Market Power and Redistribution: Evidence from the Affordable Care Act[1]

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Broad motivation

- Negative effects of market power on consumers long recognized — but focus on aggregates, not the distributional consequences
- Yet market power can have substantial distributional implications
- Many government policies create markets that aim to both: (1) get efficiency gains from competition and (2) implement redistributional policies
- **In this paper we use the empirical laboratory of publicly-subsidized health insurance markets to examine if these policy objectives may be in direct conflict with each other**

Our Goals and Contributions

1. Outline general economic forces that govern distributional consequences of strategic intermediaries
   - Heterogeneous consumers
   - Uniform pricing
   - Firms with market power
2. Highlight general mechanism: a **demographic externality** wherein my price depends on demographic composition of neighbors
3. Quantify the efficiency and distributional losses from market power in an important program with strategic intermediaries and means-tested public transfers

Empirical context:

- Market for health insurance plans created in 2010 under the Affordable Care Act
- Why is ACA a good environment to study distributional effects of market power?
  1. **In-kind means-tested** subsidies
  2. Scope for intermediaries' **market power**

Preview of Results

- Market power:
  - 21% lower average CS
  - 15pp lower rate of insurance coverage
  - Firms capture 50% of surplus from public transfers
- Impact of market power varies across income groups
  - Willingness to pay for insurance low among low-income (subsidized) consumers
  - Larger relative losses from market power among low-income consumers
- Means-tested subsidy design *exacerbates* distortions from market power and is inefficient under a utilitarian welfare function
- Need high preferences for redistribution for the means-testing in the presence of market power to be the CS-maximizing policy

Setting and Data

Conceptual Model

Empirical Model

Policy Simulations

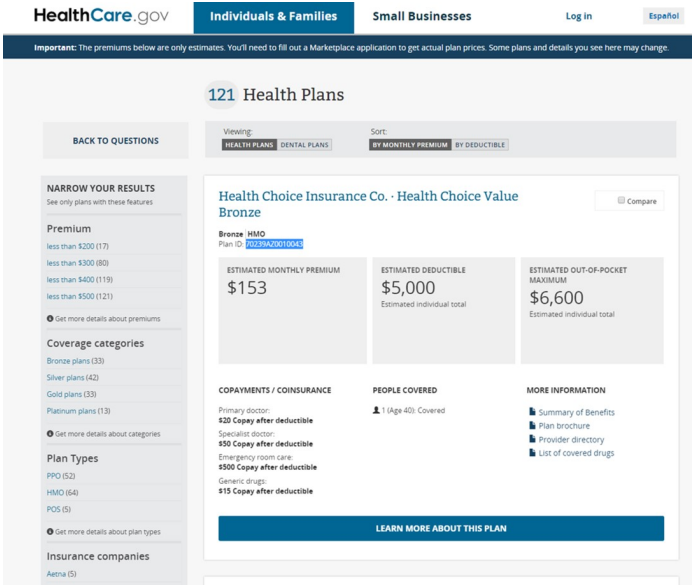
Basic Institutional Facts

- ACA Marketplaces - individual health insurance contracts
- Ca. 9 million potential consumers
- Markets (roughly) at county level (2,561 counties)
- Consumers don't have to buy, but insurers have to sell
- **Uniform list prices conditional on age and market**[2]
- Consumers with low incomes eligible for means-tested subsidies

[2] Smoking status can be underwritten, but in practice is not verifiable.

Means-Tested Subsidies

- A key feature of the market is that list prices are uniform conditional on age, but consumers are eligible for **means-tested subsidies**
- CAP := maximum amount that **tax family** f "should" be spending on health insurance premiums
- SLSP := premium of the second cheapest Silver (70%) plan in family $f's$ market for the **coverage family**
- Compute subsidy (tax credit) for **tax family**
  - If $CAP > SLSP$, subsidy=0
  - If $CAP < SLSP$, subsidy = $(SLSP - CAP)$
  - Subsidy at most equal to actual premiums paid



- Online interface for plan choice personalizes premiums and cost-sharing
- Plans are highly multi-dimensional

Data

For year 2017 (closest to equilibrium set of institutions),

- **Choice set data:**
  - CMS data on all plan features, plan premiums, and where plans are offered
- **Enrollment data:**
  - Outside option (i.e. potential market size) data provided by KFF
  - CMS enrollment data: county by metal; county by demographic group; plan-level
- **Demographics:**
  - ACS survey - restrict the sample to individuals without public insurance (incl. Medicaid expansion) or ESI

Summary Statistics

	Mean[3]	Std. Dev.	10th pctile	90th pctile
A. Choice set				
Number of large insurers	2.16	1.13	1	4
Average annual premium (age 40), $	5,106	902	3,978	6,351
B. Enrollment				
Market size	7,867	25,756	479	15,671
Share outside option	0.60	0.17	0.43	0.76
Plan-level enrollment	3,165	12,040	39	6,353
C. ACS Sample of Potential Consumers				
Age	39	2	36	42
Income in % FPL	295	52	231	365
Annual max premium subsidy, $	2,349	1,244	919	4,226

[3] Across counties; not population-weighted

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Overview of Conceptual Model

- Conceptual model has three key ingredients:
  1. Heterogeneous consumers $\rightarrow$ marginal cost, demand, subsidy
  2. Uniform pricing rule
  3. Firms that may have market power
- Three aims for the model:
  1. Uniform pricing rule has distributional implications per se
  2. Amplified with the introduction of type-specific subsidies
  3. Further amplified with the exercise of market power
- Assume that subsidy schedule embeds policymaker's preferences for redistribution
- Bottom line: cautions against the use of private intermediaries in environments with redistributional objectives

Demand

- Unit mass of consumers faces a menu options, $j = 1, \ldots, J$, with associated utility:

$$U_{ij} = u_j(p_j, w_i, \theta_i, \epsilon_{ij}), \tag{1}$$

  where i indexes the consumer, p_j is the product's price, w_i are consumer characteristics, θ_i is a vector of utility parameters, and ϵ_i is a vector of preference shocks
- Usual discrete choice DGP: $U_{ij} > U_{ik}, \forall k$ and $U_{ij} > 0$.
- Market-level demand from aggregating demands:

$$s_j(p) = \int s_{jd}(p_j, w) g(w) dw, \tag{2}$$

  where $s_{jd}(p; d)$ is the share of consumers within group d who buy good j and density consumer characteristics $g(w)$

Uniform Pricing Rule Without Market Power

- Under perfect competition, prices are set equal to average marginal cost:

$$\bar{p}_j = \frac{1}{s_j(\bar{p})} \int c_{dw} \cdot s_{jw}(\bar{p}, w) g(w) dw. \tag{3}$$

- First observation: the regulatory prohibition on price discrimination has distributional implications
- Uniform pricing: pools together consumers of different types, competitive price that is the sum of marginal costs weighted by each consumer type's share of market demand
- Even without market power, the equilibrium price depends on the demographic composition of their market via a pooling mechanisms in the vein of Rothschild and Stiglitz (1976) and Waldfogel (2003)
- **We label this economic relationship a "demographic externality"**

Targeted Subsidies Introduce Another Dimension of Heterogeneity

- Denoting schedule of targeted subsidies as $Z(w)$, demand shifts outward:

$$s_j(p, Z(w)) = \int s_{jw}(p, z_w) g(w) dw, \tag{4}$$

- Competitive price now determined by:

$$\hat{p}_j = \frac{1}{s_j(\hat{p}, Z(w))} \int c_{jw} \cdot s_{jw}(\hat{p}, z_w) g(w) dw. \tag{5}$$

- Second primary observation: pass-through (out-of-pocket reduction in expenditures) will generally not equal z_w since $\bar{p} \neq \hat{p}$
- Change in price in response to a marginal change in the subsidy to only type a:

$$\frac{d\hat{p}_j}{dz_a} = -\frac{(\hat{p}_j - c_{ja}) \frac{\partial s_{ja}(\hat{p}, z_a)}{\partial z_a} g(a)}{\int s_{jw}(\hat{p}, z_w) + (\hat{p}_j - c_{dw}) \frac{\partial s_{jw}(\hat{p}, z_w)}{\partial \hat{p}_j} g(w) dw} \neq 0 \tag{6}$$

With Market Power

- Third observation: intermediaries with market power will further distort the equilibrium distribution of benefits from the targeted subsidy
- Key point: firms with market power equate *marginal* revenues and costs instead of *average* revenue and cost:

$$\int s_{jd}(\tilde{p}, z_d) + \tilde{p}_j \cdot \frac{\partial s_{jd}(\tilde{p}, z_d)}{\partial \tilde{p}_j} dD = \int c_{jd} \cdot \frac{\partial s_{jd}(\tilde{p}, z_d)}{\partial \tilde{p}_j} dD. \tag{7}$$

- Change in prices with targeted subsidy:

$$\frac{d\tilde{p}_j}{dz_a} = -\frac{\frac{\partial s_{ja}(\tilde{p}, z_a)}{\partial z_a} + (\tilde{p}_j - c_{ja}) \cdot \frac{\partial^2 s_{ja}(\tilde{p}, z_a)}{\partial \tilde{p}_j \partial z_a}}{\int 2\frac{\partial s_{jd}(\tilde{p}, z_d)}{\partial \tilde{p}_j} + (\tilde{p}_j - c_{jd}) \cdot \frac{\partial^2 s_{jd}(\tilde{p}, z_d)}{\partial \tilde{p}_j^2} dD} \lessgtr 0 \tag{8}$$

- Higher-order analogue of perfectly competitive counterpart
- Sign of expression is ambiguous: empirical matter

Summary: Equilibrium Consumer Prices with Targeted Subsidies

	Subsidy	p_H	p_L
Competitive, $mc_i = \overline{mc}$	Yes	$p = mc$	$p - s$
Competitive, $mc_i = \overline{mc}$	No	$p = mc$	p
Incidence		0	s
Competitive, $mc_i \neq \overline{mc}$	Yes	$\tilde{p}^c = AVC(s > 0)$	$\tilde{p}^c - s$
Competitive, $mc_i \neq \overline{mc}$	No	$p^c = AVC(s = 0)$	p^c
Incidence		$p^c - \tilde{p}^c$	$p^c - \tilde{p}^c + s$
Market Power	Yes	$\tilde{p}^m$	$\tilde{p}^m - s$
Market Power	No	p^m	p^m
Incidence		$p^m - \tilde{p}^m$	$p^m - \tilde{p}^m + s$

- Difference between intended redistribution and actual outcomes is: $p^m - \tilde{p}^m - p^c + \tilde{p}^c$
- Bottom line: caution when using strategic intermediaries in environments with redistributional objectives

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Demand Model

- We posit that individual i in family f in market t chooses plan j from the available choice set J, so as to maximize average family utility:

$$u_{ij} = -\alpha_{d(i)} p_{ij} + \psi_{d(i)} + \gamma AV_{ij} + \delta_j +$$

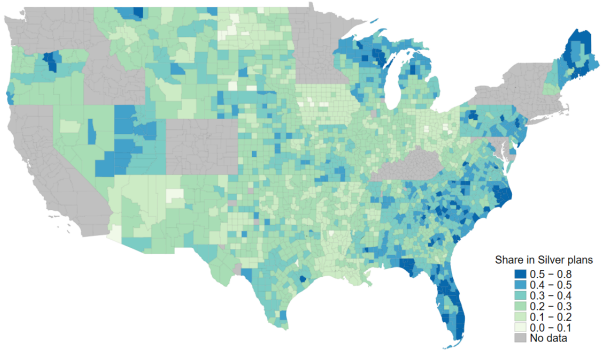
- Family f chooses a single plan or the outside option to maximize the average utility across family members:

$$\epsilon_{fj} + \frac{1}{N_f} \sum_{i \in f} u_{ij} > \epsilon_{fk} + \frac{1}{N_f} \sum_{i \in f} u_{ik}, \forall k \in J \text{ s.t. } k \neq j$$

- p_{ij} is the premium that depends on income and age
- $\psi_{a(i)}$ - average level of utility that consumers of age a get from purchasing any plan
- AV_{ij} - actuarial value of the plan that depends on income
- δ_j - non-parametrically captures the average utility from purchasing plan j
- ϵ_{fj} - family-level idiosyncratic taste shock for plan j
- Allow for demographic-group level variation in α

Demand Estimation and Identification

- Moments: market-metal; market-demographic cells; plan level (e.g. silver shares)



- Price regulation as a source of identifying variation (similar in spirit to Tebaldi, Torgovitsky, Yang 2019) – consumers face **regulation-induced** different prices for the same plan due to differences in age composition of their coverage family and household income

Demand Estimates

Demand: parameters of utility function	Mean	Age <25	Age 25–40	Age >40
Coefficient on premium, \$000 (α)				
Income <200% FPL		−5.17	−2.47	−2.21
		(0.33)	(0.16)	(0.14)
Income >200% FPL and <400% FPL		−4.32	−0.64	−3.94
		(0.27)	(0.04)	(0.26)
Income >400% FPL		−1.13	−0.20	−0.46
		(0.07)	(0.01)	(0.04)
Age-specific intercepts		1.52	−1.72	base
		(0.10)	(0.11)	
Actuarial Value	26.83			
	(1.69)			

- Higher-income consumers are less price sensitive at any age

Supply Model: Payoffs

- Profit function of firm f offering plan portfolio J_f:

$$\Pi_f(\mathbf{b}) = \sum_{j \in J_f} \sum_{d \in D} \left[(b_j \tau^d - c_j \kappa^d) s_j^d(p(b)) M^d \right]$$

- d is consumer type (age/income)
- τ is a statutory age-adjustment revenue multiplier
- $s_j^d(p(b))$ the share of consumers in age-income group d that buys plan j; $p(b)$ is the link function between list price and consumer price
- Demand (shares), subsidies, and costs vary by d
- The insurer maximizes profits by choosing a one uniform price for each plan $j \in f$ that then gets age-adjusted exogenously with τ
- The chosen bid satisfies the FOC or the MLR constraint

First-order Conditions

- Each insurer f chooses a vector of baseline list prices $\mathbf{b}$ to maximize profits
- Subject to regulatory constraints on profit margins (MLR), the optimal list price b_j for each plan $j \in J_f$ has to satisfy the following first-order condition:

$$\sum_{k \in J_f} \sum_{d \in D} \left[(b_k \tau^d - c_k \kappa^d) \frac{\partial s_k^d(p(b))}{\partial b_j} M^d + 1(j = k) \cdot \tau^d s_j^d(p(b)) M^d \right] = 0$$

- Subsidies introduce a new term in the FOC that links premiums and plan list prices:

$$\frac{ds_j(p(b))}{db_k} = \frac{\partial s_j(p(b))}{\partial p_k} \cdot \frac{\partial p_k}{\partial b_k}$$

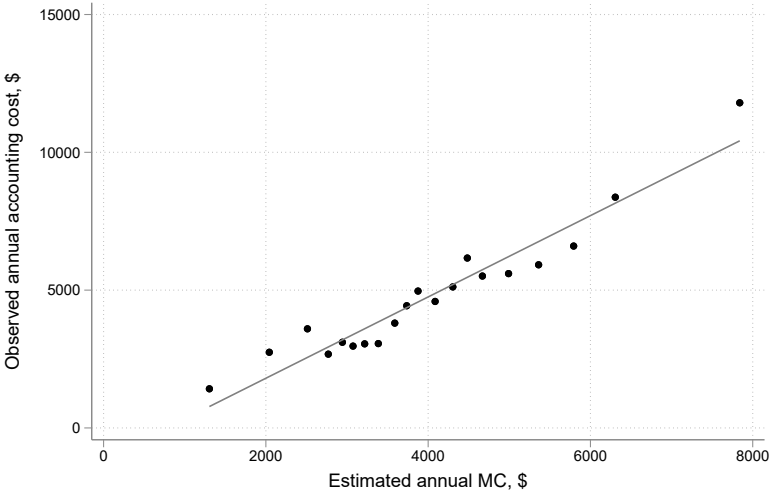
- Last term varies between zero for highly subsidized consumers and one for unsubsidized consumers

Supply Model Estimates

Supply: inversion of first-order conditions	Mean	Std. dev.	Min	Max
Marginal cost for a 20 year old with income <200% FPL, $	1,561ˆ	457ˆ	732ˆ	4,102ˆ
60% actuarial value plans	1,332	265	747	2,710
70% actuarial value plans	1,506	368	732	3,268
80% actuarial value plans	2,137	467	1,173	4,102
Estimated cost multipliers‡				
Income <200% FPL	2.77‡‡			
Income >200% FPL and <400% FPL	2.15‡‡			
Income >400% FPL	1.97‡‡			

- Cost of coverage increases with plan generosity
- Lower-income consumers are more expensive for the firms to cover

Inverted MCs Highly Correlated with Accounting costs



Consumer Surplus

- Baseline surplus for consumer i with a vector of marginal utilities θ_i takes the following form:

$$CS(\theta_i) = \frac{1}{\alpha_i}\left[\gamma + \ln\left[1 + \sum_{j=1}^{J} \exp(u_{ij}(\theta_i))\right]\right]$$

- γ is Euler's constant
- Consumer surplus with preference for redistribution (Atkinson, 1970):

$$CS_i^{\lambda} = \begin{cases} \frac{1}{1-\lambda}[(y_i + CS_i)^{1-\lambda} - y^{1-\lambda} & \text{if } \lambda \neq 1, \\ log(y_i + CS_i) - log(y_i) & \text{if } \lambda = 1 \end{cases} \tag{9}$$

- As λ increases, transfers to lower-income households become more valued by the society than equivalent transfers to higher-income households.

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- Quantifying the aggregate and distributional consequences of market power in ACA Marketplaces

Quantifying Market Power: Distortions in CS and Insurance Coverage

	With market power		Perfect competition	
	Observed	Remove (premium) subsidies	Keep subsidies; firms set $p = AC$	Remove subsidies; firms set $p = AC$
Average across potential consumers ($)				
Consumer surplus	2,495	2,152	3,147	2,534
Insurer profit	729	338		
Taxpayer cost of subsidies	1,434	23	1,775	69
Taxpayer cost net of savings on uncompensated care	614	−406	698	−548
Insurance rate	0.45	0.23	0.59	0.34
Average 20 year old list premium (unweighted), $	2,401	2,239	1,743	1,592
Among consumers buying insurance ($)				
Average cost of covering a buyer	3,993	3,348	4,045	3,425
Average list premium among buyers	5,618	4,788	4,044	3,426
Insurer profit per buyer	1,625	1,441		
Taxpayer cost of subsidies per buyer	3,196	96	3,010	204

- Market power leads to 21% lower CS and 15pp lower rate of insurance coverage

Quantifying Market Power: Distortions in Subsidy Pass-Through

	With market power		Perfect competition	
	Baseline – observed	Remove (premium) subsidies	Keep subsidies; firms set $p = AC$	Remove subsidies; firms set $p = AC$
Average across potential consumers ($)				
Consumer surplus	2,495	2,152	3,147	2,534
Insurer profit	729	338		
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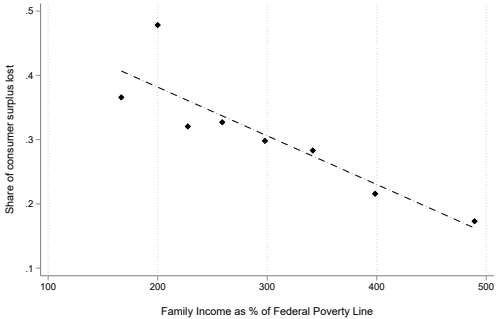
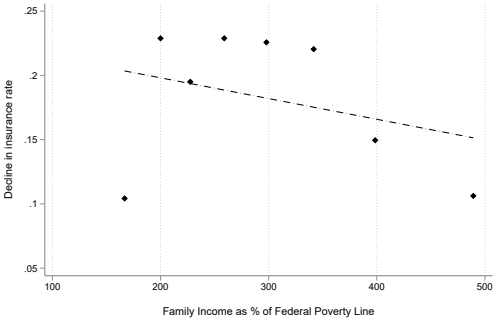
Insurance rate	0.45	0.23	0.59	0.34

- Subsidies crucial for stimulating enrollment, but consumers value insurance at less than its cash value
- With market power, $1,400 subsidy spending per capita generates only $734 extra CS+PS - large DWL
- **Firms capture 53% of the generated surplus**

Distributional Effects of Market Power





- Higher relative loss in CS from market power among lower-income consumers; higher absolute loss in insurance coverage

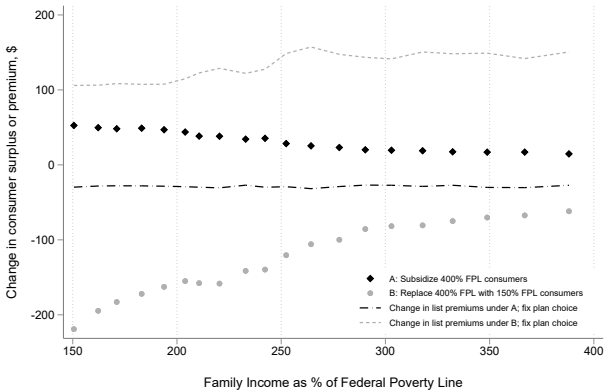
- Role of subsidy design in driving the aggregate and the distributional effects of market power

Demographic Externality

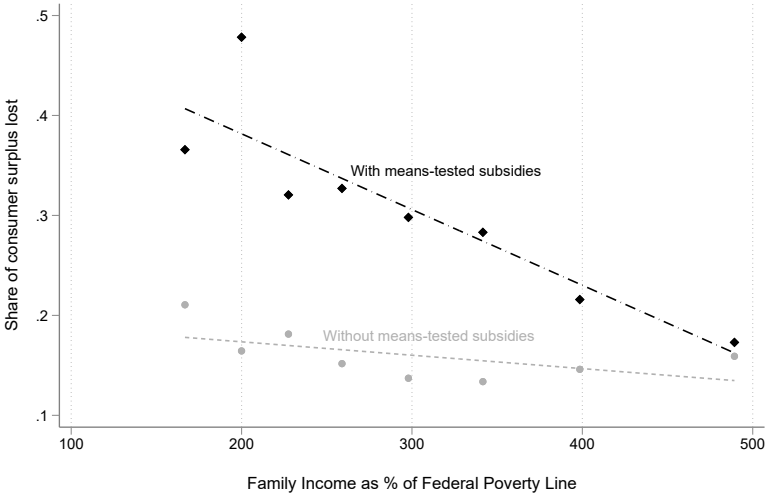
- Under (conditionally) uniform price regulation, the composition of consumer types matters for what prices firms set – a "demographic" externality
- At baseline, consumers vary in their demand (level and slope) and cost of coverage – correlated with level of income
- **Means-tested subsidies alter the demand dimension of heterogeneity**
- Changes the composition of who buys the product and pricing incentives of firms with market power

Demographic Externality: Example of American Rescue Plan Act

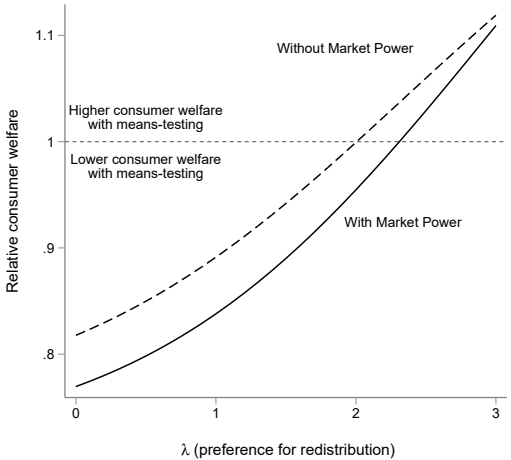
- Which consumers are subsidized and the level of subsidies matters for prices that other consumers face
- Example: introducing subsidies for 400% FPL + consumers (American Rescue Plan Act) decreases prices slightly for everyone else.



Means-Tested Subsidies Exacerbate Distributional Effects of Market Power



Equity-Efficiency Tradeoff in Subsidy Design



- For any preference for redistribution, surplus losses from means-testing are higher when market power is present
- In the presence of market power, need higher preferences for redistribution to prefer means-testing over flat subsidies

Conclusion

- Long literature in IO critiquing public enterprise
- Policy response: "leverage the private sector"
- This paper: cautions against the use of private intermediaries in environments with redistributional objectives
- Bottom line: have to have strong preference for redistribution to make targeted subsidies in the ACA efficient
- Still to do: calculate change in provision marginal cost to equate public provision with private outcomes

THANK YOU!

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