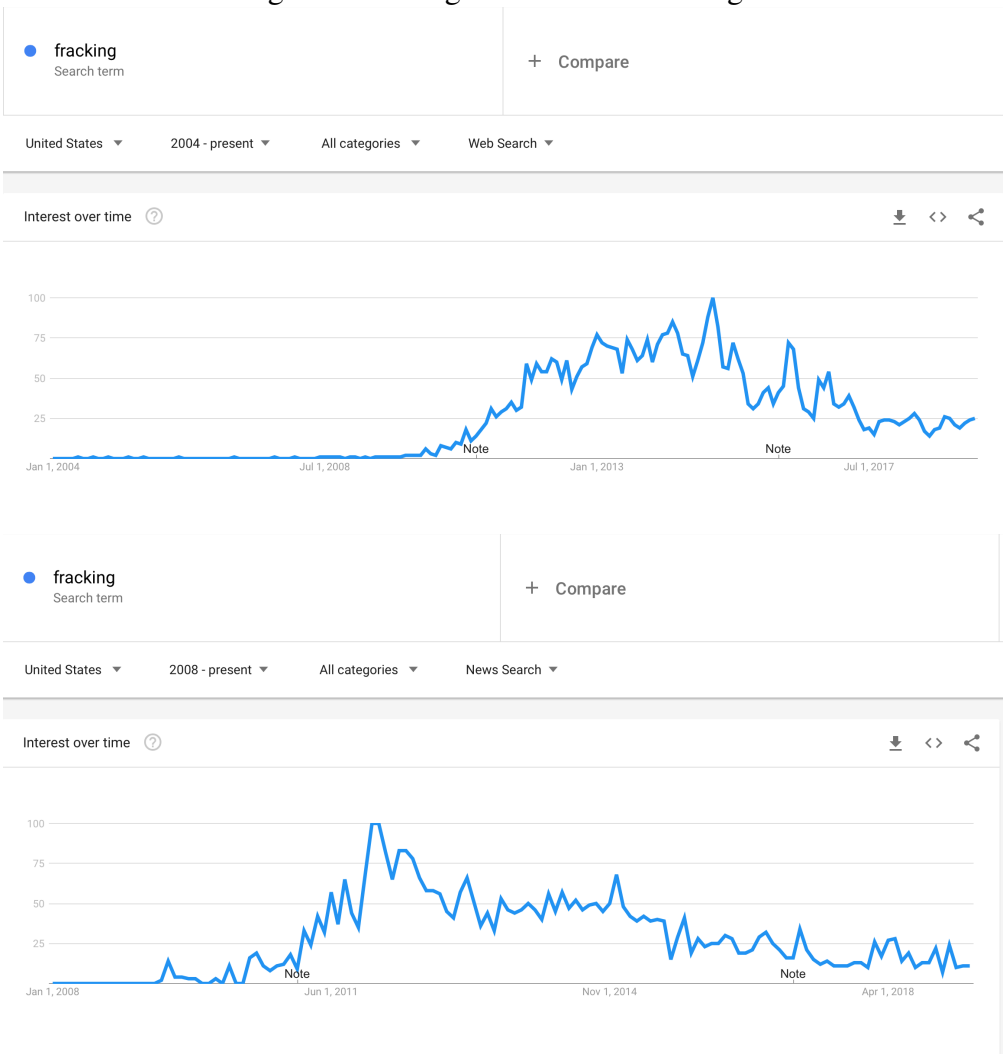
A Online Appendix

A.1 Google Trends for Fracking

Figure A1: Google trends for “fracking."



Notes: The top figure displays the Google trend for the term ‘fracking’ in web searches from January 1, 2004 to April 29, 2019. The bottom figure displays the trend for the term ‘fracking’ in news searches from January 1, 2008 to April 29, 2019. Source: `https://trends.google.com/trends/explore?hl=en-US&tz=240&date=all&geo=US&q=fracking&sni=3` (accessed on April 29, 2019).

A.2 Summary Statistics

Table A1: Summary statistics.

(a) Voting.

	Observations	Mean	Standard Deviation
Turnout 2000	1,168,677	0.71	0.45
Turnout 2004	1,704,821	0.72	0.45
Turnout 2008	2,122,869	0.66	0.47
Turnout 2012	2,407,488	0.58	0.49
Turnout 2016	2,043,412	0.66	0.47
Ideology 2000	3,184,788	46.28	14.80
Ideology 2004	3,184,788	46.28	14.80
Ideology 2008	3,184,788	46.28	14.80
Ideology 2012	3,184,788	46.28	14.80
Ideology 2016	3,240,721	45.64	14.40

(b) Campaign contributions.

	Observations	Mean	Standard Deviation
Log total contributions 2000	1,017,922	6.05	1.39
Log total contributions 2002	1,037,775	5.77	1.44
Log total contributions 2004	1,426,126	6.02	1.47
Log total contributions 2006	1,165,794	5.77	1.52
Log total contributions 2008	2,170,024	5.89	1.55
Log total contributions 2010	1,580,743	5.38	1.67
Log total contributions 2012	2,541,481	5.57	1.67
Log total contributions 2014	1,021,823	5.21	1.99
Log total to Republicans 2000	1,017,922	3.36	3.20
Log total to Republicans 2002	1,037,775	2.95	3.06
Log total to Republicans 2004	1,426,126	2.93	3.19
Log total to Republicans 2006	1,165,794	2.71	3.09
Log total to Republicans 2008	2,170,024	2.26	3.06
Log total to Republicans 2010	1,580,743	2.61	3.00
Log total to Republicans 2012	2,541,481	2.42	3.09
Log total to Republicans 2014	1,021,823	2.13	3.10
Log total to Democrats 2000	1,017,922	2.86	3.12
Log total to Democrats 2002	1,037,775	2.97	3.04
Log total to Democrats 2004	1,426,126	3.27	3.17
Log total to Democrats 2006	1,165,794	3.21	3.03
Log total to Democrats 2008	2,170,024	3.73	3.06
Log total to Democrats 2010	1,580,743	2.88	2.87
Log total to Democrats 2012	2,541,481	3.22	2.92
Log total to Democrats 2014	1,021,823	3.14	2.74

A.3 Trends in Aggregate Outcomes

In this section we visualize differences in outcomes between areas that did and did not experience fracking over the sample period, before and after the fracking boom. For voter turnout, we use county-level election return data. We take the average turnout for each year, for counties that never saw fracking and those that did. For donations, we collapse the total amount of contributions by zip code. Because not every zip code has a contributor in each year – there are about 30,000 unique zip codes total in our data set, but the average electoral cycle sees contributions from about 25,000 unique zip codes – we treat zip codes with no contributors as zeroes. This ensures we have the same number of zip codes per year.

Figure A2 shows the results. Regardless of the outcome of subsample, pre-fracking trends are always roughly parallel, while there is a shift in the difference in average outcomes in the post-boom period. When restricting the sample to high-fracking states, we see the differences in baselines are also greatly reduced.

A.4 Results With Leads and Lags

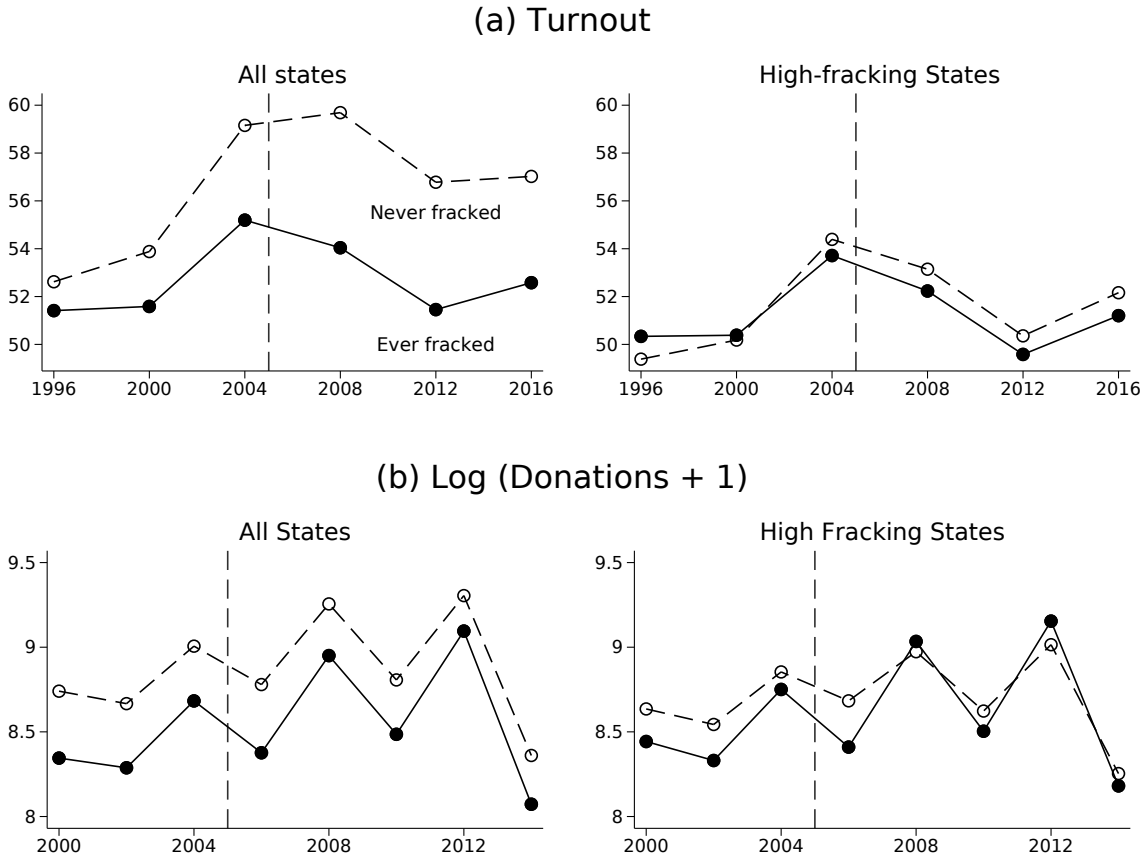
As an additional test of the parallel trends assumption, we estimate regressions including leads and lags of our fracking variables. Specifically, we estimate

$$\begin{aligned} \text{voted}_{izt} &= \alpha + \beta_{-4} * \text{fracking}_{z,t-4} + \beta_0 * \text{fracking}_{zt} + \beta_4 * \text{fracking}_{z,t+4} + \\ &\quad \text{zip code}_z + \text{year}_t + \varepsilon_{izt} \end{aligned}$$

That is, we include variables representing the value of fracking in zip code z four years forward from the current year, in the current year, and four years since the current year. If we see future fracking predict current turnout – i.e., if the estimate of β_{-4} is negative and significant – this suggests areas that experienced fracking were already diverging from other areas prior to fracking.

We estimate this specification four times: for both the log wells and any wells measures of

Figure A2: Pre-fracking trends in outcomes.



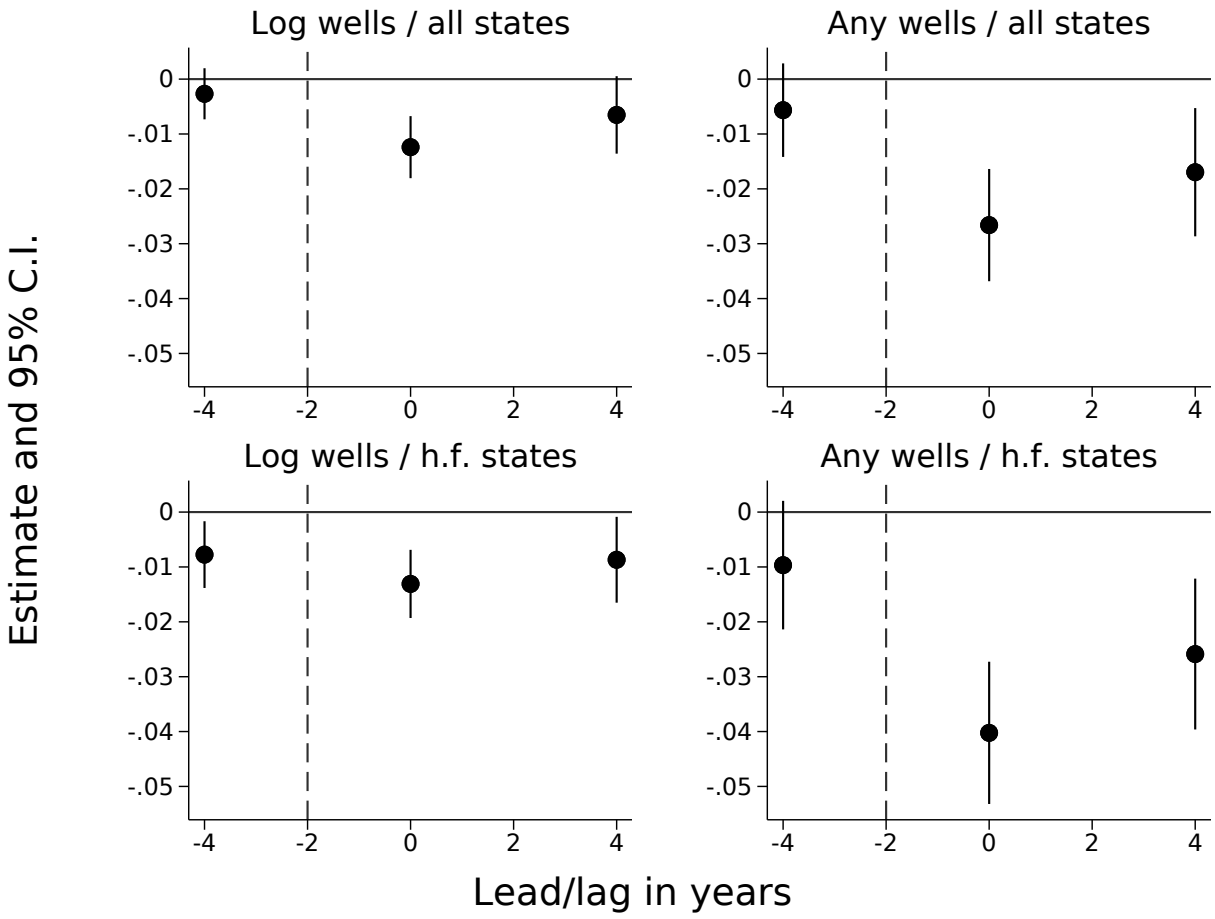
Notes: Solid lines indicate the trends for "Ever fracked" zip codes and dashed lines indicate the trends for "Never fracked" zip codes for all of the panels included in the figure.

fracking, and for both all states and high-fracking states only. We summarize the results by plotting the three β coefficients from each regression in Figure A3. In general, the lead estimates are smaller in magnitude than contemporaneous and past fracking estimates, and in only one case – using log wells for high-fracking states – is the lead estimate statistically significant.

A.5 Voter and Donor Fixed Effects

In Figure 3 in the main text we present estimates from regressions that include voter and donor fixed effects. That specification interacts a zip-code level dummy for ever fracking with indicators

Figure A3: Effect of future, current, and past fracking on voter turnout.



for each year. In this section we present estimates from our other specifications, but now also including voter and donor fixed effects. That is, we replicate Tables 2 and 3 in the main text, but include voter/donor fixed effects instead of zip code fixed effects. Results appear in Table A2 below. The results are generally consistent with the main text in terms of sign and significance. The exception is the "long difference" specifications reported in columns (3) and (6) of each panel, which have consistent signs but are not significant.

Table A2: Replication of main results with voter and donor fixed effects.

(a) Voter turnout.

	All states			High-fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.008***			-0.009***		
	(0.002)			(0.003)		
Any wells		-0.015**			-0.019**	
		(0.005)			(0.006)	
Ever fracked X post			-0.013			-0.016
			(0.009)			(0.013)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Voter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,156	29,156	29,128	5,604	5,604	5,587
Observations	7,403,855	7,403,855	3,576,165	933,412	933,412	447,765

(b) Campaign contributions.

	All states			High-fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	0.057***			0.035**		
	(0.010)			(0.011)		
Any wells		0.120***			0.079**	
		(0.022)			(0.028)	
Ever fracked X post			0.157			0.122
			(0.143)			(0.176)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Donor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,699	29,699	28,530	5,719	5,719	5,390
Observations	11,961,688	11,961,688	3,559,403	1,690,234	1,690,234	500,947

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

A.6 Instrumental Variables Analysis

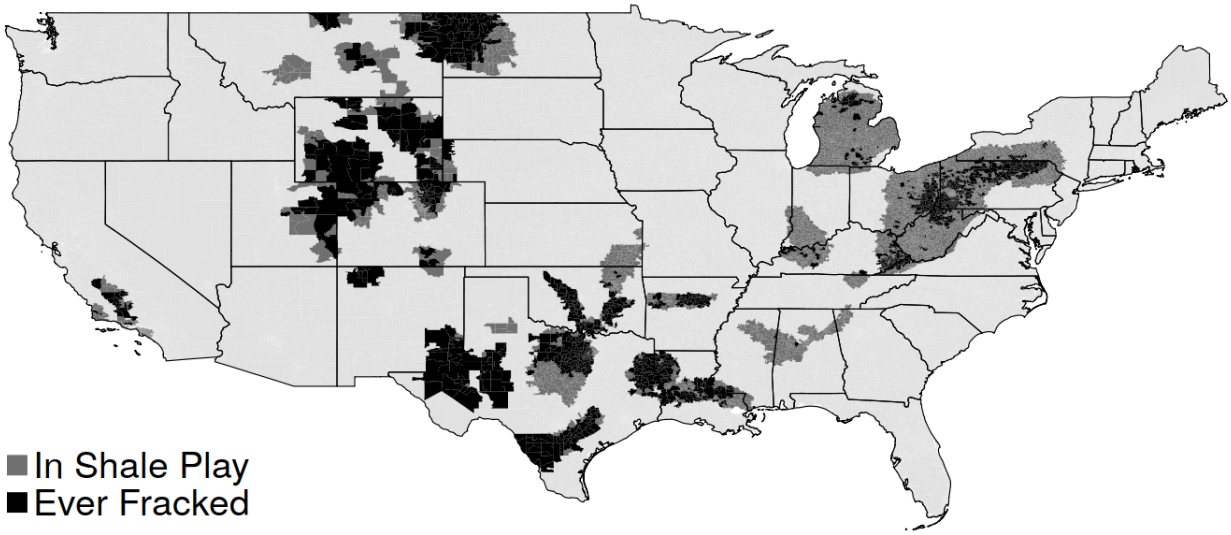
We seek to leverage naturally occurring shale deposits as an exogenous source of variation in the presence of fracking wells. The exclusion restriction is based on the assumption that areas do not control the presence of natural gas deposits trapped beneath them, even though they do control whether to extract those deposits via fracking. Several papers in economics have employed these shale deposits as instruments (e.g., Feyrer, Mansur, and Sacerdote 2017).

A.6.1 Matching Zip Codes to Shale Plays

Our data on fracking wells is at the zip code level, so we need to match each zip code in our data to a particular shale play. Shale plays cover wide swaths of the country (see Figure A4 below), and so each shale play matches to multiple zip codes. We obtained a shapefile of shale plays in the United States from the federal U.S. Energy Information Administration at `https://www.eia.gov/maps/layer_info-m.php`. We used GIS software to overlay this map of shale plays onto our map of zip codes, and used a spatial join procedure to assign each zip code to a particular shale play. We then create a dummy variable "in shale$_z$" equal to 1 if zip code z is matched to a shale play, and 0 otherwise.

Figure A4 maps zip codes in our data set. In order to make the key variables visible, we do not plot zip code boundaries (given there are so many zip codes, the boundaries themselves would take up the entire map). The medium gray areas are zip codes that are in shale plays, but do not see any fracking wells over this period. The darker gray areas are zip codes that are both within shale plays, and experience fracking wells. Overall, out of 5,711 zip codes in a shale play, 1,413 (24%) experience fracking. Not shown on the map are the 646 zip codes (2.6%), out of the 24,519 not in a shale play, that do experience fracking.

Figure A4: Map of zip codes in shale plays and experiencing fracking.



A.6.2 Estimation

While a zip code's fracking activity does vary over time, a zip code's attachment to a shale play does not. As a result, past applications of the shale-as-instrument strategy predict variation in fracking using an interaction between shale and time. For instance., Fedaseyeu, Gilje, and Strahan (2018) use as an instrument the total number of wells drilled across all states at time t (essentially, a cruder version of a time dummy) multiplied by the static presence of shale in a particular zip area; Kearney and Wilson (2018) construct their instrument using "geographic variation in county exposure to a shale play interacted with year effects" (680). We adopt a similar strategy here, using the "long difference" specification used in the main text:

$$\text{voted}_{izt} \quad = \quad \beta_0 + \beta_1 * (\text{ever fracked}_z \times \text{post}_t) + \text{zip code}_z + \text{year}_t + \varepsilon_{izt}$$

where i indexes individuals, z zip codes, and t years. Note the "main terms" for "ever fracked" and "post" are accounted for by the fixed effects for zip code and year, respectively. We instrument for the interaction between wells and post using an interaction between shale and post. The "reduced

form" regression is:

$$\text{voted}_{izt} = \alpha_0 + \alpha_1 * (\text{in shale}_z \times \text{post}_t) + \text{zip code}_z + \text{year}_t + \xi_{izt}$$

and the first stage regression is:

$$\text{ever fracked}_z \times \text{post}_t = \delta_0 + \delta_1 * (\text{in shale}_z \times \text{post}_t) + \text{zip code}_z + \text{year}_t + \nu_{zt}$$

We use fitted values from the first stage regression in the second stage:

$$\text{voted}_{izt} = \pi_0 + \pi_1 * (\widehat{\text{ever fracked}_z} \times \text{post}_t) + \text{zip code}_z + \text{year}_t + \eta_{izt}$$

As in the main text, we estimate this "long difference" specification using two years of data: 2000, for the pre-fracking period, and 2012, for the post period.

Tables A3 and A4 show the results for the four equations given above. As usual, we present results separately by dependent variable and subset of states. Table A3 presents results for turnout. Column (1) of panel (a) presents the OLS estimate, which is the same as reported in column (3) of Table 2 in the main text. Column (2) reports the reduced form: compared to voters not living in shale zip codes, voters in shale zip codes saw a 3.7 percentage point decline in turnout between 2000 and 2012. Column (3) reports the first stage, showing the predictive power of the shale-by-time interaction for the frack-by-time interaction. Intuitively, given the strong overlap between shale plays and fracking wells shown in figure A4, the first stage F-statistic is 360. Column (4) reports the second stage. This estimate implies that turnout declined by 24 points in areas that experienced fracking compared to those that did not, between 2000 and 2012. Note that this is ten times as large as the OLS estimate in column (1). Panel (b) shows substantively similar estimates for high-fracking states, though for this subsample the OLS and second stage estimates are more similar in size.

Table A4 shows results for contributions. The OLS estimate in column (1) of panel (a) is

Table A3: Instrumental variables regressions: turnout.

(a) All states

	(1) Turnout (OLS)	(2) Turnout (Reduced)	(3) Ever fracked X post (First)	(4) Turnout (Second)
Ever fracked X post	-0.024***			-0.237***
	(0.006)			(0.021)
In shale X post		-0.037***	0.156***	
		(0.003)	(0.008)	
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	29,128	29,128	29,128	28,553
Observations	3,576,165	3,576,165	3,576,165	3,575,590
F statistic			360	

(b) High-fracking states

	(1) Turnout (OLS)	(2) Turnout (Reduced)	(3) Ever fracked X post (First)	(4) Turnout (Second)
Ever fracked X post	-0.047***			-0.170***
	(0.009)			(0.026)
In shale X post		-0.048***	0.283***	
		(0.007)	(0.020)	
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	5,587	5,587	5,587	5,394
Observations	447,765	447,765	447,765	447,572
F statistic			194	

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications include a constant term and an indicator for being in the post period (2012). * p<0.05, ** p<0.01, *** p<0.001.

the same as appears in column (3) of Table 3 in the main text. It implies that donors living in fracking areas increased total contributions by 378%, compared to donors living in non-fracking areas, between 2000 and 2012. The second stage estimate is again markedly larger, suggesting a 1,500% relative increase. For high-fracking states, as reported in panel (b), the second stage and OLS estimates both suggest much smaller increases, between 100 and 200%, though the second stage estimate is not significant in this subsample.

Table A4: Instrumental variables regressions: contributions.

(a) All states

	(1) Contribs (OLS)	(2) Contribs (Reduced)	(3) Ever fracked X post (First)	(4) Contribs (Second)
Ever fracked X post	0.378***			1.563***
	(0.027)			(0.161)
In shale X post		0.219***	0.140***	
		(0.016)	(0.010)	
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	28,530	28,530	28,530	26,960
Observations	3,559,403	3,559,403	3,559,403	3,557,833
F statistic			179	

(b) High-fracking states

	(1) Contribs (OLS)	(2) Contribs (Reduced)	(3) Ever fracked X post (First)	(4) Contribs (Second)
Ever fracked X post	0.209***			0.116
	(0.032)			(0.098)
In shale X post		0.030	0.257***	
		(0.025)	(0.027)	
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	5,390	5,390	5,390	4,959
Observations	500,947	500,947	500,947	500,516
F statistic			91	

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications include a constant term and an indicator for being in the post period (2012). * p<0.05, ** p<0.01, *** p<0.001.

(A note on implementing the second stage. While we estimate the first three regressions using least squares, standard instrumental variables commands in Stata (e.g., ivreg and ivreg2) do not allow us to efficiently include fixed effects using the "absorb" option, and the alternative would be to include about 30,000 dummies, or one for each zip code. We thus rely on the tsls package written by Jacob Robbins and described at `http://www.nber.org/stata/efficient/fixed-effects.html`. This package was written expressly for efficient implementation of instru-

mental variables regressions with fixed effects. One feature of this package is that it first drops all data in clusters with only one observation; in our case, it drops all zip codes with only one voter. For this reason, the reported sample sizes for our second stage regressions are slightly smaller than those reported in our other specifications. For instance, column (4) of panel (a) of Table A4 reports a sample size of 28,553, compared to 29,128 in the preceding three columns. We have checked our results by commenting out this part of the tsls code, preventing any dropping, and they are essentially identical.)

A.7 Alternative Measures of Wells

In this section we report two alternative ways of measuring the fracking variable. First, we use the inverse hyperbolic sine of wells, instead of the log number of wells. Thus, instead of $\log(\text{wells}_{zt} + 1)$ we calculate $\log(\text{wells}_{zt} + (\text{wells}_{zt}^2 + 1)^{0.5})$. This transformation is defined for zip codes with zero wells, whereas a simple log transformation is not. We account for this issue in the main text by adding 1 to the wells value, but the addition of 1 is admittedly arbitrary. Cascio and Narayan (2019) also use the inverse hyperbolic sine transformation in their study of the effect of fracking on education.

Second, we use the year-over-year change in the number of wells. This changes the interpretation slightly, focusing in on the immediate impact of new wells only. To see this, suppose we observe two zip codes each over four periods. Zip code A goes from zero to one wells at time 2, and stays with one well for time 3 and 4. Zip code B never has any wells. Using the number of wells means the difference in difference comparison is:

[(A at time 2, 3, and 4) - (A at time 1)] - [(B at time 2, 3, and 4) - (B at time 1)]

In contrast, we only observe a value of change in wells equal to 1 for zip code A at time 2, making the comparison:

[(A at time 2) - (A at time 1, 3, and 4)] - [(B at time 2) - (B at time 1, 3, and 4)]

Table A5 shows the results. In columns (1) and (4) of each panel, we report the estimate using log wells, as used in the main text, for comparison. We observe no meaningful differences using these alternative measures.

Table A5: Alternative measures of wells variable.

(a) Voter turnout

	All states			High-fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.021***			-0.009**		
	(0.002)			(0.003)		
Inverse hyperbolic sine wells		-0.018***			-0.007**	
		(0.002)			(0.002)	
Log change in wells			-0.007*			-0.011**
			(0.004)			(0.004)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,584	29,584	29,584	5,746	5,746	5,746
Observations	9,447,267	9,447,267	9,447,267	1,256,937	1,256,937	1,256,937

(b) Campaign contributions

	All states			High-fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	0.081***			0.029***		
	(0.008)			(0.008)		
Inverse hyperbolic sine wells		0.070***			0.026***	
		(0.007)			(0.007)	
Log change in wells			0.082***			0.036***
			(0.008)			(0.008)
Year fixed effects		Yes	Yes		Yes	Yes
Zip code fixed effects		Yes	Yes		Yes	Yes
Clusters	29,699	29,699	29,699	5,719	5,719	5,719
Observations	11,961,688	11,961,688	11,961,688	1,690,234	1,690,234	1,690,234

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term which is not shown. * p<0.05, ** p<0.01, *** p<0.001.

A.8 Alternative High-Fracking States and State-Year Effects

There are several possible ways to decide which states are "high-fracking." In our paper we use the same definition as Fedaseyeu, Gilje, and Strahan (2018), who report that 92% of all horizontal drilling takes places in seven states: AR, LA, ND, OK, PA, WV, and TX. These authors note that after 2012, a few more states also experienced high fracking activity. According to more current figures on the Energy Information Administration web site (`https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm`), the ten states with the largest increases in gas production from 2000 to 2016 include the seven states we classify as high-fracking, plus Colorado, Ohio, and Wyoming.[1]

In Table A6 we test the sensitivity of our results to alternative sets of "high fracking" states. In columns 1-3 of panel (a), we report turnout regressions on the sample of our seven high-fracking states, plus Wyoming and Colorado. The results are consistent with Table 2: a little smaller in magnitude for the first two specifications, and a little higher for the third. In columns 4-6 we add two more states to our high-fracking set: Ohio and New Mexico.[2] These results are also similar, though generally smaller in magnitude and less precisely estimated. In panel (b), we repeat this exercise for campaign contributions. Again, changing the set of "high-fracking" states does not alter our substantive or statistical conclusions, though the magnitudes for the contributions estimates are generally reduced.

One alternative to deciding which states to include is to simply include all states; we pursue this strategy throughout our main analysis, always presenting results for the full sample of states as well as our subsample of "high-fracking" states. Additionally, instead of attempting to make fracking and non-fracking areas similar by restricting the sample of states, we might attempt to adjust away any differences by including separate trends for each state. We implement this strategy in Table A7. For these specifications, we replace year fixed effects with state-by-year effects, or

[1] The ten states with the largest percentage change in gas production are also the ten states with the largest absolute change in gas production, though the rank order is slightly different.

[2] While New Mexico is not among the list of ten states with the greatest increase in gas production from 2000 to 2016, it does rank among the ten with the greatest increases in oil production, and it does feature a large number of wells as shown in Figure 2 in the main text.

dummy variables for each unique combination of state and year. In panel (a), we see that these estimates are negative but statistically insignificant for the first two specifications, and negative and significant at the 0.05 level for the long difference specification. When we restrict the sample to high-fracking states in columns 4-5, however, the effects are more precisely estimated for two of the three specifications. In panel (b), we see that the estimates for contributions are generally robust to this alternative specification.

Table A6: Alternative coding of high-fracking states.

(a) Voter turnout

	+ WY, CO			+ WY, CO, OH, NM		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.010**			-0.009***		
	(0.003)			(0.003)		
Any wells		-0.020**			-0.016*	
		(0.007)			(0.007)	
Ever fracked X post			-0.037***			-0.015*
			(0.008)			(0.007)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	6,344	6,344	6,171	7,636	7,636	7,452
Observations	1,469,029	1,469,029	530,591	1,915,213	1,915,213	702,083

(b) Campaign contributions

	+ WY, CO			+ WY, CO, OH, NM		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	0.027***			0.022**		
	(0.008)			(0.008)		
Any wells		0.113***			0.089***	
		(0.022)			(0.021)	
Ever fracked X post			0.171***			0.109***
			(0.032)			(0.030)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	6,332	6,332	5,986	7,629	7,629	7,265
Observations	2,015,179	2,015,179	596,793	2,556,165	2,556,165	770,152

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term which is not shown. * p<0.05, ** p<0.01, *** p<0.001.

Table A7: Results with state-year effects.

(a) Voter turnout

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.000			-0.000		
	(0.001)			(0.002)		
Any wells		-0.005			-0.009*	
		(0.003)			(0.005)	
Ever fracked X post			-0.013*			-0.024**
			(0.006)			(0.009)
State-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,584	29,584	29,128	5,746	5,746	5,587
Observations	9,447,267	9,447,267	3,576,165	1,256,937	1,256,937	447,765

(b) Campaign contributions

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	0.027***			0.014		
	(0.007)			(0.008)		
Any wells		0.079***			0.060**	
		(0.017)			(0.020)	
Ever fracked X post			0.104***			0.086**
			(0.024)			(0.029)
State-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,699	29,699	28,530	5,719	5,719	5,390
Observations	11,961,688	11,961,688	3,559,403	1,690,234	1,690,234	500,947

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term which is not shown. * p<0.05, ** p<0.01, *** p<0.001.

A.9 Balanced Panel

To attempt to rule out compositional changes as an alternative explanation, we replicate our main results on the subsample of observations that we observe for each year of the data. For instance, for voter turnout, we limit the analysis to the roughly one million voters whose turnout decision we observe in 2000, 2004, 2008, and 2012. We assume that if Catalist knows, in 2012, how a voter voted for each election back to 2000, then this means that the voter has had the same state of residence for the entire period. Of course, this does not rule out changes in movements within states. For the contributions data, however, we observe a donor's ID and zip code of residence for each electoral cycle, and so we are more confident that our balanced sample (about 25,000 donors) does not change zip codes over the entire period.

We estimate four specifications for each outcome and each state subsample. The first three specifications are the same as those reported in the main text: using over-time variation in log wells, over-time variation in any wells, and a "long difference" estimator. The fourth specification, as in Figure 3, interacts the "ever fracked" dummy with year indicators. Also, we include individual (i.e. voter and donor) fixed effects in all specifications.

We show results in Table A8. Overall, the results are consistent in terms of sign and significance. The exceptions are some of the results for turnout for high-fracking states, as shown in the right-hand columns of panel (a). These results suggest negative impacts of fracking on turnout, but we are unable to reject the null hypothesis at conventional levels in some specifications.

Table A8: Results using a balanced panel.

(a) Voter turnout.

	All states				High-fracking states			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log wells	-0.006*				-0.006*			
	(0.002)				(0.003)			
Any wells		-0.012*				-0.011		
		(0.005)				(0.006)		
Ever fracked X post			-0.010				-0.012	
			(0.007)				(0.010)	
Ever fracked X 2004				0.005				-0.003
				(0.004)				(0.007)
Ever fracked X 2008				-0.012*				-0.006
				(0.005)				(0.007)
Ever fracked X 2012				-0.010				-0.012
				(0.006)				(0.008)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	26,675	26,675	26,675	26,675	4,924	4,924	4,924	4,924
Observations	4,557,664	4,557,664	2,278,832	4,557,664	544,840	544,840	272,420	544,840

(b) Campaign contributions.

	All states				High-fracking states			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log wells	0.070***				0.066***			
	(0.015)				(0.018)			
Any wells		0.152***				0.128*		
		(0.042)				(0.053)		
Ever fracked X post			0.214*				0.269*	
			(0.086)				(0.107)	
Ever fracked X 2002				0.084				0.022
				(0.058)				(0.065)
Ever fracked X 2004				0.014				0.009
				(0.055)				(0.071)
Ever fracked X 2006				0.079				0.034
				(0.062)				(0.077)
Ever fracked X 2008				0.101				0.045
				(0.062)				(0.069)
Ever fracked X 2010				0.162*				0.112
				(0.074)				(0.089)
Ever fracked X 2012				0.214***				0.269***
				(0.065)				(0.081)
Ever fracked X 2014				0.356***				0.234*
				(0.074)				(0.094)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	6,712	6,712	6,712	6,712	1,149	1,149	1,149	1,149
Observations	199,552	199,552	49,888	199,552	32,136	32,136	8,034	32,136

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term. * p<0.05, ** p<0.01, *** p<0.001.

A.10 Dropping Young Low-Education Males

As an additional check on whether our results are driven by movers, we test the sensitivity of our results to excluding subpopulations that are plausibly drawn to fracking areas: young males with low levels of formal education. Our Catalist data include information on age, gender, and a model-based estimate of the probability the voter has a college degree. We code voters as "young" if they are age 30 or less, and we code them as "low education" if the probability they have a college degree is under the sample median, about 0.37. Of the roughly 9.5 million voters in our analysis data set, about 200,000 have missing values on either age, gender, or education, and we drop them before conducting this analysis.

In panel (a) of Table A9, we drop voters who meet all three of these criteria: male, 30 or under, and low education. In panel (b), we drop males who are 30 and under, regardless of their assigned probability of a college education. Using this subsample should address any concerns about the validity of Catalists's estimate, or our choice of the sample median as the cutoff: by dropping all young males regardless of education, we ensure that we are dropping all males without a college degree as well. In panel (c), we drop all males. Using this subsample addresses any concerns with our choice of age 30 as the cutoff for who is "young": by dropping all males, we are dropping all young males as well.

Remarkably, estimates are similar across subsamples, even when we drop all males, reducing the sample size by about half. This stability suggests our results are not driven by movers, or at least not by the subpopulation that is most likely to be moving in and out of fracking areas due to employment opportunities.

Table A9: Results dropping young low-education males.

(a) Drop males 30 and under with Pr(college) < median.

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.020***			-0.009**		
	(0.002)			(0.003)		
Any wells		-0.044***			-0.017*	
		(0.006)			(0.007)	
Ever fracked X post			-0.024***			-0.044***
			(0.006)			(0.009)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,509	29,509	28,990	5,718	5,718	5,547
Observations	8,941,760	8,941,760	3,389,682	1,196,276	1,196,276	428,998

(b) Drop males 30 and under.

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.020***			-0.009**		
	(0.002)			(0.003)		
Any wells		-0.044***			-0.017*	
		(0.005)			(0.007)	
Ever fracked X post			-0.024***			-0.043***
			(0.006)			(0.009)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,506	29,506	28,983	5,717	5,717	5,546
Observations	8,780,783	8,780,783	3,334,497	1,177,599	1,177,599	423,560

(b) Drop males.

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.020***			-0.009***		
	(0.003)			(0.003)		
Any wells		-0.045***			-0.020**	
		(0.006)			(0.007)	
Ever fracked X post			-0.026***			-0.049***
			(0.006)			(0.009)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	28,969	28,969	27,993	5,563	5,563	5,264
Observations	4,969,223	4,969,223	1,882,265	669,269	669,269	239,190

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term. * p<0.05, ** p<0.01, *** p<0.001.

A.11 Partisan Effects

In this section we report regressions corresponding to the estimates plotted in Figure 4 in the main text. For voter turnout, we interact our measure of fracking with each quintile of voter ideology, where higher values mean more liberal. Table A10 shows these results. In column (1), we show estimates from a specification that interacts voter ideology with the log number of wells; column (2) interacts ideology with a dummy for any wells, and column (3) interacts ideology with the interaction between ever fracked and post. Regardless of the measure or subsample, we see that the effects are increasingly negative as voters become more liberal.

Table A11 shows results for campaign contributions. Panel (a) shows the effect of fracking on total donations to Democratic candidates, and panel (b) shows the effect when using total donations to Republican candidates as the dependent variable. As in Figure 4 in the main text, we see that the effects are consistently negative for donations to Democratic candidates, and consistently positive for donations to Republican candidates.

Table A10: Effect on turnout by voter ideology.

	All states			High-fracking states		
	(1) Log wells	(2) Any wells	(3) Ever X post	(4) Log wells	(5) Any wells	(6) Ever X post
Frack	-0.010***	-0.015**	0.021***	0.006*	0.032***	0.021**
	(0.002)	(0.005)	(0.005)	(0.003)	(0.006)	(0.007)
Frack X q2	-0.003*	-0.012**	-0.043***	-0.011***	-0.038***	-0.069***
	(0.001)	(0.004)	(0.005)	(0.002)	(0.005)	(0.007)
Frack X q3	-0.011***	-0.033***	-0.057***	-0.021***	-0.066***	-0.094***
	(0.002)	(0.005)	(0.006)	(0.002)	(0.006)	(0.008)
Frack X q4	-0.019***	-0.055***	-0.067***	-0.025***	-0.084***	-0.108***
	(0.002)	(0.005)	(0.006)	(0.002)	(0.006)	(0.008)
Frack X q5	-0.029***	-0.092***	-0.086***	-0.030***	-0.113***	-0.116***
	(0.003)	(0.006)	(0.008)	(0.003)	(0.007)	(0.009)
q2	-0.233***	-0.233***	-0.242***	-0.204***	-0.202***	-0.197***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
q3	-0.287***	-0.287***	-0.292***	-0.245***	-0.243***	-0.229***
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.004)
q4	-0.241***	-0.241***	-0.245***	-0.217***	-0.215***	-0.199***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)
q5	-0.116***	-0.115***	-0.118***	-0.117***	-0.112***	-0.103***
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.004)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,584	29,584	29,128	5,746	5,746	5,587
Observations	9,447,267	9,447,267	3,576,165	1,256,937	1,256,937	447,765

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term. * p<0.05, ** p<0.01, *** p<0.001.

Table A11: Effect on campaign contributions by recipient party.

(a) Democratic candidates.

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	-0.116***			-0.070***		
	(0.017)			(0.020)		
Any wells		-0.336***			-0.299***	
		(0.043)			(0.054)	
Ever fracked X post			-0.763***			-0.745***
			(0.077)			(0.093)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,699	29,699	28,530	5,719	5,719	5,390
Observations	11,961,688	11,961,688	3,559,403	1,690,234	1,690,234	500,947

(b) Republican candidates.

	All states			High fracking states		
	(1)	(2)	(3)	(4)	(5)	(6)
Log wells	0.184***			0.111***		
	(0.021)			(0.024)		
Any wells		0.546***			0.445***	
		(0.049)			(0.063)	
Ever fracked X post			1.129***			0.973***
			(0.083)			(0.104)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,699	29,699	28,530	5,719	5,719	5,390
Observations	11,961,688	11,961,688	3,559,403	1,690,234	1,690,234	500,947

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. All specifications also include a constant term. * p<0.05, ** p<0.01, *** p<0.001.

A.12 Fracking and the Supply of Candidates

We construct the federal congressional district level data for 2004-2014; it includes the number of candidates who competed in primary elections and the general election, the average CF Scores (Bonica 2016) of Democratic and Republican candidates, and the quality of challengers (Ban, Llaudet, and Snyder 2016; Jacobson 1989) to explore whether fracking is associated with the changes in types of candidates who ran. We merge zip code-level fracking wells data into congressional district level-data using the relationship files provided by the Census. Table A12 presents the results. Columns (1) and (2) show that fracking is not associated with the number of candidates who competed in primary elections in both parties. Columns (3) and (4) show that fracking is not associated with the changes in ideology of candidates who ran in primaries of each party. Columns (5) and (6) show that fracking is not associated with the ideology of general election candidates.

Table A12: The effect of fracking on federal House candidates, 2004-2014.

	Number of Primary Candidates		Primary Election CF Scores		General Election CF Scores	
	(1) D	(2) R	(3) D	(4) R	(5) D	(6) R
Any wells	0.115	-0.0104	0.0469	0.0700	0.0393	0.0790
	(0.145)	(0.204)	(0.0562)	(0.0689)	(0.0725)	(0.0673)
Constant	1.534***	1.722***	-0.777***	0.818***	-0.774***	0.815***
	(0.0547)	(0.0878)	(0.0211)	(0.0268)	(0.0219)	(0.0268)
Observations	2,357	2,249	2,357	2,249	2,333	2,224

Notes: Cell entries are regression coefficient with congressional district-clustered standard errors in parentheses. All specifications include election and congressional district fixed effects. D = Democratic Party, R = Republican Party. * p<0.05, ** p<0.01, *** p<0.001.

Table A13 presents the results of the effect of fracking on the challengers' quality measured by their prior experience in government (columns (1), (2), and (3)), and the likelihood of having an uncontested race (column (4)) in the House of Representative elections. Fracking is not associated with the quality of challengers and the likelihood of having non-contested races.

Table A14 presents the results on the effect of fracking on candidates who competed for seats in state lower chambers for 2004 - 2012. Here, we explore whether the number and the ideology

Table A13: The effect of fracking candidate quality and competition in House races, 2004-2014.

	Challenger Quality			Uncontested Race
	(1) All	(2) D	(3) R	(4)
Any wells	0.0336	0.0270	0.0387	0.00964
	(0.0583)	(0.0760)	(0.0906)	(0.0473)
Observations	2,357	1,345	1,012	2,562

Notes: Cell entries are regression coefficient with congressional district-clustered standard errors in parentheses. All specifications include election and congressional district fixed effects. D = Democratic Party, R = Republican Party. * p<0.05, ** p<0.01, *** p<0.001.

of candidates who competed for primaries and the general elections at the state-level changed after fracking booms. After fracking booms, the number of Republican candidates who competed in primary elections increased (column (2)). Columns (3) and (5) show that fracking booms are correlated with more liberal Democratic candidates who competed in primary and general elections; there is no distinctive change in the ideology of Republican candidates at the state level after the shale booms.

Table A14: The effect of frackign on state legislative candidates, 2004-2012.

	Number of Primary Candidates		Primary Election CF Scores		General Election CF Scores	
	(1) D	(2) R	(3) D	(4) R	(5) D	(6) R
Any wells	0.0364	0.221**	-0.0814*	-0.0109	-0.0832**	0.0234
	(0.0421)	(0.0702)	(0.0324)	(0.0327)	(0.0291)	(0.0293)
Constant	1.409***	1.344***	-0.554***	0.823***	-0.546***	0.798***
	(0.0223)	(0.0356)	(0.0159)	(0.0169)	(0.0143)	(0.0151)
Observations	12,900	12,411	12,900	12,411	12,835	12,358

Notes: Cell entries are regression coefficient with state lower chamber district-clustered standard errors in parentheses. All specifications include election and state lower chamber district fixed effects. D = Democratic Party, R = Republican Party. * p<0.05, ** p<0.01, *** p<0.001.

A.13 Fracking and Public Opinion

We analyze the Cooperative Congressional Election Survey (CCES) data to examine whether individuals who reside in fracking areas show any changes in their perspective on environmental protection, and whether these changes are more pronounced among liberal-leaning voters. The CCES includes the following question:

"Some people think it is important to protect the environment even if it costs some jobs or otherwise reduces our standard of living. Other people think that protecting the environment is not as important as maintaining jobs and our standard of living. Which is closer to the way you feel, or have you not thought much about this?"

Respondents were given five choices from (1) "'Much more important to protect jobs, even if environment worse" to (5) "Much more important to protect environment even if lose jobs and lower standard of living." The same question was included in all CCES waves from 2006 to 2016, except in 2014. We merge the results of the CCES question on jobs and environmental protection with wells data using zip codes and years. We divide the respondents into five different groups based on their ideology, and examine whether fracking has a different effect on individuals' opinions depending on ideology. To measure fracking activities, we use a dummy variable indicating whether a zip code had any horizontal wells. When we use the raw number of wells, the results are similar.

Table A15 presents the results. Column (1) shows residents in fracking areas put a lower priority on environmental protection over jobs than individuals who live in non-fracking areas. Column (2) shows there is no significant relationship between fracking activities and opinions once we include zip code fixed effects. Column (3) shows liberal respondents put more weight on environmental protection over jobs, but column (4) suggests no heterogeneous effect by ideology.

Studies have suggested there is a significant partisan difference in opinions about the costs and benefits of fracking (e.g., Christenson, Goldfarb, and Kriner 2017). However, surveys that ask about opinions on fracking do not ask whether a respondent lives in a fracking area, so it is

Table A15: The effect of fracking booms on opinions regarding the environment.

	(1)	(2)	(3)	(4)
Any wells	-0.163***	0.001	0.020	0.066
	(0.027)	(0.058)	(0.056)	(0.079)
Liberalism			0.508***	
			(0.003)	
Any wells X liberalism = 2				0.025
				(0.082)
Any wells X liberalism = 3				-0.089
				(0.085)
Any wells X liberalism = 4				-0.094
				(0.106)
Any wells X liberalism = 5				-0.242
				(0.157)
Liberalism = 2				0.389***
				(0.011)
Liberalism = 3				1.142***
				(0.011)
Liberalism = 4				1.548***
				(0.013)
Liberalism = 5				1.822***
				(0.016)
Constant	3.397***	3.388***	1.960***	2.459***
	(0.007)	(0.007)	(0.012)	(0.011)
Zip code fixed effects	No	Yes	Yes	Yes
Observations	157,300	157,300	146,856	146,856

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. The dependent variable is a respondent sentiment of environmental protection over jobs, ranging from 1 to 5. * p<0.05, ** p<0.01, *** p<0.001.

challenging to know whether the individuals who responded to these questions have had concrete experience with the costs and benefits from fracking. A study that measures respondents' proximity to fracking sites shows that individuals who live closer to fracking sites are more likely to support fracking (Boudet et al. 2018). Furthermore, the study shows that Democrats who lived closer to fracking sites were more supportive than those living further away, indicating that proximity weakened the negative effect of Democratic partisanship on support for fracking.

A.14 Replication Using Recent Years Only

One concern with our voter file data is that voters may move in and out of different zip codes over the sample period; however, we only observe the zip code in which the voter is registered to vote in 2012. As a check on possible movement across time, in this section we replicate our results using the most recent years only. For turnout, we first replicate the results looking at elections after 2000 (2004, 2008, 2012, and 2016); then after 2004 (2008, 2012, and 2016); then after 2008 (2012 and 2016). We report these results in Table A16 below. We obtain similar results even focusing on just the two most recent elections.

Table A16: Replication using recent years: turnout.

(a) All states

	(1) All years	(2) > 2000	(3) > 2004	(4) > 2008
Any wells	-0.047***	-0.042***	-0.022**	-0.026*
	(0.006)	(0.006)	(0.007)	(0.013)
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	29,584	29,582	29,577	29,573
Observations	9,447,267	8,278,590	6,573,769	4,450,900

(b) High-fracking states

	(1) All years	(2) > 2000	(3) > 2004	(4) > 2008
Any wells	-0.019**	-0.010	0.016	0.022
	(0.007)	(0.007)	(0.009)	(0.019)
Year fixed effects	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes
Clusters	5,746	5,745	5,740	5,737
Observations	1,256,937	1,105,370	886,685	619,723

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

We next repeat the procedure for donations. Even though our donations data do not suffer from the same limitation as the voter file data – we observe separate records of contributions

timestamped to each election cycle – we do this to be thorough. Table A17 shows the results. Again, we do not see markedly different results depending on the subsample of years used.

Table A17: Replication using recent years: contributions.

(a) All states

	(1) All years	(2) > 2000	(3) > 2002	(4) > 2004	(5) > 2006	(6) > 2008	(7) > 2010
Any wells	0.239***	0.205***	0.232***	0.178***	0.164***	0.129***	0.368***
	(0.019)	(0.019)	(0.022)	(0.021)	(0.025)	(0.031)	(0.061)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	29,699	29,640	29,570	29,448	29,309	28,955	28,408
Observations	11,961,688	10,943,766	9,905,991	8,479,865	7,314,071	5,144,047	3,563,304

(b) High-fracking states

	(1) All years	(2) > 2000	(3) > 2002	(4) > 2004	(5) > 2006	(6) > 2008	(7) > 2010
Any wells	0.119***	0.099***	0.114***	0.085**	0.082**	0.098**	0.352***
	(0.023)	(0.023)	(0.027)	(0.026)	(0.032)	(0.036)	(0.061)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip code fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	5,719	5,699	5,673	5,638	5,586	5,477	5,337
Observations	1,690,234	1,526,936	1,369,425	1,156,820	987,645	694,042	487,734

Notes: Cell entries are regression coefficients with zip code-clustered standard errors in parentheses. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

A.15 Testing for False Positives in Catalist Data

One concern with using our voter file data, and in particular when we use voter fixed effects, is a greater risk of a false positive. The voters we consistently observe over the sample period are more likely to be habitual voters who are registered throughout the entire sample period. In contrast, voters who were registered in years prior to 2012 or 2016, but became inactive in those years, will not be included in the sample. This could potentially introduce zip code-level trends in turnout, trends based on how many infrequent voters were present in a zip code in the earlier years of the sample.

To probe the potential for false positives resulting from this issue, we conduct a series of placebo regressions where we substitute an artificial, zip code-level "treatment" for the actual "any

wells" variable. Let d_t represent the actual share of zip codes with any wells equal to 1 in year t among the full sample of zip codes, and let d_t^{hf} represent this share among zip codes in high-fracking states. Then, for each iteration, we

1. Begin with the original voter data set
2. Collapse the data to the zip code-year level
3. Randomly assign d_{2004} of zip codes to a 1 on the placebo variable in 2004 through 2016
4. Randomly assign $d_{2008} - d_{2004}$ of remaining zip codes to a 1 on the placebo variable in 2008 through 2016
5. Randomly assign $d_{2012} - d_{2008}$ of remaining zip codes to a 1 on the placebo variable in 2012 and 2016
6. Randomly assign $d_{2016} - d_{2012}$ of remaining zip codes to a 1 on the placebo variable in 2016
7. Repeat steps 3. through 6. using values of d_t^{hf} applied only to zip codes in high-fracking states; save this as a separate placebo treatment
8. Merge the placebo treatment data into the individual-level voter data
9. Regress turnout on the placebo treatment, year fixed effects, and voter fixed effects among the full sample; repeat for high-fracking states only
10. Save the point estimates for the placebo treatments

We repeat these steps for 100 iterations. Note that steps 3. through 6. ensure that we achieve a distribution of placebo treatments that mirrors the observed distribution, such that zip codes maintain their treated status after the initial treatment year.

Figure A5 plots the distribution of point estimates across 100 iterations. The vertical dashed line represents the point estimate from a regression of voting on the actual any wells variable, plus year and voter fixed effects. These estimates are 0.0154 for the full sample, and 0.0195 for

the high-fracking state sample. As shown in each panel, for neither sample do we ever observe an estimate as large as the actual estimates. From this analysis, we conclude that our results are unlikely to have occurred due to a false positive.

We also experimented with using a specification without voter fixed effects, but with zip code fixed effects, in step 9, and achieved the same results in terms of the probability the actual estimates are false positives.

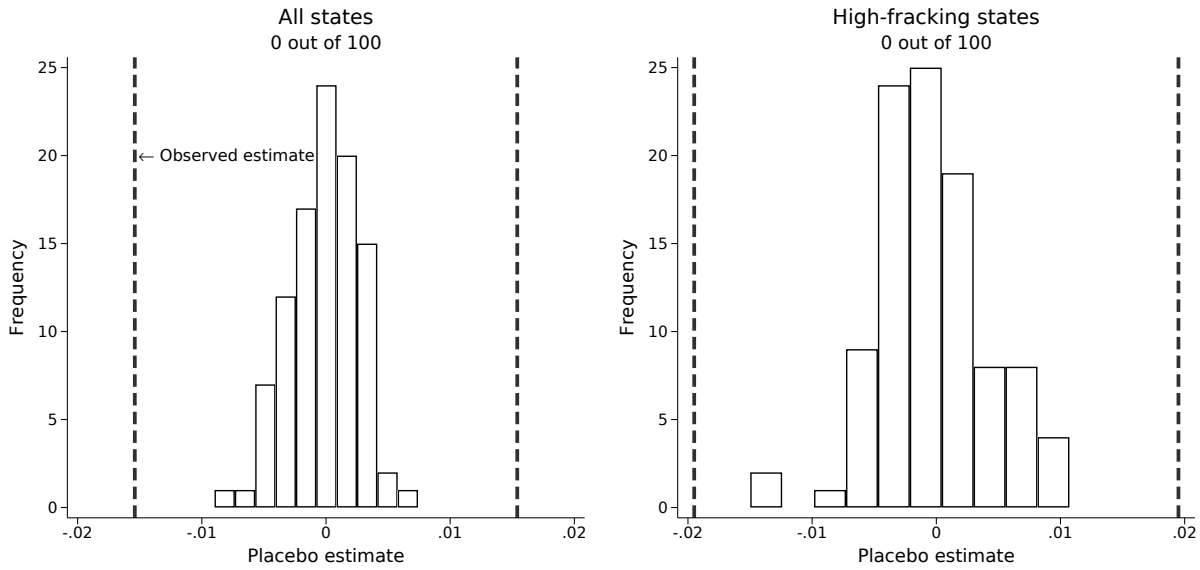



Figure A5: Distribution of point estimates for placebo treatment across 100 simulations.