The Fox News Effect: Media Bias and Voting[*]

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Abstract

Does media bias affect voting? We address this question by looking at the entry of Fox News in cable markets and its impact on voting. Between October 1996 and November 2000, the conservative Fox News Channel was introduced in the cable programming of 20 percent of US towns. Fox News availability in 2000 appears to be largely idiosyncratic. Using a data set of voting data for 9,256 towns, we investigate if Republicans gained vote share in towns where Fox News entered the cable market by the year 2000. We find a significant effect of the introduction of Fox News on the vote share in Presidential elections between 1996 and 2000. Republicans gain 0.4 to 0.7 percentage points in the towns which broadcast Fox News. The results are robust to town-level controls, district and county fixed effects, and alternative specifications. We also find a significant effect of Fox News on Senate vote share and on voter turnout. Our estimates imply that Fox News convinced 3 to 8 percent of its viewers to vote Republican. We interpret the results in light of a simple model of voter learning about media bias and about politician quality. The Fox News effect could be a temporary learning effect for rational voters, or a permanent effect for voters subject to non-rational persuasion.

1 Introduction

Over 70 percent of Americans believe that there is a great deal or a fair amount of media bias in news coverage (Pew, 2004). Evidence of bias ranges from the topic choice of the New York Times (Puglisi, 2004) to the choice of think-tanks that the media refer to (Groseclose and Milyo, 2004). Media bias was even more prevalent in the late 19th and early 20th century (Gentzkow, Glaeser, Goldin, 2005).

This evidence, however, leaves open the question of whether media bias matters. Does media bias affect the political beliefs of the audience? Does it change voting behavior? These are key questions for economics and political science that the media bias literature[1] has yet to address.

The answers to these questions also have implications for policy, such as for the regulation of media concentration. If media bias alters voting behavior, deregulation of media markets may have a large impact on political outcomes.

In this paper, we present empirical evidence on the impact of media bias on voting. We consider one of the most significant changes in the US media in recent years, the entry and expansion of the Fox News cable channel. We exploit the natural experiment induced by the timing of the entry of Fox News in local cable markets and consider the impact on voting.

We employ a difference-in-difference methodology and compare changes in the Republican vote share for towns where Fox News was introduced before the 2000 elections to towns where it was not present by 2000. We exploit three key elements of the Fox News natural experiment, the fast expansion, the geographical differentiation, and the conservative slant in its coverage.

The 24-hour Fox News channel was introduced by Rupert Murdoch in October 1996 to compete with CNN. Like CNN, it was offered only via cable and, to a smaller extent, via satellite. Thanks to an aggressive marketing campaign, a number of cable companies added Fox News to their programming over the next four years. The geographical expansion was accompanied by a corresponding increase in the audience share. By June 2000, 17.3 percent of the US population reported watching Fox News regularly (Scarborough Research data).

The nature of the cable industry induces substantial geographical variation in access to Fox News. Cable markets are natural monopolies with capacity constraints on the number of channels. The availability of Fox News in a town depends on whether the local cable company decides to add it to the programming, possibly at the expense of another channel. Cable companies in neighboring towns often make different decisions, creating idiosyncratic variation in access. This allows us to compare voting patterns in neighboring towns which are similar except for the availability of Fox News.

Even given the sudden expansion and popularity of Fox News, and the variation in Fox News

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[1] The theoretical studies include Baron (2004), Gentzkow and Shapiro (forthcoming), and Mullainathan and Shleifer (2005).

diffusion, it is unclear whether the addition of any single media source could have a significant impact on the political beliefs of voters. Fox News coverage, however, is unique among the television media. Fox News is significantly to the right of all the other mainstream television networks (ABC, CBS, CNN, and NBC) (Groseclose and Milyo, 2005). The introduction of Fox News into a cable market, therefore, is likely to have a systematic and significant effect on the available political information in that cable market. This is true whether Fox News represents the political center and the rest of the media the liberal wing, or Fox News represents the right and the rest of the media the middle.

In order to analyze the impact of Fox News on voting, we assemble a new panel of town-level data on federal elections and match it with town-level data on cable programming. The data set covers 28 US states. We compare the change in the Republican vote share between 1996 and 2000 for the towns that had adopted Fox News by 2000 with those that had not. The availability of Fox News in 2000 appears to be largely idiosyncratic. Conditional on a set of demographic, geographic, and cable controls, the Fox News and the non-Fox News towns have indistinguishable voting patterns in 1996 and indistinguishable pre-1996 voting trends.

Our main result is that Fox News had a significant impact on the 2000 elections. The entry of Fox News increased the Republican vote share in presidential elections by 0.4 to 0.7 percentage points, depending on the specification. Since Fox News in 2000 was available in about 35 percent of households, the impact of Fox News on the two-party vote share in 2000 is estimated to be 0.15 to 0.2 percentage points, 200,000 votes nation-wide. While this vote shift is small compared to the 3.5 percentage point shift in our sample between 1996 and 2000, it is still likely to have been decisive in the close presidential 2000 elections.

We consider alternative specifications and different estimation samples, leading to similar estimates. We implement placebo specifications; in particular, we show that availability of Fox News in 2000 did not affect the vote share between 1992 and 1996, when Fox News did not yet exist. We consider also how the estimates interact with town characteristics. Fox News had a smaller effect in rural areas, in Republican congressional districts, and in the South. Our interpretation of these results is that in these towns more people already voted Republican, and therefore the share of the population at risk of being convinced was smaller. In addition, the Fox News effect was smaller in towns with more cable channels, consistent with competition reducing the media effect (Mullainathan and Shleifer, 2005).

We also analyze whether Fox News affected voting in races where Fox News did not cover the candidates directly, as in most Senate races. This allows us to estimate whether the influence of Fox News is candidate-specific or whether it extends to general political beliefs. We find that Fox News significantly increased the Republican vote share for Senate by 0.8 percentage points. Additionally, the effect is not larger for the one Senatorial race that Fox News covered heavily, the New York State race between Hillary Clinton and Rick Lazio. Fox News appears to have induced a generalized ideological shift.

Finally, we consider whether the Fox News effect on Presidential elections was mainly a result of voters switching party lines, or of additional voter turnout to the polls. We find that Fox News significantly increased voter turnout, particularly in the more Democratic districts. The impact of Fox News on voting appears to be due, at least in part, to the mobilization of voters, and particularly conservative voters in Democratic-leaning districts.

Overall, we find a positive and sizeable impact of Fox News on the vote share for Republicans. This empirical result, however, does not directly quantify the effectiveness of media bias in altering voting. To estimate the persuasion rate of Fox News, we incorporate information on the extent of viewership and the share of Republicans in the Fox News audience. Using Scarborough Research data, we compute the impact on the Fox News audience of availability of Fox News in local cable programming. These audience estimates imply that Fox News convinced between 3 and 8 percent of its non-Republican listeners to vote Republican. Alternative audience measures imply persuasion effects of up to 30 percent. Exposure to the conservative coverage of Fox News, therefore, had a sizeable persuasion effect.

We compare the persuasion rates estimated in our study with the persuasion rates implied by other studies of media effects on political beliefs or voting.[2] First, we consider field experiments on voter turnout (Green and Gerber, 2004) and on party choice (Gerber, Karlan, and Bergan, 2006). The most effective turnout methods—canvassing and phone calling—convince up to 25 percent of potential voters to turn out. Second, we consider laboratory experiments involving exposure to 30-second political advertisements (Ansolabehre and Iyengar, 1995). The advertisements alter voting intentions elicited at the end of the experiment for about 8 percent of the subjects. Third, we review poll studies. Kull et al. (2003) find that Fox News watchers were 50 percent more likely that viewers of other networks to believe (erroneously) that weapons of mass destruction were found in Iraq. Gentzkow and Shapiro (2004) find significant effects on beliefs about 9/11 of exposure to CNN vs. Al Jazeera in the Islamic world. These surveys imply that media exposure persuades 10 to 15 percent of the audience. While this overview is by no means exhaustive[3], it shows that our estimates of persuasion rates are in the lower range of most estimates in the literature.

We consider three explanations of our results. The first explanation is that the findings are spurious and are induced by entry of Fox News in towns that were independently becoming more conservative. Contrary to this explanation, these towns were no more conservative nor were they becoming more conservative before the entry of Fox News. A second explanation is based on rational learning. As the model in Section 2 shows, to the extent that voters are initially uncertain about the bias of Fox News, exposure will have a (temporary) effect on beliefs and voting. Voters attribute the positive coverage of Bush in 2000 partly to Republican bias

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[2]Dyck and Zingales (2003) and Huberman and Regev (1999), among others, find that media coverage has a large impact on stock returns, even when arguably it conveys no new information.

[3]Zaller (1996) summarizes a long-standing literature on null effects of media exposure in surveys.

of the media source (Fox News) but partly also to high quality of the Republican candidate (Bush). This prediction relies on the exposure to Fox News between 1996 and 2000 being too short to precisely estimate the political bias of the media source. This model also makes the prediction that the media effect should disappear over time. However, the Fox News effect appears to be permanent, if anything increasing between 2000 and 2004. A third explanation is that viewers do not discount enough for media bias and are subject to non-rational persuasion. In this case, exposure to media slant systematically alters beliefs and voting behavior.

The latter interpretation relates to the behavioral literature on over-reliance on the advice of experts with conflict of interest. Cain, Loewenstein, and Moore (2005) show in an experiment that evaluators of information do not take sufficiently into account the incentives of the advisors, even when the incentives are known. Malmendier and Shanthikumar (2005) show that small investors follow the recommendations of affiliated analysts, despite the conflict of interest of the analysts.

Our paper contributes to the evidence on shifts in voter turnout following media market expansion. George and Waldfogel (2004) show that, in areas where New York Times circulation expanded in the '90s, voter turnout in local election decreased among likely readers. Gentzkow (2006) finds a similarly negative effect of the expansion of television on voter turnout between 1940 and 1972. Stromberg (2004) finds that entry of the radio increases county-level turnout between 1920 and 1940. We differ from these studies in that (i) we examine the introduction of a politically-slanted media, and (ii) we consider the media effects at a finer geographical level, the town. Like these authors, we find some evidence that the arrival of a new information source impacts voter turnout.

The remainder of the paper is structured as follows. In Section 2 we present a simple model of the effect of media bias on voting. In Section 3 we provide an overview of the cable industry and of Fox News. In Section 4 we introduce the data and in Section 5 we present the empirical results. In Section 6 we present estimates of persuasion rates and interpretations and in Section 7 we conclude.

2   Model

We model the impact of media bias on voting in the presence of a new media source. Voting depends on both ideological preferences and perceived politician quality. We *define a* news media *outlet to be* biased *if* it systematically slants its broadcast of politician quality to favor either the Republican or the Democratic candidate. We consider both voters who rationally update from news reports and voters who are subject to non-rational persuasion.

Setup. In each period t, the media reports about a different pair of politicians, one Republican and one Democrat. These can be candidates running against each other in an election, such as Bush and Gore, or non-elected officials, such as Rove and McAuliffe. While the politi-

cal affiliation of the politicians is known, the ability is unknown and can be guessed only using the media reports. The true differential ability of the period-t Republican politician relative to the period-t Democratic politician is θ_t, which is i.i.d. and distributed normally with mean 0 and precision γ_θ: $\theta_t \sim N\left(0, 1/\gamma_\theta\right)$.

The media observes the politician ability θ_t and broadcasts $\psi_t = \theta_t + \beta$, where β is the time-invariant degree of media bias, drawn from the distribution $N\left(\beta_0, 1/\gamma_\beta\right)$. A media source with positive β provides a more favorable broadcast of the Republican politician, and the converse for a media source with negative β. Since the focus of the model is on voter behavior and not on media strategy, we simplify matters by assuming a reduced-form 'news production function', instead of deriving an optimal bias policy from the utility maximization of the media. The voters learn about the bias β over time from the sequence of media reports ψ_t.

After observing the media reports on all the candidates from period 1 to period T, voters cast their ballots in period T for the candidates that the media covered in period T. The voting is based upon the estimated quality of the period-T candidates, as well as on ideological preference. A voter casts a ballot for the Republican candidate in period T if $\widehat{\theta}_T + \alpha > 0$ where $\widehat{\theta}_T$ is the voter estimate of the differential ability of the Republican politician in period T and α is the ideological preference for the Republican candidate (α can be positive or negative). Ideological preference α is heterogeneous, with a continuum of voters, c.d.f. $F\left(\alpha\right)$, and p.d.f. $f\left(\alpha\right) > 0$ for all α. (Voters are instead homogeneous in their updating about β and θ)

Signal extraction. The voter faces a signal extraction problem. Upon observing a media signal ψ_t, the voter makes inferences with respect to the politician quality θ_t and the degree of media bias β. A positive signal ψ_t could be due to an able Republican candidate, or to a right-wing media source. After observing T news reports with average report $\overline{\psi}_T = \sum_{t=1}^{T} \psi_t / T$, given the normal distribution of the signals, the voters estimate the bias to be[4]

$$\hat{\beta}_T = \frac{\gamma_\beta \beta_0 + T \gamma_\theta \overline{\psi}_T}{\gamma_\beta + T \gamma_\theta}. \tag{1}$$

The estimated bias is a convex combination of the mean bias, β_0, and the observed average report $\overline{\psi}_T$, with weights given by the precision of the prior γ_β and the precision of the observed signal $T\gamma_\theta$. The more signals (higher T) the voter observes, the more weight the voter puts on the news reports.

Using this estimate of media bias, rational voters estimate the differential quality of the period-T Republican candidate $\hat{\theta}_T$. They subtract the estimated bias $\hat{\beta}_T$ from the report ψ_T, and combine it in a precision-weighted average with the prior about θ_T, that is, zero (Republican and Democratic politicians are on average of the same quality). Hence

$$\hat{\theta}_T = \frac{\gamma_\theta * 0 + W[\psi_T - \hat{\beta}_T]}{\gamma_\theta + W} = \frac{W[\psi_T - \hat{\beta}_T]}{\gamma_\theta + W} \tag{2}$$

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[4]The derivation and the proofs are in Appendix B.

where W, the precision of $\psi_T - \hat{\beta}_T$, equals $(\gamma_\beta + T\gamma_\theta)^2 / (\gamma_\beta + (T-1)\gamma_\theta)$.(see Appendix B).

So far, we have considered fully rational updating by voters. We now consider a simple reduced-form model of voters subject to persuasion. As in DeMarzo et. al. (2003), we interpret persuasion as incomplete filtering of bias. Voters subject to λ-persuasion believe that the report ψ_t equals $\theta_t + (1-\lambda)\beta$, even though in reality the report ψ_T equals $\theta_t + \beta$. The parameter $\lambda \in [0, 1]$ measures the degree of persuasion, with $\lambda = 0$ nesting the standard model, and $\lambda = 1$ indicating extreme persuasion. These voters systematically underweight the importance of media bias in influencing news reports. This is consistent with the experimental findings in Cain et al. (2005) in which subjects did not take the bias of the information-provider sufficiently into account, even though the bias was common-knowledge. For simplicity, we assume that the degree of persuasion λ affects neither the estimate of media bias $\hat{\beta}_T$ nor the precision W of $\psi_T - (1-\lambda)\hat{\beta}_T$; therefore, $\hat{\beta}$ and W are not indexed by λ.[5] When estimating $\hat{\theta}_T$, voters subject to λ-persuasion subtract only $(1-\lambda)\hat{\beta}_T$ from ψ_T to form the estimate $\hat{\theta}_T^\lambda$:

$$\hat{\theta}_T^\lambda = \frac{W[\psi_T - (1-\lambda)\hat{\beta}_T]}{\gamma_\theta + W}. \tag{3}$$

In Proposition 1, we summarize the effect of media bias β on the estimated ability of the Republican politician $\hat{\theta}_T^\lambda$, conditional on the realized politician quality θ_t, $t = 1, ..., T$. We consider the case of voters subject to λ-persuasion, since the standard case is embedded for $\lambda = 0$.

Proposition 1. *For any finite T, (i) an increase in media bias β increases the estimated quality of the Republican politician, $\widehat{\theta}_T^\lambda$: $\partial(\widehat{\theta}_T^\lambda)/\partial\beta > 0$, and (ii) this increase is higher the more voters are subject to λ-persuasion: $\partial^2(\widehat{\theta}_T^\lambda)/\partial\beta\partial\lambda > 0$. (iii) In the limit as $T \to \infty$, the effect of media bias is positive in the case of persuasion ($\lambda > 0$) and zero otherwise:* $\lim_{T\to\infty} \partial(\widehat{\theta}_T^\lambda)/\partial\beta = \lambda$.

The intuition for Proposition 1 is straightforward. There are two effects of media bias β on expected politician quality $\hat{\theta}_T^\lambda$. First, a more right-wing media (higher β) issues a more positive signal ψ_T on the T-th Republican politician, which leads to a higher perceived $\hat{\theta}_T^\lambda$. Second, a higher β is associated with a higher average of past signals $\overline{\psi}_T$, and therefore to a higher perceived media bias $\hat{\beta}_T$, leading to a lower perceived $\hat{\theta}_T^\lambda$. For finite T, the first, direct effect dominates the second, indirect effect, and hence media bias has an impact on beliefs: $\partial(\widehat{\theta}_T^\lambda)/\partial\beta > 0$ (Proposition 1.(i)). Moreover, since the degree of persuasion, λ, decreases the second effect, media bias has a larger impact on beliefs for higher λ (Proposition 1.(ii)).

As $T \to \infty$, the estimated media bias $\hat{\beta}_T$ converges to the true bias β. Since eventually the voters become fully aware of the degree of bias, the media bias has no effect on the expected perceived quality as long as voters are rational ($\lambda = 0$). The same would be true if the bias β

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[5]A model where we relax this simplifying assumption and allow for λ to affect $\hat{\beta}$ and W leads to similar results, with more complicated expressions.

were known from the start. Voters that suffer from persuasion ($\lambda > 0$), instead, are affected by media bias β even after an infinite number of media reports (Proposition 1.(iii)).

Finally, we analyze the impact of media bias on voting, which takes place in period T. A voter subject to λ-persuasion casts a ballot for the period-T Republican candidate if $\alpha + \widehat{\theta}_T^\lambda > 0$. Then, the share of votes for the Republican candidate is $P(\alpha \geq -\widehat{\theta}_T^\lambda) = 1 - F(-\widehat{\theta}_T^\lambda)$, an increasing function of the estimated (differential) ability $\widehat{\theta}_T^\lambda$ of the Republican candidate. Proposition 2 summarizes the effect of media bias β on the vote share $1 - F(-\widehat{\theta}_T^\lambda)$.

Proposition 2. (i) *For any finite T, an increase in media bias β increases the Republican vote share $1 - F(-\widehat{\theta}_T^\lambda)$: $\partial[1 - F(-\widehat{\theta}_T^\lambda)]/\partial\beta > 0$. (ii) In the limit as $T \to \infty$, the effect of media bias is positive in the case of persuasion ($\lambda > 0$) and is zero otherwise.*

The impact of media bias on voting follows in a straightforward manner from its impact on beliefs. A new media source can temporarily move voters in the direction of its bias even if voters are rational (Proposition 2.(i)); in the long run, however, only voters subject to persuasion remain affected (Proposition 2.(ii)). Proposition 1.(ii) does not generalize to voting without restrictions on the shape of the distribution of voters F. While a higher λ increases the impact of β on the estimated politician quality $\widehat{\theta}_T^\lambda$, it does not necessarily increase the impact on the vote share $1 - F(-\widehat{\theta}_T^\lambda)$ if the elasticity of voting with respect to beliefs, captured in f, is lower for individuals with higher λ.

The empirical predictions of the model depend on the length of the experience of the audience with Fox News by 2000. Since Fox News was started in 1996, by the year 2000 its audience had the chance to experience its coverage of several politicians, from Clinton and Dole, to Ted Kennedy and John McCain, to Gore and Bush. The viewers were also exposed to Fox News' reporting on non-elected political figures such as Ken Starr or Jesse Jackson. To the extent that each pair of politicians is an observation t, therefore, one reasonable assumption is that by the 2000 elections the audience had a precise estimate of the Fox News bias (case $T \to \infty$). In this case, only voters subject to persuasion should be affected by the exposure to Fox News. Fox News should not impact rational voters.

A different interpretation holds that, instead, four years are too short a period for the audience to form a clear opinion of the Fox News bias, especially since some of the audience listened to it for only a year or two before 2000. In this case, Fox News should affect voting on Bush and Gore also for rational voters. The impact should diminish over time, between 2000 and the subsequent elections, and should be stronger if voters suffer from persuasion.

3 Cable Industry and Fox News

Cable industry. The cable industry is a local natural monopoly. Once one company has paid the fixed cost to lay the cables in a town, it is uncommon for a second company to pay

the fixed cost as well and enter the local market. In our sample, only ten percent of towns have two competing cable companies, and only one percent have three or more companies.

A second important feature of the cable industry is the technological constraint on the number of channels. Established channels like CNN are offered in almost all towns. New channels like Fox News have to convince local cable companies to be added, often at the expense of other channels. This generates substantial variation across towns in the programming provided.

Local cable service providers (henceforth local cable companies) pay a monthly fee, typically between 10 cents and 40 cents per user, to the networks that they carry. They also pay fees to towns that grant them the right to broadcast. These fees are typically set as part of a 10- to 15-year contract with the town. Finally, local cable companies get their revenue from their monthly subscriber fees. The amount of the subscriber fee is partly regulated and varies between $10 and $60, depending on the company, the location, and on the tier of service.

Fox News history. In March of 1996, Rupert Murdoch, CEO of News Corp., announced the introduction of a 24-hour-a-day cable news channel. The new channel, Fox News Channel ("Fox News" from here on), was created to compete with CNN. Prior to the launch of Fox News, news broadcasts took up a small share of programming of the Fox Broadcasting Corporation, which included channels like Fox Sports, Fox Entertainment, and Fox Family Channel. There was no broadcast news at a national level, and prime time programming on the various Fox channels did not include news. The main television sources for news before 1996 were the three major networks—ABC, CBS, and NBC—, in addition to CNN, distributed via cable.

The distribution of Fox News started on October 7, 1996 in a limited number of cable markets. To facilitate the spread of the new channel, the Fox Network offered a one-time payment of $10 per subscriber to cable companies that included Fox News in their programming. TCI was one of the first companies to sign a contract with Fox News. After the initial contract was signed, the local affiliates decided whether to include Fox News among the channels transmitted. The timing of the agreement is one factor inducing idiosyncratic diffusion of Fox News. By November 2000, AT&T Broadband, which acquired TCI Cable in 1999, offered Fox News in 32.5 percent of the 1,955 towns served by its affiliates (in our sample of 28 US States). Adelphia Communications, which had a late agreement with Fox News, offered Fox News in only 7.5 percent of the 1,592 towns in our sample served by its affiliates.

In addition to 24-hour cable programming, Fox News distributes short news segments to local TV stations that are affiliates of Fox Broadcasting. However, the complete programming of Fox News is only available via cable and to 12 million satellite subscribers (in 2000).[6]

By the year 2000, Fox News was present in 20 percent of towns in our sample with cable service. Since the towns reached by Fox News in 2000 were more than twice as large as the

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[6]As of June 2000, 14,458,000 US households subscribe to a satellite service, but 2 million of these subscribers do not receive Fox News (Satellite Broadcasting and Communications Association, from http://www.sbca.com/index.asp).

remaining towns, Fox News was available to 34.3 percent of the population of these states.

Fox News content and programming. A key feature of Fox News is the differentiation in its political coverage relative to CNN and the network news stations. Groseclose and Milyo (2005) use data on citations of think-tanks between 1997 and 2003 to rank the political orientation of news programs from different media sources. In particular, they impute an ADA score for the news program based on the ADA score of the members of Congress that refer to the same think-tanks.[7] Their estimation results assign an imputed ADA score for Fox News *Special Report* of 39.7. This score is significantly lower than the score for any of the other mainstream television media (ABC, CBS, CNN, and NBC), with scores between 56.0 (CNN *NewsNight*) and 73.7 (CBS *Evening News*). The news coverage of Fox News is estimated to be significantly more conservative than all other TV news channels. Moreover, Fox News coverage is estimated to be to the right of the average US elected official, which has a score of 50.1.

This study may, if anything, underestimate the political differentiation of Fox News. The two Fox News shows with the highest ratings, *The O'Reilly Factor* and *Hannity & Colmes*, are likely more conservative than the *Special Report*, which Groseclose and Milyo use to estimate the ADA citations. Both shows aired since the beginning of Fox News.

Fox News Audience. We document the Fox News penetration and the political and demographic composition of its audience using micro-level data from Scarborough Research. Scarborough collects demographic variables and two measures of audience from a representative panel of households[8]. The 'regular audience' of a given TV channel is the share of respondents who answer yes to a question on whether or not they listened regularly to the channel in the three months prior to the survey. The 'diary audience' measure is tabulated from a week-long diary of TV watching in half-an-hour intervals. The diary audience for a channel is the share of respondents who watched it for at least one full half-an-hour block in the survey week.

In Column 1 of Table 1 we report summary statistics for the 105,201 respondents to the August 2000-March 2001 survey. The regular audience for Fox News is 17.3 percent, and 34.1 percent for CNN. According to this measure, by the year 2000, Fox News already had an audience half as large as that of CNN. The diary audience is not available for this sample.

In Table 1, we also present other summary statistics for the overall sample (Column 1), for the regular Fox News audience (Column 2), and for the rest of the sample (Column 3). The regular Fox News audience is significantly more likely to also watch CNN regularly, probably reflecting a taste for television news. The education level and unemployment rate are compa-

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[7]The ADA score is a measure of political orientation created by Americans for Democratic Action.

[8]In an earlier version of the paper we used a June 2000 Pew Survey to estimate the determinants of the Fox News audience, with different results: in that sample, the Fox News audience does not appear to be selected on political variables, while it is heavily selected on low education. The Scarborough data has several advantages over the Pew Survey, including a substantially larger sample, zip-code identifiers for part of the sample, and a more precise measure of audience. We believe that at least part of the the differences between Scarborough and Pew data is due to confusion between the Fox News Channel and the Fox affiliates in the Pew survey.

rable across the two samples, African Americans are somewhat more likely to listen regularly to Fox News, and Hispanics somewhat less likely. The Fox News audience is older (49.7 vs. 44.8 years) and more likely to be male (48.1 vs. 41.2 percent).

Turning to the political variables, 37.5 percent of the regular Fox News audience self-identify as Republican, 29.4 percent as Democrat, and the remainder as Independent. Among the non-Fox News audience, 26.2 percent identify as Republican and 32.4 percent as Democrat. Fox News listeners therefore are more likely to be Republican. Since the audience data is from 2000, after the entry of Fox News, this difference could be due either to sorting of Republicans into the Fox News audience, or to a persuasion effect of exposure to Fox News. Self-reported turnout also differs: 76.9 percent of the Fox News audience state that they always vote in Presidential elections, compared to 67.7 in the complementary group.

As for the media variables, 68.7 percent of the whole sample report having cable, while only 14.7 percent report having access to satellite television. The share with cable is higher for the regular Fox News audience, while the share with satellite does not vary.

In Columns 4-6 we focus on the subsample for which ZIP code of residence and the diary audience measure are both available. This sample was recorded between February 2000 and August 2001 in five geographical areas[9]. We further restrict the sample to the 11,388 respondents living in one of the 568 towns with available cable and election data. In Section 6.1, we use this sub-sample to estimate the impact of Fox News availability via cable on the likelihood of being a Fox News viewer. In this sample (Column 4), the measure of the regular Fox News audience (16.6) is slightly lower than in the sample as a whole (Column 1); the demographics are comparable across the two samples, with the exception of a higher share of Hispanic viewers. The diary audience is 3 to 5 times smaller than the corresponding regular audience: The Fox News diary audience measure is .035. compared to a regular audience measure of .166. Similarly, the CNN measure of diary audience is .103, compared to a regular audience of .353. The diary audience is likely to understate the real audience, since it excludes anyone who watched less television than usual during the survey week, anyone who watched a channel repeatedly but either never watched a full half hour block, or anyone who watched it but failed to report it. The regular audience measure is immune to these issues, since it covers a longer time period, the quarter, but it has the disadvantage of subjectivity.

In Columns 5 and 6 we compare the Fox News audience and the non-Fox News audience according to the diary measure. The differences between these two samples resemble the ones found according to the regular audience measures (Columns 2 and 3), except that political differences are more accentuated and that African Americans are less likely to watch Fox News according to the diary measure.

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[9]The data includes respondents residing in the DMAs of Chicago (September 2000-August 2001), Los Angeles (February 2000-January 2001), Pittsburgh (September 2000-August 2001), New York (March 2000-February 2001), and Washington (March 2000-February 2001).

4 Data

Cable data. We obtained the cable data from a paper copy of the *Television and Cable Factbook,* 2001 edition (Warren, 2001). This edition contains information on all local cable companies as of November 2000, that is, right up to the 2000 elections. We did not collect information for the year 1996, since Fox News became available only in October 1996 and just for a limited number of markets. Each local cable company serves up to 100 communities in the neighboring region, all listed in the entry. All companies offer a basic service package, and over a half also offer up to three expanded basic service packages. The basic service programming typically includes channels such as C-Span and the ABC Family Channel. In addition, these companies are required by law to broadcast local television stations as part of their basic service. Expanded basic service, when available, includes channels such as Comedy Central and Fox Sports for an additional fee. Finally, cable companies sometimes offer à la carte channels such as HBO for a fee. In Appendix A we present further details on the data.

For the 28 states for which we were able to obtain town-level election data (Appendix Table 1), we collected, for each local cable company, data on the communities served, as well as an estimate of the total number of channels (excluding the local TV channels) offered. We also recorded whether CNN and Fox News were included and, if so, as part of which contract (Basic or Expanded Basic). Overall, this data set covers 17,333 communities in 28 States. (Column 1 in Appendix Table 1). The states with the largest number of communities are California (1,110), Michigan (1,373), New York (1,465), Ohio (1,873), and especially Pennsylvania (2,667).

Election data. The main sources of election data are the Federal Election Project (Lublin and Voss, 2001) for the year 2000, the Record of American Democracy (ROAD) Project (King et al., 1997) for the year 1988, and the Atlas Election data (Leip, 2004) for the 2004 Presidential election. For most other years we obtained the information from the Election Division of the Secretary of State of each state.

Since the unit of observation for the cable data is the town, we have constructed a data set of voting information at the town level. The data collection differs depending on the state. A first group of states—California, New Jersey, New York, and the New England States—directly provide voting information at the town level, which we employ. A second group of states— Iowa, Minnesota, Michigan, Montana, Ohio, Pennsylvania, Wisconsin, and Wyoming—provide precinct-level voting information with the town name explicitly specified for each precinct; in this case, we aggregate the voting information to the town level. Finally, a third group of states—Alaska, Alabama, Arkansas, Hawaii, Idaho, Missouri, North Dakota, South Carolina, Tennessee, Utah, and Virginia—only have precinct-level voting information, with precinct names that usually include the name of the town, but sometimes do not. Examples of precinct names are "02 - Concord Elem School" and "Hot Springs Retirement Hm". For these states, we recover the town name from the precinct name by elimination of numbers and commonly

used words, such as "School" and "Retirement Hm"[10]. We then aggregate the voting data over precincts with the same town name in a given county and state.[11] The twenty-eight US states that have voting information available for both years 1996 and 2000 form the sample used in this paper. The remaining states either do not have electronic voting information available at levels of aggregation below the county level, or have numeric precincts with no precinct-to-town conversion available from the state. The aggregation procedure generates 26,710 distinct localities (Columns 3 and 5 in Appendix Table 1). States like Alabama, Arkansas, and Tennessee have a very large number of localities because precinct names are often incorrectly identified as a locality by our code. (These fictitious towns drop out from the final sample, since they do not match to Census and election data.) Conversely, the New England states have a small number of exactly-identified towns because the election data is reported at the town level.

Census data. For the 28 US states in our sample, we collect information on town-level demographics from the 1990 Census and the 2000 Census. More precisely, we use data at the level of "Place", including "Remainders of Place". In order to match the Census data with the election and cable data, we transform the place name and aggregate the Census data using the same code employed for the election and cable data. This procedure leaves 27,064 places with information from both the 2000 and the 1990 Census. The average population for these places (Column 7 in Appendix Table 1) varies from 719 in Alaska to 24,070 in California.

Matched data. We match the cable, the election, and the Census data by state, county, and place name. The match between the cable data and the election data reduces the sample to 10,479 localities. We then drop 353 localities that fail to match to the Census data. We also drop 289 towns with multiple cable systems, at least one of which carries Fox News and at least one of which does not. For these towns, we do not know if cable consumers have access to Fox News. Additionally, we drop 324 towns with cable systems that do not offer CNN as part of the cable package. In these towns, cable offerings are typically limited to the re-programming of local cable channels. Their news programming, therefore, is not comparable to the programming of the other towns.[12] Finally, we drop 257 towns with likely voting data problems: 238 towns for which the number of precincts generating the town-level vote count differs by more than 20 percent between 1996 and 2000[13]; and 19 towns for which the total number of votes cast in the Presidential election differs by more than 100 percent between 1996 and 2000. For these observations, the problems are likely due to imperfect matching of the precincts aggregated to the town level in 1996 and 2000.

The final sample includes 9,256 towns. The states with the largest number of observations

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[10]The Stata ado file that translates precinct names into town names is available upon request.

[11]We drop precincts such as "Precinct 1" where the transformation algorythm leads to an empty name.

[12]The results do not vary if we include these towns.

[13]We do not apply this criterion for Michigan, New Hampshire, New York, Ohio, Rhode Island, and Utah, since the numbering of precincts is not comparable across 1996 and 2000.

(Column 2 of Appendix Table 1) are Pennsylvania (1,716), Michigan (930), and Ohio (904), three of the largest States. The Census regions with the greatest number of towns are the Northeast (4,030 towns) and the Midwest (3,812 towns), followed by the South (725 towns) and the West (689 towns). Figure 1 shows the distribution of observations by county. In the majority of the 1,166 counties in the sample, no town offers Fox News. This is not surprising given that Fox News is available in only 20 percent of towns and many counties have few towns. Very few counties have Fox News available in all towns. The remaining 290 counties, in which a fraction of the towns offers Fox News, are spread widely over the 28 states.

The towns in the final sample cover 65.9 percent of the population of the 28 States in the year 2000 (Column 11 of Appendix Table 1). The corresponding figure for the voting data is 68.6 percent for the year 2000 (Column 9) and 70.4 percent for the year 1996 (Column 10). The coverage rate is lower than 100 percent for three reasons: (i) we drop from the sample some of the largest cities like New York which have several cable systems, only some of which carry Fox News, and some of which do not, (ii) in states like Missouri, Utah, and Virginia, some of the counties have numeric precinct names that we cannot match to a town, and (iii) in states like Arkansas and Alabama, complicated precinct names induce a poor match between the election data and the cable and Census data. The exclusion of large cities or certain counties and the presence of States with a large non-matching rate should not affect the results, as long as Fox News availability and the election outcomes are measured correctly for the matching towns.

The final sample has comparable Fox News availability relative to the initial sample (Columns 1 and 2), and somewhat lower Republican vote share in 2000 and 1996 (Columns 3 through 6) because the unmatched towns are more likely to be small and rural. Except for average population, which is substantially higher in the final sample (Columns 7 and 8), the towns in the final sample are fairly comparable to the towns in the initial sample.

Variables. The indicator $d^{FOX}_{k,2000}$ equals one if all cable systems in town k in year 2000 include Fox News in either the Basic package or one of the Expanded Basic packages, and zero if no cable system includes Fox News. According to this measure, 20 percent of towns offer Fox News (Columns 1 and 2 of Appendix Table 1). In most states, the percentage varies between 10 and 30 percent, indicating substantial within-state variation in Fox News availability.

Appendix Table 1 also presents information on the voting data. For each town k in year t we denote the number of votes cast for the Republican candidate in race j (j = Pres., Sen.) as $V^{R,j}_{k,t}$. Similarly, we denote the votes cast for the Democratic candidate as $V^{D,j}_{k,t}$ and the votes cast for other parties as $V^{O,j}_{k,t}$. We define the two-party republican vote share $v^{R,j}_{k,t} = V^{R,j}_{k,t}/(V^{R,j}_{k,t} + V^{D,j}_{k,t})$. As a robustness check, we also use the all-party Republican vote share $v'^{R,j}_{k,t} = V^{R,j}_{k,t}/(V^{R,j}_{k,t} + V^{D,j}_{k,t} + V^{O,j}_{k,t})$ and the right-wing vote share $v''^{R,j}_{k,t} = (V^{R,j}_{k,t} + V^{\text{Ref},j}_{k,t})/(V^{R,j}_{k,t} + V^{\text{Ref},j}_{k,t} + V^{D,j}_{k,t} + V^{\text{Green},j}_{k,t})$, where Ref. denotes the Reform party and Green denotes the Green Party. These variables are set to missing if the number of votes for either the Republican or the Democratic candidate is zero, usually reflecting an incumbent running

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unchallenged. Over the final sample, the average two-party Republican vote share is .470 in the year 1996 (Column 6) and .538 in the year 2000 (Column 4). These unweighted averages are higher than the population-weighted average. Our main measure of turnout $t_{k,t}^j$ in town k for year t and race j is the log of the total votes cast: $t_{k,t}^j = \ln(V_{k,t}^{TOT,j})$. The change in $t_{k,t}^j$ over time is the percent change in total votes. In the turnout specifications, we also control for the log of voting-age population $\ln(Pop_{k,t})$. As an alternative measure, we use the the log of votes cast as a share of voting age population, $t_{k,t}^{j\prime} = \ln(V_{k,t}^{TOT,j}/Pop_{k,t})$.

5 Empirical results

5.1 Summary statistics

Column 1 of Table 2 presents unweighted summary statistics on the 9,256 towns in our sample. In the year 2000, the average cable system included over 28 channels in the Basic and Expanded Basic programming. The mean total population reached by a cable system was 78,124, with a median of 23,921. The mean town population was 9,612 people, with a median of 2,766. As Census controls, we include in our regressions the share of the population with some college, the share of college graduates, the share of African Americans and of Hispanics, the unemployment rate, and the share of the town that is urban (shown in Table 1). In addition, we include the share of high school graduates, the share of males, the marriage rate, the employment and the unemployment rate, average income, and the share of the population living in an urban area (not shown in Table 1). These controls are present both in their 2000 value, and in changes between 1990 and 2000. Finally, the political variables are the two-party vote share for Republicans in Presidential elections (1996 and 2000) and the total turnout in Presidential elections measured as log share of the voting-age population, $t_{k,t}^{j\prime}$ (1996 and 2000).

Columns 2 and 3 compare towns that offered Fox News in their programming (Column 2) and towns that did not (Column 3). Towns that offer Fox News have a substantially higher number of channels offered (44.5 versus 24.7), are 25 percent larger, are served by cable companies that reach three times as many people, and are more likely to be urban.

More importantly, towns that offered Fox News by 2000 increased their Republican vote share by 5.9 percentage points (from 47.9 percent to 53.8 percent) between 1996 and 2000, while those that did not offer Fox News increased theirs by an even larger 7.1 percentage points (from 46.7 percent to 53.8 percent). These figures suggest a perverse Fox News effect. This result, however, does not weight towns by size, nor does it take into account differences between Fox and non-Fox towns in voting trends across geographical areas, demographic composition, and cable market. Below, we estimate the Fox News effect taking into account all these factors.

The overall sample spans 235 congressional districts, out of 435 total[14]. Out of these 235

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[14]For the towns that are in multiple districts, we code the town as belonging to the district where the largest

districts, 152 districts include both towns that offered Fox News and towns that did not. In our difference-in-difference specification with district fixed effects, the effect of Fox News is estimated on these districts. The median district in this subsample of 7,631 towns offers Fox News in 20.4 percent of towns (Columns 4 and 5 of Table 2). Towns in this subsample are smaller but otherwise comparable to the overall sample.

We also consider the distribution of Fox News at the finer geographical level of the county. Only 284 counties out of 1,156 incorporate both towns with Fox News and towns without. These counties are more concentrated in the Northeast and less in the South (Figure 1). In our specification with county fixed effects, the effect of Fox News is estimated on the 3,890 towns in these counties. The median county in this subsample offers Fox News in 40.4 percent of towns. Towns with Fox News (Column 6 of Table 2) and without Fox News (Column 7) in this subsample are close geographical neighbors and therefore more closely matched on observables, such as demographic and voting characteristics.

5.2   Selection

The identification in this paper relies on comparing towns with Fox News in their programming in the year 2000 to towns without Fox News. Since the assignment of towns into these two groups is not random, we investigate the nature of the selection. Fox News may well have expanded first in more Republican areas, since demand for its services is likely to be higher in these areas. If Republican areas were becoming more Republican between 1996 and 2000, the estimated Fox News effect may just be capturing political trends.

To investigate this and other forms of selection, we estimate which town-level variables predict the availability of Fox News in 2000. In particular, we include the Republican vote share in presidential elections in 1996 (that is, pre-Fox News), $v_{k,1996}^{R,\text{Pres}}$. We estimate a linear probability model[15]:

$$d_{k,2000}^{FOX} = \alpha + \beta v_{k,1996}^{R,\text{Pres}} + \Gamma_{2000}X_{k,2000} + \Gamma_{00-90}X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k, \qquad (4)$$

where $X_{k,2000}$ is the set of controls from the 2000 Census, and $X_{k,2000-1990}$ is the set of changes in controls between the 1990 Census and the 2000 Census (see Table 2). In addition to the demographic variables, we control for features of the cable system by including $C_{k,2000}$, deciles in the number of channels provided and in the number of potential subscribers. Since the precision of the vote share variable $v_{k,1996}^{R,\text{Pres}}$ is increasing in the total number of votes cast, we weight the observations by the average of the total votes cast in 1996 and in 2000[16]. The

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fraction of the town's population is represented.

[15]The results are similar with logit and conditional logit specifications.

[16]The results are essentially identical if we weight by votes cast in 1996, or by votes cast in 2000. Weighting by the average reduces the potential effect of measurement error in the total votes cast.

standard errors are clustered at the level of the local cable company. There are 2,992 local cable companies in the sample, giving an average of 3.09 observations per cluster.

We first estimate (4) with demographic controls and without cable controls ($\Gamma_C = 0$) (Column 1 of Table 3). In this specification, Fox News availability in 2000 is substantially higher in more Republican towns: a 10 percentage point increase in Republican vote share is associated with a 6.5 percentage point increase in the likelihood of Fox News availability. Urban towns and more highly educated towns are more likely to have Fox News by the year 2000. While these demographic variables are significant, they predict a relatively small share of the variance, with an R^2 of .0772. In Column 2, we add the non-parametric controls $C_{k,2000}$ for potential subscribers in the cable system and for number of channels. The additional variables raise the R^2 to .4032. Larger cable systems are much more likely to offer Fox News. The introduction of the cable controls lowers the coefficient $\hat{\beta}$ on the Republican vote share by half.

In Column 3, we add congressional district fixed effects to control for some of the geographic heterogeneity in Fox News penetration. With these additional geographic controls, specification (4) captures the determinants of within-district Fox News availability. In this specification, there is no evidence that towns with higher Republican vote share are more likely to offer Fox News: in fact, the estimated $\hat{\beta} = -.0324$ is negative, albeit insignificant. Given the precision of the estimates, we can reject substantial effects of pre-existing political composition on the availability of Fox News. Moreover, none of 14 demographic controls is significant at the 5% level. This suggests that, once we control for geographic heterogeneity and size of the cable system, availability of Fox News in 2000 is idiosyncratic. We obtain similar results when we introduce county fixed effects instead of congressional district fixed effects (Column 4).

In Column 5, we replicate the specification in Column 3 with the addition of $t^{\text{Pres}\prime}_{k,1996}$, voter turnout in the 1996 Presidential election measured by log of votes cast as share of population. As with the case of the Republican vote share, voter turnout in 1996 is uncorrelated with the availability of Fox News in 2000. Finally, in Columns 6 and 7 we test whether voting trends predict the availability of Fox News. We add the change in the Republican vote share in Presidential elections between 1988 and 1992 to the specifications in Columns 3 and 4. Since town-level data for 1992 is hard to find, this reduces the sample to 3,722 towns. The time trend variable is not significant and switches sign between the two specifications.

Overall, the strongest determinant of the availability of Fox News in 2000 is the presence of a cable system with a large number of channels. Once we control for cable size and for geographical heterogeneity, the presence of Fox News in 2000 appears to be idiosyncratic. Fox News availability is not systematically related to demographics at the town level. Further, it is orthogonal to both the Republican vote share and voter turnout in the 1996 Presidential elections. Finally, it is also unrelated to the time trends in voting between 1988 and 1992.

5.3 Presidential elections

The baseline empirical specification is a standard difference-in-difference estimation. We compare towns where Fox News entered the cable market by the year 2000 with towns where Fox News was not available by the year 2000. We consider the impact of the entry of Fox News on the change in the Republican vote share between 1996 and 2000. This strategy exploits the timing of the entry of Fox News. By the November 1996 elections, Fox News had been launched in only a few markets, and, even in those markets, just one month before the elections. By the November 2000 elections, Fox News had an audience that was smaller, but nonetheless comparable to that of CNN. Our baseline specification is

$$v_{k,2000}^{R,\text{Pres}} - v_{k,1996}^{R,\text{Pres}} = \alpha + \beta_F d_{k,2000}^{FOX} + \Gamma_{2000} X_{k,2000} + \Gamma_{00-90} X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k. \tag{5}$$

As in Table 3, we control for town-level demographics from the 2000 Census ($X_{k,2000}$), changes in demographics between the 1990 and the 2000 Census ($X_{k,00-90}$), and cable-level controls ($C_{k,2000}$). The observation are weighted by the average of votes cast in 1996 and in 2000, and the standard errors are clustered at the level of the local cable company.

We first implement a simple difference-in-difference estimator and estimate (5) without controls ($\Gamma_{2000} = \Gamma_{00-90} = 0$ and $\Gamma_C = 0$) (Column 1 in Table 4). On average, in our sample the vote share for Republicans increased by 3.47 percentage points ($\hat{\alpha} = .0347$) between the 1996 and the 2000 elections. Compared to this overall increase, towns with Fox News became (insignificantly) less Republican by two tenths of a percentage point ($\hat{\beta}_F = -.0026$) relative to towns without Fox News. The standard error (.0037), however, is sufficiently large that we cannot rule out that the entry of Fox News increased the Republican vote share by half a percentage point. In Column 2, we add demographic controls, raising the R^2 of the regression from .0008 to .5199. The estimate for β_F, $\hat{\beta}_F = .0027$, becomes positive, but is still insignificant. The change in vote share for Republicans is more positive in towns with fewer college graduates, fewer blacks and Hispanics, and higher unemployment in 2000. The change in vote share is also positively correlated with decreases in the number of blacks and decreases in the number of unemployed workers between 1990 and 2000. In Column 3, we add controls for cable size $C_{k,2000}$, rendering the Fox News coefficient positive and significant ($\hat{\beta}_F = .0078$). Controlling for population, a higher number of potential cable subscribers is negatively correlated with the Republican vote share. Introducing control variables increases the point estimate of β_F, suggesting that the unobservables bias the estimate of the Fox News effect downward.

In the two benchmark specifications we include district fixed effects (Column 4) and county fixed effects (Column 5) in addition to the full set of controls. In these specifications the identification of β_F depends on the comparison of neighboring towns with and without Fox News. These specifications control for unobserved trends in voting that are common to a geographic area, and that may be correlated with Fox News availability. In Column 4, the comparison of neighboring towns takes place within a congressional district, while in Column 5 it takes place

within the finer geographical unit of the county. The key advantage of specifications with cable, demographic, and geographic controls is that, conditional on these variables, the availability of Fox News is idiosyncratic (Table 3). The estimate of the effect of Fox News is positive and significant in both cases, .0040 and .0069 respectively. In both specifications, the standard errors on the coefficient β_F are halved compared to Column 1, indicating that the additional controls increase substantially the precision of the estimates. In the specifications that best control for heterogeneity, availability of Fox News increases the Republican vote share by 4 to 7 tenths of a percentage point, a sizeable and precisely estimated effect.

In Columns 6 and 7, we replicate the results of Columns 4 and 5 after adding the change in Republican vote share between 1988 and 1992 as an additional control. Over this substantially smaller sample (3,722 observations), the effect of Fox News availability is less precisely estimated and somewhat smaller, but still significant in the specification with county fixed effects. The coefficient on 1988-1992 voting trends is close to zero with district fixed effects and significant but small with county fixed effects. Since previous voting trends are not substantial predictors of current voting trends, and since including them would lower the sample size substantially, we omit them in the remaining regressions.

Robustness. In Table 5, we examine the robustness of these results to a number of alternative assumptions. Throughout, we use the full set of controls as well as fixed effects for congressional districts, as in Column 4 of Table 4[17]. First, we test for robustness to functional form assumptions. In Column 1, we regress the vote share in 2000, $v_{k,2000}^{R,\text{Pres}}$, on the vote share in 1996, $v_{k,1996}^{R,\text{Pres}}$, instead of taking their difference. The coefficient on the 1996 vote share is .9359, close enough to 1 to support the use of the difference $v_{k,2000}^{R,\text{Pres}} - v_{k,1996}^{R,\text{Pres}}$ in the benchmark specifications[18]. In Column 2, we allow for a non-linear relationship between the 1996 and 2000 vote shares, and regress $v_{k,2000}^{R,\text{Pres}}$ on a quartic polynomial of $v_{k,1996}^{R,\text{Pres}}$. In Column 3, we use as an alternative dependent variable the change in the log of the vote share: $\log(v_{k,2000}^{R,\text{Pres}}) - \log(v_{k,1996}^{R,\text{Pres}})$. In all three specifications, the estimate for $\hat{\beta}_F$ is positive and significant and very similar to the benchmark estimate with district fixed effects. In particular, the estimate of a .85 percent effect ($\hat{\beta} = .0085$) in Column 3 is consistent with the benchmark estimate (Table 4, Column 4) of .4 percentage points, given an average Republican vote share of around .5.

In the next set of specifications, we consider alternative specifications which take into account the role of third parties, that is, Ross Perot in 1996 and, to a lesser extent, Ralph Nader in 2000. To the extent that towns with Fox News in 2000 may be more informed about third party candidates, neglecting third parties could lead to a bias in the estimates. Therefore, we consider as alternative dependent variables the all-party Republican vote share $v_{k,t}^{\prime R,\text{Pres}} = V_{k,t}^{R,\text{Pres}}/(V_{k,t}^{R,\text{Pres}} + V_{k,t}^{D,\text{Pres}} + V_{k,t}^{O,\text{Pres}})$ (Column 4) and the right-wing-party vote share

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[17]The results are similar if we instead include county fixed effects, as in Column 5 of Table 4.

[18]Further, allowing the regression coefficient of $v_{k,2000}^{R,\text{Pres}}$ on $v_{k,1996}^{R,\text{Pres}}$ to vary by State does not affect the estimate of the Fox News effect β_F.

$v_{k,t}^{\prime\prime R,j} = (V_{k,t}^{R,\mathrm{Pres}} + V_{k,t}^{\mathrm{Ref,Pres}})/(V_{k,t}^{R,\mathrm{Pres}} + V_{k,t}^{D,\mathrm{Pres}} + V_{k,t}^{\mathrm{Ref,Pres}} + V_{k,t}^{\mathrm{Green,Pres}})$ (Column 5). Across these specifications, the estimate for $\hat{\beta}_F$ is positive and significant and hovers around 4 tenths of a percentage point, as in the benchmark specification with district fixed effects.

Next, we consider alternative specifications of the Fox News variable $d_{k,2000}^{FOX}$. Exposure to Fox News is likely to be higher for towns in which Fox News is provided as part of the Basic cable package, rather than as part of the (more expensive) Expanded package. We add a dummy for towns with Fox News in the Basic package (Column 6). The estimated coefficient on this dummy is positive but insignificant. The lack of a significant difference likely reflects the near equivalence between availability in a Basic or Extended package: two thirds of Basic subscribers purchase the Extended package whenever available. While this specification accounts for differences in exposure to different packages, it does not account for variation across towns in subscription rates to cable. To account for this, we compute $r_{k,t}$, the ratio of the number of Fox News subscribers to the number of potential subscribers. This ratio is zero for towns that do not offer Fox News.[19] The coefficient on this ratio (Column 7), .0058, is positive and marginally significant. The lower precision in this estimate may be due to measurement error in the subscriber data, which is updated less frequently.

We also test the sensitivity of the results to alternative samples. To check the robustness to the weighting procedure, we run an unweighted regression restricted to the 3,115 towns with average turnout in 1996 and 2000 of at least 2000 votes (Column 8). To examine the potential impact of outliers, we trim the top and bottom 1 percent of the dependent variable (Column 9). In both of these specifications, the effect of Fox News is positive and significant.

Finally, we adopt the optimal trimming approach of Crump et al. (2005) (Column 10). This approach acknowledges that treatment and control group often differ significantly on observables, making the interpretation of average treatment effects problematic. As a solution, it focuses the analysis on an optimal subsample in which treatment and control observations are more comparable. We implement this method by estimating a propensity score for the availability of Fox News based on the controls $v_{k,1996}^{R,\mathrm{Pres}}$, $X_{k,2000}$, $X_{k,00-90}$, and $C_{k,2000}$. We then eliminate the 5,079 observations with propensity score smaller than .1 or larger than .9, the cutoffs suggested by Crump et al. (2005). The trimming eliminates most towns with fewer than 20 cable channels, since Fox News is almost never included as one of these channels. To the extent that cable companies in these towns under-report their offering, including potentially Fox News, their exclusion eliminates a source of contamination of the control group. Over the optimally trimmed sample of 4,177 towns, the point estimate for $\hat{\beta}_F$ is significant and larger than in the baseline specification, consistently with attenuation over the eliminated sample. We use this subsample in the rest of the paper as a specification check.

In Appendix Table 2, we explore the role of weighting and of measurement error. The estimates of the Fox News effect are very similar if we weight the observations by voting-age

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[19]Since subscription information is missing for some towns, 42 towns drop out from this regression.

population in 1996 (Columns 1 and 2) instead of by total votes cast. The estimates are .25 percentage points lower (.0014 and .0040) if we do not weight (Columns 3 and 4). The Fox News effect is still significant with county fixed effects but not with district fixed effects. The lower point estimates may be due to higher measurement error in very small towns or to heterogeneous treatment effects in smaller, more rural towns (see Table 6). We also present the results of another unweighted estimation procedure, nearest-neighbor matching (Abadie et al., 2001). Each town with Fox News (treatment town) is matched to the non-Fox News town (control town) with the closest value of the controls. We match observations based on cable and Census controls (Column 5), and also on District indicator variables (Column 6).[20] The average treatment effect of Fox News (.0054 and .0042) is similar to our benchmark findings, significant, and larger than the OLS estimates without weighting (Columns 3 and 4). Different weighting procedures, therefore, have only a limited effect on the results.

In Columns 7 and 8 we enlarge the baseline sample by including observations that are likely to be subject to greater measurement error. We include (as treated) 289 towns where Fox News is offered in parts but not all of the town, and 257 towns with likely voting data problems (see Section 4 for details). Consistently with increased measurement error in the Fox News variable, the estimates of the Fox News effect are lower. Finally, in Columns 9 and 10 we present a specification that is both unweighted and includes the observations with measurement error; in addition, we exclude the data from the states of Hi, Nd, Nj, and Wy. This specification is essentially the one that appeared in an older version of this paper. The failure to reject the null hypothesis stems from the inclusion of observations with greater measurement error, the equal weighting of towns of different sizes, and the smaller sample of States.

Interaction effects. In Table 6, we examine how the Fox News effect interacts with town characteristics for the benchmark specifications with district and county fixed effects (Columns 1-2 and 5-6) and in the optimally trimmed sample (Columns 3-4 and 7-8). The impact of Fox News is larger in urban towns, although this effect is not significant in the optimally trimmed sample. This result may simply reflect the fact (documented below) that the Fox News effect is larger in more Democratic towns, which tend to be more urban.

The Fox News effect is smaller in towns with more cable channels: an increase of 10 cable channels (.7 standard deviations) reduces the effect by .2 percentage points. When the Fox News message competes with a larger number of channels, its impact appears diminished (Mullainathan and Shleifer, 2005). The lower Fox News impact result could reflect exposure to more balanced reporting (though CNN and the network news are available in all towns in the sample) or merely lower audience rates for Fox News when more channels are available.

We consider also the heterogeneity across geographic regions. The effect of Fox News is highest in the North East and in the West, and significantly lower in the Midwest. The effect is significantly lower also in the South in the benchmark specifications, but this pattern is not

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[20]Matching also on county indicator variables was not feasible due to excessive number of matching variables.

significant and even reverses in the optimally trimmed sample. These results should be taken with caution in light of the small number of observations in the South (725 towns) and West (689 towns). We also interact the results with the political orientation in the District. We split congressional districts into thirds by the 2000 Republican vote share. The Fox News effect is lower for the more Republican districts, significantly so with county fixed effects.

The lower impact of Fox News in the Republican districts and states (the South) and in rural towns areas may be explained by the fact that in these towns most people already voted Republican, and therefore the share of the population at risk of being convinced was smaller.

Magnitudes. Across the different specifications, the entry of Fox News into a cable market by the year 2000 had a significant effect on the Republican vote share in Presidential elections. The implied confidence intervals for the benchmark estimates (Columns 4 and 5 of Table 4) are (.0008, .0072) with district fixed effects and (.0041,.0097) with county fixed effects. The findings, therefore, are consistent with both a small (but positive) effect of Fox News and a fairly large effect, close to one percentage point.

How large are these effects relative to shifts in vote share between 1996 and 2000? The average weighted change in vote share between 1996 and 2000 in our sample is 3.47 percentage points, with a standard deviation of 4.02. The estimated impact of Fox News is one tenth of a standard deviation with district fixed effects, and one sixth of a standard deviation with county fixed effects. The impact of Fox News is small, but not negligible.

As a second measure, we estimate the number of votes that Fox News is likely to have shifted. We assume a treatment effect of Fox News of .54 percentage points, the midpoint of the benchmark estimates, and a diffusion of Fox News of 34 percent of the population, also for the 22 States for which we do not have data. The estimated impact of Fox News on the Republican vote share is then $.34 * (.0054) = .0018$, that is, .18 percentage points. Assuming that Fox News did not affect turnout substantially, Fox News shifted approximately 200,000 votes from the Democratic candidate to the Republican candidate.

We also predict the number of votes shifted by Fox News in Florida, the pivotal State. In 2000, Fox News reached 32.8 percent of the Florida population. We assume that the Fox News effect on the 5,963,110 Florida votes cast is the same as in our sample. Under this assumption, the introduction of Fox News shifted $.328 * (.0054) * 5,963,110 = 10,561$ votes, a number substantially larger than Bush's official margin of victory of 537 votes. The estimated impact of Fox News would be smaller, and potentially negative, under the alternative assumption that the effect in Florida is the same as in the Southern states (Table 6, Columns 5 through 8).[21]

Overall, the impact of the entry of Fox News can be measured as about one tenth of a standard deviation of the shift toward Republicans between 1996 and 2000. While this estimate is moderately small, the entry of Fox News may still have contributed to the Bush

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[21]This second computation should be taken with caution given the fact that Florida, a swing state, is different from all the Southern states in the sample, which are markedly Republican.

victory in the unusually close 2000 election. Moreover, the impact may become larger over time as the Fox News audience and diffusion grows.

5.4   Timing of effects

So far, we have considered the impact of the availability of Fox News in 2000 on elections between 1996 and 2000. Now we further exploit the timing of the Fox News entry: (i) we consider the effect of the availability of Fox News in 1998 and 2004; (ii) we examine the effect of the availability of Fox News in 2000 on the change in vote share between 1992 and 1996, and between 2000 and 2004. These specifications allow us to estimate the effect of length of exposure, to further control for time trends, and to construct placebo treatments.

For 16 of the 28 states[22] in the sample, we collected the availability of Fox News in November 1998. Out of 6,672 towns in this subsample, 1,221 towns offer Fox News in 2000, and 666 towns offer it in 1998. The difference between 1998 and 2000 is almost exclusively due to expansion of Fox News: only 29 towns have Fox News in 1998 but not in 2000. In Columns 1 and 2 of Table 7, we re-estimate specification (5) including also the indicator $d_{k,1998}^{FOX}$ for the availability of Fox News in 1998. The estimated impact is negative and insignificant. Length of exposure to Fox News does not appear to have a significant effect, but these results should be taken with caution given the smaller sample and the lower audience rates for Fox News in 1998.

We also collected data on Fox News diffusion in March 2004 for the 28 states in our sample. In this period, Fox News is available in 4,844 out of 8,645 towns.[23] In Columns 3 and 4, we re-estimate specification (5) including the indicator variable $d_{k,2004}^{FOX}$ for the availability of Fox News in 2004. This is a placebo specification, since the introduction of Fox News after the year 2000 should not affect the change in vote share between 1996 and 2000. Indeed, controlling for Fox News availability in 2000, Fox News availability in 2004 has no effect on voting.

In Columns 5 and 6, we take further advantage of the staggered nature of the Fox News introduction to address endogeneity issues. The endogeneity story holds that the impact of Fox News on the Republican vote share is due to the fact that Fox News was introduced in towns that were becoming more Republican anyway. While the findings in Table 3 address this concern, as an additional test we consider the 4,844 towns that got Fox News by 2004. We compare the vote share change between 1996 and 2000 for the towns that had Fox News already in 2000 with the towns that introduced it only after 2000. These two sets of towns should have similar political trends, but only the former set was exposed to Fox News before the 2000 elections. The estimated impact of the availability of Fox News in 2000 is similar to

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[22]To save coding time, we only collected this data for the states that we assessed to have the best election data (excepted New Jersey, that was added later to our sample): Alaska, California, Connecticut, Iowa (part of), Idaho, Massachusetts, Maine, Michigan, Minnesota, New Hampshire, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

[23]We exclude 281 towns which offer Fox News in 2004 in one, but not all of the cable systems in the town.

the one in the benchmark specifications, with larger standard errors due to the smaller sample: $\hat{\beta}_F = .0034$ with district fixed effects and $\hat{\beta}_F = .0061$ (significant) with county fixed effects. Again, voting trends do not appear to explain the Fox News effect on voting.

In Columns 7 through 10 we re-estimate specification (5) with voting in different years as dependent variables. The introduction of Fox News in 2000 is associated with an insignificant .2 percentage point vote share increase between 2000 and 2004 (Columns 7 and 8). The effect of Fox News appears to be permanent, if not increasing over time.

As a placebo treatment we estimate whether the introduction of Fox News in 2000 predicts the vote share change between 1992 and 1996 (Columns 9 and 10). Obviously, Fox News introduction in 2000 should not affect voting between years in which Fox News did not exist. We find no evidence of a positive correlation; in fact, the estimates are negative though not significant. Voting trends are unlikely to be responsible for the Fox News effect.

5.5   Senate elections

The previous findings suggest that Fox News had a significant effect on the Republican vote share in the Presidential election. In this Section, we consider whether the effect of Fox News extends to local politics not covered by Fox News. This allows us to test whether the Fox News effect is candidate-specific or a general ideological shift.

Senate elections are a good test in this respect, because a large majority of Senate races fail to get national coverage. These elections are similar to local elections, for which unfortunately no town-level data set is available. At the same time, one or two Senate races per year attract substantial national coverage, almost like Presidential races. This allows us to compare the effect on Fox News on races that were not covered, where only ideological shifts should matter, to the effect on covered races, where candidate-specific coverage also could matter. In 2000, the Senate race that got the most coverage in Fox News by a wide margin was the Hillary Clinton-Rick Lazio race in New York State. These two candidates had 99 mentions in the *O'Reilly Factor* and the *Hannity & Colmes* show in the two months prior to the 2000 elections, with most mentions critical of Hillary Clinton[24]. All the other Senate candidates running in the 2000 campaign combined got a total of 73 mentions, with Joe Lieberman, who was typically mentioned because of his Vice-Presidential race, getting the lion's share of these mentions.

We examine whether Fox News impacted the vote share in Senate elections, and whether it had a differential effect for the Clinton-Lazio race. We denote by d_{NY} the indicator variable

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[24]Two excerpts from the "O'Reilly Factor" of 10/31/2000: "Now, I am saying to THE FACTOR viewers, and everyone else who hears what we have to say on this program, that Mrs. Clinton has trouble with honesty"; "Mr. Gore does have some honesty issues about campaign finance, but they pale beside the deceit factory the Clintons have set up".

for the New York Senate races. We estimate the specification

$$
\begin{aligned}
v_{k,2000}^{R,\text{Sen}} - v_{k,1996}^{R,\text{Pres}} \;=\;& \alpha + \beta_F d_{k,2000}^{FOX} + \phi_F d_{k,2000}^{FOX} * d_{NY} \\
& + \Gamma_{2000} X_{k,2000} + \Gamma_{00-90} X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k,
\end{aligned}
\tag{6}
$$

where the coefficient β_F indicates the effect of Fox News on Senate races other than New York, and ϕ_F indicates the differential effect for the featured New York race. Notice that the dependent variable is the difference of the Senatorial vote share in 2000 and the *Presidential* vote share in 1996. This specification maximizes sample size: the voting data for the 1994 Senatorial election is available for only 5 States, not including New York state.

Table 8 reports the results. The effect of Fox News on non-featured Senate races is large and significant, .0079 with district fixed effects (Column 1) and .0082 with county fixed effects (Column 2). Compared to this effect, the effect of Fox News on the New York race is not significantly different, although the standard errors on the coefficient $\hat{\phi}_F$ are relatively large.

Over the optimally trimmed subsample (Columns 3 and 4), the estimated impact of Fox News on Senate races is positive but not significant. In the specification with District fixed effects, Fox News appears to have had a significantly larger effect on the New York Senate race ($\hat{\phi}_F = .014$), but the result does not replicate with county fixed effects (Column 4). In Column 5, we use the ratio of Fox News subscribers to population in lieu of the Fox News dummy. The result is very similar to the baseline estimate, suggesting a substantial impact of Fox News on all Senate races. We then test for heterogeneity by political areas (Column 6). The Fox News effect is (marginally) significantly lower for the more Republican districts, suggesting that Fox News had the largest impact in Democratic or swing districts. Finally, the results using the all-party vote share (Column 7) parallel the benchmark finding in Column 1.

In the last two columns (Columns 8 and 9) we re-estimate (6) using the difference in the two-party Republican vote share between the 2000 and the 1994 Senate races as the dependent variable. This allows us to compare two races both featuring the 2000 incumbent, at the cost of reducing the sample to 2,037 towns in 5 States (Maine, Michigan, Minnesota, Montana, and Rhode Island). In this small sample, we find large and significant effects of Fox News in the order of one percentage point. While these estimates are less precise, they corroborate the finding of a substantial effect of Fox News on Senate races.

Overall, we find evidence of an effect of Fox News also for non-featured races such as Senate races, specially in Democratic and swing districts. We fail to find a stronger effect for highly emphasized races. These results suggest that Fox News exposure induces a generalized ideological shift, as opposed to a candidate-specific effect.

5.6 Voter turnout

The significant impact of Fox News on the Republican vote share could occur for two reasons. First, Fox News entry convinced Democratic voters to vote Republican. Second, Fox News

attracted new Republican voters. We use measures of turnout to test these hypotheses.

The baseline regression for voter turnout is:

$$t_{k,2000}^{\text{Pres}} - t_{k,1996}^{\text{Pres}} = \alpha + \beta_F d_{k,2000}^{FOX} + \gamma \left[\ln \left(Pop_{k,2000} \right) - \ln \left(Pop_{k,1996} \right) \right] \tag{7}$$
$$+ \Gamma_{2000} X_{k,2000} + \Gamma_{00-90} X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k,$$

where $t_{k,t}^{\text{Pres}}$ is the log total votes in town k in year t: $t_{k,t}^{\text{Pres}} = \ln(V_{k,t}^{TOT,\text{Pres}})$. The change in this measure over time is the percent change in total votes cast. This specification controls for the percentage change in the voting-age town population over time, $\ln \left(Pop_{k,2000} \right) - \ln \left(Pop_{k,1996} \right)$, since increases in population would naturally increase the number of votes cast.

Table 9 shows the results. The average change in log votes is .0869, implying a 8.69 percent higher turnout in the much tighter Presidential race of 2000. The estimate for β_F is positive but insignificant with district fixed effects, and is large and significant with county fixed effects. This second estimate ($\hat{\beta}_F = .018$) suggests that fox News increased turnout by 1.8 percent, a large effect. In both specifications, the elasticity γ of the change in votes cast with respect to the change in population is about .4. Over the optimally trimmed subsample (Columns 3 and 4), the Fox News effect is positive and significant with county fixed effects, and marginally significant with district fixed effects. The Fox News coefficient $\hat{\beta}_F$ is positive but insignificant using the ratio of subscribers to Fox News (Column 5). The turnout effect is concentrated in the more Democratic districts (Column 6). Together with the finding that the impact of Fox News on vote share is larger in the more Democratic areas, this suggests that the main effect of Fox News was to induce non-voters in Democratic districts to turn out and vote Republican. Finally, in Columns 7 and 8 we replicate the results of Columns 1 and 2 with an alternative turnout measure: $t_{k,t}^{j\prime} = \ln(V_{k,t}^{TOT,j}/Pop_{k,t})$. This specification is equivalent to specification (7), with the additional restriction $\gamma = 1$ (rejected by the data). The point estimates are slightly smaller, and still significant with county fixed effects.

Overall, Fox News entry into a market appears to have mobilized new voters, specially in Democratic districts. However, the evidence is not as clear-cut as for the effect on vote share.

6   Interpretations

This paper studies the effects on voting of one of the most dramatic media shifts in past years. We find that the introduction of a (comparatively speaking) conservative news channel increased the vote share of Republican presidential candidates by .4 to .7 percentage points.

We now evaluate the magnitude of this effect, compare it to other media effects in the literature, and put forward interpretations of the results. In particular, we estimate a persuasion rate, that is, the share of the Fox News audience that was convinced by Fox News to vote Republican. Clearly, Republican voters or people that were not watching Fox News could not

have been convinced. From an econometric standpoint, we do a calculation of treatment on the treated using the average treatment effect.

6.1 Persuasion rates

Model. To compute persuasion rates, we compare treatment towns T, where Fox News is available via cable, and control towns C, where Fox News is not available via cable. We denote by r the share of Republican voters, and by d the share of Democratic voters, before the introduction of Fox News. For simplicity, we neglect third parties. Consequently, $(1 - r - d)$ denotes the share of non-voters. Since the two types of towns have similar political outcomes in the pre-Fox News period (Tables 2 and 3), we assume that r and d are the same in towns T and C.

After the nation-wide introduction of Fox News, a fraction e of the town population is exposed to the new channel. The exposure parameter e is higher in treatment towns, that is, $e_T > e_C \geq 0$. We allow exposure e_C in control towns to be non-zero because, for example, of the availability of satellite which broadcasts Fox News to subscribers in both towns. For simplicity, we also assume that the exposure e_j to Fox News in town j is independent of political affiliation. That is, we assume that Republicans are as likely as Democrats or non-voters to watch Fox News when available. While the evidence in Table 1 suggests that Republicans are more likely to watch Fox News, we cannot rule out that this captures the causal convincing effect of Fox News, rather than differential exposure e_j by party.

The key parameter in the model is f, the fraction of the audience that is convinced by Fox News to vote Republican. This persuasion rate, f applies equally to Democratic voters and to non-voters, that is, to a fraction $(1 - r)$ of the Fox News audience e_j, where $j = T, C$. Therefore, the introduction of Fox News increases the fraction of people voting Republican by $(1 - r) e_j f$. The two-party vote share v_j in town j, with $j = T, C$, equals

$$v_j = \frac{r + (1 - r) e_j f}{r + d + (1 - r - d) e_j f}.\tag{8}$$

(Turnout increases since Fox News induces a fraction f of the non-voters to vote Republican.) Using expression (8), we solve for the difference in vote share between treatment and control towns, $v_T - v_C$, the equivalent of $\hat{\beta}_F$ in the data. We obtain $v_T - v_C = (e_T - e_C) f d / t_C t_T$, where $t_j \equiv (r + d + (1 - r) e_j f)$ is the turnout in town j. The implied persuasion rate f is

$$f = \frac{v_T - v_C}{(e_T - e_C)(1 - r)} \frac{(1 - r) t_C t_T}{d}.\tag{9}$$

Expression (9) is easily interpretable. The first term is the influence rate per treated population, and the second term is a factor correcting for turnout effects. The numerator of the first term, $v_T - v_C$, is the shift in Republican vote share due to the availability of Fox

News via cable. The denominator, $(e_T - e_C)(1 - r)$, normalizes this vote shift by the share of population at-risk of treatment, that is, by the differential exposure to Fox News in treatment and control towns, times the share of non-Republicans.

The second term, which disappears if turnout is perfect $(r + d = 1)$, captures the difference between the convincing effect of Fox News on a Democrat and a non-voter. In both cases, Republicans gain a vote, but only in the first case the opposing party, the Democratic party, loses a vote. Converting a Democrat, therefore, has a larger impact on the vote share than converting a non-voter. The larger the ratio of non-Republicans $(1 - r)$ to Democrats, d, hence, the bigger is the convincing impact for a given vote share change. In addition, the term $t_C t_T$ in (9) corrects for the fact that a higher turnout t_j increases the denominator of expression (8), and therefore decreases the impact of f on v_j.

We estimate the persuasion rate f using expression (9). First, we evaluate the political variables t_T, t_C, r, and d using the sample averages of the 2000 elections. We weight the averages by total votes cast in 2000 to better approximate the individual-level expressions (8) and (9). (In the robustness section, we discuss alternative estimates based on unweighted averages.) The average weighted turnout in 2000 as a share of the voting-age population is .560, and it is very similar in Fox News and non-Fox News towns. We therefore assume $t_T = t_C = .560$[25]. We estimate the percentage of Democratic voters d as the product of the turnout rate t and the average weighted Democratic two-party vote share in 2000 in our sample, that is, $.560 * (1 - .453) = .306$. This implies that $f = 1.024 * (v_T - v_C) / (e_T - e_C)$.

Audience data. We estimate the differential exposure $(e_T - e_C)$ using the micro-level Scarborough data on television audiences described in Section 3. We use the subsample of 11,388 respondents for whom we observe the ZIP code of residence, and whom we can match by ZIP code to the cable data on availability of Fox News (Table 1, Columns 4-6). We use the 'diary audience' measure, since the 'regular audience' measure is not available for most of this sample. We aggregate the data at the town level to maximize comparability to the specifications in the rest of the paper. For each town k of the 568 towns in this sample, e_k^{FOX} is the fraction of town residents that belong to the Fox News audience. We estimate

$$e_k^{FOX} = \alpha + \beta_F d_{k,2000}^{FOX} + \Gamma_{2000} X_{k,2000} + \Gamma_{00-90} X_{k,00-90} + \Gamma_C C_{k,2000} + \varepsilon_k. \qquad (10)$$

The regression is weighted by the number of respondents in a town, and the standard errors are clustered at the level of the local cable company. The coefficient β_F is the differential Fox News diary audience due to Fox News availability via cable in the town.

Table 10 shows the results. In the specification without controls (Column 1), the availability of Fox News induces 2.7 percent ($\hat{\beta}_F = .0270$) additional town residents to watch Fox News for at least a full half hour per week. The estimate is significant and sizeable. The intercept

[25]The average self-reported turnout in the Scarborough survey is 67.7 percent, but self-reported turnout is known to overstate the actual figure.

$\hat{\alpha} = .0262$ indicates that, in towns where Fox News is not available via cable, 2.62 percent of the residents still watch Fox News for at least a full half hour per week. About half of the Fox News audience, therefore, watches Fox News in ways other than via cable, possibly via satellite. This finding could also be due to measurement error in our measure of Fox News availability via cable. In either case, this implies that the estimates in Section 5 are likely to understate the impact of Fox News on voting, since they capture only the impact of Fox News availability via cable, disregarding the impact of availability in other ways.

The estimates in Column 1 do not control for demographic, geographic, or cable-system differences between towns that adopt Fox News and towns that do not. In Columns 2 and 3, we re-estimate specification (10) adding the Census, cable, and geographic controls used in the body of the paper. The estimated differential exposure rates are $\hat{\beta}_F = .0371$ with congressional district fixed effects and $\hat{\beta}_F = .0251$ with county fixed effects. Interestingly, introducing control variables and district fixed effects increases the estimated $\hat{\beta}_F$ relative to the estimate in Column 1. Columns 4 through 6 present robustness checks. In the optimally trimmed subsample (Column 4) the estimated exposure rate is still positive and significant, as is the estimate using the Fox News subscription ratio (Column 5). Finally, as a placebo test, we check that availability of Fox News via cable in 2004 does not increase audience rates in 2000 (Column 6). Indeed, the coefficient on Fox News availability in 2004 is essentially zero.

In Columns 7, 8, and 9 we replicate the specifications in Columns 1, 2, and 3 using the CNN audience as the dependent variable. This specification provides another placebo treatment. Availability of Fox News via cable should not, to a first approximation, increase the audience for CNN, since CNN is available in all towns in our sample. In the specification without controls (Column 7), availability of Fox News increases CNN audience by .0251, compared to an average audience for CNN of .0947. Once we introduce controls (Columns 8 and 9), the availability of Fox News via cable no longer forecasts the CNN audience. The audience data, therefore, passes this second placebo test.

Persuasion rate estimates. We estimate the differential exposure rate $e_T - e_C$ using the coefficient $\hat{\beta}_F$ of Columns 2 and 3 in Table 10. As a benchmark measure of audience, we use the regular audience measure, because we believe that the diary measure underestimates the actual audience. Since we cannot estimate model (10) for the regular audience variable, we multiply the estimates of $\hat{\beta}_F$ by a conversion rate. We compute the conversion rate as the ratio between the aggregate regular audience and diary audience for CNN, that is, $35.3/10.3 = 3.42$ (Table 1, Column 4). (The ratio would be somewhat higher if we used the audience measures for Fox News) The implied estimates for the differential exposure rate are $\hat{e}_T - \hat{e}_C = 3.42*.0371 = .1269$ with district fixed effects and $\hat{e}_T - \hat{e}_C = 3.42*.0251 = .0858$ with county fixed effects.

We combine the estimates of the political variables (t_T, t_C, d) and of the audience $(e_T - e_C)$ with the estimates of the voting impact $(v_T - v_C)$ to obtain a persuasion rate f. With congressional district fixed effects we get $\hat{f} = 1.024*(.0040/.1269) = .0322$, that is, Fox News

convinced 3.22 percent of its listeners that were not already voting Republican to do so. With county fixed effects, we derive $\hat{f} = 1.024 * (.0069/.0858) = .0823$, that is, Fox News convinced 8.23 percent of its audience. We summarize these results in the first rows of Table 11.

Robustness. The estimates of the persuasion rate are robust to different estimates of the political parameters t_C, t_T, and d. If, instead of using weighted town averages, we use the unweighted averages of turnout ($t = .583$) and Democratic vote share ($d = .583 * (1 - .538)$), we obtain $t_T t_C/d = .583/.462 = 1.261$. With this ratio, the estimated persuasion rates are $\hat{f} = 1.261 * .0322 = .0407$ with district fixed effects and $\hat{f} = 1.261 * .0833 = .1037$ with county fixed effects. These effects are in the ballpark of the benchmark estimates.

The persuasion rate estimates are more sensitive to assumptions about the exposure rate $e_F - e_N$. The persuasion rate f are 3.42 times larger if $e_F - e_N$ is measured using the diary data as the measure of audience. The resulting estimates $\hat{f} = .1104$ (district fixed effects) and $\hat{f} = .2814$ (county fixed effects) imply substantial persuasion effects of the media. A second factor that leads to higher persuasion rates is the self-selection of Republicans in the Fox News audience. In Table 10, we estimate the selective exposure $e_T - e_C$ in (10) using the whole population, rather than just Democratic voters and non-voters. To the extent that Republicans self-select in the Fox News audience, this upward biases the estimate of $e_T - e_C$, and therefore downward biases the estimate of f.[26]

Conclusion. The benchmark estimates imply that Fox News convinced 3 to 8 percent of its audience to shift its voting behavior towards the Republican party, a sizeable media persuasion effect. Alternative estimates using the diary audience measure lead to estimates of the persuasion rate between .11 and .28, corresponding to large media effects.

6.2 Comparison with persuasion rates in the literature

We estimate persuasion rates f for other studies in the literature, summarized in Table 11. We discuss field experiments, laboratory experiments, and surveys.

Field experiments. Green and Gerber (2004) summarizes a series of field experiments on turnout. In some of these experiments, target households within a precinct are randomly selected to receive turn-out-the-vote treatments (canvassing, phone calls, or leaflets) right before an election. Turnout is measured using official individual voting records kept at the precinct. In other experiments, the randomization is done at the precinct level, and precinct-level turnout is compared across precincts. We denote by t_T the share of individuals that turn out to vote in the treatment group, and by t_C the correspondent variable in the control group. As above, denote by e_T and e_C the respective exposure rates, and by t the underlying turnout rate. Also, like in Section 6.1, we assume that the treatment convinces a fraction f of the

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[26]Unfortunately, we cannot restrict the estimation of (10) to non-Republicans, since the party identification variable is measured in 2000 and it captures the causal effect of Fox News, as well as sorting.

people that do not usually turn out and are exposed, that is, $(1-t)\,e_j$, for $j = T, C$. It follows that $t_j = t + f\,(1-t)\,e_j$ and $t_T - t_C = (1-t)\,(e_T - e_C)\,f$. This implies

$$f = \frac{t_T - t_C}{e_T - e_C}\frac{1}{(1-t)}. \tag{11}$$

In these experiments, $e_C = 0$ since no one in the control group is exposed to the treatment, hence $t = t_C$. In Table 11 we summarize five such experiments, with treatment (Column 1), election type (Column 2), year and place (Columns 4 and 5). We also present the sample size (Column 6), the turnout rates in the control (t_C) and treatment (t_T) groups (Columns 7 and 8), and the differential exposure rate $e_T - e_C$ (Column 9). Using this information and (11), we compute the persuasion rate f (Column 10). Canvassing and phone calls convinced to vote between 4 and 26 percent of the people that would not have voted otherwise.

More recently, Gerber et al. (2006) randomly assign subscriptions to a right-wing newspaper (Washington Times) or a left-wing newspaper (Washington Post), and consider the effect on stated voting behavior in a post-election survey. They find a substantial increase in the share of (stated) Democratic voters for exposure to the left-wing newspaper, corresponding to a persuasion rate f of .109. (We use expression (11) where t is the share of Democratic votes out of all survey respondents, including non-voters)[27] However, they also find that the share of Democratic voters increases after exposure to the right-wing paper, albeit insignificantly.

Laboratory experiments. Ansolabehre and Iyengar (1995) expose experimental subjects to 30-second political advertisements supporting a candidate (or criticizing the opposite candidate). They then elicit beliefs and voting intentions at the end of the experiment. In Table 11 we summarize the findings for three sets of experiments with 1,716 total subjects. On average, exposure to one advertisement increases the stated vote share for the sponsoring party from .530 to .568.[28] Expression (11) (where t indicates the intention to vote for the sponsoring party) yields a sizeable persuasion rate f of .08. Other experiments by the authors (results not reported) lead to persuasion rates of similar or larger magnitudes.

Surveys. Following Lazarsfeld, Berelson and Gaudet (1944), political scientists have widely used surveys to assess the impact of the media. A survey in this tradition (Kull et al., 2003) finds that 33 percent of Fox News watchers believe (erroneously) that weapons of mass destruction were found in Iraq by October 2003, compared to 22 percent for the overall sample. We compute a persuasion rate f of .141 (Table 11) using an expression parallel to (11) where t is the share of respondents who believe that weapons were found. Along similar

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[27]We thank the authors for providing the data necessary for this calculation. By computing the share of Democratic voters out of all survey respondents, including non-voters, we can use expression (11) instead of expression (9).

[28]We use the data in Tables B1.1 and B2.4 in Ansolabehere and Iyengar (1995) neglecting voters that state the intention not to vote. We obtain the baseline share of voters t_C from Table B1.1 as the weighted average share of the subjects with the same party affiliation as the sponsoring party: $(50/(50+38))*46/(46+18) + (38/(50+38))*18/(46+18)$.

lines, Gentzkow and Shapiro (2004) examine the effect of media exposure in the Islamic world. Members of the CNN audience were 30 percent more likely to believe, and members of the Al Jazeera audience were 40 percent less likely to believe, that Arabs carried out the 9/11 attacks, compared to survey respondents who watched neither. The estimates imply persuasion rates between .08 and .10. While the survey estimates could be due to sorting rather than causal effects, the implied persuasion rates are quite close to the other estimates.

6.3   Explanations

Our estimates imply that Fox News convinced 3 to 8 percent of the audience to vote Republican, a sizeable media effect. We consider three explanations for this finding: one statistical, one rational, and one non-rational.

1. **Endogeneity Bias.** The Fox News effect on voting may be a spurious correlation. Towns where Fox News entered were becoming more Republican and would have voted more conservatively, independent of Fox News entry. Thus, the Fox News variable proxies for underlying political trends. However, contrary to this interpretation, conditional on the controls, vote shares in 1996 and voting trends in 1988-1992 do not predict the introduction of Fox News (Table 3). Moreover, Fox News introduction does not predict political voting trends between 1992 and 1996 (before the introduction), or between 2000 and 2004 (after the introduction) (Table 7). Fox News only affects vote share changes between 1996 and 2000. Therefore, it is unlikely that endogeneity of Fox News introduction explains the results.

2. **Rational Learning.** The model in Section 2 suggests a rational learning interpretation for the results. When Fox News entered in 1996, viewers were unsure of its political bias. Therefore, upon seeing Fox News' positive coverage of Bush, they interpreted it as a positive signal about the Republican candidate and shifted their vote. A first issue with this interpretation is that, arguably, by the year 2000 the conservative slant of Fox News should have been clear. In this case, exposure to Fox News would not have affected voting. Second, even if the political orientation of Fox News was not clear by the year 2000, it should have become clear over time. As voters become aware of Fox News' political slant, they should adjust their updating techniques to filter out Fox's bias. Contrary to this prediction, the Fox News effect over the 2000-2004 period gets if anything larger (Table 7).

3. **Persuasion.** The model provides an alternative, behavioral interpretation of the results. Viewers do not fully take into account the bias of the media source and therefore are subject to persuasion upon exposure. If voters suffer from persuasion, the effect of Fox News on voting may well be permanent, consistent with the empirical findings.

Overall, we find the data to be most consistent with the third interpretation, that voters do not optimally filter out media bias. Rational learning, however, can also explain the findings. The two interpretations have very different long-run predictions. Learning predicts that Fox

New's political effect is temporary. Persuasion predicts that Fox News permanently altered voting patterns in the United States.

Whether the effect is rational or not, it would be interesting to know the exact mechanism by which Fox News affected voting. The Senate results suggest that the effect is not due only to candidate-specific coverage, but rather to a general ideological shift. Beyond this, we cannot tell if the effect is due to conservative slant of the news or to the choice of topics like National Security that favor Republicans, as implied by the agenda setting theory (Cohen, 1963).

7   Conclusion

This paper studies the impact of media bias upon voting. We consider one of the most dramatic changes in the US media in recent years, the sudden expansion of the Fox News cable channel from 1996 to 2000. We exploit the natural experiment induced by the timing of the entry of the Fox News channel in local cable markets. We estimate the impact of the availability of Fox News in 2000 on the Republican vote share and on voter turnout. This provides a test of whether exposure to media bias affects political beliefs and voting.

We find a significant effect of exposure to Fox News on voting. Towns with Fox News have a 0.4 to 0.7 percentage point higher Republican vote share in the 2000 Presidential elections, compared to the 1996 elections. A vote shift of this magnitude is likely to have been decisive in the 2000 elections. We also find an effect on vote share in Senate elections which Fox News does not cover, suggesting that the Fox News impact extends to general political beliefs. Finally, we find evidence that Fox News increased turnout to the polls.

Based on this evidence and on micro-level audience data, we estimate that exposure to Fox News induced 3 to 8 percent of the non-Republican viewers to vote for the Republican party. This estimate is consistent with field and laboratory evidence of media effects on political beliefs and voting. This suggests that the media can have a sizeable political impact, especially when a politician controls a substantial share of the media, as Berlusconi does in Italy.

We interpret the results in light of a simple model of voter learning about media bias and about politician quality. The Fox News effect could be a temporary learning effect for rational voters, or a permanent effect for voters subject to non-rational persuasion.

This paper leaves a number of open questions on the impact of media bias. First, while we analyze the extensive margin of voting, we do not consider the effect on the intensity of political convictions of Republican voters. In ongoing research, we study the impact on the intensive margin of campaign contributions. Second, we have not directly examined the impact of the media on policy-making. While a vote shift toward Republicans is likely to induce a change in policy (Lee, Moretti, and Butler, 2004), direct evidence documenting this effect would be interesting. Finally, we hope that more evidence on the effect of other sources of media bias, such as local papers and radio talk shows, will complement the evidence in this paper.

A Appendix A - Data

Cable data. The source for the cable data is the *Television and Cable Factbook 2001* (referring to year 2000). A typical entry from the Pennsylvania state section is:
"KING OF PRUSSIA (Pa)—Comcast Cable. Counties: Delaware and Montgomery. Also serves: Collegeville, Graterford, Graterford Prison, Gulph Mills, Perkiomen, Rahns, Schmenksville, Skipjack, Swedeland, Trappe, Upper Merion Twp., Upper Providence Twp. (Delaware County), Wayne. Account No: PA0050. [...]
Basic Service: Subscribers 17,692. [...] Programming (received off-air): WFMZ-TV (I); WLVT-TV (P) Allentown; WGTW (I) Burlington; KYW-TV (C); [...]. Programming (via satellite): C-SPAN; EWTN; Fox Family Channel; MSNBC; QVC; TBS Superstation; The Box. [...] Fee: $35 installation (aerial); [...] $21.95 monthly. [...]
Expanded Basic Service: Subscribers 17,138. Programming (via satellite): A&E; AMC; Bravo; CNBC; CNN; Comedy Central; Discovery Channel; E!; ESPN; ESPN 2; Headline News; History Channel; Lifetime; MTV; Nick at Nite; Nickelodeon; Sci-Fi Channel; TLC; TNN; TNT; TWC; The Sports Network; USA Cable; VH1. Fee: N.A.
Pay Service 1: Pay units: 845. Programming (via satellite): Cinemax. Fee: $15 installation; $8.95 monthly.
Pay Service 2: [....]
Ownership: Comcast Cable Communications Inc."

Each entry is listed by State under the name of the principal community, which is the town where a given local cable company's business office is located. The additional communities reached by the local cable company are listed in alphabetical order, typically without indication of the county, which is listed separately (the number of counties is rarely more than three). In the example above, the communities listed belong to one of two counties (Delaware and Montgomery) in Pennsylvania. Since we do not know which belongs to which, we generate all combinations of town and county, except in cases where the county is explicitly listed as in "Upper Providence Twp. (Delaware County)". When we match the cable data with the Census and election data, the fictitious town-county combinations drop out. (The town-county combination that do not match to either election or Census data are already dropped from Column 1 in Appendix Table 1) The only possibility of error in the match is if there are two towns with the same name in the multiple counties listed, but in this case we expect the county to be explicitly listed next to the town name. In a few cases, the communities reached are indicated only as fractions of a county, such as "Alameda County (Western borders)". We exclude these communities, since we cannot match them to voting data. As long as these communities do not include other separately-listed towns in the cable data, their deletion will not bias the measure of cable offerings for the other towns. As a robustness check, we recompute the results in the paper excluding the 149 counties which include one such community where Fox News is available. All the results hold in this smaller sample of 8,262 towns.

The Basic Service description lists all the local television stations that the cable company rebroadcasts under the heading "Programming (received off-air)". We disregard these local stations. We estimate instead the number of cable channels broadcast in the "Programming (via satellite)" section. In order to save coding time, the total number of channels is estimated counting the number of lines listing cable channels in the Basic and Expanded Basic 1, 2, and 3 Services. The estimated number of channels follows by multiplying this number by 2.5, a conversion rate estimated on a subsample of 40 cable companies. Over this subsample, a regression of actual number of channels on forecasted number of channels yields an R^2 of .95 and a coefficient of 1.

Finally, it is worth noting that sometimes the number of subscribers or (as in this case) the price of the subscription is missing, or refers to previous years.

B Appendix B - Derivation of the Model

Estimation of $\hat{\beta}_T$. The voters observe the T signals $\psi_1, \psi_2, ..., \psi_T$ before casting votes for the T-th candidates. These signals are all independently normally distributed. Therefore, the estimate of β, $\hat{\beta}_T$, is a precision-weighted sum of signals. Since the weighted sum of these signals is a normally distributed random variable, it is completely characterized by the first two moments. Denoting the estimated bias after T periods by $\hat{\beta}_T$, we obtain expression (1).

Computation of W. We compute the precision W of the preliminary estimate $\psi_T - \hat{\beta}_T$ for the rational case ($\lambda = 0$); this precision is used, by assumption, also by voters with persuasion $\lambda > 0$. For a given race concerning candidates at time T, rational viewers ($\lambda = 0$) form a preliminary expectation of quality, $\hat{\theta}_T^P = \psi_T - \hat{\beta}_T$:

$$
\begin{aligned}
\hat{\theta}_T^P &= \frac{\psi_T \left[\gamma_\beta + T\gamma_\theta\right]}{\gamma_\beta + T\gamma_\theta} - \frac{\gamma_\beta \beta_0 + \gamma_\theta \sum_{t=1}^{T} \psi_t}{\gamma_\beta + T\gamma_\theta} \\
&= \frac{\gamma_\beta}{\gamma_\beta + T\gamma_\theta} (\beta - \beta_0) + \frac{\gamma_\beta + (T-1)\gamma_\theta}{\gamma_\beta + T\gamma_\theta} \theta_T - \frac{\gamma_\theta}{\gamma_\beta + T\gamma_\theta} \sum_{t=1}^{T-1} \theta_t,
\end{aligned}
$$

where the second step follows from substituting $\psi_t = \theta_t + \beta$ and combining terms. Note that since $\hat{\theta}_T^P$ is an estimate of θ_T, its variance does not itself depend on θ_T but does on all other random variables $(\theta_1, ... \theta_{T-1}, \beta)$. We can compute the variance of $\hat{\theta}_T^P$ to be

$$
\frac{\gamma_\beta}{(\gamma_\beta + T\gamma_\theta)^2} + \frac{(T-1)\gamma_\theta}{(\gamma_\beta + T\gamma_\theta)^2} = W^{-1}
$$

where W is the precision of $\hat{\theta}_T^P$. This implies $W = (\gamma_\beta + T\gamma_\theta)^2 / (\gamma_\beta + (T-1)\gamma_\theta)$.

Estimation of $\hat{\theta}_T^\lambda$ ($\hat{\theta}_T^\lambda = \hat{\theta}_T$ **for** $\lambda = 0$). Now that we have obtained $\hat{\beta}$ and W, we solve the signal extraction for the case of λ-persuasion. Voters with λ-persuasion form a differential quality estimate for politician pair T, $\hat{\theta}_T^\lambda$, by taking a precision-weighted average of the prior quality differential between candidates, 0 with precision γ_θ, and the estimated one, $\psi_T - (1-\lambda)\hat{\beta}_T$ with precision W. Therefore, $\hat{\theta}_T^\lambda$ equals

$$
\begin{aligned}
\hat{\theta}_T^\lambda &= \frac{\gamma_\theta}{\gamma_\theta + W} * 0 + \frac{W}{\gamma_\theta + W} * \left[\frac{\psi_T \left[\gamma_\beta + T\gamma_\theta\right]}{\gamma_\beta + T\gamma_\theta} - (1-\lambda)\frac{\gamma_\beta \beta_0 + \gamma_\theta \sum_{t=1}^{T} \psi_t}{\gamma_\beta + T\gamma_\theta} \right] \\
&= \frac{W}{\gamma_\theta + W} \left[\frac{\gamma_\beta + \lambda T\gamma_\theta}{\gamma_\beta + T\gamma_\theta} \beta - \frac{(1-\lambda)\gamma_\beta}{\gamma_\beta + T\gamma_\theta} \beta_0 + \frac{\gamma_\beta + (T - (1-\lambda))\gamma_\theta}{\gamma_\beta + T\gamma_\theta} \theta_T - \frac{(1-\lambda)\gamma_\theta}{\gamma_\beta + T\gamma_\theta} \sum_{t=1}^{T-1} \theta_t \right].
\end{aligned}
$$

Proofs of Propositions 1 and 2. The proof of Proposition 1 follows immediately from taking derivatives and limits for $T \to \infty$: $\partial(\hat{\theta}_T^\lambda)/\partial\beta = W(\gamma_\beta + \lambda T\gamma_\theta)/[(\gamma_\beta + T\gamma_\theta)(\gamma_\theta + W)] > 0$ (Proposition 1.(i)) and $\partial^2(\hat{\theta}_T^\lambda)/\partial\beta\partial\lambda = WT\gamma_\theta/[(\gamma_\beta + T\gamma_\theta)(\gamma_\theta + W)] > 0$ (Proposition 1.(i)) (Proposition 1.(iii.) uses the fact that $\lim_{T\to\infty} W/(\gamma_\theta + W) = 1$). For Proposition 2(i), we use $\partial[1 - F(-\hat{\theta}_T^\lambda)]/\partial\beta = f(-\hat{\theta}_T^\lambda) * \partial(\hat{\theta}_T^\lambda)/\partial\beta$ together with $f > 0$. For Proposition 2(ii), note that for $\lambda = 0$ $\lim_{T\to\infty} \partial(\hat{\theta}_T^\lambda)/\partial\beta = 0$ and therefore, since f is bounded, $\lim_{T\to\infty} \partial[1 - F(-\hat{\theta}_T^\lambda)]/\partial\beta = 0$. For T very large and $\lambda > 0$, the derivative $\partial[1 - F(-\hat{\theta}_T^\lambda)]/\partial\beta$ remains positive since $\partial(\hat{\theta}_T^\lambda)/\partial\beta \to \lambda$ and $f > 0$. (Notice that this does not require $f(-\hat{\theta}_T^\lambda)$ to have a limit.)

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Figure 1. Fox News Availability by County, 2000.

Counties.shp

Proportion of towns with Fox News

- No Data
- proportion = 0
- 0 < proportion < 0.5
- 0.5 <= proportion < 1
- proportion = 1
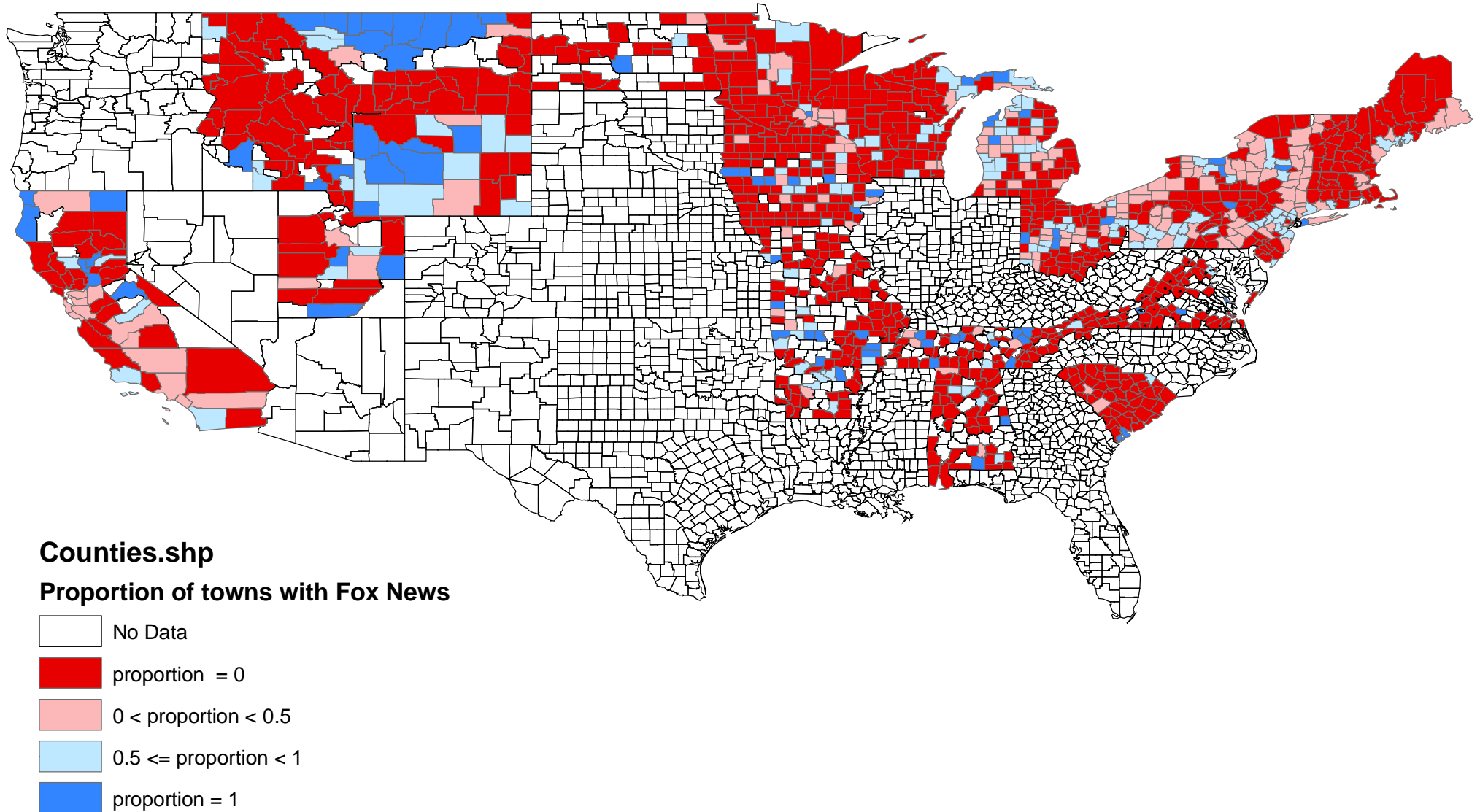
Note: Proportion for each county is calculated as the ratio of number of towns with Fox News available via cable to total number of towns in the county. Alaska and Hawaii are also in the data set, but are not included on the map due to space constraints.

Table 1. Determinants of Fox News Audience (Scarborough Data)

Sample:	Summary Statistics					
	All Survey Respondents			Matched Zip-Coded Subsample		
	All	Fox News Regular Audience	Fox News Non-Regular Audience	All	Fox News Diary Audience	Fox News Non-Diary Audience
	(1)	(2)	(3)	(4)	(5)	(6)
Cable Variables:						
Fox News	0.173	1	0	0.166*	0.591*	0.146*
(Regular Audience)	(0.379)	.	.	(0.372)	(0.493)	(0.353)
Fox News				0.035	1	0
(Diary Audience)				(0.185)	.	.
CNN	0.341	0.619	0.283	0.353*	0.603*	0.341*
(Regular Audience)	(0.474)	(0.486)	(0.451)	(0.478)	(0.490)	(0.474)
CNN				0.103	0.350	0.094
(Diary Audience)				(0.304)	(0.478)	(0.292)
Demogr. Variables:						
Some College	0.214	0.219	0.213	0.215	0.206	0.215
	(0.410)	(0.414)	(0.410)	(0.411)	(0.405)	(0.411)
College Graduate	0.344	0.356	0.341	0.386	0.452	0.384
	(0.475)	(0.479)	(0.474)	(0.487)	(0.498)	(0.486)
African American	0.097	0.111	0.094	0.084	0.020	0.086
	(0.296)	(0.314)	(0.292)	(0.277)	(0.140)	(0.281)
Hispanic	0.107	0.081	0.112	0.180	0.094	0.183
	(0.309)	(0.273)	(0.315)	(0.384)	(0.293)	(0.387)
Unemployment	0.022	0.018	0.023	0.023	0.005	0.024
	(0.147)	(0.134)	(0.149)	(0.151)	(0.070)	(0.153)
Age	45.679	49.744	44.827	44.506	51.727	44.241
	(16.633)	(16.995)	(16.429)	(16.443)	(16.362)	(16.386)
Male	0.424	0.481	0.412	0.427	0.526	0.423
	(0.494)	(0.500)	(0.492)	(0.495)	(0.500)	(0.494)
Political Variables:						
Republican	0.282	0.375	0.262	0.267	0.536	0.257
	(0.450)	(0.484)	(0.440)	(0.442)	(0.499)	(0.437)
Democrat	0.319	0.294	0.324	0.335	0.159	0.342
	(0.466)	(0.455)	(0.468)	(0.472)	(0.366)	(0.474)
Voter Turnout	0.693	0.769	0.677	0.677	0.819	0.672
	(0.461)	(0.421)	(0.468)	(0.468)	(0.386)	(0.470)
Subscriptions:						
Cable	0.687	0.784	0.666	0.754	0.886	0.749
	(0.464)	(0.411)	(0.471)	(0.431)	(0.318)	(0.434)
Satellite	0.147	0.138	0.149	0.104	0.122	0.103
	(0.354)	(0.344)	(0.356)	(0.305)	(0.327)	(0.304)
No. Observations:	N = 105201	N = 18223	N = 86968	N = 11388	N = 403	N = 10985

Notes: Data from Scarborough Research. Columns 1 through 3 show mean and standard deviation of variables in the whole US sample (August 2000 March 2001, Column 1) and in the subsamples of regular Fox News audience (Column 2) and non-regular Fox News audience (Column 3). Columns 4 through 6 show mean and standard deviation of variables in the subsample with ZIP code data that matches to a town in the cable and election sample (February 2000-August 2001, Column 4) and in the subsamples of diary Fox News audience (Column 5) and non-diary Fox News audience (Column 6). Regular Fox News audience is an indicator variable for response to "Do you watch regularly the Fox News Channel?". Diary Fox News audience is an indicator variable for whether the respondent watched at least a full 30 minute block of Fox News in the survey week.

* The number of observations for Fox News (Regular Audience) is 5,070 in Column 4, 237 in Column 5, and 5,307 in Column 6. Same number of observations for CNN (Regular Audience).

Table 2. Summary Statistics

	All Sample			Mixed Districts		Mixed Counties	
	All Towns (1)	Fox News in 2000 (2)	No Fox in 2000 (3)	Fox News in 2000 (4)	No Fox in 2000 (5)	Fox News in 2000 (6)	No Fox in 2000 (7)
Cable Variables:							
Number of Channels	28.60	44.52	24.73	44.39	24.41	45.00	26.05
	(14.64)	(15.98)	(11.31)	(16.14)	(11.57)	(16.06)	(11.81)
Potential Subscribers	78124	163622	57384	140457	47373	167006	70832
	(149015)	(246661)	(103131)	(198871)	(91025)	(254926)	(116337)
Voting Variables:							
Vote Share in 1996	0.470	0.479	0.467	0.482	0.475	0.477	0.475
	(0.125)	(0.125)	(0.125)	(0.124)	(0.124)	(0.125)	(0.127)
Vote Share in 2000	0.538	0.538	0.538	0.541	0.550	0.533	0.536
	(0.130)	(0.129)	(0.130)	(0.128)	(0.126)	(0.129)	(0.133)
Log Turnout in 1996	-0.583	-0.583	-0.583	-0.583	-0.578	-0.573	-0.566
	(0.481)	(0.482)	(0.480)	(0.471)	(0.732)	(0.434)	(0.418)
Log Turnout in 2000	-0.522	-0.525	-0.521	-0.525	-0.518	-0.510	-0.504
	(0.491)	(0.497)	(0.490)	(0.487)	(0.483)	(0.449)	(0.431)
Census Variables for 2000:							
Population	9612	11516	9150	10564	7157	11872	12266
	(32661)	(32427)	(32703)	(31000)	(23261)	(33678)	(37678)
Some college	0.257	0.259	0.257	0.258	0.257	0.258	0.254
	(0.064)	(0.063)	(0.064)	(0.064)	(0.066)	(0.063)	(0.067)
College	0.195	0.220	0.189	0.216	0.178	0.224	0.210
	(0.133)	(0.147)	(0.129)	(0.145)	(0.118)	(0.150)	(0.146)
African American	0.033	0.031	0.034	0.028	0.027	0.030	0.026
	(0.095)	(0.082)	(0.098)	(0.073)	(0.083)	(0.084)	(0.072)
Hispanic	0.031	0.035	0.030	0.032	0.027	0.035	0.041
	(0.073)	(0.072)	(0.073)	(0.067)	(0.065)	(0.074)	(0.096)
Unemployed	0.051	0.051	0.052	0.051	0.052	0.050	0.053
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.036)	(0.038)
Urban	0.406	0.537	0.374	0.518	0.331	0.556	0.441
	(0.438)	(0.447)	(0.429)	(0.446)	(0.416)	(0.446)	(0.447)
Census Variables, Change from 1990 to 2000:							
Population	704	772	687	681	584	805	934
	(3457)	(3775)	(3375)	(3499)	(2727)	(3974)	(4461)
Some college	0.040	0.035	0.041	0.036	0.044	0.035	0.034
	(0.048)	(0.046)	(0.049)	(0.046)	(0.049)	(0.046)	(0.047)
College	0.037	0.041	0.036	0.041	0.035	0.042	0.041
	(0.042)	(0.044)	(0.042)	(0.045)	(0.041)	(0.045)	(0.043)
African American	0.004	0.003	0.004	0.003	0.003	0.003	0.004
	(0.026)	(0.025)	(0.026)	(0.024)	(0.024)	(0.024)	(0.024)
Hispanic	0.011	0.013	0.010	0.012	0.010	0.013	0.011
	(0.026)	(0.030)	(0.025)	(0.027)	(0.025)	(0.029)	(0.028)
Unemployed	-0.012	-0.011	-0.013	-0.011	-0.013	-0.012	-0.012
	(0.038)	(0.037)	(0.039)	(0.037)	(0.040)	(0.038)	(0.036)
Urban	0.082	0.079	0.083	0.082	0.080	0.084	0.086
	(0.238)	(0.239)	(0.238)	(0.241)	(0.240)	(0.247)	(0.242)
No. of observations	N = 9256	N = 1807	N = 7449	N = 1734	N = 5897	N = 1548	N = 2342

Notes: Standard deviations in parenthesis. The subset "Fox News in 2000" is formed by the towns with availability of Fox News in 2000 in the cable package. The subset "No Fox in 2000" is the complementary groups of towns. Towns with district variation are towns in districts in which there is at least one town that does not get Fox News and one town that does. Towns with county variation are similarly defined except at the county level. Potential Subscribers is defined as the total voting-age population of the towns reached by a cable provider. Republican two-party vote share is the votes received by the Republican candidate in the presidential election divided by the votes received by both the republican and democratics candidates. Log turnout is measured by the log ot the ratio of total votes cast in a given town to the voting-age population of the town. Observations unweighted.

Table 3. Selective Penetration of Fox News in 2000, Linear Probability Model

	Dep. Var.: Fox News Availability in 2000 in Cable System						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pres. Republican Vote Share in 1996	0.6562 (0.2127)***	0.3987 (0.1574)**	-0.0324 (0.0948)	-0.0397 (0.1020)	-0.0326 (0.0947)	0.0849 (0.1324)	0.0603 (0.1320)
Pres. Log Turnout in 1996					0.014 (0.0125)		
Pres. Rep. Vote Share Change 1988-1992						0.2287 (0.2480)	-0.2348 (0.2335)
Census controls:							
Population 2000 (10,000s)	-0.0019 (0.0008)**	-0.0029 (0.0008)***	-0.0003 (0.0014)	-0.0009 (0.0010)	-0.0003 (0.0014)	-0.0017 (0.0014)	-0.0011 (0.0012)
Some College 2000	-0.1444 (0.4096)	0.2452 (0.3133)	-0.0004 (0.1963)	-0.3139 (0.2218)	-0.0159 (0.1963)	0.1507 (0.2709)	0.2599 (0.2967)
College Grad. 2000	0.9454 (0.3237)***	0.7312 (0.3171)**	0.0855 (0.1619)	-0.0482 (0.1820)	0.0738 (0.1610)	-0.0966 (0.2092)	0.1113 (0.2061)
African American 2000	0.5802 (0.2169)***	0.3937 (0.2020)*	-0.0098 (0.1090)	0.077 (0.1112)	-0.0139 (0.1088)	-0.2132 (0.1718)	-0.2511 (0.1587)
Hispanic 2000	0.1795 (0.2980)	0.2929 (0.2945)	-0.1197 (0.1972)	-0.2768 (0.2074)	-0.111 (0.1974)	0.0788 (0.3334)	-0.3902 (0.4148)
Unemployment Rate 2000	0.2446 (0.8408)	0.2749 (0.6388)	0.3494 (0.3811)	0.2531 (0.3542)	0.3502 (0.3802)	0.4625 (0.4309)	0.3597 (0.3707)
Urban 2000	0.1453 (0.0474)***	0.0072 (0.0349)	-0.0277 (0.0250)	-0.0113 (0.0208)	-0.0261 (0.0249)	-0.0497 (0.0315)	-0.0425 (0.0316)
Chg Popul. (00-90) (10,000s)	-0.007 (0.0126)	-0.0038 (0.0091)	-0.0194 (0.0107)*	-0.0082 (0.0080)	-0.0196 (0.0107)*	0.0036 (0.0117)	-0.004 (0.0121)
Chg Some College (00-90)	0.4883 (0.5278)	-0.3965 (0.4170)	-0.1792 (0.1934)	0.1604 (0.2043)	-0.1938 (0.1921)	-0.3915 (0.2383)	-0.5782 (0.2454)**
Chg College Grad (00-90)	-0.1477 (0.5281)	-0.1977 (0.4050)	0.0535 (0.2079)	0.2036 (0.2345)	0.0339 (0.2087)	0.1602 (0.2620)	-0.1258 (0.2582)
Chg African Am. (00-90)	-1.8736 (0.6184)***	-1.3313 (0.4619)***	-0.4128 (0.2221)*	-0.3608 (0.2838)	-0.3853 (0.2208)*	0.3925 (0.4265)	0.4598 (0.4647)
Chg Hispanic (00-90)	1.3941 (0.8469)*	0.6968 (0.7308)	-0.0245 (0.3569)	0.3903 (0.3720)	-0.0248 (0.3567)	-0.5029 (0.6976)	0.5214 (0.8511)
Chg Unemp. Rate (00-90)	0.0647 (0.6293)	-0.5119 (0.4571)	-0.3538 (0.2663)	0.0672 (0.2778)	-0.3431 (0.2668)	-0.2461 (0.3064)	-0.2209 (0.3317)
Chg Urban (00-90)	-0.1377 (0.0509)***	-0.0918 (0.0393)**	-0.0037 (0.0281)	-0.0771 (0.0276)***	-0.0059 (0.0280)	-0.014 (0.0405)	-0.0518 (0.0415)
Other Census Controls	X	X	X	X	X	X	X
Control for Cable Features		X	X	X	X	X	X
US House District Fixed Effects			X		X	X	
County Fixed Effects				X			X
R²	0.0772	0.4032	0.669	0.7673	0.6691	0.6317	0.7612
N	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 3722	N = 3722

Notes: An observation in the linear probability model is a town in one of the 28 US States in the sample. The dependent variable is a binary variables that equal one if Fox News was part of the town's local cable package in 2000. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by average total votes cast in 1996 and 2000 presidential elections. The log turnout measure is the log of the ratio of total votes cast to voting-age population in the town.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. The Effect of Fox News on the 2000-1996 Presidential Vote Share Change

| | Dep. Var.: Republican Vote Share Change between 2000 & 1996 Pres. Elections | | | | | | |
| | Two-Party Vote Share | | | | | | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	0.0347 (0.0017)***	.	.	.	.	.	.
Fox News 2000	-0.0026 (0.0037)	0.0027 (0.0024)	0.0078 (0.0026)***	0.004 (0.0016)**	0.0069 (0.0014)***	0.0036 (0.0021)*	0.0049 (0.0019)**
Pres. Vote Chg. (92-88)						0.0216 (0.0217)	0.0509 (0.0221)**
Census controls:							
Population 2000 (10,000s)		-0.0001 0.0000	0 0.0000	-0.0003 (0.0001)***	-0.0001 (0.0001)***	-0.0004 (0.0002)**	-0.0003 (0.0001)***
Some College 2000		-0.005 (0.0176)	0.0053 (0.0160)	-0.0657 (0.0141)***	-0.0613 (0.0162)***	-0.058 (0.0210)***	-0.0581 (0.0218)***
College Grad. 2000		-0.1122 (0.0154)***	-0.1091 (0.0139)***	-0.0964 (0.0104)***	-0.1197 (0.0123)***	-0.1044 (0.0172)***	-0.1494 (0.0234)***
African American 2000		-0.0845 (0.0079)***	-0.0824 (0.0073)***	-0.0542 (0.0061)***	-0.0495 (0.0062)***	-0.0774 (0.0113)***	-0.0763 (0.0120)***
Hispanic 2000		-0.1312 (0.0163)***	-0.1218 (0.0155)***	-0.0563 (0.0130)***	-0.0727 (0.0139)***	-0.0298 (0.0320)	-0.047 (0.0266)*
Unemployment Rate 2000		0.2565 (0.0414)***	0.2699 (0.0380)***	0.1201 (0.0261)***	0.0983 (0.0254)***	0.1593 (0.0447)***	0.1744 (0.0383)***
Urban 2000		-0.0181 (0.0023)***	-0.0062 (0.0024)***	-0.0072 (0.0014)***	-0.0053 (0.0014)***	-0.0065 (0.0020)***	-0.0074 (0.0022)***
Chg Popul. (00-90)		-0.0005 (0.0005)	-0.0004 (0.0005)	0.0019 (0.0005)***	0.0005 (0.0005)	0 (0.0016)	-0.0016 (0.0013)
Chg Some College (00-90)		0.0228 (0.0253)	0.0245 (0.0229)	0.0627 (0.0153)***	0.0566 (0.0152)***	0.0349 (0.0211)*	0.0125 (0.0219)
Chg College Grad (00-90)		0.0308 (0.0270)	0.044 (0.0235)*	0.0843 (0.0127)***	0.0918 (0.0131)***	0.0555 (0.0197)***	0.0693 (0.0209)***
Chg African Am. (00-90)		-0.0803 (0.0224)***	-0.071 (0.0207)***	-0.0691 (0.0182)***	-0.093 (0.0160)***	-0.0063 (0.0294)	-0.0445 (0.0281)
Chg Hispanic (00-90)		-0.002 (0.0368)	-0.006 (0.0336)	-0.0547 (0.0208)***	-0.0389 (0.0248)	-0.0737 (0.0578)	-0.0857 (0.0569)
Chg Unemp. Rate (00-90)		-0.1885 (0.0322)***	-0.1938 (0.0302)***	-0.0627 (0.0222)***	-0.0392 (0.0219)*	-0.1159 (0.0401)***	-0.1081 (0.0271)***
Chg Urban (00-90)		-0.007 (0.0027)***	-0.006 (0.0026)**	0.0033 (0.0016)**	0.0036 (0.0015)**	0.002 (0.0024)	0.0072 (0.0023)***
Other Census Controls		X	X	X	X	X	X
Control for Cable Features			X	X	X	X	X
US House District Fixed Effects				X		X	
County Fixed Effects					X		X
R²	0.0008	0.5199	0.5557	0.7531	0.8114	0.7517	0.8228
N	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 3722	N = 3722

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. The dependent variable is the two-party republican vote share for the 2000 presidential election minus the two-party republican vote share for the 1996 presidential election. Fox News 2000 is a binary variables that equal one if Fox News was part of the town's local cable package in 2000. The estimate of the constant is not reported for Columns 2-7. Robust standard errors clustered by local cable company in parentheses. The observation are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. The Effect of Fox News on the 2000-1996 Presidential Vote Share Change. Robustness

Dep. Var:.	Republican Two-Party Vote Share in 2000		Log (Vote Sh.) Change 2000-1996	Pres. Rep. Vote Share Change between 2000 & 1996 Elections						
				All-Party Vote Share	Right-Wing Vote Share	Two-Party Vote Share				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fox News 2000	0.0039 (0.0016)**	0.0037 (0.0016)**	0.0085 (0.0035)**	0.0039 (0.0016)**	0.0048 (0.0017)***	0.0038 (0.0017)**		0.0047 (0.0017)***	0.0037 (0.0015)**	0.005 (0.0018)***
Republican Vote Share in 1996	0.9359 (0.0079)***									
Fox News in Basic Package						0.0008 (0.0025)				
Share of Population Subscribing to Fox News Cable Package							0.0058 (0.0034)*			
Control Variables:										
Census 2000 and 1990	X	X	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X	X	X
US House District Fixed Effects	X	X	X	X	X	X	X	X	X	X
Quartic Polynomial in 1996 Vote Share		X								
Unweighted, Turnout>2000								X		
Outliers Dropped									X	
Optimal Trimmed Sample										X
R^2	0.9825	0.9827	0.7093	0.8273	0.6926	0.7531	0.7529	0.7361	0.7702	0.7833
N	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 9214	N = 3115	N = 9071	N = 4177

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. In columns (1) and (2), the dependent variable is the two-party republican vote share for the 2000 presidential election. In column (3), the dependent variable is the log of the two-party Republican vote share for the 2000 presidential election minus the same variables for the 1996 election. In columns (4)-(10), the dependent variable is the Republican vote share for the 2000 presidential election minus the same variables for the 1996 elections. In Column (4) the Republican vote share is computed using the all-party vote share and in Column (5) it is computed including the Reform Party votes together with the Republican votes and the Green Party together with the Democratic votes. In Columns (6) through (10) the vote share refers to the two-party vote share. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by cable affiliate in parentheses. The observations are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Fox News and the 2000-1996 Presidential Vote Share. Interactions

	Dep. Var.: Republican Vote Share Change between 2000 & 1996 Presidential Elections							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fox News 2000	0.008 (0.0037)**	0.0095 (0.0039)**	0.0128 (0.0045)***	0.0132 (0.0046)***	0.0074 (0.0021)***	0.0082 (0.0019)***	0.0088 (0.0024)***	0.006 (0.0018)***
Fox News * (No. of Channels / 10)	-0.002 (0.0008)**	-0.0014 (0.0009)	-0.0025 (0.0009)***	-0.0024 (0.0009)**				
Fox News * (Urban in 2000)	0.0052 (0.0022)**	0.0039 (0.0019)**	0.0039 (0.0026)	0.0027 (0.0023)				
Fox News * South					-0.0081 (0.0040)**	-0.0146 (0.0067)**	-0.0027 (0.0060)	0.0184 (0.0219)
Fox News * Midwest					-0.0089 (0.0028)***	-0.0047 (0.0026)*	-0.0103 (0.0034)***	-0.0053 (0.0032)*
Fox News * West					0.002 (0.0039)	0.0046 (0.0034)	-0.0021 (0.0048)	0.0057 (0.0036)
Fox * (.46 < Average 2000 Rep. Vote Share In District < .54)					-0.0002 (0.0027)	-0.0007 (0.0021)	0.001 (0.0030)	-0.0009 (0.0023)
Fox * (Average 2000 Rep. Vote Share In District > .54)					-0.0017 (0.0031)	-0.0065 (0.0027)**	-0.0049 (0.0036)	-0.0109 (0.0034)***
Control Variables:								
Census 2000 and 1990	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X
US House District Fixed Effects	X		X		X		X	
County Fixed Effects		X		X		X		X
Optimally Trimmed Sample			X	X			X	X
R^2	0.7536	0.8116	0.7843	0.8434	0.7544	0.8123	0.785	0.8439
N	N = 9256	N = 9256	N = 4177	N = 4177	N = 9256	N = 9256	N = 4177	N = 4177

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. The dependent variable is the two-party Republican vote share for the 2000 presidential election minus the same variable for the 1996 elections. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. In Columns (1) through (4) the variables Urban and No. of Channels are included in the regressions (coefficients not shown), In Columns (5) through (8) the variables South, Midwest, and West, and the indicators for political ortiention of the Districts are included in the regressions. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Timing of Fox News Effect on the Presidential Vote Share Change

Dep. Var:.	Pres. Rep. Vote Share Change '00-'96						Pres. Rep. Vote Share Change '04-'00		Pres. Rep. Vote Share Change '96-'92	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fox News 2000	0.0034	0.0072	0.0032	0.0069	0.0034	0.0061	0.0021	0.0015	-0.0022	-0.0005
	(0.0021)*	(0.0018)***	(0.0016)**	(0.0016)***	(0.0021)	(0.0018)***	(0.0020)	(0.0023)	(0.0031)	(0.0035)
Fox News 1998	-0.0008	-0.0032								
	(0.0023)	(0.0020)								
Fox News 2004			0	-0.0015						
			(0.0012)	(0.0014)						
Control Variables:										
Census 2000 and 1990	X	X	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X	X	X
US House District Fixed Effects	X		X		X		X	X	X	X
County Fixed Effects		X		X		X				
Sample with Fox News in 2004					X	X				
Optimally Trimmed Sample								X		X
R^2	0.76	0.8099	0.7524	0.8103	0.7792	0.8395	0.6289	0.6703	0.6187	0.688
N	N = 6672	N = 6672	N = 8645	N = 8645	N = 4844	N = 4844	N = 8605	N = 3886	N = 4006	N = 1706

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. In columns (1)-(6), the dependent variable is the Republican vote share for the 2000 presidential election minus the same variables for the 1996 elections. In columns (7)-(8), the dependent variable is the Republican vote share for the 2004 presidential election minus the same variables for the 2000 elections. In columns (9)-(10), the dependent variable is the Republican vote share for the 1996 presidential election minus the same variables for the 1992 elections. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. Fox News 1998 and Fox News 2004 are similarly defined. In Columns (5) and (6) the sample is restricted to towns which have Fox News available by 2004. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by local cable company in parentheses. The observation are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. The Effect of Fox News on the 2000 Senatorial Races

Dep. Var.:	Rep. Vote Share Change between 2000 Senate & 1996 Presidential Elections							Rep. Vote Share Change Senate 2000 minus 1994	
	Two-Party Vote Share						All-Party Vote Share		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fox News 2000	0.0079 (0.0026)***	0.0082 (0.0030)***	0.0033 (0.0029)	0.0045 (0.0038)		0.0105 (0.0038)***	0.0072 (0.0028)***	0.0112 (0.0049)**	0.0138 (0.0056)**
Fox News * (New York Race)	0.0011 (0.0063)	-0.0054 (0.0074)	0.014 (0.0071)**	0.0029 (0.0060)		-0.0009 (0.0063)	0.003 (0.0060)	. .	. .
Subscription Ratio to Fox News					0.0195 (0.0054)***				
(Subscription Ratio to Fox * (New York Race)					0.0108 (0.0141)				
Fox * (.46 < Average 2000 Rep. Vote Share In District < .54)						-0.0014 (0.0046)			
Fox * (Average 2000 Rep. Vote Share In District > .54)						-0.0114 (0.0065)*			
Control Variables:									
Census 2000 and 1990	X	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X	X
US House District Fixed Effects	X		X		X	X	X	X	
County Fixed Effects		X		X					X
Optimally Trimmed Sample			X	X					
R²	0.9288	0.948	0.9275	0.9468	0.9289	0.9289	0.9257	0.7484	0.8361
N	N = 8192	N = 8192	N = 3877	N = 3877	N = 8150	N = 8192	N = 8192	N = 2037	N = 2037

Notes: An observation in the OLS regression is a town in one of the 24 US States in the sample. For columns (1)-(6), the dependent variable is the two-party Republican vote share for the 2000 Senate election minus the two-party Republican vote share for the 1996 Presidential election. For column (7) the dependent variable is the same except that we use the all-party Republican vote share rather than the two-party Republican vote share. For columns (8)-(9), the dependent variable is the two-party Republican vote share for the 2000 Senate election minus the two-party Republican vote share for the 1994 Senate election. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. Fox News*(New York Race) is the interaction of the Fox News 2000 variable with an indicator for New York's senatorial race between Hillary Clinton and Rick Lazio. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by cable affiliate in parentheses. The observations are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9. The Effect of Fox News on the 2000-1996 Presidential Turnout Change

	Dep. Var.: Turnout Change between the 2000 & 1996 Presidential Elections						Log (Votes Cast / Voting-age Population)	
Measure of Turnout:	Log (Total Votes Cast)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fox News 2000	0.0048 (0.0039)	0.018 (0.0051)***	0.0081 (0.0042)*	0.0154 (0.0060)**		0.0165 (0.0065)**	0.0023 (0.0040)	0.0173 (0.0063)***
Change in Log (Voting-Age Population) bw. 2000 & 1996	0.384 (0.0442)***	0.3851 (0.0448)***	0.3065 (0.0535)***	0.3159 (0.0545)***	0.3837 (0.0438)***	0.3825 (0.0441)***		
Share of Population Subscribing to Fox News Cable Package					0.0148 (0.0090)			
Fox * (.46 < Average 2000 Rep. Vote Share In District < .54)						-0.0237 (0.0083)***		
Fox * (Average 2000 Rep. Vote Share In District > .54)						-0.0143 (0.0100)		
Control Variables:								
Census 2000 and 1990	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X
US House District Fixed Effects	X		X		X	X	X	
County Fixed Effects		X		X				X
Optimally Trimmed Sample			X	X				
R²	0.6291	0.6979	0.6762	0.7341	0.6298	0.63	0.5176	0.599
N	N = 9256	N = 9256	N = 4177	N = 4177	N = 9214	N = 9256	N = 9256	N = 9256

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. For columns (1)-(6), the dependent variable is the log of total votes cast in the 2000 Presidential elections minus the same variable in 1996. For columns (7)-(8), the dependent variable is the log of the share of total votes cast in the 2000 presidential election over the population over 18 in the same year, minus the same measure calculated with 1996 data. The population data for 1996 is interpolated from the 1990 and 2000 Census. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by local cable company in parentheses. The observations are weighted by average total votes cast in the 1996 and 2000 presidential elections.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10. The Effect of Fox News Cable Exposure in 2000 on Fox News Audience, Scarborough Data

	Dep. Var.: Share Of Town Population That Watched At Least 30 Minutes of a Channel in Past Week								
	Watched Fox News						Watched CNN		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.0262	.	.	.	.	.	0.0947	.	.
	(0.0036)***	.	.	.	.	.	(0.0054)***	.	.
Availability of Fox News	0.027	0.0371	0.0251	0.0256		0.0346	0.0251	0.0042	0.0045
Via Cable in 2000	(0.0058)***	(0.0105)***	(0.0082)***	(0.0102)**		(0.0116)***	(0.0121)**	(0.0114)	(0.0104)
Subscription Ratio to Fox News					0.0813				
					(0.0237)***				
Availability of Fox News						0.0016			
Via Cable in 2004						(0.0090)			
Control Variables:									
Census 2000 and 1990		X	X	X	X	X		X	X
Cable System Controls		X	X	X	X	X		X	X
US House District Fixed Effects		X		X	X	X		X	
County Fixed Effects			X						X
Optimally Trimmed Sample				X					
R²	0.0655	0.3105	0.3507	0.3358	0.3093	0.3148	0.0217	0.3872	0.4262
N	N = 568	N = 568	N = 568	N = 392	N = 567	N = 545	N = 568	N = 568	N = 568

Notes: An observation in the OLS regression is a town for which both Scarborough data on diary audience, as well as cable and election data are available. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000, and similarly for Fox News 2004. The Optimally trimmed Sample is defined in the text. Robust standard errors clustered by cable affiliate in parentheses. The observations are weighted by the number of survey respondents resident in the town.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11. Comparison with Persuasion Rates in Other Media Studies

							Variable: Persuasion Rate f (Share of Listeners Convinced by Media)			
Paper	**Treatment**	**Election Type or Question**	**Variable t**	**Year**	**Place**	**Sample Size**	**Control Group t_T**	**Treatment Group t_C**	**Exposure Rate e_T-e_C**	**Persuasion Rate f**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fox News Study										
DellaVigna and Kaplan (2005)	Fox News Exposure, County f.e.	Presidential Election	Republican Vote Share	2000	28 US States	N = 66,372,804	0.556	0.560	0.127	0.032
	Fox News Exposure, Distr. f.e.						0.556	0.563	0.086	0.082
Field Experiments										
Gerber and Green (2000)	Door-to-Door Canvassing	Federal Elect.	Turnout	1998	New Haven	N = 14,473	0.422	0.463	0.270	0.263
	Canvassing + Mail + Calls	Federal Elect.	Turnout	1998	New Haven	N = 14,850	0.422	0.448	0.270	0.167
Green, Gerber, and Nickerson (2003)	Door-to-Door Canvassing	Local Elect.	Turnout	2001	6 Cities	N = 18,933	0.286	0.310	0.293	0.118
Green and Gerber (2001)	Phone Calls By Youth Vote	General Elect.	Turnout	2000	4 Cities	N = 4,377	0.660	0.711	0.737	0.205
	Phone Calls 18-30 Year-Olds	General Elect.	Turnout	2000	2 Cities	N = 4,377	0.405	0.416	0.414	0.045
Gerber, Karlan, and Bergan (2006)	Free subscription to Washington Post	Governor Elect.	Dem. Share of Votes	2005	Washington	N = 1,011	0.291	0.363	0.940	0.109
Laboratory Experiments										
Ansolabehere and Iyengar (1995)	Laboratory Exposure to 30-Second Political Ad	Governor Elect. Senate Elect. Mayor Elect.	Vote Share for Party Sponsoring Ad	1990 1992 1993	Southern California	N = 1,716	0.530	0.568	1.000	0.082
Surveys										
Kull et al. (2003)	Respond. watches Fox News	Did US find WMD in Iraq?	Share of Yes Answers	2003	USA	N = 8,634	0.220	0.330	1.000	0.141
Gentzkow and Shapiro (2004)	Respondent watches CNN	Did Arabs do 9/11 attack?	Share of Yes Answers	2002	Arab Countries	N = 2,457	0.215	0.280	1.000	0.083
	Respond. watches Al Jazeera			2002		N = 2,457	0.215	0.133	1.000	0.105

Notes: Calculations of media effect by the authors based on data from the papers cited. Columns (7) and (8) report the share of Republican voters in the Control and Treatment group. Column (9) reports the Exposure Rate, that is, the difference between the Treatment and the Control group in the share of people exposed to the Treatment. Column (10) computes the estimated persuasion rate f as (tT-tC)/((eT-eC)*(1-tC)), except in the first row (see Text). The persuasion rate denotes the share of the audience that was not previously convinced and that is convinced by the message.

Appendix Table 1. Summary Statistics by State

	Average Fox News Share in 2000		Average Rep. Vote Share in 2000		Average Rep. Vote Share in 1996		Average Populat. in 2000		Share of Final to Original Sample		
	Original Sample (1)	Final Sample (2)	Original Sample (3)	Final Sample (4)	Original Sample (5)	Final Sample (6)	Original Sample (7)	Final Sample (8)	Votes in 2000 (9)	Votes in 1996 (10)	Popul. in 2000 (11)
Total	0.200	0.195	0.561	0.538	0.485	0.470	4298	7171	0.686	0.704	0.659
	N = 17333	N = 9256	N = 26678	N = 9256	N = 26479	N = 9256	N = 27064	N = 9256			
By State											
Ak	0.262	0.175	0.621	0.612	0.506	0.510	719	2416	0.117	0.141	0.432
	N = 65	N = 40	N = 294	N = 40	N = 302	N = 40	N = 311	N = 40			
Al	0.115	0.097	0.565	0.566	0.497	0.505	5107	4447	0.077	0.068	0.153
	N = 523	N = 113	N = 1888	N = 113	N = 1999	N = 113	N = 643	N = 113			
Ar	0.220	0.205	0.521	0.497	0.391	0.357	1178	1677	0.108	0.118	0.105
	N = 508	N = 122	N = 1576	N = 122	N = 1469	N = 122	N = 1658	N = 122			
Ca	0.234	0.210	0.468	0.447	0.437	0.429	24070	37088	0.535	0.706	0.598
	N = 1110	N = 391	N = 533	N = 391	N = 469	N = 391	N = 1007	N = 391			
Ct	0.160	0.156	0.441	0.442	0.425	0.427	11738	13606	0.893	0.896	0.823
	N = 188	N = 154	N = 169	N = 154	N = 168	N = 154	N = 217	N = 154			
Hi	0.391	0.414	0.394	0.385	0.349	0.336	6249	5627	0.103	0.102	0.180
	N = 128	N = 29	N = 294	N = 29	N = 298	N = 29	N = 145	N = 29			
Ia	0.112	0.158	0.553	0.526	0.483	0.455	915	5345	0.448	0.487	0.604
	N = 802	N = 247	N = 1488	N = 247	N = 1470	N = 247	N = 2388	N = 247			
Id	0.107	0.184	0.777	0.735	0.652	0.589	3669	3555	0.462	0.531	0.335
	N = 187	N = 87	N = 385	N = 87	N = 364	N = 87	N = 252	N = 87			
Ma	0.066	0.017	0.397	0.396	0.346	0.347	11596	13794	0.880	0.883	0.827
	N = 379	N = 290	N = 351	N = 290	N = 351	N = 290	N = 417	N = 290			
Me	0.154	0.175	0.524	0.500	0.399	0.387	1826	2784	0.896	0.896	0.868
	N = 396	N = 303	N = 508	N = 303	N = 508	N = 303	N = 532	N = 303			
Mi	0.267	0.267	0.554	0.544	0.475	0.475	4463	6569	0.861	0.868	0.837
	N = 1373	N = 930	N = 1413	N = 930	N = 1411	N = 930	N = 1636	N = 930			
Mn	0.131	0.110	0.565	0.531	0.454	0.427	1483	3899	0.756	0.759	0.756
	N = 865	N = 702	N = 2481	N = 702	N = 2444	N = 702	N = 2443	N = 702			
Mo	0.096	0.094	0.607	0.579	0.507	0.478	1940	2489	0.200	0.185	0.129
	N = 788	N = 212	N = 1724	N = 212	N = 1713	N = 212	N = 2116	N = 212			
Mt	0.148	0.189	0.714	0.673	0.578	0.535	2535	4916	0.799	0.809	0.576
	N = 142	N = 74	N = 175	N = 74	N = 181	N = 74	N = 249	N = 74			
Nd	0.085	0.078	0.671	0.680	0.552	0.546	296	2219	0.260	0.246	0.300
	N = 211	N = 64	N = 457	N = 64	N = 505	N = 64	N = 1600	N = 64			
Nh	0.000	0.000	0.539	0.530	0.466	0.459	3737	4550	0.921	0.923	0.903
	N = 268	N = 184	N = 239	N = 184	N = 240	N = 184	N = 248	N = 184			
Nj	0.432	0.428	0.470	0.466	0.454	0.450	9611	10801	0.917	0.909	0.860
	N = 702	N = 495	N = 538	N = 495	N = 543	N = 495	N = 647	N = 495			
Ny	0.327	0.252	0.550	0.540	0.480	0.471	8793	6514	0.588	0.604	0.339
	N = 1465	N = 738	N = 970	N = 738	N = 972	N = 738	N = 1615	N = 738			
Oh	0.228	0.232	0.596	0.581	0.518	0.508	3741	6397	0.720	0.733	0.686
	N = 1873	N = 904	N = 1572	N = 904	N = 1545	N = 904	N = 2253	N = 904			
Pa	0.231	0.226	0.580	0.563	0.524	0.511	3510	4095	0.806	0.811	0.760
	N = 2667	N = 1716	N = 2449	N = 1716	N = 2452	N = 1716	N = 2636	N = 1716			
Ri	0.184	0.182	0.383	0.378	0.348	0.343	15400	21361	0.911	0.916	0.880
	N = 49	N = 33	N = 39	N = 33	N = 39	N = 33	N = 52	N = 33			
Sc	0.103	0.051	0.556	0.529	0.502	0.466	6597	8185	0.224	0.249	0.489
	N = 330	N = 177	N = 1490	N = 177	N = 1468	N = 177	N = 449	N = 177			
Tn	0.156	0.247	0.514	0.508	0.482	0.459	7003	4507	0.080	0.095	0.175
	N = 449	N = 166	N = 1686	N = 166	N = 1686	N = 166	N = 611	N = 166			
Ut	0.118	0.117	0.754	0.799	0.682	0.690	5063	5450	0.346	0.682	0.355
	N = 195	N = 94	N = 334	N = 94	N = 304	N = 94	N = 285	N = 94			
Va	0.096	0.116	0.568	0.561	0.525	0.503	7832	12219	0.257	0.262	0.374
	N = 467	N = 147	N = 1539	N = 147	N = 1494	N = 147	N = 614	N = 147			
Vt	0.018	0.017	0.478	0.470	0.389	0.389	1709	2602	0.706	0.717	0.662
	N = 219	N = 117	N = 241	N = 117	N = 241	N = 117	N = 269	N = 117			
Wi	0.101	0.090	0.533	0.530	0.448	0.452	2419	4274	0.714	0.720	0.715
	N = 885	N = 666	N = 1628	N = 666	N = 1625	N = 666	N = 1646	N = 666			
Wy	0.475	0.443	0.787	0.753	0.670	0.599	2787	4816	0.737	0.752	0.843
	N = 99	N = 61	N = 217	N = 61	N = 218	N = 61	N = 125	N = 61			

Notes: Summary statistics on town-level availability of Fox News in 2000 (Columns 1 and 2), two-party vote share in 1996 and 2000 (Columns 3 through 6), and population in 2000 (Columns 7 and 8). The data is presented for the initial sample of cable, voting, and Census data, as well as for the final sample of 9,256 observations. The averages are unweighted.

Appendix Table 2. The Effect of Fox News on the 2000-1996 Presidential Vote Share Change. Robustness 2

	Dep. Var.: Presid. Republican Vote Share Change between 2000 & 1996									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fox News 2000	0.0033	0.0066	0.0014	0.004	0.0054	0.0042	0.0022	0.0048	-0.0003	0.0017
	(0.0016)**	(0.0016)***	(0.0016)	(0.0015)***	(0.0016)***	(0.0019)**	(0.0015)	(0.0014)***	(0.0016)	(0.0014)
Control Variables:										
Census 2000 and 1990	X	X	X	X	X	X	X	X	X	X
Cable System Controls	X	X	X	X	X	X	X	X	X	X
District Fixed Effects	X		X				X	X		X
County Fixed Effects		X		X				X		X
Specifications:										
Weighted by population	X	X								
Unweighted			X	X	X	X			X	X
Nearest-neighbour matching					X	X				
Include questionable obs.							X	X	X	X
Exclude Hi, Nd, Nj, Wy									X	X
R^2	0.7407	0.81	0.5666	0.6796	.	.	0.7539	0.8154	0.5371	0.6641
N	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 9256	N = 9802	N = 9802	N = 9131	N = 9131

Notes: An observation in the OLS regression is a town in one of the 28 US States in the sample. The dependent variable is the two-party Republican vote share for the 2000 presidential election minus the same variable for the 1996 elections. Fox News 2000 is a binary variable that equals one if Fox News was part of the town's local cable package in 2000. The specifications in Columns (1) and (2) are weighted by voting-age population in 1996. The specifications in Columns (5) and (6) are the estimate of average treatment on the treated for nearest-neighbor matching estimator, based on matching on the listed controls. The specifications in Columns (7) through (10) include 289 towns with multiple cable systems, at least one of which carries Fox News and at least one of which does not, as well as 257 towns with likely voting data problems. The specifications in Columns (9) and (10) exclude observations from the states of Hawaii, North Dakota, New Jersey, and Wyoming. Robust standard errors clustered by cable affiliate in parentheses, except in Columns (5) and (6).
* significant at 10%; ** significant at 5%; *** significant at 1%