

Practical Considerations in Evaluating a Long-term Care Securitisation

1

**DOUG ANDREWS, UNIVERSITY OF WATERLOO
&
JAIDEEP OBEROI, UNIVERSITY OF KENT**

Items to be Discussed

2

- Some background on home equity release products
- Structure contemplated for this securitisation
- Data and methodology
- How our approach differs
- Practical problems and solutions
- Inconsistencies in housing data
- Determination of suitable LTC incidence rates
- Applying housing data to longer time periods
- Further research

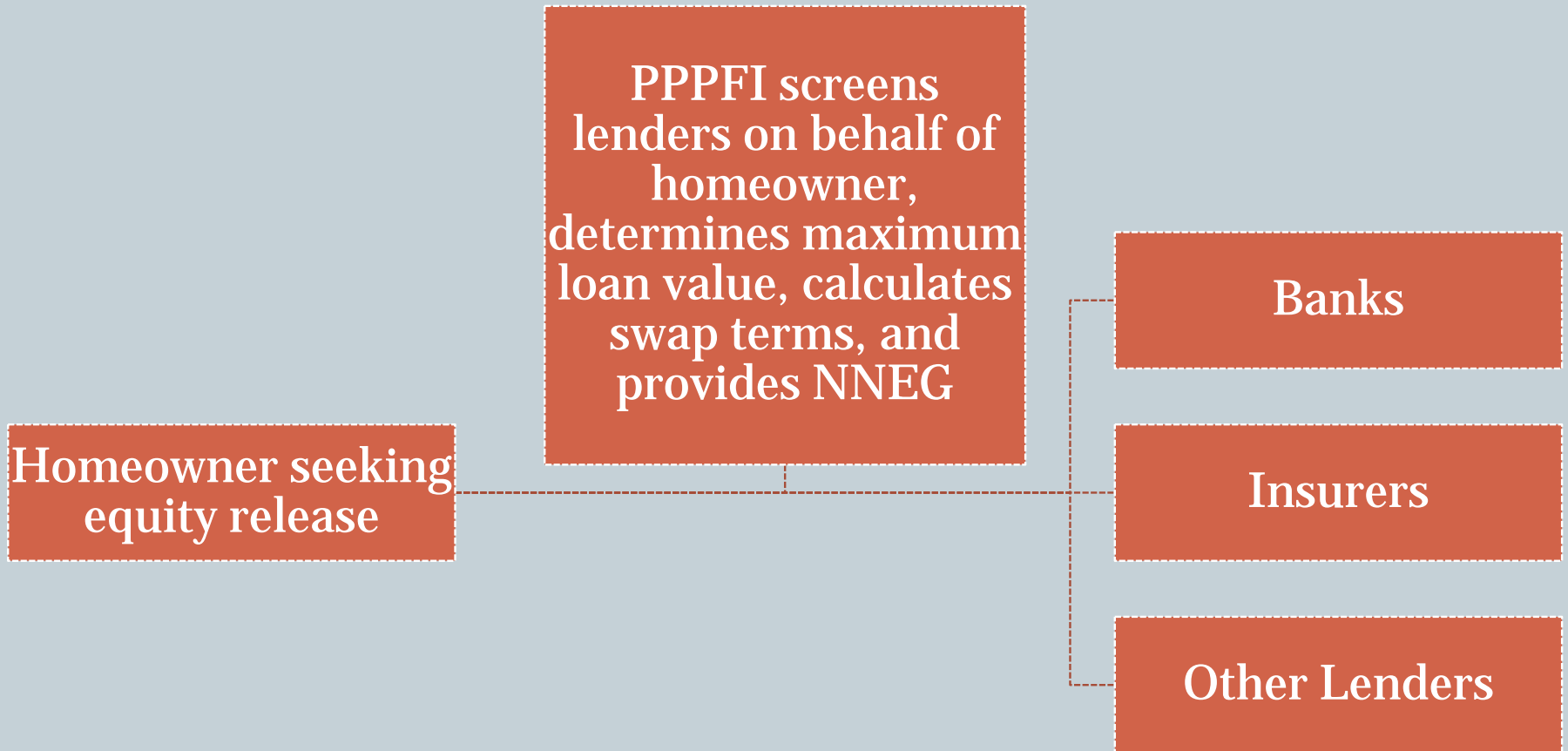
Background on HER Products

3

- Would satisfy a real need
- Actual take-up far less than expected
- Academic analysis suggests that products poorly priced (from a consumer perspective) – Non Negative Equity Guarantee (NNEG) over-valued
- Equity release for LTC is a specialised version of the product – demand should increase as the population ages

Role of PPP in Arranging HER Loans

4



Data and Methodology

5

- For post codes CT1 & CT2 (Canterbury) and ME8 (Medway) – all in Kent
- Land Registry data from January 1, 1995 – December 31, 2011: 30,724 transactions
- Only repeat sales data retained: 18,747 transactions
- For mortality & morbidity used Gompertz model parameterised by Ji, Hardy & Li 2011
- Start with couple both aged 65 with 1 healthy spouse (**X**) and 1 spouse requiring care (**Y**) – *no possibility of recovery*

Possible Transitions

6

1. No change in state of X and Y
2. X healthy, Y deceased – *no prepayments*
3. X requires care, Y requires care
4. X deceased, Y requires care
5. X requires care, Y deceased
6. X deceased, Y deceased

In states 3 – 6 home sold

From State 2 - Further Transitions

7

7. X healthy

8. X requires care

9. X deceased

In states 8 & 9 home sold

How Our Approach Differs

8

- Loan and NNEG unbundled
- Pricing of NNEG is securitised
- Loans offered on a variable rate basis
- Analysis based on actual data not a model
- Land Registry data used – not Nationwide Index
- Calnea Analytics (2007) suggest Land Registry Index is preferable due to manner of construction

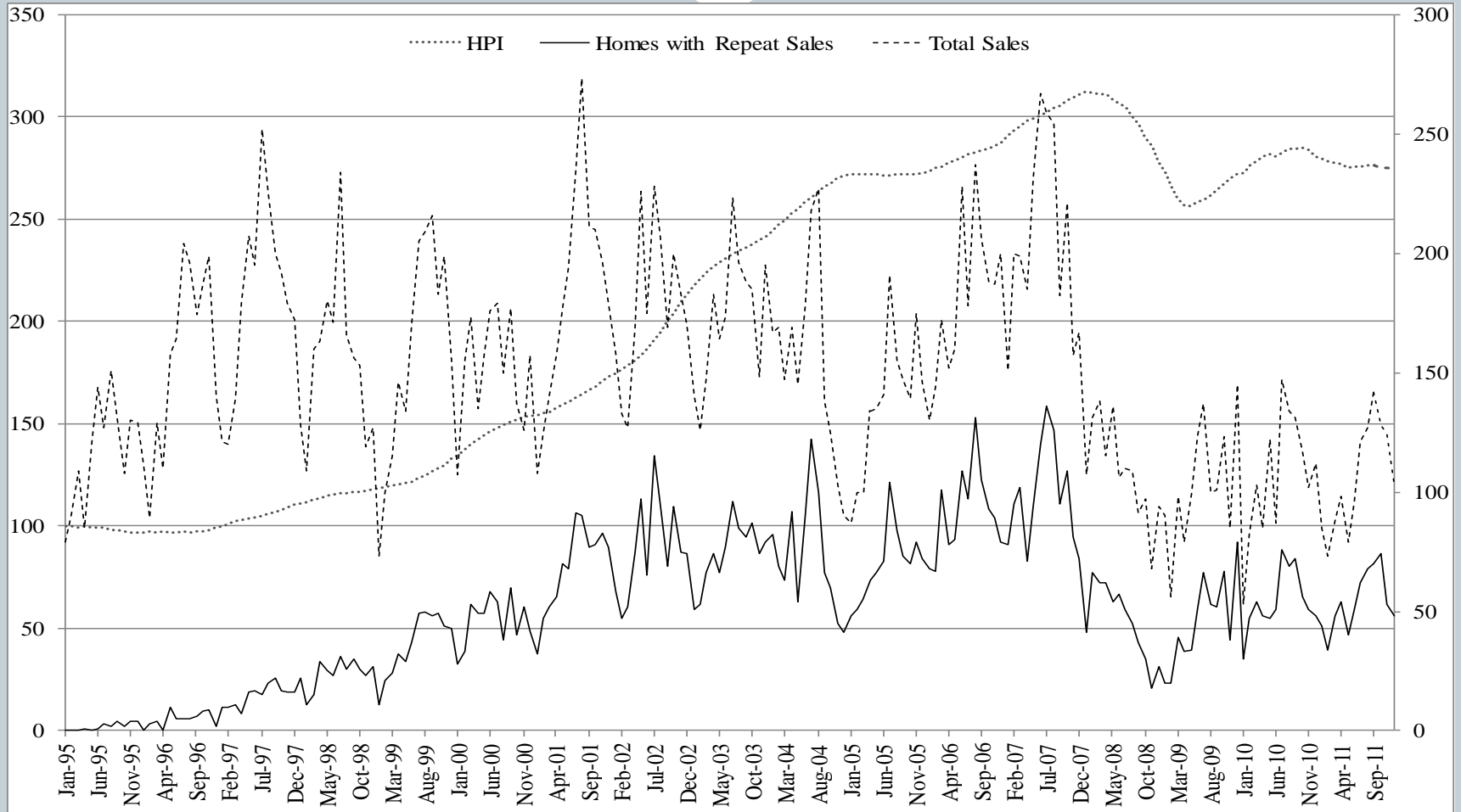
Inconsistencies in Housing Data

9

- Some transactions are repeated with separate IDs
- Some homes change in type
- Repeat transaction data more voluminous during the middle of the period
- Some transactions recorded very close to each other
- Some extreme returns – we winsorised both tails
- Transaction data has exact dates and HPI is monthly – we used linear interpolation on HPI values

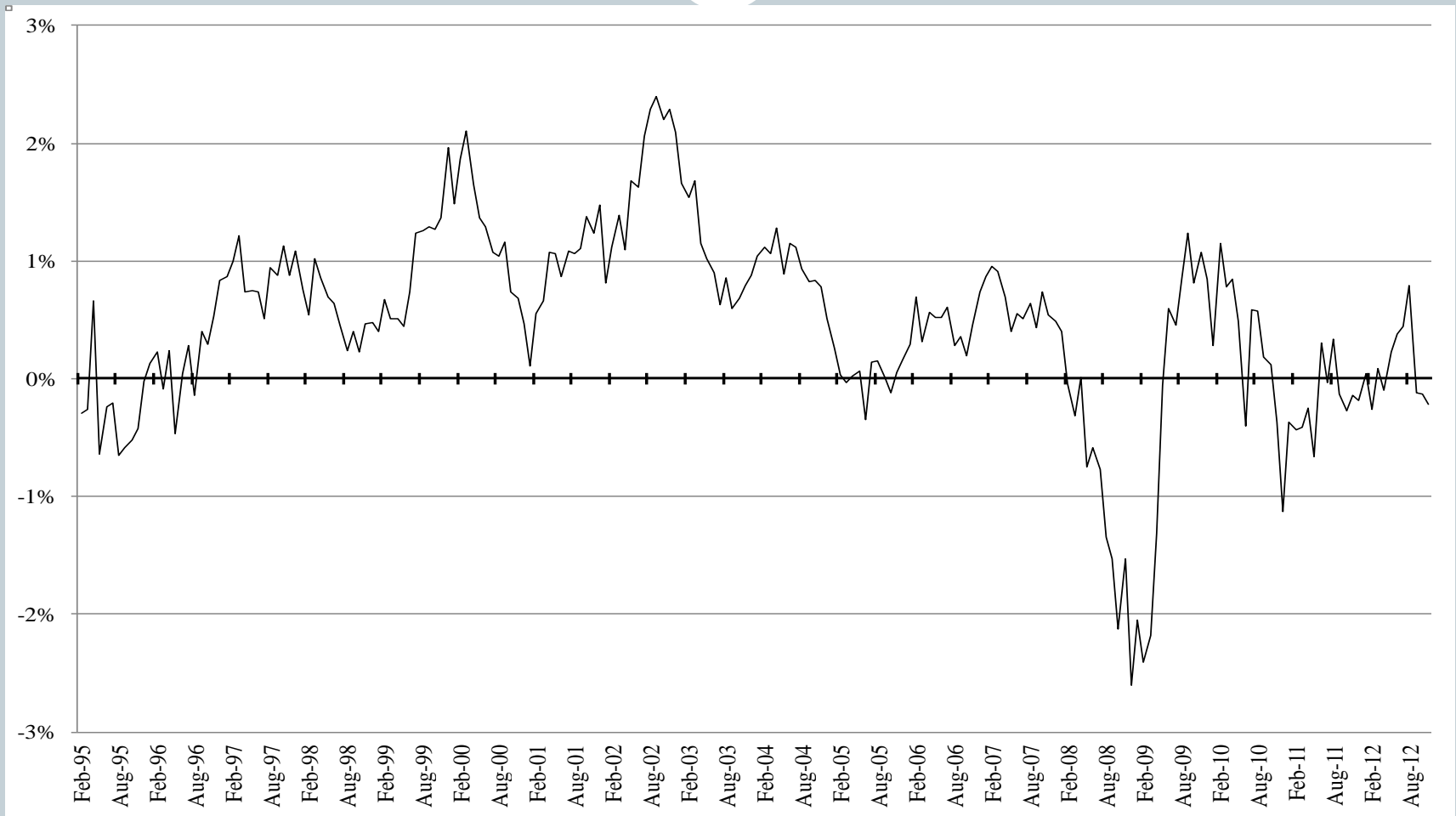
Did Not Adjust For “Under Representation”

10



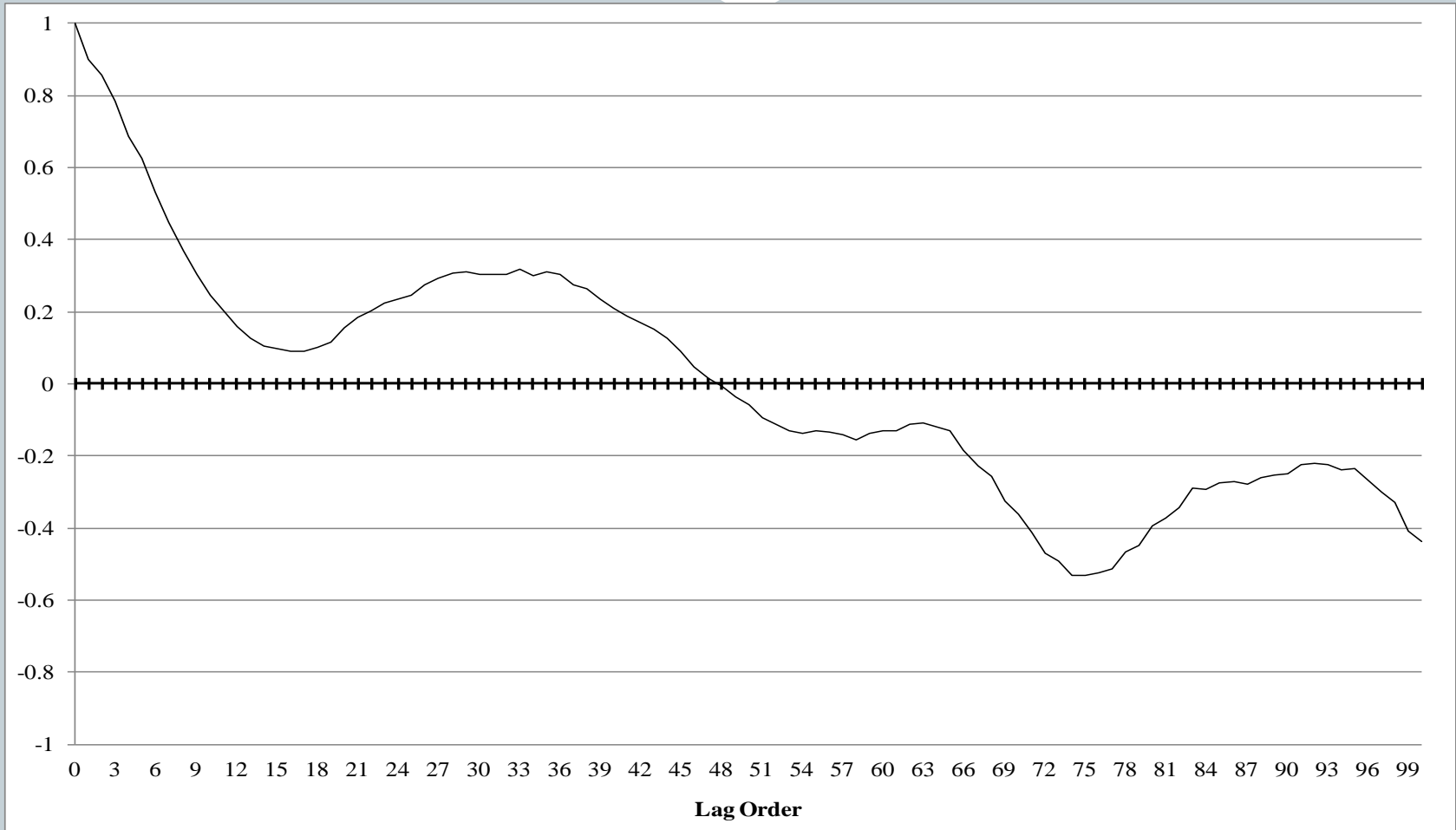
HPI: Upward Trend but High Volatility

11



Autocorrelation: A Challenge to Model

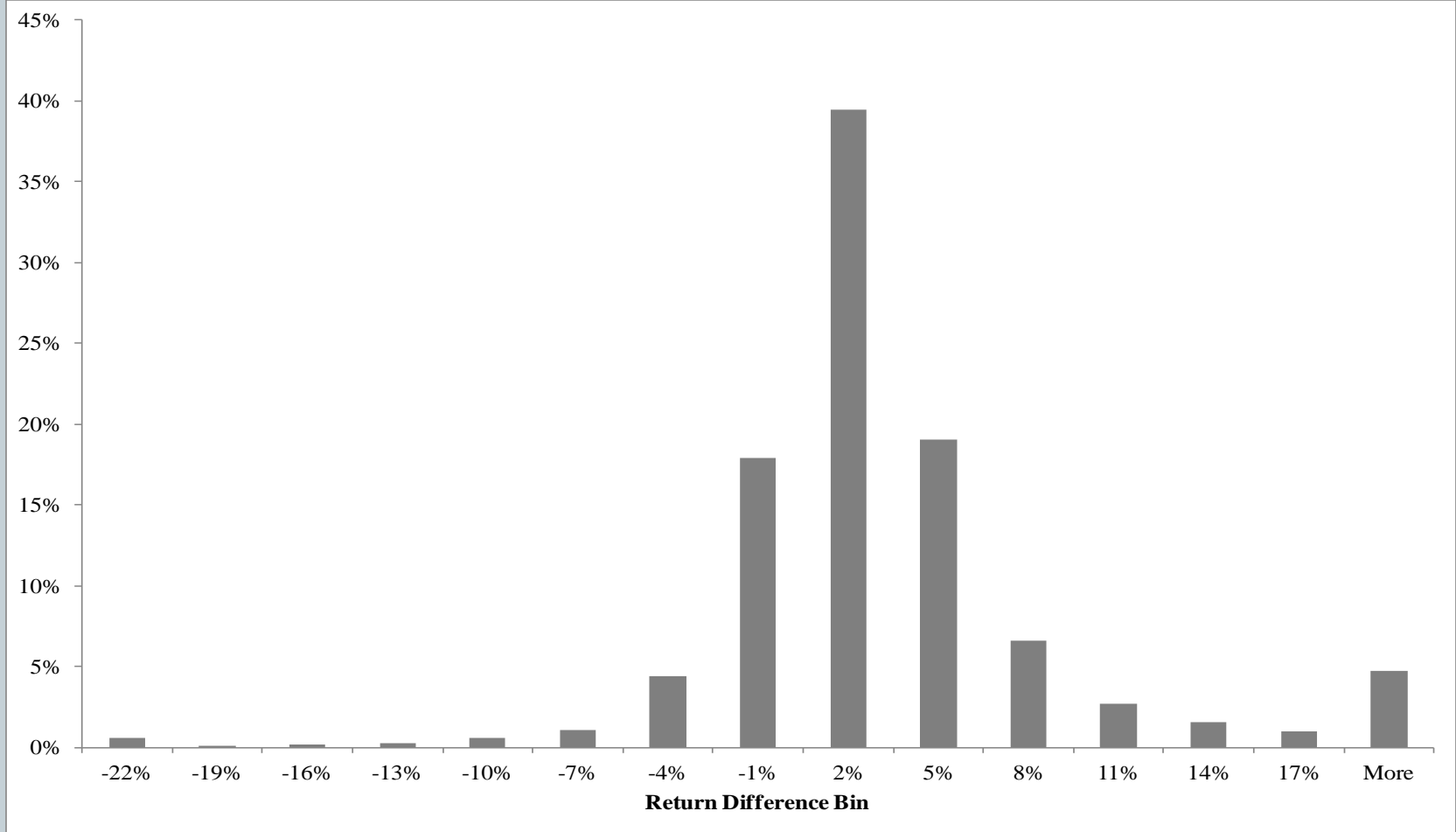
12



Return Differences

Winsorised but not De-Meaned

13



Determination of LTC Incidence Rates

14

- Desirable to have incidence rates for entry into care and duration in care, for England – *Unavailable*
- NLTCS – very detailed data regarding participants and care requirements – *Insufficient to construct incidence and exit rates*
- Used report on private insurer data in US based on unlimited benefit period to construct sex-distinct incidence and exit rates in 5 year age bands
- Used Canadian insurer J&S mortality experience
Appropriateness?

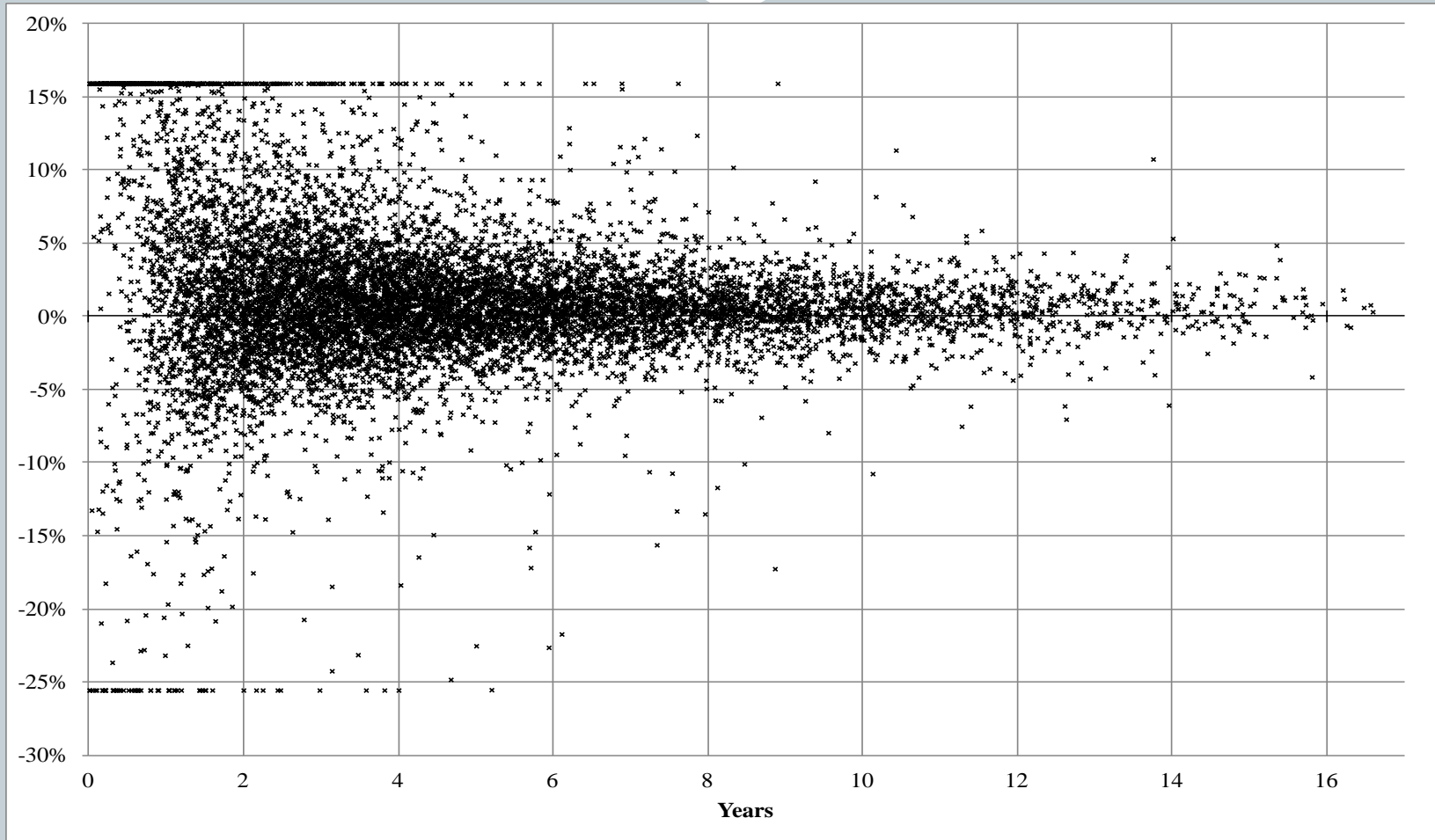
Applying Data to Longer Periods

15

- One million simulations
- Annualised return differences show a duration effect with a positive skew
- Given propensity to “age in place”, it is realistic to incorporate the duration effect
- Limitation: our data only covers a 17 year period
- We winsorized the annualised return data at 15 years

Duration Effect

16



Further Research

17

- Urgent need to gather data by country that can be used to price HER products – government action likely required to facilitate this process
- Consider feasibility of PPP structure and alternatives to provide NNEG and efficient underwriting and administration
- Regarding the variability between individual prices and the index and autocorrelation
- Effect of aging in place on property values
- Duration effect
- *We have a paper showing premiums calculated*