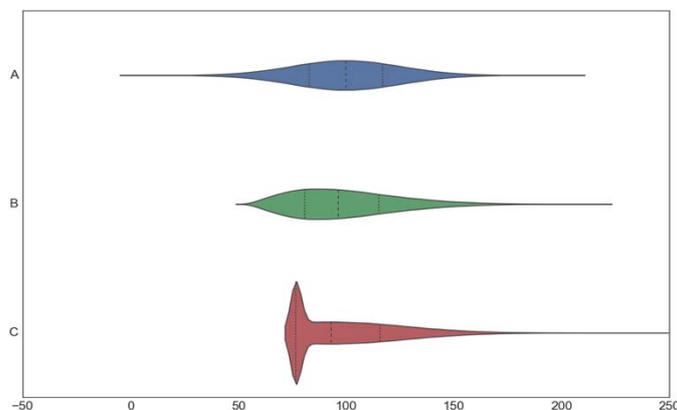
Standard Deviation: spread around the average

Spectral Risk Measure: *see later*



## Sample Products and Metrics

Kernel Density Functions



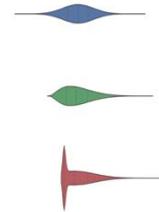
Same

- Mean (100)
- Standard Deviation (25)



## Metric Comparison

Metric (Higher = Better)			
Product	Expected Shortfall (5%)	Lower Quartile	Mean Below Mean
Product A	79	93	91
Product B	62	81	82
Product C	76	76	82



## Metric Comparison

Metric (Higher = Better)			
Product	Expected Shortfall (5%)	Lower Quartile	Mean Below Mean
Product A	79	93	91
Product B	62	81	82
Product C	76	76	82

93 91  
Similar metrics  
81 82

All expressed in currency units,  
Is a % metric possible (with say  
0% = risk free)



## Audience Interaction 4

Does it really matter which exact metric?

Do they all do the same job?

## Pro's and Con's of Risk Metrics

The table below gives a practical assessment of each risk metric

Metric / Property	Standard deviation	Value at risk	Expected shortfall	Interquartile range	Spectral risk
Ease of implementation	✓	✗	✗	✓	✗
Simple interpretation	✓	✓	✓	✗	✗
Ease of extension to other products	✓	✗	✗	✗	✗
Stable measure	✗	✗	✓	✓	✓
Captures upside & downside risk	✓	✗	✗	✓	✓

## 'Advanced' Risk Measures

**Distortion Risk Measure** Risk Measure that weighting the inverse CDF of a distribution according to a distortion function.

**Spectral Risk Measure** Special case of a Distortion Risk Measure, which reflects risk aversion (and is coherent).



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## Spectral Risk Measures

Definition

$$M_{\phi}(X) = - \int_0^1 \phi(p) F_X^{-1}(p) dp$$

Quantile Function

Spectral Function

Non-increasing weighting function



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## Spectral Risk Measures

Definition

$$M_{\phi}(X) = - \int_0^1 \phi(p) F_X^{-1}(p) dp$$

Determined from  
Portfolio Distribution

Quantile Function

Spectral Function

Based on consumer's risk  
appetite (i.e. risk aversion)



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## Challenges

Practical Challenges

- Educating the consumer
- Industry Buy In (Cost of Implementation)
- Can be applied to main products
- Estimating Distributions
- Consumer Time Horizon, Appetite to Risk?
- Consumer Understanding



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## Challenges

### Technical Challenges

- Identifying Correct Distribution
- Dealing with Multivariate Distribution (Longevity x Investment Return)

## Next Steps

- Consumer Survey
- Further research into Spectral Risk Metrics
- Common Product Testing
- Mitigating Behavioural Economics
- Extending metrics to non-investment risks
  
- New members welcome

## Questions

## Comments

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## Tables

Column title	Column title	Column title
Cell data	Cell data	Cell data
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Column titlec	Column title	Column title
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### When making tables:

- The eye follows the pale blue cells so the direction of the pale blue cells should match the direction in which the data will be read

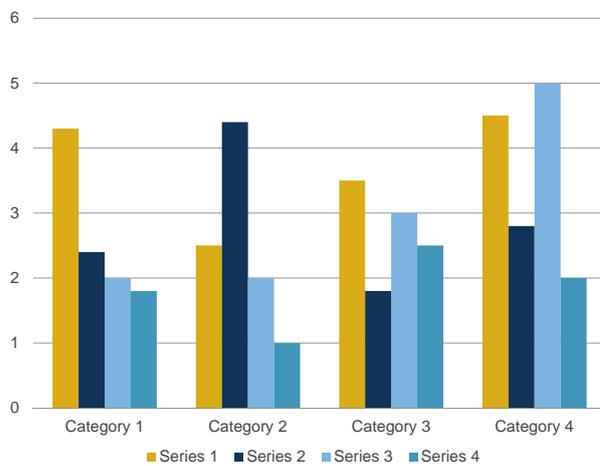


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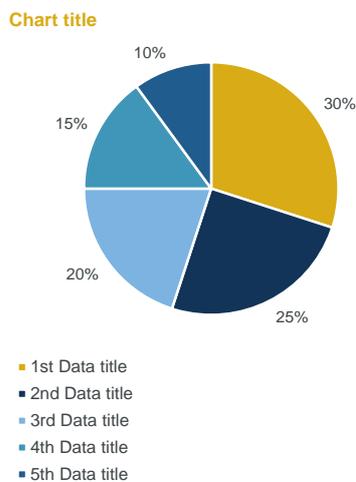
## Sample bar chart



### When making charts:

- Remove vertical lines
- Remove tick marks
- Move the legend down below the chart
- Do not use 3D charts.

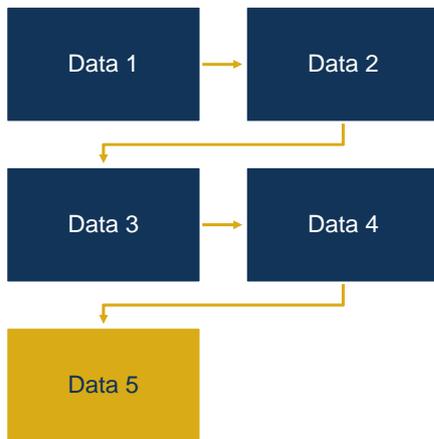
## Pie charts



### When making pie charts:

- Segments should have a 2pt white border
- Data tags should always be outside the chart
- Data legends should go below the chart
- Do not use 3D pie charts.

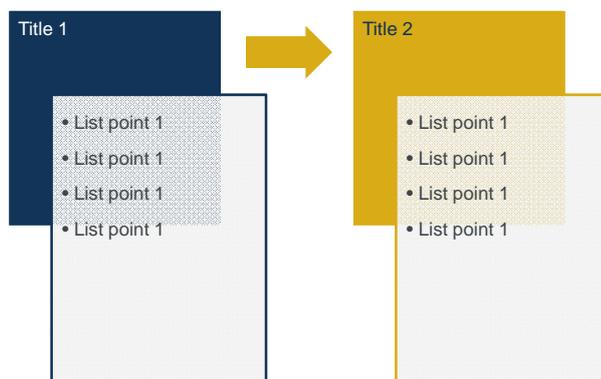
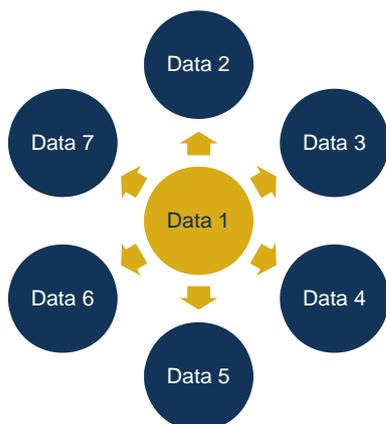
## Flow charts



PowerPoint offers a huge range of pre-set chart diagrams. You should exercise moderation when choosing a style.

- Boxes should have square corners, not rounded corners
- Circles may be used but not ovals
- Gold should be used as the highlight colour
- Do not use the 3D options.

## Flow charts – more samples



## Dual Branding

Partner logos should be approximately the same size as the Institute and Faculty of Actuaries logo and appear in the positions indicated:

### On title slides

- A title slide showing the position of partner logos is included in the title page templates
- Partner logos can appear on the other styles of title slides as long as they are in the positions indicated.

### On content slides

- The position for partner logos on content slides is indicated below
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Partner  
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### Page setup

- This presentation is set to 16:9 screen size. Do not reset the size to any other screen size
- Do not alter anything in the master slides.

### Type and typography

- Only use the font Arial and never use type smaller than 10pt
- Headings and sub-headings should always be in gold and body copy and chart text should always be dark grey
- Page titles are pre-set to gold. Page text, text blocks and chart text are pre-set in the correct dark grey
- Top level bullets should be round and second level bullets should be dashes. Further levels should alternate accordingly
- Always write in sentence case unless a proper noun is used and do not use ampersands (&)
- Only use a full stop at the end of a bullet list.

### Content styling

- A selection of different title slides is offered, all accessible via the layout tab
- Do not use clip art. If you need guidance regarding imagery please consult the brand guidelines.

### Colour palette

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