Appendix

Regulating Conflicts of Interest through Public Disclosure:
Evidence from a Physician Payments Sunshine Law

This document provides additional details, figures, tables, and robustness checks.

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Figure A1. Data Summary and Data Exclusions

Data Type:	Data Included:	Data Selection Based on:	Data Exclusions:
Geographic Regions	1) Chi, IL 2) Bos, MA 3) Phi, PA and Pit, PA 4) NYC, NY 5) Northern CA (Bay Area) and Southern CA (LA, SD areas)	1. Regions with the most academic medical centers (AMCs)	
Academic Medical Centers	23 AMCs in the above geographic regions	1. IMS AMC-hospital affiliations database	1. Hospitals not owned or operated by an AMC, with a few exceptions (e.g. Partners Healthcare, NY Presbyterian) that have full-time attendings affiliated with one of several possible AMCs
Drugs	262 drugs in nine drug classes	1. IMS drug classifications 2. Physician feedback on commonly marketed drugs	1. Rarely prescribed drugs (according to IMS) 2. Branded drugs that had a generic version come on the market during 2007-2011 3. Generics that entered the market during 2007-2011
Physicians	5,730 physicians listed as an attending at one of these AMCs in at least one quarter during the pre-policy period of January 2006 – June 2009	1. Quarterly IMS affiliations database	1. Physicians that had multiple affiliations in the pre-policy period, according to IMS
Monthly Prescriptions	Monthly prescriptions from July 2007 – July 2011 for each physician-month	1. 24 months before and after the policy	1. Prescriptions for physicians that did not prescribe a minimum amount of an entire drug class
Measures of Marketing	(1) Whether a drug is branded with no generic on the market (for a given month) (2) National sales force size in Q2 of 2009, according to SDI Health	1. FDA drug databases 2. When a generic is first prescribed in the IMS data	
Payments to Physicians	All meals and consulting payments of $50+ to MA-licensed physicians from July 2009 – December 2011	1. Disclosures collected via the Massachusetts Sunshine Law	1. Other types of payments (e.g. educational)

Figure A2. Calculations, Extrapolating Results in Model (5)

As noted in model (5), disclosure led to a net decrease of 0.140 prescriptions per doctor-month-drug observation for branded drugs in Massachusetts. Since there are 1,775,890 physician-drug-month observations in Massachusetts post-disclosure, this translates to an estimated decrease of:

0.140 per doctor-drug-month * 1,775,890 doctor-drug-months = 248,625 total branded prescriptions

This is relative to 972,275 total branded drug prescriptions actually written in Massachusetts during this time. This yields a predicted decrease of:

248,625 / (248,625 + 972,275) = 0.20 → 20% decrease in branded drugs

Relative to the 3,625,380 total prescriptions written in Massachusetts post-disclosure (in this data), this represents a decrease in total prescriptions of:

248,625 / (248,625 + 3,625,380) = 0.064 → 6.4% decrease in total prescriptions

Table A1: Alternate SE Specifications

	(A1)	(A2)	(A3)
DV	**Rx**	**Rx**	**Rx**
N (physician-drug-month)	**17,013,810**	**17,013,810**	**17,013,810**
SEs	**Clustered by Physician**	**Clustered by State**	**Bootstrapped (AMC Clusters)**
Adj. R^2	**0.874**	**0.874**	**0.874**
Policies			
1. Sunshine	0.041	0.041	0.041
	(0.028)	(0.034)	(0.041)
Interactions			
2. Sunshine*Branded	-0.181***	-0.181***	-0.181***
	(0.017)	(0.000)	(0.030)
Controls			
Month FE	YES	YES	YES
Physician*Drug FE	YES	YES	YES
Linear combinations of coefficients			
a.) 1 + 2	-0.140***	-0.140***	-0.140***
	(0.021)	(0.034)	(0.042)

***p<0.01.
SEs in (A1) and (A2) are robust.
Bootstrap in (A3) is with 100 reps and a seed of 100 in Stata.
For comparison, the average branded Rx in MA, post-policy, was 0.547 in all specifications.

Table A2: Excluding Drug Classes, Part 1

	(A4)	(A5)	(A6)	(A7)	(A8)
DV	**Rx**	**Rx**	**Rx**	**Rx**	**Rx**
N (physician-drug-month)	**13,534,864**	**16,554,960**	**15,910,300**	**14,998,402**	**16,841,946**
Drug Class Excluded	**Anti-depressants**	**Anti-hyperactives**	**Anti-psychotics**	**Anxiolytics**	**Sleep Aids**
Adj-R^2	**0.879**	**0.876**	**0.872**	**0.874**	**0.874**
Policies					
1. Sunshine Implemented	0.024	0.047	0.042	0.092**	0.039
	(0.038)	(0.037)	(0.040)	(0.042)	(0.037)
Interactions					
2. Sunshine*Branded	-0.174***	-0.188***	-0.187***	--0.244***	-0.181***
	(0.024)	(0.023)	(0.022)	(0.035)	(0.025)
Controls					
Month FE	YES	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES	YES
Linear Comb. of Coeff.					
a.) 1 + 2	-0.150***	-0.142***	-0.145***	-0.152***	-0.142***
	(0.040)	(0.040)	(0.040)	(0.041)	(0.038)

** p<0.05; *** p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA post-policy was 0.551, 0.532, 0.506, 0.548, and 0.550 respectively.

Table A2: Excluding Drug Classes, Part 2

	(A9)	(A10)	(A11)	(A12)
DV	**Rx**	**Rx**	**Rx**	**Rx**
N (physician-drug-month)	**16,192,308**	**11,278,353**	**16,394,451**	**14,404,896**
Drug Classes Excluded	**Statins**	**Anti-hypertensives**	**Proton Pump Inhibitors**	**Diabetes**
Adj-R^2	**0.874**	**0.857**	**0.877**	**0.877**
Policies				
1. Sunshine Implemented	0.035	0.067	0.007	0.029
	(0.035)	(0.045)	(0.035)	(0.038)
Interactions				
2. Sunshine*Branded	-0.130***	-0.238***	-0.123	-0.186***
	(0.017)	(0.042)	(0.020)	(0.027)
Controls				
Month FE	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES
Linear Comb. of Coeff.				
a.) 1 + 2	-0.095***	-0.171***	-0.116**	-0.157***
	(0.034)	(0.056)	(0.043)	(0.049)

** p<0.05; *** p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.428, 0.670, 0.559, and 0.618 respectively.

Table A3: Excluding States

	(A13)	(A14)	(A15)	(A16)
DV	**Rx**	**Rx**	**Rx**	**Rx**
N (physician-drug-month)	**13,440,071**	**16,054,605**	**15,807,506**	**14,825,430**
Excluded State	**CA**	**IL**	**NY**	**PA**
Adj-R^2	**0.882**	**0.875**	**0.881**	**0.868**
Policies				
1. Sunshine Implemented	0.006	0.034	0.066	0.051
	(0.044)	(0.039)	(0.037)	(0.041)
Interactions				
2. Sunshine*Branded	-0.181***	-0.181***	-0.181***	-0.181***
	(0.025)	(0.025)	(0.025)	(0.025)
Controls				
Month FE	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES
Linear Comb. of Coefficients				
a.) 1 + 2	-0.175***	-0.148***	-0.115***	-0.139***
	(0.047)	(0.043)	(0.041)	(0.045)

***p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.547.

Table A4: Excluding Partners Healthcare Physicians

	(A17)
N (physician-drug-month)	**14,244,774**
Adj. R^2	**0.874**
Policies	
1. Sunshine	0.058
	(0.040)
Interactions	
2. Sunshine*Branded	-0.203***
	(0.022)
Controls	
Month FE	YES
Physician*Drug FE	YES
Linear combinations of coeff	
a.) 1 + 2	-0.145***
	(0.041)

***p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.566.

Table A5: Only Including Drugs with 48 Months of Data

	(A18)
DV	**Rx**
N (physician-drug-month)	**8,609,328**
Drugs	**81**
Adj. R^2	**0.878**
Policies	
1. Sunshine	0.029
	(0.039)
Interactions	
2. Sunshine*Branded	-0.221***
	(0.032)
Controls	
Month FE	YES
Physician*Drug FE	YES
Linear combinations of coeff	
a.) 1 + 2	-0.192***
	(0.050)

***p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.959.

Table A6: Including All Drugs

	(A19)
DV	**Rx**
N (physician-drug-month)	**22,769,044**
Drugs	**343**
Adj-R^2	**0.860**
Policies	
1. Sunshine (Implementation)	0.178***
	(0.053)
Interactions	
3. Sunshine*Branded	-0.396***
	(0.094)
Controls	
Month FE	YES
Physician*Drug FE	YES
Linear Combinations of Coefficients	
a.) 1 + 3	-0.218***
	(0.057)

*** p<0.01.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.454.

Note: This regression includes all drugs that were dropped per the methods detailed in the "data exclusions" section.

Table A7: Ln(Rx) Specifications

	(A20)	(A21)
N (physician-drug-month)	**17,013,810**	**17,013,810**
Dependent Variable	**Ln(Rx)^**	**Ln(Rx+1)**
Adj. R^2	**0.803**	**0.803**
Policies		
1. Sunshine	0.002	-0.001
	(0.007)	(0.009)
Interactions		
2. Sunshine*Branded	-0.016***	-0.014***
	(0.002)	(0.002)
Controls		
Month FE	YES	YES
Physician*Drug FE	YES	YES
Linear combinations of coeff		
a.) 1 + 2[#]	-0.014**	-0.014*
	(0.006)	(0.007)

*p<0.10, **p<0.05, ***p<0.01. SEs are robust and clustered by AMC.
^DV = 0 for observations with 0 prescriptions.
[#]The p-value is 0.024 in Model (A20) and 0.059 in Model (A21).
For comparison, the average branded log-Rx in MA, post-policy, was 0.116 and 0.159, respectively.

Table A8: Branded Only (No Generics)

	(A22)
N (physician-drug-month)	**6,744,556**
Dependent Variable	**Rx**
Adj. R^2	**0.842**
Policies	
1. Sunshine	-0.088**
	(0.042)
Month FE	YES
Physician*Drug FE	YES

**p<0.05
SEs are robust and clustered by AMC.
This regresses only on branded drugs to test whether the generic counterfactual is crucial to the result.
For comparison, the average branded Rx in MA, post-policy, was 0.547.

Table A9: Aggregating Rx Across Drugs

	(A23)	(A24)
DV^	**Rx per Doctor-Branded-Month**	**Rx per Doctor-Branded-Month**
Specification	**OLS**	**Poisson**
N#	**543,310**	**542,894**
Adj. R^2	**0.747**	**-**
Main Effects		
1. Sunshine	6.487*	0.051**
	(3.214)	(0.026)
2. Branded	-11.478***	-0.623***
	(3.351)	(0.020)
Interactions		
3. Sunshine*Branded	-13.324**	-0.383***
	(5.631)	(0.023)
Controls		
Month FE	YES	YES
Physician FE	YES	YES
Linear combinations of coeff		
a.) 1 + 3	-6.837**	-
	(2.655)	

*p<0.10, **p<0.05, ***p<0.01.
SEs are robust and clustered by AMC.
^The DV is the aggregated prescriptions at the doctor – month level, split by branded and generic drugs (i.e. two observations per doctor – month).
#Observations are very slightly different between specifications because 17 physicians (9 treatment, 8 control) had no changes in prescriptions over time because they prescribed only drugs from these classes that were excluded in the sample, and thus were excluded in the Poisson model.
For comparison, the average branded Rx in MA, post-policy, was 14.043.

Table A10: Top 5 Drug Regressions

	(A25)	(A26)
N (physician-drug-month)	**16,510,050**	**10,773,014**
Drugs	**No Top-5 Branded**	**Only Top-5 Branded^**
Adj. R^2	**0.873**	**0.885**
Policies		
1. Sunshine	0.031	0.015
	(0.038)	(0.040)
Interactions		
2. Sunshine*Branded	-0.104***	-0.842***
	(0.020)	(0.218)
Controls		
Month FE	YES	YES
Physician*Drug FE	YES	YES
Linear combinations of coeff		
a.) 1 + 2	-0.074**	-0.827***
	(0.031)	(0.233)

**p<0.05, ***p<0.01.
SEs are robust and clustered by AMC.
^This excludes all branded drugs except the top-5.
For comparison, the average branded Rx in MA, post-policy, was 0.325 and 3.285, respectively.

Table A11: Psych and Non-Psych

	(A27)	(A28)
N (physician-drug-month)	**12,792,171**	**4,221,639**
Drugs	**Psych**	**Non-Psych**
Adj. R^2	**0.883**	**0.850**
Policies		
1. Sunshine	-0.020	0.348***
	(0.034)	(0.118)
Interactions		
2. Sunshine*Branded	-0.042**	-0.607***
	(0.016)	(0.131)
Controls		
Month FE	YES	YES
Physician*Drug FE	YES	YES
Linear combinations of coeff		
a.) 1 + 2	-0.063^	-0.259***
	(0.036)	(0.061)

**p<0.05, ***p<0.01.
^p = 0.107.
SEs are robust and clustered by AMC.
For comparison, the average branded Rx in MA, post-policy, was 0.679 and 0.476, respectively.

Table A12: Dropping Rare Doctor-Drug Combinations

	(A29)	**(A30)**
DV	**Rx**	**Ln(Rx+1)**
N (physician-drug-month)	**1,034,797**	**1,034,797**
Adj-R^2	**0.847**	**0.647**
1.Sunshine Implemented	-0.092	-0.046
	(0.275)	(0.037)
2. Sunshine*Branded	-1.493***	-0.080***
	(0.229)	(0.019)
Controls		
Month FE	YES	YES
Physician*Drug FE	YES	YES
Linear Combinations of Coefficients		
a.) 1 + 2	-1.585***	-0.126***
	(0.360)	(0.043)

*** p<0.01. SEs are robust and clustered by AMC.
Linear combination (a) represents the net effect of disclosure on *branded drugs.*

For comparison, the average branded Rx in MA, post-policy, was 7.374 and 1.681, respectively.

These specifications exclude all doctor-drug pairs with **less than 48 total scripts in the dataset** (this translates to less than 1 script per month on average). This yields 5001 remaining physicians and 179 drugs (and 37,281 unique doctor-drug combinations).

For Model (A29), the extrapolated effect size can be approximated as 1.585 ÷ (1.585 + 7.374) = 17.7%.

By comparing Model (A30) to Model (A21), this implies the ln(Rx+1) dependent variable is highly sensitive to the zeroes from these rare doctor-drug observations. Thus these should be viewed as conservative robustness checks. This makes sense when considering that the ln(Rx+1) DV likely underestimates policy effects on more highly prescribed drugs and higher-prescribing doctors; these are the very observations where marketing and thus disclosure are most likely to have true effects.

Table A13: Splitting Effects by Volume Quintiles, DV = Rx

	(A31)	(A32)	(A33)	(A34)	(A35)
N (physician-drug-month)	**6,235,343**	**4,381,007**	**2,918,677**	**1,988,417**	**1,490,366**
Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Dependent Variable	**Rx**	**Rx**	**Rx**	**Rx**	**Rx**
Adj-R^2	**0.898**	**0.651**	**0.502**	**0.397**	**0.364**
Main Effects					
1. Sunshine Implementation	0.063	0.058	0.072*	0.015	0.036
	(0.077)	(0.044)	(0.039)	(0.041)	(0.049)
Interactions					
2. Sunshine*Branded	-0.240***	-0.162***	-0.125***	-0.085*	-0.061
	(0.051)	(0.013)	(0.024)	(0.043)	(0.098)
Month FE	YES	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES	YES
Linear Comb. of Coeff.					
a.) 1 + 2	-0.177**	-0.104**	-0.053*	-0.070**	-0.025***
	(0.083)	(0.046)	(0.030)	(0.027)	(0.064)

*** p<0.01. SEs are robust and clustered by AMC.
The *Branded* indicator is dropped for being collinear to drug FE.
Linear combination (a) represents the net effect of *sunshine-implementation* on *branded drugs.*

Table A13b: Summary Stats for Table A13

Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Total physicians	1146	1146	1146	1146	1146
Total branded scripts in MA, post-policy average	0.911 (4.037)	0.320 (1.570)	0.200 (1.156)	0.140 (0.776)	0.211 (1.338)
Obs, MA post-policy	801,738	457,651	247,188	153,278	115,035
Extrapolated effect size	16%	25%	21%	33%	11%
Extrapolated scripts reduced	872,290	194,044	62,538	32,188	27,148

This extrapolates to an estimated decrease of 216,209 scripts out of an estimated counterfactual of 1,188,210 scripts, yielding an **18% estimated decrease** in branded scripts.

Table A14: Splitting Effects by Volume Quintiles, DV = Rx, Dropping Rare Doctor-Drugs

	(A36)	(A37)	(A38)	(A39)	(A40)
N (physician-drug-month)	**668,273**	**217,813**	**94,609**	**40,617**	**13,485**
Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Dependent Variable	**Rx**	**Rx**	**Rx**	**Rx**	**Rx**
Adj-R^2	**0.860**	**0.478**	**0.280**	**0.089**	**0.014**
Main Effects					
1. Sunshine Implementation	-0.343	0.432	-0.193	-0.052	0.075
	(0.403)	(0.327)	(0.184)	(0.173)	(0.169)
Interactions					
2. Sunshine*Branded	-1.750***	-1.462***	-0.258	-0.055	-0.019
	(0.301)	(0.148)	(0.329)	(0.135)	(0.110)
Month FE	YES	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES	YES
Linear Comb. of Coeff.					
a.) 1 + 2	-2.093***	-1.029**	-0.450	-0.107	0.056
	(0.477)	(0.385)	(0.369)	(0.212)	(0.184)

*** p<0.01. SEs are robust and clustered by AMC.
The *Branded* indicator is dropped for being collinear to drug FE.
Linear combination (a) represents the net effect of *sunshine-implementation* on *branded drugs.*

Table A14b: Summary Stats for Table A14

Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Total physicians	1000	1000	1000	1000	1001
Total branded scripts in MA, post-policy average	8.984 (11.058)	4.850 (4.979)	3.426 (3.497)	2.345 (2.560)	1.481 (1.657)
Obs, MA post-policy	64,878	20,567	8,166	3,081	807
Extrapolated effect size	18.9%	17.5%	11.6%	4.4.%	3.6%
Extrapolated scripts reduced	135,790	21,163	3,675	330	45

This extrapolates to an estimated decrease of 161,003 scripts out of an estimated counterfactual of 880,014 scripts, yielding an **18% estimated decrease** in branded scripts.

Table A15: Splitting Effects by Volume Quintiles, DV = Log(Rx+1), Dropping Rare Doctor-Drugs

	(A41)	(A42)	(A43)	(A44)	(A45)
N (physician-drug-month)	**668,273**	**217,813**	**94,609**	**40,617**	**13,485**
Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Dependent Variable	**Log(Rx+1)**	**Log(Rx+1)**	**Log(Rx+1)**	**Log(Rx+1)**	**Log(Rx+1)**
Adj-R^2	**0.698**	**0.410**	**0.269**	**0.111**	**0.019**
Main Effects					
1. Sunshine Implementation	-0.063	0.356	-0.101**	-0.015	0.030
	(0.046)	(0.073)	(0.046)	(0.052)	(0.063)
Interactions					
2. Sunshine*Branded	-0.060**	-0.192***	-0.033	-0.025	-0.011
	(0.026)	(0.039)	(0.071)	(0.038)	(0.044)
Month FE	YES	YES	YES	YES	YES
Physician*Drug FE	YES	YES	YES	YES	YES
Linear Comb. of Coeff.					
a.) 1 + 2	-0.123**	-0.156*	-0.113	-0.039	0.019
	(0.053)	(0.083)	(0.084)	(0.064)	(0.074)

*** p<0.01. SEs are robust and clustered by AMC.
The *Branded* indicator is dropped for being collinear to drug FE.
Linear combination (a) represents the net effect of *sunshine-implementation* on *branded drugs.*

Table A15b: Summary Stats for Table A15

Volume Quintile	**Top**	**2nd**	**3rd**	**4th**	**Bottom**
Total physicians	1000	1000	1000	1000	1001
Total log(branded) scripts in MA, post-policy average	1.859 (0.946)	1.454 (0.815)	1.203 (0.774)	0.966 (0.695)	0.722 (0.602)
Obs, MA post-policy	64,878	20,567	8,166	3,081	807

Many academic medical centers began imposing AMC-level policies on industry marketing during the 2000s and 2010s. Table A17 lists policy implementations (if any) for the AMCs in this study, provided by the Institute for Medicine as a Profession. Model (A46) controls for these policies and demonstrates that disclosure effects are robust to controlling for AMC-level policies. The effect of AMC policies is positive and significant for generics, while the net effect on branded drugs is negative, suggesting a substitution story. This is consistent with previous literature, which showed similar substitution patterns for AMC policies, and also found that AMC policy effects were significant for only approximately half of AMCs, depending on AMC policy details (Larkin et al. 2017).

Table A16: Controlling for Other AMC Marketing Policies

	(A46)
N (physician-drug-month)	**15,317,968**
Adj. R^2	**0.877**
Policies	
1. Sunshine	0.016
	(0.034)
2. AMC-Policy	0.033**
	(.015)
Interactions	
3. Sunshine*Branded	-0.145***
	(0.033)
4. AMC*Branded	-0.068***
	(0.014)
Controls	
Month FE	YES
Physician*Drug FE	YES
Linear combinations of coefficients	
a.) 1 + 3 (sunshine law)	-0.129***
	(0.043)
b.) 2 + 4 (AMC policy)	-0.035*
	(0.020)

*p<0.10, **p<0.05, ***p<0.01. SEs are robust and clustered by AMC.
a) Net effect of the sunshine law on marketed drugs.
b) Net effect of AMC policies on marketed drugs.
Observations are slightly fewer as some physicians could be identified at a state level but not a specific AMC. These were clustered together by state before but excluded here.

Table A17: List of AMCs and AMC Policy Dates

AMC Affiliations	**Marketing Policy Date**
University of California - Davis	Jul-07
University of California - San Francisco	Jul-07
University of Illinois - Chicago	Dec-07
Mount Sinai University	Jan-08
University of Southern California	Jan-08
University of Pittsburgh	Feb-08
University of California - San Diego	Mar-08
University of Rochester	Jun-08
University of Massachusetts	Jul-08
Rush University	Jan-09
Stonybrook University	Mar-09
Rosalind Franklin University	Jun-09
Temple University	Jun-09
Harvard University	Oct-09
University of California - Los Angeles	Oct-09
New York Medical College	Jan-10
Northwestern University	Jan-10
SUNY Downstate	Apr-10
Tufts University	Apr-10
Stanford University	Jul-10
Boston University	Aug-10
Thomas Jefferson University	May-11
New York College of Medicine	None

Table A18: Summary Statistics, Only Drugs Present in All 48 Months

	Total Observations (physician-drug-month)	**Jul07 – Jun09 (pre-law)**	**Total Observations (physician-drug-month)**	**Jul09 – Jul11 (post-law)**
Branded Rx, Massachusetts	875,736 (83% zeroes)	1.01 (4.58)	875,736 (81% zeroes)	0.94 (3.81)
Branded Rx, Control States	830,496 (85% zeroes)	0.85 (4.36)	830,496 (83% zeroes)	0.91 (4.33)
Generic Rx, Massachusetts	1,348,320 (74% zeroes)	1.66 (6.25)	1,348,320 (73% zeroes)	1.81 (6.64)
Generic Rx, Control States	1,250,112 (81% zeroes)	0.94 (4.66)	1,250,112 (79% zeroes)	1.11 (5.11)

Table A19: Summary Statistics, Non-Zero Observations Only

	Total Observations	Mean (SD)	Range (min to max)	Total Observations	Mean (SD)	Range (min to max)
Branded Rx, Massachusetts	177,684	5.55 (9.27)	0.26 to 201.47	199,631	4.87 (7.36)	0.35 to 156.08
Branded Rx, Control States	370,176	6.20 (10.71)	0.31 to 284.28	413,330	6.642 (10.92)	0.3 to 371.65
Generic Rx, Massachusetts	148,141	5.42 (9.50)	0.46 to 423.29	173,076	5.18 (8.86)	0.36 to 387.67
Generic Rx, Control States	253,511	4.82 (9.46)	0.43 to 404.15	287,728	5.18 (9.85)	0.41 to 349.49

Table A20: Summary Statistics, Dropping Rare Doctor-Drug Pairs

	Total Observations	Mean (SD)	Range (min to max)	Total Observations	Mean (SD)	Range (min to max)
Branded Rx, Massachusetts	96,962	7.90 (11.84)	0 to 201.47	97,499	7.37 (9.66)	0 to 156.08
Branded Rx, Control States	200,040	9.27 (13.66)	0 to 284.28	210,089	10.15 (14.12)	0 to 371.65
Generic Rx, Massachusetts	84,151	7.21 (12.12)	0 to 423.29	85,269	7.76 (11.83)	0 to 387.67
Generic Rx, Control States	128,409	6.86 (12.79)	0 to 404.15	132,378	8.24 (13.67)	0 to 349.49

Table A21: Splitting by Both Prescribing Volume and Sales Force

	(A47)
DV	**Rx**
Pre-Policy Split Based On	**Total Rx**
N (physician-drug-month)	**17,013,810**
Adj-R^2	**0.874**
*Policy * Half*	
1. Sunshine Implementation * High Volume Half	0.027
	(0.041)
2. Sunshine Implementation * Low Volume Half	0.086*
	(0.043)
*Policy * Half * Branded*	
3. Sunshine * High * Branded	-0.107**
	(0.048)
4. Sunshine * Low * Branded	-0.137***
	(0.039)
*Policy * Half * Any Sales Force*	
5. Sunshine * High * Any Sales Force	-0.202**
	(0.076)
6. Sunshine * Low * Any Sales Force	0.133***
	(0.030)
Controls	
Month FE	YES
Physician*Drug FE	YES
Linear Combinations of Coefficients	
a.) 1 + 3 (High volume, branded but no sales force)	-0.080
	(0.053)
b.) 2+ 4 (Low volume, branded but no sales force)	-0.051
	(0.030)
c.) 1 + 3 + 5 + 7 (High volume, branded with sales force)	-0.282***
	(0.068)
d.) 2+ 4 + 6 + 8 (Low volume, branded with sales force)	0.082*
	(0.047)

*p<0.10, **p<0.05, ***p<0.01.
SEs are robust and clustered by AMC.
For comparison, average branded Rx in MA, post-policy, was 0.177 (top, no sales force), 0.083 (bottom, no sales force), 1.465 (top, sales force), and 0.341 (bottom, no sales force).

Table A22: List of Drugs, with Drug Class

AMITRIPTYLINE HCL	Antidepressant	VIVACTIL	Antidepressant
AMOXAPINE	Antidepressant	WELLBUTRIN	Antidepressant
ANAFRANIL	Antidepressant	WELLBUTRIN SR	Antidepressant
APLENZIN	Antidepressant	ADDERALL	Antihyperactives
BUDEPRION SR	Antidepressant	AMPHETAMIN SALT ER	Antihyperactives
BUPROPION HCL	Antidepressant	AMPHETAMINE SALTS	Antihyperactives
BUPROPION HCL SR	Antidepressant	CONCERTA	Antihyperactives
BUPROPION HCL SR W	Antidepressant	DAYTRANA	Antihyperactives
CELEXA	Antidepressant	DEXEDRINE	Antihyperactives
CITALOPRAM HBR	Antidepressant	DEXMETHYLPHEN HCL	Antihyperactives
CLOMIPRAMINE HCL	Antidepressant	DEXTROAMPHETAMINE	Antihyperactives
CYMBALTA	Antidepressant	DEXTROSTAT	Antihyperactives
DESIPRAMINE HCL	Antidepressant	FOCALIN XR	Antihyperactives
DESYREL	Antidepressant	KAPVAY	Antihyperactives
DOXEPIN HCL	Antidepressant	LIQUADD	Antihyperactives
ELAVIL	Antidepressant	METADATE ER	Antihyperactives
FLUOXETINE HCL	Antidepressant	METHYLIN ER	Antihyperactives
FLUVOXAMINE MAL	Antidepressant	METHYLPHENIDATE	Antihyperactives
IMIPRAMINE HCL	Antidepressant	PROCENTRA	Antihyperactives
IMIPRAMINE PAM	Antidepressant	RITALIN	Antihyperactives
LEXAPRO	Antidepressant	RITALIN-SR	Antihyperactives
LUVOX CR	Antidepressant	STRATTERA	Antihyperactives
MAPROTILINE HCL	Antidepressant	VYVANSE	Antihyperactives
MIRTAZAPINE	Antidepressant	ADVICOR	Statins
NEFAZODONE HCL	Antidepressant	ALTOPREV	Statins
NORPRAMIN	Antidepressant	CADUET	Statins
NORTRIPTYLINE HCL	Antidepressant	CRESTOR	Statins
OLEPTRO	Antidepressant	LESCOL	Statins
PAMELOR	Antidepressant	LESCOL XL	Statins
PAROXETINE HCL	Antidepressant	LIPITOR	Statins
PAXIL	Antidepressant	LIVALO	Statins
PAXIL CR	Antidepressant	LOVASTATIN	Statins
PEXEVA	Antidepressant	MEVACOR	Statins
PRISTIQ	Antidepressant	SIMCOR	Statins
PROTRIPTYLINE HCL	Antidepressant	VYTORIN	Statins
PROZAC	Antidepressant	ABILIFY	Antipsychotics
PROZAC WEEKLY	Antidepressant	CHLORPROMAZINE HCL	Antipsychotics
REMERON	Antidepressant	CLOZAPINE	Antipsychotics
REMERON SOLTAB	Antidepressant	CLOZARIL	Antipsychotics
SELFEMRA	Antidepressant	DIASTAT	Antipsychotics
SINEQUAN	Antidepressant	DIASTAT ACUDIAL	Antipsychotics
SURMONTIL	Antidepressant	EQUETRO	Antipsychotics
TOFRANIL	Antidepressant	FANAPT	Antipsychotics
TRAZODONE HCL	Antidepressant	FAZACLO	Antipsychotics

FLUPHENAZINE DECAN	Antipsychotics
FLUPHENAZINE HCL	Antipsychotics
HALDOL DECANOATE	Antipsychotics
HALOPERIDOL	Antipsychotics
HALOPERIDOL DECAN	Antipsychotics
HALOPERIDOL LACT	Antipsychotics
INVEGA	Antipsychotics
INVEGA SUSTENNA	Antipsychotics
LATUDA	Antipsychotics
LOXAPINE	Antipsychotics
LOXITANE	Antipsychotics
MOBAN	Antipsychotics
NAVANE	Antipsychotics
ORAP	Antipsychotics
PERPHENAZINE	Antipsychotics
RISPERDAL CONSTA	Antipsychotics
RISPERIDONE ODT	Antipsychotics
SAPHRIS	Antipsychotics
SEROQUEL	Antipsychotics
SEROQUEL XR	Antipsychotics
THIORIDAZINE HCL	Antipsychotics
THIOTHIXENE	Antipsychotics
TRIFLUOPERAZIN HCL	Antipsychotics
ZYPREXA	Antipsychotics
ZYPREXA IM	Antipsychotics
ZYPREXA RELPREVV	Antipsychotics
ZYPREXA ZYDIS	Antipsychotics
ALPRAZOLAM	Anxiolytics
ATARAX	Anxiolytics
ATIVAN	Anxiolytics
BUSPAR	Anxiolytics
BUSPIRONE HCL	Anxiolytics
CHLORDIAZEPOX HCL	Anxiolytics
CLORAZEPATE DIPOT	Anxiolytics
DIAZEPAM	Anxiolytics
HYDROXYZINE HCL	Anxiolytics
HYDROXYZINE PAM	Anxiolytics
LIBRIUM	Anxiolytics
LORAZEPAM	Anxiolytics
LORAZEPAM INTENSOL	Anxiolytics
MEPROBAMATE	Anxiolytics
NIRAVAM	Anxiolytics
OXAZEPAM	Anxiolytics
TRANXENE T-TAB	Anxiolytics
VALIUM	Anxiolytics
VISTARIL	Anxiolytics
XANAX	Anxiolytics
DORAL	Sleep Aids
DOXYLAMINE SUCCIN	Sleep Aids
EDLUAR	Sleep Aids
ESTAZOLAM	Sleep Aids
FLURAZEPAM HCL	Sleep Aids
HALCION	Sleep Aids
LUNESTA	Sleep Aids
MIDAZOLAM HCL	Sleep Aids
NUVIGIL	Sleep Aids
RESTORIL	Sleep Aids
SILENOR	Sleep Aids
TEMAZEPAM	Sleep Aids
TRIAZOLAM	Sleep Aids
ACTOPLUS MET XR	Diabetes
AMARYL	Diabetes
AVANDAMET	Diabetes
AVANDARYL	Diabetes
AVANDIA	Diabetes
BYETTA	Diabetes
CHLORPROPAMIDE	Diabetes
DIABETA	Diabetes
DUETACT	Diabetes
GLIMEPIRIDE	Diabetes
GLIPIZIDE	Diabetes
GLIPIZIDE ER	Diabetes
GLIPIZIDE/METFORM	Diabetes
GLUCOPHAGE	Diabetes
GLUCOPHAGE XR	Diabetes
GLUCOTROL	Diabetes
GLUCOVANCE	Diabetes
GLUMETZA	Diabetes
GLYBURIDE	Diabetes
GLYBURIDE MICRO	Diabetes
GLYBURIDE/METFORM	Diabetes
GLYNASE PRESTAB	Diabetes
GLYSET	Diabetes
JANUMET	Diabetes
JANUVIA	Diabetes
KOMBIGLYZE XR	Diabetes
LANTUS	Diabetes
LANTUS SOLOSTAR	Diabetes
LEVEMIR	Diabetes
METAGLIP	Diabetes
METFORMIN ER (G)	Diabetes
METFORMIN HCL	Diabetes
METFORMIN HCL ER	Diabetes
MICRONASE	Diabetes
ONGLYZA	Diabetes
PRANDIN	Diabetes

RIOMET	Diabetes
SYMLIN	Diabetes
SYMLINPEN 120	Diabetes
SYMLINPEN 60	Diabetes
TOLAZAMIDE	Diabetes
TOLBUTAMIDE	Diabetes
TRADJENTA	Diabetes
VICTOZA 2-PAK	Diabetes
VICTOZA 3-PAK	Diabetes
ACIPHEX	Proton Pump Inhibitors
DEXILANT	Proton Pump Inhibitors
KAPIDEX	Proton Pump Inhibitors
NEXIUM	Proton Pump Inhibitors
OMEPRAZOLE (RX)	Proton Pump Inhibitors
PREVACID SOLUTAB	Proton Pump Inhibitors
PRILOSEC	Proton Pump Inhibitors
ZEGERID (OTC)	Proton Pump Inhibitors
ACCUPRIL	Antihypertensives
ACCURETIC	Antihypertensives
ACEBUTOLOL HCL	Antihypertensives
ALTACE	Antihypertensives
ATACAND	Antihypertensives
ATACAND HCT	Antihypertensives
ATENOLOL	Antihypertensives
AVAPRO	Antihypertensives
AZOR	Antihypertensives
BENAZEPRIL HCL	Antihypertensives
BENAZEPRIL/HCTZ	Antihypertensives
BENICAR	Antihypertensives
BENICAR HCT	Antihypertensives
BISOPROLOL FUM	Antihypertensives
CAPOTEN	Antihypertensives
CAPTOPRIL	Antihypertensives
CAPTOPRIL/HCTZ	Antihypertensives
CORGARD	Antihypertensives
DIOVAN	Antihypertensives
DIOVAN HCT	Antihypertensives
EDARBI	Antihypertensives
ENALAPRIL MAL	Antihypertensives
ENALAPRIL MAL/HCTZ	Antihypertensives
EXFORGE	Antihypertensives
EXFORGE HCT	Antihypertensives
FOSINOPRIL SOD	Antihypertensives
FOSINOPRIL/HCTZ	Antihypertensives
INDERAL	Antihypertensives
LISINOPRIL	Antihypertensives
LISINOPRIL/HCTZ	Antihypertensives
LOPRESSOR	Antihypertensives
LOTENSIN	Antihypertensives
LOTENSIN HCT	Antihypertensives
MAVIK	Antihypertensives
METOPROLOL TART	Antihypertensives
MICARDIS	Antihypertensives
MICARDIS HCT	Antihypertensives
MONOPRIL	Antihypertensives
MONOPRIL HCT	Antihypertensives
NADOLOL	Antihypertensives
PINDOLOL	Antihypertensives
PRINIVIL	Antihypertensives
PRINZIDE	Antihypertensives
PROPRANOLOL HCL	Antihypertensives
QUINAPRIL HCL	Antihypertensives
QUINARETIC	Antihypertensives
SECTRAL	Antihypertensives
TENORMIN	Antihypertensives
TEVETEN	Antihypertensives
TEVETEN HCT	Antihypertensives
TIMOLOL MAL	Antihypertensives
TRANDOLAPRIL	Antihypertensives
TRIBENZOR	Antihypertensives
TWYNSTA	Antihypertensives
UNIVASC	Antihypertensives
VALTURNA	Antihypertensives
VASERETIC	Antihypertensives
VASOTEC	Antihypertensives
ZEBETA	Antihypertensives
ZESTORETIC	Antihypertensives
ZESTRIL	Antihypertensives