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Insurer (In)Efficiency in the Medicare Part D Program

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Part D Basics

- Medicare created in 1965 and now insures 43+ million elderly and disabled in US (Medicaid insures the poor.)
  - Part A: hospital inpatient care and some long term care
  - Part B: hospital outpatient care and physician services
  - Part C: Medicare HMO
- For first 40 yrs –prescription drug expenses uncovered
  - Certain physician-administered drugs the exception
- Changed in Jan 2006 with enactment of Medicare Part D which created prescription drug insurance for the elderly
  - Largest expansion of Medicare since its inception
  - Projected to cost $780 billion in first ten years (2006-15)

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Novel

- **Privatized**
  - New example of procurement mechanism; private insurance plans compete for enrollees
  - Plans are 75% subsidized by the government
  - Government does not set/bargain for pharmaceutical prices, instead plans contract with manufacturers.
  - Government does not set/bargain for plan premiums; only approves plans that conform to the regulations.
- **Complex**
  - Out-of-pocket costs are a non-linear function of RX spending
  - Formularies and rules limiting access to drugs differ across PDPs
  - Prices of the drugs on the formulary are choice of PDP and also vary
  - Government allows some flexibility in benefit design (though actuarially equivalent)

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Consumer's problem

- Consumer chooses among plans in region: 27+
  - Sponsor (e.g. Humana, United Healthcare, union)
  - Standard Plan or Enhanced Plan (more benefits)
  - Schedule of out of pocket payments: "actuarially equivalent" means can vary
- Formulary
  - Different plans may have different preferred brands, prior authorization, step therapy. PDP must cover 2 drugs per therapeutic class.
  - Co-payments therefore vary across plans for same medication
- Prices
  - Expected cost = annual premium + expected out-of-pocket payments
  - Search plans for lowest prices on drugs *currently* taking and *expect* will take next year
- Other: quality, service, brand, pharmacy network

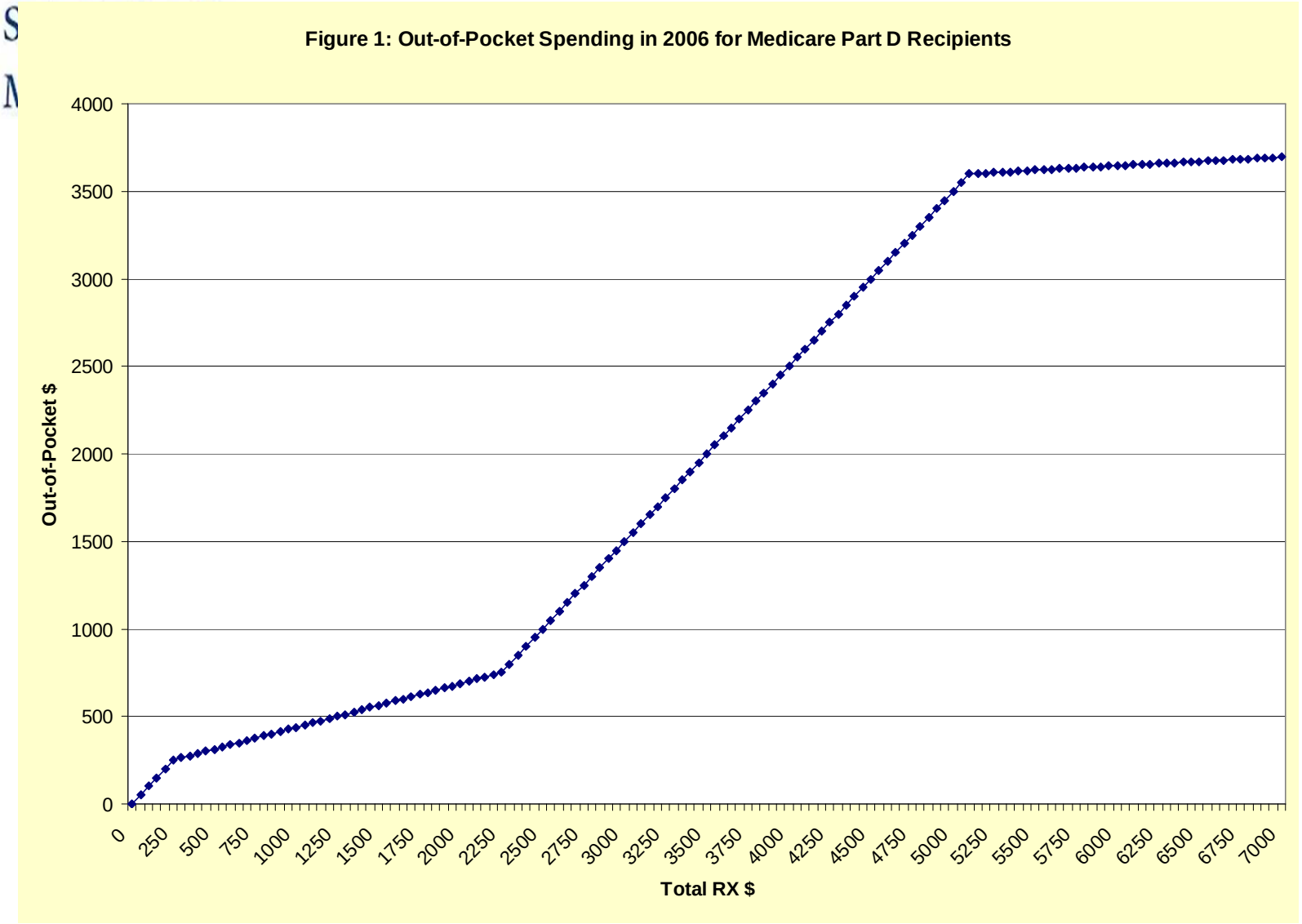
Figure 1: Out-of-Pocket Spending in 2006 for Medicare Part D Recipients
Out-of-Pocket $
4000
3500
3000
2500
2000
1500
1000
500
0
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
2750
3000
3250
3500
3750
4000
4250
4500
4750
5000
5250
5500
5750
6000
6250
6500
6750
7000
Total RX $

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Plan's problem

- **Insurers design plans**
  - Must offer a basic plan if want to offer an enhanced plan; which regions?
  - Defined benefit, or alternative design that is actuarially equivalent?
  - Design formulary; choose schedule of co-payments; negotiate pharmacy network
- **Plans submit bids**
  - Calculate cost of running plan= bid = drug purchases, administration and profit, less federal subsidies
  - Government takes average bid and applies 75% subsidy.
    - This is "base beneficiary premium"
    - Actual premium for a plan is adjusted (up or down) by the full difference between that plan's own bid and the average bid
- **After prices set, compete for consumers**
  - Premiums lower than expected in 2006. Rising steadily since then.

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Entry

- Lots of Entry
  - 226 sponsors, 1678 PDPs, 2195 MA-PDs; 3873 region-plan combinations; at least 27 plans in each state-year
- Concentration initially high
  - Top two (UHG-Pacificare and Humana, Inc.) had 44% nationally; Next eight had 28%
  - Entry and exit fairly balanced 2007-9
  - 2010-11 significant exit
- Just 14% of enrollees choose standard benefit
  - 51% in actuarially equivalent and rest in enhanced plans

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Policy questions

- How well does this marketplace perform?
- Does the private provision of benefits generate lower prices and/or better quality and innovation than a standard government program?
  - Lower prices for drugs? (Duggan and Scott Morton)
  - Lower prices for insurance? (Ho, Hogan, and Scott Morton)
- Many other questions: innovation, doughnut hole, health outcomes, etc
- Skip previous literature in the interests of time
  - Part D; other privatized markets; consumer inattention

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Impact on price of drugs

- Part D should affect pharmaceutical manufacturer's profit-maximizing price
- Two key forces– theoretically ambiguous which dominates
  - More insurance => lower demand elasticity => higher price
    - Shown for Medicaid (Duggan and Scott Morton 2006)
  - Plans compare price/efficacy => negotiate discounts => lower price
    - Impact of the PBM function
- Net effect: prices fall (20+%) for Part D consumers for drugs that face competition

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Impact on price of insurance

- Cost of treatments rising slowly 2.8%
- Cost of services rising slowly 2.4%
- Yet cost of insurance rising quickly
  - CBO – plan profits 8%p.a.
  - Our NJ data – premiums 17% p.a.
- It may be that program design is not maximizing competition among insurers

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ACA = Obamacare

- New law makes this analysis important
- Many Americans will choose a privately-provided, publicly-subsidized, healthcare plan starting in November 2013
- As with Part D, plans will compete for consumers

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Data

- Individual-level data from NJ
- Only enrollees in PDPs, only enrollees who pay full price
- 2006-2009: 4 years of data
- Detailed data: drugs purchased, payments made, demographics
- Sample each year and keep enrollees who stay in Part D (in PDP, no subsidy)

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Counterfactual payments

- Critical for Part D research; we follow the literature (Abaluck-Gruber, Ketchum et al)
- Must calculate the cost to the consumer of enrolling in each alternate plans
- Calculate expected cost ex ante to avoid including unexpected health shocks
  - Chronic drugs: assume consumer foresees
  - Acute drugs: Place consumer in demographic/usage "bin"; take median expenditure on acute drugs
- Use prices and coverage rules of plan

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Policy Problem

- Next slide graphs the consumers' options over time
  - Optimal plan
  - Randomly chosen plan
  - Observed plan
  - Best plan within the sponsor's portfolio

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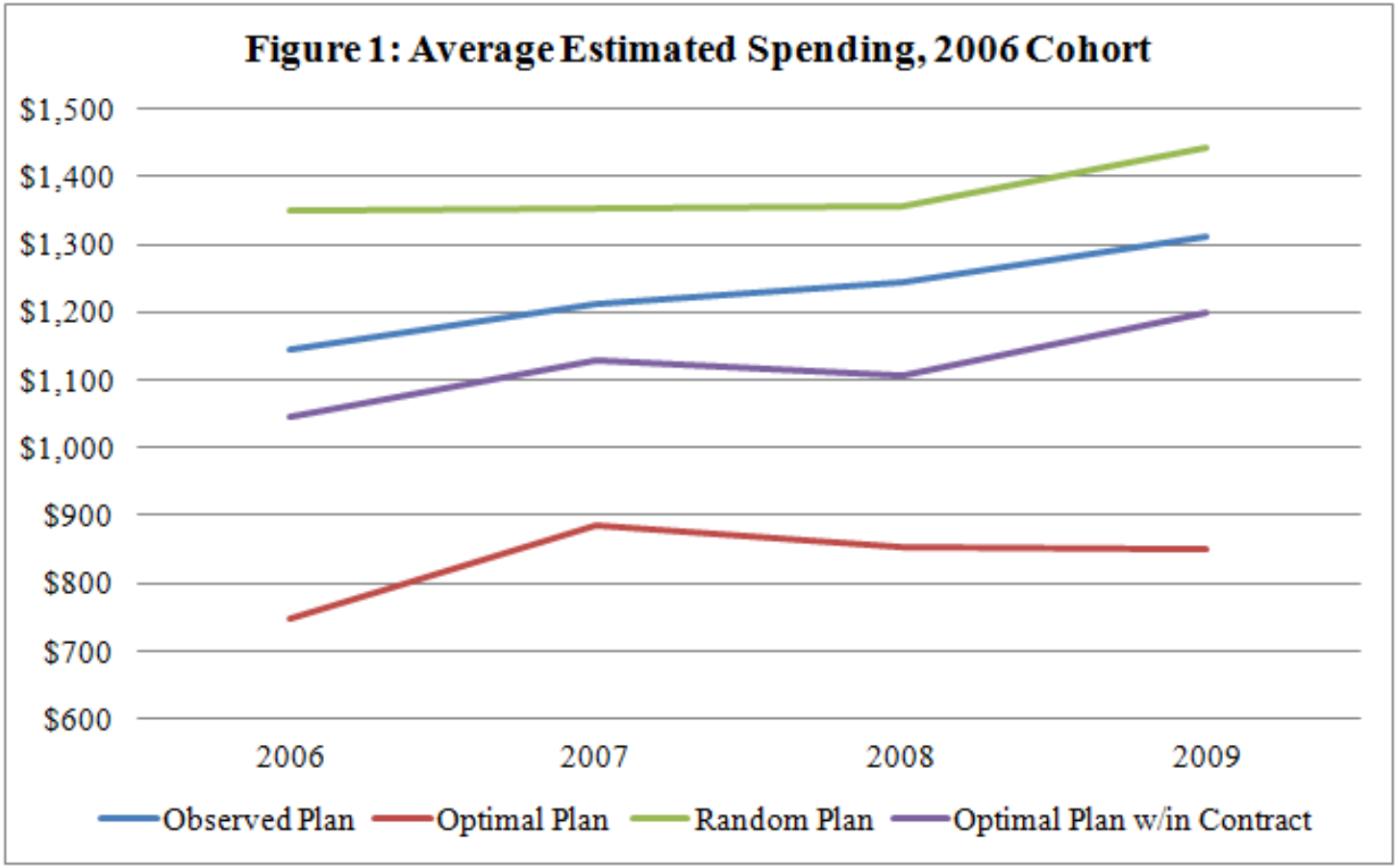
Figure 1



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Limited switching

Table 4: Switching by Demographic Group

	2006-07	2007-08	2008-09
Whole Sample	19.10%	24.10%	8.20%
Female	20.90%	26.30%	8.50%
Non-White	21.70%	26.90%	8.80%
Income	**2006-07**	**2007-08**	**2008-09**
1st Quartile	13.89%	18.38%	7.45%
2nd Quartile	18.08%	23.25%	8.21%
3rd Quartile	19.85%	24.72%	8.15%
4th Quartile	24.79%	30.68%	9.03%
Age	**2006-07**	**2007-08**	**2008-09**
Under 65	28.99%	33.10%	11.05%
65-69	12.61%	17.99%	7.69%
70-74	15.30%	20.63%	7.57%
75-79	17.53%	22.53%	7.42%
80-84	21.84%	26.26%	7.74%
Over 85	27.96%	34.21%	10.18%

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Significant overspending

Table 5: Overspending by Part D Cohort

	Full Sample			New Enrollees			2006 Enrollees		
	Count	$ Error	% Error	Count	$ Error	% Error	Count	$ Error	% Error
2006	127,654	$397.61 ($361.80)	37.20 (22.39)	127,654	$397.61 ($361.80)	37.20 (22.39)	127,654	$397.61 ($361.80)	37.20 (22.39)
2007	141,897	$320.55 ($302.50)	29.63 (18.59)	28,460	$300.23 ($314.53)	30.21 (19.27)	113,437	$325.65 ($299.19)	29.49 (18.42)
2008	151,289	$381.80 ($350.77)	32.98 (17.96)	26,802	$333.96 ($348.95)	30.83 (18.90)	99,742	$390.77 ($348.06)	33.08 (17.47)
2009	159,906	$436.96 (359.44)	36.01 (16.49)	31,275	$371.78 ($371.34)	32.02 (18.44)	84,258	$459.19 ($353.25)	37.01 (15.61)

Notes: Overspending (or error) by year. Standard deviations in parentheses.

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Fraction within x% of optimal

Table 6B: Proportion Within X% of Optimal Spending

10%	Whole Sample	Switched Past Year	Didn't Switch
2006	14.91%	-	-
2007	15.66%	15.04%	16.00%
2008	10.18%	17.28%	6.56%
2009	7.67%	27.81%	3.98%
25%	**Whole Sample**	**Switched Past Year**	**Didn't Switch**
2006	28.20%	-	-
2007	42.75%	49.94%	40.81%
2008	34.98%	43.15%	30.90%
2009	21.74%	46.99%	16.69%

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Response to own plan

- We have some work in the paper showing that consumers respond more to changes in their own plan
- The respond less to changes in other plans available in the marketplace
- Consumers appear to have asymmetric attention

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Why do consumers switch?

- Enrollees suffer from inattention; renew same plan
- A shock of some kind forces attention; attention leads to search
- Shocks we see in the data
  - Premium shock: current plan's premium rises ($5+)
  - Coverage shock: current plan's coverage drops (6%)
  - Expenditure/health shock: expenditures absolutely high (top decile) and high for demographic group (80%+)

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Switching likelihood

	No shocks	All shocks	Premium and coverage	Acute and premium
2007	3.44%	72%	60%	22%
2008	4.81%	69%	52%	16%
2009	1.52%	34%	21%	14%
Overall	2.60%	60%	44%	19%

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No evidence of learning

Table 13A: Overspending By Times Chosen

Count	Once	Twice	Three Times	Four Times
2006	127,654	0	0	0
2007	120,257	21,640	0	0
2008	116,891	20,976	13,422	0
2009	131,167	18,007	7,748	2,984
% Error	**Once**	**Twice**	**Three Times**	**Four Times**
2006	37.20%	-	-	-
2007	29.92%	28.05%	-	-
2008	34.05%	29.57%	28.94%	-
2009	36.76%	33.94%	32.18%	25.55%
Within 10%	**Once**	**Twice**	**Three Times**	**Four Times**
2006	14.91%	-	-	-
2007	15.78%	15.04%	-	-
2008	8.30%	16.27%	17.05%	-
2009	6.21%	11.40%	14.60%	31.70%
Within 25%	**Once**	**Twice**	**Three Times**	**Four Times**
2006	28.20%	-	-	-
2007	41.46%	49.94%	-	-
2008	32.84%	42.52%	41.88%	-
2009	19.84%	26.91%	32.14%	47.32%

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Where do switchers go?

Table 12: Next-Year Plan Choices and Overspending by Shock

2006	Acute Shock	No Acute Shock	Premium Shock	No Premium Shock
% Pre-ICL Coverage	69.83%	70.18%	70.90%	63.63%
% ICL Coverage	12.78%	12.07%	12.06%	12.93%
Premium	20.83	18.82	17.46	32.47
% Within 25% of Optimal	57.73%	49.06%	50.56%	44.62%
2007	**Acute Shock**	**No Acute Shock**	**Premium Shock**	**No Premium Shock**
% Pre-ICL Coverage	72.42%	70.29%	69.82%	73.47%
% ICL Coverage	34.60%	28.73%	27.02%	39.21%
Premium	27.25	26.43	25.78	29.69
% Within 25% of Optimal	53.85%	42.02%	45.38%	33.40%
2008	**Acute Shock**	**No Acute Shock**	**Premium Shock**	**No Premium Shock**
% Pre-ICL Coverage	75.94%	70.92%	72.56%	66.97%
% ICL Coverage	41.69%	28.51%	32.82%	18.16%
Premium	31.84	29.76	29.07	32.97
% Within 25% of Optimal	56.55%	46.13%	48.70%	40.92%

More ICL coverage lower premiums More ICL coverage

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First stage: decision to switch

Aggregate shock:

$$v_{it} = v_{ipt} + v_{ict} + v_{iht} + v_{iet}$$

Switch if

$$v_{it} > \bar{v}_i$$

The switching threshold varies at the individual level, estimated with demographics and health status (drug consumption)

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Second stage: to what plan?

First, utility from a plan

$$u_{ijt} = x_{ijt}\beta_1 + x_{ijt}v_{ipt}\beta_2 + x_{ijt}v_{iht}\beta_3 + x_{ijt}v_{ict}\beta_4 + \varepsilon_{ijt}$$

Utility depends on consumer characteristics as usual but may also depend on the type of shock.

No risk aversion. No learning.

X: oop costs, premium, deductible, coverage rates, national plan, enhanced plan, brand indicators

ε_{ijt} distributed EV(1)

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Likelihood function

j≠k probability of searching and then choosing plan k

$$X_{ijc}\theta_c - \log\left(1 + e^{X_{iks}\theta_s}\right) - \log\left(\sum_m e^{X_{imc}\theta_c}\right)$$

j=k probability of not searching plus the probability of searching and choosing k

$$\log\left(e^{X_{iks}\theta_s}\sum_m e^{X_{imc}\theta_c} + e^{X_{ikc}\theta_c}\right) -$$
$$\log\left(1 + e^{X_{iks}\theta_s}\right) - \log\left(\sum_m e^{X_{imc}\theta_c}\right)$$

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Estimation

- TBD!
- Hoped to have results by today but we are still working on it.
- Parameters will let us calculate elasticities of demand
- Also quantify weights that consumers put on attributes

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Insurer optimizes

- Assume insurers are profit-maximizing
- What would we expect them to do in response to consumers?
  - Raise price slowly every period so as to create no shocks
  - Create premium/coverage shock only when loss of consumers offsets gain
  - Create generous plan to attract consumers who just experienced coverage or health shock
  - Create low-premium plan to attract consumers who just experience premium shock when gain offsets low price

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Premiums increase

Table 19: Average Premium Increases

	Premium Increase		% $10 Increase	
	Basic	Enhanced	Basic	Enhanced
2007	-0.35	4.97	1.66%	17.64%
2008	2.87	5.33	18.28%	32.71%
2009	4.90	7.63	18.49%	37.46%
2010	2.52	3.96	11.36%	16.09%
2011	-0.71	8.97	7.01%	70.51%

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Enhanced plans enter

Table 16: Entry and Exit of Enhanced Plans

	# Plans	% Enhanced	Basic Entrants	Enhanced Entrants	Basic Exit	Enhanced Exit
2006	1426	42.50%	-	-	78	143
2007	1866	47.53%	375	286	84	160
2008	1824	50.71%	84	118	57	148
2009	1687	52.82%	66	2	99	119
2010	1576	50.44%	33	74	216	280
2011	1109	45.27%	22	7	-	-

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Entrants undercut w/premium

Table 17: Average Characteristics of Entrant Plans

	Premium		Formulary Size		Tier-1 Top Drugs	
Basic Plans	**Entrant**	**Incumbent**	**Entrant**	**Incumbent**	**Entrant**	**Incumbent**
2007	23.47	24.06	742.69	851.44	36.57	48.64
2008	21.15	26.96	889.33	958.40	68.42	67.46
2009	26.39	30.96	875.46	990.24	70.09	69.00
2010	28.60	33.66	1016.56	1002.72	68.69	68.49
2011	16.54	33.52	1018.96	1001.99	26.53	59.28
Enhanced Plans	**Entrant**	**Incumbent**	**Entrant**	**Incumbent**	**Entrant**	**Incumbent**
2007	55.37	39.43	766.64	873.60	47.77	49.31
2008	34.85	41.06	871.83	962.91	66.69	67.54
2009	40.10	45.88	911.00	980.85	69.00	65.32
2010	31.14	50.05	1031.90	973.27	68.11	66.34
2011	84.23	62.57	939.08	1055.96	64.93	49.64

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Who creates premium shock?

Table 20: Probit Regressions on $10 Premium Increase

	Basic Plans	Enhanced Plans
Lagged Minimum Cost Plan	0.4752894***	-0.6232133***
	(0.1491831)	(0.1819825)
Market Below Plan Premium	-0.6781189***	-0.0286261
	(0.1517455)	(0.1125818)
2006 Enrollment	-0.0476587***	0.0013921
	(0.0178041)	(0.0155525)
% LIS Enrollment	-0.8892201***	-
	(0.1489461)	-
National Plan	-0.2500414**	-0.3455039***
	(0.1108801)	(0.1205939)
Constant	0.1913813	-0.19232
	(0.2440116)	(0.1920756)
N	2226	2568
R^2	0.0463	0.0076

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Who increases coverage?

Table 21: Regressions on Change in % of Top Drugs Covered

	Basic Plans	Enhanced Plans
National Plan	-3.331616**	1.343002
	(1.509137)	(2.109799)
Lagged % of Market Below Plan Premium	3.227054*	14.61257
	(1.681067)	(1.874321)
Lagged Minimum Cost Plan	4.588222**	27.28965***
	(2.163508)	(2.519987)
2006 Enrollment	0.1446073	-0.1179206
	(0.2023322)	(0.2635939)
Constant	14.27138***	-2.387997
	(2.371712)	(3.320813)
N	2115	2362
R^2	0.0059	0.0561

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Who drops premium significantly?

Table 22: Probit Regressions on $10 Premium Decrease

	Basic Plans	Enhanced Plans
National Plan	-0.4867641***	0.1966372
	(0.1310947)	(0.2281644)
2006 Enrollment of Market Below Plan	-0.1858255***	-0.1828018***
	(0.0250658)	(0.0237597)
	3.062852***	1.642915***
	(0.3335822)	(0.2059287)
% LIS Enrollment	-0.0320105	-
	(0.1818715)	-
Constant	-2.353985***	-1.635561***
	(0.4004507)	(0.3308937)
N	2226	2568
R^2	0.2802	0.0092

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Further work

- These are preliminary results
  - Demand estimation not complete
  - Analysis of national data will be improved
- But in existing results can see the consumer search behavior and the insurer response
- We want to quantify this more precisely

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Conclusions

- Consumers are not searching often or effectively
- It might be possible to fix behavior with a larger financial incentive
- But a financial incentive conflicts
  - with purpose of insurance
  - with subsidies for low income
- Example: reduction in financial incentive, filling the coverage gap -- will increase usage, reduce shocks to expenditure, reduce search
- Dollar amounts at stake in ACA are much larger