Ex-Post Loss Sharing in Consumer Financial Markets

Alexandru Barbu

discussed by Johan Hombert (HEC Paris)

INSEAD Finance Symposium 2022

The paper in a nutshell

- Main result: Insurers/brokers nudge holders of variables annuities with in-the-money guarantees into exchanging them against less valuable contracts
- “Consumer exploitation” / “Ex-post loss sharing”
  - Twist vs. well-known hh finance biases: give up good investment vs. buy bad investment
  - $\approx$ mirror image of the mortgage non-refinancing bias

The paper in a nutshell

- Main result: Insurers/brokers nudge holders of variables annuities with in-the-money guarantees into exchanging them against less valuable contracts
- "Consumer exploitation" / "Ex-post loss sharing"
  - Twist vs. well-known hh finance biases: give up good investment vs. buy bad investment
  - $\approx$ mirror image of the mortgage non-refinancing bias
- Important topic
  1. Large market
  2. Redistributive impact
  3. Insurers risk management

The paper in a nutshell

- It is a JMP: two papers in one!

    1. Rich reduced-form evidence on contract exchanges

    2. Model, structural estimation, counterfactuals

- My discussion: (mostly) the structural estimation

Roadmap of discussion

- Summary of reduced-form evidence
- Ex-post loss sharing
- Model estimation

Summary of reduced-form evidence

- Insurers/brokers nudge consumers into exchanging their guaranteed VAs against less valuable ones
  - 1.5% to 5% of policies exchanged per year (20-80 bn USD)
- Evidence of supply-side explanation
  - More generous contracts are exchanged more
  - Event study: higher fiduciary standards in NY $\Rightarrow$ fewer exchanges
  - Exchanges correlate positively with low reputational concerns
  - Exchanges correlate with broker misconduct and discretionary compensation
- Rule out main demand-side explanations (default risk, tax, life events)

Welfare implications of ex-post loss sharing

- "Ex-post loss sharing": insurance against market risk with inattentive investors

- Inattention can be good in insurance context because of the Hirshleifer effect

Welfare implications of ex-post loss sharing

- "Ex-post loss sharing": insurance against market risk with inattentive investors
- Inattention can be good in insurance context because of the Hirshleifer effect
- Health insurance (Handel, 2013): inattentive low risk individuals buy insurance $\Rightarrow$ redistribute from the lucky to the unlucky $\Rightarrow$ Good!

Welfare implications of ex-post loss sharing

- "Ex-post loss sharing": insurance against market risk with inattentive investors
- Inattention can be good in insurance context because of the Hirshleifer effect
- Health insurance (Handel, 2013): inattentive low risk individuals buy insurance $\Rightarrow$ redistribute from the lucky to the unlucky $\Rightarrow$ Good!
- Market risk insurance in euro contracts (Hombert and Lyonnet, 2021): inattentive individuals buy when reserves are low $\Rightarrow$ redistribute from unlucky to lucky cohorts $\Rightarrow$ Good!

Welfare implications of ex-post loss sharing

- "Ex-post loss sharing": insurance against market risk with inattentive investors
- Inattention can be good in insurance context because of the Hirshleifer effect
- Health insurance (Handel, 2013): inattentive low risk individuals buy insurance $\Rightarrow$ redistribute from the lucky to the unlucky $\Rightarrow$ Good!
- Market risk insurance in euro contracts (Hombert and Lyonnet, 2021): inattentive individuals buy when reserves are low $\Rightarrow$ redistribute from unlucky to lucky cohorts $\Rightarrow$ Good!
- Market risk insurance in guaranteed VAs (this paper): inattentive individuals who invested during the crisis give up their insurance $\Rightarrow$ redistribute <u>away from</u> the unlucky $\Rightarrow$ Bad!

Structural estimation

- Model insurers' exploitation behavior to...

  estimate the share of inattentive consumers

  estimate value extracted from inattentive consumers

  estimate reputational costs from exploitation

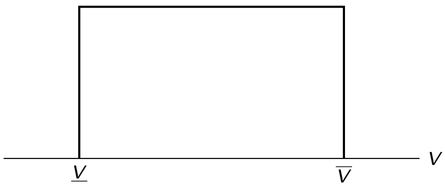
  conduct counterfactual analysis

Model

- Insurers have in-force policies, which can be exchanged
- Can only exchange policies of inattentive consumers
- Ignore value of new policy $\Rightarrow$ exchange $=$ lapse

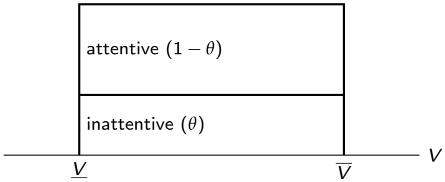
Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract



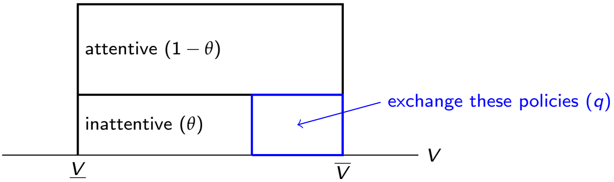
Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract



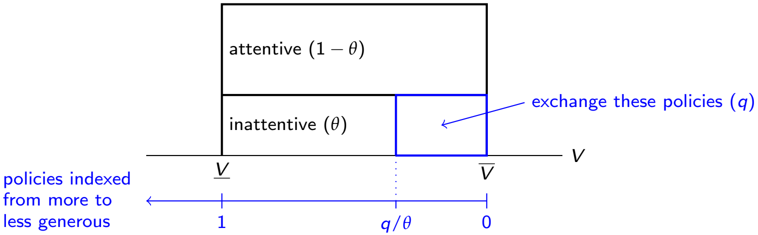
Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract



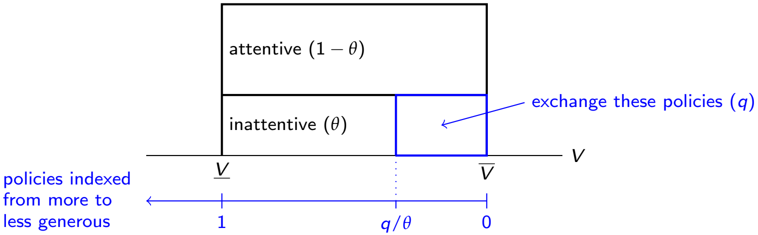
Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract



Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract

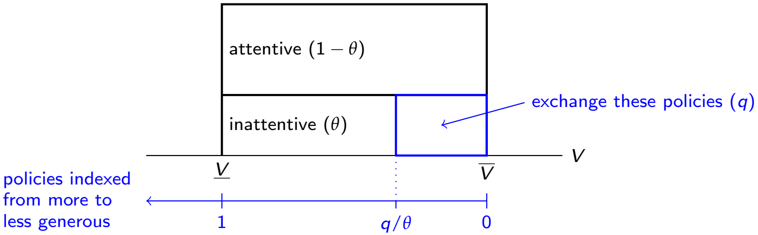


- $\max\limits_{q} \int_0^q V(q'/\theta)dq' - B(q)$

  $B(q)$: reputation cost of exchanging q

Model

- V: insurer's profit from exchanging one policy
- Distribution of V across policies within a given type of contract



- $\max_q \int_0^q V(q'/\theta)dq' - B(q)$

  $B(q)$: reputation cost of exchanging q
- FOC: $V(q/\theta) = B'(q)$

  value of marginal policy exchanged = marginal reputation cost

Model estimation

- First stage: estimate the distribution of V
- Second stage: estimate θ and $B(q)$

First stage: Estimation of the distrib of V

- Estimate the distribution of policy value V across all policies in force at a given point in time (2018)

- Ideally: data at individual policy level

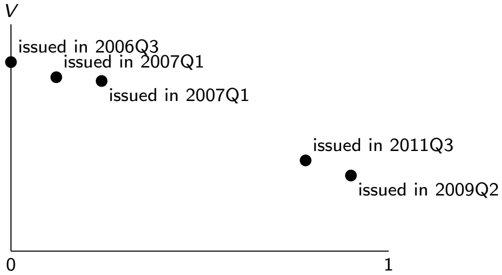
  $\Rightarrow$ Calculate V for every in-force policy

- Actually: data at contract $\times$ issuance quarter level: contract characteristics of policies issued in each quarter

  $\Rightarrow$ Calculate average V across all policies issued in a given quarter: V_{ijt} for contract i, insurer j, issued in quarter t

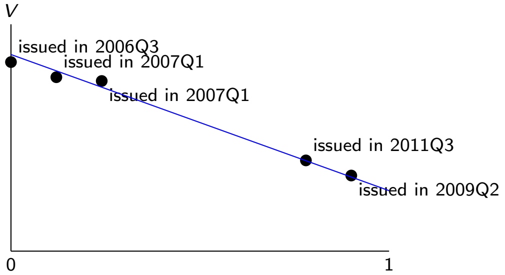
First stage: Estimation of the distrib of V

- For each contract i insurer j: plot the (inverse) cumulative distribution of V_{ijt} across issuance quarters t



First stage: Estimation of the distrib of V

- For each contract i insurer j: plot the (inverse) cumulative distribution of V_{ijt} across issuance quarters t



- $\Rightarrow V(q) = \widehat{\alpha}_{ij} + \widehat{\beta}_{ij} q$

Questions/Comments

1. Is there variation in contract value V within an issuance quarter (e.g., $\neq$ life expectancy)?

   If yes, the dispersion of V is underestimated. Does it matter?

Questions/Comments

1. Is there variation in contract value V within an issuance quarter (e.g., $\neq$ life expectancy)?

   If yes, the dispersion of V is underestimated. Does it matter?

2. Why does V vary across issuance quarters ($\neq$ entry points, $\neq$ guaranteed rate, etc.)?

Questions/Comments

1. Is there variation in contract value V within an issuance quarter (e.g., $\neq$ life expectancy)?

   If yes, the dispersion of V is underestimated. Does it matter?

2. Why does V vary across issuance quarters ($\neq$ entry points, $\neq$ guaranteed rate, etc.)?

3. Model predicts that insurers exchange inattentive consumers' policies issued in most generous quarter first, then in second most generous quarter, and so on

   Are data on exchanges granular enough to test this restriction of the model?

Questions/Comments

4. Reputational cost = function of the total number of policies exchanged across all contracts: $B\left(\sum_{i,t} q_{ijt}\right)$

- Alternative (more realistic?): reputational cost depends on the intensity of omissions and misrepresentation in exchange offers
  - Insurer chooses misrepresentation intensity m_{ijt} on each consumer
  - Consumers exchange with probability $q(m_{ijt})$
  - Reputational cost $B(m_{ijt})$
  - $\Rightarrow$ Reputational cost $= \sum_{i,t} B(q^{-1}(q_{ijt}))$

Questions/Comments

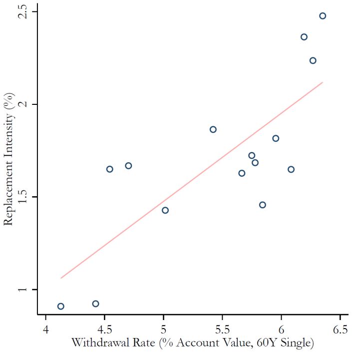
4. Reputational cost $=$ function of the total number of policies exchanged across all contracts: $B\left(\sum_{i,t} q_{ijt}\right)$

- Alternative (more realistic?): reputational cost depends on the intensity of omissions and misrepresentation in exchange offers
  - Insurer chooses misrepresentation intensity m_{ijt} on each consumer
  - Consumers exchange with probability $q(m_{ijt})$
  - Reputational cost $B(m_{ijt})$
  - $\Rightarrow$ Reputational cost $= \sum_{i,t} B(q^{-1}(q_{ijt}))$

- Similar to current model except
  1. Continuous exchange intensity at contract level
  2. No need to define and estimate θ (maximum number of policies exploitable) but only marginal reputational cost

Questions/Comments

- Still predicts more generous contracts are exchanged more
- But predicts a smooth relation between contract generosity and exchange intensity instead of a bang-bang one



- Might be simpler to estimate because FOC w.r.t. q_{ijt} does not depend on the other $q_{i'jt'}$

Second stage: Estimation of θ and $B(q)$

- Start from the FOC
$$V(q/\theta) = B'(q)$$
- Estimated in first stage: $V(q) = \alpha_{ij} + \beta_{ij} q$
- Parametric assumptions on $B(q)$: depend on contract and insurer characteristics
- This discussion: suppose $B(q) = b_0 q$
$$\Longrightarrow \qquad \alpha_{ij} + \beta_{ij}\frac{q}{\theta} - b_0 = 0$$
- Add error term
$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij}$$
- α_{ij}, β_{ij}, q_{ij} observed. θ and b_0 to be estimated
- Estimated by GMM under identifying assumption $E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$$

1. Which moments are targeted in GMM estimation?

    - Use as instruments all exogenous regressors and α_{ij}

    - But isn't α_{ij} endogenous by assumption?

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$$

2. Wouldn't it be more intuitive to assume $E[u_{ij} \mid \alpha_{ij}, \beta_{ij}] = 0$?

i.e., q_{ij} depends on contract generosity $(\alpha_{ij}, \beta_{ij})$, and on unobserved contract-specific propensity to exchange orthogonal to contract generosity (u_{ij})

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij}\,|\,\beta_{ij}, q_{ij}] = 0$$

3. If target the covariance of FOC against β_{ij}, q_{ij} (and α_{ij}?) and the expectation of FOC

   $\Rightarrow$ 3 (or 4) moments for 2 parameters

   $\Rightarrow$ Model is over-identified

   $\Rightarrow$ Great! Report over-identification test

   $\Rightarrow$ Model is probably rejected (models always are!) but direction of rejection helps determine how to revise the model

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$$

4. Intuition for identification of θ?

- Depends on which moments are targeted. Consider cov of FOC against q_{ij} and assume β_{ij} is constant across insurers

  $\Rightarrow$ Equivalent to regressing α_{ij} on q_{ij} $\quad \Rightarrow \frac{1}{\theta} = \underbrace{-\frac{1}{\beta}}_{>0} \frac{Cov(q_{ij}, \alpha_{ij})}{Var(q_{ij})}$

- $\theta > 0$ because generous contracts are exchanged more: $Cov(q, \alpha) > 0$

- More dispersion in exchange intensity across insurers (higher $Var(q_{ij})$) $\Leftrightarrow$ More inattentive consumers (higher θ)

  Intuition: Insurers with generous contracts can exploit more (inattentive) consumers without having to walk down too low in the contract generosity distribution

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$$

4. Intuition for identification of θ (cont'd)?

- In paper, cov with both q_{ij} and β_{ij} (and α_{ij}?) are targeted

- Why moments matter more to identify θ?

  $\Rightarrow$ Show the gradient of $\widehat{\theta}$ with respect to each targeted moment

- What is the economic intuition for how each moment identify θ?

Comments/Questions

$$\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta} - b_0 = u_{ij} \qquad E[u_{ij} \mid \beta_{ij}, q_{ij}] = 0$$

5. Intuition for identification of b_0

- Expectation of FOC

$$b_0 = E\left[\alpha_{ij} + \beta_{ij}\frac{q_{ij}}{\theta}\right]$$

- $q_{ij} << 1$ (around 2% on avg)

$$\implies \qquad \widehat{b_0} \approx \text{sample mean of } \alpha_{ij}$$

- Intuition: share of contracts exchanged is small, so the marginal reputational cost must be equal to the value of the most generous contracts
- (Do we need the model to make this point?)

Summary

- Super relevant and interesting!
- Reduced-form analysis convincing
- Structural model: useful for counterfactual analysis, need more intuition on identification