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C9. How Much Will I Have to Live on in Retirement?

Dr Thomas Bernhardt and Dr Rami Chehab
Heriot-Watt University
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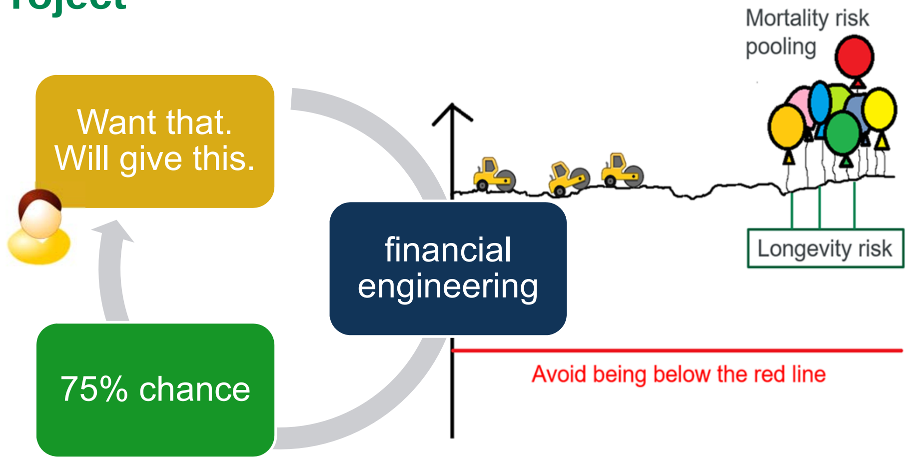
Project



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Outline

- Urgent issues in the UK pension market
- Current communication strategy with future retirees
- Our research coalition
- An approach using financial engineering
- Questions and Comments

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The present situation in the UK – DC plans

- Most people are now in defined contribution (DC) plans, or similar arrangement.
- DC are pure investment plans. The income in retirement varies with the market.
- The urgent question "What will be my retirement income?" has no certain answer.

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The savings gap in the UK

- DC is certainly not enough.

Source	Index	Value
Willis Towers Watson (2017)	DC provision for new hires for FTSE 350	98%
ONS (2016)	Contribution rate for DC in 2016 (and DB)	4.2% (and 22.7%)
Aviva (2016)	Replacement ratio in 2017 (and projected for 2047)	39% (and 31%)
Aviva (2016)	Annual pension savings gap in 2016	£447bn, 13% of GDP

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Typical customer communication

- How much do you want to contribute?

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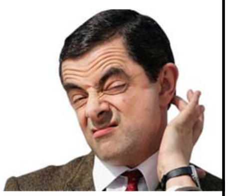
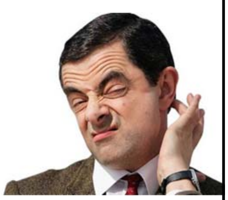
Typical customer communication



- How much do you want to contribute? … Mr Bean?
  - Most customers choose the required minimum.

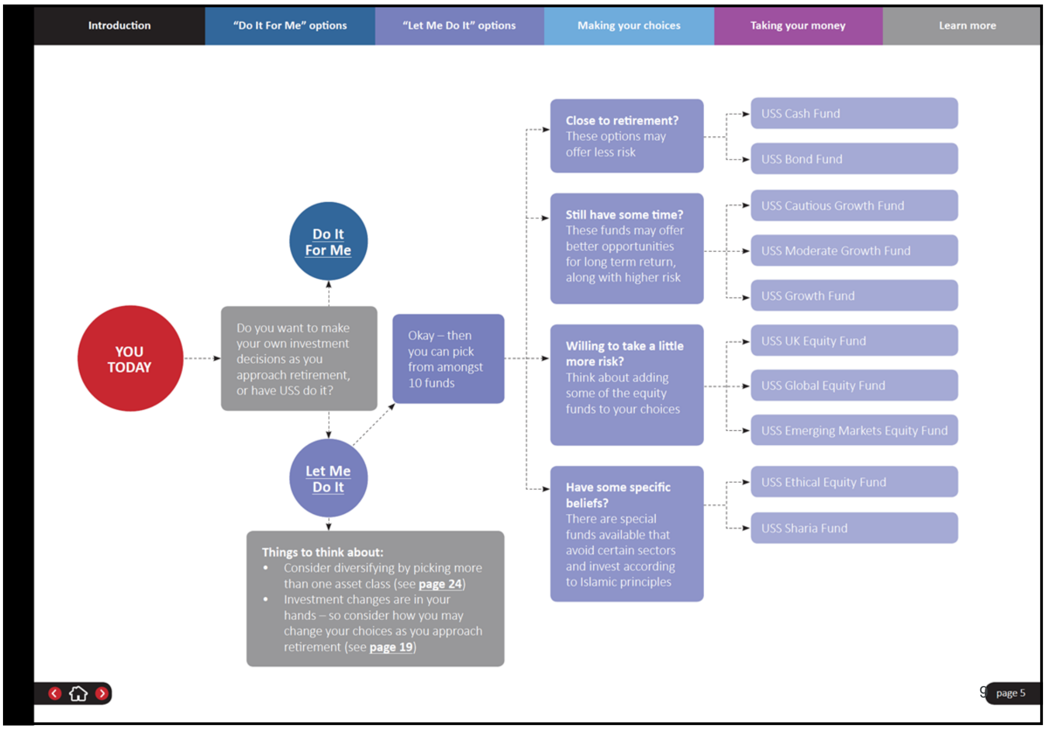
Typical customer communication



- How much do you want to contribute? … Mr Bean?
  - Most customers choose the required minimum.
- Where do you want to invest it? We have:

a lifestyling option, Cash, Bonds, Cautious growth, moderate growth, Growth, UK equity, Global equity, Emerging markets, and Ethical Equity.

  - Most customers choose the default option.



Financial literacy - Lusardi and Mitchell, 2011

- [Numeracy/Compounding] Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

More than $102; Exactly $102; Less than $102. [2/3 correct]

- [Inflation] Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

More than today; Exactly the same; Less than today. [3/4 correct]

- [Risk Diversification] Please tell me whether this statement is true or false. Buying a single company's stock usually provides a safer return than a stock mutual fund.

True; False. [1/2 correct]

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Major opportunity

- We imagine a pension product such that the questions
  - How much do you want to contribute?
  - How much income do you want for your retirement?

  are enough to provide the customer with
  - How likely this income is.

- We imagine a customer saying:
  - "Whaaat? 25% chance to have a comfortable retirement! … Okay, fine, I contribute more."

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Research goals

- Is there a better way of communicating the risk exposure to our customers?
- Give people more certainty about their pension
- Allow them to have a comfortable retirement
- Manage investment and mortality risk to the benefit of customer

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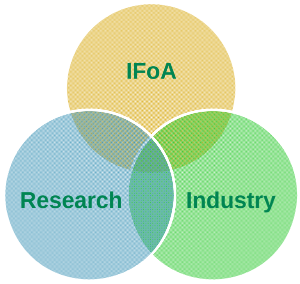
Research coalition




Dr Catherine Donnelly


Prof Montserrat Guillen

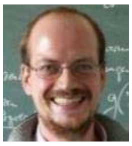

Dr Ana-Maria Perez Marin


Prof Jens Perch Nielsen


Dr Thomas Bernhardt


Dr Rami Chehab


Dr Munir Hiabu


Dr Michael Scholz


Prof Stefan Sperlich


Mr. Peter Vodička

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Robert C. Merton (2014) The Crisis in Retirement Planning.

- Merton proposed a pension product that focuses on income in retirement.
- Merton claims: "*I have developed, with Dimensional Fund Advisors, such a system for interacting with customers, and I successfully installed this kind of solution in a large Dutch company in 2006.*" (SmartNest?)
- But, Merton forgot to tell us the investment strategy.

- Need an open scientific investigation.

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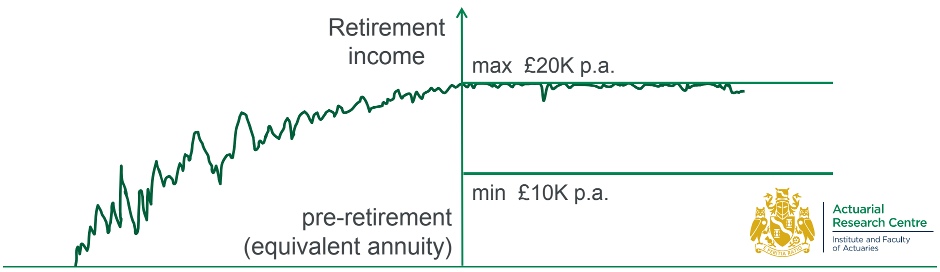
The basic idea

- Put the uncertainty in an interval [min,max] around the desired retirement income.
- min is the minimum; min has to be inflation-indexed!
- max is the goal; the risk is the failure to meet the max.



Donnelly et al. (2017) Retirement with bounds on wealth. A pre-retirement strategy.

- Assuming, there are index-linked life annuities
  - £20K p.a. = £600K lump sum at age 70,
  - £10K p.a. = £300K lump sum at age 70.
- Strategy
  - baseline strategy,
  - long synthetic put to have wealth ≥ £300K,
  - short synthetic call to have wealth ≤ £600K.

Donnelly et al. (2017) Retirement with bounds on wealth. A pre-retirement strategy.

- Mr Fawlty:
  - salary £50K, current age 35, retirement age 70, current contribution rate 17% of salary, current pension savings £50K,
  - target income £20K p.a.

- Then, in our simplified model, the chances to fail and meet the target are

0% chance of <£10K → 26% chance of £10K-£20K → 74% chance of £20K → 0% chance of >£20K

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Donnelly et al. (2017) Retirement with bounds on wealth. A pre-retirement strategy.

Contribution rate	Chance of getting £20K p.a.		
	neither target nor min	max £20K no min	max £20K, min £10K (customer feedback)
12%	35%	37%	25%
15%	54%	61%	57%
17%	65%	75%	74%

- Two reasons to cap the income target:
  - introducing max increases the chance to hit the target,
  - max can offset the cost for the guaranteed min.

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Beyond retirement - the present work of this project

- Decumulation strategy:
  - want to use same financial tools (baseline strategy, synthetic calls and puts) to create post-retirement strategy,
  - want to incorporate (time dependent) mortality distribution.

- Result: strategy for one single customer.

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Beyond retirement - the present work of this project

Combining the investments of many customers to one pool, how do the optimal strategies change?

- Risk sharing according to age structure:
  - Larger returns than expected yields shift from ‘young’ to ‘old’,
  - Smaller returns than expected yields shift from ‘old’ to ‘young’.
- Mortality sharing via tontine scheme
  - Precise rules for surviving members in the pool (Donnelly and Young (2017) Product options for enhanced retirement income)
  - ‘Ring fencing customer’s assets + precise rule’ allows for leaving the pool and entering the pool in an easy fair way

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Summary

- Should ask customers what they want in retirement and communicate how realistic are customers' goals.
- Merton's Vision of a new retirement product
  - inflation-indexed minimal income,
  - Risk = failure to meet customer's goal (the capped maximal income).
- Investment strategy based on tools from financial engineering.
- We want to see our pension product implemented.

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Summary

- Should ask customers what they want in retirement and communicate how realistic are customers' goals.
- Merton's Vision of a new retirement product
  - inflation-indexed minimal income,
  - Risk = failure to meet customer's goal (the capped maximal income).
- Investment strategy based on tools from financial engineering.
- We want to see our pension product implemented.
- So, please, tell us …

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Questions

Comments

What are the things you are most interested in?

What should we explain more?

Do you see any problems with our product?

https://risk-insight-lab.com/contact-us/

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