



香港教育大學

The Education University
of Hong Kong

How to Increase the Demand for Annuity in Hong Kong: A study of Middle-Aged Adults

Kee-Lee Chou, The Education University of Hong Kong

Wai-Sum Chan, The Chinese University of Hong Kong

Joachim Inkmann, University of Melbourne & Netspar

Hans van Kippersluis, Erasmus University Rotterdam & Netspar

Jin Yan, The Chinese University of Hong Kong

Siu Yau Lee, The Education University of Hong Kong

Central Policy Unit Public Policy Research Funding Scheme

Sharing Forum, 10 May 2017

Financial support from the Central Policy Unit Public Policy Research scheme (grant CPU PPR: 2014.A5.005.14E) in Hong Kong is gratefully acknowledged.

Motivation - General

- Annuity: reduce longevity risk and investment risk
- Annuity: improve financial well-being among retirees
- Introducing life annuity products to such an undeveloped market has the potential of improving the individual welfare of households (Yaari, 1965, Brown, 2011, Davidoff et al., 2005).

Motivation - General

- In his Nobel Prize acceptance speech given in 1985, Franco Modigliani drew attention to the “annuitization puzzle”

It is a well-known fact that annuity contracts, other than in the form of group insurance through pension systems, are extremely rare. Why this should be so is a subject of considerable current interest. It is still ill-understood.

- Annuitization puzzle in developed annuity markets in the US (Johnson et al., 2004) and UK (Inkmann et al., 2011)

Motivation – Hong Kong

- MPF matures, more and more MPF members retire with a substantial amount of retirement assets
- Longevity risk in Hong Kong – life expectancy after 65 ($65+19.65=84.62$ for men, $65+24.05=89.05$ for women) in 2014.
- Hong Kong Annuity Market is very small (office premium less than 2.2% of the total long-term business in Hong Kong, according to the OCI 2015 statistics). Most of them are annuity-certain.
- Annuitization puzzle exists in Hong Kong.

Research Questions

- How then should we design an attractive annuity product for Hong Kong? Which are the desired product characteristics?
- And how can we assess the potential demand for such a product in Hong Kong? Which household characteristics are related to the annuity demand?

Retirement Income Protection in Hong Kong

- 5-pillar Model (World Bank, 2005)
- Zero: CSSA, OALA, and OAA
- Second: MPF
- Third: Private savings
- Fourth: Family support and public services
- Life annuities are not available in Hong Kong. In 2012, about 11,000 fixed term annuities were sold compared to about 1.1 million life insurance policies (Commission on Poverty, 2015).

Characteristic of Annuity

- Two recent papers in economics (Beshears et al., 2014) and marketing (Shu et al., 2015) use surveys to investigate product characteristics that make an annuity appealing to households. The authors consider:
 - Inflation protection
 - Period-certain guarantees (should the annuitant die within a certain period, annuity is paid to a beneficiary until the end of that period)
 - Bonus payments within a month of choice (e.g. for holidays)
 - Counterparty risk (as implied by an issuer's credit rating).

Household Characteristics

- Absence of wealth
- Bequest motives
- Uncertain health and long-term care expenditures during retirement
- Chinese: funeral arrangements
- Welfare or family support: Crowding out
- Loss aversion
- Lack of financial literacy
- Wish to remain exposed to the stock market during retirement

Our Contribution

- We conduct and analyse two representative surveys among MPF members of age 40-64 who are faced with the decision on how to decumulate their retirement assets in a not too distant future.
- The first survey attempts to identify the desired product characteristics of an annuity using a discrete choice experiment (Shu et al., 2015).

Our Contribution

- The second survey attempts to identify household characteristics that are related to the demand of the preferred annuity product.
- Surveys allow us to assess the demand for a hypothetical annuity product in an undeveloped market for which we cannot observe actual life annuity purchases.

Survey Design

- Target population: full-time working members of the MPF, aged between 40 and 64. The earliest age at which participants can withdraw their savings from the MPF is 65.
- Random sampling frame provided by the Census and Statistics Department. Most up-to-date sampling frame for Hong Kong.

Survey Design

- Interviews took place in 2015 in a face-to-face format.
- 631 successful interviews for the discrete choice experiment.
- 1,066 successful interviews for the subsequent household survey.

Product Characteristics

Affecting Annuity Demand

- Inflation protection
- Period-certain guarantees
- Bonus payments within a month of choice (e.g. for holidays)
- Counterparty risk (as implied by an issuer's credit rating).
- We include all of these characteristics in our discrete choice experiment.

Discrete Choice Experiment

- Survey starts with an explanation of an annuity and a description of the aforementioned product characteristics.
- Respondents were then asked to which extent they understood the features of the annuity. Only those who either understood or completely understood (87.2% = 500 out of 631) were included in the experiment.

Discrete Choice Experiment

- Respondents were then asked to imagine that they were 65 years old and had HKD 1 million in their MPF retirement savings account. They were also told to assume a constant 3% inflation rate (explained).
- Respondents were presented with 18 choice sets (that were selected according to a statistical efficiency criterion). 18 is a trade-off between the number of parameters that can be identified and the respondents' attention span.

Discrete Choice Experiment

- In each choice set there were two rounds: in the first round, respondents could choose between two annuity options with different product characteristics and an opt-out option (“I refuse to choose and I defer my choice and continue to self-manage my retirement assets”).
- Those who refused entered a second round, in which they had to choose between two annuity options.

Discrete Choice Experiment

- The first round is more realistic and allows us to estimate actual take-up probabilities. The second round generates a sufficiently large sample.
- All annuity options have the same actuarial fair value of HKD 1 million.
- For all annuity options, the monthly starting income was shown in addition to the characteristics of this option.

Discrete Choice Experiment

- To facilitate an informed opt-out decision, respondents were shown the number of years they were able to withdraw HKD 5,000, 6000, or 7,000 (nominal or real) per month before depleting their savings account assuming a 5% return. E.g. withdrawals of HKD 6,000 nominal last for 23.3 years, while HKD 6,000 in real terms last for just 16.4 years.

Sample Statistics: DCE and Household Survey

	DCE	Household
Age		
40 – 44	35.2%	29.5%
45 – 49	23.8%	26.3%
50 – 54	19.4%	20.7%
55 – 64	21.6%	23.5%
Age (Mean, SD)	48.30 (6.81)	48.86 (6.41)

Sample Statistics: DCE and Household Survey

	DCE	Household
Sex		
Male	38.6%	44.2%
Female	61.4%	55.8%
Marital status		
Married	76.2%	76.2%
Never married	14.8%	13.7%
Widowed/Divorced /Separated	9.0%	10.1%

Sample Statistics: DCE and Household Survey

	DCE	Household
Educational attainment		
Lower secondary or below	24.0%	28.4%
Upper secondary	59.8%	54.2%
Post-secondary or above	16.2%	17.4%

Sample Statistics: DCE and Household Survey

	DCE	Household
Personal income		
Less than HK\$10,000	17.0%	17.8%
HK\$10,000 – HK\$15,000	25.4%	28.8%
HK\$15,000 – HK\$20,000	28.2%	24.2%
HK\$20,000+	29.4%	29.2%

Sample Statistics: DCE and Household Survey

	DCE	Household
Household income		
Less than HK\$20,000	17.6%	22.6%
HK\$20,000 – HK\$30,000	33.4%	33.8%
HK\$30,000 – HK\$50,000	35.0%	27.2%
HK\$50,000+	14.0%	16.4%

Percentage of Refused Annuitization in the 1st Round

No. of times refused annuitization	Percentage
0	69.6%
1	5.4%
2	4.2%
3	3.8%
4	1.4%
5	0.8%
6	0.6%

Percentage of Refused Annuitization in the 1st Round

No. of times refused annuitization	Percentage
7	0.8%
8	0.6%
9	0.8%
10	1.2%
11	0.4%
12	0.2%

Percentage of Refused Annuitization in the 1st Round

No. of times refused annuitization	Percentage
13	0.2%
14	0.4%
15	0.0%
16	0.6%
17	0.8%
18	9.8%

Econometric Analysis of Annuitization Decisions

- We estimate conditional and mixed logit models of annuitization decisions.
- The dependent variable: a binary indicator for which of the two annuity options was chosen in a choice set.
- The explanatory variables: the characteristics of these annuities.

Econometric Analysis of Annuity Decisions

- Unlike the conditional logit model, the mixed logit model allows for heterogeneous preferences (Lancsar and Louviere, 2008). The models generate very similar results with our data.
- The following table reports average marginal effect.

Results from the Discrete Choice Experiment

	Condition logit	Mixed logit
Annual increase (Ref: No increase)		
3% increase	-0.0673 (0.0102)***	-0.0551 (0.0116)***
5% increase	-0.0881 (0.0133)***	-0.0855 (0.0179)***
$\beta(3\% \text{ increase})$ $= \beta(5\% \text{ increase})$	6.49**	2.66

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. Standard errors are given in parentheses; for the mixed logit model, these were obtained from 50 bootstrap iterations. The lower panel of the table contains Wald test statistics for tests of parameter equality.

Results from the Discrete Choice Experiment

	Condition logit	Mixed logit
Having bonus payment	0.0028 (0.0043)	0.0035 (0.0338)
Period-certain guarantee (Ref: No guarantee)		
10 years	0.1137 (0.0125)***	0.1107 (0.0323)***
30 years	0.0945 (0.0101)***	0.0842 (0.0119)***
$\beta(10 \text{ years}) = \beta(30 \text{ years})$	6.49**	2.66

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Results from the Discrete Choice Experiment

	Condition logit	Mixed logit
Company rating (Ref: A)		
AA	-0.0212 (0.0064)***	-0.0140 (0.0086)**
AAA	-0.0069 (0.0075)	0.0078 (0.0139)
$\beta(AA) = \beta(AAA)$	3.96**	11.93***

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. Standard errors are given in parentheses; for the mixed logit model, these were obtained from 50 bootstrap iterations. The lower panel of the table contains Wald test statistics for tests of parameter equality.

Discussion

- A preference for nominal payments is in line with earlier findings by Shu et al. (2015) and consistent with Hurd and Rohwedder (2011) who find that expenditures of retired households are reduced by 2% per year.
- Beshears et al. (2014) find a preference for real annuities. Most recent realized inflation rates were higher (3.8%) at the time of their interviews than at the time of our interviews (2.8%). However, in the medium- and long-term, average inflation rates were higher in Hong Kong.

Discussion

- Bonus payments do not significantly affect the demand for annuities, opposite to the findings of Beshears et al. (2014) for the US.
- In line with Shu et al. (2015) for the US, we find a preference for medium-term period-certain guarantees of 10 years in Hong Kong.

Discussion

- Assuming that the attractiveness of period-certain guarantees is related to households' bequest motives, these findings suggest that bequest motives may be mostly operational within 10 years after retirement.
- Unlike Beshears et al. (2014), we do not find that respondents are concerned about counterparty risk, which affects discount rates and default probabilities.

Household Survey

- The preferred annuity product, nominal payments, no bonus payments, 10-year period-certain guarantee, A-rated provider
- The annuitization question remained unchanged.
- To analyse the impact of household characteristics on annuitization, we estimate a logit model and report again average marginal effects in the following table.

Results from the Household Survey

- 32.4% of respondents chose to annuitize.

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Amount of retirement saving (Ref: <HK\$500,000)	
HK\$500,000 – HK\$1,000,000	0.0401 (0.0539)
HK\$1,000,000 – HK\$1,500,000	0.1113 (0.0676)*
HK\$1,500,000 – HK\$3,000,000	0.1610 (0.0762)**
HK\$3,000,000+	0.1355 (0.0967)

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Results from the Household Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Anticipated sources of incomes after retirement	
Chance of receiving CSSA	0.0029 (0.0009)***
Chance of receiving OALA	-0.0005 (0.0007)
Chance of receiving OAA	-0.0023 (0.0007)***

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Results from the Household Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Financial support from adult children (Ref: 0)	
HK\$1– HK\$30,000	-0.1170 (0.0430)**
HK\$30,000 – HK\$50,000	0.0301 (0.0453)
HK\$50,000+	-0.0034 (0.0461)

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Discussion of Household Survey

- For comparison: the observed rate of voluntary annuitization among household of similar age in the UK was 5.9% in 2002 using ELSA data (Inkmann et al., 2011).
- Annuitization probabilities increase with retirement wealth (as in Inkmann et al., 2011), except for the very rich who are less likely to exhaust their financial wealth due to long life.

Discussion of Household Survey

- The impact of receiving first pillar pensions is economically small.
- Financial support from children acts as a substitute to annuitization.
- Unreported: income, health status, anticipated expenditures for health care, long-term care and funeral arrangements, health and long-term care insurance. All of these are insignificant.

Results from the Household Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Bequest motive (Ref: Do not leave savings)	
Leave savings to spouse, children, family members	0.1343 (0.0345)***
Age (Ref: 40 – 44)	
45 – 49	0.0581 (0.0463)
50 – 54	0.0932 (0.0547)*
55 – 64	0.1561 (0.0638)**
Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses	

Results from the Household

Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Sex (Ref: Male)	
Female	0.0211 (0.0339)
Marital status (Ref: Married)	
Never married	0.2096 (0.0726)***
Widowed/Divorced/Separated	0.0936 (0.0603)
Number of children (Ref: 0)	
1	0.0584 (0.0553)
2+	0.0609 (0.0553)

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Discussion of Household Survey

Results

- The number of children is insignificant in predicting annuity demand.
- Older households are significantly more likely to annuitize.
- Married households are less likely to annuitize (as in Inkmann et al., 2011), consistent with intra-household hedging of longevity risk (Kotlikoff and Spivak, 1981; Hubener et al., 2014).

Discussion of Household Survey

Results

- A self-reported bequest motive for a spouse, children or other family members increases the demand for annuities. This stands in contrast to previous empirical and theoretical work (e.g. Yaari, 1965).
- The 10-year period-certain guarantee in the preferred annuity product might attract bequest motives operating over a relatively short horizon.

Results from the Household

Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Financial literacy score	-0.0906 (0.0176)***
Understanding of annuity	0.1986 (0.0297)***
Willingness to take risk	0.0023 (0.0207)
Experience in stock investment (Ref: No experience)	
Now experience	-0.0329 (0.0406)
Experience in the past	-0.0727 (0.0390)*

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Results from the Household Survey

Average marginal effects of choosing annuity (N = 1,066)

Variables	
Educational attainment (Ref: Post-secondary or above)	
Lower secondary or below	0.0160 (0.0419)
Upper secondary	0.0124 (0.0461)
Pseudo R ²	0.170

Notes: *** p < 0.01; ** p < 0.05; * p < 0.10. Standard errors are given in parentheses

Discussion of Household Survey

Results

- A financial literacy score measuring understanding of compounding, inflation and diversification (HRS questions) negatively affects annuity demand (as in Agnew et al., 2008).
- Lusardi and Mitchell (2007, 2011) show that the financially literate are more likely to plan for retirement and accumulate retirement assets.

Discussion of Household Survey

Results

- Our findings may reflect a wish for continued stock market exposure.
- General education is insignificant but the ability to understand particular annuity product under consideration here (73%) increases the annuitization probability by about 20 percentage points.

Main Findings

- The discrete choice experiment reveals a preference for annuities
 - With a nominal payout (instead of annual 3% or 5% increase)
 - With a 10-year period-certain guarantee (instead of 0 or 30 years)
 - Without bonus payments (instead of a bonus payment in one month)
 - Provided by an issuer with an A credit rating (instead of AA or AAA).

Main Findings

- 32.4% of participants in the household survey would buy this annuity.
- Among the significant predictors of annuity demand, we find that
 - Financial literacy decreases the demand for the preferred annuity.
 - A bequest motive increases the demand for the preferred annuity.

Conclusion

- Based on previous findings from developed annuity markets, we attempt to design an attractive annuity product for an undeveloped market.
- We focus on Hong Kong, a market with substantial and growing retirement assets in which life annuities are completely absent.

Conclusion

- The exercise seems to be reasonably successful, given an annuitization probability of 32.4% for the preferred annuity product.
- Existing attempts in the literature to design an attractive annuity based on surveys yield conflicting results. Understanding these differences seems to be an important but ambitious task for future work.

Future Study

- Current cohort of older persons
- Private vs Public
- Self-selection bias in voluntary annuity
- Public annuity and Zero pillar: CSSA and OALA
- Public annuity and MPF
- Mandatory or voluntary (default option or with incentive) annuitization of MPF savings (all or partial)