Advertising in Health Insurance Markets

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University of Chicago Health Economics Workshop

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Preliminaries

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3. The authors acknowledge generous support from the Kilts Center for Marketing, the Beatrice Foods Co. and the Neubauer Family Foundation.

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- Increasing reliance of consumer choice in US health care
  1. Health Insurance
     - ACA "Obamacare" Exchanges
     - Medicare Advantage (MA)
     - Private Exchanges (e.g, Walgreens)

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     - Private Exchanges (e.g, Walgreens)
  2. Providers
     - High Deductible Health Plans (HDHPs)
     - Affordable Care Organizations (ACOs)

$\Rightarrow$ American consumers increasingly in control of $\approx$ \$3 trillion in spending

Motivation - Healthcare is Different

"Advertising and overt price competition are virtually eliminated among physicians"

- Ken Arrow, AER 1964

Motivation - Healthcare is Different

- Why do we care about advertising particularly in Healthcare?
  1. Government Involvement
     - Highly subsidized and regulated industry
     - Government might want to regulate or ban advertising
     - This is in stark contrast with more "typical" goods (e.g. Corn Flakes)

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     - Highly subsidized and regulated industry
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     - This is in stark contrast with more "typical" goods (e.g. Corn Flakes)
  2. Advertising might affect frictions special to Healthcare
     - Switching Costs/Inattention
     - Adverse Selection/Imperfect Information
     - Allocative efficiency is more directly measurable

This Project

- We're interested in advertising in health care markets
  1. Where are we now / where are we heading?
     - Trends, heterogeneity, comparison to other sectors
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  3. What have we done so far?

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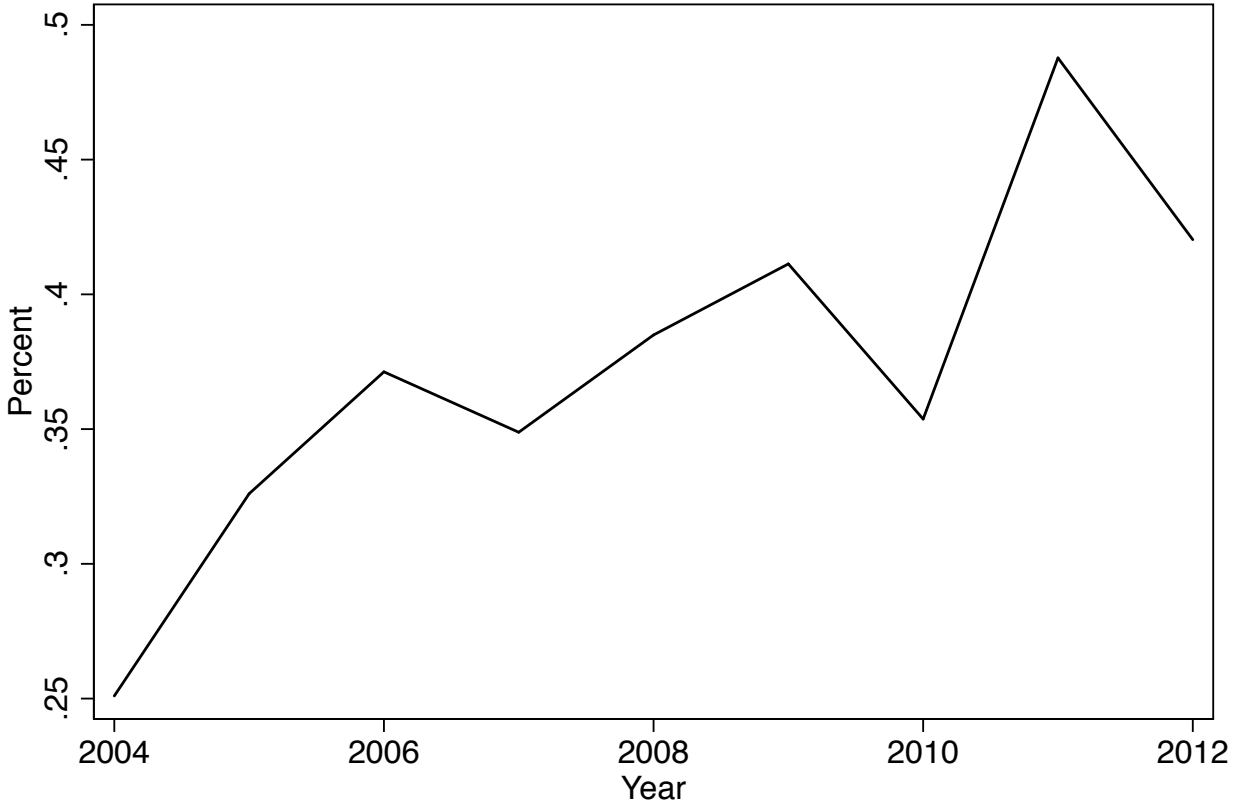
What Are the Aggregate Trends?

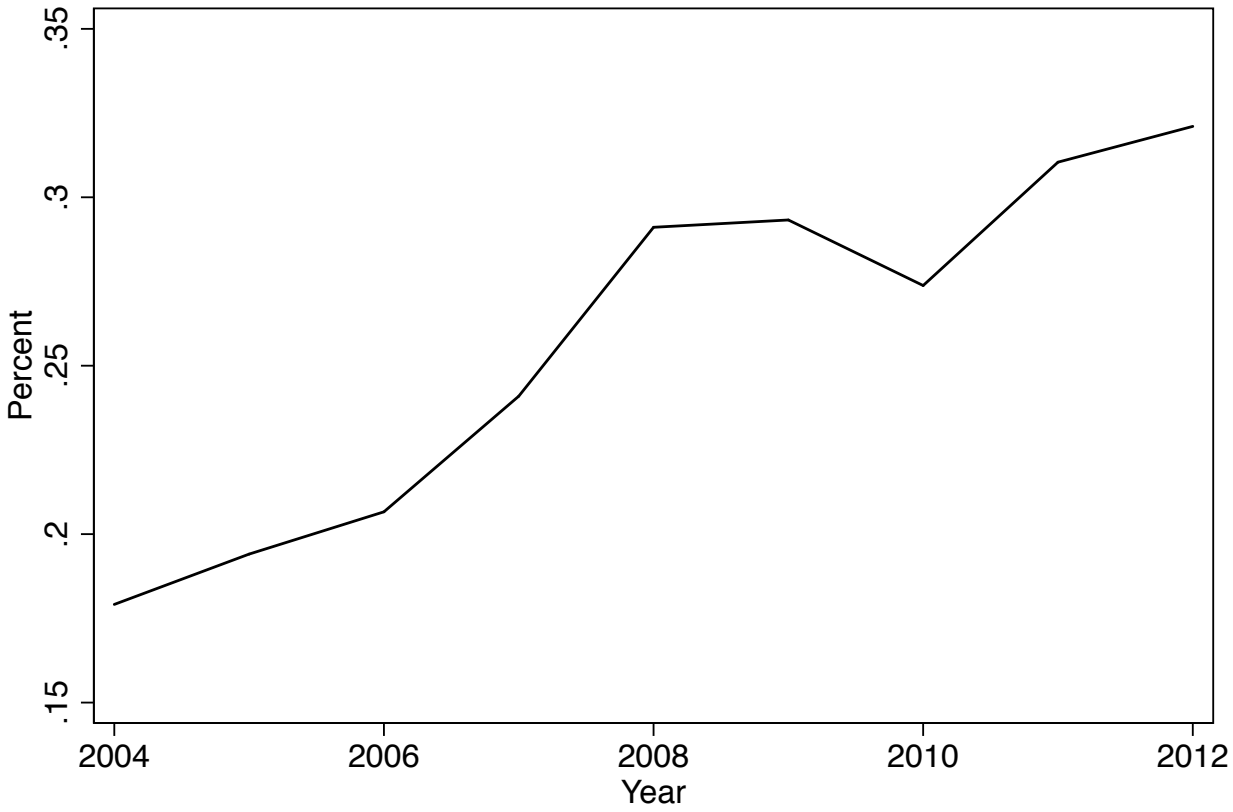
Figure: Percentage of TV Ad Spending on Heath Insurance



Aggregate TV ad spending is $\approx$ \$100B

What Are the Aggregate Trends?

Figure: Percentage of TV Ad Spending on Hospitals



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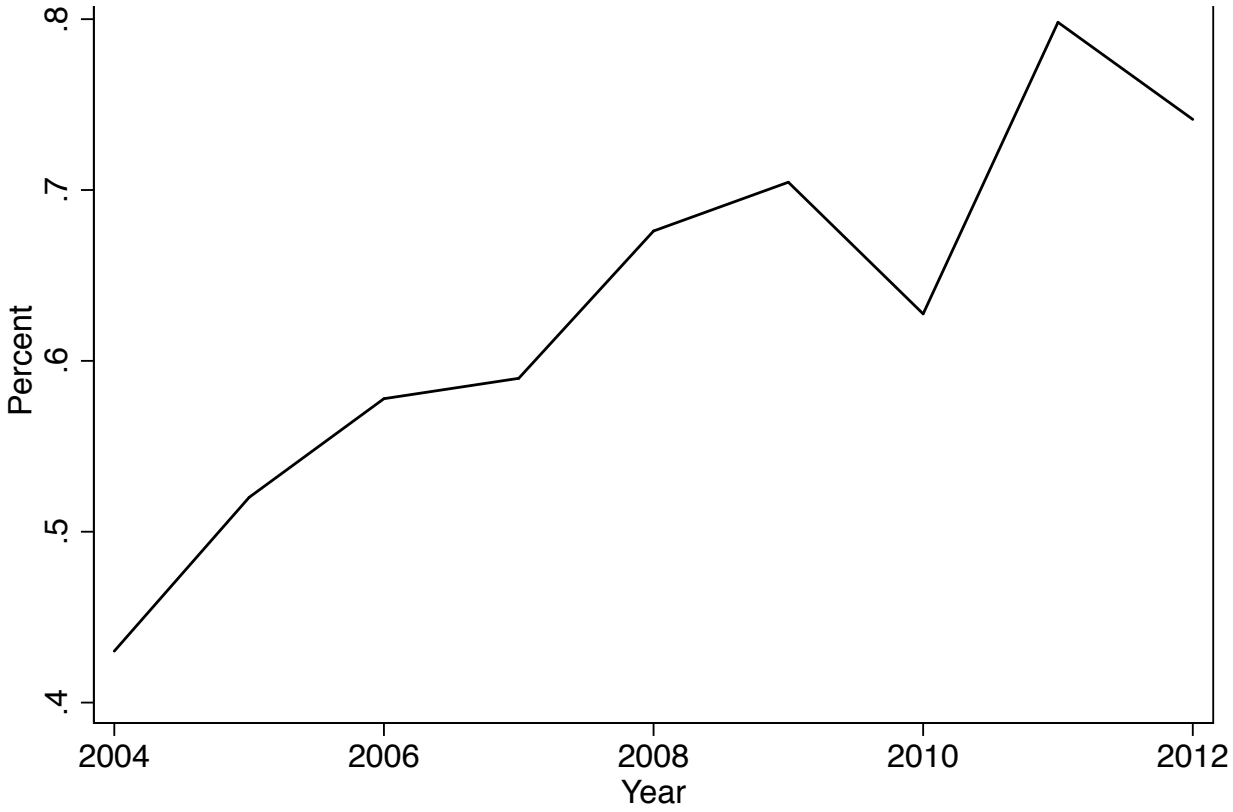

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Highest Spending Markets: Health Insurance

Table: Top 10 Markets for TV Ad Spending on Health Insurance

Rank	DMA Name	Expenditure	Percent of Expenditure
	Panel A: Sorted by Expenditure		
1	NEW YORK	$34,136,656	0.49
2	LOS ANGELES	$33,586,160	0.52
3	MIAMI-FT. LAUDERDALE	$14,196,316	0.75
4	SAN FRANCISCO-OAK-SAN JOSE	$14,180,270	0.57
5	CHICAGO	$12,286,328	0.37
6	BOSTON (MANCHESTER)	$11,873,973	0.57
7	DALLAS-FT. WORTH	$11,844,842	0.45
8	HOUSTON	$11,605,796	0.49
9	PHILADELPHIA	$11,388,822	0.46
10	DETROIT	$11,006,875	0.72
	Panel B: Sorted by Percent		
1	GLENDIVE	$56,169	1.18
2	ALPENA	$98,905	0.80
3	CHATTANOOGA	$2,128,510	0.79
4	ALEXANDRIA LA	$466,569	0.76
5	MIAMI-FT. LAUDERDALE	$14,196,316	0.75
6	MEMPHIS	$3,884,061	0.75
7	DETROIT	$11,006,875	0.72
8	PITTSBURGH	$6,269,568	0.71
9	BILOXI-GULFPORT	$648,309	0.69
10	ZANESVILLE	$190,635	0.68

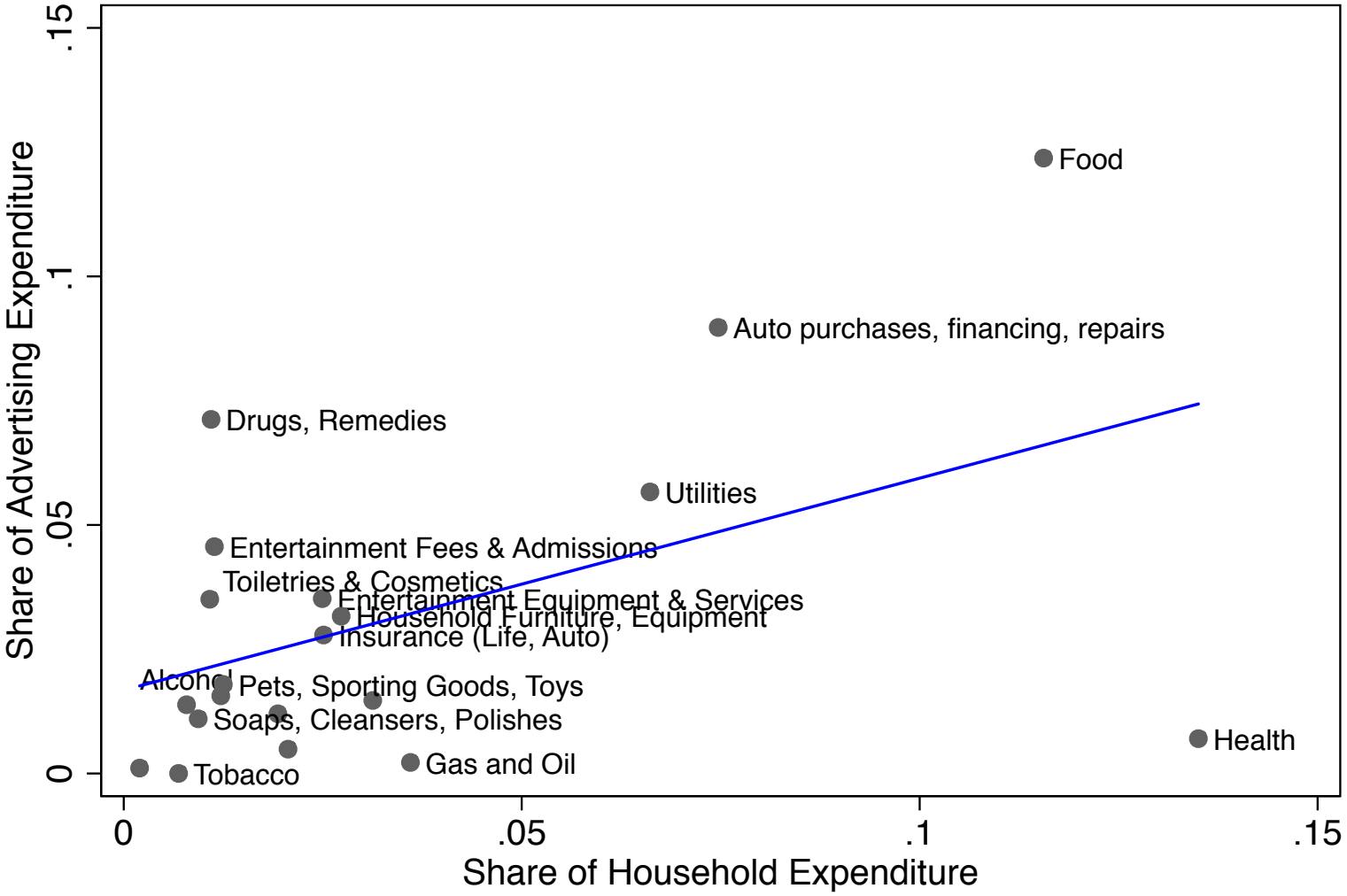
Highest Spending Markets: Hospitals

Table: Top 10 Markets for TV Ad Spending on Hospitals

Rank	DMA Name	Expenditure	Percent of Expenditure
	Panel A: Sorted by Expenditure		
1	NEW YORK	$47,353,312	0.68
2	CHICAGO	$42,082,180	1.26
3	DALLAS-FT. WORTH	$39,212,544	1.50
4	LOS ANGELES	$33,519,942	0.52
5	PHILADELPHIA	$28,447,606	1.15
6	MIAMI-FT. LAUDERDALE	$26,806,212	1.42
7	HOUSTON	$25,751,266	1.08
8	WASHINGTON DC (HAGRSTWN)	$22,565,334	0.99
9	PHOENIX (PRESCOTT)	$22,079,036	1.25
10	BOSTON (MANCHESTER)	$21,789,462	1.05
	Panel B: Sorted by Percent		
1	ZANESVILLE	$748,675	2.67
2	NORTH PLATTE	$704,262	2.66
3	FT. WAYNE	$3,874,698	1.88
4	CHARLESTON-HUNTINGTON	$5,835,089	1.79
5	CHARLESTON SC	$4,184,852	1.74
6	SOUTH BEND-ELKHART	$4,115,296	1.66
7	LAFAYETTE LA	$2,963,634	1.62
8	BATON ROUGE	$4,552,312	1.61
9	TYLER-LONGVIEW(LFKN&NCGD)	$3,429,193	1.60
10	RENO	$3,353,682	1.60

What Can We Learn From Other Sectors?

Figure: Share of Household Spend vs. TV Ad Spend by Sector



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4. Do ads increase allocative efficiency?
   - Related to information vs. persuasion
5. Do ads affect switching costs?
   - Think: Sprint "cut your bill in half" campaign

The Context - Medicare

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   - Move people out of Traditional Medicare into MA

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3. What are the margins on which this type of advertising might work?
   - Move people out of Traditional Medicare into MA
   - Steal enrollees from one MA plan into a new one

The Context - Medicare

- Welfare implications
  - Is category expansion actually good in this context?
  - Is business stealing improving allocative efficiency?
  - Is business stealing symptomatic of breaking down inertia?
  - Is business stealing a wasteful arms race?
- Relevance to the firm or Social Planner?

Research Questions

- Business stealing vs. market expansion
  - Effect of quasi-exogenous variation in ads on own / rival enrollment
- Cream-skimming
  - Effect of quasi-exogenous variation in ads on health types of enrollees
  - E.g., t-1 costs for MA switchers / costs for Part D
- Allocative efficiency
  - Effect of quasi-exogenous variation on Part D premium + OOP costs
- Switching costs
  - Effect of quasi-exogenous variation in ads on cross-plan churn

Previous Research- Advertising

1. Advertising is a firm decision, endogenous
   - Randomization: Sahni (2013), Lewis and Nguyen (2012), Blake, Nosko and Tedelis (2014)
   - Natural Experiments: Shapiro (2014)
   - Instrumental Variables: Berndt et. al. (1995), Stephens-Davidowitz et. al. (2013)
2. Mechanisms of advertising's usefulness
   - Consideration sets (Goeree 2008), Memory (Sahni 2013), Complementary/Utility (Gardete, Nair and Tuchman 2015, Dube, Hitsch, Manchanda 2005), Positive Spillovers/Information (Shapiro 2014, Sahni 2013, Shum 2012), Business Stealing (Sinkinson and Starc 2015)

Previous Research- Health Insurance

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   - People choose dominated plans if they are not in an "active choice" period. (Handel 2013)
   - Default plans are persistent. Firms respond by offering new cheaper options rather than lowering prices. (Ericson 2014)

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   - People could save a huge amount of money by switching to the lowest cost plan. (Abaluck and Gruber 2011)
3. Selection and Cream Skimming
   - Medicare Advantage plans that offer fitness membership get healthier consumers (Cooper and Trivedi 2012)

Previous Research- Advertising of Health Insurance

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   - As competition increases, the insurers advertise more and the content is targeted at healthy patients (Mehrota Grier and Dudley 2006)

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1. Selective Targeting
   - As competition increases, the insurers advertise more and the content is targeted at healthy patients (Mehrota Grier and Dudley 2006)
2. Very little about the effects of this advertising
   - Is it actually effective at all? Does it generate a healthier risk pool for the firm?
   - We hope to answer some of these questions.

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Preview of results

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Preview of results

1. Does advertising work?
   - No
2. Cannot reject the null of no effect of TV advertising
3. Back of the envelope calculations suggest we can rule out positive ROI
4. This makes many of the Health Econ questions moot, aside from waste.

Data- Advertising

- AC Nielsen Advertising Data
  - Brand-Month-TV Market level Advertising Data, 2006-2012
    - Household Views
    - Expenditures
    - Duration
    - Creative description (from which many ads can be found on YouTube)
    - Age and Gender breakdowns of Views
    - Some information about TV station, show, time of day

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- Combine with Census data
  - TV Market Population and Medicare Eligible Population
- Use GRPs (Household views per capita) as measure of advertising

Data- Health Insurance Enrollments

- CMS Enrollment Data 2006-2013
  - Plan-County-Month level quantity data
    - Plan Type (Part D, Medicare Advantage, Employer)
    - Number of Enrollments
    - Brand, Parent Organization

Research Design 1

- Medicare Advantage open enrollment period runs from Oct 15 to Dec 7
- Presidential / Congressional elections occur on first Tues in Nov

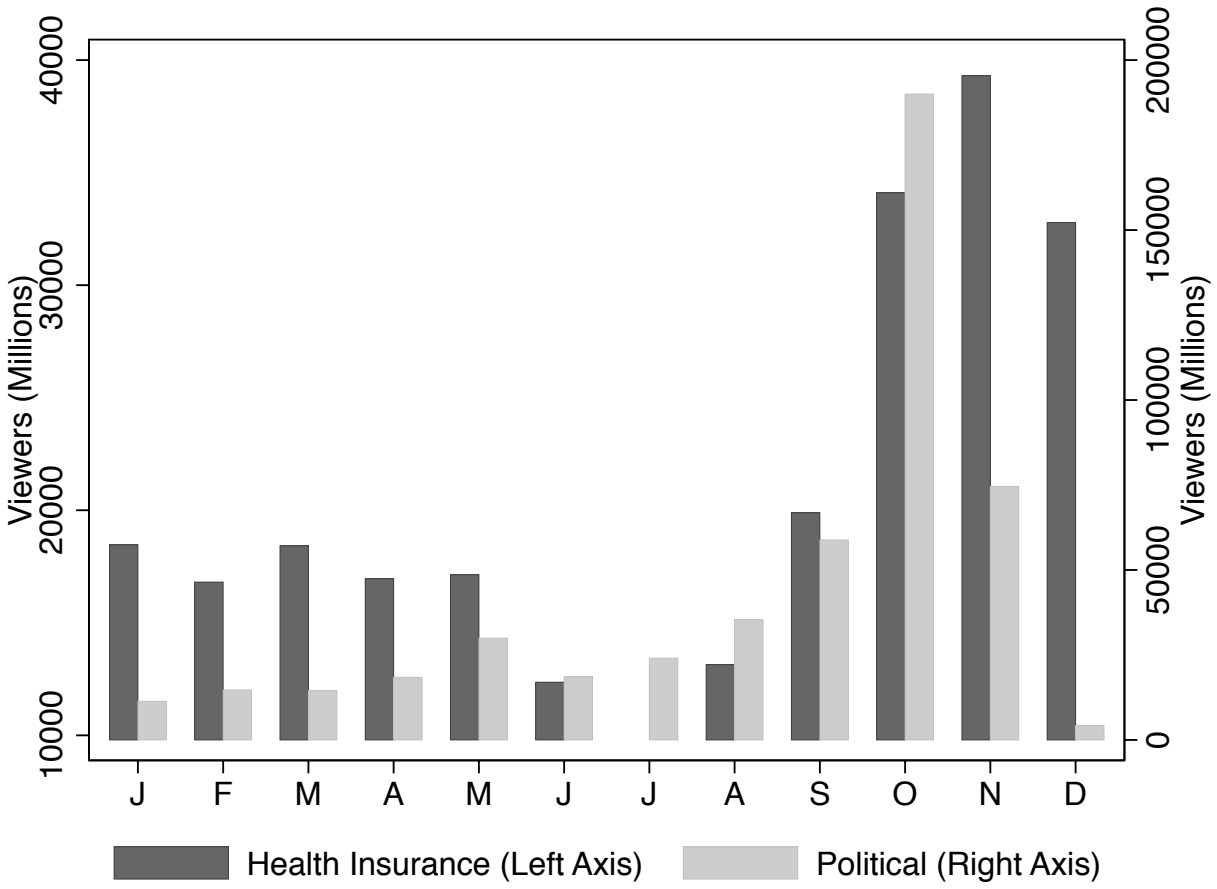
$\Rightarrow$ Political ads may crowd out health insurance ads

  - Particularly useful that target audience (65+ year olds, CNN) is similar

- Use this variation in difference-in-difference / IV framework
  - I.e., Compare swing DMAs to non-swing DMAs in 2012 vs. 2011

Seasonality in Health Insurance and Political Advertising

Figure: Health Insurance and Political Ad Views by Month



Pooled 2004-2012 data.

Econometric Specifications

- Let j indicate DMAs, t indicate years
- First stage

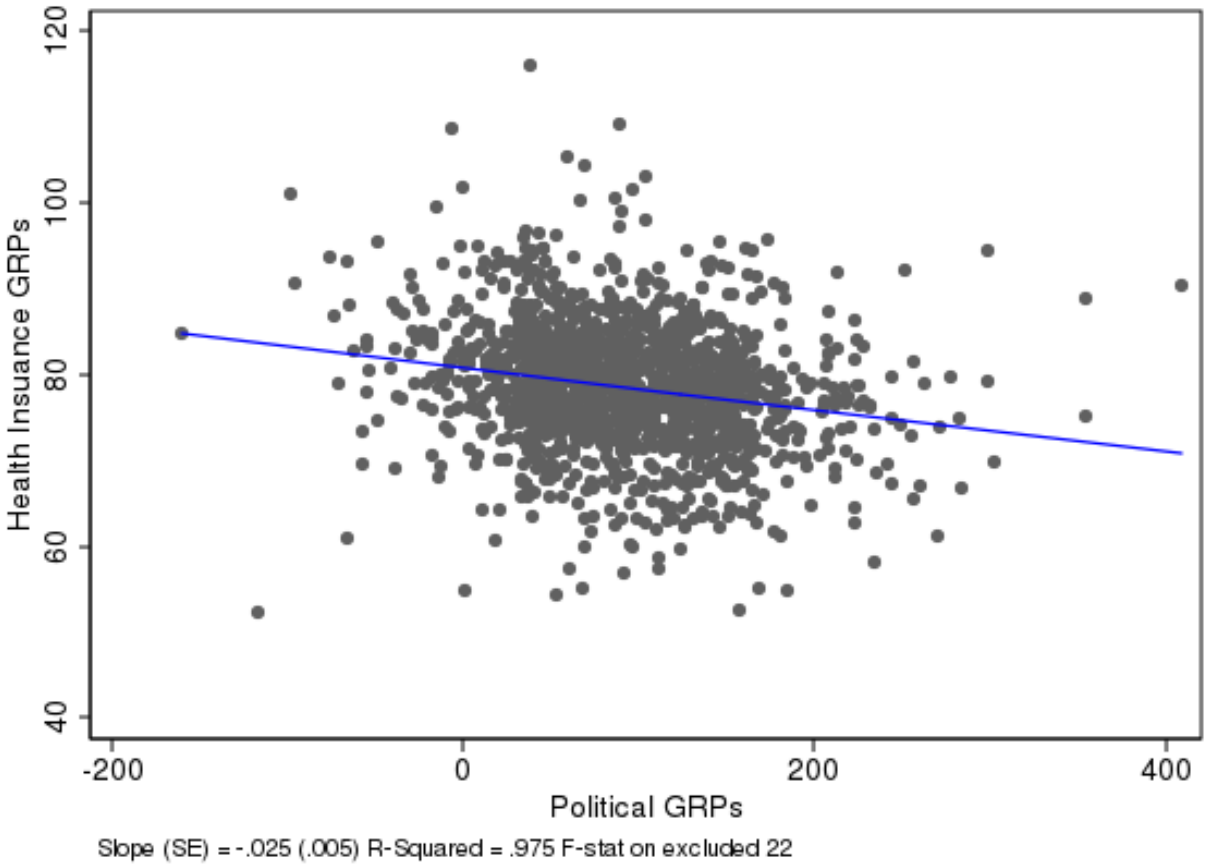
$$\text{Health Insurance Ads}_{jt} = \alpha \text{ Political Ads}_{jt} + \delta_j + \delta_t + \delta_j * \textit{time} + \epsilon_{jt}$$

- Second stage

$$\text{MA Share}_{jt} = \beta \text{ Health Insurance Ads}_{jt} + \delta_j + \delta_t + \delta_j * \textit{time} + \epsilon_{jt}$$

First Stage-Political IV

Figure: Effect of Political GRPs on Health Insurance GRPs



Residual-residual plot netting out year and DMA fixed effects and DMA time trends

First Stage Regressions

Figure: First Stage

	Dependent Variable: Health Insurance Ad GRPs			
	(1)	(2)	(3)	(4)
Political Ad GRPs	-0.0189	-0.0192	-0.0167	-0.0157
	(0.0039)	(0.0048)	(0.0041)	(0.0048)
Year Fixed Effects	X	X	X	X
DMA Fixed Effects	X	X	X	X
DMA Time Trends	X	X		
DMA Population Weights		X		X
Mean Health GRP	43.12	43.12	43.12	43.12
Mean Political GRP	143.69	143.69	143.69	143.69
Partial R2 on Excluded	0.03	0.03	0.02	0.01
Partial F on Excluded	16.86	11.29	13.78	9.10

Research Design 2

- TV Markets are collections of counties
- Everyone in each TV market sees the same advertisements

$\Rightarrow$ Households close to TV Market borders are similar to one another

  - However, they get different ads

- Treat each border region as its own "experiment" diff-in-diff
- Shapiro (2014)

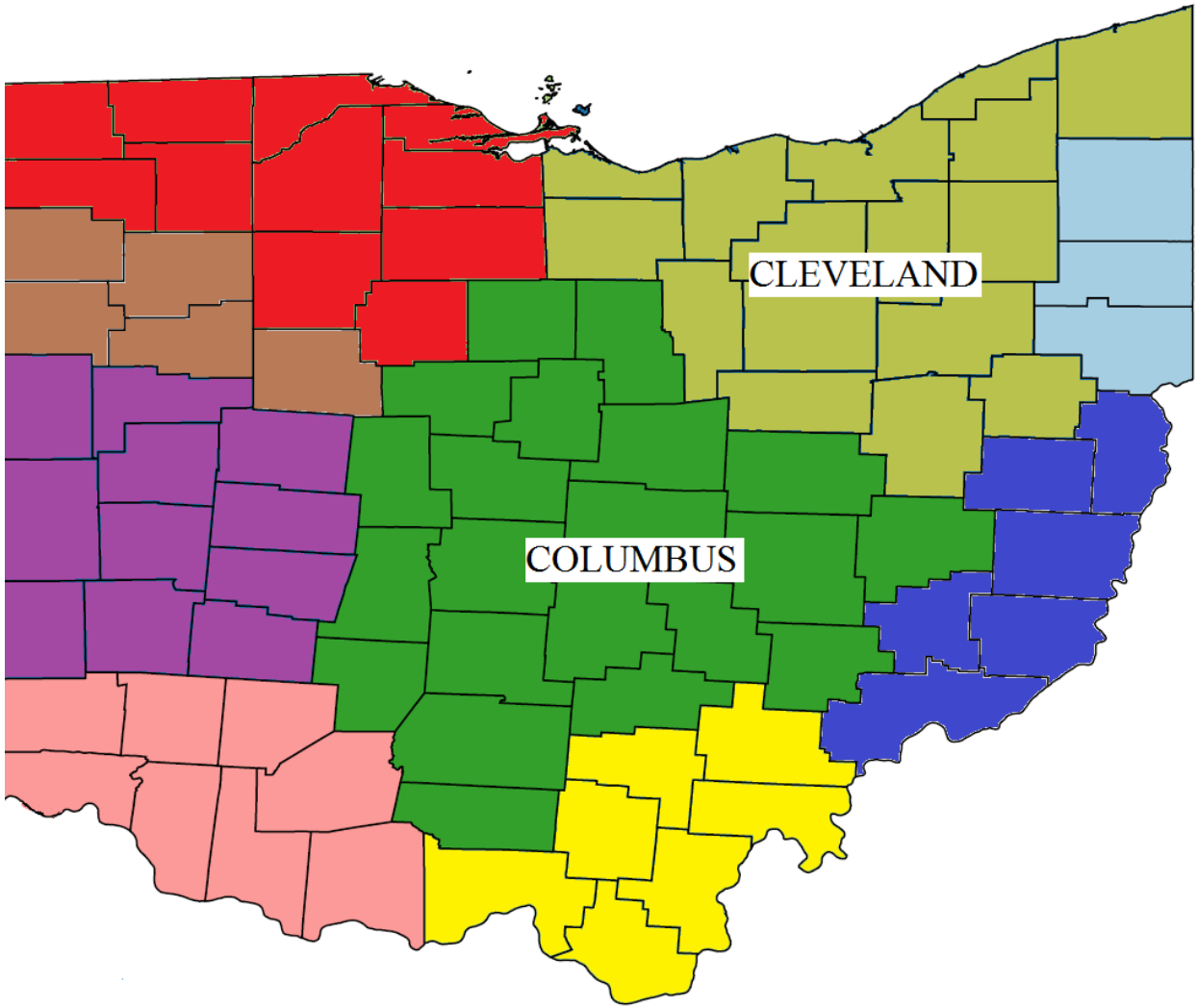
Research Design 2- Econometric Specification

- Let j indicate DMAs, t indicate years, b indicate border region

$$\text{MA Share}_{jbt} = \beta \text{ Health Insurance Ads}_{jbt} + \delta_{jb} + \delta_{bt} + \epsilon_{jbt}$$

Research Design 2

Figure: Health Insurance and Political Ad Views by Month



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- We need non-advertisers to identify the business-stealing effects
- From 2006-2009, United Health Care, one of the biggest firms, does not advertise
- Use the same pieces of variation in market advertising to test the effect on only United's market share

Results- Political IVs

Figure: IV Regressions

	Dep Var: MA Enrollment (%)				
	OLS				IV
	(1)	(2)	(3)	(4)	(5)
Health Insurance Ad GRPs	0.0020	0.0025	-0.0001	0.0000	-0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Year Fixed Effects		X	X	X	X
DMA fixed effects			X	X	X
DMA time trends				X	X
R-Squared	0.22	0.26	0.96	0.99	0.99

Results- Political IVs/Business Stealing

Figure: IV Regressions

	Dep Var: United Enrollment (%)				
	OLS				IV
	(1)	(2)	(3)	(4)	(5)
Rival Ad GRPs	0.0005	-0.0025	-0.0008	-0.0003	-0.0044
	0.0004	0.0005	0.0006	0.0003	0.0027
Year Fixed Effects		X	X	X	X
DMA fixed effects			X	X	X
DMA time trends				X	X
R-Squared	0.00	0.22	0.70	0.88	0.87

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Interpretting These Results

1. Naive OLS- It looks like MA advertising significantly lifts category enrollments.
2. Controlled OLS- It looks like MA advertising is useless for category expansion.
3. IV- A lot of noise, but cannot reject null of no effect.
4. Neither accepting the OLS nor the noise of the IV are ideal.

Border Strategy Results

Figure: Border Regressions

	MA Share		Log MA Share	United Share		Log United Share
	(1)	(2)	(3)	(4)	(5)	(6)
Health Insurance Ad GRPs	0.00101	-0.00015	-0.00088	-0.00102	0.00037	0.00487
	(0.0003)	(0.0001)	(0.0011)	(0.0006)	(0.0008)	(0.0039)
Border-Year fixed effects	X	X	X	X	X	X
Border-Market fixed effects		X	X		X	X
R-Squared	0.79	0.99	0.98	0.83	0.94	0.95

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Figure: Border Regressions

	MA Enrollment		United Enrollment	
	(1)	(2)	(3)	(4)
HI Ad Household Views (millions)	8.71302	2.49938	-0.80075	-1.88531
	(5.9738)	(3.0404)	(0.5035)	(2.7058)
Border-Year fixed effects	X	X	X	X
Border-Market fixed effects		X		X
R-Squared	0.79	0.99	0.83	0.94

Scaling the Estimates

- How do we think about magnitudes
  - An additional 1 million household views leads to an increase of category enrollments between -3.5 and 8.5
  - An additional 1 million household views of rival advertisements decreases United's enrollments by between 7.8 and -3.5
  - 1 million household views $\approx$ \$25,000.
  - Profit on an enrollment $\approx$ \$1,000.
  - We can rule out a positive ROI, either business stealing or the category as a whole.
  - We cannot reject the null of advertising having zero effect.

Summary So Far

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1. Advertising is useless?

2. Advertising builds brand equity

   - Variation in flow does not create much variation in stock
   - . . . but timing of advertising suggests firms think effects are short-term
     - Ads are targeted during open enrollment period
     - No time shifting when crowed out by political ads

Where does this leave us?

- If advertising doesn't affect category size or brand shares, is it useless?
  - If advertising is useless and firms are spending $400 million/year on it, the government may want to ban advertising
  - Lower firm costs for equal revenues could be passed through to customers in lower prices or higher quality
  - Shareholders might be in favor of advertising bans to put discipline on management

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  - Lower firm costs for equal revenues could be passed through to customers in lower prices or higher quality
  - Shareholders might be in favor of advertising bans to put discipline on management
- Allocative efficiency?
  - People could be switching, but shares are staying the same
  - More active choice as a result of ads might increase allocative efficiency
  - Need micro data to see if there is any change in allocative efficiency

But...

- Firms don't care about allocative efficiency.

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- It would take a strange model to have zero marginal effects on equilibrium, lots of positive advertising in equilibrium, and lots of switching.

Conclusions

1. Using two plausible identification strategies, we estimate the effect of advertising on Medicare Advantage enrollments.

2. A positive ROI is not in the 95
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- Questions, suggestions comments?

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