

Heriot-Watt Student Actuarial Society, Edinburgh

# Live long and...bankrupt the pension scheme?

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# 1. About the speaker

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# 1. About the speaker

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- Graduated twice from Heriot-Watt: 1990 (BSc) and 2012 (PhD)
- Consultant on longevity risk since 2005.
- Founded longevity-related analytics businesses in 2006:



- Joint venture with Heriot-Watt in 2009:



## 2. Why care about longevity risk?

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## 2. Why care about longevity risk?

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*“By providing financial protection against the major 18th- and 19th-century risk of dying too soon, life insurance became the biggest financial industry of that century [...] Providing financial protection against the new risk of not dying soon enough may well become the next century’s major and most profitable financial industry.”*

**Peter Drucker (1999)**

## 2. Why care about longevity risk?

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- Managing longevity risk is a major challenge for the next decades.
- It will play a large role in your future career!

# 3. A spot of time travel

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### 3. 1909

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- First UK state pension paid from age 70.
- Probability of a male aged 20 surviving to 70 was 34.8%.
- Life expectancy for a male aged 70 was 8.0 years.

Source: Richards (2013). Period survival probability and period life expectancy calculated according to ELT 6 Construction A in King (1909). No allowance for mortality improvements.

### 3. 2009

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- UK state pension paid from age 67 (for the speaker anyway).
- Probability of a male aged 20 surviving to 67 is 83.6%.
- Life expectancy for a male aged 67 is 16.3 years.

Source: Richards (2013). Period survival probability and period life expectancy calculated according to the Interim Life Table for the UK for 2008–2010. No allowance for mortality improvements.

### 3. Pop quiz

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Q. What would the state pension age have to be to restore the eight-year life expectancy of the original Old-Age Pension Act of 1908?

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Q. What would the state pension age have to be to restore the eight-year life expectancy of the original Old-Age Pension Act of 1908?

A. 80 years.

Source: Richards (2013). Period survival probability and period life expectancy calculated according to the Interim Life Table for the UK for 2008–2010. No allowance for mortality improvements.

## 4. Who owns UK plc?

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## 4. Who owns UK plc?

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- Legally, companies are owned by their shareholders.
- However, are shareholders seeing any profits?
- Consider two examples from 2010...

## 4. Who owns UK plc?

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*“Wolseley did not pay a dividend in 2010 or 2009 but contributed £42m to its pension scheme (2009: £47m).”*

*“British Airways did not pay a dividend during its 2010 accounting year but contributed £364m to its pension scheme.”*

Source: Lane, Clark and Peacock (2011).

## 4. Pop quiz

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Q. How many FTSE 100 companies paid more into their pension schemes than they distributed to shareholders in 2011?



## 4. Pop quiz

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Q. How many FTSE 100 companies paid more into their pension schemes than they distributed to shareholders in 2011?

A. 10 (out of 100).

Source: Lane, Clark and Peacock LLP (2012)

## 4. Who owns UK plc?

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- Some FTSE-100 companies are run primarily to fund their pension scheme...

## 4. Spot the insurance company

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<b>Company</b>	<b>Liability (£ billions)</b>	<b>Market cap. (£ billions)</b>	<b>Ratio L/M</b>
International Airlines Group	16.6	2.7	608%
BT	39.1	14.4	272%
BAE Systems	23.1	9.2	250%
Royal Bank of Scotland	27.1	12.0	227%
Lloyds Banking Group	28.2	17.6	160%
RSA Insurance	5.9	3.7	160%

Source: Figure are 2011 pension-scheme liabilities sourced from LCP's "Accounting for pensions 2012" report.

## 4. Who owns UK plc?

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- This state of affairs was predicted by Peter Drucker.
- He called it “pension-fund socialism” (Drucker, 1976).
- Sometimes the pension scheme even consumes the company...

## 4. Who owns UK plc?

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*“Under the terms of the restructuring [...] the Uniq Pension Scheme Trustee agreed to release the Company from its pension debt in exchange for a 90.2 per cent. shareholding in the Company and a cash payment to the Pension Scheme.”*

Source: Uniq plc (2011). Uniq plc is now part of Greencore.

# 5. Longevity risk factors

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## 5. Longevity risk factors

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- Actuaries historically rated mortality by age, gender and pension size.
- As of December 2012, gender is not a legally permissible rating factor.
- Actuaries urgently need new rating factors to compensate...

## 5. Relative importance of risk factors

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Financial impact of mortality rating factors:

<b>Factor</b>	<b>Step change</b>	<b>Reserve</b>	<b>Change</b>
Base case	-	13.39	
Gender	Female-male	12.14	-9.3%
Lifestyle	Top-bottom	10.94	-9.9%
Duration	Short-long	9.88	-9.7%
Pension size	Large-small	9.36	-5.2%
Region	South-North	8.90	-4.9%
Overall			-33.6%

Source: Richards and Jones (2004), page 39.



## 5. Anatomy of UK postcode

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## 5. How not to do postcode profiling

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- Compare the postcodes G1 2TD and G12 0PD
- Both in Glasgow
- Life expectancy “6.7 years less than the UK average”<sup>[1]</sup>

Source: [1] Punter Southall, [Postcode Life Expectancy Tool](#), accessed on 10th February 2013.

# 5. Anatomy of UK postcode — G1 2TD

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Source: Google Maps

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[www.longevity.co.uk](http://www.longevity.co.uk)

# 5. Anatomy of UK postcode — G12 0PD

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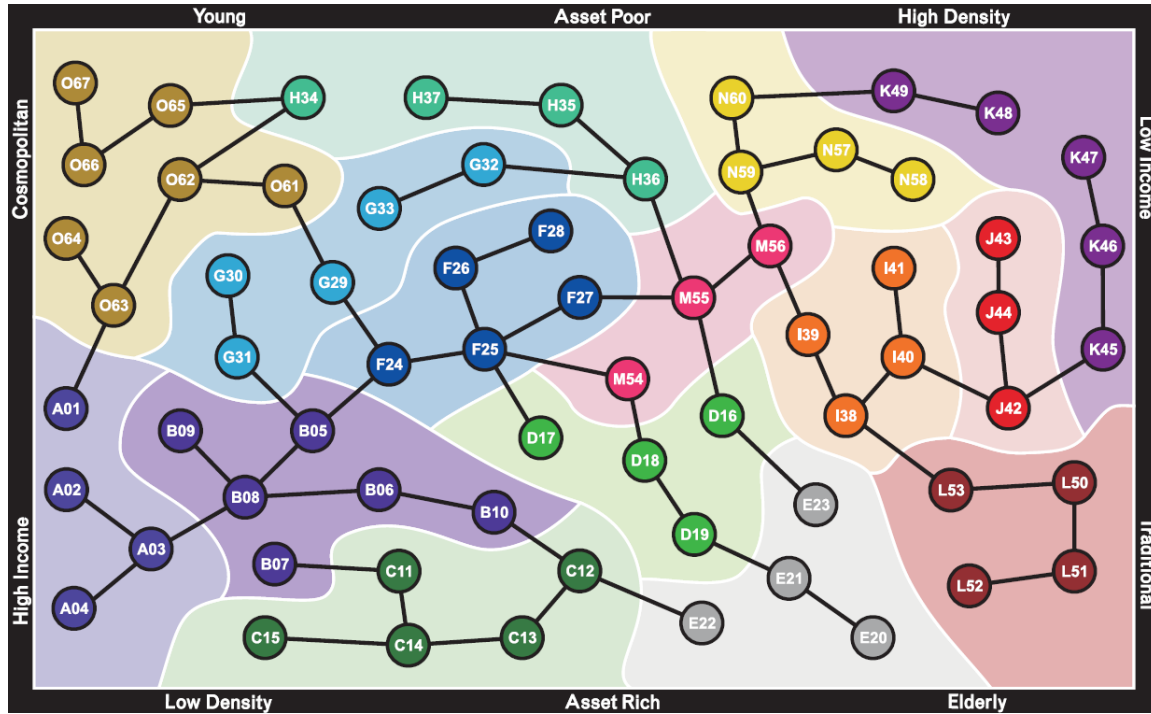
Source: Google Maps

# 5. How to do postcode profiling

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- 1.6 million residential postcodes
- Each maps to a *geodemographic type*

# 5. Geodemographic example — Mosaic



Source: Experian Ltd.

## 5. Anatomy of UK postcode — G1 2TD

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Mosaic Type K47 — “Upper Floor Living, Deprived View”

Acorn Type P54 — “High-Rise Hardship [...] high-rise estates”



Source: Google Maps, Experian Ltd, CACI Ltd.

# 5. Anatomy of UK postcode — G12 0PD

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Mosaic Type A04 — “Alpha Territory, Serious Money”

Acorn Type D13 — “Well-off professionals, larger houses [...]”



Source: Google Maps, Experian Ltd, CACI Ltd.



# 6. Conclusions

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## 6. Conclusions

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- Longevity risk will be a major actuarial challenge of the next decades.
- Modern techniques of risk management will be required.
- You are going to need your degree!



# References

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