Information Frictions and Adverse Selection: Policy Interventions in Health Insurance Markets

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Motivation: Inefficiencies in Insurance Markets

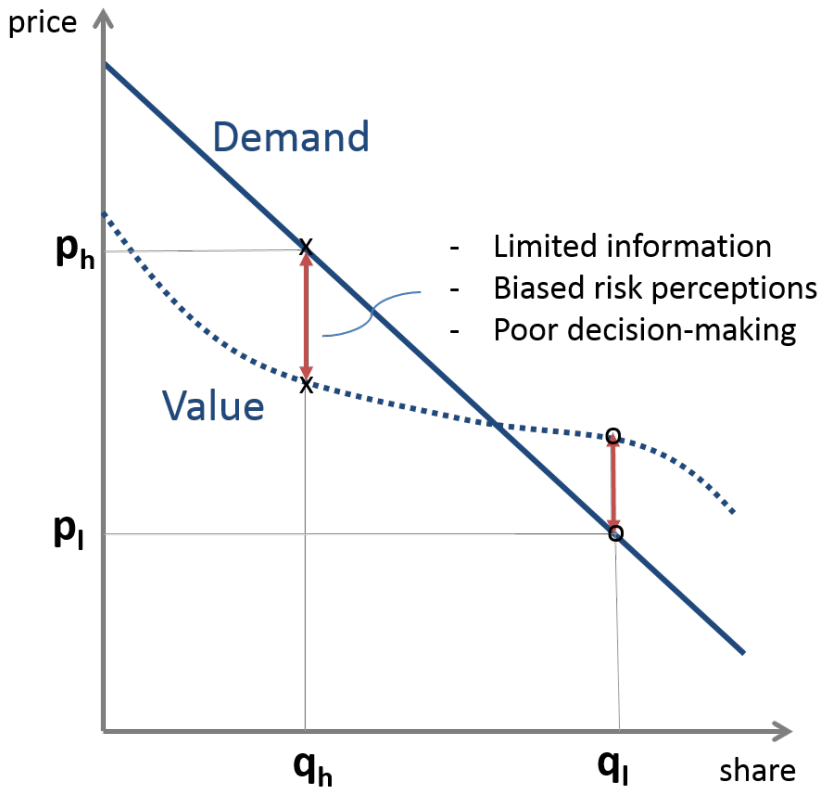
- Long literature on adverse selection in insurance markets
  - *Inefficient pricing* is key reason for policy intervention (e.g., risk-adjustment transfers)
  - Selection on risks leads to *under-insurance* (or even unravelling)
- Growing literature on information frictions and inertia
  - *Inefficient choices* are key reason for policy intervention (e.g., information provision, decision aids, default)
  - Over-estimation of risks/coverage leads to *over-insurance*
- This paper:
  - Demand-side and supply-side inefficiencies interact
  - Key for market designers / regulators to think about consumer frictions and selection issues jointly

Outline

- Model
- Simulations
- Empirical setting [HK (2015)] and Calibration
- Counterfactual Market / Policy Analysis

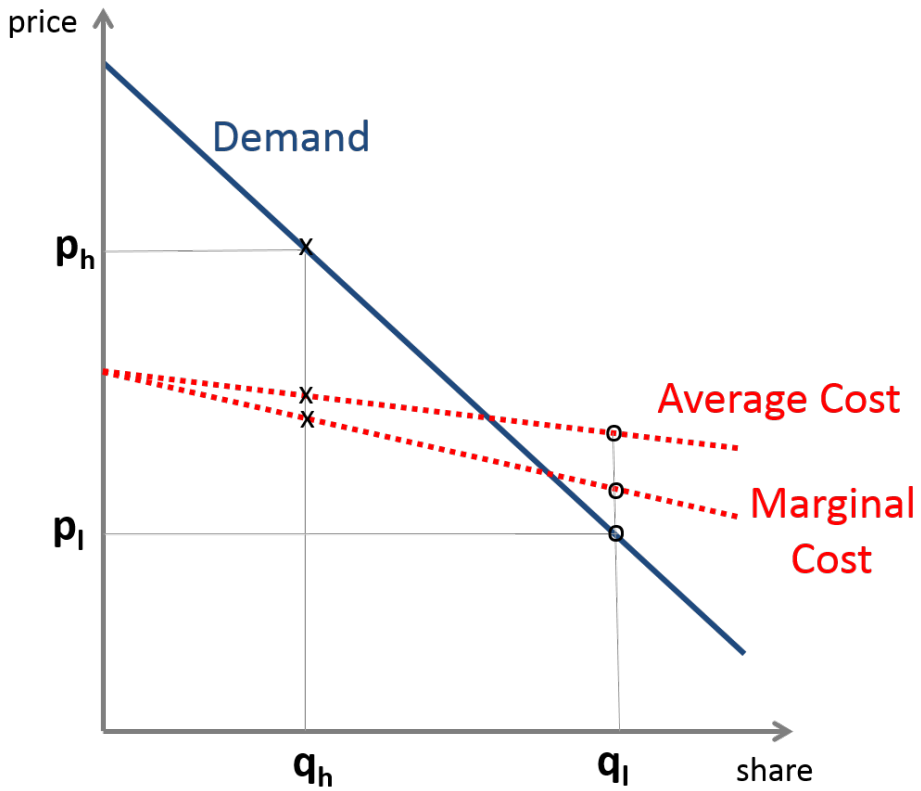
Inefficient Selection (1): Information Frictions

- Heterogeneity in willingness-to-pay determines demand for insurance
- Information frictions can lead to a difference between *demand* and welfare-relevant *valuation* (see Spinnewijn '16)



Inefficient Selection (2): Health Expenses

- Expected expenses determine both wtp and cost to insurer. Implied positive correlation induces adverse selection
- Welfare surplus depends on *marginal* cost. Competitive pricing depends on *average* cost. (see Einav et al. '10)



Insurance Model with Frictions

- Micro-foundations of willingness to insure:

$$w_i = v_i + f_i = s_i + c_i + f_i$$

- Heterogeneity in 3 'observable' dimensions (w, f and c);

  Buy if $w \geq p$. Efficient to buy if $v \geq c$.

- Demand frictions may worsen or mitigate the inefficiency due to average cost pricing

Proposition 1: *The welfare impact of an increase in equilibrium coverage is equal to the surplus of marginal buyer:*

$$E_{P^c}(s) = [P^c - E_{P^c}(c)] - E_{P^c}(f)$$

Policy Interventions

Proposition 2&3: *The impact of reducing frictions depends on*

(1) impact on demand ($\sim E_{P^c}(f)$)

(2) re-sorting on costs ($\sim var_{P^c}(f) + var_{P^c}(c) - var_{P^c}(s)$)

(3) re-sorting on surplus ($\sim var_{P^c}(f) + var_{P^c}(s) - var_{P^c}(c)$)

Proposition 4: *Risk-adjustment policies are complementary to friction-reducing policies due to the increased risk selection.*

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Empirical Application: Health Insurance

- Use estimates from Handel and Kolstad (2015) to calibrate market with two health plans:
  - Preferred Provider Organization plan ($\approx 100\% AV$)
  - High Deductible Health Plan ($\approx 75\% AV$)
  - Same providers and services
- Detailed administrative data for large firm with approx. 55,000 US employees covering 120,000 lives
  - Data on health plan choice
  - Detailed claims data / risk metrics
- AND individually-linked survey data on consumer information
  - Information about plan financial characteristics
  - Information about own health risk
  - Information about provider networks
  - Perceived ex post time and hassle costs, tastes

Example

Provider Network Knowledge

- Hypothesis: Many people think the financially comprehensive plan has better doctors/treatments
- Survey evidence:
  - *Less than 50%* of people in each plan know that medical care access is identical
  - Those who (mistakenly) believe that PPO has better doctors are more likely to choose PPO
- Structural analysis (upcoming) indicates that those who (mistakenly) believe this, value PPO's by an additional $2,362 on average

Empirical Model w/ Frictions

- Estimate random utility model with non-structural friction dummies Z_f representing \$ effect of frictions for HDHP
- Consumer k choose plan from $J = \{HDHP, PPO\}$ that maximizes expected utility:

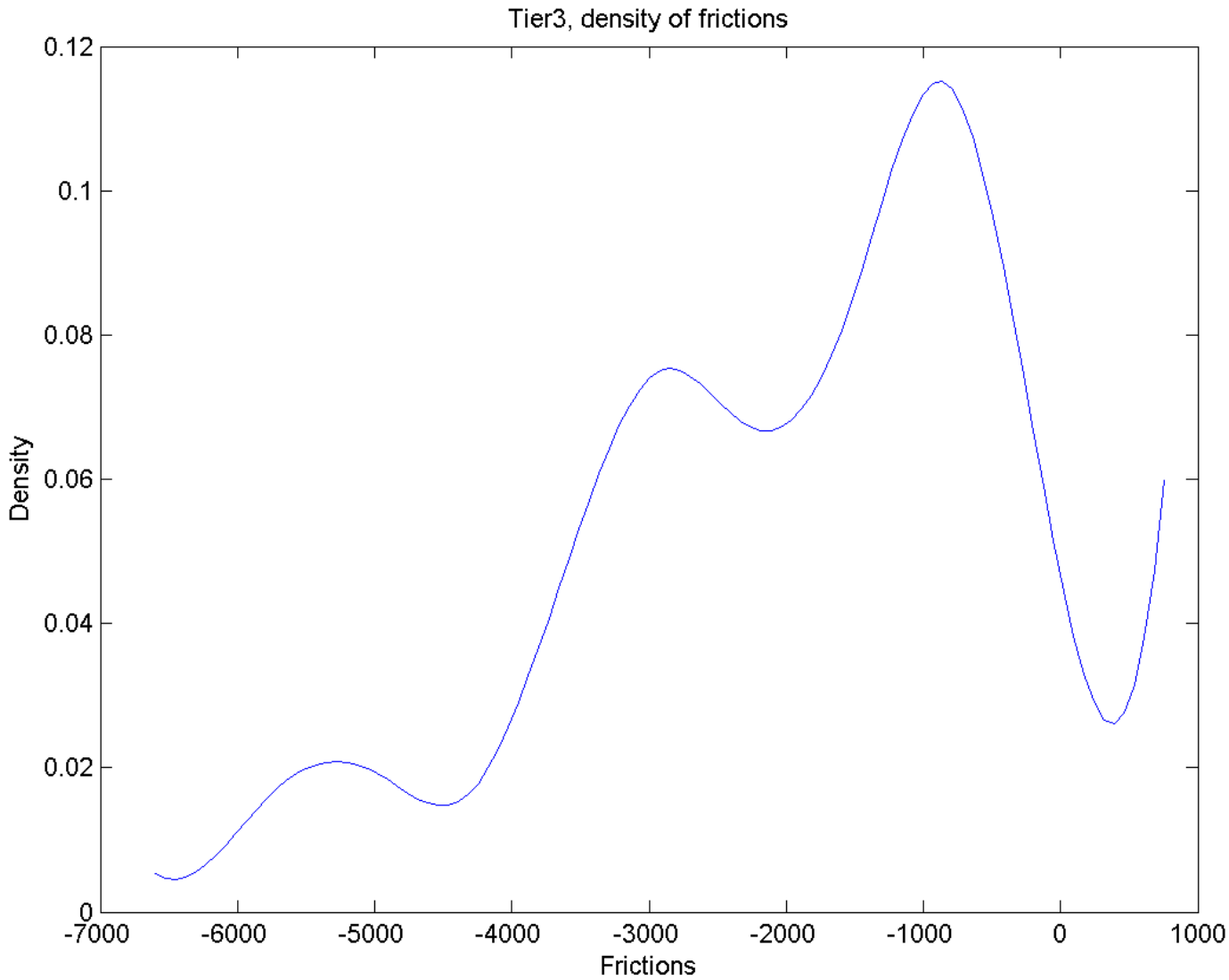
$$\max_{j \in J} U_{kjt} = \int_0^{\infty} u_k(m_j, OOP) f_{kjt}(OOP) dOOP$$

$$u_k(m_j, OOP) = -\frac{1}{\gamma_k(X_k^A)} e^{-\gamma_k(X_k^A)(m_j - OOP)}$$

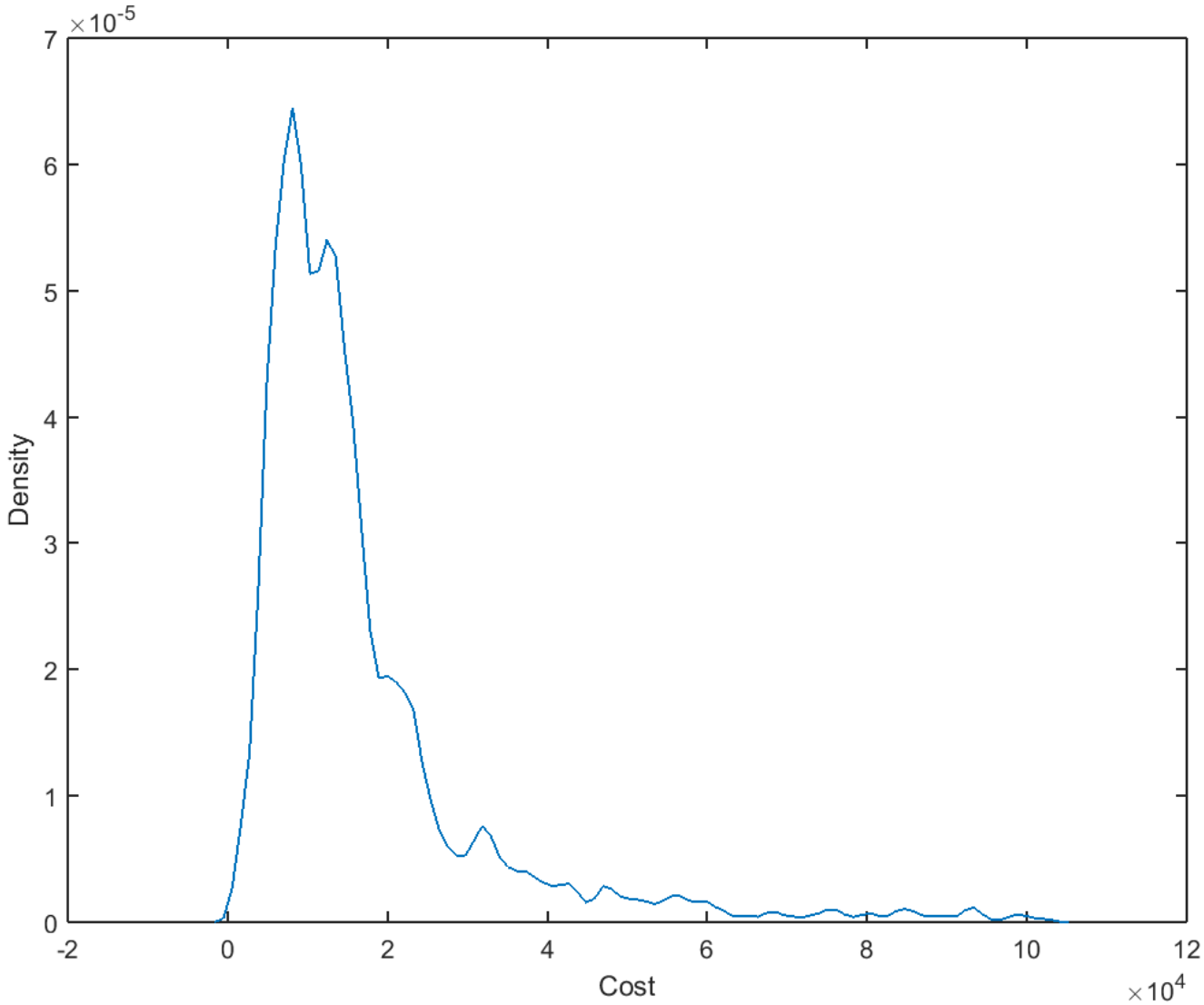
$$m_j = W_{kt} - P_{kjt} + \eta(X_k^B)\mathbf{1}_{j_t = j_{t\ 1}} + \Sigma_{f=1}^{F} \beta_f Z_f * I_{HDHP} + \epsilon_{kjt}$$

- Calibrate micro-foundations (f, c, s) of insurance model

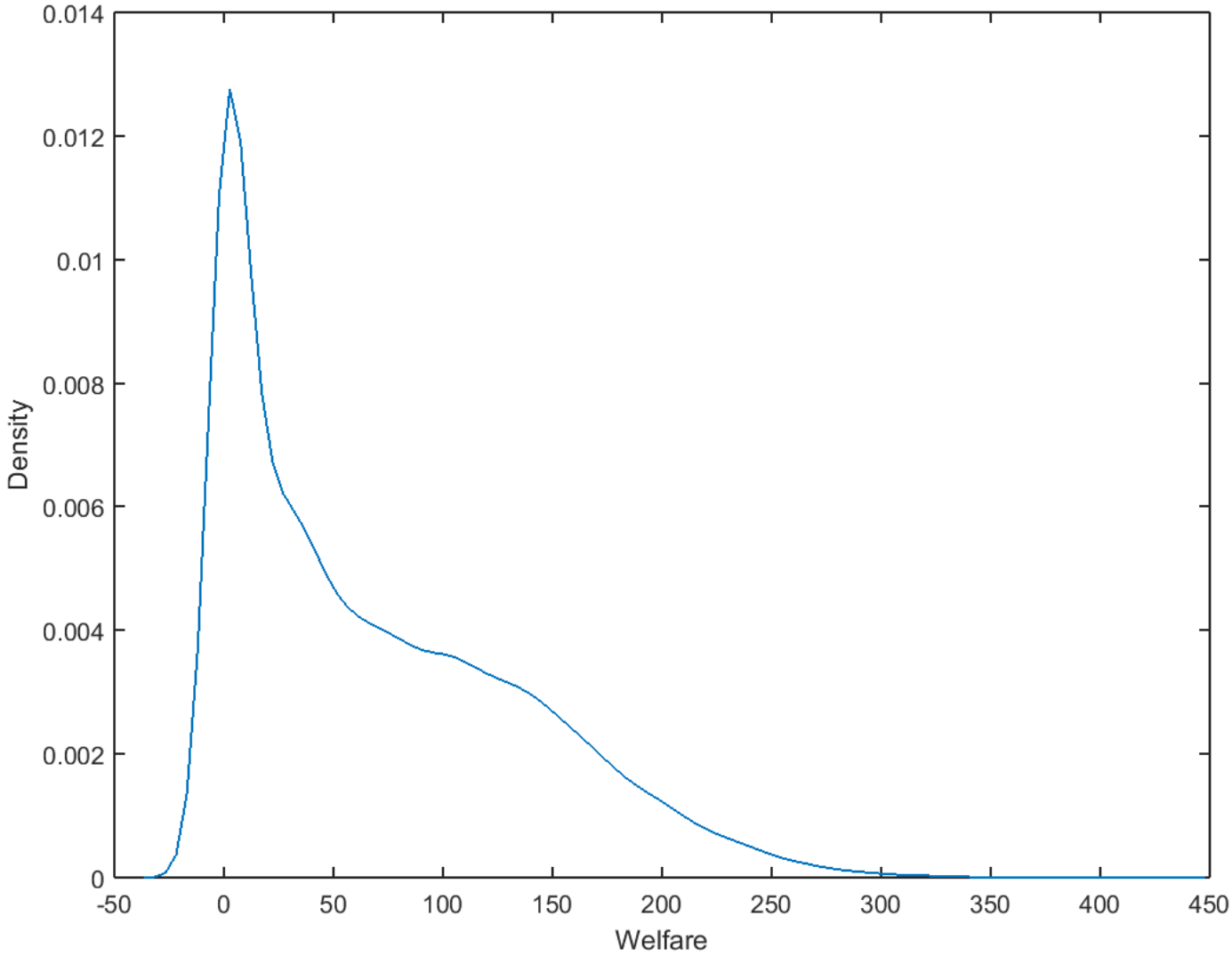
Distribution of Friction Values for HDHP



Distribution of Expected Costs



Distribution of Insurance Surplus



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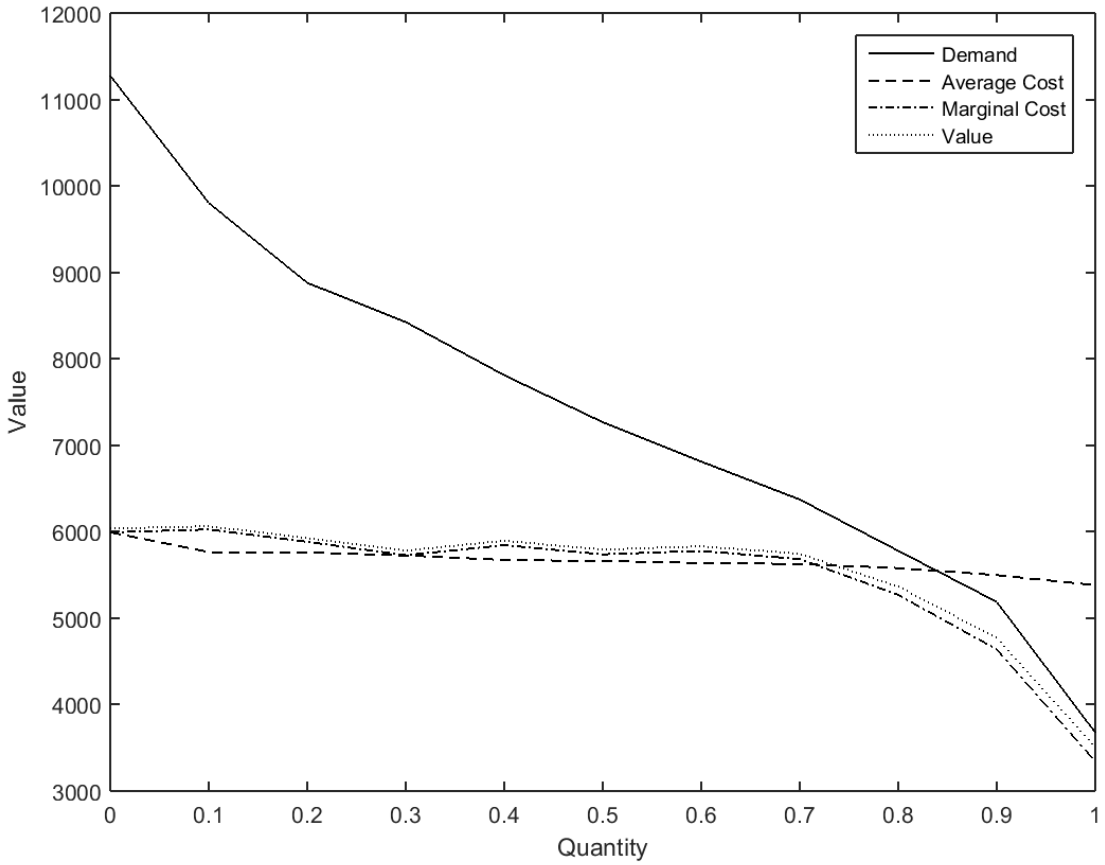
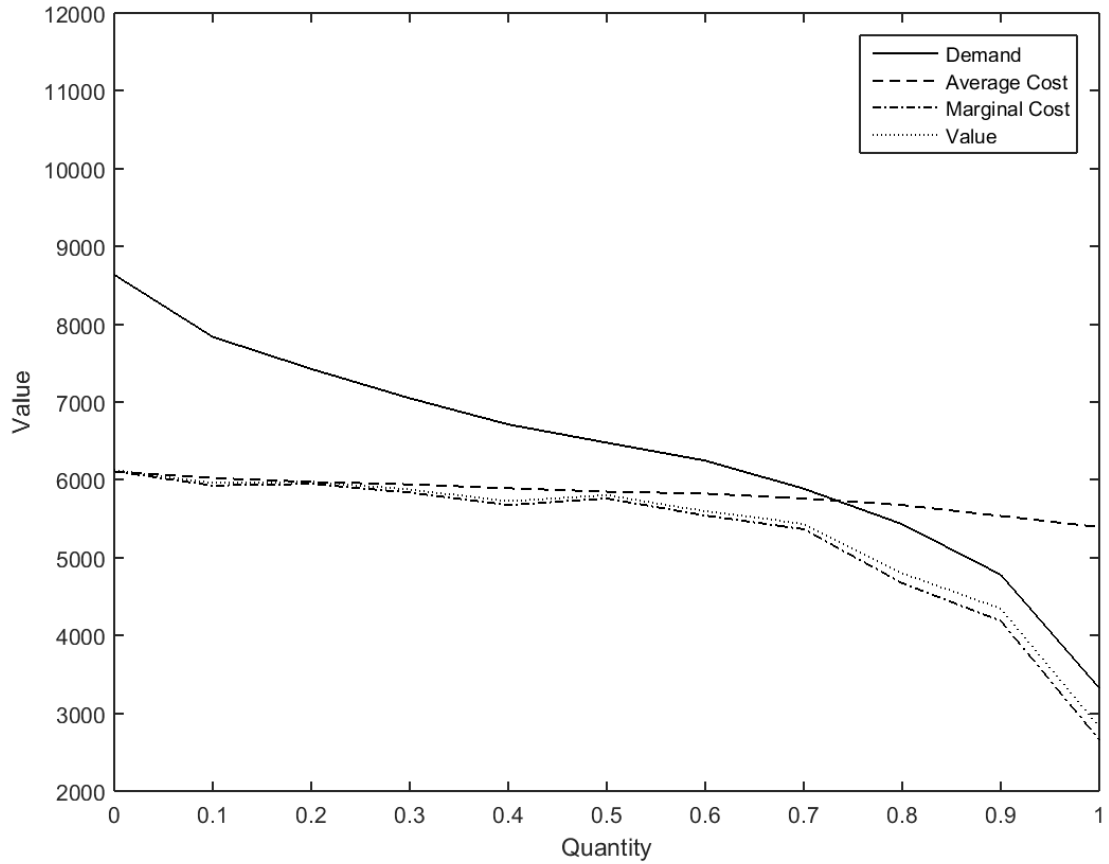
Baseline Case: No Intervention



- *PPO* Mkt Share $\approx$ 84%. Fairly low risk preference estimates lead to small, but positive surplus from buying *PPO*.

Partially Reduced Information Frictions

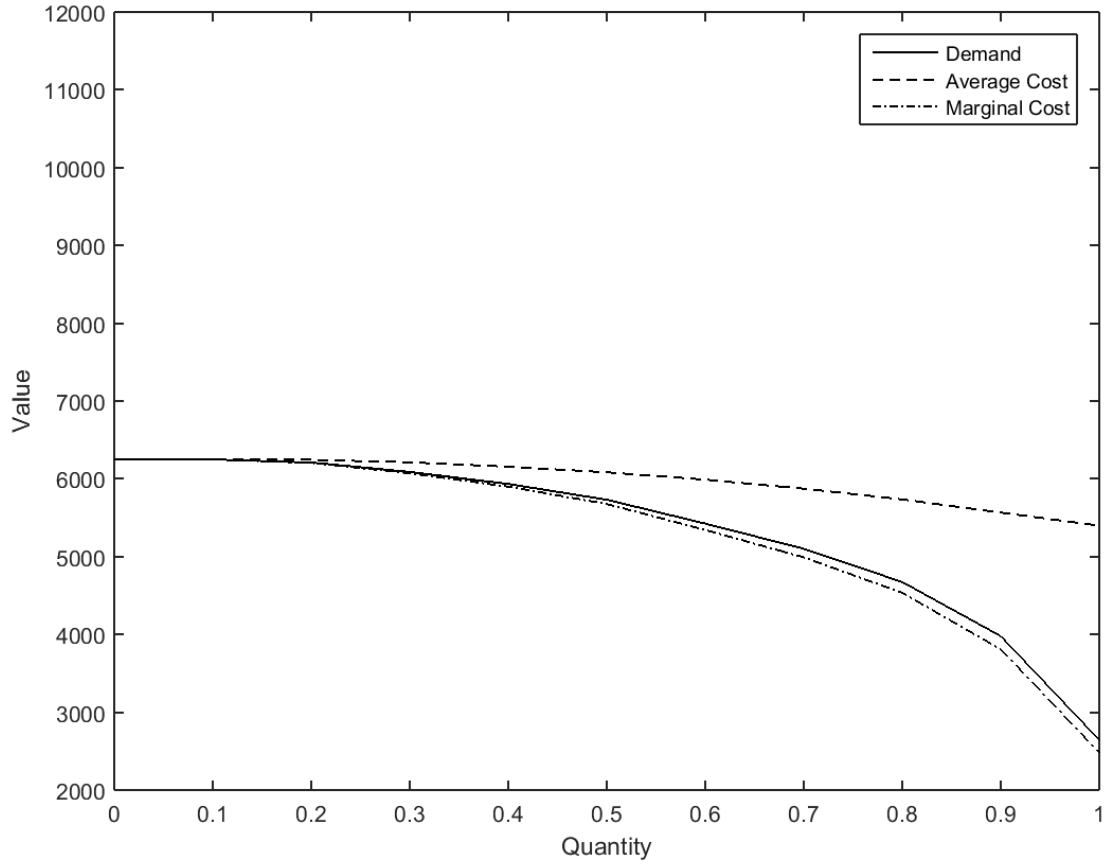
$\alpha = 0.5, \beta = 0$



- *PPO* Mkt Share drops to $\approx$ 72%. Some incremental adverse selection.

Fully Reduced Information Frictions

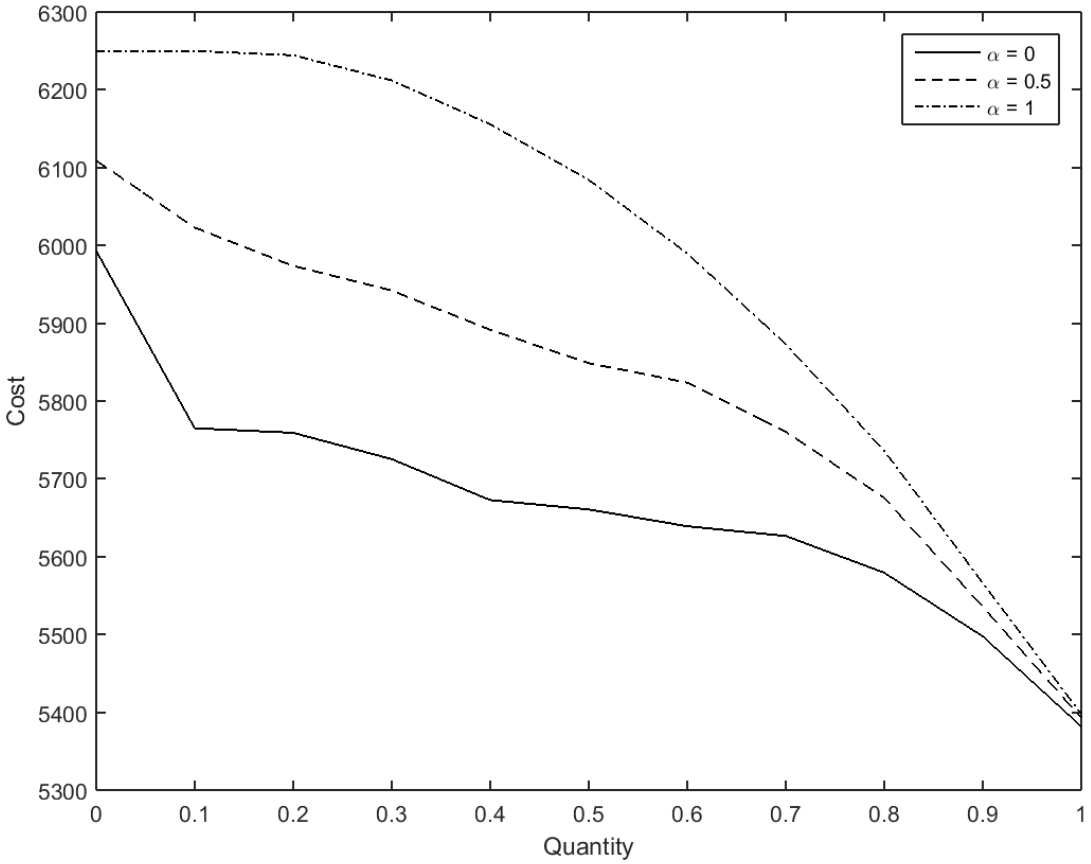
$\alpha = 1, \beta = 0$



- Market essentially unravels (very low *PPO* market share). Demand shifts in and scope for adverse selection increases.

Sorting Effect: Cost Curves

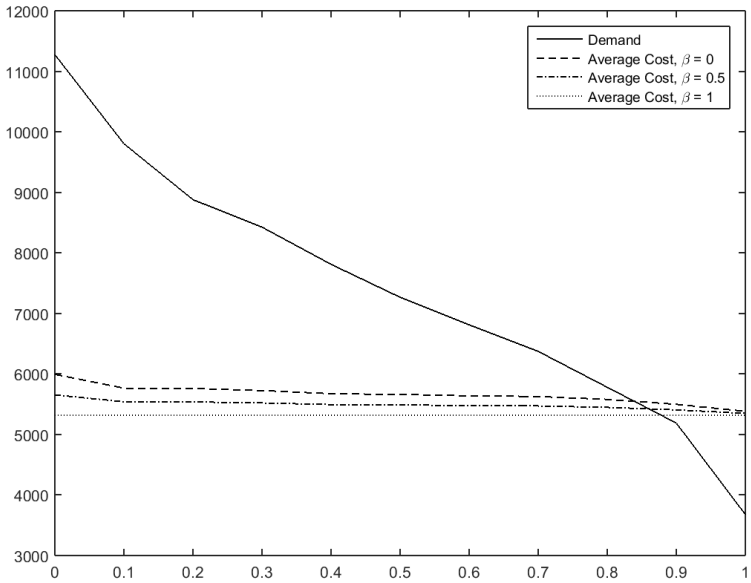
Reduced Frictions

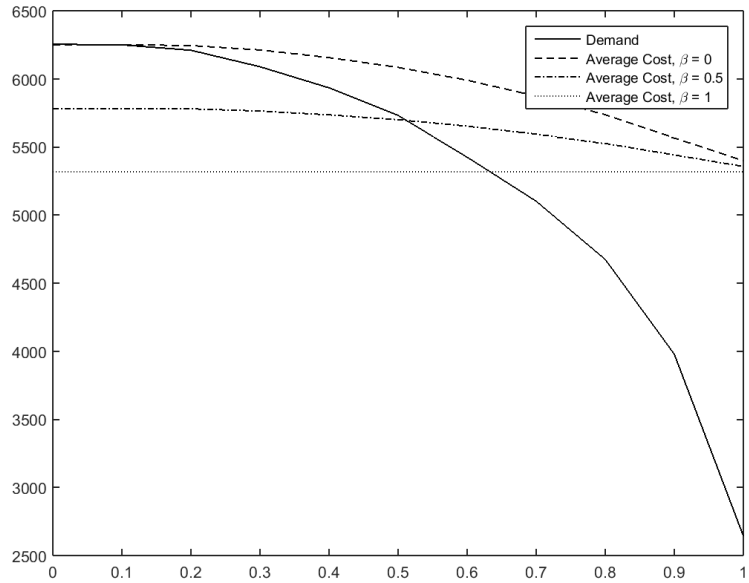


- As frictions are reduced the cost curves become steeper.

Impact of Risk-Adjustment Transfers

Insurer AC curves $\alpha = \{0, 1\}, \beta \in \{0, .5, 1\}$

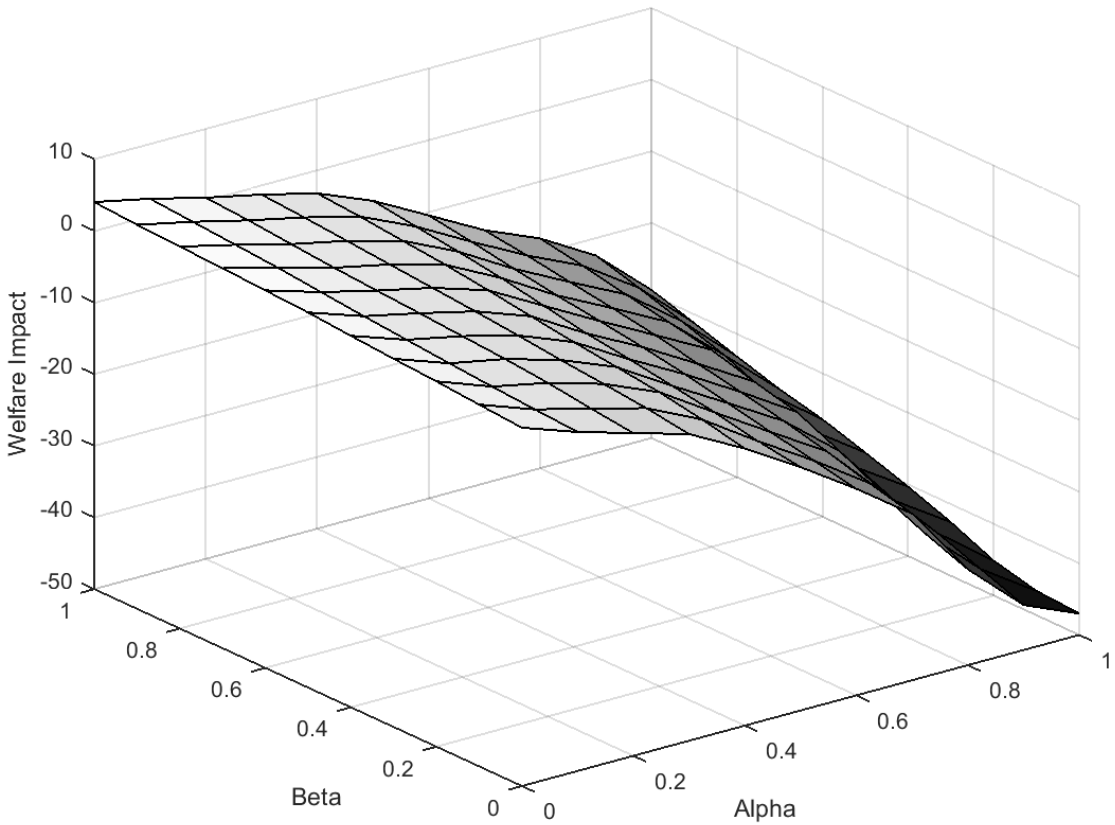




- Full insurer risk-adjustment transfers ($\beta = 1$) increase *PPO* mkt. share from 84% to 90% with frictions, from 0% to $\approx$ 65% with no frictions

Welfare

Function of α (friction-reduction) and β (risk-adjustment)



- Decrease in coverage level translates into lower welfare
- Improved sorting on surplus for high α has limited welfare effect

Conclusion

- Policies to reduce choice frictions have important implications in selection markets
- We develop framework with key 'sufficient' micro-foundations to analyze (i) friction-reducing policies and (ii) risk-adjustment transfers
- Allows us to investigate when such policies will be welfare-increasing vs. welfare-reducing, and develop comparative statics with respect to key foundations
- Empirical implementation, with estimates of micro-foundations, illustrates how framework can be applied
- Important for market designers / regulators thinking about both consumer frictions and selection issues