

Assessing the Demand for Annuities in an Undeveloped Market: Evidence from Hong Kong

Kee-Lee Chou, The Education University of Hong Kong

Joachim Inkmann, University of Melbourne & Netspar

Hans van Kippersluis, Erasmus University Rotterdam & Netspar

Wai-Sum Chan, Chinese University of Hong Kong

“Future Well-Being of the Elderly” Conference

HEC Montréal, 5-6 December 2016

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

- Assume a market that is characterized by a substantial and growing amount of retirement assets and a complete absence of life annuities.
- Introducing life annuity products to such an undeveloped market has the potential of improving the individual welfare of households (Yaari, 1965, Brown, 2001, Davidoff et al., 2005).
- However, we know from developed annuity markets in the US (Johnson et al., 2004) and UK (Inkmann et al. , 2011) that households are reluctant to voluntarily purchase annuities, an observation that has been described as the “annuitization puzzle” (Modigliani, 1986).

Research Questions

- How then should we design an attractive annuity product for an undeveloped market? Which are the desired product characteristics?
- And how can we assess the potential demand for such a product? Which household characteristics are related to the annuity demand?
- We attempt to answer these questions for a particular undeveloped annuity market, Hong Kong.

Retirement Income Protection in Hong Kong

- A large scale, compulsory occupational DC pension scheme, the Mandatory Provident Fund (MPF), was introduced in 2000, which consists of individual accounts that are privately managed.
- About USD 76 billion accumulated in the MPF by the end of 2015.
- First pillar consists of three programs that cover about 70% of older persons in Hong Kong. Two are means-tested, one (OAA) is universal and provides about USD 160 per month.
- 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).

Overview

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

Main Findings

- The discrete choice experiment reveals a preference for annuities
 - with a nominal payout (instead of annual 3% or 5% increases)
 - 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 A credit rating (instead of AA or AAA).
- 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.

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 Department of Census and Statistics. Most up-to-date sampling frame for Hong Kong.
- 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

- 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).
- We include all of these characteristics in our discrete choice experiment.

Discrete Choice Experiment 1/3

- Survey starts with an explanation of an annuity and a description of the aforementioned product characteristics. Unlike Beshears et al. (2014), we do not avoid the term “annuity” because we probably can rule out negative associations with existing annuities in an undeveloped market.
- Respondents were then asked to which extent they understood the features of the annuity. Only those who either understood or completely understood (500 out of 631) were included in the 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).

Discrete Choice Experiment 2/3

- 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.
- 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 3/3

- 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.
- To facilitate an informed opt-out decision, respondents were shown the number of years they were able to withdraw HKD 5000, 6000, or 7000 (nominal or real) per month before depleting their savings account assuming a 5% return. E.g. withdrawals of HKD 6000 nominal last for 23.3 years, while HKD 6000 in real terms last for just 16.4 years.

Percentage of Refused Annuitization in the 1st Round

Table 2 Proportion of respondents who refused annuitization in the DCE (N = 500)

Number 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%
7	0.8%
8	0.6%
9	0.8%
10	1.2%
11	0.4%
12	0.2%
13	0.4%
14	0.0%
15	0.0%
16	0.0%
17	0.0%
18	9.8%

Econometric Analysis of Annuitization Decisions

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

Results from the Discrete Choice Experiment

Table 3: Average marginal effects of conditional and mixed logit models

	Conditional logit	Mixed logit
Annual increase (Ref.: No increase)		
3% increase	-0.0673 (0.0102) ^{***}	-0.0551 (0.0108) ^{***}
5% increase	-0.0881 (0.0133) ^{***}	-0.0855 (0.0186) ^{***}
Having bonus payment	0.0028 (0.0043)	0.0035 (0.0041)
Period-certain guarantee (Ref.: No guarantee)		
10 years	0.1137 (0.0125) ^{***}	0.1107 (0.0152) ^{***}
30 years	0.0945 (0.0101) ^{***}	0.0842 (0.0096) ^{***}
Company rating (Ref.: A)		
AA	-0.0212 (0.0064) ^{***}	-0.0140 (0.0065) ^{**}
AAA	-0.0069 (0.0075)	0.0078 (0.0071)
Percentage of correct prediction	59.7%	60.1%
$\beta(3\% \text{ increase}) = \beta(5\% \text{ increase})$	6.49 ^{**}	2.08
$\beta(10 \text{ years}) = \beta(30 \text{ years})$	4.66 ^{**}	2.51
$\beta(\text{AA}) = \beta(\text{AAA})$	3.96 ^{**}	12.18 ^{***}

Discussion of Results 1/2

- 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.
- Bonus payments do not significantly affect the demand for annuities, opposite to the findings of Beshears et al. (2014) for the US.

Discussion of Results 2/2

- 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.
- 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) was then taken to the second survey. The annuitization question remained unchanged.
- 32.4% of respondents chose to annuitize. For comparison: the observed rate of voluntary annuitization among households of similar age in the UK was 5.9% in 2002 using ELSA data (Inkermann et al., 2011).
- To analyse the impact of household characteristics on annuitization, we estimate a logit model and report again average marginal effects in the following table.

Selected Results from the Household Survey 1/3

Table 6 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)
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)***
Financial support from adult children (Ref: HK\$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)

Discussion of Results 1/3

- 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.
- 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.

Selected Results from the Household Survey 2/3

Table 6 Average marginal effects of choosing annuity (N = 1,066) - continued

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) ^{**}
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)

Discussion of Results 2/3

- 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).
- 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.

Selected Results from the Household Survey 3/3

Table 6 Average marginal effects of choosing annuity (N = 1,066) - continued

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 participating	-0.0329 (0.0406)
Experience in the past	-0.0727 (0.0390)*
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 Results 3/3

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

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.
- 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.