

**Supplemental Appendix for “How Does Local TV News Change Viewers’ Attitudes?
The Case of Sinclair Broadcasting”
This Version: January 2021**

Measuring Ownership of Local TV Stations

Because I am primarily concerned with the effect on local television news, I restrict my analysis to those Sinclair owned stations that air a local newscast. As of mid-2019 (when the data was collected), Sinclair owned 191 TV stations, 59 of which broadcast no news programs, and instead show Stadium (a sports network), Comet (a science fiction network), MeTV (a classic TV sitcom network), or another type of content without local news programming.¹ Given this, I exclude these channels without a news cast from my analyses below.

But what, exactly, does ownership mean? Local TV station ownership is somewhat complicated, as there are many stations that Sinclair does outright own, but where they do create the news that airs on that station. For example, in the Johnstown-Altoona-State College (Pennsylvania) media market, Sinclair owns WJAC (the local NBC affiliate), but Sinclair-produced TV news also airs on WATM-TV (the local ABC affiliate) and WWCP (the local Fox Affiliate). The stories are not merely similar, but are typically identical and are produced by the exact same Sinclair team, consistent with Martin and McCrain’s (2019) findings. Such an arrangement is known as a news-sharing agreement or a local marketing agreement (Farhi, Gillum, and Alcantra 2018). I count such situations as "ownership" for this analysis, since I am interested in the effects of Sinclair-produced news on viewers, and happily, such agreements are publicly available. Importantly, this is also how Sinclair sees itself. If you go to the Sinclair broadcasting homepage (<http://sbgi.net/>) and look up their list of their TV stations, they make no

¹ To confirm whether each channel broadcasts a news program, my research assistants checked each stations programming guide and/or called each network. For a full list of Sinclair-owned stations, see their website at: <http://sbgi.net/>.

distinction between stations they outright own and stations where they have some sort of news-sharing arrangement. So while I refer to the effects of television news ownership below, I am really measuring the effects of controlling the production of local TV news, which is the actual theoretical construct of interest.

Descriptive Data on Sinclair Station Ownership

Table A1 presents some simple descriptive statistics about Sinclair's purchasing of TV stations from 2008 to 2018.

[Insert Table A1 about Here]

Over time, we see that Sinclair went through a series of acquisitions over this period, the large changes in 2013 and 2017 correspond to them buying up smaller TV systems: they purchased the stations owned by Barrington Broadcasting and Fisher Communications, as well as several stations owned by other firms, in 2013, and the Bonten Media Group in 2017. As a result, the fraction of U.S. 3-digit zip codes with at least one Sinclair-owned station more than doubles over this 10-year period, and as of 2018, 4 in 10 of U.S. 3-digit zip codes have at least one Sinclair-owned station available in them.

This, of course, raises the question of where Sinclair owns stations in 2008 (the start of the analysis), and where it buys stations over this period. The concern is that they might be strategically buying stations in areas that are trending Republican, which would potentially call the analysis in the paper into question. The results in Table 3 in the paper suggest this is not the case, but it is possible to provide additional evidence on this point. To do so, I predict Sinclair

station availability as a function of demographics and presidential election returns. Here, I work at the county level, since these variables are not measured at the zip-code level. Table A2 provides the results.

[Insert Table A2 about here]

In column 1, we see that places where Sinclair owned stations at the start of this period (2008) were whiter and poorer. While there is a negative effect of the percentage of senior citizens, this is largely because places that have more senior citizens are also (on average) whiter and poorer. This would be consistent with Sinclair's original station profile, which was typically in smaller, more secondary markets. Interestingly, in column 2, note that conditional on demographics, there is no effect of Obama's 2008 vote share: if anything, counties where Sinclair owned were slightly more Democratic (controlling for demographics), though this effect is not statistically significant.

When we look at places where Sinclair purchased stations over this period, we see a similar pattern: again, places that are whiter, and also a bit smaller (on average). But note that there is no effect on the change in Obama's vote share 2008-2012. So, conditional on demographics, these places are not changing politically in a way that would threaten the analysis in the paper.

Stability of the Estimate of the Effect of Obama Approval

In the body of the paper, I showed that the availability of a Sinclair-owned TV station changes evaluations of President Obama's approval: in areas where viewers can watch a Sinclair-owned

TV station, they are less likely to approve of President Obama's performance. In the body of the paper, I presented my main results from a model with fixed effects for zip code and interview date, as well as a set of statistical controls. In that specification, I find that Obama's approval falls by 0.09 (95% CI: [-0.11, -0.07]) in areas where viewers receive a Sinclair-owned channel. In that model, I controlled for the respondent's partisanship, a set of other demographic variables, and then set a fixed effects for the respondent's zip code, as well as fixed effects for the month and day of the week of the interview (to control for differences across geography and time, as well as to account for the fact that a different set of people answer the phone for a survey firm during the week vs. the weekend).

But how sensitive are my estimates to controlling for partisanship, these other demographics, and including these other fixed effects? While this is the "correct" model specification (or at least a version of it), I wanted to ensure that these choices are not overly sensitive to these choices. To assess the sensitivity of these results, I re-estimated a series of models: with and without controls, with and without fixed effects, and so forth. Comparing the estimated effects of a Sinclair-owned TV station on Obama approval under these specifications gives me a sense of the robustness of the results. Figure A1 shows the coefficient estimate under these different scenarios.

[Insert Figure A1 about here]

The top half of Figure A1 shows the estimated coefficient (and associated 95 percent confidence interval) from a model produced by including the various elements from the bottom half of the figure. The estimate from the body of the paper is the right-most estimate in the figure: the

estimated effect of Sinclair availability on Obama approval controlling for the respondent's partisanship, their demographics, and including fixed effects for zip code, month of interview and the day of the week of the interview. Moving across the figure, each estimate systematically includes or excludes elements of the original model (a gray square indicates it is included, a blank space means that feature is excluded). As you go across the figure from right to left, you remove these factors one at a time so you can see the effect of removing each of these factors individually on the size of the estimate (and its associated confidence interval). So for example, the second from the right estimate includes everything in the main specification, but omits the respondent's partisanship, the third includes party but omits other demographics, and so forth.

The main take-away from Figure A1 is that the estimate is stable across specifications, but the exact size of that estimate varies depending on what is included or excluded from the model. There are some much larger estimates, but those typically do not control for the respondent's partisanship or differences across time (via fixed effects). This makes sense, as we know partisanship drives approval in this period (Donovan et al. 2020), and there is also large variation over time in Obama's approval rating (with them generally falling over the course of his term). Take, for example, the left-most estimate, which is from a model omitting both the respondent's party ID and other demographic controls, leads and lags of the treatment, and both zip code and interview date fixed effects. Here, the estimated effect of the availability of a Sinclair-owned TV station is -0.04 (95% CI: [-0.06, -0.02])—Obama's approval falls here by 4 percent (technically, 3.92 percent), a massive effect. Note that this is several times larger than the estimate from Table 1 in the body of the paper. But that is because this estimate is missing some key control variables, so this is not an estimate one should trust. But note that once we include the fixed effects, and control for party, the results are much more sensible, and are all much

closer to the estimates from Table 1 in the paper. Indeed, not only are they similar, they are all statistically significant except when excluding either party ID or the fixed effects, both of which should be included in the model, as they are key predictors of Obama approval. This suggests that my results are not simply the results of a particular specification, but rather reflect a more robust relationship between Sinclair availability and Obama approval.

Results Using the 5-digit Zip Code

In the body of the paper, I used the availability of a Sinclair-owned station at the 3-digit zip code level. But I can also measure availability at the 5-digit zip code level. Table A3 presents these results.

[Insert Table A3 about here]

Note that these results are substantively very similar to the ones presented in the body of the paper.

Results using DMA-Level Availability

As I discussed in the body of the paper, the typical method used to determine if viewers can receive a local TV signal is to treat the DMA as a discontinuity: if a station is located in a DMA, then only viewers inside that DMA receive the TV channel (see the discussion in appendix A of Llaudet 2018). This captures most, but not quite all, of a channel's potential audience, as some viewers outside of a DMA can and do receive these channels, as I discussed in the paper. To ensure that my results are not driven simply by this particular coding rule, I replicated my results

using the literature standard for availability (i.e., assuming that only viewers inside a DMA have access to a local station). Table A4 below replicates these results; note that the results are the substantively identical to those I present in the body of the paper.

[Insert Table A4 about here]

Results from the 2013 Purchases Only

As another robustness check, I also re-estimated the model specification from the body of the paper looking only at the 2013 Sinclair acquisitions. This is the largest group of Sinclair purchases—that year, Sinclair purchased Barrington Broadcasting and Fisher Communications, adding 43 stations in that year (nearly $\frac{1}{2}$ of their total acquisitions over this period). Looking at just this one year of acquisitions allows me to focus in on a likely more homogeneous set of stations, potentially removing some (unobserved) heterogeneity from my estimates. In table A5 below, I re-estimate the estimates from the body of the paper looking only at this sub-set of acquisitions.

[Insert Table A5 about here]

We see here that these largely replicate the results from the body of the paper. Indeed, if anything, the effects here on Obama approval are somewhat larger than those in the paper: here, the availability of a Sinclair-owned station lowers approval by 1.3 percent, versus 0.9 percent pooling across all estimates in the paper. This suggests that there is likely some heterogeneity in Sinclair’s effect induced by some of its later acquisitions.

Heterogeneous Effects by Partisanship and Ideology

In the body of the paper, I focused on a story where Sinclair persuades its audience to move to the left (as a result of nationalized partisan content). But there is potentially another version of this story: rather than simply persuading subjects, Sinclair might polarize subjects, pushing Democrats/liberals to the left and Republicans/conservatives to the right. Testing for that possibility involves examining a search for heterogeneous treatment effects based on partisanship and ideology. Table A6 presents those results for Obama approval.

[Insert Table A6 here]

The results here show that there is no heterogeneous effect of Sinclair availability by partisanship, but there is some heterogeneity based on liberal-conservative self-identification. In column (2), we see that the effect on Obama approval is coming through its effect on conservatives, who are the ones who persuaded to change their opinion. While plausible, I emphasize that this model should be viewed with caution for four reasons. First, given the partisan nature of the content, it is odd that there is no heterogeneous effect for party ID, which should make the reader skeptical of the effect on ideology, because there is no *ex ante* compelling reason why ideology would condition this relationship but not party. Second, even with this massive data, I am likely still probably under-powered to search for these sorts of heterogeneous effects. Third, these effects are likely conditioned by political information/awareness, which is not measured in the Gallup data. Fourth, and finally, this sort of analysis requires that partisanship and ideology be treated as exogenous to treatment (i.e., not

affected in any way by Sinclair availability). While I find null effects in the body of the paper, it is still theoretically possible that it could affect these variables, hence this sort of analysis runs the risk of conditioning on a post-treatment variable (Montgomery, Nyhan, and Torres 2018). Given this, while this analysis is interesting, it should be viewed as very preliminary. Analyses that seem to test for this sort of heterogeneous treatment effect will need a different set of data and design.

Effects on Presidential Vote

So far, the analysis has focused on the effects on individual-level analysis. But if the arguments above are correct—that Sinclair availability drives attitudes toward, and approval of, President Obama, then we should see effects on actual election returns. To test this hypothesis, I estimate the following equation:

$$vote_{it} = \beta_0 + \beta_1 Sinclair_{it} + \gamma_i + \alpha_{s(i),t} + \epsilon_{it} \quad (A1)$$

Where $vote_{it}$ is the Democratic candidate's share of the 2-party vote in county i in election t , $Sinclair$ is whether or not there is a Sinclair-owned station in county i at the time of election t , γ_i is a set of county fixed effects, and $\alpha_{s(i),t}$ are a set of state-year fixed effects (for state s containing county i in year t). The county fixed effects control for unobserved county-level factors (i.e., the areas normal vote, see Levendusky, Pope, and Jackman 2008), and the state-year fixed effects control for state-year variation in political targeting advertising, competitiveness, and so forth. Table A7 presents those results.

[Insert Table A7 here]

Here, in column 1, we see that having a Sinclair-owned TV station broadcast in a given county lowers Democratic vote share by 0.3%, all else equal, and the effect is statistically distinguishable from 0. To put this effect in perspective, the standard deviation of within-county changes in Democratic vote share across these three elections is 5 percent, so this effect is approximately 1/6th of a standard deviation. We can also benchmark this relative to advertising exposure: using data from 2016, Sides, Tessler, and Vavreck (2108) estimate that each additional 1,000 ads Hillary Clinton ran in a county increased her vote share by 0.1 percent (192-3), so this is the equivalent to a candidate running an additional 3,000 ads. Simply put, this is a modest—but not insignificant—effect of local TV news on vote share.

One concern is that—much like in the body of the paper—I may be picking up on the fact that Sinclair stations go into areas trending against the Democrats for other reasons. In Table A2, I tested this possibility, and found that it was not the case. There, I showed that shifts in Obama’s vote share from 2008 to 2012 did not predict where Sinclair was purchasing additional stations, suggesting that the relationship in Table A7 is not simply a spurious correlation.

Works Cited (Not in Main Text)

- Donovan, Kathleen, Paul Kellstedt, Ellen Key and Matthew Lebo. 2020. "Motivated Reasoning, Public Opinion, and Presidential Approval." *Political Behavior* 42(4): 1201-21.
- Farhi, Paul, Jack Gillu, and Chris Alcantara. 2018. "In This Town, You Can Flip the Channel All You Want—The News is Often the Same." *Washington Post* 14 June.
- Levendusky, Matthew, Jeremy Pope, and Simon Jackman. 2008. "Measuring District-Level Partisanship with Implications for the Analysis of U.S. Elections." *Journal of Politics* 70(3): 736-53.
- Montgomery, Jacob, Brendan Nyhan, and Michelle Torres. 2018. "How Conditioning on Posttreatment Variables Can Ruin Your Experiment." *American Journal of Political Science* 62(3): 760-75.
- Sides, John, Michael Tesler, and Lynn Vavreck. 2018. *Identity Crisis: The 2016 Presidential Campaign and the Battle for the Meaning of America*. Princeton, NJ: Princeton University Press.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of Stations Owned	43	43	43	47	64	107	117	117	121	131	132
Purchased That Year	0	0	0	4	17	43	10	0	4	10	1
% of 3-digit Zip Codes with at least one Sinclair-Owned Station	18.8	18.8	18.8	20.5	25.5	33.4	38.8	38.8	39.6	40.8	40.8

Table A1: Descriptive Statistics on Sinclair’s Station Purchasing Behavior, 2008 – 2018

	Pre-2008 Stations (1)	Pre-2008 Stations (2)	2008-2018 Purchases (1)	2008-2018 Purchases (2)
Constant	0.100*** (0.026)	0.072** (0.032)	0.014 (0.060)	0.137* (0.075)
% Seniors	-0.236* (0.121)	-0.350** (0.149)	0.522* (0.268)	-0.537* (0.308)
% White	0.096*** (0.019)	0.145*** (0.039)	0.297*** (0.039)	0.201** (0.081)
% College Grad.	0.003 (0.116)	0.031 (0.143)	-0.039 (0.243)	-0.406 (0.273)
Population (Thousands)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000** (0.000)
Median Income (Thousands)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003* (0.001)	0.003* (0.002)
2008 Democratic Vote Share		0.028 (0.052)		
Change in 2008- 2012 Vote Share				-0.213 (0.422)
N	2494	1782	2494	1782
R2	0.025	0.014	0.062	0.010
Adj.R2	0.023	0.011	0.060	0.007

Table A2: Characteristics of Counties Where Sinclair Purchases Stations

Note: Cell entries are OLS parameter estimates with robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Party ID (1)	Party ID (2)	LibCon Self ID (1)	LibCon Self ID (2)	Obama Approval (1)	Obama Approval (2)	Economy Evaluation (1)	Economy Evaluation (2)
Sinclair Availability	0.005	0.002	-0.001	-0.003	-0.010***	-0.008***	-0.005	-0.003
	(0.005)	(0.005)	(0.004)	(0.003)	(0.002)	(0.002)	(0.004)	(0.005)
Party ID				0.322***		-0.189***		-0.084***
				(0.001)		(0.000)		(0.001)
African-American		-0.85***		0.169***		0.113***		0.020***
		(0.008)		(0.004)		(0.002)		(0.005)
White		0.533***		-		-0.078***		-0.023***
		(0.005)		0.083***		(0.002)		(0.003)
Female		-		-		0.019***		-0.110***
		0.331***		0.086***		(0.001)		(0.002)
		(0.002)		(0.001)		(0.001)		(0.002)
College Graduate		-		-		0.041***		0.076***
		0.140***		0.130***		(0.001)		(0.002)
		(0.003)		(0.002)		(0.001)		(0.002)
Age		-0.000*		0.006***		-0.001***		-0.002***
		(0.000)		(0.000)		(0.000)		(0.000)
R2	0.102	0.160	0.091	0.357	0.129	0.540	0.085	0.129
Adj.R2	0.094	0.151	0.079	0.347	0.112	0.528	0.072	0.109

Table A3: Replication of Table 1, Alternative Rule for Determining Audience (5-Digit Zip Code Level Availability)

Note: Cell entries are OLS parameter estimates for equation (1) in the paper with associated standard errors (clustered at the zip code level) in parentheses. All models include zip code and day of interview fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Party ID (1)	Party ID (2)	LibCon Self ID (1)	LibCon Self ID (2)	Obama Approval (1)	Obama Approval (2)	Economy Evaluation (1)	Economy Evaluation (2)
Sinclair Availability	0.004	-0.004	0.002	0.001	-0.008	-0.007**	0.001	0.000
	(0.014)	(0.013)	(0.005)	(0.003)	(0.006)	(0.003)	(0.007)	(0.010)
Party ID				0.324***		-0.189***		-0.083***
				(0.002)		(0.001)		(0.001)
African-American		-		0.174***		0.116***		0.015**
		0.881***		(0.010)		(0.004)		(0.006)
		(0.025)						
White		0.579***		-		-0.084***		-0.024***
				0.092***				
		(0.019)		(0.011)		(0.002)		(0.004)
Female		-		-		0.019***		-0.111***
		0.332***		0.085***				
		(0.004)		(0.002)		(0.001)		(0.002)
College Graduate		-		-		0.046***		0.085***
		0.154***		0.148***				
		(0.007)		(0.004)		(0.001)		(0.002)
Age		-0.000		0.006***		-0.001***		-0.002***
		(0.000)		(0.000)		(0.000)		(0.000)
R2	0.061	0.134	0.058	0.337	0.081	0.524	0.070	0.111
Adj.R2	0.060	0.133	0.057	0.336	0.079	0.522	0.068	0.108

Table A4: Replication of Table 1, Alternative Rule for Determining Audience (DMA/County Level Availability)

Note: Cell entries are OLS parameter estimates for equation (1) in the main paper with associated standard errors (clustered at the county level) in parentheses. All models include county and day of interview fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Party ID	Lib-Con Self ID	Obama Approval	Economic Evaluations
Sinclair Availability	-0.008 (0.012)	0.006 (0.006)	-0.013** (0.006)	-0.009 (0.015)
Party ID		0.321*** (0.002)	-0.190*** (0.001)	-0.097*** (0.001)
African-American	-0.930*** (0.028)	0.174*** (0.008)	0.120*** (0.004)	0.075*** (0.007)
White	0.566*** (0.018)	-0.086*** (0.008)	-0.065*** (0.003)	-0.014*** (0.004)
Female	-0.323*** (0.004)	-0.081*** (0.002)	0.022*** (0.001)	-0.088*** (0.002)
College Graduate	-0.102*** (0.008)	-0.157*** (0.004)	0.038*** (0.001)	0.083*** (0.003)
Age	-0.001*** (0.000)	0.005*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)
R-Squared	0.123	0.337	0.515	0.129

Table A5: Replication of Table 1, 2013 Sinclair Purchases Only

Note: Cell entries are OLS parameter estimates for equation (1) in the paper with associated standard errors (clustered at the zip code level) in parentheses. All models include zip code and day of interview fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Party ID	Ideology
Sinclair Availability	-0.012** (0.005)	0.002 (0.005)
Party ID	-0.163*** (0.001)	-0.163*** (0.001)
African-American	0.130*** (0.004)	0.130*** (0.004)
White	-0.095*** (0.002)	-0.095*** (0.002)
Female	0.009*** (0.001)	0.009*** (0.001)
College Graduate	0.036*** (0.001)	0.036*** (0.001)
Ideology	-0.084*** (0.001)	-0.083*** (0.001)
Sinclair*Party	0.001 (0.001)	
Sinclair*Ideology		-0.003** (0.001)
R2	0.548	0.548
R2 Adj.	0.547	0.547

Table A6: Heterogeneous Effects of Partisanship and Ideology on Obama Approval, Gallup Data

Note: Cell entries are OLS parameter estimates for equation (1) in the paper with associated standard errors (clustered at the zip code level) in parentheses. All models include zip code and day of interview fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Estimate
Sinclair Availability	-0.0035* (0.0016)
R-Squared	0.98

Table A7: Effect on County-Level Vote Shares

Note: Cell entries are OLS parameter estimates for equation (A1) in the appendix with associated standard errors in parentheses. All models include county and state-year fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

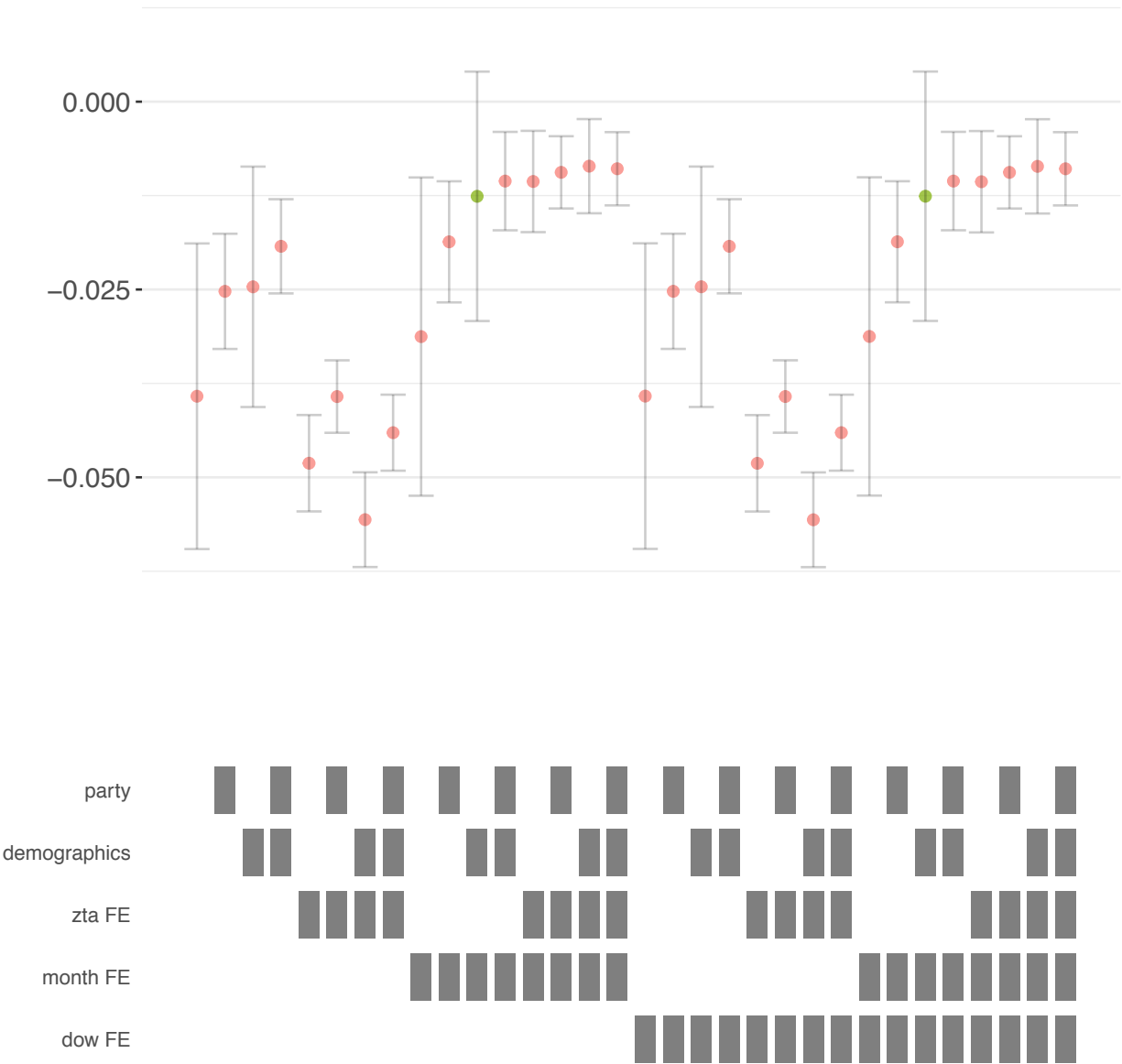


Figure A1: Stability of the Effect of Sinclair Availability on Obama Approval
Note: each point estimate in the upper graph corresponds to a model estimate including the items given in the bottom half (gray = include, white = excluded), with 95% confidence intervals given by the bars.