

Commitment, Competition, and Preventive Care Provision

Anran Li

Cornell University

8/7/24

DSE Conference

7 out of 10 deaths in US are caused by preventable diseases. (CDC, 2021)

Motivation

- **Preventive care**: prevention, early detection, disease management (Kenkel, 2000)
 - Vaccines, cancer screenings, monitor blood sugar level for diabetes patients, ...
- **Increases life expectancy, reduces future costs** (CDC, 2021; USPSTF, 2021)
 - Vaccines prevent diseases, death; diabetes care prevents diabetic complications; ...
- **Under-provided/utilized** compared to govt./medical guidelines (ACA, 2010; HHS, 2023)
 - lead to an extra disease burden of over a trillion dollars annually (Devol et al., 2007)

→ What leads to prevention underprovision in equilibrium?

Investment Externalities

- Key friction: **investment externalities from insurer competition**

Insurer competition + consumer turnover (lack of consumer commitment)

→ Insurers do not internalize all future returns

→ Insurers reduce preventive investment in consumers' health

⇒ Key trade-off: **investment externalities** (low investment) vs. **market power** (high prices)

Q: How does insurer competition affect investment, health, and welfare?

This Paper

Q: How does insurer competition affect investment, health, and welfare?

1. New evidence (regression)

- Consumer turnover reduces insurers' preventive investment (nationwide exchange)

2. New framework (model)

- Dynamic insurer competition with endogenous quality & endogenous health (UT)

3. New insight (simulation)

- Efficiency losses from competition due to investment externalities can be substantial
- Policy options: consider price-invest. tradeoff + role of govt. mandate

Empirical Setting

- The individual exchange market
 - Direct consumer-insurer interactions
 - High consumer turnover: in/out exchanges (30%) + across insurers within mkt. (20%)
- Preventive care → [intertemporal incentives](#)
 - Study procedures: well-known to save future costs + guidelines available to measure
 - Mandatory coverage, free to consumers
 - Low utilization/provision compared to medical guidelines (20pp gap)
- Data
 - Insurance product choice, claims records: Utah All Payer Claims Data
 - Preventive utilization, investment: CMS quality rating system, medical loss ratio

Motivating Evidence of Investment Externalities

1. Insurers are important in prevention utilization

- Insurer invest: remind, educate consumers + incentivize providers
- Quasi-experiment: Insurer exit, compare utilization before/after, switcher/stayer
- Move to insurer w. 1pp \uparrow utilization \rightarrow consumer's utilization prob. \uparrow 0.9pp

Motivating Evidence of Investment Externalities

1. Insurers are important in prevention utilization

- Insurer invest: remind, educate consumers + incentivize providers
- Quasi-experiment: Insurer exit, compare utilization before/after, switcher/stayer
- Move to insurer w. 1pp \uparrow utilization \rightarrow consumer's utilization prob. \uparrow 0.9pp

2. Insurers reduce prevention provision in response to consumer turnover

- Regress investment on share of consumers retained on the exchange, at state-year level
- IV for turnover: national-industry job hiring (shift) + industry-st. employment (share)
- 1 pp \uparrow retention \rightarrow 0.79 pp \uparrow utilization, \$5.3 \uparrow per member preventive investment

Equilibrium Model - Insurance Demand

$$u_{ijt} = \underbrace{(\alpha_0 + \alpha_1 \mu_{it-1}) p_{jt}}_{\substack{\text{price sensitivity} \\ \text{by health status}}} + \underbrace{(\rho_0 + \rho_1 \mu_{it-1}) e_{jt}}_{\substack{\text{prevention pref.} \\ \text{by health status}}} + \underbrace{\gamma \mu_{it-1} co_ins_j}_{\substack{\text{out-of-pocket} \\ \text{expenses}}} + \underbrace{\eta \mathbf{1}[d_{it-1} \neq j]}_{\text{inertia}} + \theta X_{jt} + \xi_{jt} + \epsilon_{ijt}$$

- Forces
 - Repeated choices, **do not commit** to stay with one insurer
- Key Primitives
 - Inertia η
 - Preference for price α , preventive care ρ , medical expenses γ

Equilibrium Model - Insurance Supply

$$V_f(\vec{s}_{t-1}, \vec{\mu}_{t-1}) = \max_{\vec{p}_{ft}, x_{ft}} \left\{ \underbrace{\pi_{ft}(\vec{s}_{t-1}, \vec{\mu}_{t-1}, \vec{x}_t, \vec{p}_t)}_{\text{flow profit}} + \underbrace{\beta \int V_f(\vec{s}_t, \vec{\mu}_t) \overbrace{g_f(\vec{s}_t, \vec{\mu}_t | \vec{s}_{t-1}, \vec{\mu}_{t-1}, \vec{x}_t, \vec{p}_t)}^{\text{state transitions}} dF_{\vec{\mu}_t}}_{\text{expected future profit}} \right\}$$

- Forces
 - **Invest** x_{ft} : tradeoff static costs - higher future profits, lower health risks
 - **Price** p_{ft} : tradeoff market power - investment externalities

- Key Primitives
 - Investment cost $x_f(e_{ft})$: dollar expenses in prevention \rightarrow utilization
 - Returns to prevention $g(\mu_t | \mu_{t-1}, e_{ft})$: current health + utilization \rightarrow next period health

Equilibrium Model - Insurance Supply

$$V_f(\vec{s}_{t-1}, \vec{\mu}_{t-1}) = \max_{\vec{p}_{ft}, x_{ft}} \left\{ \underbrace{\pi_{ft}(\vec{s}_{t-1}, \vec{\mu}_{t-1}, \vec{x}_t, \vec{p}_t)}_{\text{flow profit}} + \underbrace{\beta \int V_f(\vec{s}_t, \vec{\mu}_t) \overbrace{g_f(\vec{s}_t, \vec{\mu}_t | \vec{s}_{t-1}, \vec{\mu}_{t-1}, \vec{x}_t, \vec{p}_t)}^{\text{state transitions}} dF_{\vec{\mu}_t}}_{\text{expected future profit}} \right\}$$

- Oblivious assumption for MPNE
 - Keep track of “average” enrollees of every competitor
 - State space: vector of market shares \vec{s}_{t-1} , average health status by insurer $\vec{\mu}_{t-1}$
- Computation: extended trilinear interpolation, polynomial approximations, etc
- Novelty: dynamic quality incentives + endogenous population health

Key Market Features Implied by Model Estimates

1. Consumers

- Relatively price elastic, -5.47
- Low willingness-to-pay for prevention
- No meaningful diff. in preference for prevention by health → not effective selection tool

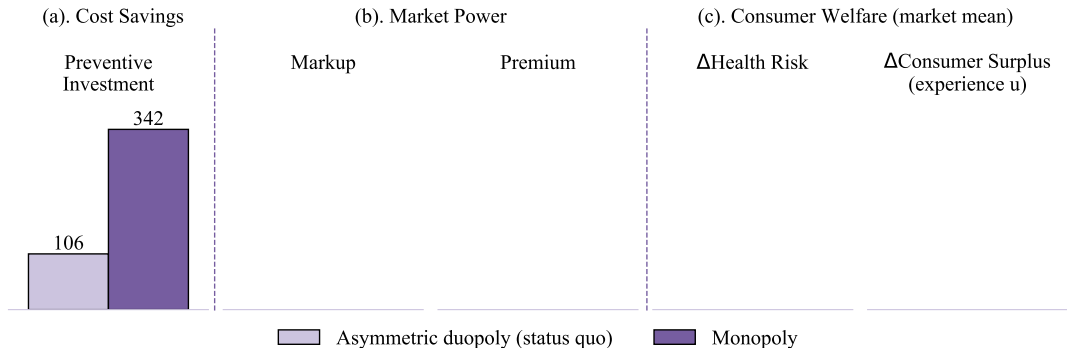
2. Insurers

- Cost savings motives dominate static market share motives for investment
- Costly preventive investment, ↑ 3-4 times from \$174 to achieve govt. targets
- Consumer turnover impact investment returns, ↑ competitor → 28.1% ↓ cost savings

3. Model fit: predicted effects of retention on investment match reduced-form well

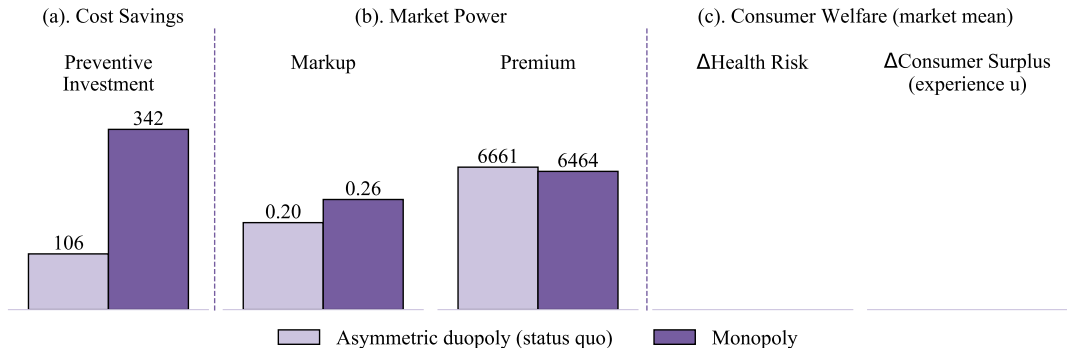
Welfare Effects of Insurer Competition

- \uparrow **invest**: \downarrow turnover, capture more returns + no free riding



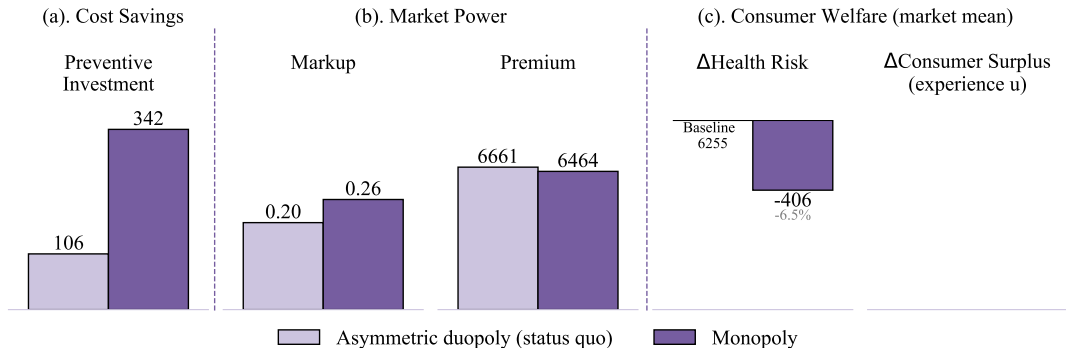
Welfare Effects of Insurer Competition

- $\sim p$: \uparrow investment, $\downarrow MC \approx \uparrow$ markup



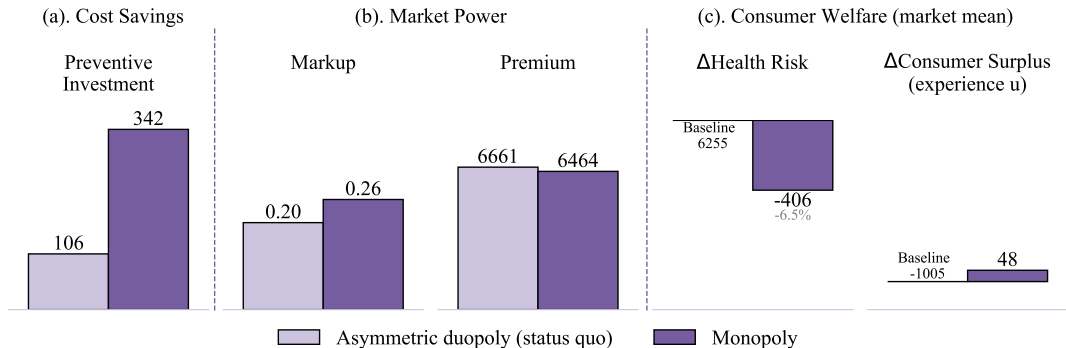
Welfare Effects of Insurer Competition

- ↓ **health risk**: invest. per insured + share of insured cons. who receive prevention



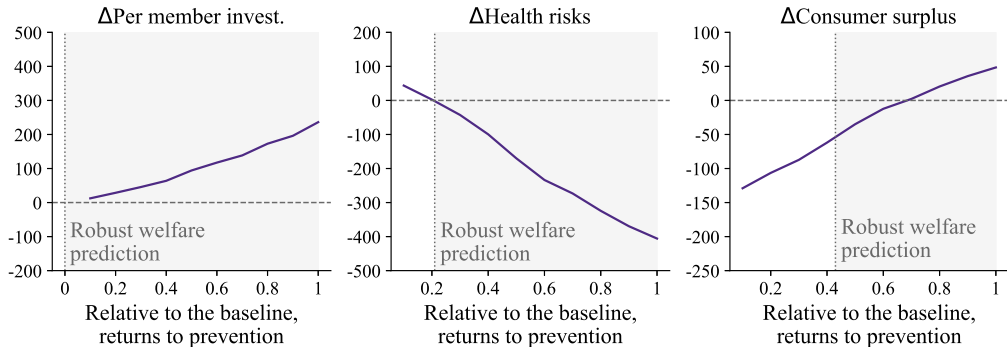
Welfare Effects of Insurer Competition

- \sim **CS**: welfare distortions of underinvestment about same size as high pricing power



Welfare Effects of Insurer Competition

- \downarrow health risks, \sim CS: hold for a reasonable range of returns to prevention parameter



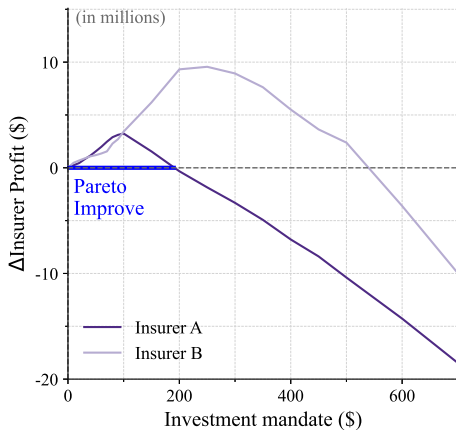
Welfare Effects of Insurer Competition

→ Efficiency losses of competition from investment externalities can be substantial

- Next, what policies can improve investment and welfare?

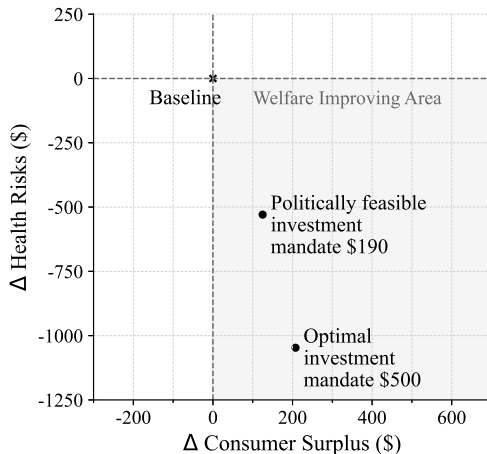
Policy Simulation: Investment Mandates

- Investment mandate could resolve insurers' prisoners' dilemma



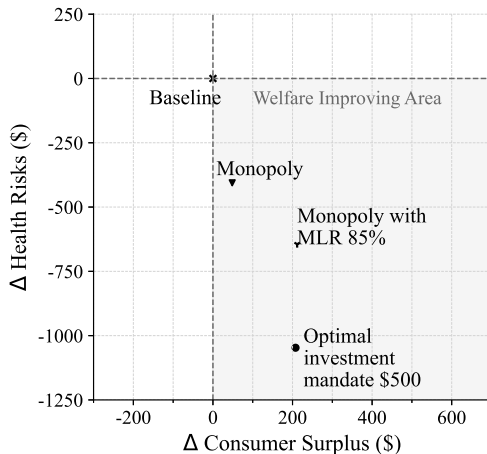
Policy Simulation: Investment Mandates

- Optimal mandate: cost savings vs. premium increases → consider invest.-price tradeoff



Policy Comparison

- Direct quality regulation is most effective in addressing investment externalities



Conclusion

- **Summary: efficiency losses of competition due to investment externalities**
 - **New evidence:** consumer turnover reduces insurers' preventive investment
 - **New framework:** dynamic insurer competition with endogenous prod. char. & health
 - **New insight:** importance of long-run quality incentives; tradeoff w. market power
 - **Policy implications:** direct quality regulation can improve investment, welfare

Thank you!

anran.li@cornell.edu