The Welfare Cost of Asymmetric Information: Evidence from the U.K. Annuity Market

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General motivation

- Theoretical literature on adverse selection emphasizes private market inefficiency and potential for welfare improving government policy.
- Empirical work mainly focused on *detection* of asymmetric information.
  - Recent emphasis on importance of preference heterogeneity in addition to risk heterogeneity.
- Little / no empirical work on the *magnitude*:
  - of efficiency costs of asymmetric information.
  - of welfare costs of government intervention (e.g., mandates).

Relevance for social security

- Many of the social security reform proposals suggest to replace defined benefit programs with defined contribution in which individuals accumulate a lump sum balance.
- A key question is whether to let individuals take this as a lump sum at retirement or require them to annuitize all or some of it.
- Issues that come up:
  - If we make annuitization voluntary: how great is the cost of adverse selection?
  - If we make annuitization compulsory: how different are individuals' preferences regarding annuitization?
- These two quantities is what we try to evaluate.

Plan of the paper

- Motivate general modeling approach by showing that simple summary statistics can't provide an answer.
- Use insurance data on choices and risk experience (and modeling assumptions) to recover distribution of risk type and preferences:
  - Heterog. in risk type $\longrightarrow$ adverse selection (voluntary annuitization$\Downarrow$)
  - Heterog. in preferences $\longrightarrow$ "one size fits all" not good (compulsory annuitization$\Downarrow$)
- Use estimates to compute welfare at:
  1. Observed equilibrium (which allows contract choice).
  2. Counterfactual: symmetric information (first best).
  3. Counterfactual: mandatory social insurance (no contract choice).
- Obtain:
  - $2-1=$ welfare loss from adverse selection in a voluntary market
  - $2-3=$ welfare loss from mandating everyone to do the same even though they may want to do different things.

Setting

- Semi-compulsory U.K. annuity market
  - Individuals with tax preferred retirement savings required to annuitize their accumulated balance at retirement
    - £6 billion in new funds annuitized in 1998
  - Choice of annuity contract, i.e. guarantee length (during guaranteed period, annuity payments are unconditional):
    - Private/unpriced information about risk type
    - Preference for "wealth after death"
- Advantages of setting:
  - Important market; and, as mentioned, relevant for Social Security reforms
  - Relatively simple contracts (0, 5, or 10 year guarantee)
  - Evidence that asymmetric information affects guarantee choice (Finkelstein and Poterba, 2004)
  - Negligible moral hazard (attractive for estimation/identification)

Data

- From one of the five largest annuity providers in the U.K.
- Data on guarantee choices, age, gender, and subsequent mortality experience.
- All annuities purchased in 1988-1994 and were still active as of 1/1/1998.
  - Observe mortality outcome through 2005.
- Limit analysis to:
  - Single-life annuities
  - Age at purchase of 60 or 65
  - Accumulated funds within the company
  - Nominal annuities

Summary statistics

	60 Females	65 Females	60 Males	65 Males	All
No. of obs.	1,800	651	1,444	5,469	9,364
Share of 0	14.0	16.0	15.3	7.0	10.2
Share of 5	83.9	82.0	78.7	90.0	86.5
Share of 10	2.1	2.0	6.0	3.0	3.2
Fraction who die:					
Entire sample	8.4	12.3	17.0	25.6	20.0
Among 0	6.7	7.7	17.7	22.8	15.7
Among 5	8.7	13.3	17.0	25.9	20.6
Among 10	8.1	7.7	16.1	22.9	18.5

$\Rightarrow$ 5 year guarantee is by far the most common, and those choosing it have the highest mortality.

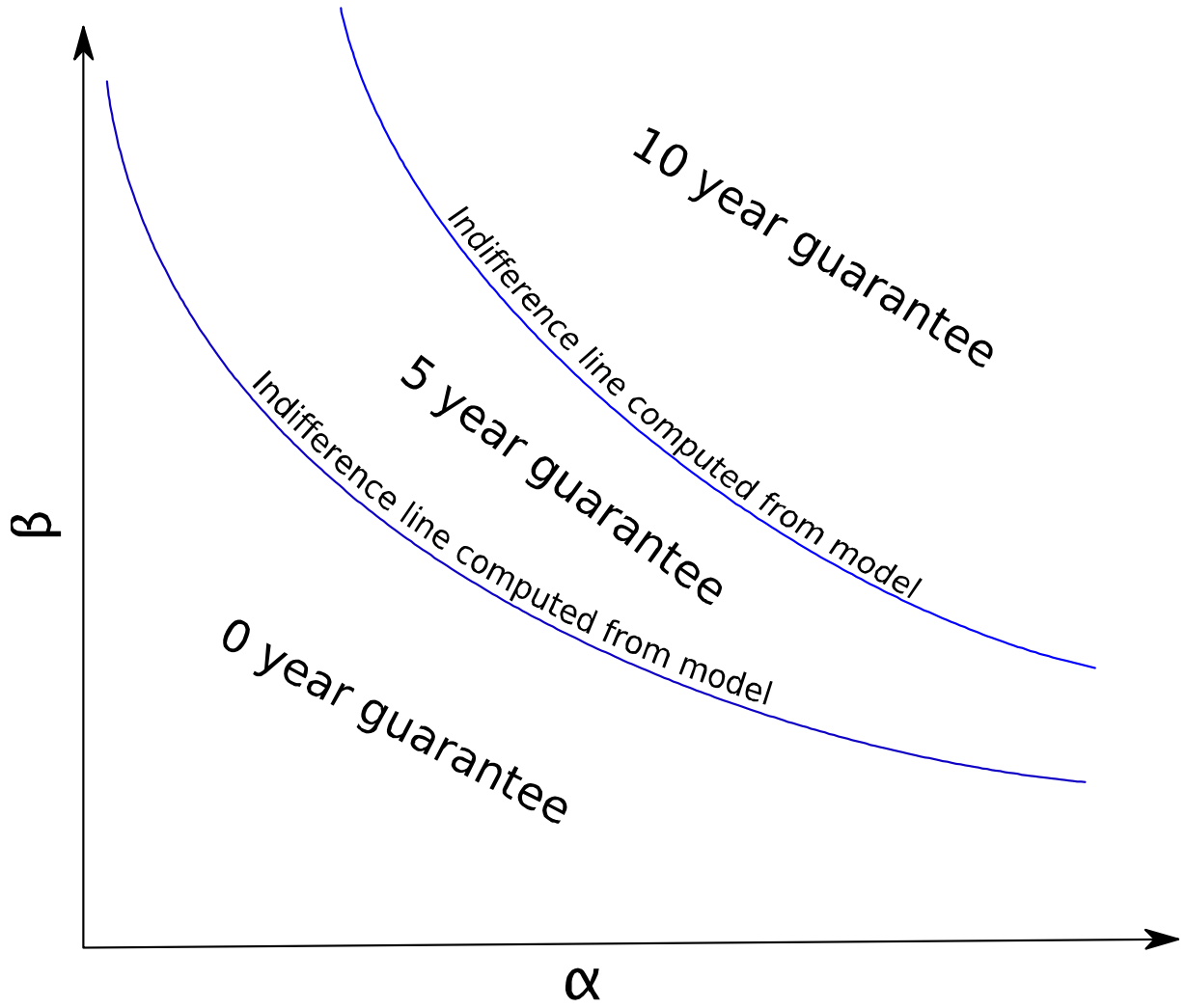
- Linear pricing:

Guarantee Length	60 Females	65 Females	60 Males	65 Males
0	0.1078	0.1172	0.1201	0.1330
5	0.1070	0.1155	0.1178	0.1287
10	0.1049	0.1115	0.1127	0.1198

Model and estimation

- Goal: recover distribution of preferences and risk types
- Observe: menu of guarantee choices, annuitants' choices, and mortality
- How to think about choice of guarantee:
  - Longer guarantee $\longrightarrow$ lower annuity payout while alive
  - Longer guarantee more attractive to someone who:
    - is more likely to die sooner (adverse selection)
    - has higher value for "wealth after death"
- Joint distribution of risk type and preferences identified from relationship between mortality and guarantee choice in the data

Intuition for estimation



Summary of results

- Both preferences and risk type important for guarantee choice
- Symmetric information (first best):
  - Average welfare loss due to asymmetric information = £127 million annually (2% of premiums, 25% of relevant guarantee margin)
  - Driven by distortion in choices: under symmetric information, all individuals choose 10 year guarantee
- Government mandates (no guarantee choice):
  - Mandate can increase (10 yr) welfare by £127 million or decrease (0 yr) by £107 million depending on which contract is mandated
  - Not ex-ante obvious that 10 year guarantee would be optimal mandate (rarely chosen in equilibrium) $\Rightarrow$ achieving welfare gains through mandatory insurance may be difficult in practice: how would we know to choose the "right" compulsory contract?
- Robustness: qualitative results fairly stable across a wide array of deviations from the baseline model.

Conclusions

- First attempt, to our knowledge, to empirically estimate welfare costs of asymmetric information in insurance markets and welfare consequences of mandatory social insurance.
  - Cannot be estimated from reduced form equilibrium relationship between insurance coverage and risk occurrence.
- Similar approach could be applied in other insurance markets
  - Data requirements are same as what are frequently being used to detect asymmetric information in various markets (auto, health, long term care, etc.)
  - Choice model may have to be customized to the particular context
- Moral hazard:
  - Some other markets may also have little or no moral hazard (e.g. nursing home use)
  - For markets where moral hazard is likely to be important, additional source of variation in data probably required
  - Recent work using dynamic insurance data