Online Appendix

Newspaper Reports and Consumer Choice: Evidence from the Do Not Call Registry

"Do Not Call" registry

The FTC opened the "do not call" (DNC) registry on June 27, 2003. For the first 10 days, residents of states west of the Mississippi (including Minnesota and Louisiana) could register through the Internet and a toll-free telephone number. Residents of all other states could only register through the Internet. However, from July 7 onward, everyone could register through the Internet and telephone.[1]

The FTC stipulated that all registrations prior to September 1, 2003 (10 weeks after the registry was opened) would be effective from October 1, 2003, while all subsequent registrations would be effective only after a 90-day waiting period.[2] From January 1, 2005, the waiting period was cut to 31 days. Until February 2008, "do not call" registrations were effective for five years, but, following passage of the Do-Not-Call Improvement Act, registrations were indefinite.[3]

The registry applied to both inter-state and intra-state telemarketing calls to *residential* numbers. Any telemarketer who called a number on the registry could be fined up to $11,000. The registry did not apply to political campaigning, survey research, nonprofit and charitable organizations, and organizations with a recent commercial relationship with the consumer.

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[1] Federal Trade Commission, "Do Not Call Registrations Permanent and Fees Telemarketers Pay to Access Registry Set," News flash, April 10, 2008. http://www.ftc.gov/opa/2008/04/dncfyi.shtm [Accessed August 7, 2010]

[2] Federal Trade Commission, "Thirteen Days Remain for Initial Do Not Call Registration," Press Release, August 19, 2003. http://www.ftc.gov/opa/2003/08/dnc2weeks.shtm [Accessed August 7, 2010]

[3] Federal Trade Commission, "Do Not Call Registrations Permanent and Fees Telemarketers Pay to Access Registry Set," News flash, April 10, 2008. http://www.ftc.gov/opa/2008/04/dncfyi.shtm [Accessed August 7, 2010]

Perhaps not surprisingly, the telemarketing industry bitterly fought the federal DNC registry in U.S. courts.[4] On September 23, 2003, U.S. District Judge Lee R. West of Oklahoma enjoined the DNC registry on grounds that the FTC did not have the relevant authority. Congress quickly passed a bill to provide the FTC with the authority, and President Bush signed the legislation into law on September 29, 2003.

However, on October 1, 2003, U.S. District Judge Edward W. Nottingham of Colorado enjoined the registry on grounds that it violated the constitutional right to free speech. The FTC suspended the DNC registry until October 7, 2003, when the U.S. Court of Appeals for the 10th Circuit suspended the District Court order.

On February 17, 2004, the Court of Appeals overruled the District Courts and held that the DNC registry was constitutional as it "targets speech that invades the privacy of the home, a personal sanctuary that enjoys a unique status in our constitutional jurisprudence."[5] Finally, on October 4, 2004, the U.S. Supreme Court declined to hear the telemarketers' appeal, which ended their legal challenge.

Prior to the federal DNC registry, 27 states had established state-level "do not call" registries.[6] Some states charged a fee for registrations. Subsequently, 17 states merged their registries with the federal registry, while others kept their registries in parallel with the federal registry (Varian et al. 2004). The FTC provided us with data on all registrations, including the redacted telephone number with area code and exchange prefix (e.g., (617) 363-

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[4] The following review of legal actions against the DNC registry is based on Federal Trade Commission, "The Status of the National Do Not Call Registry", Prepared Statement before the Committee on Commerce, Science And Transportation, U.S. Senate, Washington, D.C., September 30, 2003.
[5] "Supreme Court Upholds Do-Not-Call Registry," *Washington Post*, October 5, 2004.
[6] They were Alabama, Alaska, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Minnesota, Missouri, New York, North Dakota, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Vermont, Wisconsin, and Wyoming.

xxxx), and the date of registration, with the DNC registry between June 26, 2003 and January 6, 2006.[7]

Weekly "do not call" registrations

We obtained records of registrations with the federal DNC registry from the FTC for the period between June 27, 2003 and January 6, 2006. Our empirical analysis included one year of these records till the end of June 2004. These showed daily registrations by redacted telephone number for each area code and exchange, e.g., (617) 363-xxxx. For each area code and exchange, we aggregated the FTC daily-level data to the weekly level to obtain the number of "do not call" registrations for each calendar week, defined as Sunday to Saturday.[8]

To proceed, we needed to match the registrations with data on demographics, newspaper reports, and the 2004 Presidential election voter turnout and results which were available at the county level. We procured the *North American Local Exchange NPA-NXX Database* (NALENND) from Quentin Sager Consulting.[9] Using the NALENND database, we identified the counties served by each telephone exchange.

Some telephone exchanges spanned multiple counties. For these exchanges, we used the NALENND database to allocate the "do not call" registrations within an exchange to the respective counties according to the relative number of households in the counties as reported by Census 2000. Additionally, we tried two other methods of allocating the exchange-level registrations to the respective counties: number of housing units and the population in each

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[7] Varian et al. (2005) analyzed the demographics of the federal DNC registry at the county level, and found that registration was positively associated with household income and negatively associated with education and the presence of teenagers in the household. Varian et al. did not consider the media impact of newspaper reports on "do not call" registrations.

[8] Since "do not call" registrations started on June 27, 2003 which was a Friday, registrations for the first week in our data set comprised registrations from just two days -- June 27 and 28.

[9] http://www.quentinsagerconsulting.com/npanxx_phonecodes.htm [Accessed August 7, 2010]

county. Across these three methods of allocation, our findings from the empirical analyses were remarkably similar.

Based on information from the NALENND database, we also removed "do not call" registrations originating from area codes and exchanges associated with mobile phones, pagers, and federal, state and local government. We excluded mobile telephone numbers for two reasons: it was not possible to associate mobile phone numbers with geographical units of analysis, and mobile numbers were already protected from telemarketing by the Telephone Consumer Protection Act of 1991 (Varian et al. 2004).

<u>Weekly newspaper circulation</u>

We computed the county-level weekly circulation of newspaper titles in the fall of 2003 based on circulation as reported by the Audit Bureau of Circulation (ABC). For each newspaper title, the ABC reported the "coverage", in terms of the ratio of circulation to the number of households, for possibly four days of the week – Monday, Friday, Saturday, and Sunday – by county.

Then, for each newspaper, according to its respective publication cycle, we computed the *weekly* circulation by county as follows:

$$\text{Weekly circulation} = \begin{cases} \text{Monday} \times 5, \text{ if only Monday circulation reported} \\ \text{Monday} \times 4 \ + \ \text{Friday, if only Monday and Friday circulation reported} \\ \text{Monday} \times 4 \ + \ \text{Friday} \ + \ \text{Saturday, if Sunday circulation not reported} \\ \text{Monday} \times 4 \ + \ \text{Friday} \ + \ \text{Saturday} \ + \ \text{Sunday, if all days' circulation reported} \end{cases}$$

We summed the weekly circulation across all newspapers with circulation in a county to derive the weekly circulations of all newspapers for that county.

Table A-1. Newspaper reports: robustness checks
(feasible generalized least squares and random coefficients)

VARIABLES	(1) RE-FGLS	(2) Random Coefficients
Reports	0.022***	0.019***
	(0.001)	(0.002)
Lagged reports		
No. of households	0.984***	0.977***
	(0.002)	(0.007)
Household size	-1.095***	-1.084***
	(0.030)	(0.097)
Household income ($'000)	0.490***	0.360***
	(0.015)	(0.049)
Unemployment (%)	-0.114***	-0.159***
	(0.010)	(0.032)
Commute time	-0.069***	-0.074**
	(0.012)	(0.037)
Retail density	-0.082***	-0.067***
	(0.006)	(0.025)
Constant	-2.607***	-2.207***
	(0.058)	(0.191)
Reports - standard deviation, σ_λ		0.029***
		(0.003)
Observations	163,134	163,134
Number of counties	3,078	3,078

Notes: Dependent variable: Log registration; state and week fixed effects.
Column (1): FGLS with county random effects, allowing for
heteroskedasticity and autoregressive (AR1) errors within counties;
Column (2): Random coefficients on news reports. Robust standard
errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A-2. Cross-sectional test of endogeneity (selection bias): Reports prior to Day 1

VARIABLES	(1) OLS: Day 1	(2) OLS: Reports prior to Day 1	(3) OLS: With newsprint & staff size	(4) OLS: With newsprint, staff size & number of pages
Predicted registration		0.278***	0.130***	0.126***
		(0.011)	(0.014)	(0.018)
Newsprint			0.117***	0.103***
			(0.009)	(0.029)
Staff size			0.015	0.039
			(0.028)	(0.047)
Number of pages				-0.018***
				(0.006)
No. of households	1.119***			
	(0.011)			
Household size	-1.300***			
	(0.155)			
Household income ($000)	0.538***			
	(0.079)			
Unemployment (%)	-0.004			
	(0.048)			
Commute time	0.028			
	(0.054)			
Retail density	0.016			
	(0.039)			
Constant	-8.261***	-0.407***	-0.159***	0.160
	(0.317)	(0.057)	(0.051)	(0.117)
Observations (counties)	3,078	3,078	2,924	2,346
R-squared	0.909	0.521	0.551	0.510

Notes: Dependent variable: Column (1): Log registration; Columns (2)-(4): Log news reports prior to Day 1. Estimation with state fixed effects. Robust standard errors clustered by county in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A-3. Newspaper reports (by week, excluding number of households as model covariate)

VARIABLES	(1) RE: Demo-graphics	(2) RE: Reports	(3) FE: Reports	(4) RE: Hausman-Taylor	(5) OLS: Day 1	(6) RE: State registry	(7) FE: State registry	(8) RE: Local/national
Reports		0.018***	0.017***	0.017***		0.039***	0.038***	
		(0.002)	(0.002)	(0.002)		(0.003)	(0.003)	
Reports prior to June 27					0.441***			
					(0.036)			
State addition						-2.480***		
						(0.298)		
Reports × state addition						-0.115***	-0.116***	
						(0.009)	(0.009)	
Reports in national papers								0.046***
								(0.004)
Reports in local papers								0.010***
								(0.002)
Household size	-1.653***	-1.649***		-1.649***	-1.610***	-1.917***		-1.643***
	(0.290)	(0.289)		(0.249)	(0.338)	(0.375)		(0.289)
Household income ($000)	4.044***	4.024***		4.026***	3.925***	3.991***		4.006***
	(0.131)	(0.131)		(0.104)	(0.154)	(0.158)		(0.131)
Unemployment (%)	1.415***	1.410***		1.411***	1.618***	1.336***		1.404***
	(0.084)	(0.084)		(0.077)	(0.099)	(0.096)		(0.084)
Commute time	-0.409***	-0.407***		-0.408***	-0.221*	-0.461***		-0.394***
	(0.106)	(0.106)		(0.094)	(0.121)	(0.136)		(0.105)
Retail density	0.326***	0.321***		0.321***	0.287**	0.114		0.318***
	(0.110)	(0.110)		(0.063)	(0.124)	(0.125)		(0.110)
Constant	-6.140***	-6.089***	6.572***	-6.094***	-10.633***	-5.314***	6.646***	-6.091***
	(0.554)	(0.552)	(0.008)	(0.487)	(0.624)	(0.690)	(0.010)	(0.551)
Observations	163,134	163,134	163,134	163,134	3,078	108,332	108,332	163,134
Number of counties	3,078	3,078	3,078	3,078	3,078	2,044	2,044	3,078

Notes: Dependent variable: Log registration; state and week fixed effects. Estimation method as stated at head of column (RE = random effects, FE = fixed effects; OLS = cross-section ordinary least squares). Robust standard errors clustered by county in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table A-4. Newspaper reports (by day, from Day 1 to 96)

VARIABLES	(1) RE: Demo- graphics	(2) RE: Reports	(3) FE: Reports	(4) RE: Hausman- Taylor	(5) RE: State registry	(6) RE: Local/ national	(7) 2SLS RE: News- print	(8) 2SLS RE: Editorial staff size	(9) 2SLS RE: Pages
Reports		0.033***	0.033***	0.033***	0.028***		0.566***	1.358***	0.549**
		(0.002)	(0.002)	(0.002)	(0.003)		(0.100)	(0.236)	(0.240)
State addition					-0.690***				
					(0.142)				
Reports × state addition					0.006				
					(0.009)				
Reports in national papers						0.054***			
						(0.005)			
Reports in local papers						0.027***			
						(0.003)			
No. of households	0.928***	0.926***		0.926***	0.933***	0.926***	0.924***	0.893***	0.957***
	(0.008)	(0.008)		(0.007)	(0.010)	(0.008)	(0.008)	(0.014)	(0.011)
Household size	-1.210***	-1.208***		-1.208***	-1.085***	-1.207***	-1.189***	-1.122***	-1.131***
	(0.112)	(0.112)		(0.092)	(0.156)	(0.112)	(0.091)	(0.132)	(0.112)
Household income ($000)	0.378***	0.372***		0.373***	0.305***	0.371***	0.287***	0.154**	0.222***
	(0.057)	(0.057)		(0.046)	(0.072)	(0.057)	(0.049)	(0.078)	(0.071)
Unemployment (%)	-0.143***	-0.143***		-0.143***	-0.207***	-0.144***	-0.138***	-0.149***	-0.123***
	(0.031)	(0.031)		(0.030)	(0.038)	(0.031)	(0.031)	(0.044)	(0.039)
Commute time	-0.175***	-0.175***		-0.175***	-0.184***	-0.173***	-0.179***	-0.186***	-0.127***
	(0.036)	(0.036)		(0.035)	(0.047)	(0.036)	(0.034)	(0.049)	(0.043)
Retail density	-0.093***	-0.095***		-0.095***	-0.103***	-0.095***	-0.143***	-0.198***	-0.132***
	(0.031)	(0.031)		(0.024)	(0.036)	(0.031)	(0.023)	(0.036)	(0.028)
Constant	-3.987***	-3.981***	3.917***	-3.981***	-3.821***	-3.993***	-4.082***	-3.965***	-4.386***
	(0.228)	(0.228)	(0.017)	(0.182)	(0.292)	(0.228)	(0.179)	(0.260)	(0.218)
Observations	295,488	295,488	295,488	295,488	196,224	295,488	280,704	280,704	225,216
Counties	3,078	3,078	3,078	3,078	2,044	3,078	2,924	2,924	2,346

Notes: Dependent variable: Log registration; state and day fixed effects. Column (1): Background demographics; Column (2): Baseline estimate of news reports with county random effects; Column (3): Estimate of news reports with county fixed effects; Column (4): Estimate by Hausman-Taylor model; Column (5): Accounting for addition of state registries to federal registry; Column (6): Distinguishing between reports in national vis-à-vis local newspapers;

Column (7): Two-stage least squares estimate with county random effects and newsprint consumption as instrument; Column (8): Two-stage least squares estimate with county random effects and staff size as instrument; Column (9): Two-stage least squares estimate with county random effects and page count as instrument. Due to computational infeasibility and constraints, we were not able to estimate the daily-level model using the Arellano-Bond system Generalized Method of Moments method with newsprint consumption, staff size, and page count as excluded instruments. Robust standard errors clustered by county in parentheses, *** p<0.01, ** p<0.05, * p<0.1.