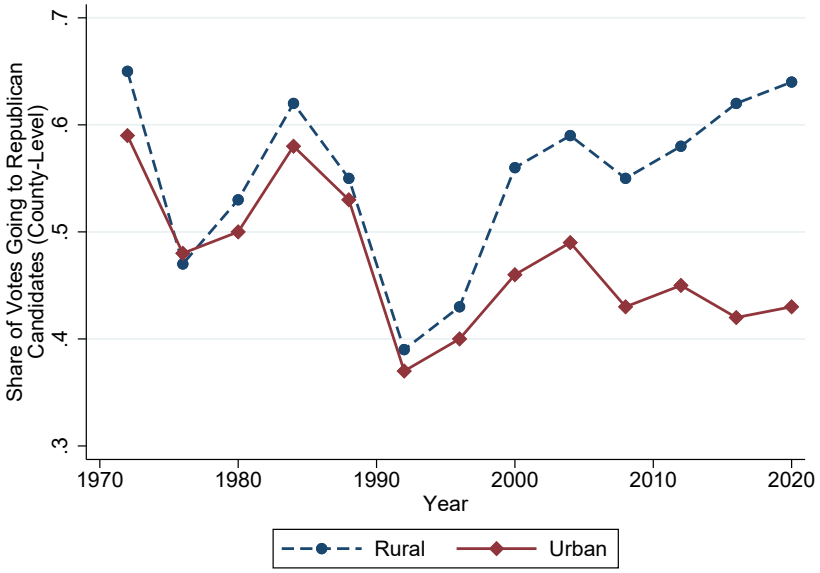
Online Appendix

The Political Legacy of Conservative Talk Radio

By Heyu Xiong

A. Additional Tables & Figures

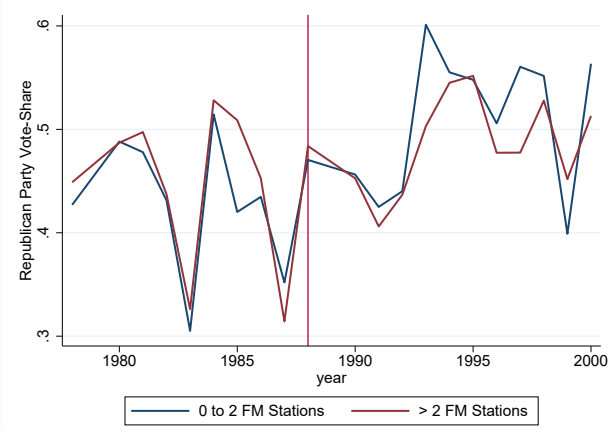
Figure A1. : Urban-Rural Divide in U.S. Presidential Elections



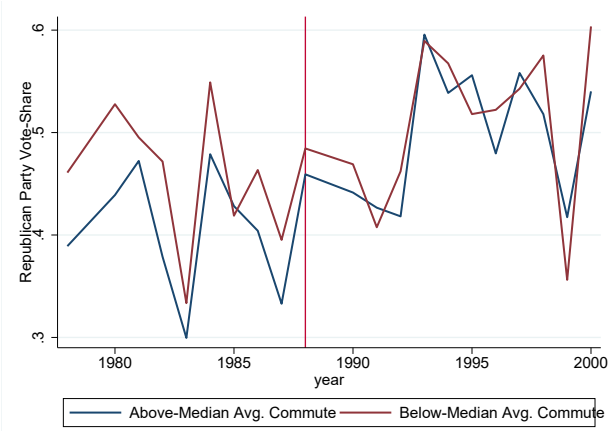
Notes: Plotted using data points from Figure 1 of Brown and Mettler (2023).

Figure A2. : Time-Series of Republican Vote-Share By Radio Concentration and Commuting Time

(a) Low vs. High # of FM Stations



(b) Above vs. Below-Median Commuting Time



Notes: The top panel plots the evolution of Republican vote share separately for counties with more than two FM stations and those with two or fewer. The bottom panel presents the corresponding trajectories for counties above and below the median commuting time. In both panels, each series reflects the unweighted average Republican vote share across all counties in the county–election panel for a given year.

Table A1—: Nationally Syndicated Conservative Talk Radio in the 1990s

Host Name	Show Title	Primary Station (AM/FM)	Year of National Syndication	Approx. Number of Stations at Peak
Rush Limbaugh	The Rush Limbaugh Show	WABC-AM / EIB Network	1988	600
Chuck Harder	For The People	Sun Radio Network (AM)	1989–90	300
Barry Farber	The Barry Farber Show	ABC Radio Network (AM)	1990	N/A
G. Gordon Liddy	The G. Gordon Liddy Show	WJFK-AM / Radio America	1992	160
Ken Hamblin	The Ken Hamblin Show	KOA-AM / Entertainment Radio	1992	200
Dr. Laura Schlessinger	The Dr. Laura Show	KFI-AM / Premiere Radio Networks	1994	450
Oliver North	Common Sense Radio	Radio America (AM)	1995	100+
Michael Savage	The Savage Nation	KSFO-AM	1999 (partial)	200
Michael Medved	The Michael Medved Show	KTTH-AM / Salem Radio Network	1997	200
Sean Hannity	The Sean Hannity Show	WABC-AM	2001	N/A in 1990s
Bob Grant	The Bob Grant Show	WABC-AM / WOR-AM	N/A	Primarily NYC market
Mike Gallagher	The Mike Gallagher Show	WABC-AM / Salem Radio	1998	150
Dennis Prager	The Dennis Prager Show	KRLA-AM / Salem Radio Network	1999	100+
Neal Boortz	The Neal Boortz Show	WSB-AM / Cox	1999	230
Mark Belling	The Mark Belling Show	WISN-AM	N/A	Milwaukee & Wisconsin region
Charlie Sykes	The Charlie Sykes Show	WTMJ-AM	N/A	Milwaukee & Wisconsin region
Howie Carr	The Howie Carr Show	WRKO-AM	N/A	New England regional network
Larry Elder	The Larry Elder Show	KABC-AM	2002	Southern California
Bill Cunningham	The Big Show	WLW-AM	2007	Ohio/Kentucky & WLW clear-channel reach

Notes: This table provides a brief overview of the landscape of conservative talk radio in the 1990s, with emphasis on the contemporaries of Rush Limbaugh. It chronicles the growth of major voices and programs in detail. The information is drawn from a range of historical and biographical references on talk radio, including contemporary news articles, industry publications, and host biographies. Notable sources include the Radio Hall of Fame, Talkers Magazine features, and Wikipedia summaries of hosts, which document the dates and scope of syndication for many shows.

Table A2—: List of Elections in Sample

Years	President	Governor	Senate	U.S. House	State Office
1978		✓	✓	✓	✓
1979					
1980	✓	✓	✓	✓	✓
1981		✓		✓	✓
1982		✓	✓	✓	✓
1983		✓			✓
1984	✓	✓	✓	✓	✓
1985		✓		✓	✓
1986		✓	✓	✓	✓
1987		✓		✓	✓
1988	✓	✓	✓	✓	✓
1989					
1990		✓	✓	✓	✓
1991		✓			
1992	✓	✓	✓	✓	
1993		✓			
1994		✓	✓	✓	
1995		✓			
1996	✓	✓	✓	✓	
1997		✓			
1998		✓	✓	✓	
1999		✓			
2000	✓	✓	✓	✓	

Table A3—: Robustness: Coarsened Exact Matching

Dep. Var.:	Republican Party Vote Share			
Elections:	All	Presidential	House & Senate	Governor & State Offices
	(1)	(2)	(3)	(4)
0 to 2 FM Stations × Log Average Commute × Post	0.053**	0.030**	0.077*	0.020
	(0.026)	(0.015)	(0.041)	(0.023)
0 to 2 FM Stations × Post	-0.149**	-0.098**	-0.211*	-0.060
	(0.074)	(0.043)	(0.117)	(0.065)
Log Avg. Commute	0.052	0.020	0.088	-0.032
	(0.041)	(0.022)	(0.066)	(0.041)
0 to 2 FM Stations × Log Avg. Commute	-0.030	0.012	-0.056	-0.010
	(0.037)	(0.021)	(0.061)	(0.041)
Post × Log Avg. Commute	-0.037	-0.012	-0.062	0.001
	(0.025)	(0.015)	(0.040)	(0.022)
County FE	✓	✓	✓	✓
Office by Year FE	✓	✓	✓	✓
State by Year FE	✓	✓	✓	✓
State by Office FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Observations	21,977	3,716	12,061	6,175
R^2	0.620	0.960	0.639	0.865

Notes: Coarsened Exact Matching performed using county covariates in 1988 between counties with more than two FM stations and those with zero to two. Sample is restricted to counties inside the common support. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

Table A4—: Robustness: State Clustered Standard Errors

Dep. Var.:	Republican Party Vote Share			
Elections:	All	Presidential	House & Senate	Governor & State Offices
	(1)	(2)	(3)	(4)
0 to 2 FM Stations × Log Average Commute × Post	0.063**	0.074***	0.071**	0.034
	(0.025)	(0.014)	(0.030)	(0.033)
0 to 2 FM Stations × Post	-0.163**	-0.215***	-0.179**	-0.078
	(0.071)	(0.041)	(0.086)	(0.094)
Log Avg. Commute	-0.115**	-0.081***	-0.092	-0.096
	(0.055)	(0.029)	(0.085)	(0.068)
0 to 2 FM Stations × Log Avg. Commute	0.066*	0.078***	0.052	-0.049
	(0.036)	(0.024)	(0.049)	(0.063)
Post × Log Avg. Commute	-0.028	-0.046***	-0.021	-0.020
	(0.030)	(0.016)	(0.039)	(0.040)
County FE	✓	✓	✓	✓
Office by Year FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Observations	85,427	14,387	47,115	23,925
R^2	0.461	0.887	0.472	0.585

Notes: Standard errors are clustered at the state level. * p<0.1, ** p<0.05, *** p<0.01.

Table A5—: Robustness: Latitude and Longitude Controls

Dep. Var.:	Republican Party Vote Share			
Elections:	All	Presidential	House & Senate	Governor & State Offices
	(1)	(2)	(3)	(4)
0 to 2 FM Stations × Log Average Commute × Post	0.066***	0.072***	0.071**	0.040
	(0.024)	(0.016)	(0.031)	(0.032)
Latitude	0.019	0.049*	0.007	0.024
	(0.031)	(0.027)	(0.042)	(0.018)
Longitude	-0.008	-0.010	-0.008	-0.007
	(0.023)	(0.016)	(0.030)	(0.017)
$Latitude^2$	-0.000	-0.001*	-0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.000)
$Longitude^2$	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
State FE	✓	✓	✓	✓
Office by Year FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Observations	85,289	51,370	14,363	47,031
R^2	0.279	0.275	0.602	0.249
Mean of dep. var.	0.484	0.227	0.517	0.485
SD of dep. var.	0.185	0.327	0.126	0.212

Notes: Main effects and interaction terms are included in all specifications. Standard errors are clustered at the state level. * p<0.1, ** p<0.05, *** p<0.01.

Table A6—: Robustness: Additional Fixed Effects

Dep. Var.:	Republican Party Vote Share			
Elections:	All	Presidential	House & Senate	Governor & State Offices
	(1)	(2)	(3)	(4)
0 to 2 FM Stations × Log Average Commute × Post	0.050***	0.050***	0.055***	0.041***
	(0.013)	(0.008)	(0.020)	(0.013)
0 to 2 FM Stations × Post	-0.134***	-0.153***	-0.146**	-0.105***
	(0.038)	(0.024)	(0.057)	(0.036)
Log Avg. Commute	0.046**	-0.024	0.074**	0.054**
	(0.023)	(0.015)	(0.036)	(0.025)
0 to 2 FM Stations × Log Avg. Commute	-0.018	0.050***	-0.035	-0.067***
	(0.021)	(0.014)	(0.034)	(0.025)
Post × Log Avg. Commute	-0.060***	-0.038***	-0.072***	-0.033***
	(0.013)	(0.008)	(0.019)	(0.012)
County FE	✓	✓	✓	✓
Office by Year FE	✓	✓	✓	✓
State by Year FE	✓	✓	✓	✓
State by Office FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Observations	85,424	14,387	47,112	23,925
R^2	0.622	0.949	0.634	0.853
Mean of dep. var.	0.484	0.517	0.484	0.462
SD of dep. var.	0.185	0.126	0.212	0.152

Notes: Main effects are included in all specifications. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

Table A7—: Robustness: Controlling for Religious Composition and Manufacturing Employment

Dep. Var.:	Republican Party Vote Share			
Elections:	All	Presidential	House & Senate	Governor & State Offices
	(1)	(2)	(3)	(4)
0 to 2 FM Stations × Log Average Commute × Post	0.036**	0.061***	0.030	0.027
	(0.016)	(0.010)	(0.024)	(0.023)
0 to 2 FM Stations × Post	-0.100**	-0.187***	-0.083	-0.063
	(0.047)	(0.029)	(0.068)	(0.066)
Log Avg. Commute	-0.135***	-0.094***	-0.127***	-0.090**
	(0.029)	(0.018)	(0.045)	(0.042)
0 to 2 FM Stations × Log Avg. Commute	0.088***	0.094***	0.086*	-0.050
	(0.029)	(0.017)	(0.044)	(0.044)
Post × Log Avg. Commute	-0.006	-0.032***	0.014	-0.015
	(0.015)	(0.009)	(0.021)	(0.021)
County FE	✓	✓	✓	✓
Office by Year FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Religious Pop. Share × Post	✓	✓	✓	✓
Manuf. Employment × Post	✓	✓	✓	✓
Observations	84,019	14,141	46,263	23,615
R^2	0.471	0.891	0.487	0.588
Mean of dep. var.	0.484	0.517	0.485	0.463
SD of dep. var.	0.185	0.126	0.211	0.152

Notes: Baseline controls include population, rural population share, poverty rate, household income, gender ratio, non-White population share, unemployment rate, and education level. All variables are interacted with a post-1988 binary indicator. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

Table A8—: Association Between Rural Population Share and Commuting Time/Radio Infrastructure

Dep. Var:	Rural Population Share					
Year:	1980		1990		2000	
	(1)	(2)	(3)	(4)	(5)	(6)
Log Avg. Commute	0.254***		0.250***		0.509***	
	(0.094)		(0.092)		(0.083)	
Number of FM Stations		-0.058***		-0.058***		-0.057***
		(0.007)		(0.007)		(0.007)
Observations	3,149	3,149	3,151	3,151	3,149	3,149
R^2	0.146	0.339	0.147	0.338	0.247	0.345

Notes: Each column presents univariate OLS estimates using cross-sections of counties in the United States for the respective year indicated in header. All regressions include state-fixed effects. Standard errors are clustered at the state level. * p<0.1, ** p<0.05, *** p<0.01.

B. Calculation of Persuasion Rates

This section describes how the persuasion rates reported in the main text were estimated. I use the formula based on a continuous measure of radio exposure introduced by Enikolopov, Petrova and Zhuravskaya (2011) to compute persuasion rates. It yields the effect of an infinitesimally small change in media exposure, taking into account the potential impact on turnout and controlling for the size of persuadable population (i.e., people who would not have voted Republican regardless of talk radio) (Adena et al., 2015).

To facilitate the derivation of persuasion rates for the 1992 presidential election, I estimate the baseline triple-differences specification for presidential elections with 1992 being the sole post-treatment years included in the regression. The results are shown in Table A9. These estimates form the basis for the persuasion rates calculation.

Specifically, the persuasion rate f (in percent terms) is defined as:

$$f = \frac{1}{(1 - v_0 t_0)} \left(t \frac{\mathrm{d}v}{\mathrm{d}e} + v \frac{\mathrm{d}t}{\mathrm{d}e} \right) = \frac{1}{(1 - v_0 t_0)} \left(t \frac{\mathrm{d}v/\mathrm{d}c}{\mathrm{d}e/\mathrm{d}c} + v \frac{\mathrm{d}t/\mathrm{d}c}{\mathrm{d}e/\mathrm{d}c} \right) \tag{A1}$$

where v is the Republican Party vote-share, t is turnout, v_0 and t_0 are the Republican vote-share and turnout in the absence of talk radio. v_0 is calculated based on the average Republican Party vote-share in counties with more than two FM stations. t_0 is taken to be turnout from the 1988 race.[31]

Because we cannot directly estimate $\frac{\mathrm{d}v}{\mathrm{d}e}$ and $\frac{\mathrm{d}t}{\mathrm{d}e}$ from the data, we have to infer them by combining the effect of driving on listenership with the relationship between political outcomes and commuting time. $\frac{\mathrm{d}v}{\mathrm{d}c}$ is the effect of the change in average commuting time on vote share in counties with zero to two FM stations as compared with high-radio competition environments (columns 2 and 3 of Table A9 for presidential and congressional elections, respectively). $\frac{\mathrm{d}t}{\mathrm{d}c}$ is the corresponding effect for turnout. $\frac{\mathrm{d}e}{\mathrm{d}c}$ is the effect of the change in daily driving time on the likelihood of listening to political talk radio in counties with zero to two stations (column 2 of Table 2).[32]

Because listenership in this context is through car radio, I multiply the exposure rate by the number of eligible voters per vehicle, using a rough approximation based on the average occupancy rate per car in 1977, which was 1.87 according to the U.S. Department of Transportation.[33]

[31] I retrieve turnout information for presidential elections from FairVote.org.

[32] I equate the elasticity of exposure to commuting time with that of mileage driven under the assumption of constant driving speed.

[33] See: https://www.fhwa.dot.gov/ohim/1977/g.pdf

Under these assumptions, the equation for persuasion rates for presidential elections becomes:

$$\text{(A2)} \quad 49.17\% = \frac{1}{(1 - 0.388 * 0.528)} \left(0.581 \frac{0.032}{1.87 * 0.051} + 0.398 \frac{0.047}{1.87 * 0.051} \right)$$

Table A9—: Triple-Differences Estimates For Persuasion Rates Subsample

Dep. Var.:	Republican Vote Share	Log Voter Turnout
Elections:	President	President
0 to 2 FM Stations × Log Avg. Commute × Post	0.032**	0.047**
	(0.012)	(0.021)
0 to 2 FM Stations × Post	-0.100***	-0.142**
	(0.037)	(0.059)
Log Avg. Commute	-0.059*	0.032
	(0.035)	(0.044)
0 to 2 FM Stations × Log Avg. Commute	0.003	-0.098*
	(0.038)	(0.058)
Log Avg. Commute × Post	0.038***	0.000
	(0.011)	(0.015)
Post-Treatment Years	1992	1992
Baseline Controls	✓	✓
County FE	✓	✓
Office by Year FE	✓	✓
Observations	9,563	9,563
R^2	0.902	0.995
Mean of dep. var.	0.526	9.576
SD of dep. var.	0.128	1.161

Notes: Each observation is a county-election by year pair. The outcome in each column is the Republican candidate vote share for each county-election observation. $0to2FM\ Stations$ equals 1 if the number of FM radio stations in a county is two or fewer. *Log Avg. Commute* is the logged average commuting time in a county calculated based on the nearest decennial censuses. Baseline controls include population, rural population share, poverty rate, household income, gender ratio, non-White population share, unemployment rate, and education level. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

C. National Radio Quiet Zone & Radio Deserts 'Placebo' Test

This section provides the details of a placebo test using areas of the United States where commercial radio broadcasting is strictly prohibited or plausibly absent.

To set up and motivate this exercise, I first illustrate a key pattern in the data. Specifically, I examine the relationship between changes in Republican vote share after 1988 and average commuting time conditional on the number of radio stations present in the county. These results are presented in Table A10. As shown in column 1, in counties with zero or only one FM radio station, the increase in Republican vote share following 1988 significantly correlates with the

county having an above-average commuting time. Yet this association starts to weaken and disappear once we move to counties with more robust radio offerings in subsequent columns. The point estimate diminishes in a more or less monotonic fashion as the number of FM stations increases and becomes a precisely estimated zero once the number of FM stations exceeds five.

Conceptually, my research design posits that the positive correlation between average commuting time and Republican vote share in low FM station counties reflects the effect of political talk radio. If this is true, then we should expect the relationship to disappear in locations where political talk radio is credibly known to be absent. Following this logic, I conduct a falsification test that examines whether average commuting time is predictive of the increase in Republican party political support in locations where it is reasonable to infer that talk radio was largely unavailable.

Namely, the United States National Radio Quiet Zone (NRQZ) is a region in the United States that's protected from radio frequency interference (RFI) to facilitate scientific research and the gathering of military intelligence. The NRQZ is located near the border of Virginia and West Virginia and includes a small portion of Maryland. I focus on counties fully enclosed within the quiet zone, where restrictions are the most strict. Because most broadcast transmitters in the central area of the NRQZ are required to operate at reduced power and use directional antennas, exposure to political talk radio should have been negligible, serving as a reasonable placebo.

Following the exact same empirical procedure as Table A10 but with these locations, I explore the relationship between commuting time and Republican Party support over time. Specifically, I regress the Republican vote share on the interaction between average commuting time and a post-1988 indicator using the different samples of counties. The results are provided in Table A11. In column 1, the sample includes all counties with a below-median number of FM stations. The positive and significant coefficient indicates that, within this subsample, counties with longer commute times became more Republican leaning following 1988. In stark contrast, column 2 shows that the average commuting time in the NRQZ is not significantly correlated with the post-1988 increase in Republican political support. The juxtaposition of these two findings suggests that the relationship between commuting time and the growth of conservatism is, at the very least, predicated on the presence of radio programming.

Along similar lines, I also define radio "deserts" at the county level as places largely devoid of radio stations in the county and surrounding counties.[34] When I expand the set of NRQZ counties to include radio deserts in column 3 of Table A11, the interaction between the post indicator and commuting time remains insignificant. These findings are consistent with the causal interpretation of the

[34] I forego simply using counties without radio stations as a placebo because there is a high likelihood that residents can receive a radio transmission from neighboring counties. By imposing a stricter definition of radio deserts, I hope to minimize the incidence of such false negatives.

findings.

Table A10—: DiD Estimates of Effect of Talk Radio by # of FM Stations in County

Sample:	# of FM Stations = 0 or 1	# of FM Stations = 2 or 3	# of FM Stations = 3 or 4	# of FM Stations $\geq$ 5
Post × Log Avg. Commute	0.026***	0.017**	0.012	-0.007
	(0.005)	(0.007)	(0.010)	(0.008)
Observations	48,954	22,353	11,391	9,797
R^2	0.471	0.441	0.403	0.441

Notes: This table shows the difference-in-differences specification employing the interaction between Post and *Above Median Commute* for different subsamples of counties based on the number of radio stations in that county in 1987. Each observation is a county-election pair. The outcome in each column is the Republican candidate vote share for each county-election observation. The county sample is indicated in each column header. All regressions include county, year, and political office by year fixed effects. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

Table A11—: Relationship Between Commute and Republican Vote-Share by Radio Availability

Dep. Var.:	Republican Party Vote Share		
Sample:	Below-Median FM Stations	NRQZ	NRQZ & Radio 'Deserts'
	(1)	(2)	(3)
Log Avg. Commute × Post	0.063***	-0.487	-0.084
	(0.010)	(0.295)	(0.094)
County FE	✓	✓	✓
Year FE	✓	✓	✓
Political Office by Year FE	✓	✓	✓
Observations	48,615	340	608
R^2	0.440	0.486	0.352

Notes: This table presents the regression of Republican vote-share on the interaction between average commuting time and a post-1988 indicator for different subsamples of counties. The sample is indicated in each column header. All regressions include county, year, and political office fixed effects. Standard errors are clustered at the county level. * p<0.1, ** p<0.05, *** p<0.01.

D. Political Contributions Data

This section describes the outcome data analyzed in Section IV.D. I construct a county-by-year panel of political donations using individual campaign contributions reported to the Federal Election Commission (FEC) between 1980 and 2000. These data include all itemized contributions, which under federal law are required to be reported if an individual contributes more than $200 to a given committee in an election cycle. I obtain the raw itemized filings directly from the FEC, which reports, for each transaction, the contribution amount, date, recipient committee, and limited donor information (including name and zipcode).

Each contribution is classified as Republican or not based on the recipient committee's reported party affiliation in the FEC's candidate and committee master files. I assign the gender of each donor based on their first and last names, using the genderit package in Stata (`https://github.com/IES-platform/r4r_gender`). Next, I geolocate each donor by mapping their residential ZIP code to county FIPS codes using a standard ZIP-to-county crosswalk.

I then aggregate all individual contributions to the county-year level, separating donors by inferred gender. Within each county-year, I sum the total dollar amount contributed by men and women, distinguishing contributions made to Republican-affiliated recipients. This yields a balanced panel where each observation corresponds to a county in a given year, and records the political giving by male and female residents of that county (both overall and to Republican committees in particular).

From the processed data, I construct two key measures of gendered partisan giving: the male Republican contribution share and the female Republican contribution share. For each county-year observation, having calculated the total dollar amount contributed to Republican-affiliated committees by male and female donors separately, I divide each of these gender-specific Republican totals by the total amount of all itemized contributions made in that county-year, regardless of recipient party or donor gender. This results in two variables:

- Male Republican Share: the share of total county-level contributions made by men to Republican recipients.
- Female Republican Share: the share of total county-level contributions made by women to Republican recipients.

Importantly, both measures use a common denominator, the total volume of contributions from all donors in the county-year, rather than conditioning on gender-specific donation totals.[35] These variables capture how visible or dominant partisan giving by men and women is within the overall political donation landscape of a locality.

[35] For county-year pairs where the denominator is zero, the values of both variables are imputed to be zero.

Descriptive statistics for these variables along with total contributions amounts are provided below in Table A12.

Table A12—: Summary Statistics For Political Contributions

	Mean	Std. dev.	25th percentile	Median	75th percentile	N. of Obs.
Republican Committee Contribution Share	0.20	0.32	0.00	0.00	0.31	69762.00
Male Republican Contribution Share	0.14	0.26	0.00	0.00	0.16	69762.00
Female Republican Contribution Share	0.06	0.17	0.00	0.00	0.00	69762.00
Total Contribution (thousands)	28.37	614.41	0.00	0.75	4.01	69762.00
Total Republican Contribution (thousands)	4.67	32.29	0.00	0.00	1.00	69762.00
Total Male Republican Contribution (thousands)	3.38	25.17	0.00	0.00	0.70	69762.00
Total Male Contribution (thousands)	17.88	234.04	0.00	0.50	2.85	69762.00

Notes: Summary statistics for contributions variables from the county-year panel.