Local News and National Politics*

Gregory J. Martin† Josh McCrain‡

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Abstract

The level of journalistic resources dedicated to coverage of local politics is in a long term decline in the US news media, with readership shifting to national outlets. We investigate whether this trend is demand- or supply-driven, exploiting a recent wave of local television station acquisitions by a conglomerate owner. Using extensive data on local news programming and viewership, we find that the ownership change led to 1) substantial increases in coverage of national politics at the expense of local politics, 2) a significant rightward shift in the ideological slant of coverage and 3) a small decrease in viewership, all relative to the changes at other news programs airing in the same media markets. These results suggest a substantial supply-side role in the trends toward nationalization and polarization of politics news, with negative implications for accountability of local elected officials and mass polarization.

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†Corresponding Author. Assistant Professor of Political Economy, Stanford Graduate School of Business. 655 Knight Way, Stanford, CA 94305. Email: gjmartin@stanford.edu

‡PhD Candidate in Political Science, Emory University. 1555 Dickey Drive, Atlanta, GA 30322. Email: josh.mccrain@gmail.com

Local newspapers are in decline in the US, with falling readership and decreasing levels of newsroom personnel (Hayes and Lawless 2017; Peterson 2017; Pew Research Center 2016). Given the importance of news coverage in driving citizen engagement in politics and in allowing citizens to hold their elected officials accountable (Snyder and Strömberg 2010; Hayes and Lawless 2015; Shaker 2014; Hopkins and Pettingill 2015), this trend is worrisome. Economic changes in the production of news and greater national competition in the news market could potentially be imposing negative externalities on the quality of local political information available to citizens and consequently on the performance of local governments.

On the other hand, it is also possible that declines in local coverage are primarily demand- rather than supply-driven. In an age of increasing nationalization of elections (Hopkins 2018; Abramowitz and Webster 2016; Jacobson 2015), dedicated coverage of local politics may no longer be as valuable to citizens as it once was. The more closely do local elected officials' positions align with those of their national party, the more does information about national party leaders suffice for most readers' purposes and the less incremental value is there in coverage of local figures. The long-term decline in local coverage may thus simply reflect adaptation by the news industry as a whole to changes in audience tastes for political information (e.g., Mullainathan and Shleifer 2005).

Changes in news distribution technologies may be accelerating the influence of such demand-side shifts. The modern news environment, characterized by a proliferation of choices available to news consumers through broadband internet and cable television (Arceneaux and Johnson 2013; Hindman 2009), plausibly expands the role of consumer demand in determining news content relative to the late-20^{th} century period of dominance by print newspapers and broadcast TV. Whereas a 1970s news reader unhappy with her city paper's local focus and seeking more national coverage would have had limited and relatively high-cost alternatives, today's news reader can easily access a wide variety of national sources for low or no cost.

This greater opportunity for news consumers to choose their favored sources that modern

news media affords has led to a second kind of concern: that proliferation of media choice will lead to increased ideological or partisan polarization of content (Prior 2007; Lelkes, Sood and Iyengar 2017). Evidence from cable news shows that the cable news channels' content has in fact polarized over the past decade and a half (Martin and Yurukoglu 2017). The emergence of highly partisan misinformation or "fake news" on social media in the 2016 presidential election (Guess, Nyhan and Reifler 2018; Allcott and Gentzkow 2017) demonstrates that a more extreme version of the same phenomenon is present in online news as well.

In this paper, we present evidence on the underlying cause of these trends towards the nationalization and polarization of politics coverage, using an extensive data set of local television news broadcasts. Local TV news has large audiences, with viewership on the order of 25 million viewers per night in the aggregate (Pew Research Center 2017).[1] We analyze the content and viewership of 743 local news stations over the latter two-thirds of 2017, a period which saw the acquisition of a set of local television stations by a large conglomerate owner, the Sinclair Broadcast Group.

We measure news program content using a topic model fit to more than 7.4 million transcript segments from this period. Using a differences-in-differences design that compares the Sinclair-acquired stations to other stations operating in the same markets, we find that the acquisition led to a roughly three percentage point increase in the share of programming devoted to coverage of national politics, a roughly 25% increase relative to the average level in the sample. Furthermore, this increase came largely at the expense of coverage of local politics. We also find that text-based measures of ideological slant (Gentzkow and Shapiro 2010) shifted to the right at Sinclair-acquired stations following the acquisition, relative to other stations in the same market.[2] The magnitude of the ideological shift induced following

[1]And given the documented ability of information from TV sources to spread through viewers' social networks (Druckman, Levendusky and McLain 2018), the effective reach is even larger.

[2]Sinclair's conservative slant has received attention in recent popular media (e.g., Levitz

the Sinclair acquisition is equivalent to approximately one standard deviation of the cross-station ideological distribution.

Using the same differences-in-differences design, we also measure the change in viewership attributable to the change in ownership. Consistent with a supply-driven story, the diff-in-diff estimate of short-term viewership changes at the Sinclair-acquired stations is negative, though small enough to be statistically indistinguishable from zero. The shifts toward more right leaning slant and more national politics coverage do not appear to have gained these stations additional viewers. If anything, viewers prefer the more locally-focused and ideologically neutral coverage to the more nationally-focused and ideologically conservative coverage: existing Sinclair stations acquired prior to 2017 see significantly lower viewership for their news broadcasts compared to other stations operating in the same market, paying a ratings penalty of about 1 percentage point. Nonetheless, there are very clear economies of scale for a conglomerate owner in covering national as opposed to local politics, thanks to the ability to distribute the same content in multiple markets.[3] Given that the ratings penalty we document is fairly small, it seems likely that these cost efficiencies dominate in Sinclair's calculus. This finding is in contrast to demand-side explanations for changes in news content, which predict that news outlets cater their content to viewers' preferences (Hamilton 2004; Mullainathan and Shleifer 2005).

These results are a flip side of the coin to George and Waldfogel's (2006) finding that the entry of a national competitor (the New York Times) into local newspaper markets led local incumbent papers to focus more on their comparative advantage in local coverage, and Gentzkow, Shapiro and Sinkinson's (2014) finding that greater newspaper competition is associated with greater ideological diversity. Acquisition of existing local outlets by a national conglomerate produces the opposite impact on coverage relative to entry by a new, sepa-

2017).

[3]Sinclair also received media attention for its policy of distributing nationally produced, "must-run" segments to every station in its portfolio (Gold 2017).

rately owned national outlet. A conglomerate owner can reduce production costs, perhaps dramatically, by substituting nationally-focused and ideologically unified content produced in a single studio for locally-focused and ideologically diverse content produced by many local journalists. Even if viewers would prefer locally-tailored politics content, the fact that politics coverage is bundled with other kinds of content - crime reporting, weather, sports, and so on - that are less affected by consolidation mutes the demand response.

Taken together, our results contribute to a growing literature showing that supply-side forces in the market for news have real consequences both for the political content of news (such as the coverage of campaigns, candidates, and salient issues; Branton and Dunaway 2009; Dunaway and Lawrence 2015) and on downstream election outcomes (Archer and Clinton 2018; Dunaway 2008; Durante and Knight 2012). Media consolidation can produce cost efficiencies in the production of news, but these efficiencies are not neutral with respect to the content of news coverage. Consolidation changes the incentives of news providers, shifting coverage towards topics that can be distributed in multiple markets rather than those - such as local politics - that are market-specific. Consolidation among conglomerate owners is also correlated with changes in editorial decisions, where newly-consolidated outlets are more likely to produce content that favors the political and financial interests of their owners (Bailard 2016; Gilens and Hertzman 2000). These content changes influence viewers' available information about local elections and elected officials, along with the ideological slant of news to which they are exposed. As existing research (DellaVigna and Kaplan 2007; Snyder and Strömberg 2010) has shown, both dimensions of content are consequential for the accountability and preference aggregation functions of elections.

Data and Institutional Background

This paper exploits recent changes in ownership of broadcast television networks as a driver of variation in the content covered by the stations that changed ownership.[4] Specifically, we compare stations acquired by the Sinclair Broadcast Group to other stations within the same Designated Market Area (DMA). Sinclair is of particular interest for two reasons. First, anecdotal evidence suggests the company's political orientation leans to the right, with politics coverage frequently compared to that of the Fox News Channel (Farhi 2017).[5] This right-leaning coverage is delivered across all Sinclair stations through "must-run" segments which have clearly identifiable partisan messaging. Many recent "must-run" segments feature Boris Epshteyn, a former Trump White House official.[6]

Press accounts suggest reason to believe that Sinclair ownership may have real effects on the content of coverage. Upon taking ownership of a station, Sinclair mandates that some of its larger stations produce their own partisan content - resulting in the resignation of some experienced local news anchors - and quickly replaces management with personnel more friendly to its business practices (Farhi 2014). As many reporters and staff vocalize their discontent with the change in news content and procedures (Stetler 2018), Sinclair also

[4]Sinclair, like other media conglomerates, owns local stations that are affiliated with one of the national networks (ABC, CBS, NBC, or FOX). Sinclair's stations cover a mix of all four network affiliations. We focus on local news broadcasts produced by affiliates, excluding the networks' nationally distributed news programs.

[5]Our systematic analysis of news content backs up this impression; Appendix E demonstrates that Sinclair stations' coverage looks more similar to the Fox News Channel than that of non-Sinclair stations.

[6]For instance, regarding former FBI Director James Comey's testimony, Epshteyn said, "Contrary to widespread expectations, we actually learned much more about the president's opponents and his critics from Comey's testimony that about any issue involving the president himself." (Gold 2017)

restructures their employment contracts making it more difficult and costly for employees to leave (Maxwell 2018).

Second, Sinclair is in the midst of acquiring a substantial number of new stations across the country. In the middle of the time period covered by our data (June-December 2017), Sinclair purchased the Bonten Media Group's stations. This purchase, completed on September 1, 2017, added 14 new stations to Sinclair's portfolio in 10 markets, though not all stations broadcast local news - 10 of these stations in 7 markets have their own news broadcast. Sinclair currently owns 193 stations in 89 DMAs, acquired through a steady process of expansion that began in the 1980s (see Figure 1 for geographic coverage). If a proposed purchase of Tribune Media is completed, Sinclair's portfolio will grow to 233 stations in over 100 DMAs, meaning a Sinclair-owned station will be viewable in 72% of American households.[7] Through the elimination of the "main studio rule"[8], the FCC has paved the way for Sinclair's expansion by eliminating the need for Sinclair to maintain physical studios within each station's locality, making growth more economical for Sinclair.

Broadcast Transcripts and Viewership Data

To measure the effect of a change in ownership on the content of local news broadcasts, we collect data on 743 stations in every DMA throughout the country. Our analyses employ transcript and viewership data which come from the data vendor TVEyes and cover March (for viewership) or June (for transcripts) to December of 2017. We collect the viewership data and full transcripts from every weekday news broadcast in each station throughout this time period.[9] The resulting dataset has 7.41 million 2.5 minute segments which we then

[7]Tribune Media, like Sinclair itself, is a conglomerate which has been growing through acquisitions of local TV affiliates since the 1980s.

[8]https://www.fcc.gov/document/fcc-eliminates-main-studio-rule-0

[9]Our process for identifying local news broadcasts and filtering out national network news and other non-news programming is described in detail in Appendix A.

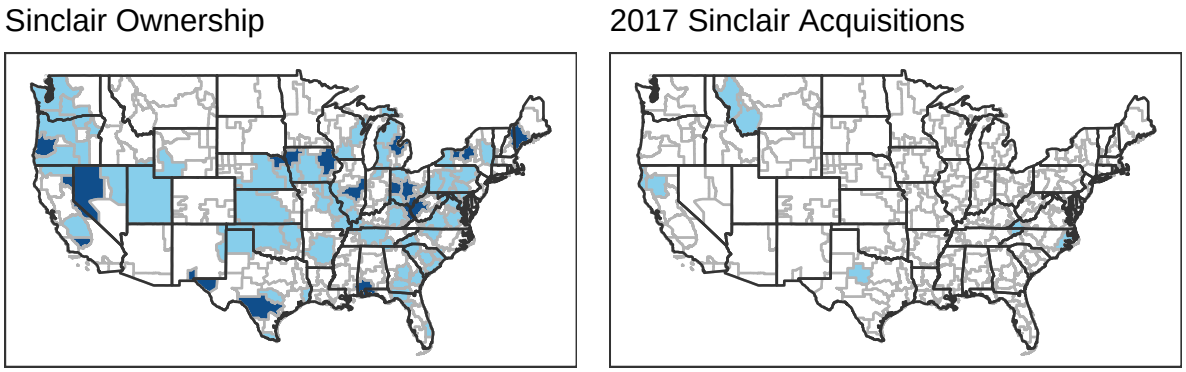


Figure 1: Map of Sinclair Ownership by DMA

The plot on the left shows DMAs pre-2017 in which Sinclair owns 1 (light color) or 2 (dark color) stations. The plot on the right shows DMAs in which Sinclair acquired a station in 2017. The light grey borders outline distinct DMAs.

Table 1: Station Summary Statistics

	Overall			Sinclair Only		
	Total	Mean	S.D.	Total	Mean	S.D.
Unique Stations	743	-	-	99	-	-
Total DMAs	210	-	-	72	-	-
Distinct Shows	6,710	9.7	15.7	665	7.9	4.3
Timeblocks	5,771	7.8	2.3	601	7.2	2.7

Timeblocks refers to 30 minute periods. Shows are differentiated by the title of the program broadcast during a 30 minute timeblock.

process and input to a latent Dirichlet allocation (LDA) topic model, producing 15 distinct topics.[10] Finally, we collected a variety of demographic data from the US census aggregated to the DMA level and matched to each station based on the DMA that contains the station. Summary statistics are displayed in Table 1.

Figure A3 in the Appendix displays aggregate trends in the fifteen topics uncovered by the topic model over the time period of the data. Local and national politics have both remained relatively stable, with the latter seeing a slight decrease on average. The largest change in relative coverage of a topic is due to the strong hurricane season that affected the United States around September 2017; the "disasters" topic, which contains words like "hurricane," "Irma," and "Harvey," saw a spike around this time and then declined as hurricane season ended.

Our analysis focuses on the topics clearly associated with coverage of politics. Figure A1 in Appendix B shows word clouds of the most indicative words for each of these topics, as well as the "weather" and "crime" topics for comparison purposes. There are five total topics which we identify as politics-related: three national politics topics (one which focuses on domestic policy, one focused on foreign policy, and one we label "Trump scandals") and two local politics topics (one focused on schools and education and the other on local government,

[10]The process used to fit the topic model and choose the number of topics is described in detail in Appendix B. We use 2.5 minute segments because the TVEyes interface displays clips in segments of that length.

particularly local infrastructure projects). We group the three national and two local topics together for purposes of the analysis.

Figures 2(b) and 2(c) depict monthly trends in the composite local and national politics topics, disaggregated by station ownership. This figure shows that seasonal trends in coverage over this period are similar between Sinclair and non-Sinclair stations. Sinclair-owned stations consistently spend more time on average on national politics and less on local politics. Figures 3(a) and 3(b) zoom in to show daily trends in local and national politics coverage, respectively, among only those stations in DMAs in which Sinclair acquired a station in 2017. We plot daily averages of each variable, disaggregated by ownership, for stations located in one of the former Bonten Group markets. These plots are a visual analogue to the difference-in-differences results in the next section, and provide further evidence that trends in coverage are parallel for stations in this set of markets up to the time of acquisition of a station by Sinclair, when they begin to diverge.

For segments that discuss the national politics topics, we construct a text-based measure of left-right slant based on an extension of the method of Gentzkow and Shapiro (2010). The approach is described in detail in Appendix C, but the basic idea is to compare language use in news outlets to language use by members of congress in the Congressional Record (CR). The method produces an estimated ideology for every segment that is a function of its frequency of use of phrases that are indicative of partisanship in the CR. Because these phrases are fairly uncommon on local news and the resulting estimates can be noisy, we 1) limit to segments that have at least 50% estimated weight on the national politics topics from the topic model, and 2) aggregate to the level of station-day. To assess the robustness of this slant measure, we also constructed a similar measure that compares the language used by local outlets to the language used by cable news networks and scales the local station based on its similarity to MSNBC or Fox News.[11] Results using this cable-news scaling measure

[11]This approach is similar to that used in Bakshy, Messing and Adamic (2015) and Flaxman, Goel and Rao (2016).

are very similar to those presented here using the Congressional Record scaling; details of the approach and analogous results are provided in Appendix E.

Figure 4 shows the density of the resulting slant estimates across stations. There is some dispersion across stations in the measure, with standard deviation equal to about .02.[12] Sinclair's portfolio of stations is, unsurprisingly given the anecdotal reports, shifted to the right relative to non-Sinclair stations; the mean difference is about .012. Figure 3(c) shows the over-time change in this measure for stations in one of the Bonten Group DMAs; again trends are close to parallel for acquired and non-acquired stations until the time of the acquisition, when the Sinclair acquisitions move rightwards.

We also examine viewership before and after the acquisition in Sinclair-acquired and non-Sinclair-acquired stations. Viewership comes from Nielsen Media Research and are estimates based on Nielsen's panel of households.[13] Figure 2(a) demonstrates that Sinclair and non-Sinclair stations across the country have similar seasonal in viewership, with Sinclair stations having on average somewhat lower viewership numbers.[14] Figure 3(d) shows, analogously to the plots of the coverage measures, daily viewership among acquired and non-acquired

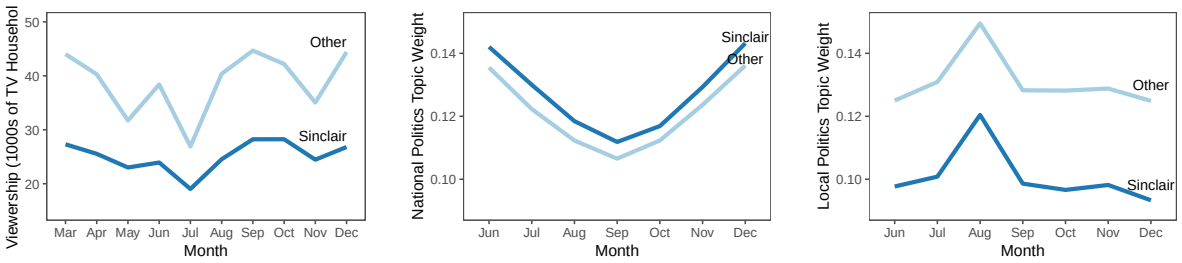
[12]The slant measure is on the DW-NOMINATE scale, which ranges from -1 to 1. We find the distribution across media outlets to be compressed relative to the underlying distribution of DW-NOMINATE scores. This is a result of the fact that partisan-indicative phrases make up only a small portion of total phrase usage in the transcripts. Martin and Yurukoglu (2017), using data from cable news outlets, also find a compressed distribution on the DW-NOMINATE scale and estimate a scale factor for viewer perception of the channels' slant that is significantly greater than one, indicating that viewers perceive differences in slant across outlets to be larger than that indicated by the raw slant score differences.

[13]Larger markets use automated collection of viewership data using Nielsen's "Local People Meter" technology; the smallest markets still use manual diary-based collection.

[14]This difference is partly accounted for by the fact that many of Sinclair's existing stations are in smaller markets, as can be seen in Figure 1.

stations within the former Bonten Group markets.[15]

Finally, Table 2 shows the results from regressions of DMA-level demographic characteristics on Sinclair ownership (both pre- and post-2017). The general pattern is that Sinclair's portfolio of stations skews towards smaller, more racially homogeneous localities with lower average incomes.[16] Interestingly, Sinclair's stations are not located in markets with higher Republican vote share in the 2016 election. In Appendix D, we show the correlations of the DMAs in which Sinclair acquires stations with a variety of other demographic variables.



(a) Viewership (b) Topic Weight: National (c) Topic Weight: Local

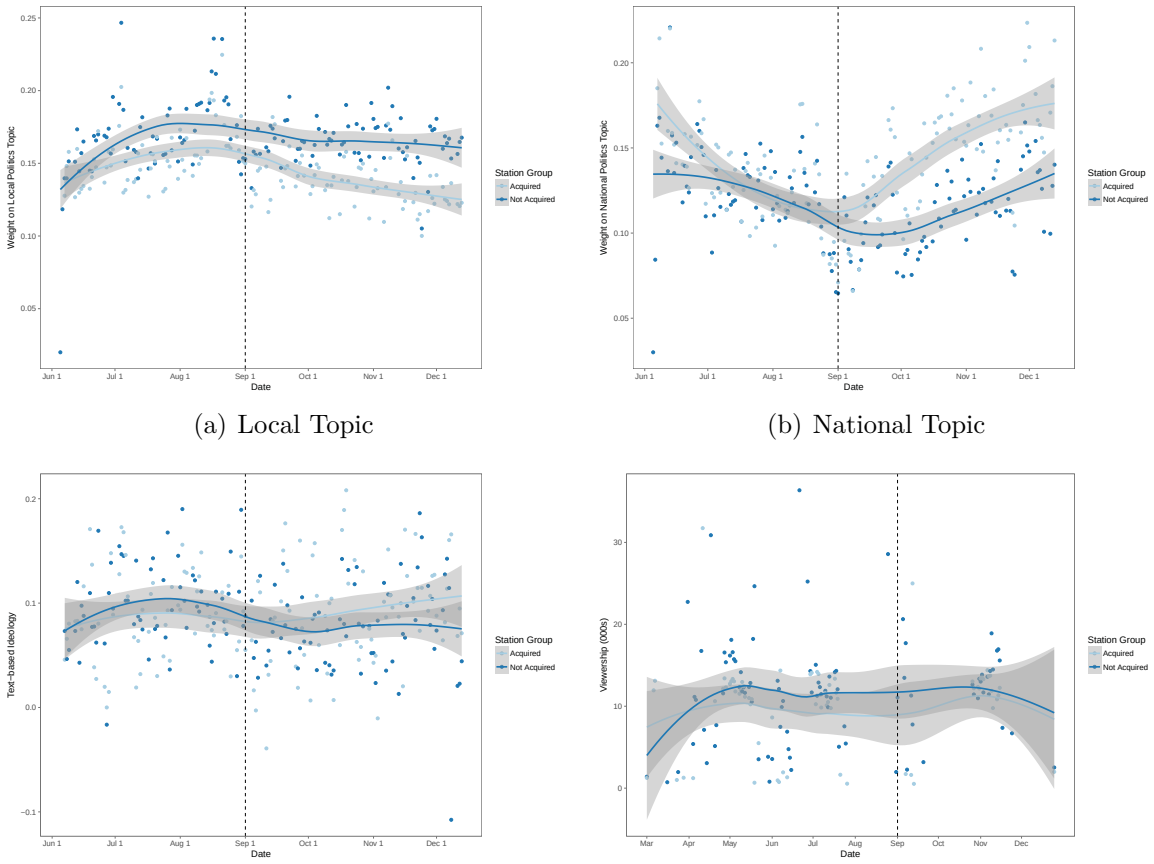
Figure 2: National-average trends in local news viewership (left panel), national politics topics weight (center panel), and local politics topics weight (right panel) around the time of Sinclair's acquitision of Bonten in September 2017. Lines are monthly averages among all Sinclair-owned stations (darker lines) and all non-Sinclair-owned stations (lighter lines) across the US.

Estimating the Influence of Station Ownership

To estimate the influence of station ownership on content and viewership we run both cross-sectional and difference-in-differences regressions employing a station's pre-2017 ownership status by Sinclair as the independent variable in the former and 2017 Sinclair acquisition as

[15]There is some missingness in the viewership data at the daily level in these markets, due to the fact that they are all smaller markets in which Nielsen collects viewership only during "sweeps" periods. Sweeps periods last a few weeks at a time and occur on a regular and approximately quarterly schedule.

[16]This pattern will change substantially if the Tribune purchase is approved.



(a) Local Topic

(b) National Topic

(c) Slant

(d) Viewership

Figure 3: Trends in local and national politics coverage (top row); ideological slant (bottom left); and viewership (bottom right) in markets affected by a new Sinclair acquisition. Figures include only stations located in a DMA in which Sinclair acquired a station in 2017 - the former Bonten Group markets. Points are daily average values across stations in the indicated group; lines are a locally weighted regression smoother. Darker lines / dots indicate stations acquired by Sinclair; lighter lines / dots indicate other stations in the same markets that were not acquired. The date of acquisition is noted by the vertical dashed line.

Table 2: Regressions of DMA characteristics on Sinclair ownership, pre-2017 stations.

	R Vote %	Pop (MM)	White %	% College	% Income$\geq$ 100K	% Age $\geq$ 60
	(1)	(2)	(3)	(4)	(5)	(6)
Sinclair Pre-2017 Station	−0.006	−0.612**	0.028**	−0.004	−0.010*	0.002
	(0.013)	(0.283)	(0.012)	(0.010)	(0.006)	(0.004)
Sinclair 2017 Acquisition	0.035	−1.404***	0.053	−0.040	−0.053***	0.018**
	(0.059)	(0.282)	(0.041)	(0.026)	(0.009)	(0.009)
Constant	0.535***	1.704***	0.788***	0.354***	0.195***	0.210***
	(0.009)	(0.276)	(0.009)	(0.007)	(0.005)	(0.002)
N	694	700	700	700	700	700
R^2	0.002	0.008	0.008	0.003	0.015	0.005

*p < .1; **p < .05; ***p < .01

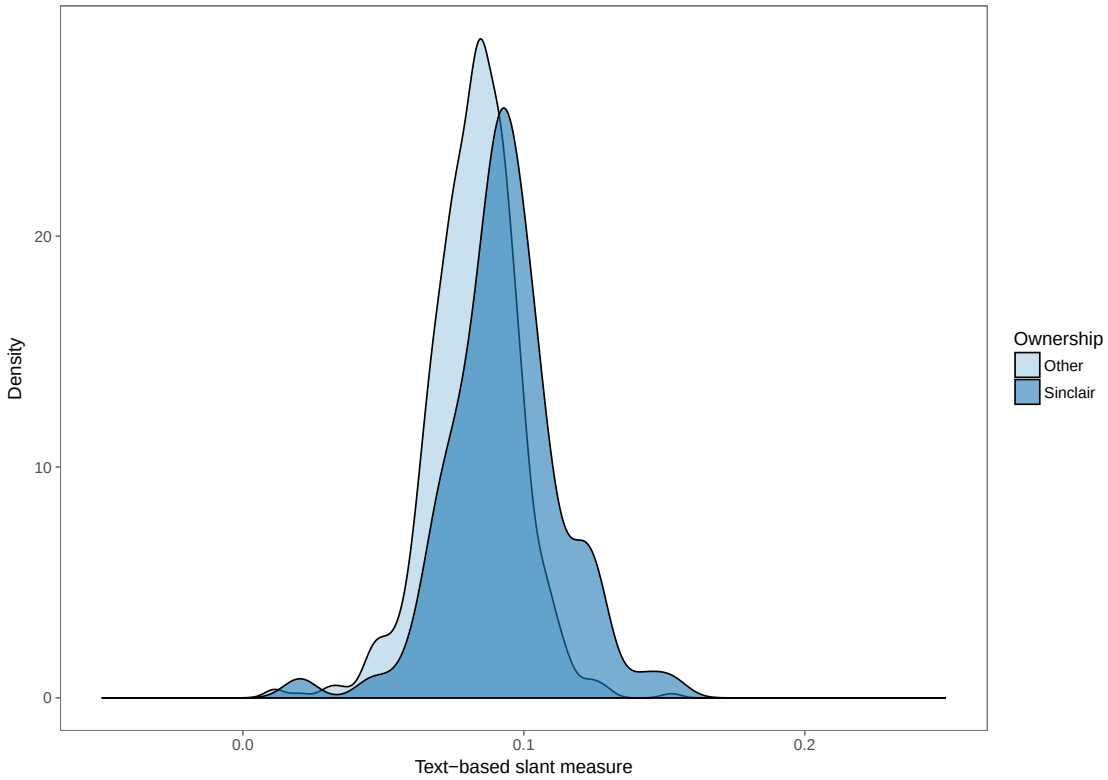


Figure 4: The density of estimated text-based slant, aggregated to the station level. The lighter-shaded density is non-Sinclair stations; the darker-shaded density is Sinclair-owned stations.

the treatment in the latter. In Tables 3 through 6 we present five model specifications for each dependent variable. The level of observation for each model is an individual 2.5 minute transcript segment; we cluster standard errors by station to match the level at which the treatment variable (Sinclair ownership) varies. All models include time slot[17], day-of-week, and network affiliation[18] dummy variables, so we estimate the effect of Sinclair ownership in all models within individual show times and days. Local news content and viewership vary systematically by time of day and day of week; for example, traffic reports are much more prevalent in early-morning time slots than in the evening news slot. The inclusion of a complete set of dummy variables for time and day ensures that our estimates of the treatment effect are not biased by a differing mix of air times or days at Sinclair- versus non-Sinclair-owned stations.

The first and second models in each table are cross-sectional regressions run on the entire dataset. The first column is a pooled regression including only the time/day dummies, while the second column introduces DMA-level fixed effects. The DMA fixed effects hold constant all time invariant market characteristics - observables like age, income and education levels, as well as unobservables like tastes for news content. Hence, their inclusion eliminates differences in content between Sinclair and non-Sinclair owned stations attributable to differences in characteristics of viewers in markets in which Sinclair operates compared to characteristics of viewers in markets in which it does not operate. Hence, the DMA fixed effects partially eliminate demand-driven sources of variation in news content.

However, DMA fixed effects do not rule out the possibility that Sinclair operates or acquires those stations within a given market that already attract a relatively more conser-

[17]A time slot here is the 30 minute block in which the segment aired, e.g. 5:30AM, 6:00AM, etc.

[18]Each station in the data set may be affiliated with one of the four national networks (ABC, CBS, NBC, FOX) or may be unaffiliated. We include separate dummies for each affiliation.

vative, or more national-news focused audience. In models 3-5 in each table we implement a difference-in-differences (DiD) design on a subset of the data limited to those DMAs in which Sinclair acquired a station in September 2017 (see Table 1 for descriptive statistics on stations acquired by Sinclair, and Figure 1 for a map of the location of these markets). In these models, we include an interaction of an indicator for being acquired by Sinclair in 2017 with a dummy variable indicating whether the observation is after September 2017, as well as main effects for both dummies. In other words, we now analyze the change in content for individual stations before and after the acquisition by Sinclair relative to other stations and programs operating in the same media market. The coefficient on the interaction term is the differential effect of Sinclair ownership on the change in a station's content from pre- to post-September 2017.

The DiD approach eliminates confounding by fixed unobservables specific to the stations acquired by Sinclair, as well as common seasonal trends in news coverage from the pre-acquisition (summer) to post-acquisition (fall) periods.[19] The first of the DiD specifications includes no additional fixed effects beyond the time slot and day-of-week dummy variables. In the second, we include DMA fixed effects, estimating the effect of Sinclair ownership within DMA. In the final specification (with the exception of Table 5, for reasons previously discussed), we include DMA by show fixed effects, estimating the effect of ownership within a given show within a DMA. The inclusion of the DMA by show fixed effect holds audience attributes constant at an even more fine-grained level than DMA fixed effects alone. It rules out possible confounding by, for instance, the set of anchors or reporters on Sinclair-owned or -acquired stations being more appealing to certain types of viewers, e.g. those with greater taste for national politics news. If we find an effect in the DiD here, it cannot be simply because Sinclair-acquired stations were already set up to appeal to a relatively

[19]As previously noted, and as depicted in Figures 2(b) and 2(c), there is strong evidence for the parallel trends assumption holding in this setting: stations display the same trends in topic coverage except for change in station ownership.

nationally-focused or relatively conservative segment of the local news audience.

Content choices: Topical coverage Across all specifications we find strong evidence in both statistical and substantive terms that Sinclair ownership affects the content of the stations they operate. In Table 3, we find in the cross-section that coverage at stations owned by Sinclair prior to 2017 places, on average, just under 4 percentage points less weight on local politics than at non-Sinclair stations in the same DMA. Given that the average local politics weight in the sample is about 12.6 percentage points, this is a substantively large reduction. In the DiD specifications, we find that when a station is acquired by Sinclair its weight on local politics coverage drops by around 1.5 percentage points, relative to the change in other stations operating in the set of DMAs in which Sinclair acquired a station. The coefficients on the topic weights can be thought of as the proportion of time spent on a specific topic, so a reduction of 4 percentage points in this context can be interpreted as, for example, 1.2 minutes less time devoted to coverage of local politics in a typical 30-minute news broadcast.[20]

In Table 4 we find the reverse effects for the national politics topic. Cross-sectionally, Sinclair stations allocate about 1 percentage point more weight to national politics on average. However, after being acquired by Sinclair, stations see a substantial shift in coverage towards national politics of about 3 percentage points – a 25% increase relative to the average level in the sample.

Appendices F and G show that this analysis is not an artifact of measurement error from the topic model we use to measure content characteristics. To assess the magnitude

[20]Appendix B includes descriptive statistics of both the national and local topic weights disaggregated by station ownership. For Sinclair stations, the mean and standard deviation for national topic weights is 0.123 and 0.203, respectively, and 0.119 and 0.199 for non-Sinclair stations. For local topic weights the same statistics are 0.099 and 0.151 for Sinclair and 0.129 and 0.178 for other stations.

Table 3: Cross-sectional and diff-in-diff regressions of local politics topics weight on Sinclair ownership.

	Weight on Local Politics Topics				
	(1)	(2)	(3)	(4)	(5)
Sinclair Pre-2017 Station	−0.029***	−0.037***			
	(0.004)	(0.004)			
Sinclair 2017 Acquisition			−0.008	−0.010	
			(0.031)	(0.009)	
Post September 2017			−0.006	−0.007	−0.006
			(0.004)	(0.004)	(0.004)
Sinclair 2017 x Post September			−0.014**	−0.013*	−0.014**
			(0.006)	(0.007)	(0.007)
Time Slot Dummies:	Y	Y	Y	Y	Y
Day-of-Week Dummies:	Y	Y	Y	Y	Y
Fixed Effects:	None	DMA	None	DMA	DMA x Show
N	7,182,509	7,090,507	188,806	188,806	188,806
R^2	0.009	0.062	0.015	0.067	0.083

*p < .1; **p < .05; ***p < .01
Standard errors (clustered by station) in parentheses. An observation is a segment. Columns 1-2 use the full sample of markets and stations. Columns 3-5 restrict to markets in which Sinclair acquired at least one station in 2017.

Table 4: Cross-sectional and diff-in-diff regressions of national politics topics weight on Sinclair ownership.

	Weight on National Politics Topics				
	(1)	(2)	(3)	(4)	(5)
Sinclair Pre-2017 Station	0.009***	0.011***			
	(0.003)	(0.003)			
Sinclair 2017 Acquisition			0.028***	0.017	
			(0.010)	(0.012)	
Post September 2017			−0.013***	−0.014***	−0.012***
			(0.002)	(0.002)	(0.003)
Sinclair 2017 x Post September			0.030***	0.031***	0.029***
			(0.005)	(0.005)	(0.006)
Time Slot Dummies:	Y	Y	Y	Y	Y
Day-of-Week Dummies:	Y	Y	Y	Y	Y
Fixed Effects:	None	DMA	None	DMA	DMA x Show
N	7,182,509	7,090,507	188,806	188,806	188,806
R^2	0.006	0.016	0.020	0.027	0.040

*p < .1; **p < .05; ***p < .01
Standard errors (clustered by station) in parentheses. An observation is a segment. Columns 1-2 use the full sample of markets and stations. Columns 3-5 restrict to markets in which Sinclair acquired at least one station in 2017.

of possible measurement error, we had research assistants manually code a sample of 10,000 segments. In this sample, we find strong agreement between human assessments and our topic weights, and no evidence that measurement error would lead to bias in the direction of finding spurious Sinclair ownership effects.

We also used this manually coded sample to train supervised classifiers that predict local versus national politics content from word usage. Predicted values from the supervised classifier can be used in place of the topic weights, yielding similar results to Tables 4 and 3. Although the results from the supervised classifier are directionally the same, we prefer the topic model approach because it uses information from all of the words in the data rather than a selected set and from all segments in the corpus rather than a small training subsample.

The results showing reduced coverage of local politics at Sinclair stations also hold if we measure coverage of local politics by counting mentions of the names of locally-elected officials who hold office in the market in which the station operates. Mentions of local officials are lower at Sinclair-owned relative to comparable (same-market) non-Sinclair stations, both in the cross-sectional and the DiD specifications. Mentions by name of local officials are very rare in local news coverage, however, and hence this approach also sacrifices precision relative to the topic model.

In Appendix D we conduct some additional analyses on the topic model output aimed at separating an explanation for these effects based on Sinclair ownership's partisan or ideological motivation from one based on production cost efficiencies of cross-market distribution. Tables A3 and A4 separately break out two of the sub-components of our composite national politics topic measure: the "foreign policy" topic and the "Trump scandals" topic, respectively. We find Sinclair increases coverage of both by similar amounts, consistent with a cost-efficiency motivation (as both kinds of story are distributable across Sinclair's portfolio) but less consistent with a partisan motivation (as Sinclair's partisan preference might push it to suppress news about the Mueller investigation or Russian interference in

the 2016 election). We also find in Table A5 that Sinclair does not increase coverage of crime stories: if anything, the Sinclair effect on crime coverage is negative. Although perceptions and attitudes about crime are closely connected with support for conservative policies in the post-civil-rights era (Weaver 2007), crime stories are local and require investment in local reporting resources. These two results provide some evidence in favor of the idea that Sinclair's exploitation of cost efficiencies in the production of news are at least part of the mechanism behind the Sinclair ownership effect on news content.

Content choices: Slant In Table 5, we analyze the ideological slant of coverage, as measured by our text-based slant estimate described in Appendix C. For purposes of this analysis, we focus on segments with 50% or more weight on the national politics topics. We restrict to national-politics-focused segments because the training set used to fit our model of ideology on phrase frequency comes from the Congressional Record (CR), and hence focuses on national rather than local issues. Including other non-national-politics segments tends to compress the distribution of slant estimates because doing so adds numerous phrases with no ideological valence in the CR.

Table 5: Cross-sectional and diff-in-diff regressions of estimated text-based slant on Sinclair ownership.

	Estimated Slant (DW-NOMINATE scale)			
	(1)	(2)	(3)	(4)
Sinclair Pre-2017 Station	0.008***	0.010***		
	(0.002)	(0.001)		
Sinclair 2017 Acquisition			−0.009	−0.012**
			(0.007)	(0.006)
Post September 2017			−0.021***	−0.021***
			(0.006)	(0.006)
Sinclair 2017 x Post September			0.023**	0.023**
			(0.009)	(0.010)
Time Slot Dummies:	Y	Y	Y	Y
Day-of-Week Dummies:	Y	Y	Y	Y
Fixed Effects:	None	DMA	None	DMA
N	6,756,741	6,673,159	175,435	175,435
R^2	0.006	0.019	0.012	0.014

*p < .1; **p < .05; ***p < .01
Standard errors (clustered by station) in parentheses. An observation is a segment. Columns 1-2 use the full sample of markets and stations. Columns 3-4 restrict to markets in which Sinclair acquired at least one station in 2017.

Columns 1-2 of this table show that according to this measure, Sinclair stations on

average are more right-leaning compared to the rest of the sample (column 1) and other stations in the same market (column 2). The DiD results in columns 3-4 show that, first, Sinclair's 2017 acquisitions were actually somewhat left-leaning prior to the acquisition (row 2). This pre-existing difference is also visible in Figure 3(c). Second, after the acquisition, coverage shifted to the right at these acquired stations, relative to other stations in the same set of markets (row 4). The size of the effect is an increase of 0.023 in the projected DW-NOMINATE score of the national politics coverage on these stations. In terms of the distribution of DW-NOMINATE scores in Congress, this is a small increase, but as Figure 4 shows, the distribution of projected scores for local news coverage is much more compressed than the distribution in Congress.[21] The magnitude of the DiD estimate here corresponds to an increase of roughly one standard deviation of the distribution of slant scores for local news stations.

In Appendix E we show that the results of this slant analysis are very similar if instead of scaling segments relative to speech in Congress, we scale relative to speech on cable news. Sinclair stations' coverage looks more similar to Fox News Channel coverage, and less similar to MSNBC coverage, than non-Sinclair stations.

The difference-in-difference results demonstrate that evidently, the content difference we see in the cross-section is not purely a function of differences in audience characteristics - stations newly acquired by Sinclair in 2017 shifted their coverage after the acquisition, making their coverage look more like that at existing Sinclair-owned stations in other markets. The large relative magnitudes of the shifts in content we measure imply that the supply-side role in the determination of news content is substantial.

[21]This is due both to the fact that the model fit in the Congressional record is far from perfect, and to the fact that ideology-indicative phrases are relatively rare in local news coverage. Both features compress the distribution of projected ideology scores on local news.

Viewer response Table 6 estimates the reaction of viewers to the change in ownership. Here, the dependent variable is the number of households (in thousands) viewing the news show, as measured by the Nielsen company. The unit of observation here is a show-day, as this is the level at which Nielsen estimates viewership. We present analogous specifications as in the content regressions above.

In Table 6 we see from the first two columns that stations owned by Sinclair prior to 2017 had news shows with relatively low viewership. This is partially explained by the fact that the Sinclair portfolio tilts towards smaller markets (see Table 2) but the difference persists even within market. The overall average difference is a drop of about 13K households, which aligns with the differences in means seen in Figure 2(a). Restricting to within-market variation, Sinclair stations draw viewership of about 7K less than other competitors operating in the same market. This is a substantial difference, equivalent to nearly 30% of typical news program viewership.[22]

The DiD results in columns 3-5 of Table 6 show that there is a small, but not statistically significant, drop in viewership at the 2017 Sinclair-owned stations after the change in ownership, relative to other stations in the same market. The magnitude of the drop is around 600 households, or about 2.5% of the median news show viewership in the sample. The 95% confidence interval is narrow enough to rule out an increase of more than about 700 households. On average, then, the response of viewers to the change in content driven by the Sinclair acquisition is close to zero, with a small decline more likely than a small increase.

These are short-term changes, however. It may take more time than the three months we have available in our data set for viewers to recognize and adjust to changes in content at

[22]Table A6 in Appendix D estimates a specification using ratings points (the fraction of total TV households in the DMA who watch) rather than absolute numbers of viewing households. The magnitude of the within-DMA Sinclair effect on ratings there is a drop of just over one percentage point.

their preferred station. Given that the average within-market viewership penalty experienced by existing Sinclair stations is much larger, it is plausible that this gap may widen over time.

Sinclair's influence on content choices at its newly-acquired stations was, on the whole, costly in viewership terms.[23] Looking at the established Sinclair stations - which experience substantially lower viewership for their local news broadcasts than their same-market competitors - is suggestive that the DiD estimate for the newly acquired stations is an under-estimate of the long-term viewership effect of these changes. The fact that Sinclair nonetheless implemented the changes in content we document suggests that cost efficiencies on the production side (for example, airing the same nationally-focused and right-leaning segments on all stations in the portfolio) dominated the potential loss of advertising revenues from the viewership decline.

Table 6: Cross-sectional and diff-in-diff regressions of news program viewership on Sinclair ownership.

	Viewership (000s)				
	(1)	(2)	(3)	(4)	(5)
Sinclair Pre-2017 Station	-13.210^{***}	-7.410^{***}			
	(2.856)	(2.412)			
Sinclair 2017 Acquisition			2.855	1.938	
			(6.517)	(2.863)	
Post September 2017			0.895	0.986	0.968
			(0.714)	(0.765)	(0.706)
Sinclair 2017 x Post September			−0.129	−0.606	−0.679
			(0.785)	(0.829)	(0.755)
Time Slot Dummies:	Y	Y	Y	Y	Y
Day-of-Week Dummies:	Y	Y	Y	Y	Y
Fixed Effects:	None	DMA	None	DMA	DMA x Show
N	525,636	522,985	4,364	4,364	4,364
R^2	0.133	0.500	0.183	0.509	0.666

$^{*}p < .1$; $^{**}p < .05$; $^{***}p < .01$
Standard errors (clustered by station) in parentheses. An observation is a program. Columns 1-2 use the full sample of markets and stations. Columns 3-5 restrict to markets in which Sinclair acquired at least one station in 2017.

[23]The two changes in content we document - on the ideological dimension and the local/national dimension - are non-separable, and thus we cannot disentangle which is the source of the viewership drop.

Discussion

Our findings show that ownership matters for the content of local news. Following the acquisition of Bonten Media Group by Sinclair, the former Bonten stations' content shifted towards coverage of national politics at the expense of local politics, relative to other stations in the same media market. Acquired stations' content also moved to the right on the ideological dimension, again relative to other stations in the same media markets. This change brought the acquired stations closer in line with the pattern of coverage at existing Sinclair-owned stations, at the cost of a small decline in viewership relative to the stations' same-market competitors.

Both dimensions of content are important for political outcomes. Given the decline of local print media, local TV news is one of the few remaining sources of locally-focused journalism. The substantial post-acquisition drop in local coverage at Sinclair-acquired stations can be expected to reduce viewers' knowledge of the activities of local officials. Although the recency of the Bonten acquisition limits the set of downstream political outcomes that we can study, existing evidence (Snyder and Strömberg 2010; Hayes and Lawless 2015) suggests a strong prior that a local coverage drop will translate into reductions in both accountability for local officials and citizen engagement in local and state-level politics.

These results are a counterpoint to Hopkins (2018), who finds "no evidence of a shift away from state and local content (pp. 199)" in a sample of seventy stations from 2005-2009. While there may not be a secular long-term trend away from local and state content in TV news, we show that consolidation can generate meaningful changes in the levels of local content even in the very short term. Insofar as the longstanding trend in local TV is towards greater concentration (Matsa 2014), it is likely that this local-to-national shift will continue. Although the specific acquisition that we study is very recent, Sinclair and other conglomerates have been steadily expanding since the 1980s. Ownership consolidation effects are therefore unlikely to be limited to the particular case we study here, but have influence on the broader news environment over a long time horizon.

The rightward shift in content at Sinclair-acquired stations can also be expected to have real consequences for election outcomes and mass polarization. Media outlets' persuasive power is mitigated by the sensitivity of their audiences to content changes - if all left- (right-)leaning viewers fled following a leftward (rightward) shift in content, then "persuasion rates" (DellaVigna and Kaplan 2007) would be small and subsequent electoral influence minimized. In the local news case, the demand response to the content shift that we measure is fairly small. The estimated average viewership decline in our sample is about 700 households, compared to the median program-level viewership in the sample of about 25,000 households. Although we have only aggregate viewing data and hence cannot say definitively whether any individual viewers switched or not, given the very high documented persistence of individuals' TV news viewership over time (Martin and Yurukoglu 2018), a plausible interpretation of this estimate is that the vast majority of viewers watching before the acquisition date continued to watch afterwards. For such non-switching viewers, the ideological valence of their news diet lurched rightwards following the acquisition.

Implications for ownership effects on news coverage. These results speak directly to the literature on the influence of media ownership on the political content of the news produced by a media organization. This research program has found that the ownership of a media outlet determines how that outlet covers campaigns and candidates (Branton and Dunaway 2009; Dunaway and Lawrence 2015) and how the outlet slants its coverage away from issues potentially damaging to the the ownership's political or financial interests (Bailard 2016; Gilens and Hertzman 2000). We provide additional support for these claims, documenting a substantial shift in topics covered and ideological slant of political coverage as a product of ownership change. Moreover, the empirical strategy we employ allows us to assess the change in a station's coverage relative to other stations in the same media market and ascertain that these changes in content are due to change in ownership and not simply products of confounding by cross-outlet differences in audience composition.

These implications are particularly meaningful for the context discussed in this paper – ownership of multiple local outlets by a conglomerate owner. Dunaway (2008), for instance, documents a relationship between corporate ownership and the quality of campaign coverage by local outlets. Research on determinants of ideological slant (e.g., Gentzkow and Shapiro 2010; Hamilton 2004; Mullainathan and Shleifer 2005), however, has tended to find that most variation in slant is attributable to variation in audience taste rather than ownership structure. In contrast, we find consistent effects of ownership on slant within market and within station, which are not accompanied by corresponding viewership increases and hence are difficult to explain in terms of the new ownership providing content better matched to local audience tastes.

Our results also provide evidence for a different mechanism for ownership influence than that usually considered in the literature on determinants of media coverage. While the rightward shift in slant we document is consistent with the political preferences of Sinclair's ownership, we find evidence that Sinclair devotes more coverage to all national politics topics - including some that are harmful to its partisan objective - and does not devote more coverage to some topics that might be ideologically beneficial but would also require more investment in local reporting resources. Both facts imply that at least some of the ownership effect on content is not limited to owners motivated by desire for political influence but is due to cost-efficiency motives general to all profit-seeking media owners.[24] This influence of

[24]In pursuit of such efficiencies, Sinclair also appears to be changing the *profession* of the local news anchor. Existing research has argued that local news styles are largely homogeneous across stations and geographies because anchors move from one station to another as their careers advance, bringing their style and presentation with them (Belt and Just 2008; Rosenstiel et al. 2007). However, Sinclair's new strict contract model (Holman, Greenfield and Smith 2018) for its employees and anchors may result in a change to this status quo, eventually driving larger gaps in content and slant when comparing Sinclair stations to non-Sinclair stations. Changing the incentives and behavior of news anchors may be another

production costs on content is consistent with existing work on the institutional determinants of news quality (Dunaway 2011). Local politics coverage can be thought of as a measure of the quality of an outlet's news product, reflecting its investment in journalistic staff. Changes in ownership structure can change the relative costs of providing different kinds of content, and thus the outlet's willingness to make these investments.

Implications for media regulation. Finally, our results have strong implications for the regulatory oversight of mergers in the TV industry. One factor enabling Sinclair's rapid recent expansion is the FCC's elimination of the "main studio rule", which required local news stations to maintain a physical studio in the broadcast area. For Sinclair and other conglomerates, the potential for economies of scale resulting from the elimination of the rule is straightforward. The results presented here document a cost of the current laissez-faire approach to cross-market consolidation.

Regulatory oversight has traditionally focused on measures of concentration defined at the local market level, such as the FCC's prohibition on a single entity owning both a full-power TV station and a daily newspaper in the same market and caps on DMA-level TV market share that can be owned by a single entity.[25] Prat (2018) has previously argued that this traditional approach is good at measuring a media owner's pricing power but very bad at measuring its *political* power; to measure the latter, Prat shows, one needs a measure of ownership concentration - "attention share" - defined at the individual rather than the market level.

Our analysis points to a distinct but similarly consequential problem with the use of such market-level concentration statistics to assess mergers in the TV industry. Prat observed that two configurations of reader- or viewer-ship could produce identical concentration statistics

mechanism that produces long term shifts in news coverage style, slant and quantity.

[25] `https://www.fcc.gov/consumers/guides/fccs-review-broadcast-ownership-rules`

but very different implications for media influence and polarization: contrast, for example, a hypothetical world where all consumers devote equal time to each of three media outlets, to one where one-third of consumers read only the first outlet, one-third only the second, and one-third only the third. Though in each configuration each outlet has a one-third share of the total readership, in the first readers can cross-check factual claims of one outlet against the others, limiting media owners' ability to distort information; in the second, each media owner has an unfettered monopoly over the information available to its share of the reading public.

Our analysis shows that an analogous property is true when moving in the opposite direction of aggregation: the news content that would be provided by a TV industry consisting of a handful of national conglomerates would look very different than that provided by one comprising numerous single-market operators, even holding measures of market-level concentration fixed. The cost efficiencies of consolidating news production appear to be large enough to make up for net losses in viewership it induces.[26] Even though consumers on average appear to prefer the more local-focused and ideologically moderate (pre-Sinclair) mix of coverage to the more national-focused and ideologically conservative (post-Sinclair) mix, Sinclair management still opted to reduce local heterogeneity in coverage across its stations by substituting centrally-produced, nationally focused conservative segments for locally-produced, less partisan content. Although the short-term post-acquisition viewership drop we document is small, the fact that both the DiD and within-market fixed-effect estimates of Sinclair ownership on viewership are negative - and the within-market estimate substantially so - implies that catering to viewer preferences is not the primary motivation for the changes in content implemented at the former Bonten stations.

[26]As noted earlier, this effect of consolidation can hold even if conglomerate owners are pure profit-maximizers with no political interest or agenda. An ideologically-motivated owner might be willing to tolerate even greater viewership losses in order to push coverage in the direction of the owner's preference.

Given the importance of local news provision for the accountability of local elected officials, regulators should not neglect this effect of cross-market ownership consolidation on local news content. Current trends towards national consolidation in TV and other media ownership have worrying implications for the performance of local governments and for mass polarization.

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