Dissertation draft

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Standard economic theory suggests that retirement annuities should be highly prized by individuals as a way to insure against the risk of late death Yaari (1965). However, in developed countries rates of annuitization are far below the levels that theory predicts. In this paper I test two competing hypotheses for the annuity problem: bequests and pessimistic life expectancy. Under the coalition government in the UK the law regarding the use of private defined contribution pensions changed. Individuals were no longer forced to annuitise their pension pots and could access them in a variety of ways such as lump sum withdrawals or income drawdown and subsequently the number of annuities sold in the UK dropped precipitously.

Depending on the reason for the lack of annuitization in the UK, the consumption response of retirees to the pension reform will differ. If individuals do not annuitise because of pessimistic life expectancy I will show that their consumption should increase. If, on the other hand, individuals do not annuitise because of a bequest motive, consumption should not change much as a result of the reform. I will solve lifecycle models for both of these cases and simulate consumption decisions with, and without, forced annuitization. I will then use a variety of empirical models to measure the consumption change in early retirement that resulted from the policy reform. The size and magnitude of this change will be indicative of the mechanism causing the annuitization problem.

The importance of retirement policy to individuals in the UK is growing. The number of individuals of pensionable age is expected to grow from 11.9 million in 2020 to 15.2 million in 2045 according to the latest ONS statistics and for every 1000 people of working age there will be 341 of pensionable age in 20145 compared to 280 in 2020 ONS (2020). The increase in absolute and relative numbers of elderly makes retirement policy more important. Moreover, private, defined contribution (DC), pensions are becoming increasingly common and are predicted to grow as current cohorts age Cribb and Karjalainen (2023). Therefore, policies regarding how private pensions can be accessed will have a larger impact on overall welfare for retirees.

The so called "pensions freedom act" received Royal Asset in December 2014 marked the end of a series of pension reforms carried out by the coalition government between 2010 and 2015. The reform was announced in the Spring budget and made it possible to withdraw money from a private pension pot subject to the marginal rate of income tax that an individual faced. In the June 2010 budget the government made a first reform to the annuitization rules, creating an minimum income requirement above which individuals would not need to annuitise more HMT (2011). However, this was set at £20,000 and therefore few individuals were eligible. The minimum income requirement was scrapped in the 2014 bill finally eliminating the compulsory annuities market. The impact of the reforms on annuity demand has been documented by Cannon et al. (2016). Using data from the Association of British Insurers they show that annuity demand dropped by 75% from its maximum.

0.1 Literature review

My paper draws on three main strands of literature. The annuity problem, the retirement saving problem and lifecycle models. **this intro is rubbish**

Yaari (1965) was the first to show that under standard assumptions we would expect individuals to annuitise all of their wealth at retirement to insure against the risk of long life. Since then there has been much literature discussing possible reasons that people do not annuitise. Finkelstein and Poterba (2002) and Finkelstein and Poterba (2004) find evidence of adverse selection, thereby making the 'money's worth' of annuities lower for the general population as opposed to the population of annuitants. However, they also find that theory would still predict annuitization.

Friedman and Warshawsky (1990) show that annuitization decisions can be fully explained by a mixture of bequest motives and actuarily unfair annuities. They solve an augmented life-cycle model with a range of parameters on how severe the rate of return is on the annuity versus market rates. For plausible values they find that individuals would optimally not annuitise much wealth. Similarly to Finkelstein and Poterba (2004), Friedman and Warshawsky (1988) show that there is a significant difference between the life expectancy of annuitants and the general population in the American annuity market but this cannot fully explain the annuitization problem. Only when bequest motives are added to the model can annuitization rates be rationalized.

Lockwood (2012) builds on this and shows that a realistic bequest motive in lifecycle simulations achieves realistic annuitization rates. He solves a simple lifecycle model with bequest motives taken from several recent papers in the literature. The bequest motives he picks therefore match other important aspects of the lifecycle model such as how much individuals actually bequest and how rich individuals are when they bequest.

Lockwood (2018)

Vidal-Melia and Lejárraga-García (2004) have some interesting results. Need to talk about that.

0.2 Data

The main data set I use is the English Longitudinal Study of Ageing (ELSA) Banks et al. (2023). ELSA repeatedly interviews individuals over the age of 50 and asks them a range of questions relating to their income and wealth as well as expectations about the future. Importantly it also includes detailed information pensions including the type of pension that an individual holds when working, thus I am able to distinguish between individuals who have defined benefit and defined contribution pensions. For ease of access I use Harmonized ELSA [1] which ensures that variables are comparable across waves. Since this only includes a subset of the questions in ELSA I also supplement it with variables taken directly from the data.

I also use ONS life tables data.

I also use annuitant life tables data.

I also use FCA product data.

0.3 Methodology

I first solve a modified retirement lifecycle model. The problem that retirees face is as follows: **This is not correct – need to include probs**

$$E(U) = \sum_{t=x}^{110-w} [u(c_t)]$$

subject to their budget constraint

$$c_t = a_t(1 + r) + p_t + ann_t - a_{t+1}$$

where a_t are asset holdings in time t, p_t is state pension income in time t, and ann_t is annuity income in time t. I use the standard CRRA utility function.

$$u(c_t) = \frac{c_t^{1-\sigma}}{1-\sigma}$$

[1] "This analysis uses data or information from the Harmonized ELSA dataset and Codebook, Version G.2 as of July 2021 developed by the Gateway to Global Aging Data. The development of the Harmonized ELSA was funded by the National Institute on Aging (R01 AG030153, RC2 AG036619, R03 AG043052). For more information, please refer to https://g2aging.org/."

In some specifications retirees can leave bequests, I use the bequest function from Lockwood (2012).

$$u(b_t) = (\frac{m}{1-m})^{\sigma} \frac{((\frac{mc_0}{1-m}) + b_t)^(1-\sigma)}{(1-\sigma)}$$

Where b_t is the amount left at death, m is a measure of bequest motive strength and c_0 is a minimum amount of consumption that individuals want. **Check this**

I solve the retirees problem using backward induction. At age 110 there is certainty of death so any leftover assets are carried over into the next period and bequested. This means that the value at the end of the final period is either 0 (if we do not allow a bequest motive) or the value of bequests. I then take this value function and solve an individuals final period problem, choosing assets next period (i.e. those to bequest) and how much to consume.

Using the optimal policy function in the last period, I calculate the value of the last period, which the utility function and the value function evaluated at the maximum. This is then used in the problem the year before that. I repeat this process back to the age of retirement to obtain optimal consumption amounts for each year of retirement and associated value functions.

To simulate the ELSA data I solve this retirement problems for each new retiree in the data set.

0.4 Rough plan

- Intro
    1. I think Eric French wrote something about population that I could use in then intro to say why it is important.
    2. "Latest data from HM Revenue Customs (published in April) showed more than £45bn has been taken from pots since 2015." https://www.ftadviser.com/pensions/2022/0 freedoms-were-they-really-a-good-idea/
    3. Need annuity theory references – Yarri?
- Lit review
- Models
- Empirical
    1. Diff in diff
    2. RDD

3. Matching?
4. can I use anything I learnt in panel? In some sense the decision to annuitise is a discrete choice problem so I could use something from there.

- Conclusion

References

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