Sinking, Swimming, or Learning to Swim in Medicare Part D

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Research on Part D

As more data is becoming available, researchers appear to agree that Medicare Part D was a *tactical success*:

- Expensive but largely deemed successful:
  - Participation rates over 90%.
  - expanded prescrition drug use and lowered out-of-pocket (OOP) drug prices.
  - Beneficiaries are generally satisfied with the program.
  - The overall cost of the program is lower than initially expected, though still high (over $39bn per year).⇒Is it worth it?
- Most remaining controversy is about whether consumer choice among numerous private plans is beneficial.

The Early Consensus

McFadden (2006):

"The new Medicare Part D prescription drug insurance market illustrates that leaving a large block of uninformed consumers to sink or swim, and relying on their self-interest to achieve satisfactory outcomes can be unrealistic."

— Presidential Address to the AEA on January 7, 2006.

The Early Consensus

Krugman (2006):

"The insertion of private intermediaries into the program has several unfortunate consequences. First, as millions of seniors have discovered, it makes the system extremely complex and obscure. It is virtually impossible for most people to figure out which of the many drug plans now on offer is best."

— The New York Review of Books, March 23, 2006.

The Early Consensus

Thaler and Sunstein (2008):

"(...) offering people forty-six choices and telling them to ask for help is likely to be about as good as no help at all."

— Chapter 10 of their book "Nudge."

The Early Consensus

Liebman and Zeckhauser (2008):

"Health insurance is too complicated a product for most consumers to purchase intelligently and it is unlikely that most individuals will make sensible decisions when confronted with these choices."

— NBER Working Paper No. 14330.

The Early Consensus

Stephen Colbert (2006):

"America finally has a simple solution to our seniors' prescription drug problems. A voluntary enrollment system of tiered formularies run by private interests in which drugs may be differently tiered and have different copays in any of the dozens of similar plans seniors may choose from depending on their home state, age and employment background. Voila!"

— The Colbert Report.

In Favor or Against the Market

Needless to say that the current debate on health care reflects the same opposed views of the Medicare Part D Program:

- Republicans argue that by relying on competition among private insurers, it is possible to offer an increased level of coverage and improved access at a low cost.
- They point out that this program, so far, costs much less than what it was expected by the Congressional Budget Office.

In Favor or Against the Market

- Democrats claim that participation could have been higher under a different government sponsored program.
- They view the existence of the doughnut hole as a regrettable limitation of the benefits for the poor.
- They believe that competition has the perverse effect of offering an abundance of choices that lead beneficiaries to get confused among the different options, thus paying higher prices than necessary and achieving only a suboptimal level of access for low income beneficiaries.

Traditional *vs.* Behavioral Economics

- Traditional: Numerous options are welfare enhancing if consumers have heterogeneous preferences.
  - This is likely the case for prescription drugs as individuals have different risk aversion and medical conditions also differ among potential beneficiaries.
- Behavioral: Numerous options may be counterproductive depending on issues such as, confusion, deliberation costs, limited cognition, aging effects, framing, or many other *ad hoc* reasons.
  - Lack of data (only survey or lab experiments) to support these interpretations.
  - Support government intervention using sophisticated arguments.
  - Dismal view on consumers' abilities regardless of the lack of data.

Directly Related Works

Medicare Part D is an important, high stakes environment to study how consumers choose among many complex, multi-attribute products.

- Burgeoning research showing numerous consumer biases, particularly when cognition is limited by age, illness or limited attention, or overwhelmed by too many choices (JEL 2009 survey paper by Della Vigna).
- However, this empirical analysis relies on cross-sectional samples or is lab-based $\Rightarrow$This may preclude the roles of market evolution, learning and decision support (Multiple papers by List).

Directly Related Works

Two main contributions:

- Heiss, McFadden, and Winter (2007) use self-reported data on the consumption of a (large) subset of given drugs for a sample of individuals who are healthier, younger, and more educated than the population.

- Abaluck and Gruber (2009) use a very large cross-section of individuals for 2006 only. They observe actual drug consumption but not the choice of plans, which they rather impute indirectly. Unfortunately, this assignment *cannot be uniquely determined* and thus, it is not possible to analyze *with precision* whether beneficiaries made mistakes in choosing among plans, and the size of these mistakes.

Indirectly Related Works

We are not the first to study whether consumers revise their past choices in order to minimize expenses:

- Della Vigna and Malmendier — AER (2006).
- Economides, Seim, and Viard — RAND (2008).
- Miravete — AER (2002).

The major difference with the present paper is that Part D insurance companies also change plans every year (perhaps due to learning) $\Rightarrow$Ignoring the supply side we might attribute an excessive portion of the overspending to consumer mistakes.

History

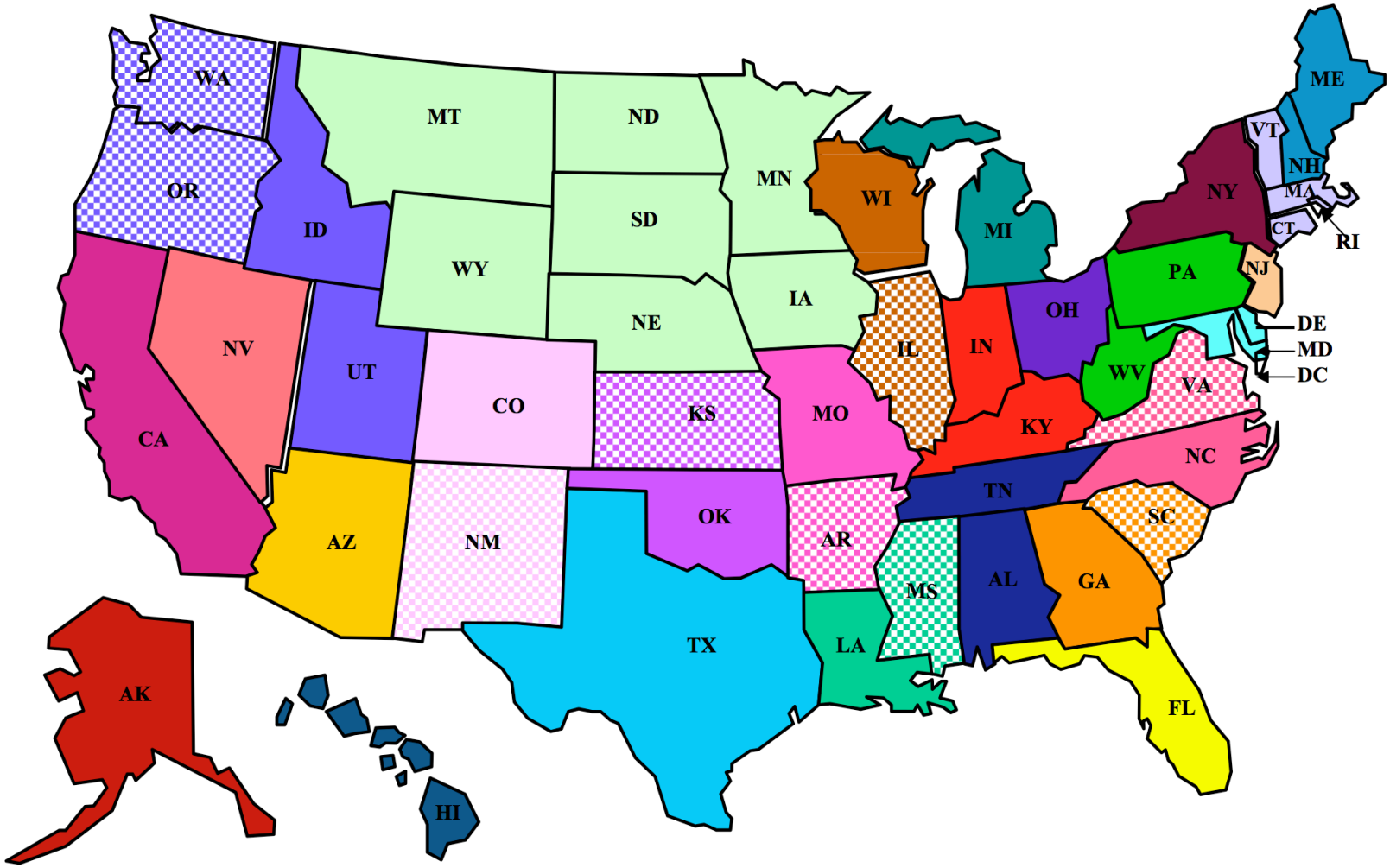
- The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 was enacted on January 1st, 2006.
- It is the most important expansion of an entitlement program in three decades (currently at about $39bn a year).
- It aims at providing access to affordable drug coverage to all Medicare beneficiaries (senior citizens).
- It does so without relying on the government to provide the improved drug benefit directly although the whole program is heavily subsidized.

How does it work?

After turning sixty-five, senior citizens become eligible for Medicare benefits.

- Among the different benefits, Part D offers several plans to insure against the cost of drugs.
- A plan generally includes an annual premium, some deductible, a set of drugs automatically covered on the formulary.
  - Enhanced plans may insure against the doughnut hole.
  - Beneficiaries may have a preference for different plans depending on their financial status and medical conditions.
  - Plans differ across regions, need to be approved, and are required to be actuarially equivalent.
  - Low income households receiving Federal assistance (studied separately) can sign up for heavily subsidized plans.

Part D Regions



Consumers Choose

Consumers take responsibility for choosing their desired level of coverage rather than leaving the government to offer an uniform coverage to everybody.

- Consumers have to choose among numerous competing private insurance providers.
  - The goal is to foster competition among insurers so that drugs are provided at the lowest cost possible.
  - Simultaneously, the overall cost of the program is controlled by exposing enrolles to the full incremental cost of drugs ("doughnut hole" with thresholds at $2,250 and $5,100 in 2006).
  - Participation in the program is induced by increasing premiums by 1% for each month's delay past initial eligibility (after turning sixty-five year old).

Choosing Among Plans

Beneficiaries may have to discern among up to *50* different plans.

- Each October, starting in 2005, beneficiaries have an enrollment period to sign up for one of the plans available for the following year.
- Information about these plans is widely available. Ways to compare became widely available during 2006 (in both government and private websites).
- The selection cannot be changed until next year (unless the beneficiary falls in the low income category).
- If a beneficiary fails to enroll, premiums increase by 1% each month delayed.
- Low income beneficiaries that fail to enroll in a plan are automatically and randomly enrolled in one of the income-subsidized plans.

Important Issues

Medicare Part D presents a unique opportunity to study the determinant of choices among options and their evolution over time.

- Consumers face multiple common attributes characterizing insurance plans $\Rightarrow$Potential role of uncertainty and complexity.
- Consumers also face specific attributes due to plans formularies and their medical conditions $\Rightarrow$Individual heterogeneity.
- Subjects are old and potentially sick individuals $\Rightarrow$Incidence of aging and limited cognitive ability.
- In 2006 all individuals of different age face these choices for the first time $\Rightarrow$Avoid individual heterogeneity due to initial conditions.
- Consumer needs can be addressed $\Rightarrow$Role of expectations.
- Results are robust to the existence of risk aversion as long as it remains constant over time.

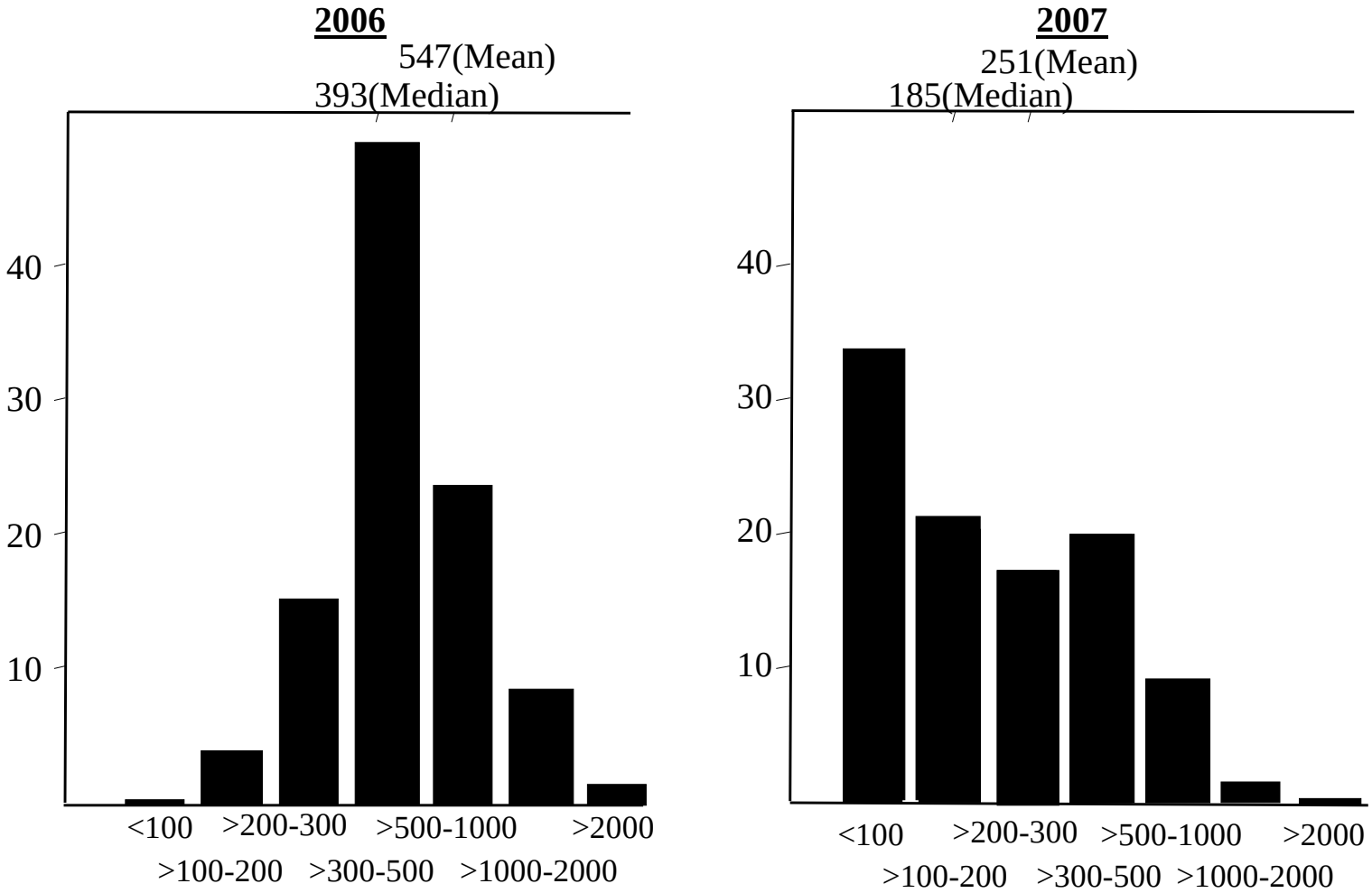
A Most Important Consideration

Suppose that using a cross-section of data we can determine whether indiiduals' OOP expenses in drugs exceeded those under a different plan than the one chosen.

- (This is a more complicated task than what it seems. Need to care not only for price differences of drugs but also by coverage of each formulary).
- Should we conclude that individuals are not rational? Is it all a matter of a complex choice by old individuals with limited cognition?
- What size of the mistake turns an individual into a non-rational subject?
- Should the government intervene? How? What model should guide such an intervention?
- Choices are repeated over time $\Rightarrow$Learning and switching?

The Question

Figure 1. Overspending by Year



The Question (In Words)

Are patterns of Figure 1 robust to the existence of individual heterogeneity and/or plan design?

- Do individual choices of Part D Plans (PDPs) improve over time? Or do poor choices persist?
- Who improved most and how? Is it the result of active switching?
- Do age and cognitive limitations inhibit improvement?
- Are individual biases and missperceptions ameliorated by other institutions such a family or social networks and the overall market experience?

Broader Question

Is choice beneficial (neoclassical economics) or does confusion reign (behavioral economics)? If the latter...

- Non-beneficial products can flourish.
- Partial economic rationale for greater regulation and government intervention, standarization of products, and limited choice.
- Concerns about health insurance, credit cards, mortgages, retirement planning, *et cetera*.
- Economists would need new models to interpret and predict consumer behavior.

Our Approach

- Analyze two years of data on individuals' choices of PDPs controlling for:
  - Time-invariant individual heterogeneity.
  - Changes in health.
- Examine choice quality as measured by OOP:
  - Defined as the difference between the cost of current medication under the chosen PDP and the least expensive alternative (including no insurance).
  - Adopt an *ex post* approach.
- Focus on within-person changes from 2006-2007.
- Analyze switching decisions.
- Focus on the non-subsidy subsample exclusively.

The Answers

- 40-54% reductions in overspending in just one year (non-poor).
- The more beneficiaries overspent, the larger the reduction (all beneficiaries).
- Switching was the main source of improvement.
- Improvements were greatest among oldest beneficiaries.
- Elders suffering from Alzheimer's improved by as much as the mean beneficiary.
- Results are robust to a wide variety of alternative working assumptions.

Data Description

We combine public and proprietary data sources to construct a data set for years 2006 and 2007.

- Centers for Medicare and Medicaid Services (CMS): All available PDPs and their formularies.
- CVS/Caremark: Large data set of enrollees including:
  - Region of residence and the chosen plan.
  - Every prescription drug claims.
  - Subsidy status and level.
  - Gender, age, and health measures via Ingenix "PRG" system.
- Wolter Kluwer Health and CMS Plan Finder "Scrapper" data: Prices of drugs in alternative plans.

Sample

Defining our sample:

- Individuals enrolled for all of 2006 in a PDP or MA plan sold or administered by the PBM.
- Enrolled at some point in 2007 in a stand-alone Prescription Drug Plan (PDP) administered by the Pharmacy Benefits Manager (PBM), CVS/Caremark.
- Total of 485,696 individuals; 224,803 in PDPs.
- In the balanced panel we have 178,494 individuals (71,399 of them are non-subsidy) over two years from all 34 Part D Regions.

Sample

Generating OOP costs:

- Sum of the plan's premiums (net of any premium support) and OOP Rx costs.
- Generate this for every available PDP for every individual drug consumption profile in the market of the beneficiary.
- Compute the cost of no insurance using a \$0 premium and the CVS usual and customary prices.
- Assume an elasticity of demand for Rx of -0.54 (Shea et. al., 2007) $\Rightarrow$We obtain similar results when assuming perfectly inelastic demand for Rx.

Sample

The role of the PBM:

- CVS/Caremark sells some plans directly (Silverscript brand) but also administers others sold under different names and that are randomly assigned to the PBM to administer.
  - It includes 9 different PDPs in 2006 and 18 in 2007.
  - The PBM cannot design the other plans or negotiate prices for them, just administer their claims.
  - All features of all PDPs available (and not only those administered by CVS/Caremark) are available.
  - Reductions in deductibles and premiums of our plans are more important than others not included in the sample. Ours become also slightly less generous on formulary coverage.

Table 1. Part D Plan Characteristics

	Plans in Study Sample			All Plans		
	Mean	5th Pct.	95th Pct.	Mean	5th Pct.	95th Pct.
2006						
Deductible	161.58	100	250	92.23	0	250
Annual Premium	542.33	302.76	735	446.10	226.2	719.4
Number of the Top 100 Drugs						
On the Formulary	95.74	92	98	93.44	78	100
Requiring Prior Authorization	5.45	5	5	9.61	1	31
"Doughnut hole" coverage for generics	0.00	0	0	0.13	0.0	1.0
"Doughnut hole" coverage for brands	0.00	0	0	0.02	0.0	0.0
Enhanced plan	0.00	0	0	0.43	0.0	1.0
Observations		95			1,431	
2007						
Deductible	90.78	0	265	88.83	0	265
Annual Premium	440.98	283.2	747.6	436.91	229.2	836.4
Number of the Top 100 Drugs						
On the Formulary	90.71	86	97	91.46	78	98
Requiring Prior Authorization	5.13	1	8	2.35	0	10
"Doughnut hole" coverage for generics	0.36	0.0	1.0	0.25	0	1
"Doughnut hole" coverage for brands	0.00	0	0	0.05	0	0
Enhanced plan	0.50	0	1	0.49	0	1
Observations		258			1,804	

NOTE: The plan is identified by the plan ID, which is unique for each region.

Information Set

We compare OOP of plans *ex post*.

- *ex ante* evaluation is not possible since we do not observe individuals' drug consumption in 2005.
- Risk aversion remains unknown and thus it is impossible to determine what is an *ex ante* "acceptable" level of overpayment for each beneficiary.
- Panel data allow us to control (fixed effects) for the effect of risk aversion on the change of overspending over time.

Estimates of Mean Improvement

To address the importance of OOP reduction we first estimate:

$$\Delta O_i = \alpha + \Gamma \Delta H_i + \Delta u_i,$$

where:

- ΔO_i: within-person change in overspending for beneficiary i.
- ΔH_{it}: indicators of within-person changes in health status.
- Δu_i: changes in the idiosyncratic error.

Estimate this on the full sample, with and without control for within-person changes in health, and on a sub-sample in stable health.

Table 2. First Difference Models of Within-Person Change in Overspending 2006-2007

	Health Controls		*Stable Health Only*	
	No	*Yes*	*Inclusive Definition*	*Narrower Definition*
Intercept	-295.97 [3.890] ***	-298.29 [4.131] ***	-266.01 [6.924] ***	-255.39 [9.268] ***
Observations	71,399	71,399	30,149	15,247
Mean Overspending in 2006	546.9	546.9	515.2	504.5
Within-person change in Overspending				
Mean	-296.0	-296.0	-266.0	-255.4
5th Percentile	-1,136.0	-1,136.0	-1,044.0	-991.3
10th Percentile	-766.4	-766.4	-682	-642.5
25th Percentile	-409.4	-409.4	-381.4	-364.8
50th Percentile	-236.7	-236.7	-210.6	-189.1
75th Percentile	-44.1	-44.1	-38.9	-38.7
90th Percentile	98.9	98.9	77.0	72.7
95th Percentile	235.8	235.8	188.3	147.6

NOTE: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. The second, third and fourth models include controls for within-person changes in health.

- Mean reduction in OOP: $300, or 54%. 80% of beneficiaries improved, with mean reductions in OOP about twice larger than mean increases for those who worsened.
- Results are robust to changes in individual health.

Observable Individual Characteristics

To test how improvements varied by demographics we estimate:

$$\Delta O_i = \alpha + \Gamma \Delta H_i + \beta X_i + \Delta u_i,$$

where X_i includes time-invariant, observed characteristics of individuals.
Results:

- Poor choices are transient: improvements are greatest by those who overspent most in 2006.
- Also greatest for female and older, and average for those with Alzheimer's $\Rightarrow$Suggests that institutions or market mechanisms help overcome cognitive limitations.
- Those who acquire new conditions improve by more than average $\Rightarrow$Importance of private information.

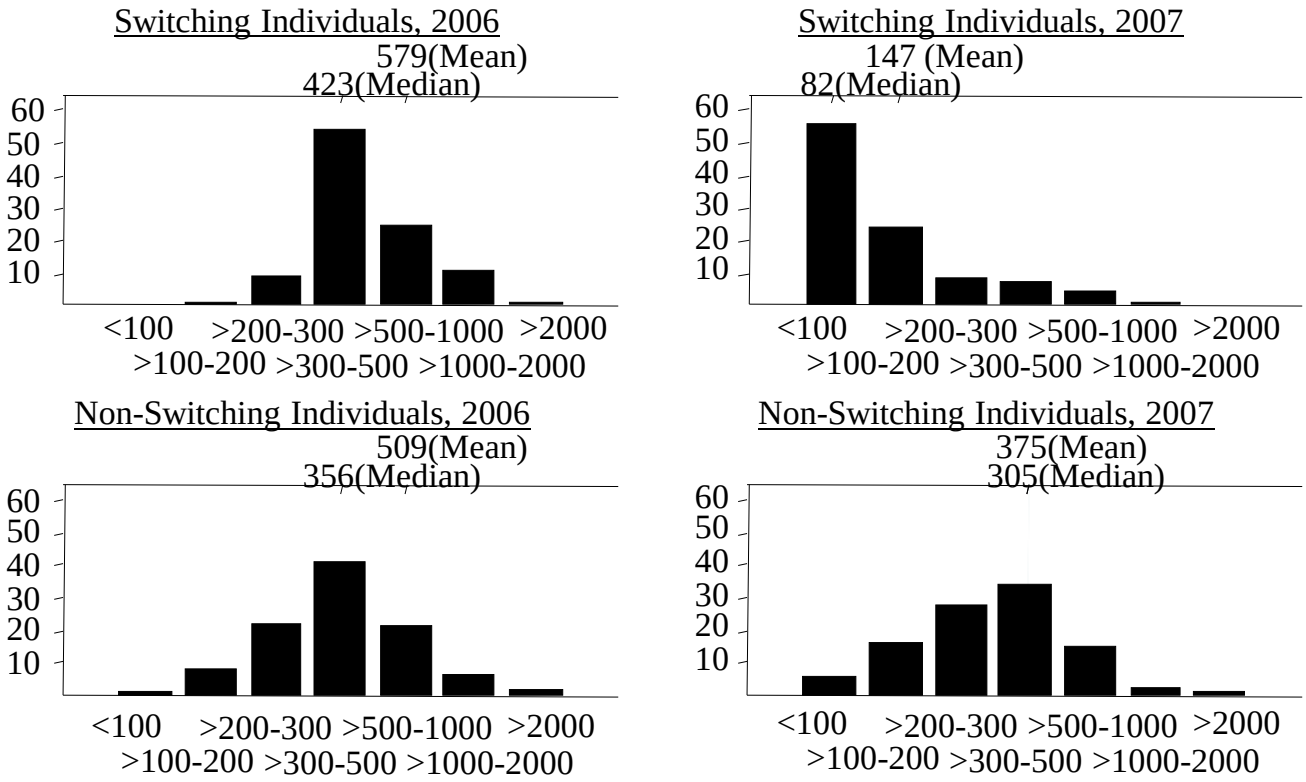
Table 3. First-Difference Models of Within-Person Change in Overspending 2006-2007, by Observed Individual Characteristics

2006-2007 Change Allowed to Vary with:	*Age, Sex, Levels and Changes in Health*	*And 2006 Overspending*	*And Levels and Changes in Drug Consumption*
Overspending Level in 2006 ($)			
less than 100		*Reference Category*	*Reference Category*
between 100 and 200		-163.51 [17.406] ***	-206.70 [46.436] ***
between 200 and 300		-254.67 [21.333] ***	-301.89 [50.344] ***
between 300 and 500		-408.61 [17.003] ***	-457.76 [53.532] ***
between 500 and 1000		-632.37 [16.969] ***	-644.07 [38.039] ***
between 1,000 and 2,000		-1298.78 [17.988] ***	-1229.90 [42.816] ***
more than 2000		-3172.82 [205.489] ***	-2953.45 [111.632] ***
Age in 2006			
Age 65-69	*Reference Category*	*Reference Category*	*Reference Category*
Age 70-74	-42.49 [10.561] ***	-26.39 [9.083] ***	-31.02 [9.314] ***
Age 75-79	-63.07 [16.328] ***	-39.02 [15.701] **	-50.03 [16.336] ***
Age 80-84	-113.53 [9.332] ***	-87.49 [7.733] ***	-91.02 [11.234] ***
Age 85 up	-108.47 [8.668] ***	-94.01 [7.284] ***	-93.30 [13.535] ***
Male	13.36 [11.429]	26.90 [10.172] ***	26.96 [10.718] **
Risk Score in 2006	-40.85 [4.325] ***	-1.21 [3.159]	5.61 [34.246]

Took medication in 2006 for			
Hypertension	23.33 [10.227] **	11.21 [9.743]	16.02 [9.388] *
Cholesterol and other cardiovascular	-72.76 [11.853] ***	-22.05 [10.881] **	2.28 [14.430]
Pain	36.64 [11.117] ***	7.53 [9.930]	7.17 [9.953]
Mental health	20.54 [13.165]	19.08 [11.413] *	24.34 [12.737] *
Antibiotics	9.72 [9.417]	-3.72 [8.143]	5.61 [7.082]
Anticoagulants	-43.55 [10.891] ***	-16.16 [9.100] *	-15.31 [10.458]
Thyroid	0.60 [9.013]	11.65 [7.591]	11.38 [11.751]
Diabetes	-2.45 [13.535]	-0.99 [10.349]	-2.82 [17.528]
Osteoporosis	-14.36 [9.775]	-23.73 [7.617] ***	-13.63 [11.942]
Alzheimer's	17.88 [17.760]	-6.39 [13.276]	-37.98 [25.713]
Change in Risk Score	5.25 [5.685]	14.91 [5.241] ***	-14.10 [28.768]
Change in takes medication for			
Hypertension	-16.62 [13.402]	-22.12 [11.747] *	-38.77 [11.376] ***
Cholesterol and other cardiovascular	-14.91 [18.389]	1.62 [17.136]	-3.10 [18.785]
Pain	2.68 [8.382]	-7.33 [7.411]	-9.83 [7.421]
Mental health	2.42 [12.040]	3.56 [10.667]	23.71 [14.991]
Antibiotics	-5.60 [8.516]	-11.12 [7.726]	-9.96 [7.386]
Anticoagulants	-51.36 [15.017] ***	-36.72 [12.975] ***	-54.74 [15.437] ***
Thyroid	22.46 [13.256] *	14.59 [10.377]	1.86 [11.761]
Diabetes	-27.32 [39.774]	-43.22 [37.173]	-28.50 [29.665]
Osteoporosis	-27.07 [12.925] **	-26.57 [10.585] **	-32.20 [17.213] *
Alzheimer's	-11.59 [19.951]	-54.63 [16.813] ***	-84.81 [19.043] ***
2006 Gross Drug Spending			-0.04 [0.052]
Change in Gross Drug Spending			0.10 [0.070]
Intercept	-39.78 [9.761] ***	294.66 [19.681] ***	339.78 [50.496] ***
Observations	71,395	71,395	71,395

NOTE: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Figure 2. Overspending by Year and Switching



- Switching is the main driver of the reduction in OOP ⇒Financial incentives promoted learning about alternative plans.
- Conditional on health status, changes in plan design are responsible for 85% of improvement of nonswitchers.

Table 4. First-Difference Models of Within-Person Change in Overspending 2006-2007, by Switching and Other Observed Individual Characteristics

2006-2007 Change Allowed to Vary with:	*Full Sample*		*Subset with Stable Health Only*
	Switching Plans and Changes in Health	*And Other Characteristics*	*And Other Characteristics*
Switched plans	-298.46 [8.256] ***	-232.98 [7.279] ***	-231.97 [12.884] ***
Overspending Level in 2006 ($)			
less than 100			
between 100 and 200		-174.57 [17.424] ***	-170.37 [21.042] ***
between 200 and 300		-222.99 [21.514] ***	-196.72 [36.930] ***
between 300 and 500		-313.81 [17.135] ***	-291.67 [21.145] ***
between 500 and 1000		-547.74 [17.285] ***	-517.15 [21.687] ***
between 1,000 and 2,000		-1195.86 [18.646] ***	-1175.86 [25.325] ***
more than 2000		-3103.24 [206.809] ***	-2394.51 [434.065] ***
Age in 2006			
Age 65-69			
Age 70-74		-2.89 [9.216]	-8.58 [6.898]
Age 75-79		16.19 [16.810]	27.64 [34.832]
Age 80-84		-12.16 [8.519]	-11.10 [10.106]
Age 85 up		-3.66 [8.227]	0.48 [9.520]
Male		-3.91 [9.684]	14.23 [17.709]
Risk Score in 2006		0.91 [3.140]	2.91 [4.261]

Took medication in 2006 for								
Hypertension				12.65	[9.717]		17.21	[15.611]	
Cholesterol and other cardiovascular				-20.69	[10.836]	*	-42.26	[20.047]	**
Pain				3.80	[9.887]		3.49	[14.172]	
Mental health				13.81	[11.358]		2.15	[13.619]	
Antibiotics				-10.13	[8.093]		-13.84	[13.390]	
Anticoagulants				-18.37	[9.053]	**	-31.80	[18.110]	*
Thyroid				2.34	[7.549]		-7.36	[11.622]	
Diabetes				5.24	[10.219]		-21.75	[17.385]	
Osteoporosis				-25.41	[7.518]	***	-56.37	[11.554]	***
Alzheimer's				-18.18	[13.155]		-44.38	[22.236]	**
Change in Risk Score	22.61	[6.416]	***	16.47	[5.245]	***	70.33	[39.000]	*
Change in takes medication for								
Hypertension	-8.97	[12.528]		-19.72	[11.680]	*	-0.02	[12.340]	
Cholesterol and other cardiovascular	27.17	[18.239]		-1.58	[17.115]		-33.61	[14.589]	**
Pain	-18.63	[6.255]	***	-12.28	[7.378]	*	-5.56	[10.136]	
Mental health	-25.19	[12.789]	**	-16.77	[10.753]		0.36	[15.646]	
Antibiotics	-9.04	[7.973]		-13.75	[7.719]	*	-42.13	[17.352]	**
Anticoagulants	-30.57	[13.929]	**	-34.99	[12.880]	***	-24.04	[21.959]	
Thyroid	6.86	[12.671]		9.72	[10.020]		-3.98	[21.133]	
Diabetes	-37.35	[40.805]		-40.66	[36.886]		-4.69	[39.925]	
Osteoporosis	-6.20	[12.621]		-26.19	[10.402]	**	-48.30	[20.475]	**
Alzheimer's	-44.92	[19.897]	**	-58.64	[16.600]	***	-56.39	[27.195]	**
Intercept	-136.90	[7.654]	***	295.04	[19.648]	***	280.84	[28.118]	***
Observations	71,399			71,395			30,145		

NOTE: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

When Do Beneficiaries Switch?

To analyze individuals' decisions to switch we estimate the probit model:

$$\S_i = \alpha + \Gamma \Delta H_i + \beta X_i + \Psi P06_i + \epsilon_i,$$

where $P06_i$ (only included in last column) is a 2006 plan fixed effect indicator to account for the probability of switching being driven by plan-specific attributes such as:

- Backwards-looking drug consumption.
- Forward-looking relative ranking of the plan after all plans have been redesigned for 2007.

Table 5. Average Marginal Effects from Probit Models of Switching

	Full Sample	*Subset with Stable Health only*	*Full Sample with 2006 Plan Fixed Effects*
Overspending Level in 2006 ($)			
less than 100	*Reference Category*	*Reference Category*	*Reference Category*
between 100 and 200	-0.08 [0.039] **	-0.12 [0.067] *	-0.03 [0.062]
between 200 and 300	0.21 [0.032] ***	0.21 [0.057] ***	-0.09 [0.057]
between 300 and 500	0.49 [0.029] ***	0.51 [0.051] ***	-0.06 [0.059]
between 500 and 1000	0.50 [0.020] ***	0.49 [0.036] ***	0.01 [0.059]
between 1,000 and 2,000	0.48 [0.010] ***	0.49 [0.017] ***	0.14 [0.059] **
more than 2000	0.43 [0.007] ***	0.45 [0.011] ***	0.19 [0.060] ***
Change in 2006 Plan's Percentile Ranking	0.77 [0.009] ***	0.84 [0.015] ***	0.13 [0.012] ***
Age in 2006			
Age 65-69	*Reference Category*	*Reference Category*	*Reference Category*
Age 70-74	0.12 [0.007] ***	0.14 [0.010] ***	0.13 [0.008] ***
Age 75-79	0.25 [0.006] ***	0.28 [0.009] ***	0.30 [0.008] ***
Age 80-84	0.33 [0.006] ***	0.36 [0.008] ***	0.38 [0.007] ***
Age 85 up	0.39 [0.005] ***	0.41 [0.008] ***	0.43 [0.007] ***
Male	-0.14 [0.005] ***	-0.15 [0.007] ***	-0.13 [0.006] ***
Risk score in 2006	0.01 [0.001] ***	0.00 [0.002] *	0.01 [0.001] ***

Took medication in 2006 for			
Hypertension	-0.02 [0.006] ***	-0.01 [0.009]	0.00 [0.007]
Cholesterol and other cardiovascular	-0.03 [0.005] ***	-0.04 [0.008] ***	-0.02 [0.006] ***
Pain	-0.00 [0.006]	-0.00 [0.011]	0.04 [0.007] ***
Mental health	-0.03 [0.006] ***	-0.03 [0.010] ***	0.01 [0.007] **
Antibiotics	-0.04 [0.006] ***	-0.04 [0.009] ***	-0.06 [0.007] ***
Anticoagulants	-0.04 [0.006] ***	-0.04 [0.010] ***	-0.02 [0.007] **
Thyroid	-0.06 [0.006] ***	-0.06 [0.009] ***	-0.01 [0.007] *
Diabetes	0.01 [0.006]	0.02 [0.011]	0.02 [0.008] **
Osteoporosis	-0.02 [0.006] ***	-0.03 [0.010] ***	-0.03 [0.007] ***
Alzheimer's	-0.06 [0.012] ***	-0.02 [0.021]	-0.07 [0.014] ***
Change in Risk Score	0.01 [0.001] ***	0.03 [0.016]	0.01 [0.002] ***
Change in takes medication for			
Hypertension	-0.00 [0.009]	0.03 [0.021]	0.02 [0.011] *
Cholesterol and other cardiovascular	-0.02 [0.008] ***	-0.03 [0.024]	-0.02 [0.009] **
Pain	-0.01 [0.005] **	-0.01 [0.009]	0.02 [0.006] ***
Mental health	-0.10 [0.007] ***	-0.14 [0.018] ***	-0.05 [0.008] ***
Antibiotics	-0.02 [0.005] ***	-0.02 [0.008] *	-0.02 [0.005] ***
Anticoagulants	-0.01 [0.009]	-0.02 [0.024]	0.01 [0.010]
Thyroid	-0.04 [0.015] ***	-0.02 [0.030]	-0.00 [0.018]
Diabetes	-0.01 [0.014]	0.04 [0.054]	-0.01 [0.017]
Osteoporosis	0.00 [0.009]	-0.00 [0.024]	-0.00 [0.011]
Alzheimer's	-0.02 [0.014]	0.02 [0.060]	-0.04 [0.017] **
Observations	71,391	30,145	70,914

NOTE: Robust standard errors in brackets. *** p<0.01, **p<0.05, * p<0.1.

When Do Beneficiaries Switch?

Probit analysis with a similar specification:

- Males are 14% less likely to switch than females.
- Oldest group is 39% more likely to switch than the 65-69 group.
- The effect of main medical conditions is negative but much smaller.
- Other less common conditions lead to switching.
- Individuals who acquire a condition are also slightly less likely to switch.
- The probability of switching jumps up if OOP in 2006 exceeded \$200-\$300.
- Percentile Ranking: The hypothesis of choice inertia can be clearly rejected.

Robustness Analysis

Several alternative specifications:

- Assume that demand for drugs is inelastic.
- Use actual spending for the actual plan chosen rather than estimating it.
- Exclude no-insurance option.
- Exclude premiums from computing the variation in OOP.
- Evaluate the choices in 2007 under an alternative *ex ante* criteria (since data for 2006 is available).
- The magnitude of result vary slightly but qualitative implications stand.

Table 6. First Difference Models of Within-Person Changes in Overspending, Alternative Approaches

	Controlling for Changes in Health (Identical to Table 2 Column 2)		*And Switching (Identical to Table 4 Column 1)*	
A. Main results reported in Tables 2 and 4				
Intercept	-295.97	[3.890] ***	-136.90	[7.654] ***
Switched plans			-298.46	[8.256] ***
Mean Overspending in 2006	546.9		546.9	
B. Assuming perfectly inelastic demand				
Intercept	-368.60	[4.991] ***	-158.25	[8.864] ***
Switched plans			-389.00	[9.876] ***
Mean Overspending in 2006	794.0		794.0	
C. Using actual rather than simulated cost for actual plan				
Intercept	-273.46	[4.677] ***	-107.1	[8.582] ***
Switched plans			-307.66	[9.329] ***
Mean Overspending in 2006	586.0		586.0	
D. Excluding no insurance as an option				
Intercept	-303.02	[4.123] ***	-139.25	[7.637] ***
Switched plans			-302.87	[8.236] ***
Mean Overspending in 2006	538.5		538.5	
E. Overspending excluding premiums				
Intercept	-70.77	[4.204] ***	-15.85	[7.773] **
Switched plans			-101.57	[8.469] ***
Mean Overspending in 2006	464.8		464.8	

NOTE: Robust standard errors in brackets. *** p<0.01, **p<0.05, * p<0.1. N = 71,399 for all models.

Table 7. Comparing 2007 Overspending Using *Ex Ante* and *Ex Post* Prescription Drug Claims

	Ex Post *Using 2007 Claims ($)*	*Ex Ante* *Using 2006 Claims ($)*
Mean	251.0	298.4
Median	184.8	197.8
5th Percentile	0.0	0.0
10th Percentile	1.7	14.0
25th Percentile	65.0	79.1
75th Percentile	184.8	345.9
90th Percentile	515.7	526.8
95th Percentile	682.9	700.5

NOTE: The *ex ante* approach defines the total spending in each available plan in 2007 using the claims filled by the person in 2006. The *ex post* approach uses the claims filled by the person in 2007. Both rely on the plans available and their attributes (e.g., premiums and formularies) in 2007.

Summary

- Consumer choices of insurance plans by non-poors improved substantially over time when measured as *ex post* overspending.
- A large fraction of the improvement follows an active decision to switch plans although plan design benefits even non-switchers.
- Switching follows financial incentives, with thresholds sufficiently low so as to make switching a common event.
- Beneficiaries have private information on their health status and aticipate changes in health when subscribing a new one.
- There is no evidence to support inertia.
- Those likely to have cognitive limitations do not perform worse than the rest of the population.