

AUCTIONING ANNUITIES

TIAA Institute Fellows Symposium

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MOTIVATION

- Retirement programs are facing a dilemma
 - Reduce benefit to stay viable
 - Increase benefit to help people
 - E.g., 48% of US household with 55 years old head have zero retirement savings
 - Q. Can we use market-based system to provide better retirement products?
E.g., annuities?
- Lot of research on determinants of demand
- Relatively little information about costs
 - i. How do demand and strategic supply interact to determine “prices” and welfare?
 - ii. How do they change with informational friction?
 - iii. How can we choose market system to promote efficiency?

OBJECTIVE

- **Sheds light on these questions in the context of Chilean annuity market**
- Demand from risk averse retiree depend on
 - savings
 - information processing costs
 - bequest-preference
 - mortality (longevity) risks
 - heterogenous preferences
- Supply
 - private annuitization costs
 - varies across firm and retirees
 - private information
 - first-price auctions + bargaining
 - winner gives highest utility

WHY CHILE?

- Started privatized system in 1981
- eBay for annuities started in 2004
- Rich data, simpler annuity contracts.
- High annuitization rate (>60%).
- Still plagued by low pensions
- Debates about ways to improve pensions.
- In the Context of US
- Secure Act of 2019 promotes Annuities
- How to structure the market?
- No existing data – *annuity puzzle*
- Chile provides an ideal setting

DATA

- Chile from Jan 2007 to Dec 2017
- Those without any qualifying children
- Retire within the normal range
- 238,548 qualify to buy annuity
- We focus on the rest who chose an annuity.
- Average Savings
 - male \$121,955
 - female \$97,308
- Median Savings
 - male \$69,372
 - female \$81,185

OFFERED PENSIONS

Annuity Type	Gender	Mean	Median	Savings Q1	Savings Q2	Savings Q3	Savings Q4	Savings Q5
Immediate	Female	479	414	202	288	385	510	857
	Male	631	435	200	269	372	585	1329
	Full Sample	570	423	201	278	378	556	1152
Deferred	Female	412	374	190	258	349	463	714
	Male	473	356	187	241	331	529	1019
	Full Sample	446	365	189	248	339	500	882

Predicted Median Age at Death

Savings	Male	Female	Overall
Q1	85.15 (5.79)	93.80 (6.03)	86.89 (5.82)
Q2	85.86 (5.81)	94.24 (6.06)	87.64 (5.84)
Q3	86.45 (5.83)	94.83 (6.09)	88.23 (5.88)
Q4	87.62 (5.88)	95.48 (6.12)	89.40 (5.95)
Q5	90.87 (6.01)	97.25 (6.21)	93.52 (6.11)
Total	86.75 (5.82)	94.91 (6.09)	89.57 (5.94)

TIMING OF THE GAME

1. Retiree requests offers on several annuities
2. Active life insurance companies decide to participate or not
3. Those who take part make multidimensional sealed-bids.
4. Retiree can choose from these offers, outside option or bargain.
5. If bargaining, bargaining happens over one type annuity.
6. Winner: who can offer highest *indirect utility* not just pension.

MODEL

Indirect Utility:

$$U_{ij} = \rho(P_{ij}) + \theta_i \times b_i(P_{ij}) + \beta_i \times Z_j - U_0(S_i)$$

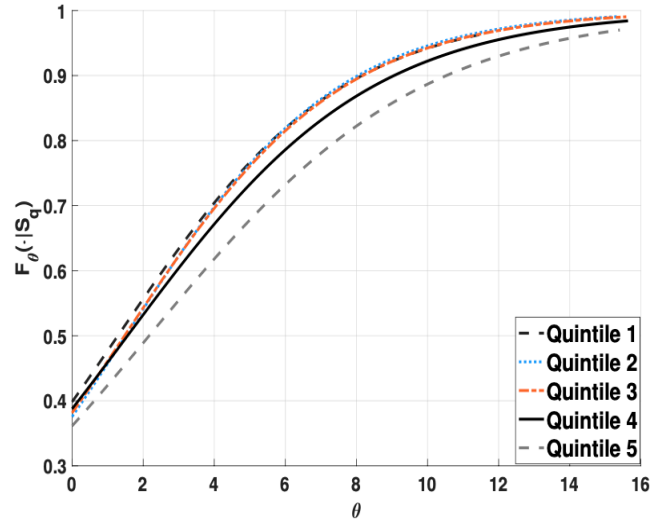
- Pension $\rho(P_{ij})$ expected present discounted util
- Bequest $b_i(P_{ij})$ expected present discounted util
- Risk rating Z_j
- Savings S_i
- Bequest preference $\theta \sim F_{\theta|S}(\cdot | \cdot)$

Annuitization Cost

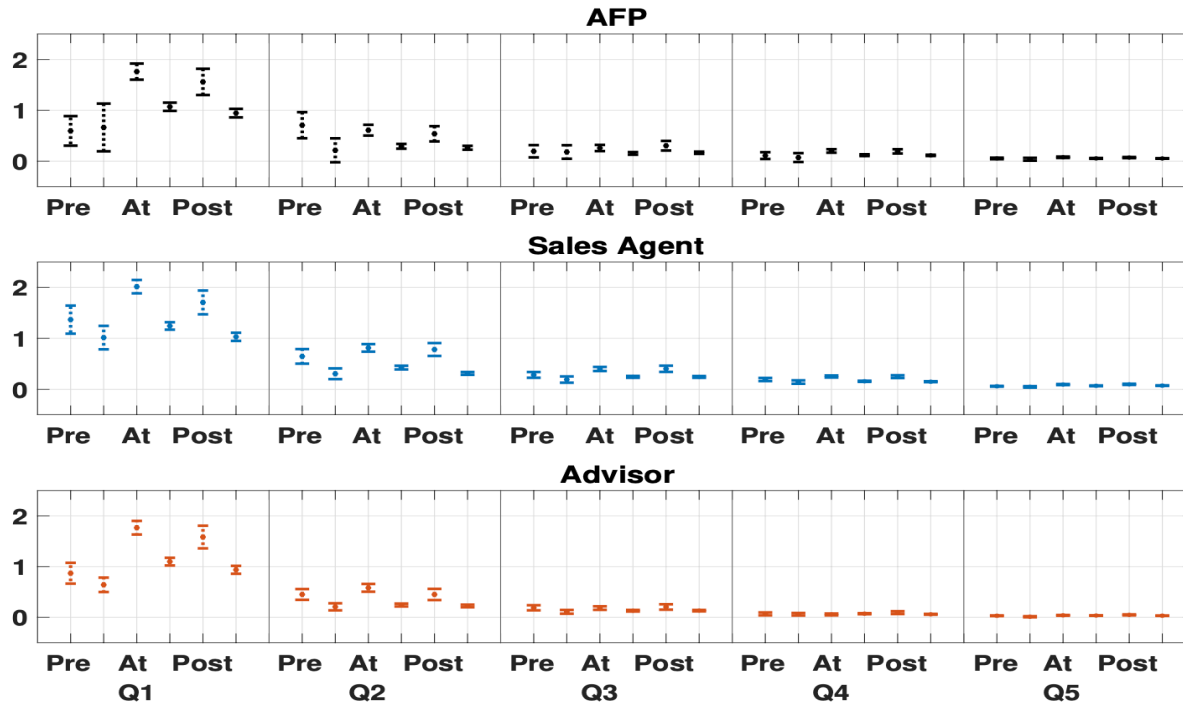
- if firm j promises to pay i $\$P_{ij}$ until death
- It varies across firms, and across retirees.
 $C_{ij} = C(P_{ij}) = P_{ij} \times UNC_j$
- Unitary Necessary Capital (UNC)
- To make cost comparable we work with

$$r_{ij} \equiv \frac{UNC_j}{UNC_i} \sim W_{r|S}(\cdot | \cdot)$$

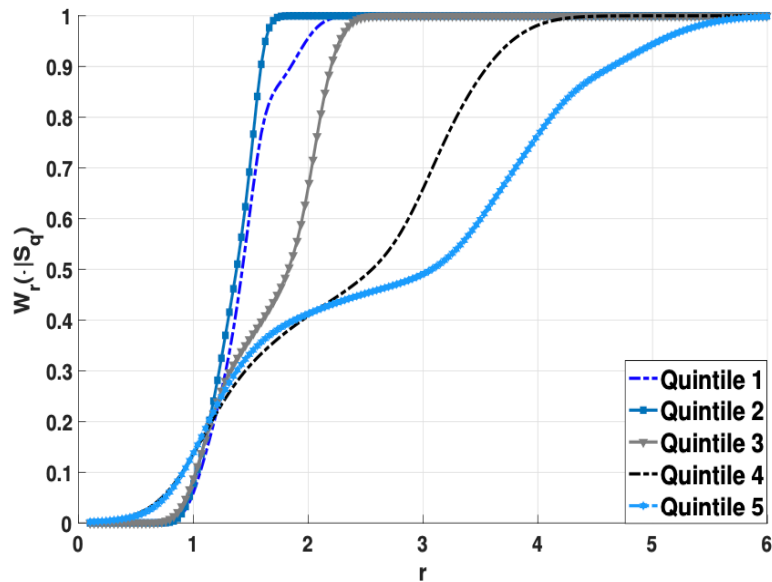
BEQUEST PREFERENCE



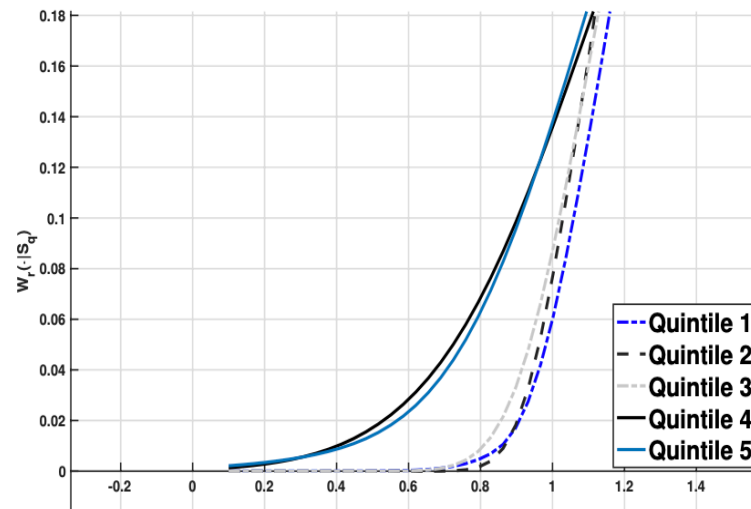
Preference for Risk Ratings



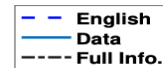
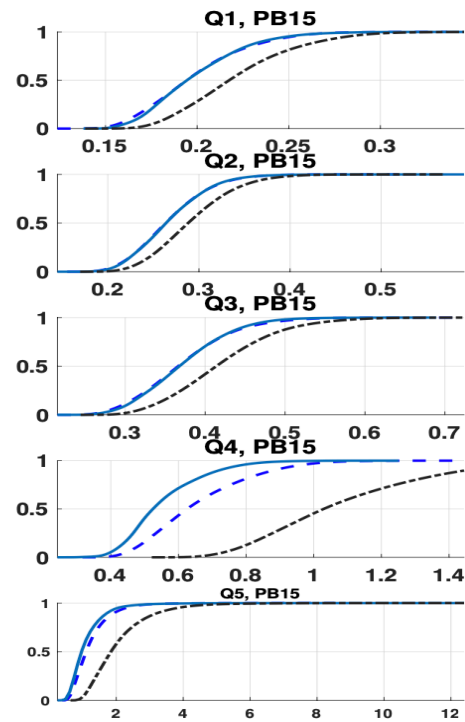
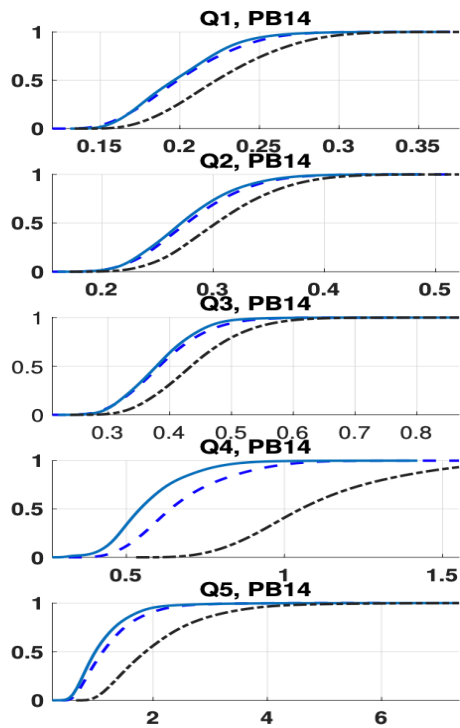
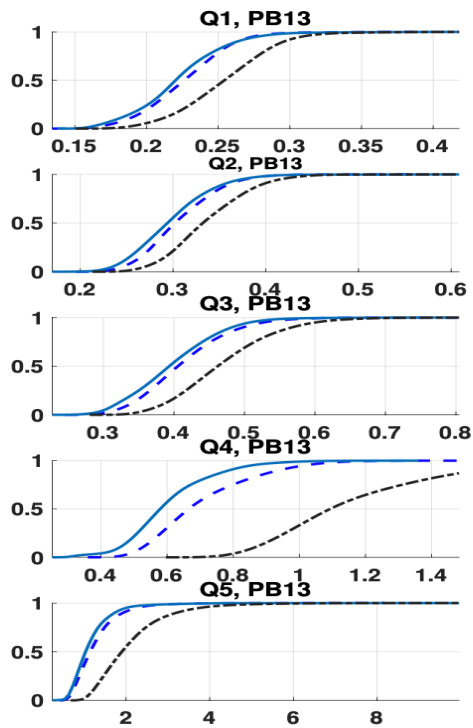
COST



(i) Over the Full Support



(ii) Focusing on $r < 1$.



MAIN FINDINGS

1. Low savers care more about risk-rating.
2. \uparrow Savings \downarrow information processing costs.
3. 50% show no preference for bequest.
4. But among the rest, significant heterogeneity.
5. E.g., top 20% savers care average 2.82 times more about bequest.
6. Firms' costs lower for top 40%.
7. Market is quite competitive.
8. Asymmetric Information hurts top 40%.
9. Simplify auctions \Rightarrow \uparrow pensions.
10. Most significant gain for the top 40%
11. Yet, DMU \Rightarrow welfare do not change.

THANK YOU!