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What is the right way to value no-negative equity guarantees on equity release mortgages?

Tom Kenny, Just
Charles Golding, Golding Smith & Partners

16 November 2018

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Agenda

- **Who are the working party?**
- **Why is equity release important?**
- **What does academic research show?**
- **What do firms currently do?**
- **What are the issues?**
- **Possible solutions**
- **CP13/18?**
- **Next steps**



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The ERM Working Party and the IFoA Support

Working party members

- Tom Kenny (Chair) - Just
- Charles Golding (Deputy) – Golding Smith
- Gina Craske - KPMG
- Andrew Dobinson - LBG
- Stuart Farrell – LV=
- Owen Griffiths – L&G
- Sam Gunter - Hodge
- Nigel Hayes - Aviva
- Jyotsna Kaushik - PWC

Working party members (ctd)

- Alex Mockridge – L&G
- Scott Robertson - Phoenix
- Raj Saundh - EY
- James Thorpe – Deloitte

IFoA support team

- Mairi Russell



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Why is equity release important?

- **Customers**

https://www.youtube.com/watch?v=qZol_C3BGAc

- **Investors**

+£4bn 5.2% 15-20yrs +75bps

Source: Equity release council/Bank of England

£1.8tn of £2.6tn



Why is equity release important?

- **Who are the investors?**

6 retail annuity providers

-£4bn in 2018 (source: ABI)



8 bulk annuity providers

- £35bn in 2018 (source: Hymans)



Why is equity release important?

- Who are the investors?

-Reinsurers

-Pension funds

-Fund managers



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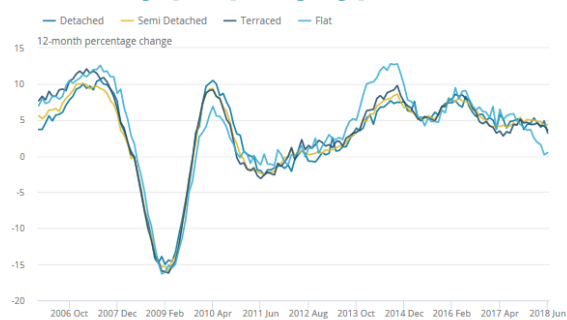
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What does academic research show?

House prices exhibit

- Autocorrelation
- Mean reversion
- Conditional heteroscedasticity
- Volatility that varies by property groups
- Momentum effects
- Jumps

HPI by property type (Source: ONS)

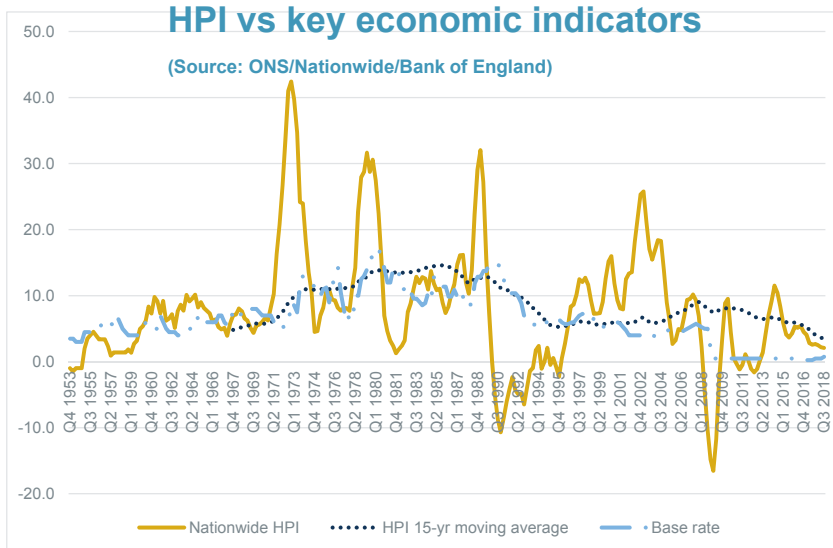


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What does academic research show?



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Assuming Geometric Brownian Motion could lead to inaccurate results



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What does academic research show?

Autocorrelation is well documented. The ERWP in 2005 gave figures based on Nationwide regional indices which we have updated to the end of 2017.

Annual or quarterly price movements: 30 years to 2017					Annual or quarterly price movements: 10 years to 2017				
Region	Annualised volatility		Autocorrelation		Region	Annualised volatility		Autocorrelation	
	Quarterly	Annual	Quarterly	Annual		Quarterly	Annual	Quarterly	Annual
North	7.4%	10.4%	25.2%	41.1%	North	4.3%	4.3%	13.3%	59.1%
Yorks & Hside	7.5%	11.4%	47.8%	29.2%	Yorks & Hside	4.8%	5.9%	26.6%	-32.8%
North West	6.1%	9.5%	56.5%	55.6%	North West	4.4%	6.0%	38.6%	-4.6%
East Mids	6.6%	10.7%	57.2%	44.9%	East Mids	4.3%	6.3%	58.4%	22.1%
West Mids	6.2%	9.8%	55.2%	45.4%	West Mids	4.3%	6.2%	50.4%	19.5%
East Anglia	7.3%	10.6%	42.5%	25.6%	East Anglia	5.5%	8.0%	41.2%	-7.8%
Outer S East	6.5%	10.2%	57.9%	32.9%	Outer S East	5.3%	7.5%	50.3%	9.4%
Outer Met	5.9%	9.5%	61.5%	28.0%	Outer Met	5.5%	8.2%	54.7%	11.8%
London	6.5%	9.5%	45.1%	38.4%	London	6.5%	9.2%	42.1%	20.2%
South West	6.7%	10.3%	51.6%	29.4%	South West	4.9%	6.6%	42.4%	11.1%
Wales	7.3%	10.3%	35.8%	47.5%	Wales	6.0%	5.1%	-1.5%	5.4%
Scotland	5.8%	7.0%	19.6%	30.9%	Scotland	4.4%	3.9%	-2.0%	-8.1%
N Ireland	8.9%	12.9%	32.9%	29.3%	N Ireland	9.2%	14.7%	36.9%	56.2%
UK	5.4%	8.6%	64.2%	40.2%	UK	4.6%	6.7%	53.6%	12.6%



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What do firms currently use to model NNEG?

Black Scholes and variants

- Assuming a random walk with drift
- Constant volatility
- Black 76 requires a forward house price
- Some firms use a stochastic model for valuation/validation



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What are the issues?

- Monte Carlo vs Closed form
- Calibration of parameters
- Sophistication of models
- Need for deferment rate/rental yield assumption
- Real world vs risk-free or “halfway house”
- Choice of discount rate
- Consistency with overall valuation of the NNEG



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Possible solutions

- There are multiple possible models including:
 - ARMA, ARIMA, Esscher Transforms, GARCH, Maximum Entropy, MCMC and VAR
 - Lévy processes could be incorporated
- Combined models such as ARMA-GARCH and ARIMA-GARCH could be considered
- Closed form solutions might require a compromise and suitable calibration



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Regulatory perspective



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CP13/18 | What is it?



- David Rule speech April 2018, Bank of England priority is:

“insurers capture the compensation for the risks they are exposed in the Fundamental Spread...so...Matching Adjustment is not overstated”

- *“insurers hold appropriate capital against these risks.”*

CP13/18 | What is it?

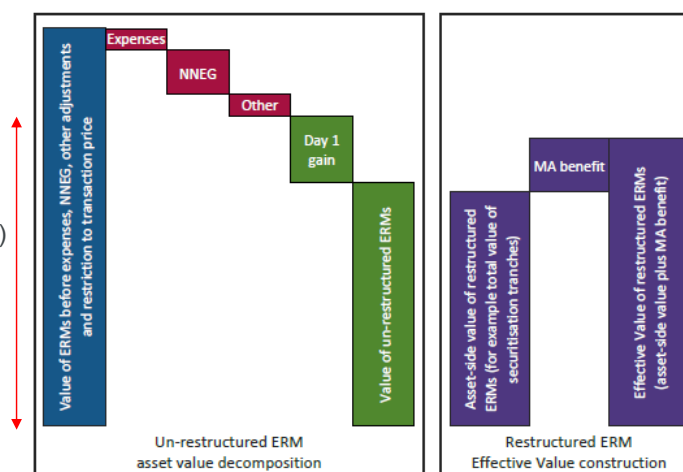
- SS3/17 (July 2017)
- Four principles applied in Effective Value Test
 - No reduction in risk if all securitised notes held
 - Economic value of ERM < PV Deferred Possession
 - PV Deferred Possession < Value of Immediate Possession
 - Compensation for risks retained > BE cost of NNEG
- PRA will use EVT to determine if MA benefit is too high



CP13/18 | What is it?

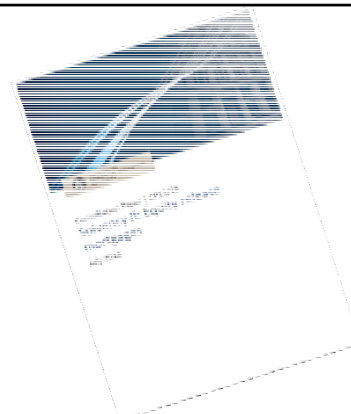
- Effective Value Test

Economic value (green) < PV of Deferred Possession



CP13/18 | So what?

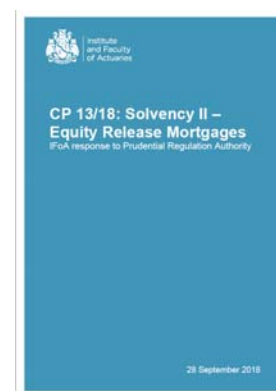
- **Key changes from SS3/17**
- A prescribed minimum calibration in EVT
 - Black-Scholes, Volatility=13%, Deferment Rate=of 1%
(but 2% considered to be a more central assumption)
- Proposed phase-in period less than 3 years
- Retrospective change of regulatory requirements



CP13/18 | So what?



Use online poll to survey audience on points raised from CP13/18



Closing remarks



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Next steps

- Co-funded research being undertaken by IFoA and ABI on NNEG modelling
- Sessional paper from working party in December
- Collaborating with CMI on ERM tables (Mortality, LTC and Voluntary redemptions)
- Further research

Questions

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