

2019 ASIA-PACIFIC
ANNUAL SYMPOSIUM



Session 5B, A Hybrid Equity Release Plan for Retirement Financing

Presenters:

Koon Shing Kwong, FSA, CERA

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A hybrid equity release plan for retirement financing

KWONG KOON SHING, PHD, CERA, FSA

Collaborators: Yiu-Kuen YSE and Junxing CHAY

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Equity Release Plans

- Purpose: convert housing wealth to retirement incomes
- Types:
 - Reverse Mortgage (first transaction made in 1989 by The Department of Housing and Urban Development in US; products offered in many countries)
 - Home Reversion (Homesafe Wealth Release by Homesafe Solutions Ltd in Australia since 2005; Home reversion plans by Bridgewater and Crown in the UK)
 - Lease Buyback (offered by Housing & Development Board (HDB) in Singapore since 2009)

Hong Kong Reverse Mortgage

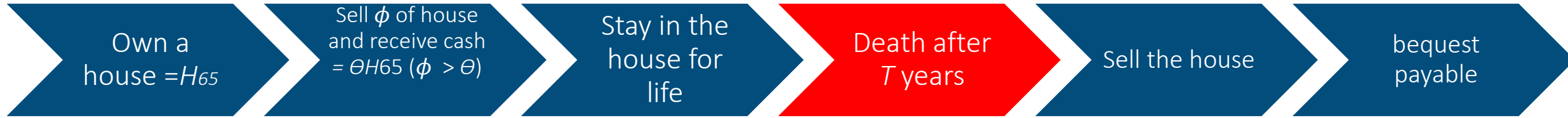


$$\text{Bequest} = \max\{ H_{65+T} - L_{65+T}, 0 \}$$

No of Applicant(s):	1
Age of Applicant(s):	65
Appraised Property Value ¹ :	HK\$ 5,000,000
Specified Property Value ² (for payout calculation):	HK\$ 5,000,000
Cash Surrender Value at Application ³ (for payout calculation):	HK\$ 0
Interest Rate Option:	Floating Rate
	Hong Kong Prime Rate ⁴ minus 2.5% per annum, which is currently 2.75% per annum
Interest:	Interest is calculated on the Outstanding Loan Balance on a monthly compound basis. (Note: Hong Kong Prime Rate is quoted by The Hong Kong Mortgage Corporation Limited (HKMC) and is subject to change from time to time)
	Maximum amount ⁵ : HK\$ 1,851,200.00
Lump-Sum Payout ⁶ :	Minimum amount ⁶ : HK\$ 527,695.00
	Amount requested at drawdown: HK\$ 1,000,000.00 (optional)

Payout Levels ⁷			
Payment Term	Lump-Sum Payout amount requested at first drawdown (HK\$)	Amount of Monthly Payout (HK\$)	Total Amount of Monthly Payout (HK\$)
10 years	1,000,000.00	11,304.81	1,356,577.20
15 years	1,000,000.00	8,478.61	1,526,149.80
20 years	1,000,000.00	7,193.97	1,726,562.80
Life	1,000,000.00	6,423.19	3,083,131.20

Australia Home Reversion



$$\text{Bequest} = (1 - \phi)H_{65+T}$$

Homesafe Wealth Release[®] is available to older Homeowners in Sydney and Melbourne subject to the following criteria*:

- Homeowners who are at least 60 years of age in Victoria, or at least 55 years of age in New South Wales (where at least one Homeowner in NSW is at least 60 years of age), at the date of Contract with Homesafe.
- Homes within eligible postcode areas. Homesafe currently covers approximately 90% of metropolitan Melbourne and Sydney postcodes.
- Homes which are free-standing, or if a Unit or Strata property, there are no more than 6 dwellings on the Title Plan (excludes apartments)
- The property is the principal place of residence for at least one Homeowner at the time of exchange of Contracts.
- The land value of the property is 60% or greater of the total market value of the home as determined by an Independent Homesafe Panel Valuer.
- Where all permanent residents in the home are shown as property owners (or have an interest) on the Certificate of Title or can be added as required.
- Homeowners with no debt on their Title or where all existing mortgages can be discharged before, or at the time Homesafe contracts with Homeowners.

Other considerations:

- Lump sums available from \$25,000 to \$1,000,000*
- The maximum share a Homeowner can sell is 65% of the future sale proceeds of the home.
- Homeowners can enter into additional contracts over time, up to a total share of 65%.

Singapore Lease Buy-back Scheme (LBS)



$$\text{Bequest} = (H_{65} - L) \times (n - T) / n$$



Illustrating an example

Joint Singapore Citizen (SC) Owners aged 65 years old

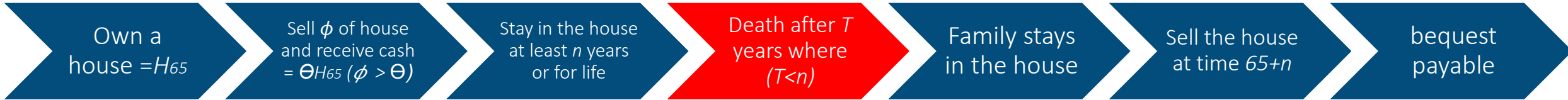
Assumptions:

- 4-room flat held under joint tenancy
- No outstanding loan
- Balance lease: 65 years
- Market value: \$450,000
- Choose to keep a 30-year lease
- Sell the tail-end 35-year lease to HDB for \$190,000

Comparisons of products

	Hong Kong Reverse Mortgage	Australia Home Reversion	Singapore Lease Buy-back
Government offer	Indirect	No	Direct
Right to stay in your house for life	Yes	Yes	No
Benefit from house appreciation when it is sold	Fully	Partially	No
Overall benefit risk	Low	High	Low
Insurance costs on non-recourse loan	Yes	No	No
Bequest amount	Decreasing and high variation	Fixed proportion	Decreasing and low variation
Complexity	High	Medium	Medium
Flexibility	High	High	Low
Interest rate risk	Yes	No	No
Payout dependent on home owner's age	Yes	Yes	No

Proposed Equity Release Scheme



$$\text{Bequest} = (1 - \phi)H_{65+n}$$



$$\text{Bequest} = (1 - \phi)H_{65+T}$$

Pricing of LBS

H_t : Market price of the flat at time t

R : Market first-year monthly rental income

B_n : Price of retained n -year lease based on market rental

B_n^* : Price of retained n -year lease offered by HDB

L_y : Price of tail-end y -years lease based on market rental

L_y^* : Price of tail-end y -year lease sold to HDB

n : Retained lease term in years

m : House lease term in years

i : Market yield rate per year

r : Annual rate of incremental rental (after considering inflation and flat depreciation)

$$\begin{aligned}
 H_0 &= R + \frac{R}{1+j} + \frac{R}{(1+j)^2} + \dots + \frac{R}{(1+j)^{11}} + \\
 &\quad \frac{R(1+r)}{(1+j)^{12}} + \frac{R(1+r)}{(1+j)^{13}} + \dots + \frac{R(1+r)}{(1+j)^{23}} + \frac{R(1+r)^2}{(1+j)^{24}} + \dots + \frac{R(1+r)^{m-1}}{(1+j)^{12m-1}} \\
 &= R \times \ddot{a}_{\overline{12}|j} \times \left[1 + \frac{1+r}{1+i} + \frac{(1+r)^2}{(1+i)^2} + \dots + \frac{(1+r)^{m-1}}{(1+i)^{m-1}} \right] \\
 &= R \times \ddot{a}_{\overline{12}|j} \times \ddot{a}_{\overline{m}|i^*}
 \end{aligned}$$

where $j = (1+i)^{1/12} - 1$ and $i^* = (i-r)/(1+r)$

$$B_n = R \times \ddot{a}_{\overline{12}|j} \times \ddot{a}_{\overline{n}|i^*}$$

$$B_n^* = \alpha B_n \quad (\alpha < 1)$$

$$\text{and then } L_{t-n}^* = H_0 - B_n^*$$

Cash paid
to owner

House
Value

Cost of staying
for n years

$$D_d = \begin{cases} B_n^* \times \frac{n-d}{n} & \text{if } d < n \\ 0 & \text{if } d \geq n \end{cases}$$

Some calculations for LBS illustration

Illustrating an example

Joint Singapore Citizen (SC) Owners aged 65 years old

Assumptions:

- 4-room flat held under joint tenancy
- No outstanding loan
- Balance lease: 65 years
- Market value: \$450,000
- Choose to keep a 30-year lease
- Sell the tail-end 35-year lease to HDB for \$190,000

Table 1: Illustrative examples of LBS pricing model with $H_0 = S\$450,000$, $n = 30$, $m = 65$

(r, i)	$R = 1,800$					
	B_{30}	L_{35}	$\alpha = 70\%$		$\alpha = 75\%$	
			B_{30}^*	L_{35}^*	B_{30}^*	L_{35}^*
$(-2\%, 2.62\%)$	354,891	95,109	248,424	201,576	266,168	183,832
$(-1\%, 3.65\%)$	354,294	95,706	248,006	201,994	265,720	184,280
$(0\%, 4.67\%)$	353,703	96,297	247,592	202,408	265,277	184,723
$(1\%, 5.69\%)$	353,118	96,882	247,183	202,817	264,839	185,161
$(2\%, 6.71\%)$	352,539	97,461	246,778	203,223	264,405	185,596

New Hybrid Equity Release Product

$$Y = \begin{cases} 0 & \text{for } K_x = 0, 1, \dots, n-1 \\ v^n \times \ddot{a}_{K_x-n+(J+1)/12}^{(12)} & \text{for } K_x = n, \dots, \omega - x - 1 \end{cases}$$

$$L = -(\phi - \theta)H_0 + 12R\alpha\phi \times \ddot{a}_n^{(12)} + 12R\alpha\phi \times Y$$

$$\phi H_0 = \theta H_0 + \phi B_n^* + 12R\alpha\phi \times {}_nE_x \times \ddot{a}_{x+n}^{(12)} \quad \text{since } E(Y) = {}_nE_x \times \ddot{a}_{x+n}^{(12)}$$

House Value sold

Cash paid to owner

Cost of staying for n years

Deferred n years right of staying for life

$$D_d = \begin{cases} (1 - \phi)H_n & \text{if } d < n \\ (1 - \phi)H_d & \text{if } d \geq n \end{cases}$$

Illustrative examples of new product

Table 2: Illustrative examples of new scheme pricing model with $H_0 = S\$450,000$, $R = S\$1,800$, $m = 65$, and $\alpha = 75\%$

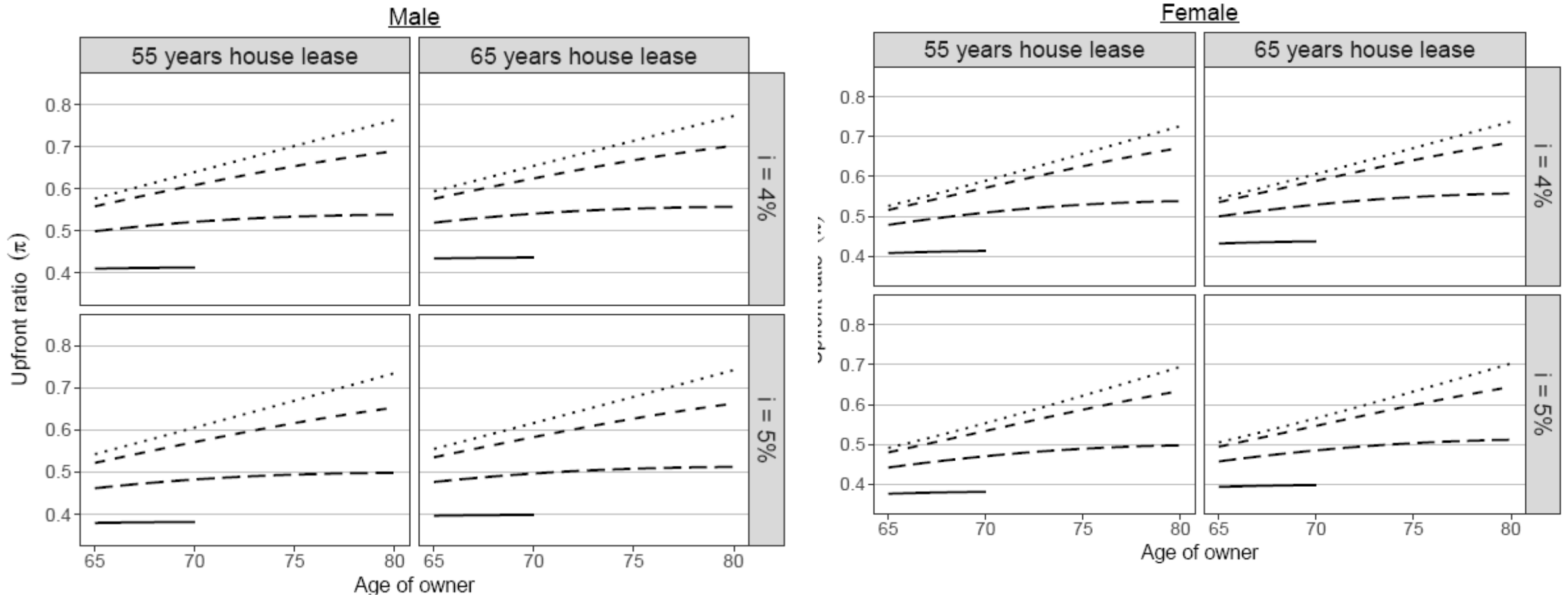
Gender	x	n	ϕ	θ	Flat value sold	Cash proceeds	Lease value	
Male	65	0	79.26%	45%	356,675	202,500	154,175	
		10	82.06%	45%	369,286	202,500	166,786	
		20	91.85%	45%	413,143	202,500	210,643	
		30	100.00%	40.81%	449,988	183,645	266,343	
	75	0	65%	36.90%	292,500	166,065	126,435	
			10	65%	35.64%	292,500	160,394	132,106
			20	65%	31.85%	292,500	143,367	149,133
		30	65%	26.53%	292,500	119,373	173,127	
			0	65%	44.86%	292,500	201,879	90,621
			10	65%	41.62%	292,500	187,270	105,230
75	20	65%	33.95%	292,500	152,761	139,739		

Based on Singapore 2016 Life Tables with maximum attainable age of 100

$\alpha = 75\%$	
B_{30}^*	L_{35}^*
266,168	183,832
265,720	184,280
265,277	184,723
264,839	185,161
264,405	185,596

Analysis of New Plan: Upfront ratio

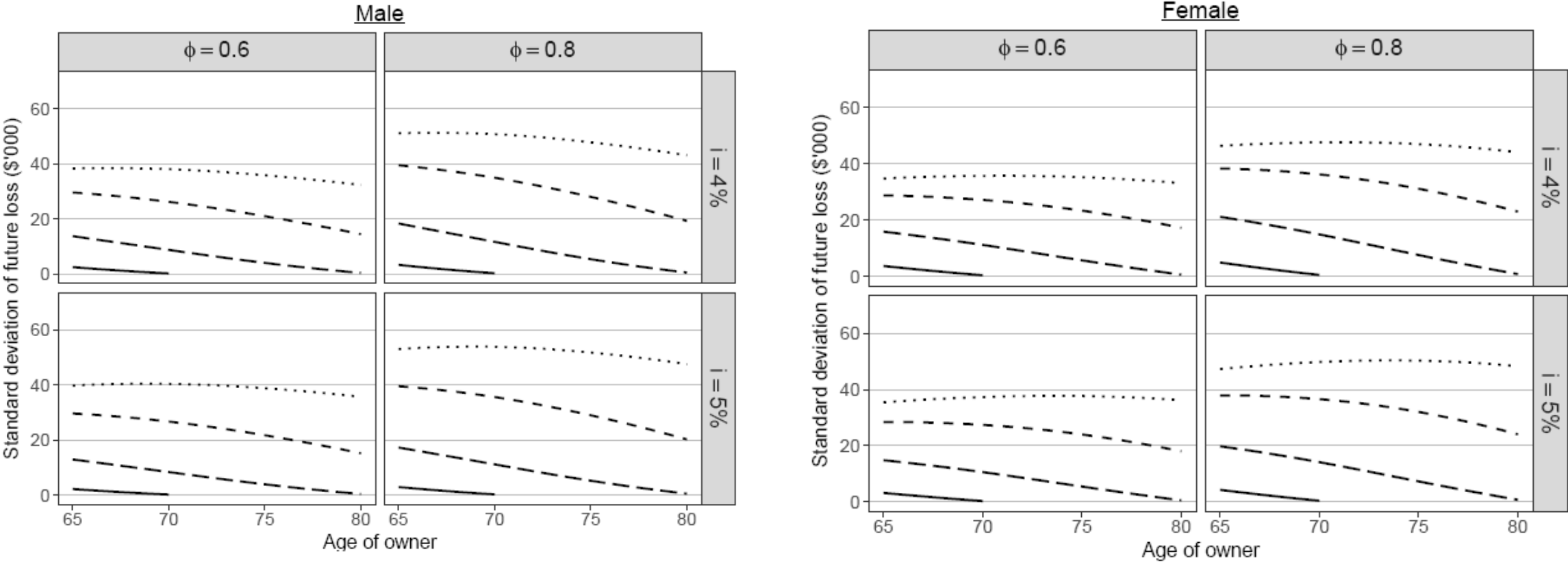
$$\pi = \theta / \phi$$



Years of retained lease ····· 0 - - - 10 - - - 20 ——— 30

Analysis of New Plan: Standard deviation of loss

$$H_0 = 450,000, m = 65, \alpha = 0.75$$



Years of retained lease 0 - - - 10 - . - . 20 ——— 30

Comparisons of all products

	Hong Kong Reverse Mortgage	Australia Home Reversion	Singapore Lease Buy-back	Hybrid Equity Release Plan
Government offer	Indirect	No	Direct	Direct
Right to stay in your house for life	Yes	Yes	No	Yes
Benefit from house appreciation when it is sold	Fully	Partially	No	Partially
Overall benefit risk	Low	High	Low	Low to medium
Insurance costs on non-recourse loan	Yes	No	No	No
Bequest amount	Decreasing and high variation	Fixed proportion	Decreasing and low variation	Fixed proportion
Complexity	High	Medium	Medium	Medium
Flexibility	High	High	Low	Very High
Interest rate risk	Yes	No	No	No
Payout dependent on home owner's age	Yes	Yes	No	Yes

The End