The Effects of Price Regulation in Markets with Strategic Entry: Evidence from Health Insurance Markets

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Introduction

- Price regulation
  - Pharmaceuticals
  - Interest rate limits
  - Housing markets
  - Health insurance
- Entry responses interfere
- Hard to distinguish entry decisions resulting from:
  - price regulation
  - market characteristics

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  - market characteristics

Key Question: How does strategic entry interact with price regulation?

Setting: Community Rating in Health Insurance

- *Community rating*: insurance priced on location not health status
- US individual market: pricing restrictions at the rating area level (group of counties)
- Entry decisions at the county level
  - Partial entry: enter some but not all counties in rating area

Trade-offs in Rating Area Design

When a regulator adds a county to a rating area:

- Size of the market increases
  - Economies of scale $\rightarrow$ more entry, $\downarrow$ prices
- Composition of the market changes
  - If different costs, pricing rules can lead to partial entry $\rightarrow$ less entry, $\uparrow\downarrow$ prices
    - Fang and Ko (2024)
  - Changes in market composition affect prices $\rightarrow$ different prices
- Two goals: competition and pooling consumers with different costs

This Paper

1. Shows community rating design affects entry and prices
   - Counties near state borders are in smaller rating areas with different market outcomes
   - Structural model of firm entry and pricing decisions in the state of Oregon

This Paper

1. Shows community rating design affects entry and prices
2. Evaluates whether entry and price regulations should be aligned geographically
   - Policy Proposal #1: **Ban partial entry**
     - Net positive entry
     - Marginal firms charge higher prices

This Paper

1. Shows community rating design affects entry and prices
2. Evaluates whether entry and price regulations should be aligned geographically
3. Quantifies trade offs of expanding rating areas with partial entry
   - Policy Proposal #2: **Increase rating area size**
     - Increased competition
     - Less price variation
     - Heterogeneity → Selective non-entry
     - Regulators must balance two goals

Literature Review

Outline

Individual Health Insurance Exchanges

1. Price regulations
   - Firms set base price for rating area (groups of counties)
   - Age, smoking adjustments regulated
   - Consumers subsidized by federal government

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   - Consumers subsidized by federal government
2. Entry regulations
   - Entry decisions at county level
   - Guaranteed issue
   - Must meet network adequacy standards
3. States as regulators
   - Define rating areas
   - May add additional regulations

Colorado Rating Area Change | Texas Rating Area Change

Data

1. National Market
   - Qualified Health Plans (QHP) Public Use Files: entry decisions, plan characteristics
   - CMS Open Enrollment data: enrollment
   - American Community Survey (ACS) + Area Health Resource Files (AHRF): demographics, health info
2. Oregon
   - All of the above plus:
   - Plan enrollment + off exchange enrollment from insurance regulator
   - Small Area Health Insurance Estimates
   - All Payer All Claims cost data

Outline

State Lines Constrain Rating Areas

- Challenge: rating areas not drawn at random
- Solution: use that rating areas cannot cross state lines

$$Y_{ist} = \alpha_s + \tau_t + \beta_1 \cdot \text{Rural}_i + \beta_2 \cdot \text{Distance}_i + \beta_3 \cdot \text{CrossState}_i + \gamma \cdot X_{it} + \epsilon_{ist}$$

- where:
  - Y_{ist}: rating area size, entry, prices
  - α_s: state fixed effects
  - τ_t: year fixed effects
  - Rural_i: indicator for being rural
  - Distance_i: distance to the nearest metropolitan area
  - CrossState_i: indicator for being across a state line from the metropolitan area

Constrained Rating Areas Have Different Market Outcomes

	(1) RA Size	(2) # Insurers	(3) Missing Insurer?	(4) Log(Price)
Cross State=1	-12.22***	-0.254***	-0.0505***	0.0386***
	(3.223)	(0.0372)	(0.0166)	(0.00649)
N	8211	8211	8211	8211
Outcome Mean	97.52	2.546	0.361	8.166
R2	0.719	0.607	0.372	0.756

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

- Counties whose rating area is constrained are in smaller rating areas
- They have less competition, fewer missing insurers, and higher prices

Enrollment | Other Outcomes | Balance Table | Robustness | More Coefficients | FL/SC Placebo

Outline

Model Set Up

- Players: Insurers that enter anywhere in Oregon
- Actions:
  - Entry
  - Pricing
- Uncertainty:
  - Fixed costs (ν_1, ν_2)
  - Demand (ξ)
  - Marginal costs (ω)

Model Set Up

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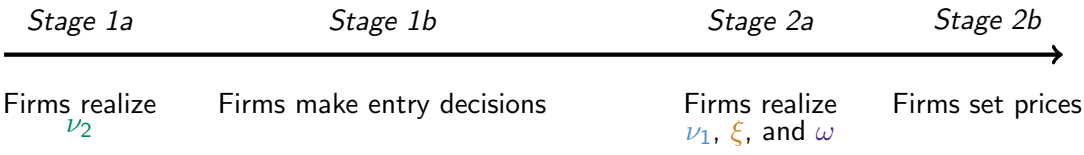
- Timing:



Expected Profits

Insurer n's expected profits Π_{nbr} from entering bundle b of counties in area r are given by:

$$\Pi_{nbr} = \underbrace{\sum_{m \in b} D_{nm}(p_{nb}; \theta) \cdot (p_{nb} - c_{nm})}_{VP_{nr}(b; \theta, c_{nm})} - F_{nbr}$$

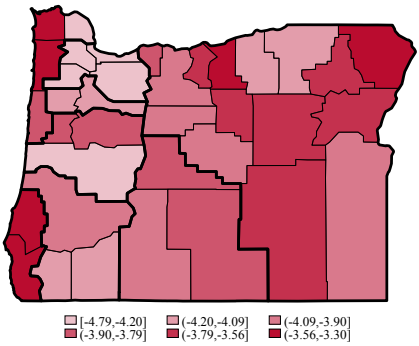
- $D_{nm}(p_{nb}; \theta)$: demand for insurer n's three insurance products in market m
- p_{nb}: prices for those products in bundle of counties b
- c_{nm}: marginal costs of providing insurance
- F_{nbr}: fixed cost of entering bundle b of counties in rating area r

Demand

- Consumer utility from: >
  - Plan characteristics
  - Price (age, income specific)
- Outside option: being uninsured
- Estimate using BLP with micro moments:
  - Outside option market shares by demographic groups
  - Silver share for consumers eligible for cost subsidies
- Price endogeneity: regulatory features of subsidies

Demand Estimates

- Price sensitivity highest for low income consumers >
- Low income consumers value silver plans extra >



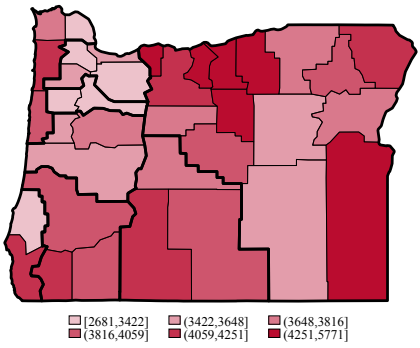
Average Silver Plan Elasticity

Marginal Cost Estimation

- Invert first order conditions to get bundle-level costs >
- Project onto characteristics to get cost parameters >
- Estimate county level costs from these parameters

Marginal Cost Estimates

- Costs are higher in less dense areas >
- Costs are higher in non-entered counties >



Silver Level Marginal Costs

Fixed Costs

- Two components of fixed costs: rating area specific and county specific

$$F_{nbrt} = F_R + \sum_{m \in b} F_{nmt}$$

- F_R: regulatory and marketing costs

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  - Function of county characteristics and insurer characteristics

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$$F_{nbrt} = F_R + \sum_{m \in b} F_{nmt}$$

- F_R: regulatory and marketing costs
- F_{nmt}: costs of network set up for county m
  - Function of county characteristics and insurer characteristics
- Estimation by moment inequalities
  - Revealed preference approach >
  - Create unconditional inequalities (Eizenberg 2014) to handle selection on error term
  - Estimates of entering an entire rating area largely between $1-5 million

Model Validation

Outcome	Observed	Model
Number of Firms	2.47	.
# Markets Unserved	0	.
Avg. Silver Price	4740.23	4694.69
Std Dev Avg. Silver Price	384.54	174.74
Avg. Enrollment	30.31%	30.63%
Avg. CS ($)	.	472.73

Outline

Eliminating Partial Entry Increases Entry

Outcome	Observed	Model	No Partial Entry	County RAs
Number of Firms	2.47	.	3.11	
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When partial entry is banned:

- More firms enter partially non-entered counties than exit partially entered

Skip Maps

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Number of Firms	2.47	.	3.11	
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Avg. Silver Price	4740.23	4694.69	4958.12	
Std Dev Avg. Silver Price	384.54	174.74	287.69	
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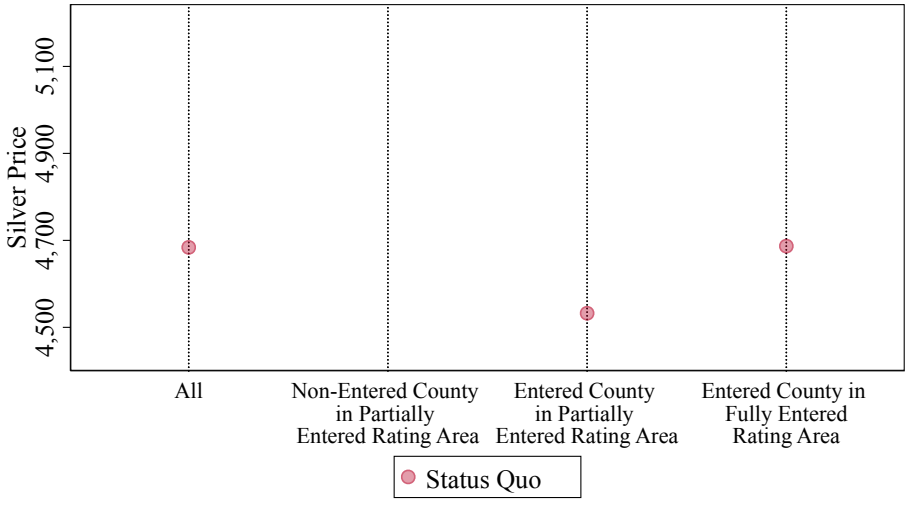
When partial entry is banned:

- More firms enter partially non-entered counties than exit partially entered
- Marginal insurers charge more

Skip Maps

Prices Changes



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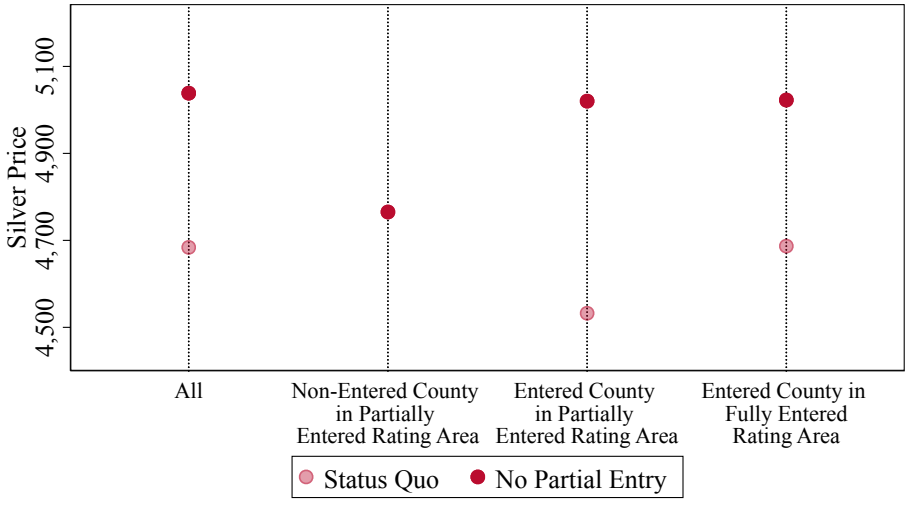

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Avg. CS ($)	.	472.73	505.59	

When partial entry is banned:

- More firms enter partially non-entered counties than exit partially entered
- Marginal insurers charge more
- New entrants plus subsidy changes cause increased enrollment

Maps

One County Rating Areas Are Too Small

Outcome	Observed	Model	No Partial Entry	County RAs
Number of Firms	2.47	.	3.11	2.08
# Markets Unserved	0	.	0	1
Avg. Silver Price	4740.23	4694.69	4958.12	5044.32
Std Dev Avg. Silver Price	384.54	174.74	287.69	808.22
Avg. Enrollment	30.31%	30.63%	31.40%	26.93%
Avg. CS ($)	.	472.73	505.59	410.16

When rating areas are set at the county level:

- Number of entrants falls
- One market goes unserved
- Price variation increases substantially

Maps Weighted Other Designs Effects By Income

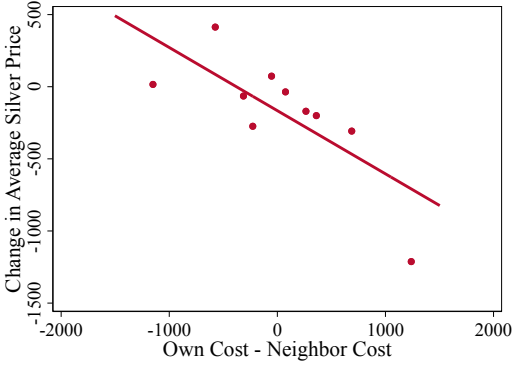
Grouping Counties Promotes Entry

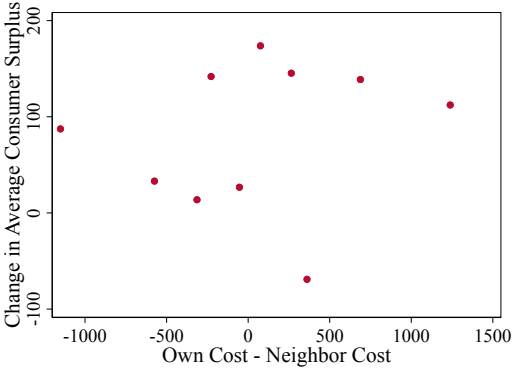
Outcome	County RAs	Two County RAs
Number of Firms	2.08	2.39
# Markets Unserved	1	1
Avg. Silver Price	5044.32	4862.59
Std Dev Avg. Silver Price	808.22	435.55
Avg. Enrollment	26.93%	33.36%
Avg. CS ($)	410.16	497.14

- More firms enter
- One market goes unserved
- Price variation falls

Maps

Effects Vary By Heterogeneity of New Rating Area





- Variation in heterogeneity of marginal costs within rating areas >
- Benefits largest for homogeneous groupings

Conclusion

- Rating area design affects the equilibrium outcomes in health insurance markets
- Banning partial entry increases entry and prices
- Tradeoffs between size and heterogeneity
- Balance between risk pooling and competition

Thanks!

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Bounds on Fixed Costs

- Bounded above by deviation from entry to non-entry
- Bounded below by deviation from non-entry to entry
- ν_2 introduces a selection problem: not mean zero conditional on entry decision

Bounds on Fixed Costs

- Bounded above by deviation from entry to non-entry
- Bounded below by deviation from non-entry to entry
- ν_2 introduces a selection problem: not mean zero conditional on entry decision
- Solution: create unconditional inequalities (Eizenberg 2014) >
  - Assume fixed costs bounded by largest change in variable profits

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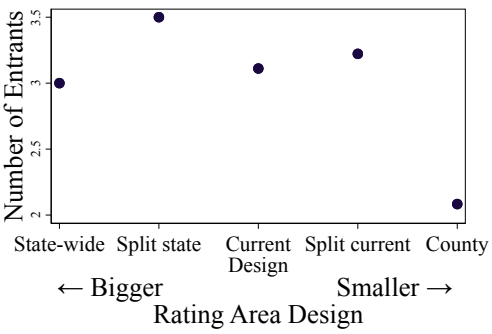
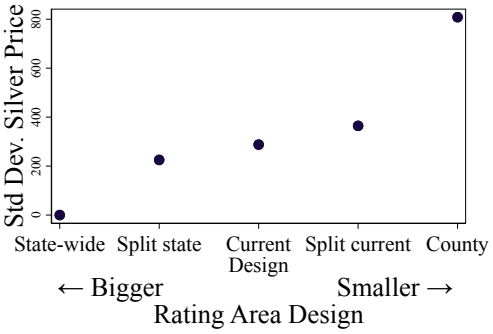
Trade-offs of Size, Without Partial Entry





Alternative Outcomes Back

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Colorado Rating Area Change

- 2014: 11 rating areas
- Garfield County threatens a lawsuit over grouping with high cost counties
- 2015: switch to 9 rating areas
- 2016: consider and reject move to single rating area

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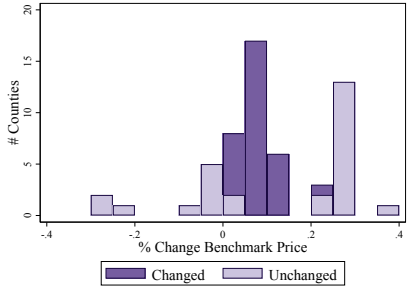
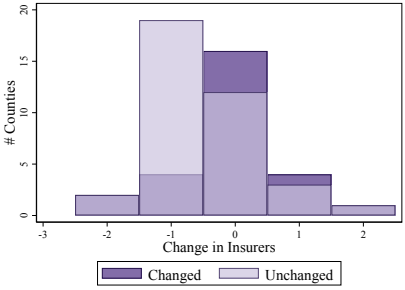
Colorado Rating Area Change

- 37 counties unaffected by rating area change
- 27 counties end up in new larger rating areas





- Combined rating area results in flattened prices
- More entry (relative to unchanged area)
- More partial entry (relative to unchanged areas)

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Texas Rating Area Change

- Follow default guidance: MSAs + 1
- 2023: switch to areas based on Public Health Regions (PHRs)

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Contributions

- Price discrimination and entry

  Maini and Pammolli 2020; Dubois and Lasio 2019; Cuesta and Sepulveda 2021

  - Setting where demand, marginal costs, fixed costs matter; rules on both entry and pricing

- Health insurance exchanges

  Dickstein et al 2015; Fang and Ko 2018; Starc and Ericson 2015; Orsini and Tebaldi 2017; Tebaldi 2017; Saltzman 2019; Polyakova and Ryan 2019

  - Add entry dimension into analysis of rating policies

- Entry and moment inequalities

  Ciliberto and Tamer 2009; Pakes 2010; Eizenberg 2014; Wollmann 2018; Ho and Pakes 2014; Fan and Yang 2020

  - Apply entry and product positioning literature to health insurance

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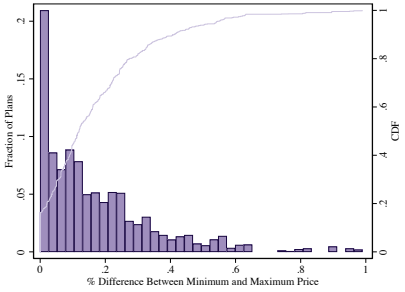
Distribution of Price Differences



Distribution of Price Differences

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Geography matters for partial entry decisions

	(1) Insurer Partial	(2) Number of Insurers
Metro Adj	0.101***	0.271***
	(0.0220)	(0.0566)
Metro	-0.0168	0.487***
	(0.0234)	(0.0688)
N	8112	8679
R^2	0.0555	0.312
Outcome Mean		
County Controls, Year FEs?	Y	Y

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Back Summary Stats

Cross State Summary Statistics

	(1)		
	count	mean	sd
Cross-State HRR	7805	.2237028	.4167518
Cross-State HSA	7805	.1182575	.3229335
Cross State	7805	.2641896	.440929
Miles to Metro / 100	7805	.6197539	.7748957
Observations	7805		

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Prevalence by Geography

	Insurer Partial	Plan Partial	Number of Insurers
Metro	.3606706	.5101948	3.310376
MetroAdj	.4639175	.5940722	2.68299
Rural	.3449683	.50068	2.068676
Total	.3797921	.5273276	2.534816
Observations	8947		

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State Lines and Enrollment

	(1) % Enrolled	(2) % Silver	(3) % Bronze	(4) % Gold
Rural	0.0107***	0.00529***	0.00349***	-0.000561
	(0.00253)	(0.00191)	(0.00108)	(0.000517)
Miles to Metro / 100	-0.00364	-0.00509*	0.00162	-0.00234**
	(0.00422)	(0.00287)	(0.00173)	(0.00109)
Cross State=1	-0.00240	-0.00482**	0.00230*	-0.000347
	(0.00260)	(0.00188)	(0.00124)	(0.000503)
N	8208	8208	8208	8208
Outcome Mean	0.279	0.188	0.0651	0.0130
R2	0.705	0.607	0.583	0.409

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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Other Outcomes

	(1) Deductible	(2) Avg Price	(3) % Paying Penalty	(4) Credit Per Return
Rural	-51.89	9.224***	0.00125***	0.0136***
	(38.29)	(1.334)	(0.000445)	(0.00321)
Miles to Metro / 100	-95.05***	11.77***	0.00266***	0.00239
	(24.38)	(1.323)	(0.000743)	(0.00491)
Cross State=1	-36.79	12.73***	0.00158***	0.00510
	(30.05)	(1.742)	(0.000454)	(0.00355)
N	8211	9050	3941	3941
Outcome Mean	3412.4	327.3	0.0420	0.174
R2	0.283	0.776	0.675	0.628

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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Balance Table

Variable	Difference	
Population	-7,866.494	(11,527.843)
Population Density	7.632	(24.224)
Median Income	-864.634*	(447.060)
Share Black	0.004	(0.005)
Share White	-0.003	(0.006)
Share Hispanic	-0.005	(0.005)
Share less high school	0.001	(0.002)
Share more high school	-0.001	(0.004)
Share under 18	-0.001	(0.001)
Share $\leq$138% FPL	-0.000	(0.003)
Share 138-400% FPL	0.000	(0.002)
Observations	2,255	

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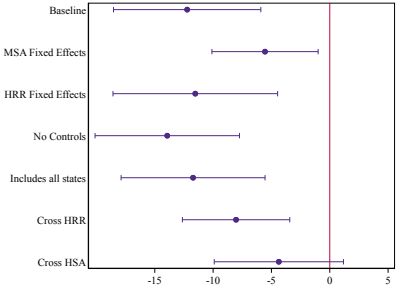
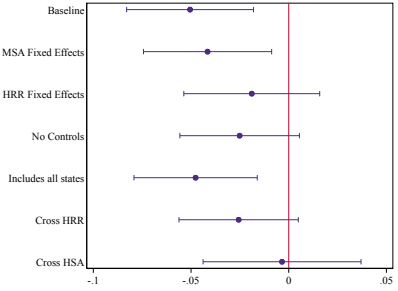
Robustness



Rating Area Size



Insurer Partial Offering

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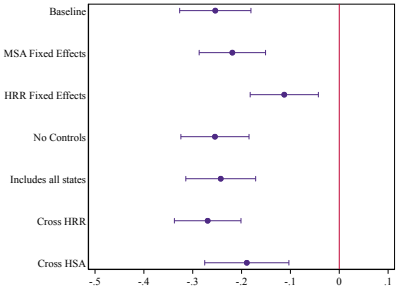
Robustness



Number of Insurers

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Other Regression Coefficients

	(1) RA Size	(2) Missing Insurer?	(3) # Insurers	(4) Log(Price)
Rural	24.28***	0.0866***	-0.180***	0.0191***
	(4.905)	(0.0184)	(0.0370)	(0.00596)
Miles to Metro / 100	-19.00***	-0.0392***	-0.163***	0.0474***
	(3.014)	(0.0149)	(0.0298)	(0.00489)
Cross State=1	-12.22***	-0.0505***	-0.254***	0.0386***
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FL/SC Placebo

	(1) RA Size	(2) # Insurers	(3) Log(Price)
Cross State=1	0.0526	-0.122	-0.0617*
	(0.114)	(0.153)	(0.0359)
N	451	451	451
Outcome Mean	22.85	2.477	8.161
R2	1.000	0.776	0.866

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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Variety of Prevalence of Partial Entry by Insurers

	% Counties Partially Offered
Atrio	0.312
Bridgespan	0.0250
Kaiser	0.658
Lifewise	0
Moda	0.106
PacificSource	0.467
Providence	0
Trillium	0.667
Zoom	0.250

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Partial entry is common in this setting

Table: Number of Partially Entered Rating Areas

Issuer	2016	2017	2018	2019
Atrio	2	2	-	-
Bridgespan	0	0	1	1
Kaiser	3	3	3	2
Lifewise	0	-	-	-
Moda	0	4	3	3
PacificSource	0	3	3	3
Providence	0	0	0	0
Trillium	1	-	-	-
Zoom	1	-	-	-

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How often do insurers offer additional plans?

On the Silver level, number of non-standard plans offered (max allowed is 4) across all rating areas:

	2016	2017	2018	2019	2020
Atrio	4	3	-	-	-
BridgeSpan	2	2	1	2	3
Kaiser	2	2	2	2	2
LifeWise	2	-	-	-	-
Moda	4	2	2	3	2
PacificSource	0	0	0	0	4
Providence	3	3	1	1	1
Trillium	0	-	-	-	-
Zoom	2	-	-	-	-

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Example

Oregon's Rating Area 2: Benton, Lane, and Linn Counties

$$B = \{(None), (Benton), (Lane), (Linn), (Benton, Lane), (Benton, Linn), (Lane, Linn), (Benton, Lane, Linn)\}$$

Back x

Consumer Decision Problem

- Consumer i's utility from plan j in market m (following Polyakova and Ryan 2019):

$$U_{ijm} = -\alpha_{d(i)} p_{ijm} + \gamma \cdot \mathbb{I}[y(i) \leq 250\% FPL] \times \mathbb{I}[AV_j = 70] + \delta_{jm} + \epsilon_{ijm}$$

where

- p_{ijm}: price after subsidies and age rated
- δ_{jm}: average plan utility
- ϵ_{ijm}: i.i.d. extreme value
- Outside option: being uninsured

Back

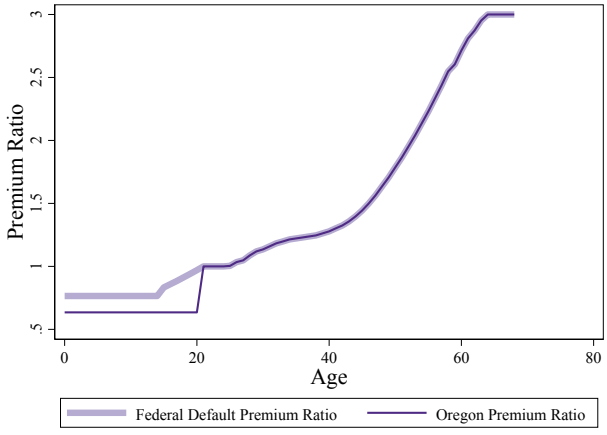
Demand Estimates

$$U_{ijm} = -\alpha_{d(i)} p_{ijm} + \gamma \cdot \mathbb{I}[y(i) \leq 250\% FPL] \times \mathbb{I}[AV_j = 70] + \delta_{jm} + \epsilon_{ijm}$$

	Mean	Age <18	Age 18-34	Age 34-54	Age 54-65
Coefficient on premium (α), \$1Ks					
Income $\leq$ 250%	-	3.685	3.391	3.786	3.417
		(0.041)	(0.190)	(0.315)	(0.113)
Income 250-400%	-	0.729	0.854	0.811	0.484
		(0.027)	(0.107)	(0.053)	(0.002)
Income $>$ 400 %	-	0.841	1.177	0.458	0.157
		(0.028)	(0.108)	(0.036)	(0.001)
Silver Boost (γ)	2.576	-	-	-	-
	(0.133)				

Back

Age Curves



Age Premium Ratio Curves

Back

First Order Conditions

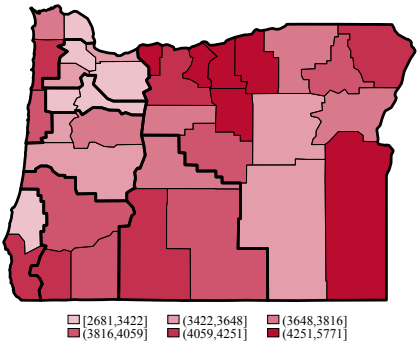
$$\text{Bronze}: \sum_m N_m s_{mb} + \sum_v p_{rv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rb}} = \sum_v c_{bv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rb}}$$

$$\text{Silver}: \sum_m N_m s_{ms} + \sum_v p_{rv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rs}} = \sum_v c_{bv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rs}}$$

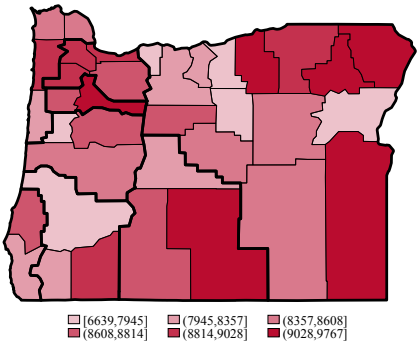
$$\text{Gold}: \sum_m N_m s_{mg} + \sum_v p_{rv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rg}} = \sum_v c_{bv} \sum_m N_m \frac{\partial s_{mv}}{\partial p_{rg}}$$

Back

Marginal Cost Estimates: Step 3



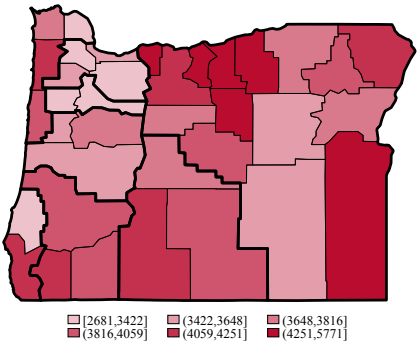
Average Silver Level Marginal Costs



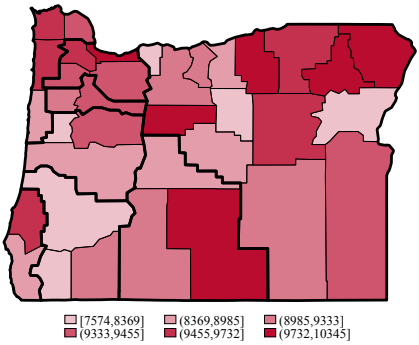
Dartmouth Atlas Price Adjusted Claims

Back

Marginal Cost Estimates: Step 3



Average Silver Level Marginal Costs



Dartmouth Atlas Claims

Back

Marginal Cost Functional Form

Assume marginal costs take the following functional form:

$$c_{nbv} = \alpha_n + \alpha_v + \beta_1 V_b + \beta_2 \text{Claims}_{vb} + \omega_{nbv}$$

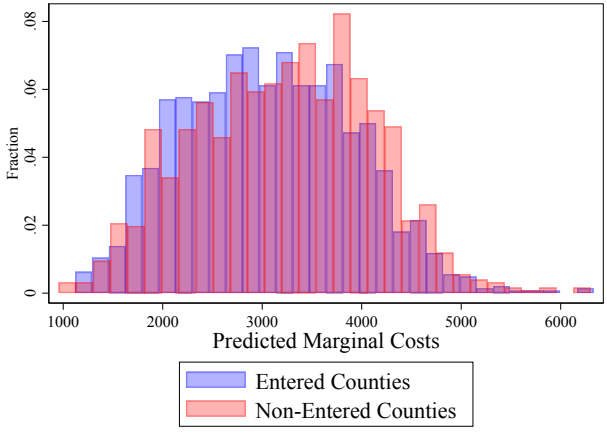
where V_b are the weighted average of county characteristics and Claims_{vb} are the weighted metal level claims for exchange plans

Then use this to get county specific marginal costs:

$$\hat{c}_{nmv} = \hat{\alpha_n} + \hat{\alpha}_v + \hat{\beta}_1 V_m + \hat{\beta}_2 \text{Claims}_{vm}$$

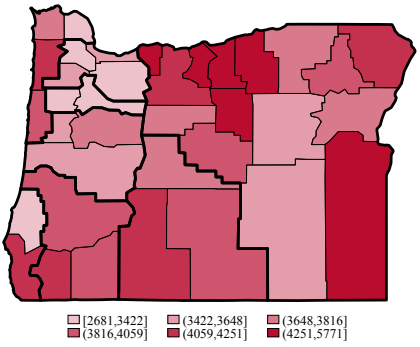
Data Back

Marginal Cost Estimates Are Higher in Non-Entered Counties

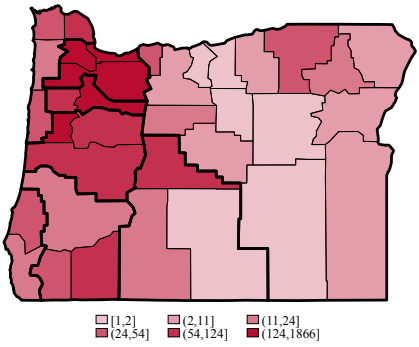


Back

Marginal Cost Estimates and Population Density



Silver Level Marginal Costs



Population Density

Back

Bounds on Fixed Costs

- Upper bound >

$$F_{nmt} \leq E[VP_{nt}(b_{nt};\theta) - VP_{nt}(b_{nt} - 1^m;\theta)] = \overline{F_{mnt}}(\theta)$$

- Lower bound >

$$F_{nmt} \geq E[VP_{nt}(b_{nt} + 1^m;\theta) - VP_d(b_{nt};,\theta)] = \underline{F_{mnt}}(\theta)$$

Assumptions

Assumption 1: Bounded Support

$$\sup_{n,m}\{F_{nmt}\} = F_t^U < \infty, \inf_{n,m}\{F_{mnt}\} = F_t^L > -\infty$$

Assumption 2: Support Contained in Changes in Variable Profits

$[F_t^I, F_t^U] \subset$ supp(expected change in variable profit due to entry or non-entry of a single firm in a single county in time t)

Let the support of the expected changes be denoted $[V_t^L, V_t^U]$

Bounds

Then,

$$L_{nmt}(\theta) = \begin{cases} V_t^L(\theta) & m \in b_{nt} \\ \underline{F_{nmt}}(\theta) & m \notin b_{nt} \end{cases}$$

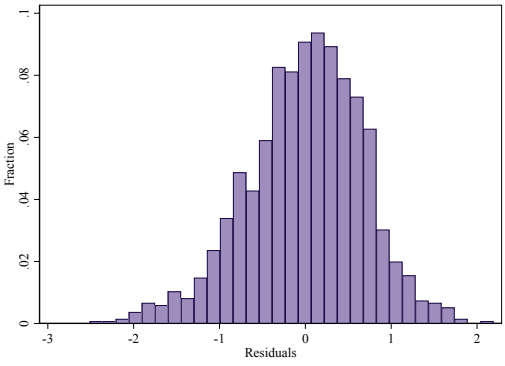
$$U_{nmt}(\theta) = \begin{cases} \overline{F_{nmt}}(\theta) & m \in b_{nt} \\ V_t^U(\theta) & m \notin b_{nt} \end{cases}$$

where

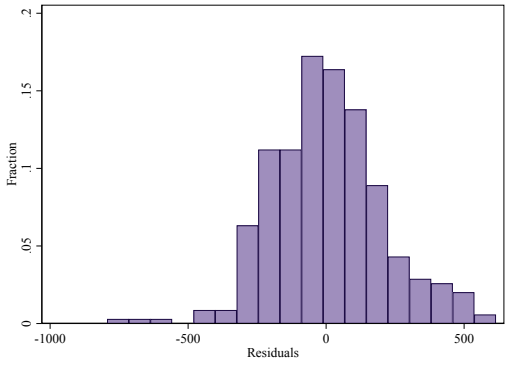
$$L_{nmt}(\theta) \leq F_{mnt} \leq U_{nmt}(\theta)$$

Back

Distribution of Demand and Marginal Cost Shocks



No Restricted Ratio

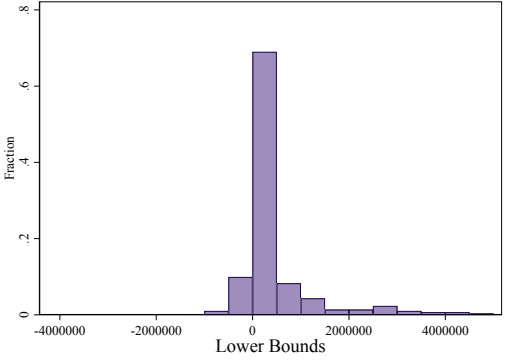


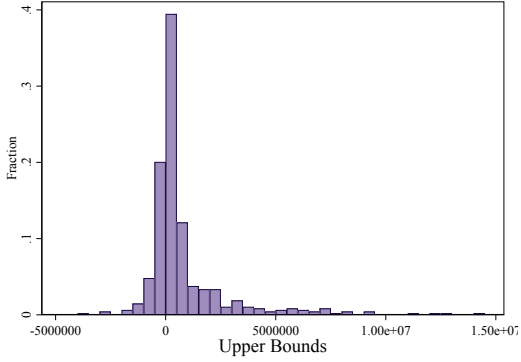
Marginal Costs

Back

Distribution of Upper and Lower Bounds

- Simulate expected profits for observed entry decisions and one-county deviation entry and exit decisions





Shock Distributions Back

Implementation

- Take unconditional expectations over moment inequalities
- Interact with "instruments"
  - indicators for being in other counties in the rating area, in high ECP areas, being vertically integrated, and interactions of these characteristics
- Inference follows Chernozhukov, Chetverikov, and Kato 2018 (inference with a large number of moment inequalities) to construct the confidence set

Inference Details Back

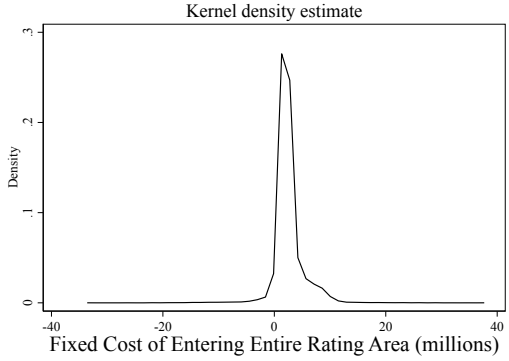
Inference Details

$$T_n^{\max}(\theta) = \max[\max_j \frac{\sqrt{n}\bar{m}_{n,j}(\theta)}{\hat{\sigma}_{n,j}(\theta)}, 0]$$

where $\theta = \alpha, \beta, F_R$

Reject H_0 when $T > c$ to create the confidence set Back

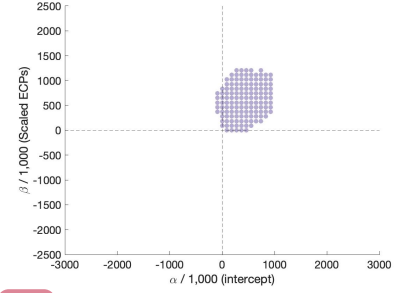
Fixed Cost Estimates: Distribution of Estimated Rating Area Fixed Costs

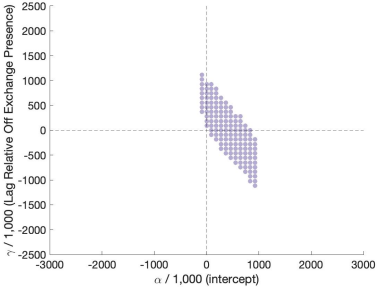


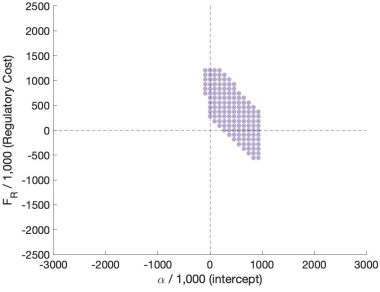
- Estimates largely between $1-12 million

Parameters Implementation

Fixed Cost Estimates: Parameters







Back

Different Effects in Partially Entered and Non Partially Entered Counties

	Not Partially Entered	Partially Entered
Change in Number of Firms	–0.20	0.96
Change in Price	76.99	340.62
Change in Minimum Price	–60.62	–243.69
Change in Enrollment	–0.01	0.02
Change in Consumer Surplus	–20.53	58.82
Number of Counties	10	26

Back

Enrollment Declines Example

- In the status quo:
  - County A has three entrants; counties B and C have two
  - Insurer 2 offers only to county A and sells at lower prices than the other two insurers
- If partial entry is disallowed, insurer 2 now sells to all three
  - The price of insurer 1's plan goes up
  - The benchmark plan changes in the newly entered counties
  - Prices consumer face go up decreasing enrollment
  - Equilibrium prices of the other two plans adjust to new market composition
    - Prices go up because more price sensitive consumers were priced out of market

Status Quo

	1	2	3
A	5500	4100	4500
B	5500	.	4500
C	5500	.	4500

Counterfactual

	1	2	3
A	5600	4200	4700
B	5600	4200	4700
C	5600	4200	4700

Back

Entrants v. Non-Entrants

	Silver Price	Profits	Variable Profits
Entered in Status Quo	5155.8179	602068.3	763511.6
New Counterfactual Entrant	4450.8647	303974.7	552239.8

Back

Implementation of Counterfactuals

Run N simulations:

- Simulate demand and marginal cost shocks to calculate expected variable profits
- Draw values for F_{nmt}:
  1. Take median estimate of α
  2. Given the choice of α, take the median value of β conditional on α. Repeat for γ, F_r
  3. Simulate fixed cost shocks
     - Calculate $\hat{F}_n = mean(F_{nmt})$
     - Draw $\mu_{nmt} \sim N(0, .05 \cdot \hat{F}_n)$
     - Define $\hat{F_{nmt}} = \hat{\alpha} + \hat{\beta} \cdot \text{Presence}_{nmt} + \hat{\gamma}\text{ECP}_m + \mu_{nmt}$
- Vertically integrated firms restricted to only enter into places where they have an off exchange market presence

Model Validation Back

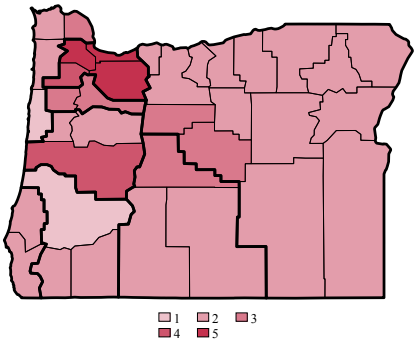
Model Validation: Entry

Rating Area 3: 2 counties

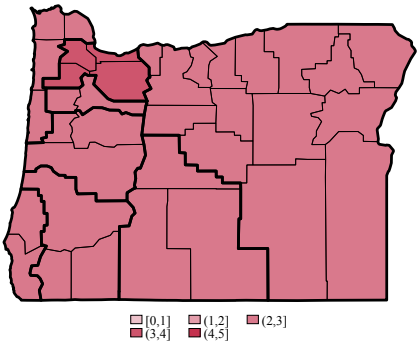
- Three issuers enter everywhere (Kaiser, Moda, Providence)
- Two issuers enter nowhere (Bridgespan, PacificSource)
- Couple of challenges:
  - 1,024 (4^5) possible equilibria to check: this is okay, but going to the 3 county case is a problem
  - Non-existence/multiple equilibria are possible
- I find one equilibrium: Kaiser, Moda, Pacific Source enter (only Moda fully)
- PacificSource is the least profitable firm who enters

Back to Results Back to Model Validation

No Partial Entry Counterfactual: Maps



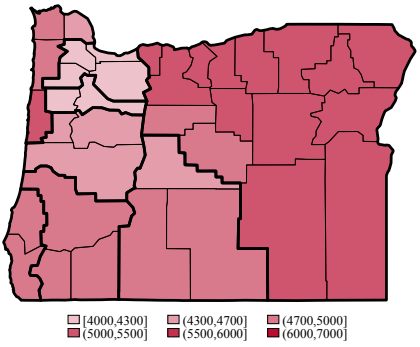
Number of Observed Entrants



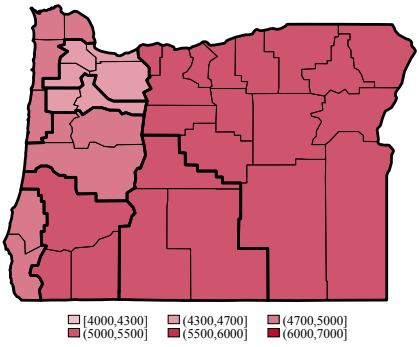
Number of Counterfactual Entrants

Back to Results

No Partial Entry Counterfactual: Maps



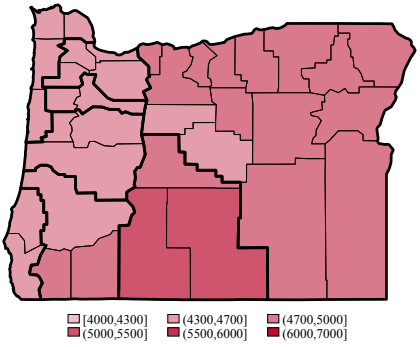
Observed Average Price of Silver Plans



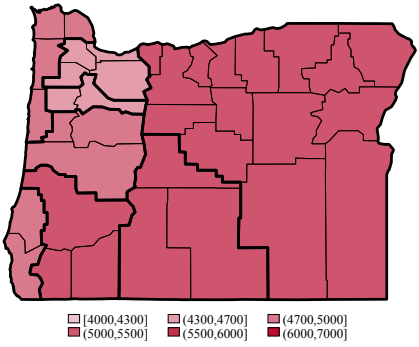
Counterfactual Average Price of Silver Plans

Back to Results

No Partial Entry Counterfactual: Maps



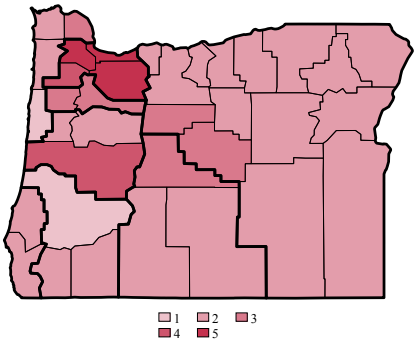
Model Average Price of Silver Plans: Holding Entry Decisions Fixed



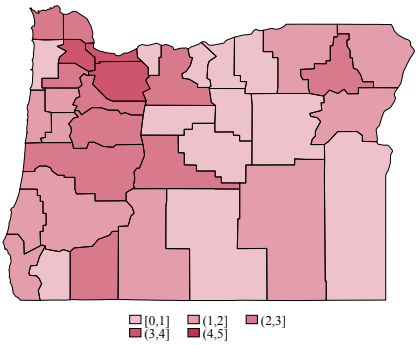
Counterfactual Average Price of Silver Plans

Back to Results

County Rating Areas Counterfactual: Maps



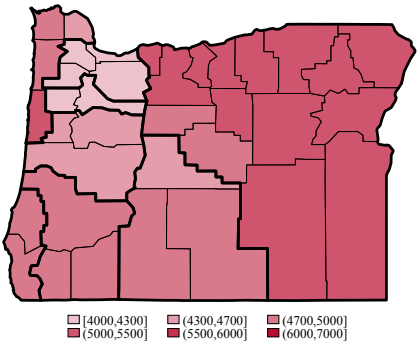
Number of Observed Entrants



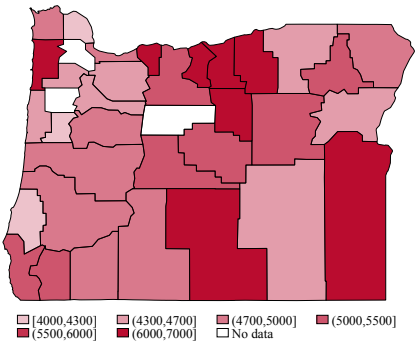
Number of Counterfactual Entrants

Back to Results

County Rating Areas Counterfactual: Maps



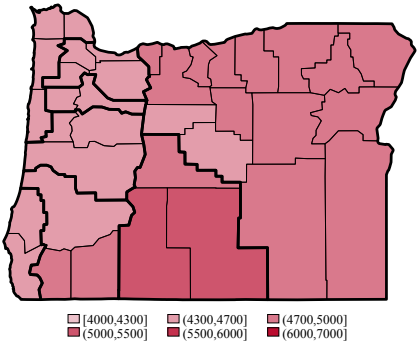
Observed Average Price of Silver Plans



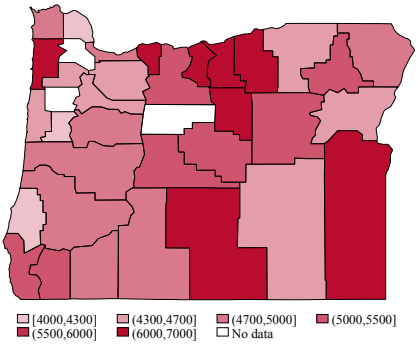
Counterfactual Average Price of Silver Plans

Back to Results

County Rating Areas Counterfactual: Maps



Model Average Price of Silver Plans: Holding Entry Decisions Fixed



Counterfactual Average Price of Silver Plans

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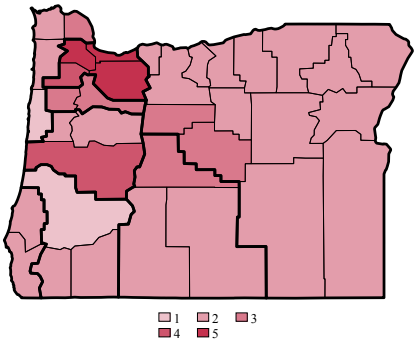
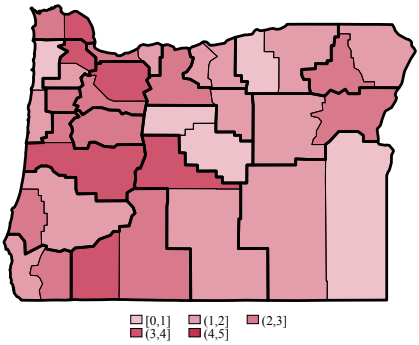
Two County Rating Areas Counterfactual: Maps



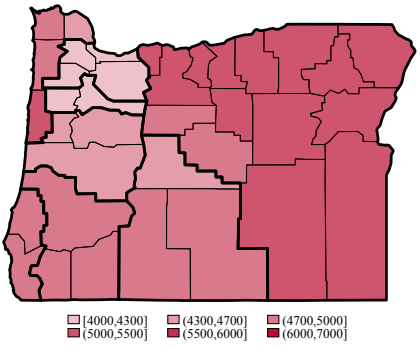
Number of Observed Entrants



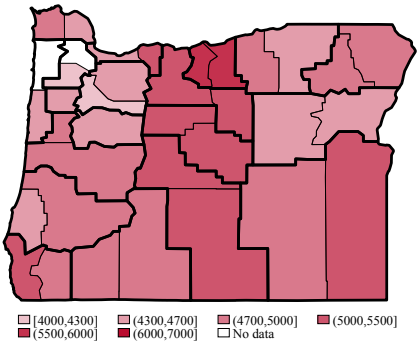
Number of Counterfactual Entrants

Back to Results

Two County Rating Areas Counterfactual: Maps



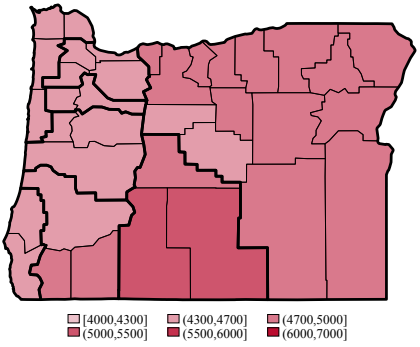
Observed Average Price of Silver Plans



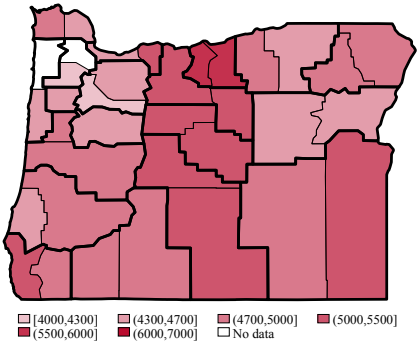
Counterfactual Average Price of Silver Plans

Back to Results

Two County Rating Areas Counterfactual: Maps



Model Average Price of Silver Plans: Holding Entry Decisions Fixed



Counterfactual Average Price of Silver Plans

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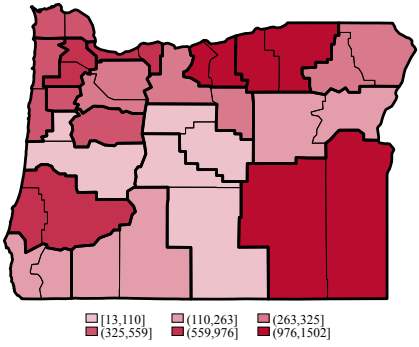
Two County Rating Areas Counterfactual



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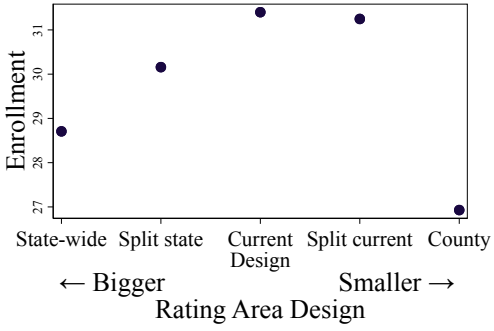
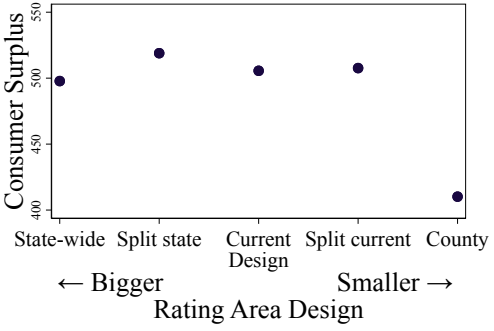
Consequences of Ignoring Entry Adjustments

Outcome	County RAs	County RAs: No Entry Adjustment	Two County RAs	Two County RAs: No Entry Adjustment
Number of Firms	2.08	2.47	2.39	2.47
# Markets Unserved	1	0	1	0
Avg. Enrollment	26.93%	30.40%	33.36%	32.12%
Avg. Silver Price	5044.32	4776.37	4862.59	4777.94
Std Dev Avg. Silver Price	808.22	460.15	435.55	422.73
Avg. CS ($)	410.16	463.92	497.14	481.40

Back

Trade-offs of Size, Without Partial Entry





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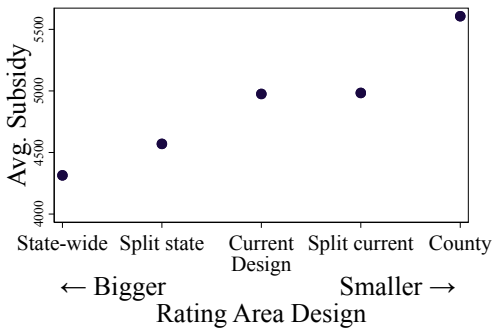
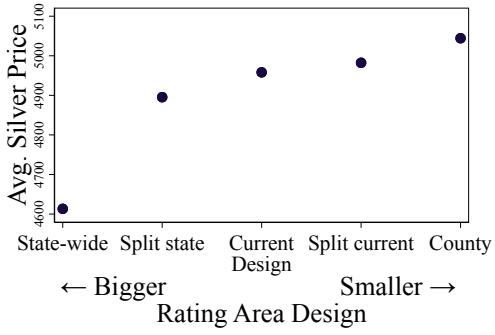
Trade-offs of Size, Without Partial Entry





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Two County Rating Areas: Ban Partial Entry

Outcome	Two County RAs	Two County RAs: No Partial Entry
Number of Firms	2.39	2.72
# Markets Unserved	1	0
Avg. Enrollment	33.36%	29.76%
Avg. Silver Price	4862.59	4872.85
Std Dev Avg. Silver Price	435.55	401.29
Avg. CS ($)	497.14	473.79

Back

Weighted Counterfactual Results

Outcome	Observed	Model	No Partial Entry	County RAs
Number of Firms	3.66	.	3.45	3.18
# Markets Without Entrants	0	.	0	1
Avg. Enrollment	31.10%	28.45%	29.29%	29.56%
Avg. Silver Price	4342.12	4616.49	4666.20	4608.31
Std Dev Avg. Silver Price	361.99	138.58	295.21	482.64
Avg. CS ($)	.	497.47	513.71	509.65

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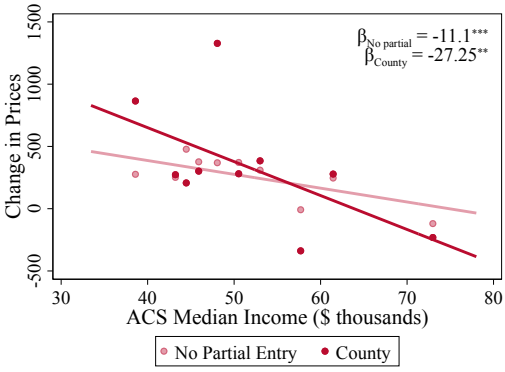
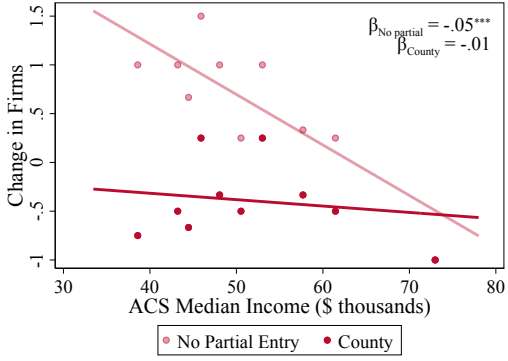
Price and Entry Effects Vary By Income





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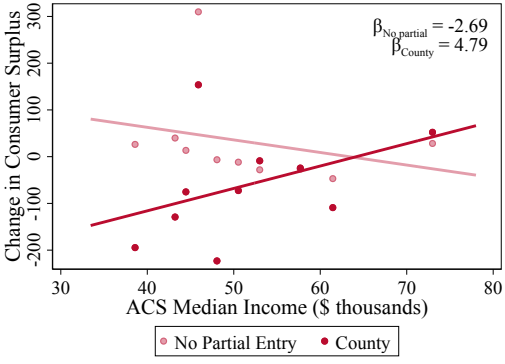
CS Effects Vary Less With Income



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