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

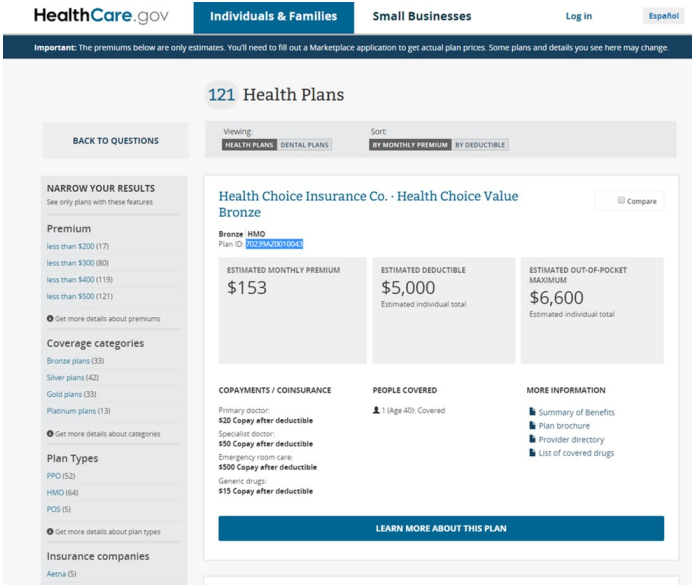
Basic Institutional Facts

- 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 = $(SLSP \quad CAP)$
  - 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 $!$ 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, $j = 1;:::;J$, with associated utility:

$$U_{ij} = u_j(p_j; w_i; \ _i; \ _{ij}); \tag{1}$$

  where i indexes the consumer, p_j is the product's price, w_i are consumer characteristics, $_i$ is a vector of utility parameters, and $_i$ is a vector of preference shocks

- Usual discrete choice DGP: $U_{ij} > U_{ik}; 8k$ 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:

$$p_j = \frac{1}{s_j(p)} \int c_{dw} \quad s_{jw}(p; w) g(w) dw: \tag{3}$$

- 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:

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

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

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

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:

$$\int s_{jd}(\mathbf{p}; z_d) + p_j \frac{\partial s_{jd}(\mathbf{p}; z_d)}{\partial p_j} dD = \int c_{jd} \frac{\partial s_{jd}(\mathbf{p}; z_d)}{\partial p_j} dD: \tag{7}$$

- Change in prices with targeted subsidy:

$$\frac{dp_j}{dz_a} = \frac{\frac{\partial s_{ja}(\mathbf{p}; z_a)}{\partial z_a} + (p_j \quad c_{ja}) \frac{\partial^2 s_{ja}(\mathbf{p}; z_a)}{\partial p_j \partial z_a}}{\int 2\frac{\partial s_{jd}(\mathbf{p}; z_d)}{\partial p_j} + (p_j \quad c_{jd}) \frac{\partial^2 s_{jd}(\mathbf{p}; z_d)}{\partial p_j^2} dD} \quad 7 \; 0 \tag{8}$$

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

- Difference between intended redistribution and actual outcomes is: p^m p^m $p^c + p^c$
- 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:

$$u_{ij} = \quad _{d(i)}p_{ij} + \quad _{d(i)} + \quad AV_{ij} + \quad _{j} +$$

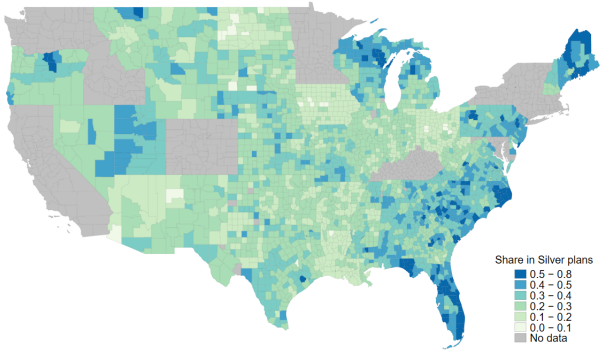
- Family f chooses a single plan or the outside option to maximize the average utility across family members:

$$_{fj} + \frac{1}{N_f}\sum_{i2f} u_{ij} > \quad _{fk} + \frac{1}{N_f}\sum_{i2f} u_{ik}; 8k \; 2 \; J \text{ s.t. } k \; \cancel{6}= \; j$$

- p_{ij} is the premium that depends on income and age
- $_{a(i)}$ - 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
- $_{j}$ - non-parametrically captures the average utility from purchasing plan j
- $_{fj}$ - family-level idiosyncratic taste shock for plan j
- Allow for demographic-group level variation in

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
Coe□cient on premium, $000 ($\alpha$)				
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:

$$_f(\mathrm{b}) = \sum_{j2J_f} \sum_{d2D} \left[(b_j \quad ^d \quad c_j \quad ^d) s_j^d(p(b)) M^d \right]$$

- d is consumer type (age/income)
- 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 2 f that then gets age-adjusted exogenously with
- 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:

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

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

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

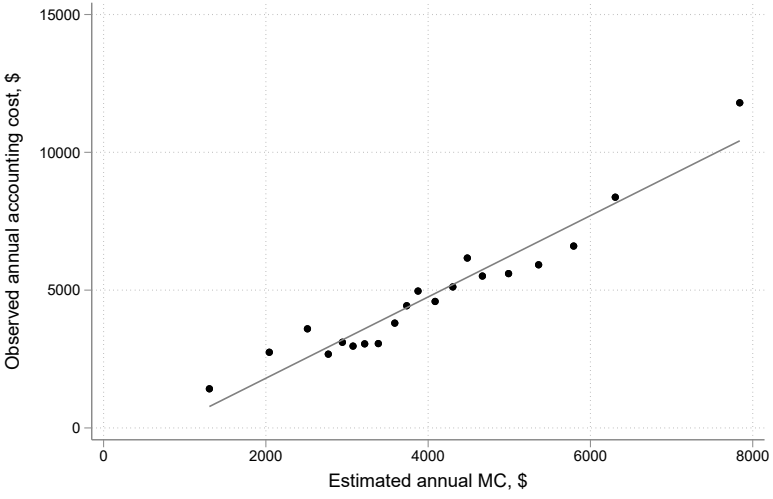
- Last term varies between zero for highly subsidized consumers and one for unsubsidized consumers

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, $	1,561^	457^	732^	4,102^
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 $_i$ takes the following form:

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

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

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

- As 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

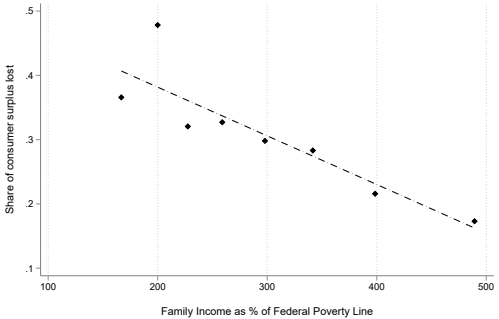
- Market power leads to 21% lower CS and 15pp lower rate of insurance coverage

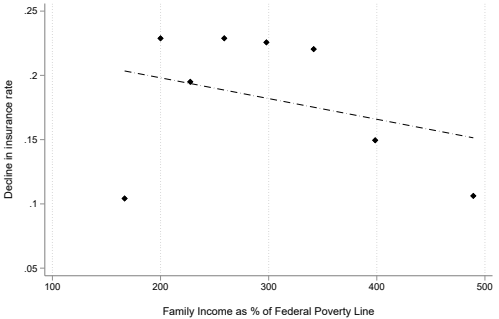
Quantifying Market Power: Distortions in Subsidy Pass-Through

	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		
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

- 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

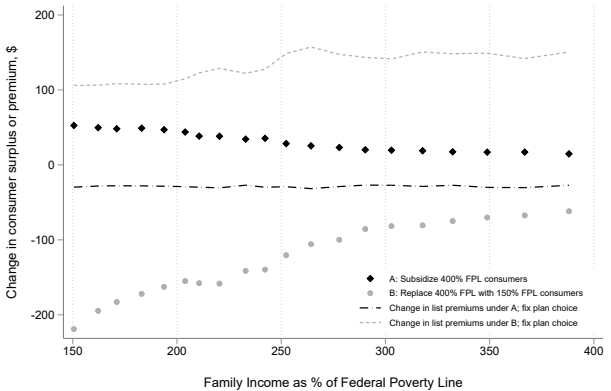
- Role of subsidy design in driving the aggregate and the distributional effects of market power

Demographic Externality

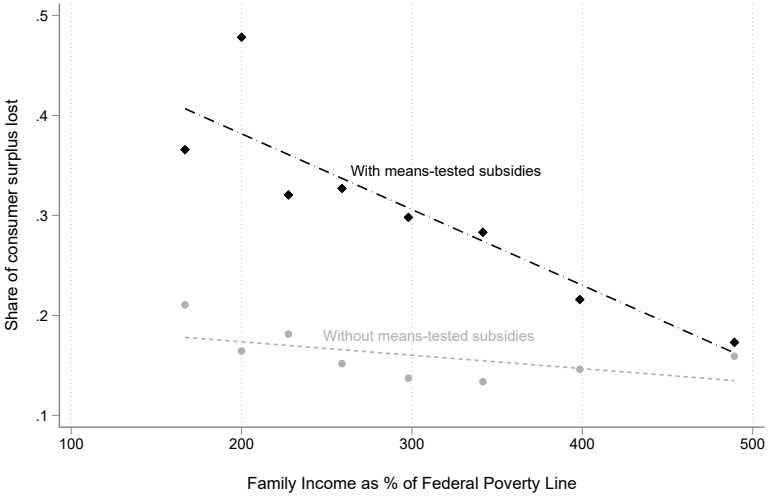
- Under (conditionally) uniform price regulation, the composition of consumer types matters for what prices firms set – a "demographic" externality
- At baseline, consumers vary in their demand (level and slope) and cost of coverage – correlated with level of income
- Means-tested subsidies alter the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

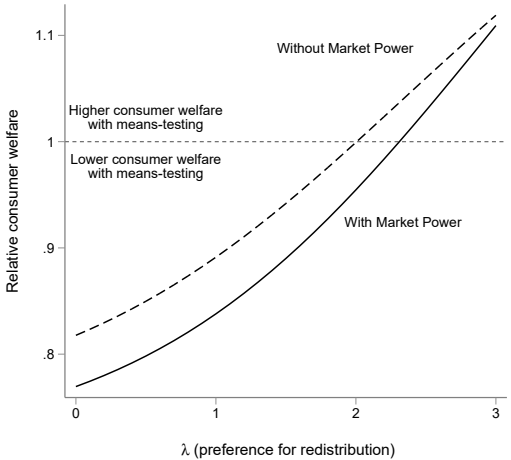
- Which consumers are subsidized and the level of subsidies matters for prices that other consumers face
- Example: introducing subsidies for 400% FPL + consumers (American Rescue Plan Act) decreases prices slightly for everyone else.



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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