

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

Ben Handel (Berkeley & NBER), Jonathan Kolstad (Berkeley & NBER) and Johannes Spinnewijn (LSE & CEPR)

November 16, 2016 – Amsterdam

# Motivation: Inefficiencies in Insurance Markets

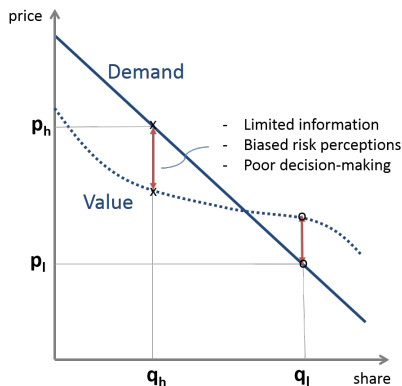
- Long literature on adverse selection in insurance markets
  - ▶ *Inefficient pricing* is key reason for policy intervention (e.g., risk-adjustment transfers)
  - ▶ Selection on risks leads to *under-insurance* (or even unravelling)
- Growing literature on information frictions and inertia
  - ▶ *Inefficient 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

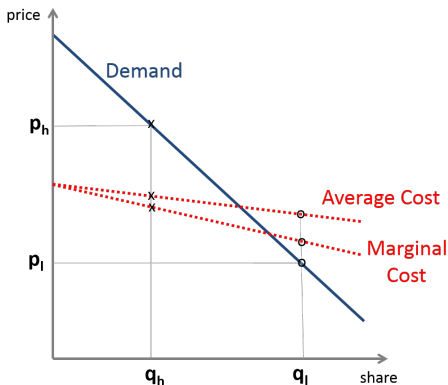
# Inefficient Selection (1): Information Frictions

- 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 ( $\sim E_{Pc}(f)$ )*

(2) *re-sorting on costs ( $\sim \text{var}_{Pc}(f) + \text{var}_{Pc}(c) - \text{var}_{Pc}(s)$ )*

(3) *re-sorting on surplus ( $\sim \text{var}_{Pc}(f) + \text{var}_{Pc}(s) - \text{var}_{Pc}(c)$ )*

**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:

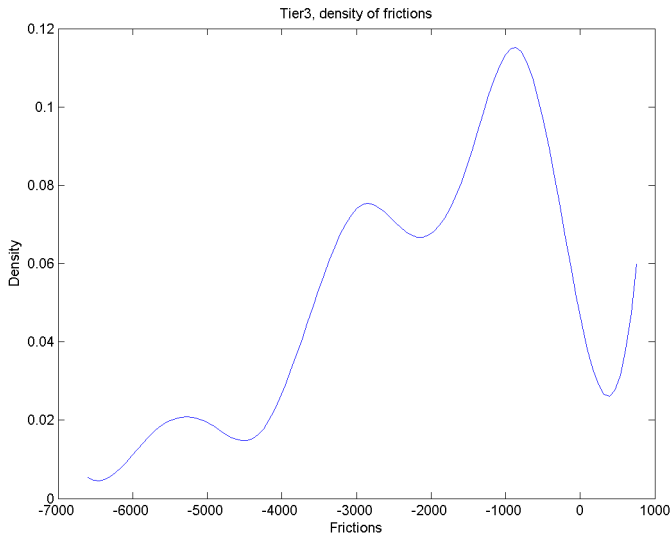
$$\max_{j \in J} U_{kjt} = \int_0^{\infty} u_k(m_j, OOP) f_{kjt}(OOP) dOOP$$

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

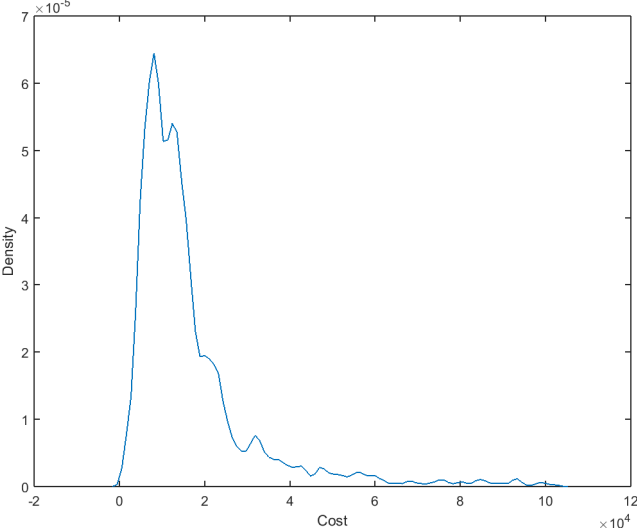
$$m_j = W_{kt} - P_{kjt} + \eta(X_k^B) \mathbf{1}_{j_t=j_{t-1}} + \sum_{f=1}^F \beta_f Z_f * I_{HDHP} + \epsilon_{kjt}$$

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

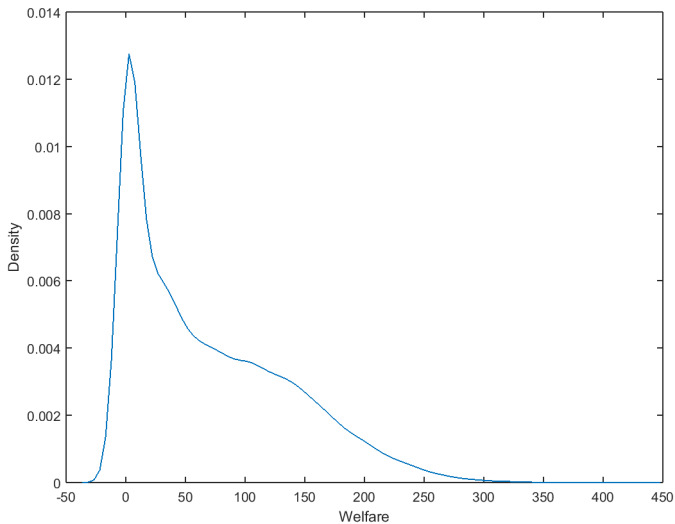
# Distribution of Friction Values for HDHP



# Distribution of Expected Costs



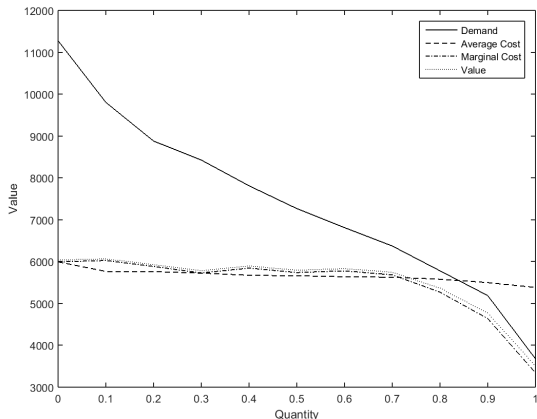
# Distribution of Insurance Surplus



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# Baseline Case: No Intervention

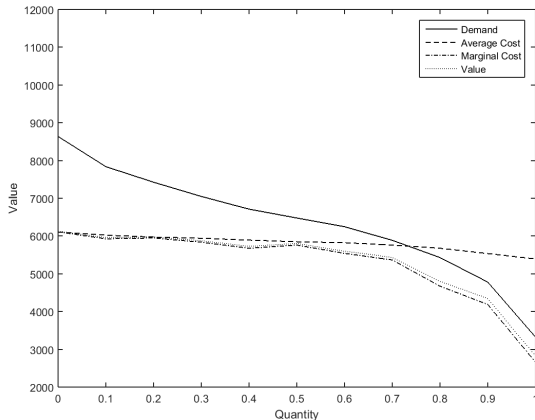


- *PPO* Mkt Share  $\approx 84\%$ . Fairly low risk preference estimates lead to small, but positive surplus from buying *PPO*.



# Partially Reduced Information Frictions

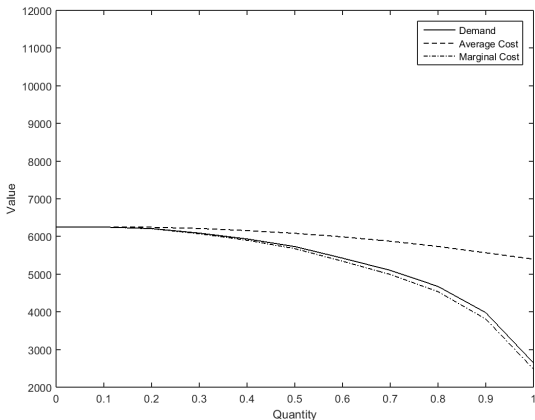
$$\alpha = 0.5, \beta = 0$$



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

# Fully Reduced Information Frictions

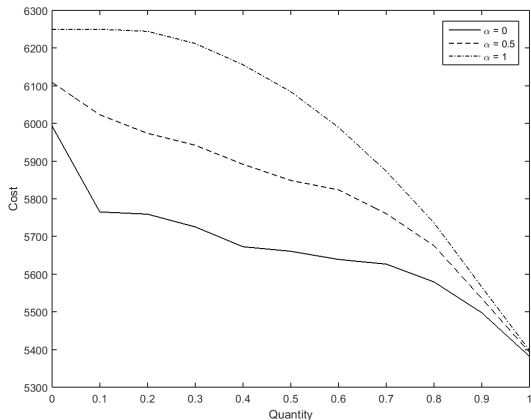
$$\alpha = 1, \beta = 0$$



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

# Sorting Effect: Cost Curves

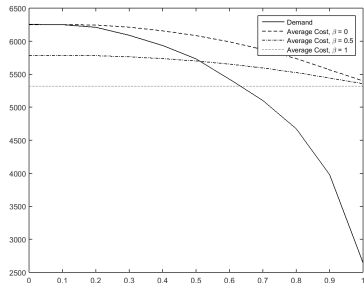
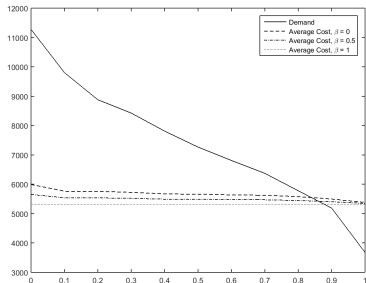
## Reduced Frictions



- As frictions are reduced the cost curves become steeper.

# Impact of Risk-Adjustment Transfers

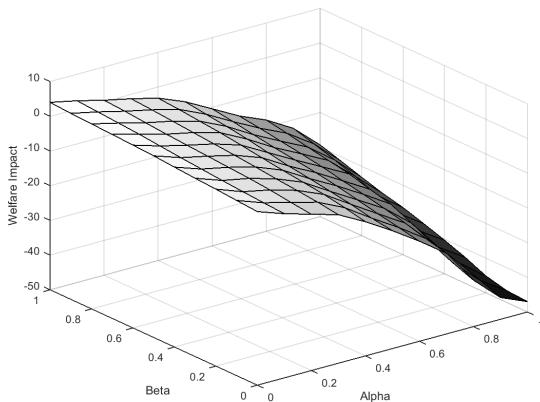
Insurer AC curves  $\alpha = \{0, 1\}, \beta \in \{0, .5, 1\}$



- 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  $\alpha$  (friction-reduction) and  $\beta$  (risk-adjustment)



- Decrease in coverage level translates into lower welfare
- Improved sorting on surplus for high  $\alpha$  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