

Austin Professional Resourcing, 155 Morrison Street, Edinburgh

Longevity risk in the 21st Century

Stephen Richards

17th January 2014



Copyright © Longevity Ltd. All rights reserved. Electronic versions of related papers and presentations can be found at www.longevity.co.uk

Contents

1. About the speaker
2. Why care about longevity risk?
3. A spot of time travel
4. Who really owns UK plc?
5. Longevity risk factors
6. Conclusions

1. About the speaker

1. About the speaker

- 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?

2. Why care about longevity risk?

“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?

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

3. A spot of time travel

3. 1909

- 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

- 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

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

3. Pop quiz

Q. What would the state pension age have to be to restore the eight-year life expectancy at retirement 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?

4. Who owns UK plc?

- Legally, companies are owned by their shareholders.
- However, are shareholders seeing any profits?
- Some FTSE-100 companies appear to be run primarily to fund their pension scheme...

4. Who owns UK plc?

Company	Employer pension contributions (£ millions)	Dividends paid to shareholders (£ millions)
Lloyds Banking Group	667	56
BT	2,179	590
Royal Bank of Scotland	977	301

Source: Figure are for 2012, sourced from LCP's "[Accounting for pensions 2013](#)" report.

4. Who owns UK plc?

- This state of affairs was predicted by Peter Drucker (yes, him again).
- He called it “pension-fund socialism” (Drucker, 1976).
- Even large companies can be dwarfed by their pension schemes...

4. Tail wags dog

Company	Liability (£ billions)	Market cap. (£ billions)	Ratio L/M
International Airlines Group	18.52	3.43	540%
BT	40.99	17.51	234%
BAE Systems	25.16	10.93	230%
Royal Bank of Scotland	30.11	19.52	154%
RSA Insurance	6.43	4.51	143%
Babcock	3.04	2.86	106%

Source: Figure are 2012 pension-scheme liabilities sourced from LCP's "Accounting for pensions 2013" report.

4. Who owns UK plc?

Sometimes the pension scheme even consumes the company:

“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

5. Longevity risk factors

- 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

Financial impact of mortality rating factors:

Factor	Step change	Reserve	Change
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



5. How not to do postcode profiling

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

Source: [1] Punter Southall, [Postcode Life Expectancy Tool](#), accessed on 13th January 2014.

5. Anatomy of UK postcode — G1 2TD



Source: Google Maps

Slide 23

www.longevity.co.uk

5. Anatomy of UK postcode — G12 0PD

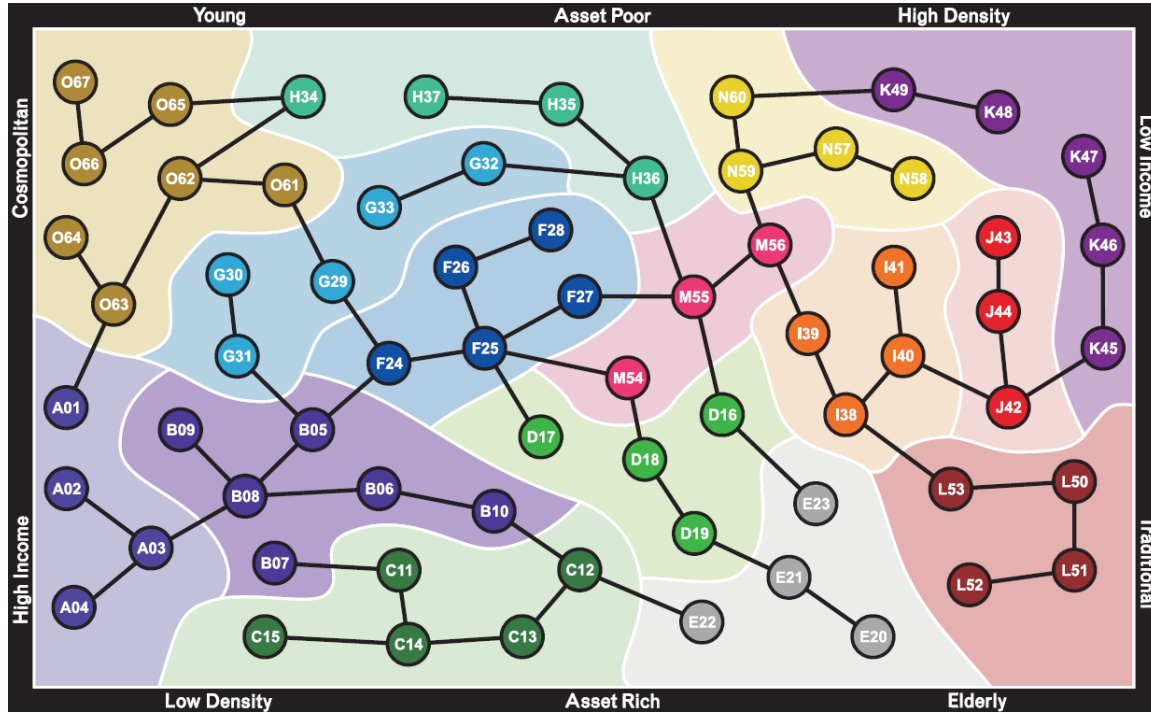


Source: Google Maps

5. How to do postcode profiling

- 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

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

Mosaic Type A04 — “Alpha Territory, Serious Money”

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



Source: Google Maps, Experian Ltd, CACI Ltd.

6. Conclusions

6. Conclusions

- Longevity risk will be a major actuarial challenge of the next decades.
- Modern techniques of risk management will be required.



References

DRUCKER, P. F. **1976** *The Unseen Revolution*, Harper and Row, ISBN: 0-06-011097-X

DRUCKER, P. F. **1999** *Innovate or die*, [The Economist](#), September 23rd 1999

LANE, CLARK AND PEACOCK LLP **2013** *Accounting for pensions 2013*,

RICHARDS, S. J. AND JONES, G. L. **2004** *Financial aspects of longevity risk*, Staple Inn Actuarial Society, London

RICHARDS, S. J. **2013** *Insurance or right?*, www.longevitas.co.uk

UNIQ PLC **2011** *Statement of 1st April 2011*,