ARC CENTRE OF EXCELLENCE IN POPULATION AGEING RESEARCH

Policy Dialogue on Housing and Ageing

Session 4 Panel Session
Policy, Practice and Research: Issues and Responses

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Role of Housing in Insuring and Financing Retirement Risks

- As a major asset for retirees, what is the role of home equity in insuring and financing retirement risks?
  - consumption (imputed rent), precautionary savings (aged care, nursing home), bequest (illiquid), investment (return and volatility)
- What is the role of equity release?
  - make home equity liquid, higher consumption while healthy, fund longevity or aged care risks through purchase of life annuities or long term care insurance
- What is the best form of equity release?
  - reverse mortgage or home reversion? lump sum or income stream?
- Modelling and understanding equity release products?
  - models of risks (house price, interest rate, move to nursing home, mortality, early prepayment)
  - valuation (fair price for NNEG, loan interest rate margin)
  - risk quantification (solvency, capital for suppliers).

Housing - Financing and Insuring Retirement Risks

Pecking Order

Account based pension
Housing
Private Savings

Aged Pension
Aged Care
Pensions Loan Scheme

Life annuity
Variable annuity
Equity release – reverse mortgage, home reversion
Pooled annuity fund
Long term care insurance
Combo products

Factors

Self insuring
Precautionary savings
Bequest

Co-insurance
Safety net

Private market
Mutuality
Guarantees
Fees and charges
Solvency

Housing and Insurance product decisions research

- Classical model - full coverage with “fair priced” long term care and longevity insurance, provided no liquidity constraints (illiquid housing)
- Our research
  - Benefits of “combo” products – lump sum reverse mortgage with long term care insurance (or life annuity), life annuity with long term care insurance (care annuity)
  - Impact of wealth: lower wealth levels - aged pension reduces demand for private annuities, lower use of RMs but full LTC insurance; higher wealth levels - housing reduces demand for private long term care insurance

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Housing and Individual optimal insurance product decisions

Increased housing wealth increases demand for RMs

Full LTC insurance (fair priced) for low and middle wealth

Table 7

Optimal reverse mortgage LTVR and private LTC insurance coverage PI for a 65-year-old female with different wealth levels (in $1000) and wealth allocations between liquid asset and housing asset.

Scenario	Wealth			Only RM	Only LTCI	Both	
	Total ($1,000)	Liquid	Housing	LTVR	PI	LTVR	PI
Scen 1.1	450	33%	67%	0.3	0.9	0.4	0.9
Scen 1.2	450	50%	50%	0.2	0.9	0.4	0.9
Base	450	67%	33%	0	0.9	0.4	0.9
Scen 2.1	240	33%	67%	0.3	0.9	0	0.9
Scen 2.2	240	50%	50%	0.2	0.9	0	0.9
Scen 2.3	240	67%	33%	0	0.9	0	0.9
Scen 3.1	900	33%	67%	0.3	0.5	0.4	0.7
Scen 3.2	900	50%	50%	0.2	0.6	0.4	0.8
Scen 3.3	900	67%	33%	0	0.7	0.4	0.8

Full LTC insurance for low wealth

Reduced demand for LTC insurance for higher wealth

Modelling House Price Returns and Risks Research

- Need for models for major risks for equity release products
  - Housing prices, rental yields, interest rates
  - Mortality, long-term care move-out, prepayment, and refinancing
  - Reverse mortgage “crossover risk”
- Actuarial risk factors and stochastic discount factors for fair pricing (RMs not a conventional housing loan)

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Home Equity Release – provider risk and profitability analysis research

- Reverse Mortgage (RM) and Home Reversion
- Need to quantify
  - Actuarial present value based on uncertain future repayments and value of house
  - Uncertain future gains or losses (crossover risk)
  - “Fair” value of no negative equity guarantee (NNEG) for Reverse Mortgage and Lease for life (LL) for Home Reversion
- Loan to value Ratio (LTVR) is critical for RMs

- Sun, D and Sherris, M. (2010), **Risk Based Capital and Pricing for Reverse Mortgages Revisited**, Paper presented to the Institute of Actuaries of Australia 5th Financial Services Forum 13 – 14 May 2010 Sydney
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Home Equity Release – Profit and Risk

Little risk for reverse mortgages for low LTVR

Home reversions have less risk for higher LTVR

TABLE 12
The Impact of the LVR with Assumptions Age = 65, H0 = $600,000, LR = 100%, No Mortality Improvement

	Reverse Mortgage				Home Reversion			
LVR	NN	E[RM]	VaR	CVaR	LL	E[HR]	VaR	CVaR
15%	0	29,623	0	0	35,764	25,906	−3,873	−6,564
25	0	49,210	0	0	59,607	43,177	−6,454	−10,939
35	614	68,023	0	0	83,449	60,447	−9,037	−15,316
40	1,616	76,262	0	0	95,370	69,082	−10,328	−17,504
45	3,636	83,052	0	−7,293	107,292	77,719	−11,618	−19,691
50	7,456	88,131	−12,840	−27,451	119,213	86,354	−12,909	−21,879
55	14,178	90,087	−34,914	−49,778	131,134	94,989	−14,201	−24,067
64	39,280	82,155	−78,849	−93,941	152,593	110,533	−16,524	−28,005

Note: NN is the value of the no negative equity guarantee and LL is the value of the lease for life agreement. E[RM] (or E[HR]) denotes the average actuarial present value of the reverse mortgage (or home reversion) contract. VaR and CVaR are calculated at the 99.5% level.

House Price Returns and Risks – NNEG loading

Loan Margin for low LTVR is minimal, Increase significantly for high LTVR

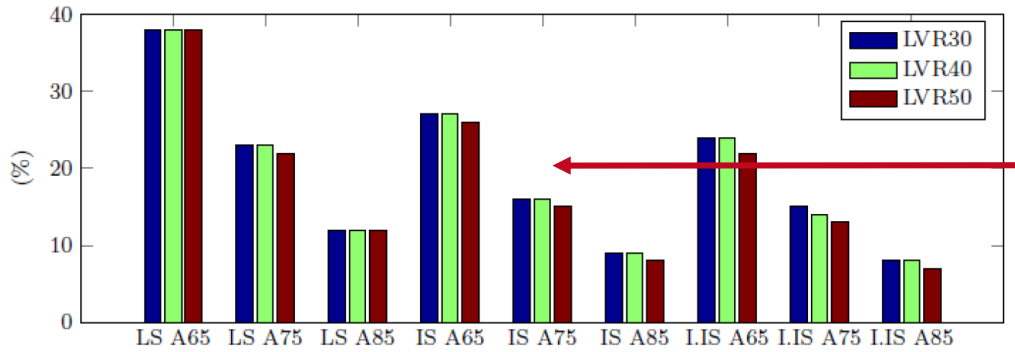
Mortality model has limited impact on NNEG expected value but impacts risk

Table 8
Valuation of the mortgage insurance premium rate π and the NNEG for reverse mortgages with different loan-to-value (LTV) ratios.

Model	Deterministic			Wills–Sherris			Cairns–Blake–Dowd		
LTV	0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6
A. Overall Sydney house price index									
π (p.a.)	0.003%	0.230%	3.246%	0.009%	0.360%	2.583%	0.003%	0.237%	3.126%
NNEG	71	12,734	408,817	279	22,393	335,952	98	13,147	379,366
S.E.	17	498	2,131	36	639	2,038	18	491	2,094
TVaR	0.000	0.000	0.000	0.467	6.048	12.913	0.179	5.278	13.487
B. Price index for houses near the central business district									
π (p.a.)	0.218%	0.720%	1.829%	0.239%	0.711%	1.621%	0.218%	0.716%	1.819%
NNEG	6,043	42,421	186,092	7,298	46,370	181,302	6,036	42,138	184,776
S.E.	470	1,673	4,092	494	1,680	3,876	463	1,651	4,048
TVaR	0.000	0.000	0.000	6.654	17.148	29.594	6.424	17.779	31.168
C. Price index for houses near to coastlines									
π (p.a.)	0.076%	0.255%	1.184%	0.088%	0.302%	1.183%	0.076%	0.257%	1.173%
NNEG	2,062	14,238	110,932	2,624	18,645	124,031	2,070	14,284	109,598
S.E.	289	879	2,399	308	939	2,402	286	866	2,359
TVaR	0.000	0.000	0.000	4.387	11.923	21.331	3.893	11.512	22.120
D. Price index for houses near to an airport									
π (p.a.)	0.243%	0.492%	0.967%	0.247%	0.484%	0.901%	0.242%	0.491%	0.966%
NNEG	6,748	28,189	88,181	7,570	30,584	90,594	6,735	28,142	87,983
S.E.	565	1,552	3,146	572	1,554	3,087	558	1,538	3,123
TVaR	0.000	0.000	0.000	8.041	19.035	31.435	8.063	19.653	32.754

Home Equity Release Product Design – Value and Risk

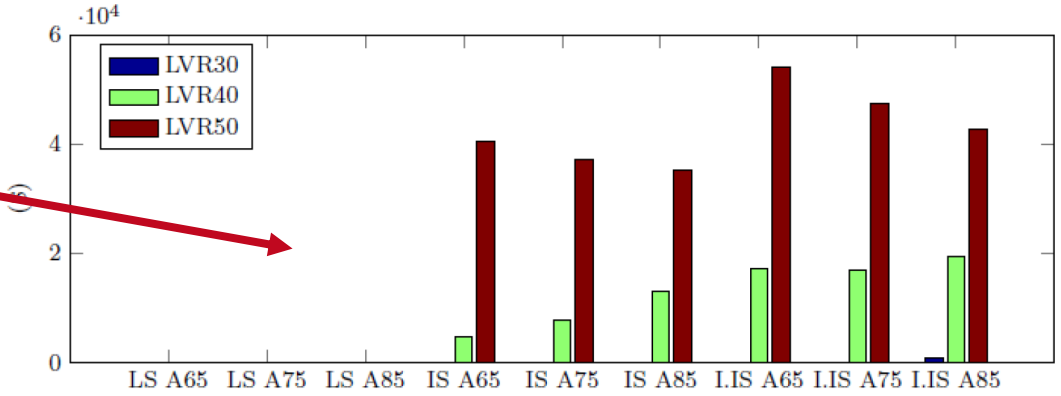
Figure 4.11: Expected Present Value of Net Payoff as a percentage of the Equity Released at $t = 0$.
(LS=Lump-sum, IS=Income stream, I.IS=Inflation-indexed income stream)



Expected values - Lump sum schemes have higher actuarial values

Figure 4.9: Value-at-Risk at 99.5% Level.
(LS=Lump-sum, IS=Income stream, I.IS=Inflation-indexed income stream)

Risk - Virtually no risk for lump sum schemes compared to income streams (longevity risk)



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Thank You for Your Attention

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