The Welfare Effects of Supply Side Regulations in Medicare Part D

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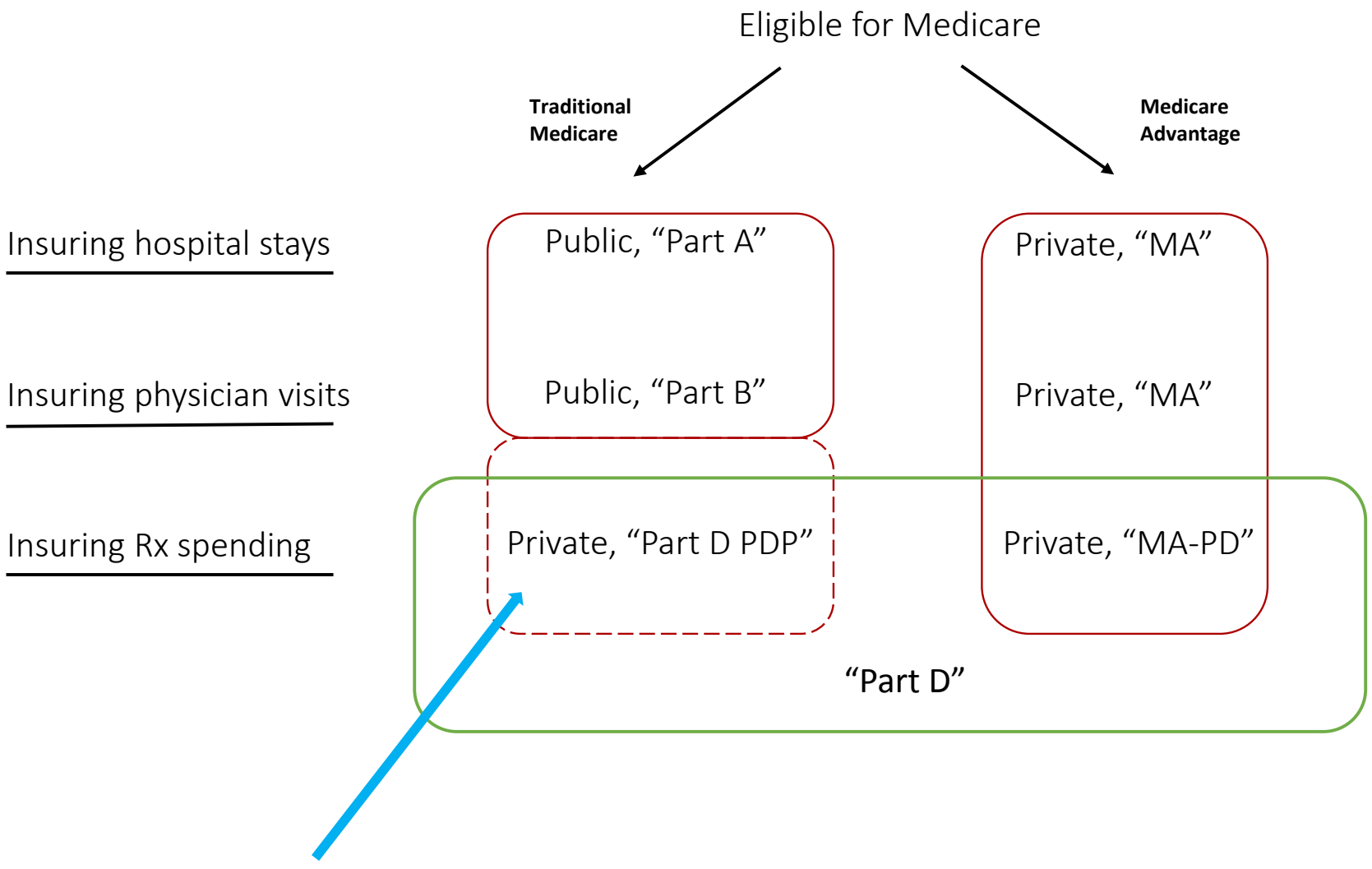
Relationship with My Research Agenda

- How the rules of a market influence its firms' behavior
- How altering/redesigning these rules can lead to more desirable social outcomes
- Several applications [representative papers]:
  - Subsidy rules in Medicare Part D: distortions of price competition and welfare implications [AER, 2015; DPR]
  - Enrollment rules in Medicare Part C&D: competition effects on both premium and benefit design [JHE, 2017; DGL]
  - Comparison of awarding mechanisms for public procurement [AEJ, 2014; MS, 2015; AEJ, 2016; IER, 2017; DFP]
  - Online ad auctions: collusion through intermediaries under different auction formats [DGP1&2]

Motivation

- **Subsidizing health insurance**
  - Medicare and Medicaid spending increased from \$530B to \$897B in last decade
  - Share of subsidies grew from 23% to 38%
- **Publicly funded private provision** motivated by reducing costs and increasing quality
- Understanding **incentives created by subsidization** key for regulatory design
  - Subsidization affects how much insurance people purchase and which contracts they choose
  - Subsidies may distort prices away from marginal cost and create rents for firms

Laboratory of Medicare Part D: Market Definition



Research Goals and Strategy

- Setting: Medicare privatized prescription drug insurance program
- Goals:
  - Positive: assess **efficiency** of observed allocation and the **degree of market power** under currect regulation
  - Normative: role of **subsidization mechanisms** for allocative efficiency
- Approach:
  1. Demand system recovers individual preferences
  2. Profit functions of insurers, taking into account a multitude of regulatory details
  3. Recover insurers' marginal costs
  4. Simulate equilibria under counterfactual regulatory mechanisms, including a social planner's benchmark

Preview of results

- Positive:
  - Reasonably competitive: estimated **mark-ups on average 9%**
  - Conditional on existing close substitutes, estimate low value-added of Part D **PDP** (enrollment <1% if face full cost)
  - Value depends on allocation of subsidies across different parts of the program
- Normative:
  - Existing mechanism reasonably close to optimal uniform voucher (welfare ˜ \$2B)
  - Social planner generates much higher surplus (˜ \$3-4B) → non-uniform **subsidies** could more effectively **steer consumers to plans with highest social value**
  - Market power → proportional subsidies - really bad idea

Literature

- Medicare Part D
  - Supply: Duggan and Scott Morton 2010; Ericson 2013; Ho, Hogan, Scott Morton 2015; Decarolis 2015; Starc and Town 2016; Lavetti and Simon 2016
  - Demand: Heiss et al., 2010, 2013; Abaluck and Gruber, 2011, 2015; Ketcham et al., 2012, 2015, 2016; Kling et al., 2012; Kesternich et al., 2013; Einav et al. 2015, Polyakova 2016, Miller and Yeo 2013; Ho et al. 2016; Wu 2016
- Procurement, subsidies, and price distortions in health insurance
  - Duggan 2004; Gruber and Washington 2005; Duggan, Scott Morton 2006; Bundorf, Levin, Mahoney 2011; Cramton, Ellermeyer, Katzman 2011; Duggan, Starc, Vabson 2014; Cabral, Geruso, Mahoney 2015; Curto, Einav, Levin, Bhattacharya 2016; Jaffe, Shepard 2016; Tebaldi 2017
- Large literature in PF and IO on government procurement, subsidies, and regulation of private provision

Conceptual framework: subsidies

- Demand: distortions; extensive / intensive margins
  - In-kind subsidies $\Rightarrow$ more *HI* purchased
  - If several choices of *HI*, buy relatively more subsidized ones
- Supply: if have market power
  - some subsidy surplus passed to firm
  - net welfare effect depends on degree of market power
- **Pass-through and net welfare depend on subsidy design**

Institutional Setting and Data

Consumers

- Medicare beneficiaries either in A/B or MA
- Can get Rx coverage:
  - Elective Part D PDP
  - Bundled in MA
- Two types of enrollees: regular and low-income (LIS)
  - Face different prices / choices; most don't pay premiums
- Restrictions on bids tie the two markets: **one bid submitted**
  - only plans with low enough bids get LIS enrollees and these enrollees are randomly assigned

3 prescription Drug Plans

Compare

Humana Walmart Rx Plan PDP View Details

Humana Prescription Drug

$15.70 per month

→ Enroll now

✕ **Medical Coverage**
not included

✓ **Prescription Coverage** included
Annual prescription deductible: $320.00

Add your prescriptions

Add your pharmacy

Compare

Humana Preferred Rx Plan PDP View Details

Humana Prescription Drug

$26.10 per month

→ Enroll now

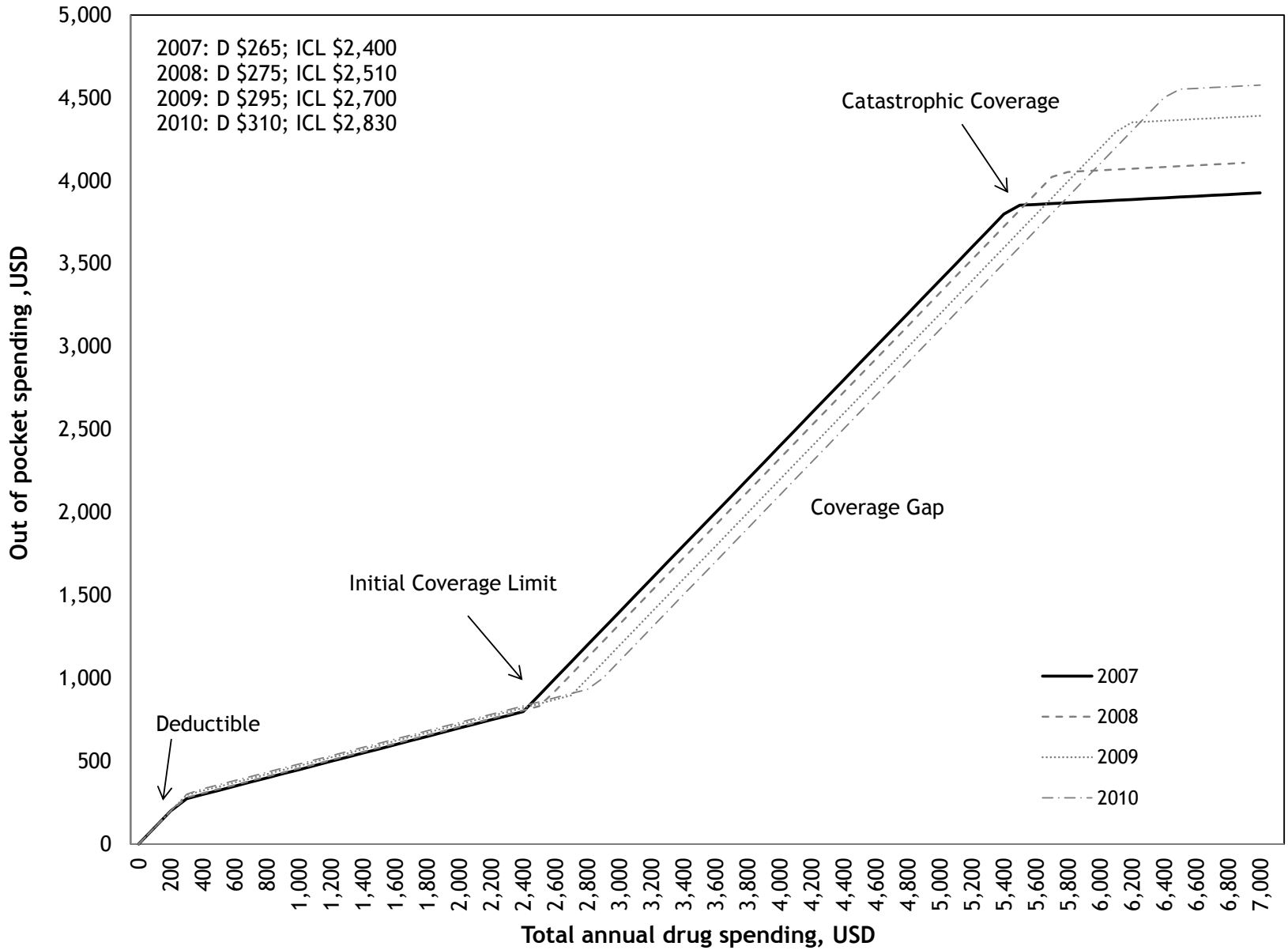
✕ **Medical Coverage**
not included

✓ **Prescription Coverage** included
Annual prescription deductible: $320.00

Add your prescriptions

Add your pharmacy

Minimum Coverage Requirements in Part D



Insurance plans

- Annual financial contracts
- Pay Rx expenditures after cost-sharing
- Minimum standard with infamous donut hole
- Insurers are allowed to adjust features
- Financial:
  - deductible
  - cost-sharing
  - coverage in the gap
- Non-financial: # drugs on formulary, pharmacies in-network, quality of service

Subsidy mechanism

- Plan premiums are subsidized
- Insurers announce "bids" (b) $\Rightarrow$ government splits them into premiums and subsidies
- "Regular market": subsidy = 70% of average bid, $\bar{b}$, premium $p_{jt} = max\{0,\ b_{jt} - 0.7\bar{b}\}$
- "Low-income market" (LIS):
  - beneficiaries randomly assigned to *qualifying* plans with 100% subsidy
  - *tie* to "regular" market: plans qualify if have $p_{jt} < \overline{p_t}$

Data

- Aggregate plan-level statistics released by CMS for 2007-2010
- Observe:
  - Premiums
  - Characteristics of contracts
  - Enrollment
  - Subsidies
  - (bids)
  - Parent Organizations (key reason for using aggregate data!)
  - Enrollment statistics for non-PDPs (MA-PD, RDS, other)

Data: Supply-side landscape and subsidy levels

Year	2007	2008	2009	2010
Plans				
Total number of PDP plans	1,742	1,791	1,674	1,565
Average number of PDP plans per market	51	53	49	46
Firms				
Total number of PDP parent organizations	56	56	50	50
Average number of PDP parent organizations per market	19	19	17	17
Premiums				
Unweighted average annual PDP consumer premium	$439	$477	$545	$559
Subsidies				
CMS subsidy for average risk beneficiary	$637	$631	$648	$677

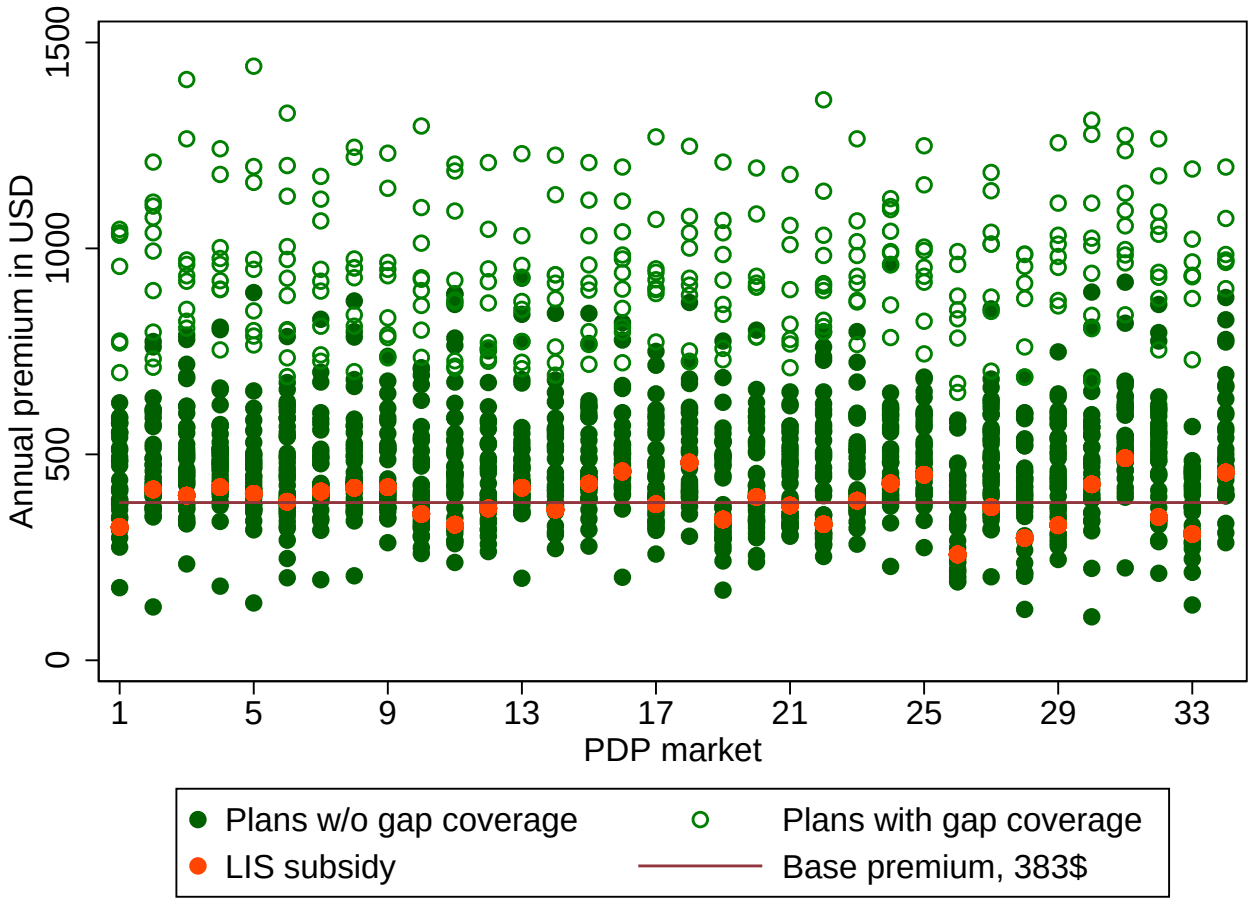
Data: observe detailed enrollment counts across different parts of Part D program

- Example of California's 2010 market
- **Total eligible for Medicare Part D**: 4,757,352 (100%)
- in stand-alone PDPs: 1,655,498 (35%)
  - 38% **regular**
  - 62% **LIS**
- in MA-PDs: 1,621,214 (34%)
- other coverage: 920,183 (19%)
- no coverage: 560,457 (12%)

Data: Distribution of prices

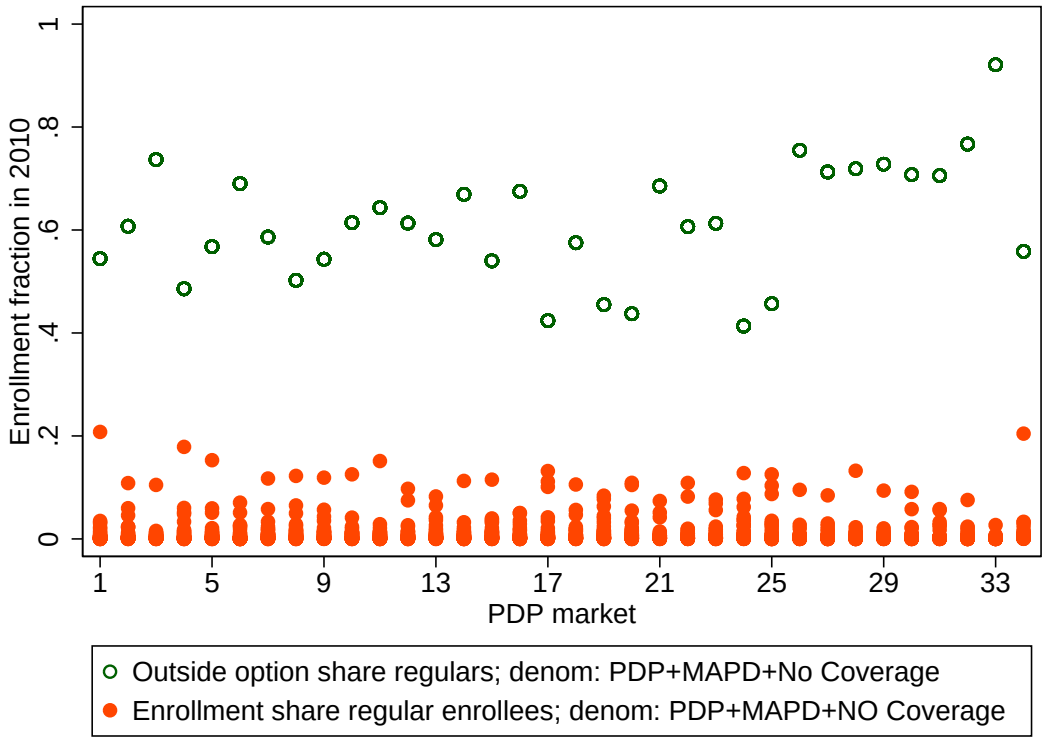
Annual premiums for PDP plans in 2010, LIS threshold, and "base premium".

- Premium $p_{jt} = max\{0,\ b_{jt} - 0.7\bar{b}\}$ + possible "enhanced coverage" premium



Distribution of market shares

- Attractive outside option (defined this way, as includes MA-PD coverage) - will explore what happens when we endogenize subsidy to the outside option in counterfactuals
- Heterogeneity in market shares of individual plans - range from close to 0% to 20%



Model of Demand and Supply

Model: Demand

$$v_{ijt} = -\alpha_i p_{jt} + \beta_i x_{jt} + \xi_{jt} + \epsilon_{ijt}$$

$$\ln \alpha_i = \alpha + \sigma_\alpha \nu_i$$

$$\beta_i = \beta + \sigma_\beta \nu_i$$

$$\text{where } \nu \sim \mathcal{N}(0,1) \text{ and } \epsilon_{ijt} \sim T1EV$$

- Individual i, plan j, market t
- p_{jt}- premium; x_{jt}- characteristics {deductible, donut hole coverage, formulary, vintage, insurer, market, year FE}
- ξ_{jt}- unobserved characteristics

Model: Demand in LIS market

- Most randomly assigned
- But! may choose to opt out and select their own plan
- ~ 1.7 million LIS choosers in 2010
- Issue: do not observe all LIS choosers, require stronger assumptions
- Our approach:
  - Combine enrollment of plans eligible for random assignment into one plan
  - Mostly infer preferences from choices among "ineligible" plans

Model: Demand

- Statute-defined markets: 34 regions, 2007 - 2010, total 136 markets
- Outside option: MA-PD or no Part D
- Estimation: BLP (1995)
- 4 instruments: number of PDP (or MA-PD) plans in a region-year by same PO; deductible of MA plans in the same region-year; average premiums in other markets by the same insurer
- Estimate separate models for regular and LIS market taking into account differences in characteristics and premiums

Model: Supply

- Complex set of supply-side policies that we attempt to integrate into the profit function
- Key features:
  - Static Bertrand-Nash
  - Insurers choose bids, not premiums
  - Conditional on risk adjustment, no selection on premiums [data supports this as a plausible approximation]
  - Take into account the tie across regular and LIS markets: insurers submit one bid
  - No entry/exit margin - don't observe a lot of entry/exit of big insurerers in the data

Model: Supply

- Consider one contract not eligible for LIS random assignment:

$$\pi_j(b_j) = \Gamma \left[\sum_{i \in j} \left(p_j(\bar{b}, b_j) + z_i(\bar{b}, r_i) - c_{ij}(r_i, x_j) \right) \right]$$

- Static model, decision variable: bid submitted to Medicare b_j
- Premiums $p_j(\bar{b}, b_j)$ and subsidy from government $z_i(\bar{b}, r_i)$
- Costs per enrollee: $c_{ij}(r_i, x_j)$
- Adjustment of ex-ante-profits through risk corridors - Γ

Model: Supply

$$\pi_j(b) = \Gamma \left[N(\mathbf{p}) \left(p_j(\overline{b}, b_j) + z(\overline{b}) - c_j(\overline{r}, x_j) \right) + \left(\sum_{i \in j} \eta_{ij}(x_j) \right) \right]$$

- $N(\mathbf{p})$ is the number of enrollees in plan j in equilibrium
- For each individual: $z_i = z + \tilde{z}_i$ and $c_{ij} = c_j + \tilde{c}_{ij}$
- Individual-specific difference between subsidy and cost: $\eta_{ij} = \tilde{c}_{ij} - \tilde{z}_i$
- $\eta_{ij}(x_j)$ measures selection; assume depends on x_j, not p_j
- Assume$(\sum_i \eta_{ij}(x_j))$ is zero on average

Model: Supply

- Can now re-write the pre-risk corridor profits as:

$$\pi_j(b_j) = (b_j - c_j)s_j(p_j, p_{-j})M - H_j(x)$$

- where $H_j(x) = (\sum_i \eta_{ij}(x))$
- b_j plan j's bid
- M-market size
- Premiums are functions of bids: $p_j(\overline{b}, b_j)$ and $p_{-j}(\overline{b}, b_{-j})$

Model: Supply

- Adding multi-plan insurers and LIS market

$$\begin{aligned}\pi_J(\mathbf{b}) \quad = \quad & \sum_{t \in T} \Gamma[\sum_{j \in J_t} M_t^R s_{jt}^R(b)(b_{jt} - c_{jt}^R) - H_{jt}^R(x) \\ & + \sum_{j \in J_t} M_t^{LIS} s_{jt}^{LIS}(b)(b_{jt} - c_{jt}^{LIS}) - H_{jt}^{LIS}(x)]\end{aligned}$$

- $p_{jt}^R = \max\left\{0, b_{jt} - \gamma \bar{b}_t\right\}$
- s_{jt}^{LIS} is non-linear and consists of two pieces:
  1. If $p_{jt} > \overline{p_t}$ (or LIPSA in this market), then s_{jt}^{LIS} consists only of LIS choosers
  2. Otherwise a discontinuous jump in s_{jt}^{LIS}

Model: Marginal cost

- Construct the F.O.C. with r.t. bids for plans not "distorted" by random assignment
  - "Distorted" plans = all plans of an insurer in a market if at least one plan was eligible for random LIS assignment
- Note the difference to standard FOC - market size matters
- Assuming that risk-adjustment equalizes MC for LIS and non-LIS up to a factor κ, can write the FOC (here simplify to $\kappa = 1$) as:

$$c = b - \Omega^{-1}(M^R s^R(p^R(b)) + M^{LIS} s^{LIS}(p^{LIS}(b)))$$

where Ω is: $\Omega_{kj} = \begin{cases} -M^R \frac{\partial s_k^R(p)}{\partial p_r} - M^{LIS} \frac{\partial s_j^{LIS}(p)}{\partial p_k} & \text{if } \{j,k\} \in J \\ 0 & \text{else} \end{cases}$

Marginal cost estimation

- For "distorted plans" - recover MC through a hedonic projection using non-distroted plans:

$$mc_{jt} = X_{jt}\beta + \delta_t + \gamma_j + \epsilon_{jt}$$

- Idea: "production" function and characteristics of plans determine how costly it is to provide insurance
- The assumption is that for distorted plans, this "structural" production function is the same
- Lots of caveats: sampling error, random error, specification error

Model: Welfare

- Consumer surplus + insurer profit - gov't spending

$$W = \overbrace{M \int \frac{1}{\alpha} \left(\gamma + \ln \left[1 + \sum_{j=1}^{J} \exp(v_j(\theta)) \right] \right) dF(\theta)}^{\text{Consumer Surplus (CS)}}.$$

$$+ \overbrace{\sum_{j=1}^{J} (b_j - c_j) s_j(p) M}^{\text{Producer Profit } (\Pi)}$$

$$- \overbrace{\lambda \left(\sum_{j=1}^{J} (G_j^{PDP} - G^{MAPD}) s_j(p) M \right)}^{\text{Social Cost of Government Spending (G)}}$$

Model: Social Planner's Solution

- For Social Planner's problem add fiscal cost on the product market term $\sum_{j=1}^{J}(b_j - c_j)s_j(p)M$
- FOC for max W(p):

$$(\lambda - 1)s(p) + \lambda\Omega(p)(p - c - \Delta G) = 0$$

- Price vector of social planner:

$$p^{SocialPlanner} = c + \Delta G + \Omega(p)^{-1}\frac{(1-\lambda)}{\lambda}s(p)$$

Estimation results

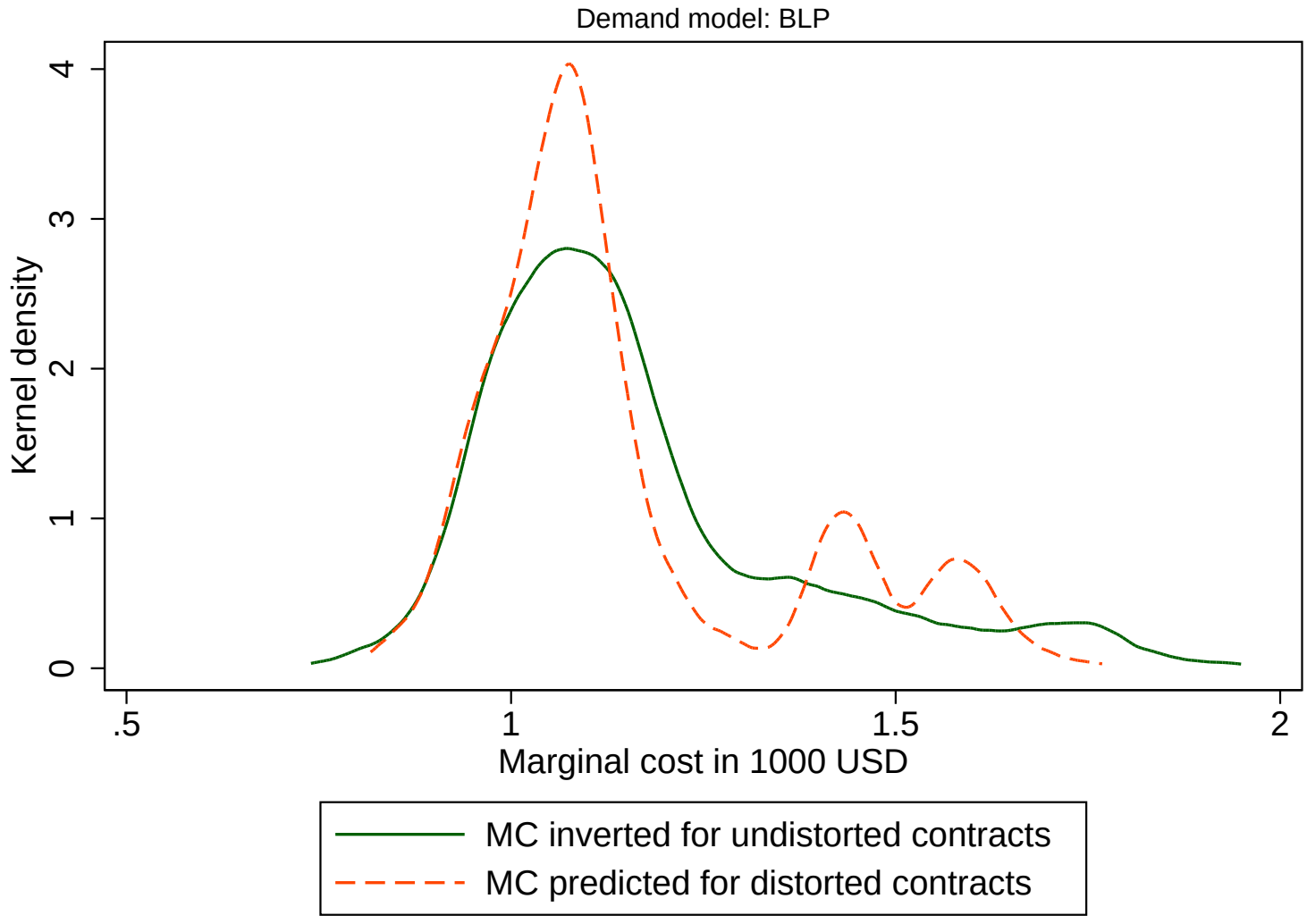
Demand Estimates: Regular Enrollee Market

		BLP with random coefficient on…		
	2SLS	**price**	**price and gap**	**price, gap, inner option**
\mu_alpha	2.32	2.58	2.58	2.58
\sigma_alpha	-	0.27	0.268	0.268
Mean marginal utility of income	-10.2	-13.7	-13.69	-13.69
Median marginal utility of income	-10.2	-13.2	-13.2	-13.2
Modal marginal utility of income	-10.2	-12.3	-12.3	-12.3
\sigma_inner	-	-	-	0
Annual Deductible	-6.62	-7.11	-7.11	-7.11
Coverage in the Gap	2.85	2.89	2.89	2.89
\sigma_gap	-	-	0	0
Number of Top Drugs Covered	30.7	30.4	30.4	30.4
Pharmacy Network Measure	0.290	0.313	0.313	0.313
Number Years Plan on Market	0.872	0.895	0.895	0.895
Modal own-price elasticity	-4.45	-5.90	-5.98	-5.98
Modal cross-price elasticity	0.0437	0.059	0.0586	0.0586
GMM Objective Function	0.004	0.003	0.003	0.003

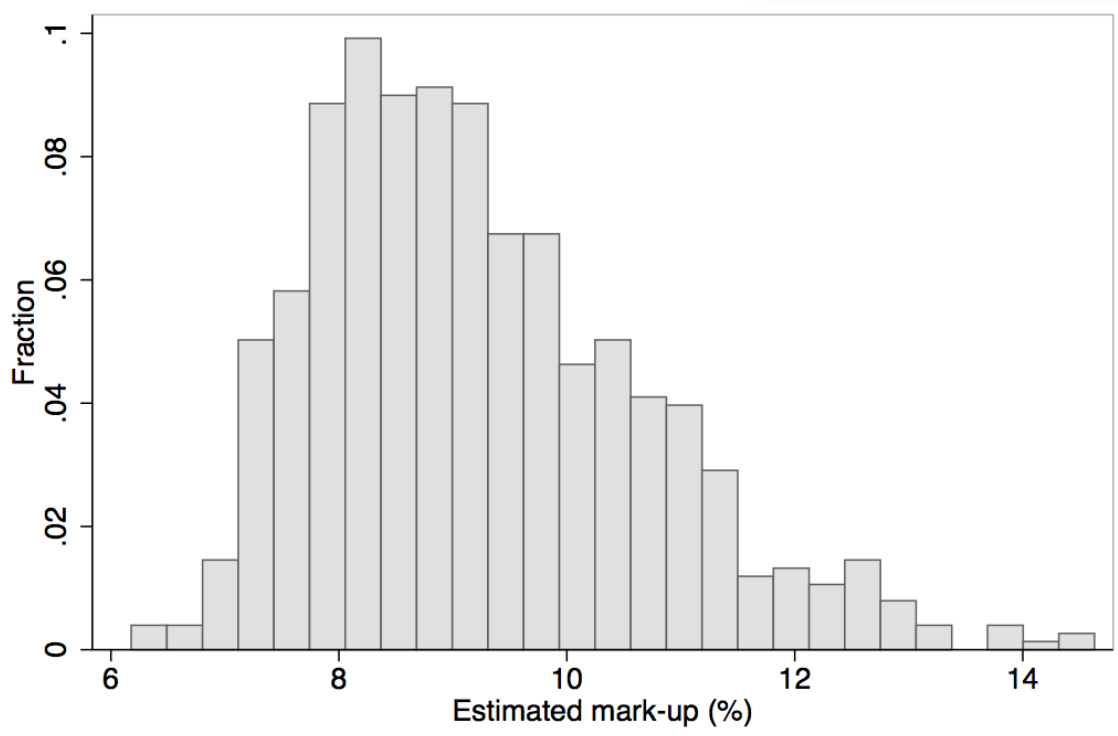
Marginal cost: Hedonic projection

	Berry MC inversion	BLP MC inversion
Annual deductible	-0.365***	-0.354***
	(0.0440)	(0.0428)
No. of common APIs	0.142	0.183
	(0.130)	(0.127)
Has coverage in the gap (1/0)	0.422***	0.412***
	(0.0105)	(0.0102)
Enhanced plan (1/0)	-0.0352**	-0.0326**
	(0.0118)	(0.0114)
No. of top drugs in Tier 1 and 2	-0.569	-0.422
	(0.380)	(0.370)
No. of top drugs covered	-8.696***	-8.975***
	(2.476)	(2.407)
Pharmacy network measure	-0.188***	-0.196***
	(0.0509)	(0.0495)
No. years the plan is on the market	46.09***	44.01***
	(3.170)	(3.082)
Mean dep.var.	1.171	1.172
Std. dev. dep.var.	0.239	0.228
R-squared	0.868	0.864
Number of observations	756	756

Results: Inverted and Projected MC



Results: Markups



Positive analysis: Welfare under observed allocation

	Observed Allocation (Regular Enrollees)
Consumer Surplus, $M	2,517
Insurer Profit, $M	447
Premium Subsidy, $M	5,936
Reinsurance Subsidy, $M	3,444
Inside Option Enrollment, '000	8,772
Inside Option, Percent	38
Average Weighted Premium, $	502
Average Weighted Bid, $	1,123
MA-PD Premium Subsidy, $M	6,018
MA-PD Reinsurance Subsidy, $M	2,281
Total surplus, $M	**1,559**
per PDP Subsidy Dollar, $	0.17
per Opportunity Cost Dollar, $	1.11

Results of counterfactual simulations

Removing cross-market links in current mechanism

	Observed (Reg.Enr.)	No LIS Link	No LIS or MA-PD Link
Consumer Surplus, $M	2,517	2,881	3,399
Insurer Profit, $M	447	1,058	1,275
Premium Subsidy, $M	5,936	7,768	10,082
Reinsurance Subsidy, $M	3,444	4,042	4,960
Inside Option Enrollment, '000	8,772	10,512	12,892
Inside Option, Percent	38	45	55
Average Weighted Premium, $	502	473	420
Average Weighted Bid, $	1,123	1,153	1,145
MA-PD Premium Subsidy, $M	6,018	7,211	8,844
MA-PD Reinsurance Subsidy, $M	2,281	2,733	3,352
Total surplus, $M	**1,559**	**1,515**	**974**
per PDP Subsidy Dollar, $	0.17	0.13	0.06
per Opportunity Cost Dollar, $	1.11	0.62	0.26

Alternative Ownership

	Observed (Reg.Enr.)	Independent Plans	Monopoly
Consumer Surplus, $M	3,399	3,336	2,807
Insurer Profit, $M	1,275	1,168	2,151
Premium Subsidy, $M	10,082	9,695	8,853
Reinsurance Subsidy, $M	4,960	4,924	4,049
Inside Option Enrollment, '000	12,892	12,580	10,556
Inside Option, Percent	55	54	45
Average Weighted Premium, $	420	428	450
Average Weighted Bid, $	1,145	1,142	1,241
MA-PD Premium Subsidy, $M	8,844	8,630	7,241
MA-PD Reinsurance Subsidy, $M	3,352	3,271	2,745
Total surplus, $M	**974**	**970**	**1,167**
per PDP Subsidy Dollar, $	0.06	0.07	0.09
per Opportunity Cost Dollar, $	0.26	0.27	0.31

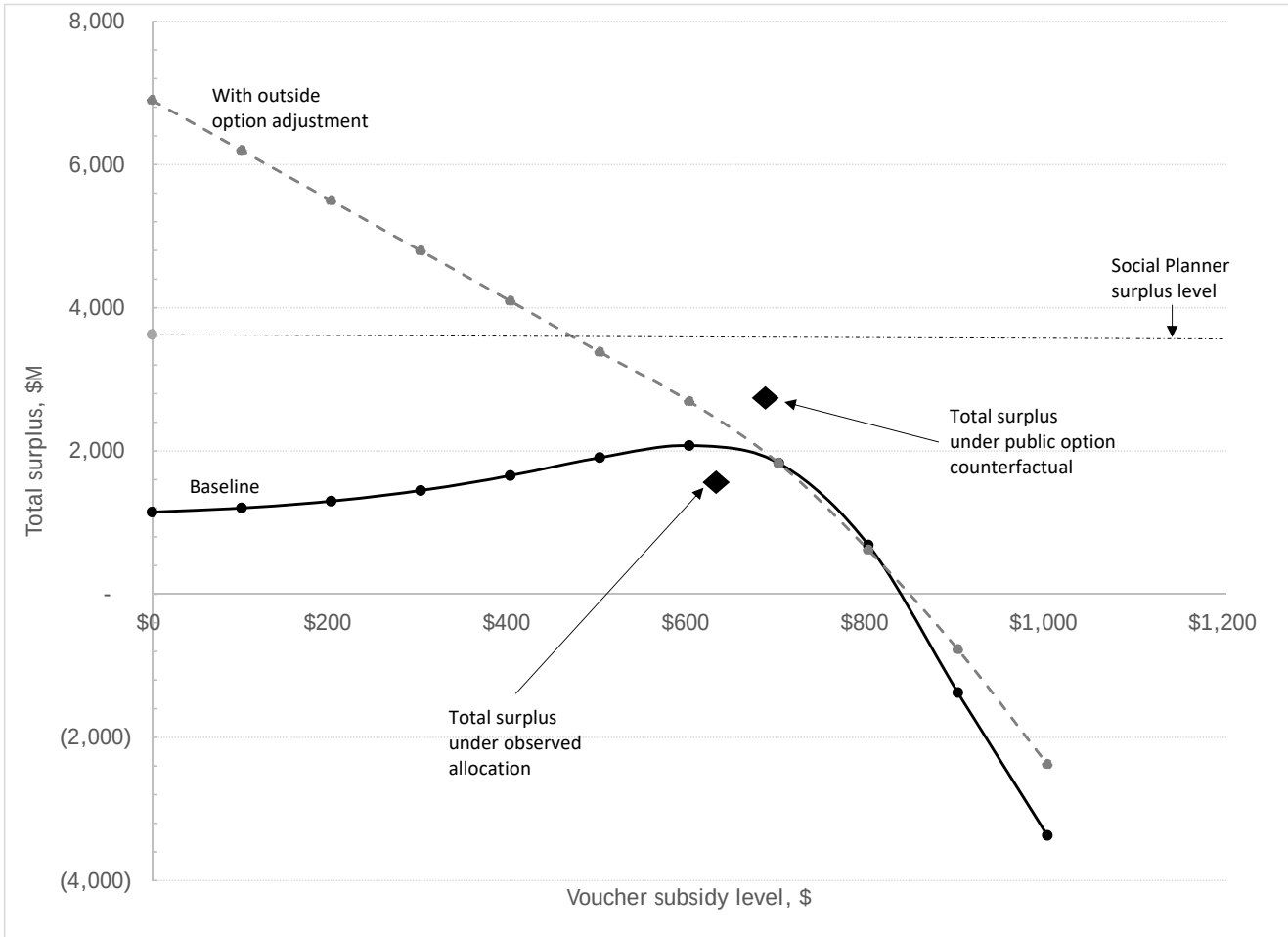
Social planner's solution

	Marginal Cost		Social Planner		Optimal Voucher	
	Private (1)	Social (2)	Baseline (3)	Public Option (4)	National (5)	Market (6)
Consumer Surplus, $M	1,094	1,064	2,871	2,996	1,819	1,934
Insurer Profit, $M	-	-	(9,725)	-	514	561
Premium Subsidy, $M	-	-	-	8,785	2,852	3,332
Reinsurance Subsidy, $M	93	-	-	3,655	1,842	1,948
Inside Option Enrollment, '000	216	35	10,895	12,996	4,753	5,272
Inside Option, Percent	1	0	47	56	20	23
Average Weighted Premium, $	1,284	1,450	377	192	650	631
Average Weighted Bid, $	1,284	1,450	377	868	1,250	1,246
MA-PD Premium Subsidy, $M	148	24	7,474	8,915	3,260	3,617
MA-PD Reinsurance Subsidy, $M	56	9	2,833	3,379	1,236	1,371
Total surplus, $M	**1,240**	**1,106**	**3,627**	**2,806**	**2,075**	**2,116**
per PDP Subsidy Dollar, $	13.40	-	0.29	0.23	0.44	0.40
per Opportunity Cost Dollar, $	-	-	-	-	8.08	5.58

Alternative subsidy mechanisms in a decentralized market

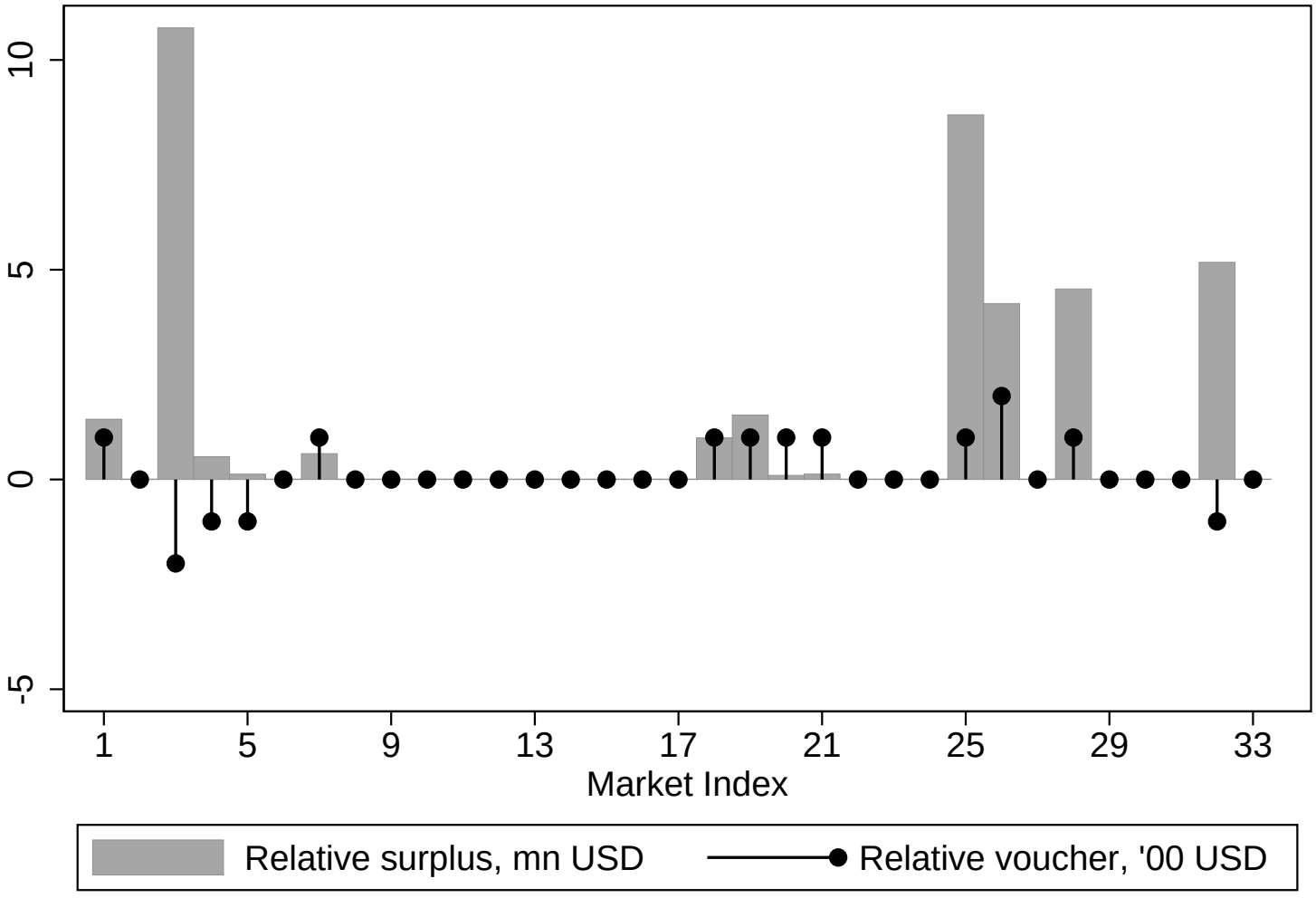
	Proportional Subsidies			Vouchers		
	p=5%	p=32%	p=95%	$0	$700	$1,400
	(1)	(2)	(3)	(4)	(5)	(6)
Consumer Surplus, $M	13,344	4,533	1,081	1,073	2,497	12,581
Insurer Profit, $M	50,405	4,845	20	13	879	4,814
Premium Subsidy, $M	84,156	18,086	10	-	5,997	32,599
Reinsurance Subsidy, $M	15,695	8,183	58	39	3,296	10,367
Inside Option Enrollment, '000	23,280	14,498	133	89	8,567	23,297
Inside Option, Percent	100	62	1	0.4	37	100
Average Weighted Premium, $	190	587	1,382	1,441	522	77
Average Weighted Bid, $	3,805	1,835	1,455	1,441	1,222	1,477
MA-PD Premium Subsidy, $M	15,970	9,946	92	61	5,877	15,982
MA-PD Reinsurance Subsidy, $M	6,053	3,770	35	23	2,227	6,057
Total surplus, $M	**(37,428)**	**(6,942)**	**1,177**	**1,146**	**1,830**	**(9,811)**
per PDP Subsidy Dollar, $	(0.37)	(0.26)	17.29	29.62	0.20	(0.23)
per Opportunity Cost Dollar, $	(0.37)	(0.43)	-	-	1.18	(0.36)

Normative analysis: observed allocation vs a uniform flat voucher



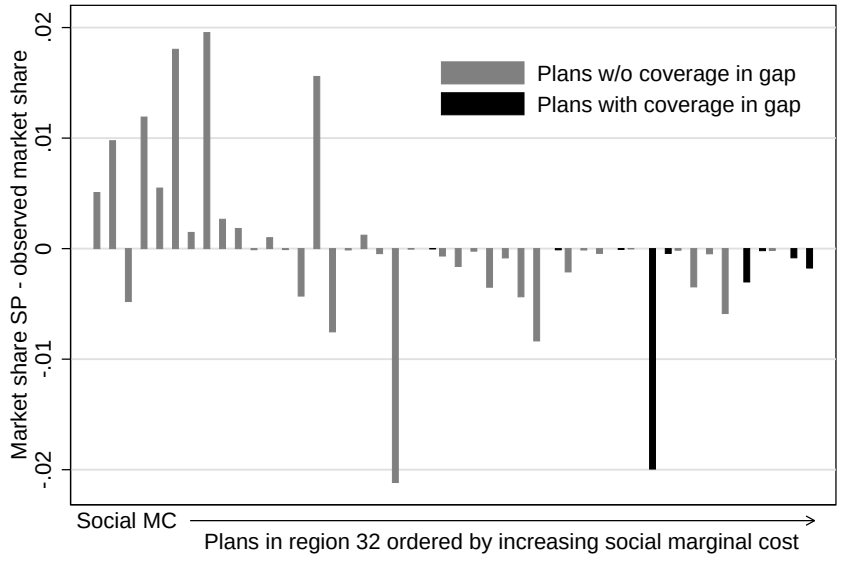
- Max total surplus under uniform voucher ($2.1B) higher than welfare under observed allocation ($1.6B)
- Much lower that social planner's solution ($3.6B)

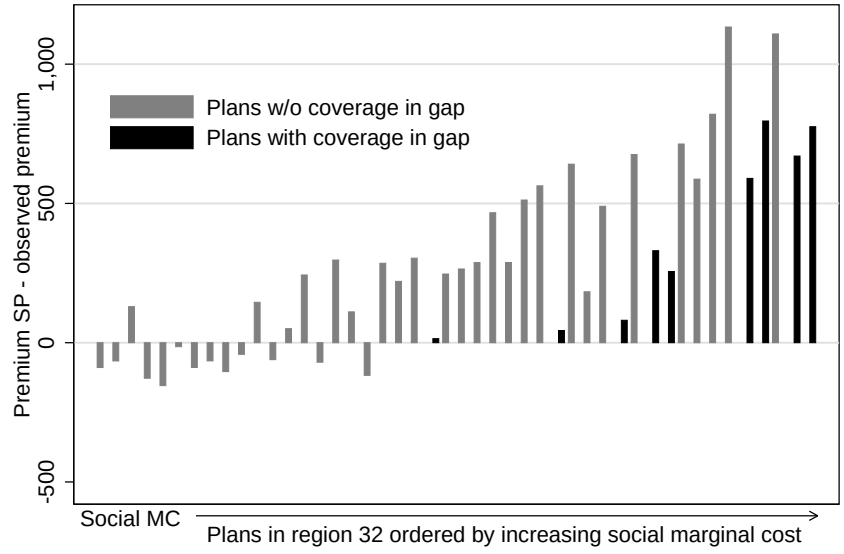
Optimal vouchers: market-specific vs. uniform



Normative analysis: social planner's solution (California example)

- Social planner raises prices for plans with higher SMC; enrollment shifts to plans with lower SMC





Extensions and Robustness Checks

Extensions:

- Endogenizing the subsidy to outside option MA-PD go
- Adding welfare of LIS-eligible consumers go

Robustness checks:

- Vintage and inertia: no vintage; MC +/- 20 percent (Miller, 2014) go
- Social cost of funds: $\lambda \in \{1, 1.7, 2\}$ go
- Alternative demand estimates for regular enrollees: characteristics with RC go

Conclusion

- In a setting with publicly financed, but privately provided goods:
  - Behavior of private insurers is essential in understanding how the programs work
  - Subsidies are central in determining the allocations and consumer welfare conditional on supply-side behavior
  - The structure of subsidy mechanisms may have large impact on supply-side
- Current mechanism close to optimal flat voucher, but could do better per budget $
- Providing the right incentives to insurers in these markets is highly complex

THANK YOU!

First Stage Regression for Plan Premiums

	Regular (1)	LIS (2)
No. of PDP plans in a region-year by same PO	−9.631***	2.048
	(2.375)	(4.101)
No. of MA plans in a region-year by same PO	-0.184	-0.467
	(0.242)	(0.470)
Deductible of MA plans in the same region-year	-0.147	-0.0204
	(0.173)	(0.326)
Hausman IV	0.371***	0.721***
	(0.0326)	(0.0471)
Observations	6675	5313

Observed Allocation; Link and Ownership Counterfactuals with Endogenous Outside Option

	Data (1)	No LIS Link (2)	No LIS or MA-PD Link (3)	Independent Plans (4)	Monopoly Ownership (5)
Consumer Surplus, $M	2,517	3,483	4,309	4,151	4,709
Insurer Profit, $M	447	856	911	867	1,199
Premium Subsidy, $M	5,936	6,152	6,970	6,927	5,651
Reinsurance Subsidy, $M	3,444	3,204	3,429	3,506	2,585
Inside Option Enrollment, '000	8,772	8,325	8,913	8,988	6,738
Inside Option, Percent	38	36	38	38	29
Average Weighted Premium, $	502	484	438	445	444
Average Weighted Bid, $	1,123	1,162	1,159	1,156	1,229
MA-PD Premium Subsidy, $M	6,018	5,711	6,115	6,166	4,622
MA-PD Reinsurance Subsidy, $M	2,281	2,165	2,317	2,337	1,752
Additional MA-PD Subsidy Payment, $M	-	797	1,387	1,222	2,544
MA-PD Change in Average Premium, $	-	(44)	(75)	(67)	(111)
Total surplus, $M	**1,559**	**1,379**	**859**	**921**	**181**

Proportional and Flat Subsidy Counterfactuals with Endogenous Outside Option

	Proportional Subsidies			Vouchers		
	p=5%	p=32%	p=95%	$0	$700	$1,400
	(1)	(2)	(3)	(4)	(5)	(6)
Consumer Surplus, $M	13,389	4,358	(12,304)	(13,496)	2,720	12,704
Insurer Profit, $M	49,008	5,129	851	778	815	4,414
Premium Subsidy, $M	81,651	19,262	486	-	5,519	30,250
Reinsurance Subsidy, $M	15,161	8,735	3,030	2,886	3,035	9,629
Inside Option Enrollment, '000	22,488	15,518	7,790	7,492	7,884	21,620
Inside Option, Percent	96	66	33	32	34	93
Average Weighted Premium, $	191	584	1,184	1,228	526	80
Average Weighted Bid, $	3,822	1,825	1,247	1,228	1,226	1,479
MA-PD Premium Subsidy, $M	15,427	10,645	5,344	5,140	5,408	14,831
MA-PD Reinsurance Subsidy, $M	5,847	4,035	2,025	1,948	2,050	5,621
Additional MA-PD Subsidy Payment, $M	202	(235)	(9,932)	(10,887)	217	1,244
MA-PD Change in Average Premium, $	(152)	22	628	677	(-15)	(-222)
Total surplus, $M	**(36,064)**	**(7,519)**	**6,468**	**6,897**	**1,828**	**(9,753)**

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Welfare with flat vouchers in regular and LIS markets

Voucher in regular market	Voucher in LIS market: $0	$100	$200	$300	$400	$500	$600	$700	$800	$900	$1,000
$0	1,935	1,933	1,930	1,923	1,909	1,879	1,813	1,667	1,350	688	(584)
$100	1,992	1,991	1,987	1,980	1,964	1,932	1,862	1,711	1,388	721	(554)
$200	2,087	2,085	2,082	2,074	2,057	2,022	1,947	1,788	1,456	778	(502)
$300	2,235	2,234	2,230	2,222	2,204	2,167	2,087	1,920	1,573	880	(413)
$400	2,445	2,444	2,440	2,432	2,414	2,376	2,294	2,119	1,758	1,045	(265)
$500	2,696	2,695	2,692	2,684	2,666	2,628	2,545	2,368	1,999	1,269	(58)
$600	2,865	2,865	2,862	2,856	2,839	2,801	2,720	2,546	2,180	1,451	128
$700	2,621	2,621	2,619	2,614	2,599	2,563	2,483	2,312	1,958	1,252	(31)
$800	1,477	1,478	1,477	1,472	1,458	1,422	1,339	1,164	811	126	(1,105)
$900	(581)	(581)	(582)	(587)	(603)	(644)	(739)	(938)	(1,321)	(2,032)	(3,261)
$1,000	(2,573)	(2,574)	(2,576)	(2,583)	(2,602)	(2,651)	(2,765)	(2,999)	(3,439)	(4,215)	(5,507)

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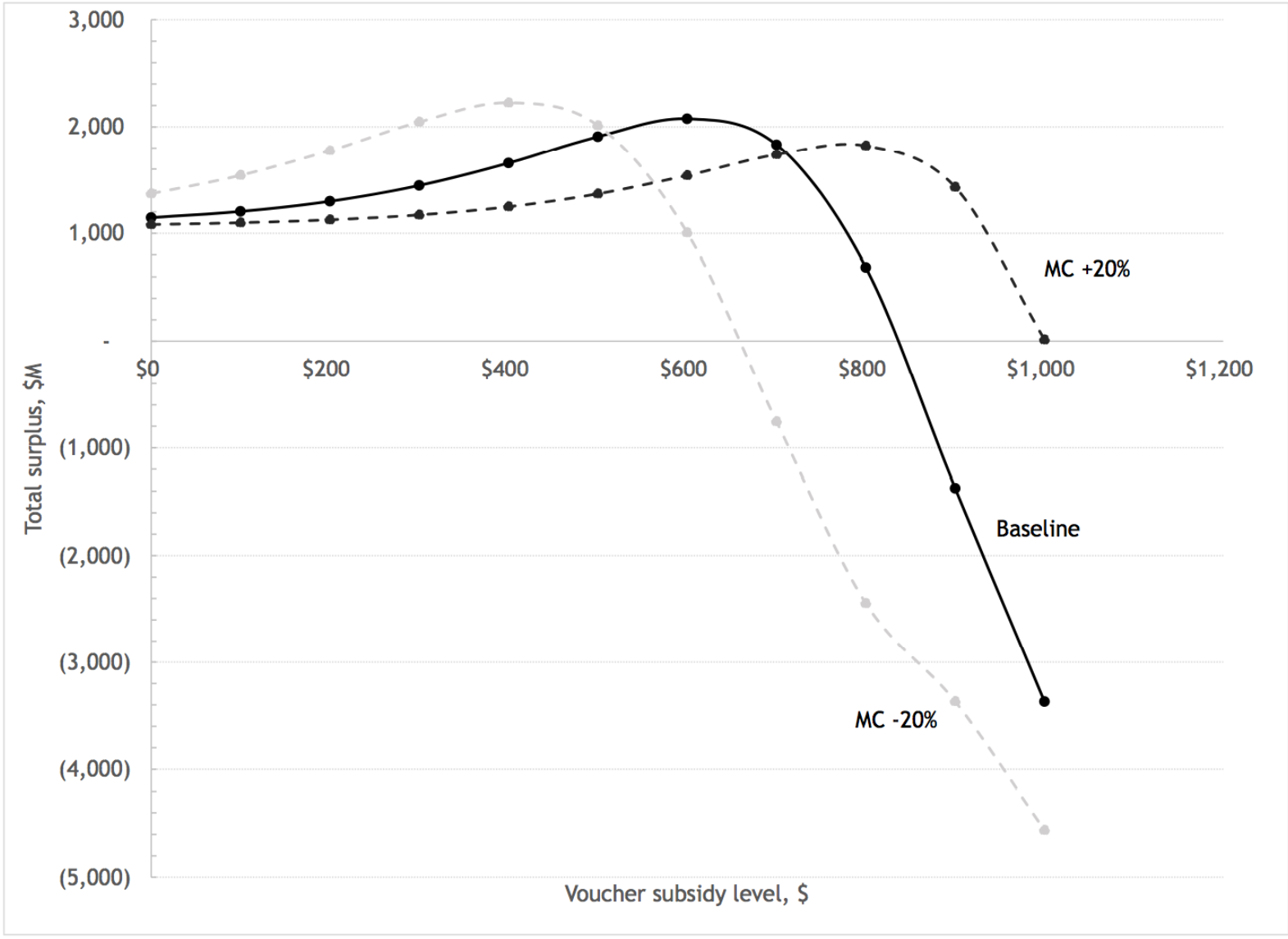
Sensitivity checks (1/3)



Sensitivity checks (1/3)

	Observed Allocation			Social Planner		
	No vintage (1)	MC -20% (2)	MC +20% (3)	No vintage (4)	MC -20% (5)	MC +20% (6)
Consumer Surplus, $M	1,152	2,517	2,517	1,198	5,114	1,572
Insurer Profit, $M	447	2,426	(1,531)	(1,221)	(15,908)	(3,189)
Premium Subsidy, $M	5,936	5,936	5,936	-	-	-
Reinsurance Subsidy, $M	3,444	3,444	3,444	-	-	-
Inside Option Enrollment, '000	8,772	8,772	8,772	1,325	19,145	3,508
Inside Option, Percent	38	38	38	6	82	15
Average Weighted Premium, $	502	502	502	294	244	563
Average Weighted Bid, $	1,123	1,123	1,123	294	244	563
MA-PD Premium Subsidy, $M	6,018	6,018	6,018	909	13,134	2,407
MA-PD Reinsurance Subsidy, $M	2,281	2,281	2,281	345	4,978	912
Total surplus, $M	**193**	**3,537**	**(420)**	**1,240**	**7,978**	**1,740**

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Sensitivity checks (2/3)

	$\lambda = 1$ (1)	$\lambda = 1.3$ (2)	$\lambda = 1.7$ (3)	$\lambda = 2$ (4)
Observed allocation	1,883	1,559	1,126	802
Observed allocation with welfare-neutral vintage	518	193	(239)	(563)
Observed allocation with MC 20% down	3,861	3,537	3,104	2,780
Observed allocation with MC 20% up	(96)	(420)	(853)	(1,177)
No LIS link	2,074	1,515	768	209
No LIS or MA-PD link	1,828	974	(165)	(1,019)
Independent Plans	1,785	970	(118)	(933)
Monopoly Ownership	2,042	1,167	0	(875)

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Sensitivity checks (3/3)

Coefficient	Point Estimate	SE
Without Any Random Coefficients		
σ_{price}	-	-
σ_{gap}	-	-
$\bar{\alpha}$	2.32	0.208
σ_{inside}	-	-
GMM Objective Value: 0.00377880		
With RC on Coverage in the Gap		
σ_{price}	0.268	0.111
σ_{gap}	0.00	0.0836
$\bar{\alpha}$	2.58	0.257
σ_{inside}	-	-
GMM Objective Value: 0.00332521		
With RC on the Inside Option		
σ_{price}	0.268	0.0377
σ_{gap}	-	-
$\bar{\alpha}$	2.58	0.265
σ_{inside}	0.00	0.0460
GMM Objective Value: 0.00332521		
With RC on Coverage in the Gap and Inside Option		
σ_{price}	0.268	0.0742
σ_{gap}	0.00	0.0277
$\bar{\alpha}$	2.58	0.220
σ_{inside}	0.00	0.0202
GMM Objective Value: 0.00332521		

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