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Media and Political Persuasion: Evidence from Russia

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This paper compares electoral outcomes of 1999 parliamentary elections in Russia among geographical areas with differential access to the only independent from the government national TV channel. It was available to three-quarters of Russia's population and its signal availability was idiosyncratic conditional on observables. Independent TV decreased aggregate vote for the government party by 8.9 percentage points, increased the combined vote for major opposition parties by 6.3 percentage points, and decreased turnout by 3.8 percentage points. The probability of voting for opposition parties increased for individuals who watched independent TV even controlling for voting intentions measured one month before elections.

JEL codes: J0, D0, H0

> *"Contrary to a common perception, mass media*
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> *is an instrument, rather than an institution,"*
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> – Vladimir Putin, to the director of independent
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> radio station Echo Moscow.[1]

In August 1999, Vladimir Putin, whose popularity rating was below 2 percent at that time, was appointed prime minister of Russia by its first president, Boris Yeltsin. Eight

[1] As reported by Alexei Venedictov, editor-in-chief of *Echo Moscow*, at a public lecture at the New Economic School on February 26, 2009.

months later, he won the March 2000 presidential elections in the first round with 52.9 percent of the vote. In the December 1999 parliamentary elections, the new pro-government party "Unity"—created less than two months prior to the election—finished second in the electoral race with 23.3 percent of the total vote. Scholars and journalists hypothesized that the massive and well-organized media campaigns by the state-owned television played crucial roles in achieving these electoral results (Timothy Colton and Michael A. McFaul 2003; Hale Henry, McFaul and Colton 2004; Sarah Oates 2006). Can mass media really have such a substantial effect on political outcomes; and if so, under what circumstances?

A large body of evidence suggests that media has an important but rather small—in terms of magnitude—effect on political outcomes in established democracies, characterized by competitive media, stable party systems, and political parties with well-known and well-understood ideological platforms. One, however, should expect a larger effect of media on political outcomes in a country with weak democratic institutions, such as Russia in the 1990s. Russia's party system was unstable, with many short-lived political parties coming and going. Voters had little prior knowledge about parties and put substantial weight on new information, which mostly came from mass media during election campaigns. Parties ran on platforms with vaguely defined ideology, and ideological differences were often unclear to voters. As a result, issues not related to policy, such as candidate's charisma, were important elements of voting decisions. In addition, competition in Russia's media market was highly imperfect: in many regions all major media outlets were controlled by the government, and voters only had access to one-sided political coverage.[2]

Despite the overall success of the newly created pro-government Unity party in the 1999 Russian parliamentary elections, the success was far from uniform across the country.

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[2] In countries with relatively free and competitive media, persuasion effects of media are mitigated by consumers' ability to self-select to their most preferred media outlet (Ruben Durante and Brian G. Knight 2009). Media outlets, consequently, tailor their coverage to the tastes of their audience (Matthew Gentzkow and Jesse M. Shapiro 2010). In countries with controlled media people cannot do that.

For example, the party received less than 14 percent of the vote in the city of Perm and more than 32 percent in the city of Voronezh. We show that to a large extent these differences are explained by the variation in voters' access to an independent media outlet in different parts of the country. Indeed, if the governing party controls all major media sources, an access to an alternative source of information can be important in helping people to make informed choices.[3] In this paper, we estimate the impact of the only independent national TV channel, NTV, on voting behavior during the Russian 1999 parliamentary elections. Using data on the location of NTV transmitters inherited from a Soviet educational channel and geographical variation in signal propagation, we calculate the strength of the signal in each locality in Russia and on the basis of the signal strength predict the availability of NTV. We investigate two types of effects. First, we analyze the aggregate effects of NTV availability on the official electoral results in sub-regions (an analogue of U.S. counties). Second, we use data from a large-scale representative panel survey to investigate the media effects on the individual level, using the strength of NTV signal as an instrument for NTV exposure.

We find a large and significant effect of NTV availability on the voting outcomes. As a result of NTV broadcast the pro-government party lost about a quarter of its voters and the opposition parties increased their political support by a factor of 1.6. In addition, access to NTV broadcasts decreased turnout by 3.8 percentage points. Using the individual-level data, we find that exposure to NTV had a significant effect on individual votes in favor of two of the three opposition parties (supported by NTV) even controlling for voting intentions measured one month prior to the elections. NTV had a particularly large negative effect on the vote for the pro-government party among voters who were undecided a month before the election.

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[3] John McMillan and Pablo Zoido (2004) show that the existence of a single independent TV channel can threaten the stability of a corrupt regime. Their findings suggest that an independent media outlet can help to achieve government accountability.

A key assumption for our identification strategy is that the availability of NTV was idiosyncratic conditional on observables, i.e., there are no unobserved characteristics of sub-regions correlated with NTV availability that could drive the observed differences in voting behavior. This assumption cannot be tested directly, but we can provide indirect evidence to support it. First, we show that the location of NTV transmitters—the vast majority of which were built for the Soviet educational channel before NTV was formed—is correlated with the population size, average wage, and urban status of a sub-region; but, it is not correlated with other socio-economic characteristics of the sub-regions or pre-1999 voting choices, once we control for population size, average wage, and urban status. Second, and most importantly, we conduct a placebo experiment by estimating the effect of our main explanatory variable, i.e., NTV availability, on the voting behavior in 1995 (instead of 1999 as in our baseline specification). During the 1995 election campaign, there were no significant differences in the political coverage of the national TV channels (NTV was not yet a national channel and had a negligible audience). Utilizing NTV's availability as of 1999, which had a large effect on voting behavior in that year, we do not find that it had any effect on the vote in 1995. The results of this placebo experiment suggest that unobservable characteristics of sub-regions, which could potentially be correlated with political preferences of the electorate, on the one hand, and with the availability of NTV, on the other hand, cannot explain our main findings.

In addition, we investigate the longer-run effect of NTV by looking at the results of the subsequent 2003 election. The political news coverage by NTV and other national TV channels was less distinct in 2003, as NTV was taken over by a state-owned company. We find statistically significant effects of NTV availability on the vote for the two liberal parties (supported by NTV in 1999) and on turnout. However, the magnitude of the effect on voting for liberal parties is substantially smaller than in 1999.

We calculate persuasion rates separately for the positive message of NTV, encouraging voting for the parties supported by NTV, and for the negative message of NTV, discouraging voting for the party opposed by NTV. The persuasion rate for the positive message is 8 percent, which is very similar to the findings in Stefano DellaVigna and Ethan Kaplan (2007) if we use a comparable measure of media exposure. The persuasion rate for the negative message is much higher: 66 percent. The large magnitude of the effect of NTV is consistent with the hypothesis that the weakness of democratic institutions is associated with a greater persuasion power of the media. Furthermore, both the high persuasion rate for the negative message and the negative effect of NTV on turnout are consistent with the findings of the literature on negative political advertising (Stephen Ansolabehere and Shanto Iyengar 1995, Ansolabehere, Iyengar, and Adam Simon 1999; Scott Deposato 2009).

Recent contributions to the literature employ experimental and quasi-experimental approaches to deal with the inherent endogeneity of survey-based studies and show that media does affect voting behavior (see DellaVigna and Gentzkow 2010 for a survey). Most of the evidence comes from established democracies and points to the effect of media on voting outcomes through its impact on turnout.[4] There is also evidence that both television (DellaVigna and Kaplan 2007) and newspapers (Alan Gerber, Dean S. Karlan, and Daniel Bergan 2009) can affect vote for a particular political party, whereas James M. Snyder, Jr., and Strömberg (2010) show that the coverage by local media affects the behavior of politicians and, as a result, public policies.

The evidence on the effects of media on voting outside the developed world is scarce. These studies suggest that media have a substantial effect on political preferences in regimes

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[4] Previous literature found a positive effect on turnout of the penetration of local radio stations (David Strömberg, 2004) and TV stations targeting a particular group of population (Felix Oberholzer-Gee and Joel Waldfogel 2009), and a negative effect of the introduction of television (Gentzkow 2006) and increased access to national newspapers (Lisa M. George and Waldfogel 2006).

other than advanced democracies.[5] The importance of media effects for the outcomes of Russian elections in 1999 and 2000 was studied in Colton and McFaul (2003) and Stephen White, Oates, and Ian McAllister (2005) using survey-based approach. The latter work is most closely related to our paper, as it also tries to estimate the effect of Russian media and finds a significant media exposure effect on voting results. White, Oates, and McAllister (2005), however, use the self-reported vote choice and the self-reported presence of state-owned or commercial television from a survey conducted 18 months after the elections. This methodology is subject to severe endogeneity problems. Our approach is superior from a methodological perspective because it allows us to evaluate the size of the *causal* effect of NTV on voting decisions.

The rest of the paper is organized as follows: Section I provides background information on the television market and political landscape in Russia at the end of the 1990s. In section II, we formulate our hypotheses and describe the data. Section III presents aggregate-level results. Section IV presents individual-level results. We conclude in section V.

I. Background information

A. Political Landscape

Throughout the 1990s, Russia's political landscape changed from one election to the other (see, e.g., White, Matthew Wyman, and Olga Kryshtanovskaya 1995; White, Richard Rose, and McAllister 1997; Ted Brader and Joshua A. Tucker 2001). New parties formed and

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[5] For example, it has been shown that media affects attitudes and vote choices in Mexico (Chappell Lawson and James A. McCann 2007), the extent of anti-Americanism in Arabic countries (Gentzkow and Shapiro 2004), and the support of the authoritarian regime in East Germany (Jens Hainmueller and Holger Kern 2009). McMillan and Zoido (2004) provide an account of how the media was used to undermine democratic accountability in Peru. In addition, the lack of media freedom is associated with state media ownership (Simeon Djankov, Caralee McLiesh, Tatiana Nenova, and Andrei Shleifer 2003), resource curse and low incentives for bureaucracy (Georgy Egorov, Sergei Guriev, and Konstantin Sonin 2009), low level of social spending (Maria Petrova 2008), and high corruption (Aymo Brunetti and Beatrice Weder 2003).

old ones disappeared. Partisan attachments, however, were rather weak, with the exception of the very loyal supporters of the communist party, KPRF (Colton, 2000).[6]

Our main focus is on the party-list vote in December 1999 elections to the Duma (the lower house of Russia's parliament).[7] The main political parties that participated in these elections were as follows. The most popular party at the official launch of the election campaign in October 1999 was the opposition party called OVR ("Fatherland – All Russia"), which had centrist ideology and based its campaign on criticizing the government. It was created in August 1999 from a coalition of the two pre-existing centrist parties, "Fartherland" and "All Russia." According to polls two months before the elections, OVR was expected to get 29 percent of the total vote.[8] The second and the third most popular political parties at the start of the campaign were KPRF (communists) and "Yabloko" (liberals), which were expected to get 21 percent and 10 percent of the vote, respectively. Each of the other political parties was expected not to overcome the 5 percent threshold required for representation. A new political party, Unity ("Edinstvo" in Russian) was created on September 27, 1999. The leaders of the party officially stated that it had no ideology other than to support the government and its head Vladimir Putin.[9] In October 1999, Unity was still completely unknown to voters and the official polls did not even include it in the list of competitors for the upcoming election. The results of the December 1999 election sharply contrasted with the forecasts: KPRF was first with 24.3 percent, Unity second with 23.3 percent, and OVR third

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[6] Russia's political environment can be characterized as a "partial democracy" (David L. Epstein, Robert H. Bates, Jack Goldstone, Ida Kristensen, and Sharyn O'Halloran 2006). Such political environments possess some but not all properties of full democracies. "Partial democracies" have elections, but the competitiveness and fairness of these elections is questionable at best.

[7] Prior to the 2004 political reform, the Duma was formed by a mixed electoral rule. One half of all seats (225 deputies) was chosen in single-member-district majoritarian elections and the other half of the seats was filled by party-lists voting in a single national district according to a proportional representation formula with a 5 percent entry barrier.

[8] See the results reported by a major Russian polling firm, "Foundation Obschestvennoe Mnenie," on October 20 1999, http://bd.fom.ru/report/cat/policy/party_rating/o907003.

[9] The leader of Unity, Sergei Shoigu, the minister of emergency situations, said about the ideology of the newly created movement: "We do not bind ourselves to any narrow ideological direction. We are not centrists, rightists, or leftists. We are a party of consolidation of all healthy forces in society, free of ideological bias." By "healthy forces" he meant the support of Putin's government and Putin himself. Source: *Nezavisimaya Gazeta*, December 8, 1999, as cited in Colton and McFaul (2003).

with only 13.3 percent. Three other political parties passed the 5 percent electoral threshold: liberal SPS ("the Union of Rightwing Forces"), liberal Yabloko, and nationalist LDPR ("Zhirinovsky bloc") with 8.5, 5.9, and 6.0 percent of the total vote, respectively.

Only three out of the parties that got Duma representation in 1999 participated in the previous elections held in 1995. These were KPRF (communists), LDPR (nationalists), and Yabloko (liberals); all of them were also represented in the Duma as a result of the 1995 election and got 22.3, 11.2, and 6.9 percent of the total vote, respectively.[10]

Unity and OVR, the fierce competitors during the 1999 election campaign, both had a centrist ideology; and by the time of the subsequent election held in 2003, they united to create the "United Russia" party. United Russia became the main "party of power" in the 2003 elections and got 37.6 percent of the vote. KPRF (communists) and LDPR (nationalists) also got into the Duma in 2003 with 12.6 and 11.5 percent of the vote. Liberal Yabloko and SPS participated in the 2003 election, but did not pass the representation threshold; they received 4.3 and 4.0 percent of the total vote.

B. Mass Media Coverage of Election Campaigns

What accounts for the change in voter preferences in the fall of 1999? Colton and McFaul (2003) conjecture that the massive support from state-owned TV channels caused the rise of Unity. During the election campaign of 1999, television played a very important role in disseminating political information to voters: according to a nationally representative survey, television was the "basic source of information about political events" for 89 percent of adult population, compared to 8 percent who named radio, and 3 percent who named newspapers (Colton and McFaul 2003, pp. 32, 241).[11]

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[10] In addition, the liberal SPS party was the direct political heir of the liberal party "Democratic Russia's Choice," which participated in 1995 election and got 3.9 percent of the vote (Colton 2000).
[11] These numbers are consistent with those found by other scholars, i.e., White and Oates (2003); Hale, McFaul, and Colton (2004); and Ellen Mickiewicz (2008).

Three major national TV channels broadcast political news in 1999. The two largest channels, ORT and RTR, were state-controlled. The third major channel, NTV ("Independent TV"), was a commercial network owned by a media tycoon Vladimir Gusinsky. Gusinsky was in political opposition to Putin; and his channel, NTV, openly criticized the Kremlin.[12] Many sources point out that the commercial success of NTV was not nearly as important for Gusinsky as the ability to gain political influence through the channel (see, e.g., David E. Hoffman 2002, p.172; Oates, 2006 p. 35).[13] After the election of Putin in 2000, Gusinsky was imprisoned for a brief period of time and was forced to sell his stake in NTV and flee the country (Tavernise 2000; Colton and McFaul 2003, pp. 216-217; Oates 2006, p. 36).

During the 1999 election campaign, the coverage of political parties on the two state-controlled national TV channels differed sharply, both quantitatively and qualitatively, from that of NTV.[14] The largest differences concerned the pro-government Unity and the centrist opposition OVR. The state-controlled channels ORT and RTR devoted 28 percent and 24 percent of the news time to Unity, whereas NTV devoted only 5 percent of its news time to Unity. In contrast, the two state-controlled channels allocated 15 percent and 13 percent of their news time to OVR, whereas NTV devoted 33 percent of its news time to OVR.[15]

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[12] This is important as governments can influence even independent private media outlets and not only state-owned ones (Nancy Qian and David Yanagizawa 2010).

[13] In a chronicle of Russian oligarchs, Hoffman (2002) describes the face-off between Putin and Gusinsky during 1999-2000 in the following way. "In Putin's world, Gusinsky was a marked man. His television channel, with its open criticism of the Kremlin and Putin, ran counter to all Putin's instincts and desires… [Below Hoffman quotes Sergei Dorenko, the deputy director general of the ORT TV channel during the 1999 election campaign.] Dorenko said: 'First of all, he [Putin] believed that Gusinsky was working for Luzhkov [one of the leaders of the main opposition party, OVR]... Second, Putin thought that Gusinsky rebuilt himself to serve American political interests. And third, Gusinsky cannot be controlled. He is strong and not a Putin man... Putin cannot stand beside anybody whose opinion differs from his own, especially publicly…' " (Hoffman 2002, p. 475). Similarly, Sabrina Tavernise (2000) notes that "President Vladimir Putin has made no secret of his dislike of Mr. Gusinsky and …lashed out at the businessman publicly."

[14] Three independent institutions monitored political news coverage by the national TV channels in 1999: European Institute for the Media (EIM), Organization for Security and Cooperation in Europe/Office for Democratic Institutions and Human Rights (OSCE), and Jamestown Foundation Monitor (JFM). In this section, we rely on their reports and on the work of political scientists to document the differences in political coverage across the channels.

[15] The coverage of party leaders was also quantitatively different. Sergei Shoigu, the head of the Unity's party list, received 19 percent and 15 percent of the news time devoted to key political figures in state-controlled channels ORT and RTR, and only 4 percent in NTV. The leaders of OVR, Luzhkov and Primakov, together got

Perhaps, even more importantly, the content of broadcasted messages also differed. All sources report that news reports about Unity were given a positive spin by the state channels and a negative spin by NTV. Exactly the opposite was the case for OVR. (See JFM 1999; EIM 2000, pp. 33, 36-39; OSCE 2000, pp. 16-18, 36; and also Colton and McFaul 2003, pp. 56, 92, 114, 216; Oates 2006, pp. 33, 35.) In an interview with EIM, NTV's chief news editor Vladimir Kulistikov admitted that NTV deliberately allocated more time to OVR, in order to outweigh the excessive negative coverage of the party on ORT. He said: "We are sympathetic to the Kremlin's opponents and we give them the floor" (EIM 2000, p. 38).[16]

Liberal parties were also covered differently by NTV and state-controlled channels. The differences were less pronounced in terms of the spin with which the news about these parties were presented, but were substantial in terms of the time allocation across different parties and in terms of issues important for the campaign. SPS received 32 percent of all NTV news time devoted to political parties, while it got only 6 percent of news time devoted to political parties on each of the state-controlled channels (EIM 2000, pp.35-38).[17] The other liberal party Yabloko was almost never mentioned on ORT; but received similar amount of time allocated to political parties at RTR and NTV, 10 percent and 8 percent, respectively. Yet, a key issue of the election campaign was the war in Chechnya: the start of which was associated with the appointment of Vladimir Putin as prime minister. Yabloko was the only

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4 percent and 7 percent of the time devoted to key political figures on the state-controlled channels, and 26 percent on NTV (EIM 2000, pp. 35-38).

[16] State TV channels also actively engaged in negative campaigning. In particular, a Sunday newsmagazine with Sergei Dorenko shown prime time on ORT claimed that the OVR leaders Primakov and Luzhkov were involved in assassination plots and worked for the CIA with the sole purpose of overthrowing Prime Minister Vladimir Putin (Laura Belin 1999; White, Oates, and McAllister 2005, p. 198). These accusations were not based on any evidence. Subsequently, Luzhkov sued Dorenko for defamation and won; but this was after the election (EIM 1999, p. 39). David Remnick, a journalist from *The New Yorker* said that this newsmagazine was similar to "The Jerry Springer Show" ('The black box', *The New Yorker*, March 27, 2000, p. 41).

[17] The tone of coverage for SPS was similarly neutral across all channels (EIM 2000, p. 35; Colton and McFaul 2003, p. 144).

political party that actively opposed the war (Colton and McFaul 2003, p.151). Similarly, NTV was the only TV channel that criticized the conduct of the war.[18]

There were no profound differences in coverage of other political parties. KPRF (communists) received very little time (relative to its broad political base) on all three channels: 7 percent of news time for all political parties on state channels and 3 percent on NTV (EIM 2000, pp. 33, 35-36). The news stories about KPRF were presented without any particular spin (Colton and McFaul 2003, pp. 114, 121). LDPR (nationalists) received larger share of time allocated to political parties, but it was similar (about 16 percent) on state-controlled channels and NTV (EIM 2000, pp. 35-38).[19]

Overall, during the 1999 election campaign, the pro-government Unity party was opposed by NTV relative to the two main state-controlled TV channels, while the centrist opposition OVR party and liberal opposition SPS and Yabloko parties were supported by NTV relative to the two state-controlled TV channels.

The 1999 election was the only episode in Russia's political history when different TV channels had different political orientations. During the 1995 election campaign, all national TV channels were state-owned and had similar coverage of the election campaign (EIM 1996, OSCE 1996). NTV already existed (since 1993), but was not yet a national TV channel. The broadcasting infrastructure used by NTV in 1999 belonged to the state educational TV channel (Channel 4 Ostankino), which did not cover political news. In 1995, NTV was able to use a small part of this network to broadcast for several hours per day, but regional television companies were given a priority to broadcast on this frequency and often exercised it. The

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[18] NTV showed casualties, refugees, and destroyed homes of civilians; whereas both state-controlled channels broadcast optimistic messages about military victories (Belin 2002, pp. 22-25; JFM 1999; Oates 2006, pp. 34, 59).

[19] Media analysts suggest that LDPR attracted much of viewers' attention due to its leader's (ultra-nationalist Zhirinovsky) scandalous appearance. Sergei Kostornov, the head of the special projects department at RTR said: "Viewers need 'bread and circus'… Putin is the 'bread' and Zhirinovsky is the 'circus' " (EIM 2000, p. 35). Attracting viewers was an important task for all channels, as all of them derived a significant part of their income from advertising revenue (EIM 2000, p. 35).

broadcasting infrastructure was transferred to NTV on Yeltsin's orders in 1996.[20] NTV became a national channel in 1998, which implied that no regional channel could use its frequency without the channel's explicit consent.[21] As a result, the audience of NTV increased dramatically, from less than 6 percent in 1995 to more than 75 percent in 1999.

By the time of 2003 election campaign, NTV belonged to the state-owned monopoly Gazprom for a few years, ever since the successful takeover in April 2001 (see Masha Lipman and McFaul 2004, pp.61-64 for a detailed account of the takeover). The takeover lead to a replacement of most journalists and of the entire managerial team, which resulted in a change of the style of news coverage at NTV (Colton and McFaul 2003, pp. 216-217; Lipman and McFaul 2004, pp. 55, 62-64; Mickiewicz 2006, p. 10; Mickiewicz 2008, p.51; Oates 2006, pp. 28, 34-36).[22] Most sources point out that qualitatively political news coverage on NTV during the 2003 election campaign was very similar to that of ORT and RTR. Several sources, however, point out that some quantitative differences remained in the amount of time devoted to coverage of key political figures; most of these differences, however, can be explained by a relatively low amount of time devoted to 2003 election campaign at NTV (OSCE 2004, p. 15-16, Oates 2006, pp. 171-175). A noticeable but small difference in political news coverage during the campaign was that the SPS's leader Anatoly Chubais was given slightly more time for uninterrupted speech on NTV than on the other two state channels (see Oates 2006, p. 173).[23]

NTV was not the only independent source of information for voters in the largest cities, such as Moscow and St. Petersburg, and their surrounding areas, as there were

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[20] Yeltsin's Order N1386, 20.09.96 Source: www.lawrussia.ru, accessed 02.12.10.
[21] Yeltsin's Order N55, 21.01.98 Source: www.lawrussia.ru, accessed 02.12.10.
[22] According to Hale, Colton, and McFaul (2004, p. 310): "Under control of those closely tied to the Kremlin, the old NTV has gradually come to resemble the other two national television networks." Colton and McFaul (2003, p. 217) described the 2003 media market for political news as follows: "In nationwide television broadcasting, Russia is closer today [i.e., in 2003] to a monopoly than in any time since the establishment of NTV in 1993."
[23] If anything, one could interpret quantitative results of monitoring of TV broadcast as a very small bias of NTV in favor of the pro-government party United Russia, as compared with the first two channels.

independent local TV channels with a limited reach available in these areas; there was also some diversity of opinions on the radio and in print media.[24] For the vast majority of voters, located far enough from Moscow's TV and radio transmitters, NTV was the only source of alternative information about politics.

II. Empirical hypotheses, the data, and identification strategy

A. Hypotheses

In 1999, approximately three-fourths of Russia's population had access to NTV (Oates 2006, p. 14, Colton and McFaul 2003, p.242).[25] Thus, one-fourth of voters located in parts of the country where NTV was not accessible were exposed to only one-sided media coverage of the election campaign, as they could only watch the state channels, ORT and RTR. In contrast, three-fourths of voters located in parts of the country that had access to NTV could watch the political news reported from the point of view of both sides of the political struggle. Our aim is to estimate the effect of the access to alternative media outlet on the political choices of the electorate.

The availability of alternative media sources can have an important effect on voting behavior even if the information that they provide is not necessarily accurate (see DellaVigna and Gentzkow 2010 for a survey). One possibility is that media content is informative at least in some states of the world. In this case, rational viewers will not fully discount information provided by media and use for Bayesian updating of their beliefs about political parties (e.g.,

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[24] The most prominent example of a local independent TV was TV-Tsentr, the channel owned by the Moscow government, favorable to OVR (according to EIM 2000, it devoted 71 percent of its news time to OVR). In 2001, after a substantial expansion of its network, the channel reached 16 percent of population (Oates 2006, p. 30). Another independent TV channel, also with a limited reach, TV-6, devoted a significant part of its news time to Our Home is Russia (the former party of power), Unity, and the communists (EIM 2000, p. 38-39). Most radio stations were neutral in their political coverage, but some devoted more time to OVR and the liberal parties compared to Unity, such as Ekho Moskvy and Radio 7 (EIM 2000, pp. 41-43, OCSE 2000, p. 19). Similarly, there were some independent voices in newspapers; for example, a weekly *Argumenty i Fakty* was favorable towards OVR (EIM 2000, p. 45). All sources point out, however, that radio and newspapers were a much less significant source of political news as compared to television.

[25] NTV had a satellite transmission ("NTV Plus") that was available throughout Russia, but less than 1 percent of voters subscribed to this service (at the beginning of 2000 there were only 110,000 subscribers).

Gentzkow and Shapiro 2006; Petrova 2008; Scott Gehlbach and Sonin 2009). Alternatively, media outlets can have an effect because not fully rational viewers underestimate the biases in media content (e.g., Daylian M. Cain, George Loewenstein, and Don A. Moore 2005; Erik Eyster and Matthew Rabin 2009), think categorically (Sendhil Mullainathan 2002; Mullainathan, Joshua Schwarzstein, and Shleifer 2008), or double count repeated information (Peter M. DeMarzo, Dimitri Vayanos, and Jeffrey Zwiebel 2003). Having access to media outlets with alternative points of view may also discourage voters from participating in elections, particularly when mass media use negative campaigning (Ansolabehere and Iyengar 1995; Ansolabehere, Iyengar, and Simon 1999). In the context of Russia's partial democracy characterized by large uncertainty about political parties' ideological positions and weak priors of voters about political parties, most theories predict large persuasion effects of the media. Thus, we expect to find a large effect of the availability of NTV on voting behavior in the 1999 elections.

Our main hypothesis is that there is a significant positive effect of the availability of NTV on voting for all parties that were supported by NTV (centrist opposition OVR, and liberal opposition Yabloko and SPS) and a significant negative effect of the NTV availability on the vote for pro-government Unity, which was criticized by NTV and praised by the other national TV channels. The prediction about the effect of NTV on turnout is ambiguous, as negative campaigning can discourage voters from participating in elections, but NTV could also convince undecided voters to vote for the parties supported by NTV.[26] The prediction about the effect of NTV on voting for parties receiving similar coverage on NTV and the state TV channels, i.e., KPRF (communist) and LDPR (nationalist), is ambiguous. On the one hand, potential voters for these parties should be less likely to switch to Unity when NTV is

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[26] Note that DellaVigna and Kaplan (2007) find positive effect of Fox News on aggregate-level turnout.

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available and, on the other hand, the availability of NTV makes it more likely that they switch to voting for the parties supported by NTV.

B. Data Sources

We construct our main explanatory variable using data on geographical coordinates, power, and frequency of the NTV transmitters in 1997 and 1999. These data come from Video International, a major Russian media advertising company. The data on transmitters are used to estimate the effect of NTV availability on the official voting results at the sub-region level (second-tier administrative division analogous to US counties) and on individual political choices using survey data.

Data on the official electoral outcomes are from the Central Election Commission of the Russian Federation. Specifically, we use the data on voting results for major parties and voter turnout in the party-list Duma elections of 1995, 1999, and 2003. The data are at the level of electoral districts (officially, Local Election Commissions). Electoral districts typically coincide with sub-regions in rural areas. In contrast, large cities are subdivided into several electoral districts and we aggregated voting results to the sub-regional level.[27] We exclude two metropolitan areas, Moscow and St. Petersburg, from the sample. There is no variation in NTV availability within them, as they have the status of regions; whereas our main specification includes region fixed effects. In addition, Moscow and St. Petersburg are clear outliers in individual-level analysis, which would have played in favor of our main hypothesis: metropolitan areas had the highest NTV availability and the highest political support for liberal parties and OVR supported by NTV. We also exclude Chechnya, Dagestan and Ingushetia because of the poor security situation in these regions caused by Chechnya's

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[27] In Russia, all 89 regions are divided into sub-regions (which is our unit of analysis). Sub-regions are administrative districts, similar to counties in the United States. A typical sub-region is an urban or rural area with a population of 200 to 300 thousand people. There were 2724 Local Election Commissions ("Territorialnye Izbiratelnye Komissii") during the 1999 Parliamentary elections. For the vast majority of sub-regions, they coincided with electoral districts; but some large sub-regions (typically, larger cities) are divided into several electoral districts.

armed conflict. The resulting sample consists of 2268 out of 2325 sub-regions. Some of these sub-regions lack data on socio-economic characteristics and, therefore, the number of observations in regressions is reduced further to 2005.

In the aggregate-level analysis, we use socio-economic characteristics by sub-region as control variables. These data are available for the years 1996 and 1998 from Rosstat, the official Russian statistical agency.

For the individual-level analysis, we use data from a nationally-representative multi-regional survey of voters from Colton (2000) and Colton and McFaul (2003). The survey is a large-scale panel survey of the Russian electorate held before and after the 1999 parliamentary elections. The panel consists of 1324 respondents from 45 sub-regions in 31 regions. After the exclusion of Moscow and St. Petersburg, the resulting sample consists of 1148 respondents from 42 sub-regions in 28 regions. The survey instruments included questions on respondents' socio-demographic characteristics, political preferences, and the sources of political information. In particular, respondents reported which TV channels were available in their locality and which TV channels and programs they actually watched. Based on these questions, we constructed individual-level dummies for whether the respondent indicated that NTV was available and for whether the respondent watched NTV (equal to 1 if the respondent watched either daily news or weekly news magazines on NTV "almost every day" or "from time to time").

Table A1 in the online appendix summarizes the variables in the survey data for our sample. The first two rows of the table indicate that in our sample NTV was available for 73 percent of respondents and about 61 percent of respondents watch NTV. These figures are lower than the aggregate figures for the whole country (77 percent for "NTV available" and 64 percent for "watch NTV") as we exclude Moscow and St. Petersburg.

In addition, we use data from a similar survey conducted right after the 1995 elections. Different individuals were surveyed in the same localities as in the 1999 survey and were asked about their votes in the 1995 election.

C. NTV availability and our identification assumption

Our identification strategy for estimating the effect of NTV on voting behavior relies on the premise that voters in the locations with and without access to NTV are similar in all unobserved characteristics that may drive their voting behavior once we control for observable differences between these locations. Later in the paper we present a validation test of this premise; in this section, we discuss whether this assumption is reasonable on an *a priory* basis and describe how we construct the measure of NTV availability.

The broadcasting infrastructure in Russia was largely inherited from the Soviet era. The two state channels, ORT and RTR, were the successors to the two main Soviet channels accessible to almost 100 percent of the population. NTV was created in 1993 as a small, privately-owned news channel with the ambition to become a major national channel. In September 1996, it was granted the whole broadcasting infrastructure (i.e., the transmitters) of the national educational channel (Channel 4 Ostankino) which ceased to exist at that time. The location for the transmitters inherited by NTV was driven by the whims of the Soviet central planning system rather than by any strategic considerations. In 1997, NTV had 387 active transmitters. By 1999, the number of active transmitters was expanded to 425. The primary reason for this was that a part of the inherited infrastructure was out of order and NTV expanded its transmitter network mainly by conducting repairs. The availability of functioning transmitters in 1999, however, was still primarily based on the inherited infrastructure.[28]

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[28] Source: Authors' interview with the former anchor and general director of NTV, Evgeny Kiselev.

Where did the Soviet planners build the infrastructure for the educational channel? Figure A1 in the online appendix presents the location of transmitters on the map of Russia. The figure illustrates that the transmitters were more or less evenly dispersed throughout the country, with the exception of a higher density around very big cities like Moscow and lower density in low-populated areas of Siberia. We have not come across a source that would describe the logic behind the choice of location. It is reasonable, however, to conjecture that transmitters were more likely to be located in large industrial cities. This conjecture is testable. Table 1 reports the results of the investigation of the correlates of the transmitter location using OLS regressions with regional fixed effects. In the first column, we regress the dummy for the location of a transmitter in 1999 in a sub-region on a city dummy, population and average wage. All regressors have the predicted sign and are highly statistically and economically significant. In the subsequent columns, we allow for a more flexible specification by including fifth-order polynomials of population and wage. In columns 3 and 4, we present regressions of NTV transmitter dummy on the results of the 1995 election. The location of an NTV transmitter in 1999 is significantly correlated with pre-existing political preferences of the electorate, but only if we do not control for city dummy, population and wage. Once basic controls for city status, population and wage are included, electoral variables do not add any explanatory power (R-squared does not change from column 2 to column 4) and become individually and jointly insignificant. In column 5, we verify that other socio-economic characteristics of the sub-regions do not add explanatory power to the regression explaining the choice of transmitter location. The last three rows of the table show F-statistics for the joint significance of the three groups of variables: only the basic determinants of transmitter location, namely, city dummy, population and wage, are jointly statistically significant. Finally, column 6 studies the determinants of the change in transmitter location from 1997 to 1999 (as we include transmitters in 1997 as an additional control).

Again, we find that 1995 election results are jointly insignificant, and therefore, we can conclude that the expansion of the NTV network of transmitters from 1997 to 1999 also was not aimed at reaching specific groups of voters.

[TABLE 1 ABOUT HERE]

Due to varying distances and topography, not all areas within sub-regions where NTV transmitters were located actually received NTV signal and some of the areas of sub-regions that had no NTV transmitter received strong signals from neighboring sub-regions. In our survey data, 19 percent of respondents reported that NTV is not available in sub-regions with an NTV transmitter and 60 percent of respondents reported that it was available in sub-regions without a transmitter. We use data on the location and power of NTV transmitters in order to determine areas where NTV was available.

First, we determine the power of the NTV signal for each of the Russia's sub-regions. Similarly to Benjamin Olken (2008), we apply the Irregular Terrain Model (George A. Hufford 2002) to calculate the signal loss caused by physical distance and topography between the transmitting and receiving locations. The model allows calculating the signal power for each sub-region-transmitter pair using the geographical center of each sub-region as the receiving location. Our measure of the signal strength for each sub-region is the maximum of the signal powers across all transmitters.[29]

Second, we estimate the relationship between the probability that a respondent in our survey reports that NTV is available and the NTV signal strength in the respective sub-region with a probit regression. The estimation results are as follows:

$$Prob\{NTV\_available_i = 1\} = \Phi \left(\underset{[0.00069]}{0.008} \; Signal\_strength_i + \underset{[0.039]}{0.654} \right) \tag{1}$$

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[29] Russia is characterized by high distances and relatively low variation in topography. Thus, in contrast to Olken (2008) who controls for the free-space signal strength and uses only the variation in signal power due to topography, we use the variation in the signal strength driven both by topography and physical distance.

There are 1311 observations from 45 sub-regions. Using this estimated equation, we predict the probability that NTV is available in and out of sample, i.e., in the rest of the sub-regions. For urban sub-regions in which NTV was available via free cable, we set the predicted probability that NTV was available at its maximum value among other sub-regions. In the analysis of the effect of NTV on voting outcomes as our primary measure of NTV availability we use the predicted probability that NTV was available as it allows easier interpretation of the size of the effect compared to using other functions of signal strength. Figure A1 in the online appendix presents the map showing the predicted probability that NTV is available (henceforth, NTV availability, in short) by sub-region. NTV availability varies between 0.25 and 0.91 with the mean of 0.58 and standard deviation of 0.09. Table A2 in the online appendix presents summary statistics for socio-economic characteristics of sub-regions with high and low NTV availability along with summary statistics for the election results in 1995 and 1999. Differences in these variables for the two groups of sub-regions are almost always statistically significant; but the comparison is based on the unconditional means and does not take into account regional fixed effects or differences in population, wage or urban/rural status between the two groups of sub-regions. Below we present the results of a placebo experiment, which provides additional evidence that pre-existing political preferences of the electorate did not systematically differ with NTV availability conditional on observables. Figures A2 and A3 in the online appendix present electoral maps with voting results for Unity and OVR in 1999 by sub-region.

III. Aggregate-level results

A. **Benchmark results**

In order to test whether NTV availability had an effect on aggregate voting outcomes in 1999 elections, we estimate the following model:

$$vote_{s,1999}^{j} = \beta_0 + \beta_1 NTV_{s,1999} + \boldsymbol{\beta}_2' \mathbf{X}_{s,1999} + \boldsymbol{\beta}_3' \mathbf{E}_{s,1999} + \delta_r + \varepsilon_s^{j}, \qquad (2)$$

$vote_{s,1999}^{j}$ is the percent of votes for party j in sub-region s at the 1999 Duma elections; $NTV_{s,1999}$ is the predicted NTV availability in sub-region s in 1999, $\mathbf{X}_{s,1995}$ is a vector of electoral outcomes in 1995 elections, $\mathbf{E}_{s,1998}$ is a set of socio-economic characteristics of sub-region s measured in 1998, and δ_r are region fixed effects. Standard errors are adjusted to allow for clusters within each region.

The vector of socio-economic controls $\mathbf{E}_{s,1998}$ in the baseline regressions includes dummy for cities, the fifth-order polynomial of population, the fifth-order polynomial of average wage (as the direct determinants of NTV availability) and the number of doctors and nurses per capita (as a proxy for the quality of public goods provision, which can be an important determinant of voting for the pro-government party). We verified that our results are robust to including a larger set of socio-economic controls (such as migration rate, average pension, the fraction of retired people, the fraction of unemployed, the number of people employed in farms, and crime rate).

Table 2 presents regression results for the vote for major parties and voter turnout. Panel A presents results for the main party opposed by NTV, Unity, and the main centrist opposition party supported by NTV, OVR. Panel B looks at the effect on liberal parties supported by NTV, SPS and Yabloko. Panel C features the effect of NTV on parties that got similar coverage by NTV and the state television channels. Finally, Panel D looks at the effect on voter turnout. Two sets of results are presented for each outcome: without and with controls for the election results from 1995.

[TABLE 2 ABOUT HERE]

The vote for Unity was significantly smaller in sub-regions with higher NTV availability. The magnitude of the effect is large: a ten percent increase in the NTV availability (i.e., the predicted probability that NTV is available) in a sub-region (which is

slightly above one standard deviation) leads to a decrease of the vote for Unity of 1.55 percentage points. This result is consistent with the hypothesis that NTV was a successful counterweight to the pro-government, pro-Unity propaganda broadcast by the two main state channels. The effect of NTV availability on the combined vote for the three opposition parties, supported by this channel, is significantly positive. An increase in the predicted NTV availability by ten percentage points leads to an increase in the vote for OVR of 0.36 percentage points, for SPS of 0.35 percentage points, and for Yabloko of 0.38 percentage points. In addition, it leads to a decline in turnout of about 0.67 percentage points. These results are qualitatively robust to excluding the 1995 electoral outcomes from the list of covariates, but the magnitudes of the effects in that case become slightly larger.[30]

In addition, we find smaller but statistically significant effects on parties with no difference in coverage (as we discussed in hypotheses section, the theoretical prediction for the effect on these parties is ambiguous). When NTV availability was greater by ten percentage points, KPRF (the communist party) gained 0.39 percentage points (if we do not control for 1995 electoral outcomes, the effect is smaller in magnitude and insignificant); and LDPR (the nationalist party) lost about 0.14 percentage points.

Two exercises help to interpret the magnitude of the estimated effects. First, we calculate the overall effect of NTV broadcasts on voting outcomes by comparing the vote for each of the parties to what it would have been had NTV not been there at all. To predict voting results in the counterfactual scenario of zero NTV availability in all sub-regions, we

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[30] Regressions presented in Table 2 put equal weight on all sub-regions. We have also estimated regressions weighted by sub-regional population; the size and statistical significance of the coefficients of interest are robust to such weighting (not reported). We also check if the results hold for specification in which identification relies only on variation in topology, i.e. in which we add a dummy variable for presence of transmitter in sub-region and the fifth order polynomial of the "predicted free-space (not obstructed by mountains or curvature of the Earth) signal strength" as additional controls. The effect of NTV on the vote for Unity, Yabloko and KPRF is robust. For the effect on OVR and SPS the results are the same if we do not control for electoral outcomes in 1995, but lose their significance if these controls are included. The effect on voter turnout remains significant except for the case in which we control both for the dummy variable for presence of transmitter in sub-region and predicted free-space signal strength, but do not control for electoral outcomes in 1995. The effect on vote for LDPR is present when we include the dummy variable for presence of transmitter in sub-region, but loses significance if we control for the predicted free-space signal strength.

use the estimated equation (1) with the full set of covariates (including the electoral outcomes of 1995) set to their mean values in the sample with the exception of NTV availability, which is set to zero. The predicted vote in our sample (which excludes Moscow and St. Petersburg) in the counterfactual scenario without NTV is as follows: Unity would have gotten 36.9 percent of the total vote, parties supported by NTV would have received 10.7 percent of the total vote, and the turnout would have been 59.8 percent. We compare these numbers to the predicted vote at the mean value for all the covariates including NTV. Therefore, the overall effect for each party is equal to the estimated coefficient on NTV availability times the mean value of NTV availability. This calculation indicates that as a result of NTV broadcast, the aggregate vote for the government party decreased by 8.9 percentage points, the combined vote for the major opposition parties increased by 6.3 percentage points, while turnout decreased by 3.8 percentage points. Thus, the government party lost about a quarter of its voters and the opposition parties increased their political support by about 60 percent as a result of NTV broadcast. Since our sample includes 88.4 million registered voters, these results imply that as a result of NTV broadcasts, 5.7 million voters decided not to vote for Unity, 2.8 million voters decided to vote for OVR, SPS, and Yabloko, and 3.4 million voters decided not to participate in the election.

The second exercise is to calculate persuasion rates, as they help to compare our estimates with others available in the literature (DellaVigna and Gentzkow 2010; DellaVigna and Kaplan 2007). The persuasion rate, in our case, is the fraction of the audience of a media outlet who were convinced to change their behavior as a result of being exposed to this media outlet. Our approach differs from that of DellaVigna and Kaplan (2007) in the following three respects: First, we focus on the case of continuous exposure by analyzing the effect of an infinitesimal change in NTV exposure. Second, we allow turnout to decrease for those voters who received the NTV message, as some people who would have voted in the absence of the

message may decide to abstain from turning up for the election. This assumption is dictated by the data, as, according to our results (i.e., Table 2), the predicted availability of NTV had a negative effect on turnout in our sample, whereas in DellaVigna and Kaplan (2007) the estimated effect of Fox News on turnout is positive. And third, a distinctive feature of the television programs in Russia in 1999 was the negative campaigning against some parties, so that the differences in the content of different TV channels can be interpreted either as the differences in the positive message (i.e., the encouragement to vote for a specific party) or as the differences in the negative message (i.e., the discouragement to vote for a specific party). The difference between the two interpretations is particularly important in multi-party systems (such as Russia). Thus, we calculate separately the persuasion rates of the positive and of the negative messages of NTV.

By assumption, the persuasion rate of a positive message to vote for a specific party applies only to those who (in the absence of the message) would have voted for the other parties or would not have voted at all. We denote the number of people who would have voted for the supported parties even without NTV by y_0. Then, the exposure to the positive message of NTV ("Vote for OVR, SPS, or Yabloko") increases this number by $(1 - y_0)ef$, where f is the persuasion rate and e is the exposure to NTV. Thus, the formula for the persuasion rate is as follows:

$$f = \frac{1}{1 - v_0 t_0}\left(t\frac{dv}{de} + v\frac{dt}{de}\right),$$
(3)

where v is the vote share of supported parties and t is turnout. See the online appendix for details on the derivation of the formula. As v_0 we take the predicted vote without NTV, as described in the previous paragraph. $\frac{dv}{de}$ is measured as the product of the sum of the coefficients on NTV availability for supported parties, which are the estimates of the derivative with regard to availability rather than exposure (i.e., the fourth column in Panel A

and the second and fourth columns in Panel B of Table 2) and the inverse of the share of voters who watch NTV when it is available (which equals 0.81 in individual-level data). Similarly, the derivative of turnout with respect to exposure equals the coefficient on turnout (the second column of Panel D in table 2) divided by the share of voters who watch NTV when it is available. We evaluate f at $t = t_0$. Thus, the persuasion rate of the positive message of NTV is equal to 7.7 percent: f=1/(1-0.58*0.107)[0.58*(3.62+3.52+3.85)/ 0.81+0.107*6.67/0.81]=7.7 percent. Thus, the persuasion rate of the positive message of NTV is comparable to the one found in DellaVigna and Kaplan (2007), i.e., 8 percent, and lower than the persuasion rate of 20.0 percent found in Gerber, Karlan, and Bergan (2009).[31]

Voters who can potentially respond to the negative message ("do not vote for Unity") are only those who in the absence of NTV would have voted for Unity. Thus, the formula for the negative message takes the following form:

$$ f = \frac{-1}{\mu_0 t_0} \left(t \frac{d\mu}{de} + \mu \frac{dt}{de} \right), \tag{4} $$

where μ is the vote share of parties opposed by NTV. As in the case of positive message, we estimate persuasion rate at $t = t_0$ and $\mu = \mu_0$. As $\frac{d\mu}{de}$ we take the coefficient on NTV availability for the Unity vote (from the second column of Panel A in Table 2) multiplied by the inverse of the share of voters who watch NTV when it is available. Thus, the persuasion rate for the party opposed by NTV is equal 65.6 percent: f=[15.48/0.37+*6.67/0.60]/0.81=65.6 percent. The persuasion rate of the negative message of NTV is much higher than the one found in DellaVigna and Kaplan (2007). If we interpret the message of Fox News as a negative one ("do not vote for Democrats"), the persuasion rate for this message equals 14 percent.[32]

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[31] For consistency, we are comparing our results to the persuasion rate in DellaVigna and Kaplan (2007) based on recall data, since our measure of NTV exposure is based on recall data as well.

[32] For this calculation, we use the following formula for the discrete case: $f = -\frac{1}{\mu_0 t_0} \frac{\mu_T t_T - \mu_C t_C}{e_T - e_C}$ (see the details in the online appendix). In the case where turnout does not change, this formula differs from the formula for the persuasion rate used in DellaVigna and Kaplan (2007) by the factor of 1/t.

The results indicate that the negative message of NTV ("do not vote for Unity") was much more persuasive than the positive message ("vote for OVR or liberal parties") as some potential voters for Unity decided not to come to the election booths and some turned to other parties (for which there was no difference in the content of different channels such as the communist KPRF). This result is consistent with the findings of the literature that negative political advertising is often more effective than positive.[33] Note also that from the theoretical point of view, the effect of political advertising should be smaller than the effect of biased news as long as journalists report the truth at least in some states of the world and viewers adjust to the incentives of the message sender (DellaVigna and Gentzkow 2010; Gentzkow and Shapiro 2006; Knight and Chun-Fang Chiang 2009).

As we discussed in section III, three political parties participated in both 1995 and 1999 elections. These were liberal Yabloko, supported by NTV in 1999, KPRF (communists), and LDPR (nationalists), towards which NTV was neutral. In addition, in 1995, another liberal party, Democratic Russia's Choice, participated in the election; that party was the direct predecessor of SPS, and therefore, we can assume that these two parties actually were the same party. For these four parties, we can use difference-in-difference approach and estimate the effect of NTV, controlling for sub-region (rather than region) fixed effects using the following specification:

$$vote_{st}^{j} = \beta_0 + \beta_1 NTV_{st} + \beta_2 D_{1999} + \varphi_s + \varepsilon_{st}^{j}, \tag{5}$$

where t equals one of the two years: 1995 and 1999, j indexed the four parties that were present in both elections and the voter turnout, D_{1999} is a dummy for the year 1999, and φ_s are sub-region fixed effects. To account for serial autocorrelation, we cluster the error term at the sub-regional level. We code NTV availability to be equal to zero in all sub-regions in 1995, as

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[33] Recent experimental and survey evidence on political advertising implies higher persuasion rates of negative compared to positive messages (see, for instance, Ansolabehere and Iyengar 1995; Ansolabehere, Iyengar, and Simon 1999; and Deposato 2009).

the NTV audience at that time was negligible. NTV broadcasted only for a few hours per day with regional television companies having a priority over broadcasting on its frequency.[34] (We do not include 2003 in the panel analysis as we do not have data on the location of NTV transmitters in 2003.) Thus, β_1 estimates the effect of the differential increase in NTV availability on the election results from 1995 to 1999, controlling for cross-sectional heterogeneity of sub-regions.

Table 3 presents the results. Consistent with our main hypothesis, we find that NTV had a significant positive effect on the vote for the two liberal parties supported by NTV and no significant effect on turnout or on the vote for the two parties which were similarly covered by NTV and the state channels. Qualitatively, the results of the panel and cross-section estimations are consistent. The magnitude of the estimated effects on SPS increases from 3.5 to 6.5; while the effect for Yabloko decreases from 3.8 to 1.8. The difference in the size of the effects in part is driven by differences in the sample size. In the panel estimation we do not need to control for socio-economic indicators available only for a subsample of sub-regions.[35] Since neither Unity nor OVR—the two parties that according to cross-sectional results were affected by NTV the most—were present at the time of 1995 elections, we cannot estimate the effect of NTV on these parties in panel analysis.

[TABLE 3 ABOUT HERE]

B. Placebo experiment: checking the validity of the instrument

The key identifying assumption in our baseline cross-sectional specification is that the availability of NTV, controlling for observable characteristics of sub-regions, is uncorrelated with the political preferences of voters other than through the effect of NTV. There are two

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[34] In 1995 in a representative survey of Russians, less than 6 percent of respondents said that NTV was their source of political information; in contrast, 77 percent and 25 percent of respondents made that claim about the two national channels, ORT and RTR (Colton, 2000).

[35] If we restrict the sample to those sub-regions that are included in the cross-section estimation, the effect on SPS equals 4.3 and the effect on Yabloko equals 2.2.

potential reasons why this assumption may not hold. First, there might be reverse causality, as sub-regions with certain political preferences could be more likely to receive NTV. Second, there may have been some omitted characteristics of sub-regions that correlated both with the presence of the NTV signal and the political preferences of the population. For example, one could argue that our results are driven by the effect of the Soviet educational channel, whose infrastructure was inherited by NTV. If the educational channel had a lasting effect on the level of education and the political preferences of the electorate, NTV availability could just be a proxy for it.[36]

To test the validity of our main assumption, we conduct a placebo experiment. As in the panel regressions with sub-region fixed effects, we exploit the fact that NTV could not have a noticeable effect in 1995 because of the negligible audience. Table 4 reports the results of estimating the effect of NTV availability in 1999 on the voting results for all major parties and voter turnout in the 1995 parliamentary elections. We expect to find no effect of NTV availability for any of the parties as this is the only result consistent with no endogeneity problem in the baseline regressions. Panel A of Table 4 presents results for the liberal parties (Democratic Russia's Choice and Yabloko), whose direct heirs (SPS and Yabloko) were supported by NTV in 1999. Panel B presents results for KPRF (communist) and LDPR (nationalist). Finally, panel C presents the results for the main pro-government party from the 1995 election (NDR) and voter turnout.[37] For each electoral outcome in Table 4, we present regressions with exactly the same specification as in table 2, but with electoral outcomes of

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[36] This, however, is unlikely as Channel 4 had very little viewership since its programs were "exceedingly boring" in the 1990s (Mickiewicz 1997, p. 171); and it was also true during the Soviet times (Mickiewicz 1988, p.9).

[37] If our results for SPS and Yabloko in 1999 were driven by unobserved heterogeneity between sub-regions, one would have expected positive significant coefficients on NTV availability for these parties. As there was no relative bias in coverage of KPRF and LDPR by NTV and state channels in 1999, the results for these parties in 1999 either are an indirect effect of NTV persuasion or are driven by unobserved heterogeneity. In the latter case, we expect to find a positive effect on KPRF and a negative effect on LDPR. For the voter turnout, one would have expected a negative significant effect of NTV availability in 1999 if our baseline results were driven by endogeneity problems.

1995 instead of 1999. The coefficients for NTV availability are much smaller in size and statistically insignificant for all the electoral outcomes in 1995.

[TABLE 4 ABOUT HERE]

An alternative way to conduct this placebo experiment is to use 1995 electoral outcomes to predict 1999 electoral outcomes and test whether these predicted outcomes are affected by the availability of NTV in 1999. The results (not reported) are robust to using this alternative approach: we find no statistically significant relationship between the availability of NTV in 1999 and the voting outcomes in 1999 predicted by the vote in 1995. Summing up, the results of the placebo experiment are consistent with the premise that our main identification assumption is valid.

C. Persistence of NTV Effects

In order to examine the persistence of the political persuasion of the media, we estimate the effect of NTV availability in 1999 on voting results in the next parliamentary elections of 2003. In 2003, after NTV was taken over by the state monopoly Gazprom, there were no substantial differences between news coverage of NTV and other national TV channels for all parties participating in the election, with possibly one exception. Oates (2006, pp. 171-175) noted that the liberal SPS got slightly more time on NTV compared to ORT and RTR. If the effect of NTV is persistent, one would expect to see a significant effect of NTV availability in 1999 on the voting in 2003 for parties covered differently in 1999 and similarly in 2003. These results should become insignificant once we control for voting results of 1999. Yabloko was the party for which we would expect this kind of a pattern, as it participated in both elections; and in 2003, unlike 1999, NTV had similar coverage of this party to the other TV channels (Oates 2006, pp.171-173; Vladimir Gel'man 2005, p. 240). As there may have

been some small differences in coverage of SPS in 2003, one may expect to see some incremental effect of NTV even after controlling for the voting results of 1999.

As far as the other parties that participated in 2003 elections are concerned, the prediction is less clear-cut. KPRF (communists) and LDPR (nationalists) were only indirectly affected by NTV in 1999 and it is not clear whether such an effect should be persistent. OVR formed an alliance with Unity and they participated in 2003 parliamentary elections as a single party, United Russia. Since in 1999 NTV was supporting OVR and opposing Unity, the effect of NTV on the vote for United Russia in 2003 is ambiguous even if it is long-term.

Table 5 reports the results of estimating the effect of NTV availability in 1999 on the voting results in 2003. For each electoral outcome, we present results of three regressions: first, the specification identical to our baseline, i.e., controlling for 1995 election results; then, without any electoral controls, and third, with 1999 election results as controls. Panel A presents the results for SPS and Yabloko; panel B for KPRF and LDPR; and panel C for United Russia and voter turnout. We find a positive and significant effect of the NTV availability in 1999 on the vote for the liberal parties SPS and Yabloko and negative and significant effect on the voter turnout in 2003 (both with and without electoral controls from 1995). The magnitude of the effects for the vote in 2003 for each of the two liberal parties is about one half of that in 1999 and is similar for the voter turnout. The effect of NTV availability drops in magnitude and becomes statistically insignificant for Yabloko and turnout once we control for the voting results in 1999. In contrast, the vote for SPS is positive and marginally significant, albeit much smaller, even after controlling for the election results of 1999. We also find that votes for KPRF, LDPR and United Russia in 2003 were not significantly affected by NTV. The results of our analysis of the 2003 electoral outcomes are consistent with the hypothesis that NTV had a long-term persuasion effect on voting for liberal parties and on the decisions to participate in elections.

[TABLE 5 ABOUT HERE]

Overall, our findings at the aggregate level data can be summarized as follows: The presence of NTV signal had a robust significant effect on the vote for the parties that were covered differently by NTV and the two state channels. Persuasion rates are much bigger for the negative message conveyed by NTV ("do not vote for Unity") as compared to the positive message ("vote for parties supported by NTV"). NTV's persuasion effect is persistent; it was present three years after the takeover of NTV.

IV. Individual-level results

A. **Benchmark results.**

The analysis of individual-level data adds to the aggregate-level results in the following important respects: First, it allows us to estimate the persuasion effect of NTV controlling for individual characteristics. For example, we were not able to control for the level of education of voters in the aggregate-level analysis as there are no such data for sub-regions, but we can do so at the individual level. Second, since the survey was conducted both before and after the elections it gives us an opportunity to examine in more detail which groups of voters get more easily persuaded by the media.

Using survey data we estimate the effect of whether the respondent watched NTV in 1999 on which party the respondent voted for in the 1999 election. Both the information on watching NTV and information on voting are self-reported by the respondent. Since self-reported measure of media exposure is subject to significant reporting biases and may be endogenous to vote choice (Vincent Price and John Zaller 1993; Markus Prior 2009), one cannot consistently estimate the effect of watching NTV without a source of exogenous variation. To cope with this problem, we instrument the reported exposure to NTV programs

by our measure of predicted NTV signal strength (which we derived using information on the power and the location of transmitters).

In particular, we estimate bivariate probit regression model with the following structural equation of interest:

$$Pr\left(vote_{i,1999}^{j} = 1\right) = \Phi\left(\beta_0 + \beta_1 Watched\_NTV_{i,1999} + \mathbf{\beta}_2' \mathbf{C}_{i,1999} + \varepsilon_i^j\right) \tag{6}$$

where i indexes individual respondents and j indexes parties. Dummy variable $vote_{i,1999}^{j}$ equals 1 if respondent i reported voting for party j and zero if the respondent reported voting for some other party. $Watched\_NTV_{i,1999}$ equals 1 if the respondent i reported watching news programs on NTV in 1999 and zero otherwise. $\mathbf{C}_{i,1999}$ is a set of individual and sub-regional level characteristics.[38] In the first-stage equation, $Watched\_NTV_{i,1999}$ is instrumented by the predicted NTV signal strength in 1999 in the home sub-region of individual i. The error term is clustered at the sub-regional level.

Table 6 presents the results of the first stage regressions for two specifications: on the full sample with the baseline set of controls and on the sample of respondents who had well-defined voting intentions one month before the 1999 election controlling for the voting intentions. In both specifications, predicted NTV signal strength is a strong predictor of the respondents' exposure to NTV programs (F-statistics for the excluded instrument are 29.7 in the baseline and 13.6 with the controls for voting intentions just one month prior to the election).

[TABLE 6 ABOUT HERE]

Table 7 presents the results of the second stage regressions. The four panels of the table are organized in the same way as Table 2. For each dependent variable (dummy for

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[38] Individual social and demographic characteristics include: gender, age, marital status, dummy for ethnic Russian, education (dummy for college education or higher), religiosity (answer to the question: Do you attend regularly religious services?), dummy for former membership in Communist Party of the Soviet Union (CPSU), and a consumption index. We follow Colton and McFaul (2003) to construct the consumption index as a sum of the answers to the following questions: "Do you own: A car? A dacha (summer home)? A computer? A phone? An automatic washing machine? Do you have Internet access? Have you ever been abroad?" We also control for the logarithms of sub-regional population and average wage and for the city dummy.

whether the respondent reported voting for a particular party or showing up for election), we report coefficients from the IV probit and probit regressions along with their marginal effects. The coefficients on our main variable of interest, *Watched_NTV*$_{i,1999}$, in the second stage are the estimates of the causal effect of watching NTV. It had a significant negative effect on the reported vote for the pro-government party Unity opposed by NTV and a significant positive effect on the reported vote for the two out of three parties supported by NTV, namely, centrist OVR and liberal SPS. The effect on Yabloko (the other liberal party supported by NTV) is positive, but small in magnitude and statistically insignificant. We find no relationship in the individual-level data between watching NTV and self-reported turnout or voting for the two parties with similar coverage by NTV and the state TV, i.e., KPRF (communist) and LDPR (nationalist). The magnitude of the estimated effects is substantial: marginal effects imply that survey respondents who watched NTV were 40 percentage points less likely to vote for Unity, 20 percentage points more likely to vote for OVR, and 23 percentage points more likely to vote for SPS.

[TABLE 7 ABOUT HERE]

To calculate persuasion rates for individual-level results we use formulas (2) and (3), where as $\frac{dv}{de}$ we use the estimated marginal effects. To predict voting results in the counterfactual scenario of zero NTV availability in all sub-regions, we use the estimated equation (2) and calculate for each individual predicted probability of voting for a given party with *Watched_NTV*$_{i,1999}$ set to zero. The predicted share of votes in the counterfactual scenario without NTV is as follows: Unity would have gotten 47.0 percent of the total vote (instead of 28 percent), parties supported by NTV would have received 9.4 percent of the total vote (instead of 25 percent), and the turnout would remain 81 percent. The resulting persuasion rate of the positive message ("vote for OVR or liberal parties") equals 44.6 percent, whereas

the persuasion rate of the negative message of NTV ("do not vote for Unity") equals 47.9 percent.[39]

Overall, our main hypothesis is supported by the individual-level results: we do find that NTV had strong persuasion powers as it affected the propensity to vote for Unity, OVR and SPS. In survey data, however, we find that the effect of watching NTV on the reported vote for the liberal Yabloko is not statistically significant in contrast to the aggregate-level results (but the point estimate has the right sign). In addition, in survey data we find no effect on reported turnout; yet this may be the case because respondents might not be willing to reveal their political apathy by admitting that they did not turn up for election. The individual-level results are robust to using a reduced-form probit model with NTV availability in 1999 as a measure of NTV exposure (defined in the same way as in the aggregate-level analysis). Statistical significance of the results remains unchanged; the magnitude of marginal effects for Unity and SPS is very similar, while marginal effects for OVR increases to 27 percentage points. As in the case of the aggregate-level analysis, we test the validity of our identification assumption with placebo regressions and find no effect of NTV on voting choices of individuals in 1995 (the results are presented in the online appendix).

B. Who gets persuaded?

So far we have analyzed survey responses about voting choices right after the elections. One month prior to the 1999 election, there was another round of the survey in which the same respondents were asked about their intentions to vote. Using this information, we can estimate the effect of watching election campaign on NTV for a month right before election on voting decisions by controlling for the intention to vote one month prior to the election. We can also estimate the effect of NTV on the undecided voters (i.e., those voters

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[39] In the online Appendix we compare the magnitudes of the effects estimated using individual and aggregate-level data.

who did not answer which party they were going to vote for in the pre-election survey but answered which party they voted for in the post-election survey) as well as on the intention to vote for a particular party one month before election. Table 8 presents the results. For each political party, we present results of three regressions. Two regressions are on the subsample of voters who had well-defined voting intentions: with the actual reported vote in the post-election survey as the dependent variable controlling for which party the respondent intended to vote for one month prior to the election; and for reported intention to vote in the pre-election survey as dependent variable. The third regression is for the reported vote on the subsample of undecided voters. After we control for voters' intention to vote for a particular party just a month before the election, the exposure to NTV made people 30 percentage points more likely to vote for OVR, the main opposition party supported by NTV (albeit only the coefficient is significant and not the marginal effect), 46 percentage points more likely to vote for SPS, one of the two liberal parties supported by NTV. It also made people 50 percentage points less likely to vote for KPRF (communist party) and 25 percentage points less likely to vote for LDPR (nationalists). The effect of NTV on pro-government Unity as well as on other parties is insignificant once we control for voting intentions. Thus, watching the coverage of the intensive election campaign for one month before the election persuaded voters to switch their political orientation towards OVR and SPS (and away from KPRF and LDPR). In addition, watching NTV had a large effect on the intention to vote for OVR a month before the election (37 percentage points) and for Yabloko (32 percentage points; although, in the case of intention to vote for Yabloko, only the coefficient is significant and not the marginal effect). Again, we find no significant effect of NTV on intention to vote for Unity. In contrast, the largest effect among undecided voters is on Unity: watching NTV for a month before election made undecided people 49 percentage points less likely to vote for Unity. Overall, we can conclude that TV matters for voting decisions even in the very short run.

[TABLE 8 ABOUT HERE]

We also tried to explore whether the persuasion power of the media depends on individual characteristics of respondents, such as income, education, and age. We did not find robust evidence that any of these individual characteristics make people more or less easily persuaded by the media.[40]

V. Conclusions

We document the effects of media on voting outcomes in Russia's parliamentary elections of 1999. We base our identification on the variation in the geographical availability of NTV, the only major TV channel that was independent from the government at that time. This allows us to estimate the causal effect of exposure to media on voting behavior and to avoid endogeneity biases inherent in survey-based studies. At the aggregate level of analysis, we find that the effect of NTV availability was positive and significant for the three opposition parties supported by NTV and negative and significant for the pro-government party opposed by NTV. Raising the predicted NTV availability by ten percentage points increases the vote for these parties by 1.1 percentage points and decreases the vote for pro-government Unity party by 1.55 percentage points. In addition, it leads to a decline in turnout of about 0.67 percentage points. These results imply that in our sample the government party lost about a quarter of its voters and the opposition parties increased their political support by about 60 percent as a result of NTV broadcasts. The analysis of the persuasion rates indicates that about 8 percent of people who watched NTV were persuaded to vote for the three opposition parties, which is similar to findings in DellaVigna and Kaplan (2007). However, 66 percent of the potential pro-governmental party supporters who watched NTV were persuaded not to vote for it, which is substantially higher than persuasion rates found in the

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[40] If we use the presence of NTV transmitter in the sub-region as a measure of NTV availability, the effect of persuasion is less pronounced for people with higher political knowledge and people with access to alternative sources of information. The results are available in the working paper version of this work.

previous literature. NTV had large persuasion effects despite some presence of diversity of opinions on the radio and in print media. Our findings imply that the absence of independent TV may not be fully compensated by other media, and, therefore, television may need to be considered a separate market for the purposes of regulation.

Using survey data, we find that even controlling for the voting intentions just a month before the elections, NTV had a substantial effect on the vote for the major opposition party supported by NTV. Thus, NTV was able to persuade its viewers to vote for this party despite their initial voting intentions just before the elections. We also find that NTV prevented undecided voters from voting for the pro-government party criticized by NTV.

Our results suggest that the media possesses a substantial power of political persuasion in countries characterized by weak democratic institutions such as Russia. By comparing our results with other findings in the literature, we conclude that the power of political persuasion of the media can be much larger in environments with weak democratic institutions than in established democracies. It would be too quick, however, to conclude that it is the case in any imperfect democracy or any other country at a similar stage of institutional development. Media effects in Russia are large due to the combination of such factors as the unstable party system, weak partisan attachments, the lack of prior information about the performance of politicians in office, unclear policy positions, the importance of candidates' individual traits, and the lack of competitiveness in the media market. We expect media effects to be large in countries with all these conditions in place. Further research is needed to estimate the relative importance of these conditions and the magnitudes of media effects in other countries.

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Table 1. Correlates of the location of NTV transmitter in 1999

	NTV Transmitter in 1999					
	(1)	(2)	(3)	(4)	(5)	(6)
Determinants of transmitter location						
City dummy, 1998	0.1562	0.0633		0.0484	0.0496	0.04
	[0.0271]***	[0.0317]**		[0.0370]	[0.0372]	[0.0234]*
Population, 1998	0.001					
	[0.0001]***					
Average wage, 1998	0.0732					
	[0.0335]**					
Fifth-order polynomial of log population, 1998		Yes		Yes	Yes	Yes
(F-statistic, population polynomial)		(24.49)***		(25.05)***	(24.83)***	(9.69)***
Fifth-order polynomial of log average wage, 1998		Yes		Yes	Yes	Yes
(F-statistic, wage polynomial)		(10.65)***		(3.12)**	(3.03)**	(5.3)***
Election results, 1995						
Vote for NDR (Pro-government) in 1995, percent			0.0014	-0.0012	-0.0015	-0.0005
			[0.0013]	[0.0014]	[0.0014]	[0.0012]
Democratic Russia's Choice (Liberal), percent			0.0099	-0.0038	-0.0043	-0.0022
			[0.0110]	[0.0026]	[0.0026]*	[0.0016]
Vote for Yabloko (Liberal) in 1995, percent			0.035	-0.0062	-0.0082	-0.0075
			[0.0089]***	[0.0098]	[0.0099]	[0.0057]
Vote for KPRF (Communist) in 1995, percent			-0.0002	-0.0001	-0.0002	-0.0008
			[0.0015]	[0.0016]	[0.0015]	[0.0009]
Vote for LDPR (Nationalist) in 1995, percent			-0.001	-0.0023	-0.0025	-0.0016
			[0.0028]	[0.0025]	[0.0025]	[0.0020]
Voter turnout in 1995, percent			-0.0084	-0.0004	-0.0002	0.0001
			[0.0018]***	[0.0020]	[0.0020]	[0.0016]
Socio-economic characteristics, 1998						
Doctors per 1000, 1998					0.0016	-0.00002
					[0.0012]	[0.0008]
Nurses per 1000, 1998					-0.0005	-0.0003
					[0.0004]	[0.0002]
Population change, 1998					-0.0076	-0.0014
					[0.0048]	[0.0017]
Migration rate, 1998					0.0082	-0.0017
					[0.0096]	[0.0074]
Fraction of retired people, 1998					-0.0012	-0.0009
					[0.0019]	[0.0010]
Fraction of unemployed, 1998					0.0078	-0.0011
					[0.0076]	[0.0045]
Fraction of population employed in farms, 1998					0.0073	-0.0035
					[0.0061]	[0.0021]
Crime rate, 1998					0.0001	0.0001
					[0.0001]	[0.0001]
NTV Transmitter in 1997						0.7227
						[0.0342]***
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2058	2058	1948	1727	1723	1723
R-squared	0.34	0.38	0.29	0.39	0.39	0.71
F-statistic, Determinants of transmitter location	(87.78)***	(38.7)***		(10.58)***	(10.51)***	(5.62)***
F-statistic, Election results variables			(23.54)***	(0.86)	(1.29)	(0.63)
F-statistic, Socio-economic characteristics					(1.15)	(1.19)

Robust standard errors in brackets. F-statistics in parentheses. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 2. Effect of NTV availability on voting behavior in 1999, aggregate data, cross-section

Panel A	Opposed by NTV in 1999		Supported by NTV in 1999	
	Vote for Unity in 1999 (centrist, pro-government)		Vote for OVR in 1999 (centrist, opposition)	
NTV Availability in 1999	-17.72	-15.48	5.72	3.62
	[2.51]***	[2.77]***	[1.95]***	[1.72]**
Electoral controls from 1995	No	Yes	No	Yes
Socio-economic controls 1998	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes
Observations	2005	1686	2005	1686
Number of regions	81	79	81	79
R-squared	0.67	0.66	0.79	0.82

Panel B	Supported by NTV in 1999			
	Vote for SPS in 1999 (liberal)		Vote for Yabloko in 1999 (liberal)	
NTV Availability in 1999	4.47	3.52	4.58	3.85
	[1.07]***	[1.15]***	[0.84]***	[0.67]***
Electoral controls from 1995	No	Yes	No	Yes
Socio-economic controls 1998	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes
Observations	2005	1686	2005	1686
Number of regions	81	79	81	79
R-squared	0.78	0.82	0.78	0.84

Panel C	Similar coverage by NTV and state TV in 1999			
	Vote for KPRF in 1999 (communist)		Vote for LDPR in 1999 (nationalist)	
NTV Availability in 1999	1.68	3.92	-1.72	-1.39
	[2.03]	[1.86]**	[0.66]**	[0.61]**
Electoral controls from 1995	No	Yes	No	Yes
Socio-economic controls 1998	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes
Observations	2005	1686	2005	1686
Number of regions	81	79	81	79
R-squared	0.74	0.81	0.70	0.73

Panel D	Voter turnout in 1999			
NTV Availability in 1999	-6.54	-6.67		
	[1.94]***	[1.42]***		
Electoral controls from 1995	No	Yes		
Socio-economic controls 1998	Yes	Yes		
Regional dummies	Yes	Yes		
Observations	2005	1686		
Number of regions	81	79		
R-squared	0.71	0.81		

All dependent variables are measured in percentages of total vote. Electoral controls include the results of Duma elections in December 1995, in particular vote for KPRF (Communists), vote for Yabloko, vote for NDR (Our Home is Russia), vote for LDPR (Liberal-Democratic Party of Russia), vote for Democratic Russia's Choice, and voter turnout. The set of socio-economic controls includes fifth order polynomial of population, fifth order polynomial of average wage, number of nurses per capita, number of doctors per capita, and dummy for cities. Robust standard errors adjusted for clusters by region in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 3. Effect of NTV availability on voting behavior, aggregate panel data

	Supported by NTV in 1999		Similar coverage by NTV and state TV in 1999		
	Vote for SPS and its predecessor Democratic Russia's Choice (liberal)	Vote for Yabloko (liberal)	Vote for KPRF (communist)	Vote for LDPR (nationalist)	Voter turnout
NTV Availability	6.65	1.84	-2.2	1.18	-2.06
	[1.40]***	[0.76]**	[2.12]	[1.38]	[2.01]
Year dummy for 1999	-0.54	-1.42	3.72	-7.09	-10.82
	[0.83]	[0.44]***	[1.24]***	[0.82]***	[1.19]***
Constant	1.94	3.61	25.39	13.48	68.85
	[0.06]***	[0.03]***	[0.11]***	[0.06]***	[0.09]***
Sub-region dummies	Yes	Yes	Yes	Yes	Yes
Observations	4240	4240	4240	4240	4240
Number of sub-regions	2302	2302	2302	2302	2302
R-squared	0.35	0.03	0.07	0.61	0.72

All dependent variables are measured in percentages of total vote. Robust standard errors adjusted for clusters by sub-region in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 4. Placebo regressions for the elections of 1995, aggregate data, cross-section

	Supported by NTV in 1999		Similar coverage by NTV and state TV in 1999			
	Vote for SPS and its predecessor Democratic Russia's Choice in 1995 (liberal)	Vote for Yabloko in 1995 (liberal)	Vote for KPRF in 1995 (communist)	Vote for LDPR in 1995 (nationalist)	Vote for NDR in 1995 (pro-government)	Voter turnout in 1995
NTV Availability in 1999	0.60	1.06	-2.33	-2.85	0.12	-3.94
	[0.37]	[0.83]	[3.44]	[1.71]	[1.61]	[2.67]
Socio-economic controls from 1998	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1686	1686	1686	1686	1686	1686
Number of regions	79	79	79	79	79	79
R-squared	0.73	0.79	0.73	0.60	0.62	0.67

All dependent variables are measured in percentages of total vote. The set of socio-economic controls includes fifth order polynomial of population, fifth order polynomial of average wage, number of nurses per capita, number of doctors per capita, and dummy for cities. Robust standard errors adjusted for clusters by region in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 5. Long-term effect of NTV for the elections of 2003, aggregate data

Panel A	Supported by NTV in 1999; more time allocated on NTV in 2003			Supported by NTV in 1999; similar coverage by NTV and state TV in 2003		
	Vote for SPS in 2003 (liberal)			Vote for Yabloko in 2003 (liberal)		
NTV Availability in 1999	1.79	2.18	1.06	1.75	2.13	0.38
	[0.48]***	[0.53]***	[0.57]*	[0.35]***	[0.43]***	[0.30]
Electoral controls from 1995	Yes	No	No	Yes	No	No
Electoral controls from 1999	No	No	Yes	No	No	Yes
Socio-economic controls from 1998	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1662	1662	1662	1662	1662	1662
Number of regions	79	79	79	79	79	79
R-squared	0.71	0.67	0.71	0.84	0.79	0.86

Panel B	Similar coverage by NTV and state TV in 1999 and 2003					
	Vote for KPRF in 2003 (communist)			Vote for LDPR in 2003 (nationalist)		
NTV Availability in 1999	-0.71	-1.55	-1.99	-0.5	-0.89	1.42
	[1.66]	[1.84]	[1.55]	[1.09]	[1.24]	[1.00]
Electoral controls from 1995	Yes	No	No	Yes	No	No
Electoral controls from 1999	No	No	Yes	No	No	Yes
Socio-economic controls from 1998	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1662	1662	1662	1662	1662	1662
Number of regions	79	79	79	79	79	79
R-squared	0.70	0.63	0.76	0.73	0.68	0.79

Panel C	Similar coverage by NTV and state TV in 2003					
	Vote for United Russia in 2003 (pro-government, centrist, formed as an alliance of OVR and Unity)			Voter turnout in 2003		
NTV Availability in 1999	-2.95	-3.2	0.28	-6.72	-8.76	-2.88
	[3.15]	[3.23]	[3.11]	[2.76]**	[3.45]**	[2.65]
Electoral controls from 1995	Yes	No	No	Yes	No	No
Electoral controls from 1999	No	No	Yes	No	No	Yes
Socio-economic controls from 1998	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1662	1662	1662	1662	1662	1662
Number of regions	79	79	79	79	79	79
R-squared	0.76	0.73	0.79	0.79	0.72	0.82

All dependent variables are measured in percentages of total vote. Electoral controls from 1995 include vote for KPRF (Communists), vote for Yabloko, vote for NDR (Our Home is Russia), vote for LDPR (Liberal-Democratic Party of Russia), vote for DVR (Democratic Russia's Choice), voter turnout. Electoral controls from 1999 include vote for Unity, vote for OVR, vote for KPRF, vote for SPS, Yabloko, vote for LDPR, and voter turnout. The set of socio-economic controls includes fifth order polynomial of population, fifth order polynomial of average wage, number of nurses per capita, number of doctors per capita, and dummy for cities. Robust standard errors adjusted for clusters by region in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 6. Individual-level results, the first stage estimation

	Watched NTV in 1999 (self-reported)			
	OLS	Probit	OLS	Probit
NTV signal power in 1999	0.003	0.007	0.002	0.006
	[0.000]***	[0.001]***	[0.001]***	[0.002]***
Gender (1 if male)	0.068	0.218	0.036	0.122
	[0.035]*	[0.105]**	[0.044]	[0.125]
Age	-0.002	-0.007	-0.002	-0.006
	[0.001]**	[0.003]**	[0.001]	[0.004]
Finished high school	0.074	0.195	0.103	0.272
	[0.048]	[0.135]	[0.056]*	[0.155]*
Marital status (1 if married)	0.03	0.081	0.037	0.099
	[0.037]	[0.107]	[0.045]	[0.126]
Consumption index	0.026	0.084	0.029	0.088
	[0.013]**	[0.040]**	[0.015]*	[0.046]*
Ln (population), 1998	-0.058	-0.202	-0.069	-0.221
	[0.016]***	[0.053]***	[0.020]***	[0.065]***
Ln (Average wage), 1998	0.161	0.584	0.218	0.726
	[0.046]***	[0.168]***	[0.060]***	[0.217]***
Intention to vote for Unity in 1999			0.08	0.222
			[0.072]	[0.201]
Intention to vote for OVR in 1999			0.057	0.141
			[0.073]	[0.205]
Intention to vote for SPS in 1999			0.103	0.289
			[0.085]	[0.249]
Intention to vote for Yabloko in 1999			0.074	0.209
			[0.076]	[0.222]
Intention to vote for KPRF in 1999			0.115	0.331
			[0.058]**	[0.162]**
Intention to vote for LDPR in 1999			0.045	0.104
			[0.118]	[0.318]
Observations	901	901	656	656
R-squared	0.13		0.11	
F-statistics for the exclusion of NTV1999	29.65		13.60	
χ^2 statistics for the exclusion of NTV1999		29.9		13.85

Robust standard errors in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Availability of NTV alone explains 7 percent of variation in NTV exposure. Survey weights are applied.

Table 7. Self-reported vote and NTV in 1999, survey data

Panel A	Opposed by NTV in 1999		Supported by NTV in 1999	
	Vote for Unity in 1999 (centrist, pro-government)		Vote for OVR in 1999 (centrist, opposition)	
	IV probit	Probit	IV probit	Probit
Watched NTV in 1999	-0.831	-0.139	1.180	0.135
	[0.301]***	[0.128]	[0.477]**	[0.156]
Marginal effect	-0.26	-0.05	0.25	0.02
	[0.09]***	[0.04]	[0.14]*	[0.02]
Controls	Yes	Yes	Yes	Yes
Observations	901	901	901	901
Number of sub-regions	42	42	42	42
χ^2 statistics for the exclusion of NTV1999 in the first stage	34.72		24.79	

Panel B	Supported by NTV in 1999			
	Vote for SPS in 1999 (liberal)		Vote for Yabloko in 1999 (liberal)	
	IV probit	Probit	IV probit	Probit
Watched NTV in 1999	1.210	0.272	0.467	0.039
	[0.405] ***	[0.149]*	[0.555]	[0.178]
Marginal effect	0.24	0.04	0.06	0.004
	[0.11]**	[0.02]*	[0.08]	[0.02]
Controls	Yes	Yes	Yes	Yes
Observations	901	901	901	901
Number of sub-regions	42	42	42	42
χ^2 statistics for the exclusion of NTV1999 in the first stage	28.90		30.47	

Panel C	Similar coverage by NTV and state TV channels in 1999			
	Vote for KPRF in 1999 (communist)		Vote for LDPR in 1999 (nationalist)	
	IV probit	Probit	IV probit	Probit
Watched NTV in 1999	-0.296	0.052	-0.266	-0.10
	[0.351]	[0.111]	[0.764]	[0.140]
Marginal effect	-0.09	0.02	-0.02	-0.01
	[0.11]	[0.04]	[0.07]	[0.01]
Controls	Yes	Yes	Yes	Yes
Observations	901	901	901	901
Number of sub-regions	42	42	42	42
χ^2 statistics for the exclusion of NTV1999 in the first stage	30.29		29.91	

Panel D	Voter turnout			
	IV probit	Probit		
Watched NTV in 1999	0.219	0.102		
	[0.337]	[0.115]		
Marginal effect	0.06	0.03		
	[0.08]	[0.03]		
Controls	Yes	Yes		
Observations	1,148	1148		
Number of sub-regions	42	42		
χ^2 statistics for the exclusion of NTV1999 in the first stage	35.39			

Bivariate probit model is used in the IV regressions with "Watched NTV" variable from the pre-election survey instrumented by the measure of NTV signal power. Observations are weighted by sample survey weights. Vector of controls includes dummy variables for gender, age, marital status, education, consumption index, logarithms of sub-regional population, and average wage. Robust standard errors adjusted for clusters by sub-region in brackets. *significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Survey weights are applied.

Table 8. Intention to vote and vote in 1999

Panel A	Opposed by NTV in 1999			Supported by NTV in 1999		
	Unity in 1999 (pro-government)			OVR in 1999 (centrist, opposition)		
Subsample	Excluding undecided		Undecided only	Excluding undecided		Undecided only
Depended variable	Reported Vote	Intention	Reported Vote	Reported Vote	Intention	Reported Vote
Watched NTV in 1999	-0.631	0.073	-1.391	1.713	1.508	0.081
	[0.724]	[0.698]	[0.605]**	[0.133]***	[0.171]***	[0.987]
Marginal effect	-0.17	0.01	-0.42	0.37	0.41	0.01
	[0.19]	[0.13]	[0.15]***	[0.03]***	[0.05]***	[0.15]
Intention to vote	Yes	No	No	Yes	No	No
Observations	656	786	245	656	786	245
Number of sub-regions	42	42	42	42	42	42
X² statistics for exclusion of NTV	15.23	14.64	15.40	7.219	17.23	22.05

Panel B	Supported by NTV in 1999					
	SPS in 1999 (liberal)			Yabloko in 1999 (liberal)		
Subsample	Excluding undecided		Undecided only	Excluding undecided		Undecided only
Depended variable	Reported Vote	Intention	Reported Vote	Reported Vote	Intention	Reported Vote
Watched NTV in 1999	1.808	-0.329	1.033	-0.164	1.103	1.040
	[0.161]***	[0.472]	[0.389]***	[0.856]	[0.316]***	[0.644]
Marginal effect	0.28	-0.05	0.17	-0.01	0.24	0.14
	[0.03]***	[0.07]	[0.09]**	[0.06]	[0.10]**	[0.12]
Intention to vote	Yes	No	No	Yes	No	No
Observations	656	786	245	656	786	245
Number of sub-regions	42	42	42	42	42	42
X² statistics for exclusion of NTV	12.35	15.11	20.20	13.45	16.68	20.04

Panel C	Similar coverage by NTV and state TV channels in 1999					
	KPRF in 1999 (communist)			LDPR in 1999 (nationalist)		
Subsample	Excluding undecided		Undecided only	Excluding undecided		Undecided only
Depended variable	Reported Vote	Intention	Reported Vote	Reported Vote	Intention	Reported Vote
Watched NTV in 1999	-0.746	-0.713	0.804	-0.584	-0.347	1.075
	[0.412]*	[0.874]	[0.757]	[1.020]	[0.794]	[0.796]
Marginal effect	-0.16	-0.22	0.21	-0.04	-0.03	0.13
	[0.10]	[0.26]	0.20	[0.10]	[0.08]	[0.17]
Intention to vote	Yes	No	No	Yes	No	No
Observations	656	786	245	656	786	245
Number of sub-regions	42	42	42	42	42	42
X² statistics for exclusion of NTV	15.04	9.040	22.68	14.11	14.33	22.49

Panel D	Voter turnout in 1999					
Subsample	Excluding undecided		Undecided only			
Depended variable	Reported Vote	Intention	Reported Vote			
Watched NTV in 1999	-0.609	0.313	0.378			
	[0.525]	[0.449]	[0.453]			
Marginal effect	-0.12	0.05	0.13			
	[0.12]	[0.08]	[0.15]			
Intention to vote	Yes	No	No			
Observations	764	1,105	384			
Number of sub-regions	42	42	42			
χ² statistics for exclusion of NTV	15.33	30.86	23.27			

Bivariate probit model. Watched NTV variable form the post-election survey instrumented by the measure of NTV signal power. In columns marked "Undecided only" only respondents that did not report their intention to vote in the pre-election survey are included in the sample. Observations are weighted by sample survey weights. All specifications include the following vector of controls includes gender, age, marital status, education, consumption index, logarithm of sub-regional population and wage. Controls for intention to vote include dummy variables for intention to vote for 6 major parties. Robust standard errors adjusted for clusters by sub-region in brackets. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Survey weights are applied.

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Media and Political Persuasion: Evidence from Russia

Ruben Enikolopov, Maria Petrova, Ekaterina Zhuravskaya

Web Appendix

Table A1. Summary statistics. Intention to vote and reported vote,
December 1999 Duma elections

	Obs.	Mean	Std. Dev.
Watches NTV	1148	0.61	0.49
NTV available	1148	0.73	0.44
Intention to vote for OVR (centrist, opposition)	764	0.13	0.34
Intention to vote for Unity (centrist, pro-government)	764	0.11	0.32
Intention to vote for SPS (liberal)	764	0.07	0.26
Intention to vote for Yabloko (liberal)	764	0.11	0.31
Intention to vote for KPRF (communist)	764	0.31	0.46
Intention to vote for LDPR (nationalist)	764	0.04	0.21
Intended to participate in elections	1069	0.91	0.29
Vote for Unity (centrist, pro-government)	901	0.28	0.45
Vote for OVR (centrist, opposition)	901	0.09	0.28
Vote for SPS (liberal)	901	0.10	0.31
Vote for Yabloko (liberal)	901	0.06	0.24
Vote for KPRF (communist)	901	0.31	0.46
Vote for LDPR (nationalist)	901	0.04	0.20
Turnout	1148	0.81	0.39
Male	1148	0.40	0.49
Age	1148	29.04	16.56
Finished high school	1148	0.80	0.40
Married	1148	0.67	0.47
Consumption index	1148	1.56	1.35
Political knowledge	1148	6.87	2.49
Reads newspapers	1148	0.31	0.46
Listens to radio	1148	0.37	0.48

Survey weights are applied.

Table A2. Summary statistics, socio-economic characteristics of sub-regions

|	Low Availability of NTV			High Availability of NTV				Official Results of Elections
	Mean	St. dev.	Obs.	Mean	St. dev.	Obs.	p-value of difference	
Socio-economic characteristics								
Population, thousands	31.24	41.75	1146	74.04	149.05	1146	[0.000]***	
Population change	-0.34	2.52	1028	-0.25	2.19	1053	[0.412]	
Migration rate, %	-0.28	1.46	1028	0.22	0.87	1053	[0.000]***	
Average wage, thousands of rubles	846.45	643.54	1031	806.95	535.22	1055	[0.000]***	
Average pension, thousands of rubles	405.91	79.13	955	393.52	48.22	965	[0.128]	
Retired , %	25.13	9.81	1026	25.76	11.33	1051	[0.179]	
Unemployed, %	2.03	1.99	1028	1.55	1.48	1053	[0.000]***	
Population employed in farms, %	0.23	1.46	1028	0.26	1.71	1053	[0.665]	
Crime rate, per 10000	148.55	176.93	1028	179.16	248.16	1053	[0.001]***	
Vote in parliamentary elections in Duma, 1995								
Vote for NDR (pro-government), %	8.31	8.98	947	8.53	7.32	991	[0.554]	10.13
Democratic Russia's Choice (liberal), %	1.60	2.58	947	2.16	2.90	991	[0.000]***	3.86
Vote for Yabloko (liberal), %	2.86	2.48	947	4.19	3.51	991	[0.000]***	6.89
Vote for KPRF (communist), %	24.98	11.20	947	26.57	12.48	991	[0.003]***	22.30
Vote for LDPR (nationalist), %	14.03	6.53	947	12.92	5.91	991	[0.000]***	11.18
Voter turnout, %	70.46	8.80	947	67.53	8.47	991	[0.000]***	64.38
Vote in parliamentary elections in Duma, 1999								
Vote for Unity (centrist, pro-government), %	30.44	11.04	1146	25.61	10.65	1146	[0.000]***	23.32
Vote for OVR (centrist, opposition), %	9.45	14.99	1146	10.48	12.96	1146	[0.077]*	13.33
Vote for SPS (liberal), %	4.51	4.09	1146	6.02	4.01	1146	[0.000]***	8.52
Vote for Yabloko (liberal), %	2.45	2.01	1146	4.13	3.13	1146	[0.000]***	5.93
Vote for KPRF (communist), %	27.12	10.50	1146	28.01	10.79	1146	[0.046]**	24.29
Vote for LDPR (nationalist), %	7.50	3.30	1146	6.68	2.68	1146	[0.000]***	5.98
Voter turnout, %	58.34	10.28	1146	55.14	9.39	1146	[0.000]***	61.85
Vote in parliamentary elections in Duma, 2003								
Vote for United Russia (centrist, pro-government), %	41.98	13.79	1148	39.42	13.27	1322	[0.017]**	37.57
Vote for SPS (Liberal), %	2.15	2.67	1148	3.09	2.79	1322	[0.000]***	3.97
Vote for Yabloko (Liberal), %	1.90	1.36	1148	3.28	2.41	1322	[0.000]***	4.30
Vote for KPRF (communist), %	14.08	5.91	1148	13.52	5.18	1322	[0.025]**	12.61
Vote for LDPR (nationalist), %	12.53	5.14	1148	12.07	4.21	1322	[0.040]**	11.45
Voter turnout, %	61.65	12.37	1148	56.94	11.51	1322	[0.000]***	55.75
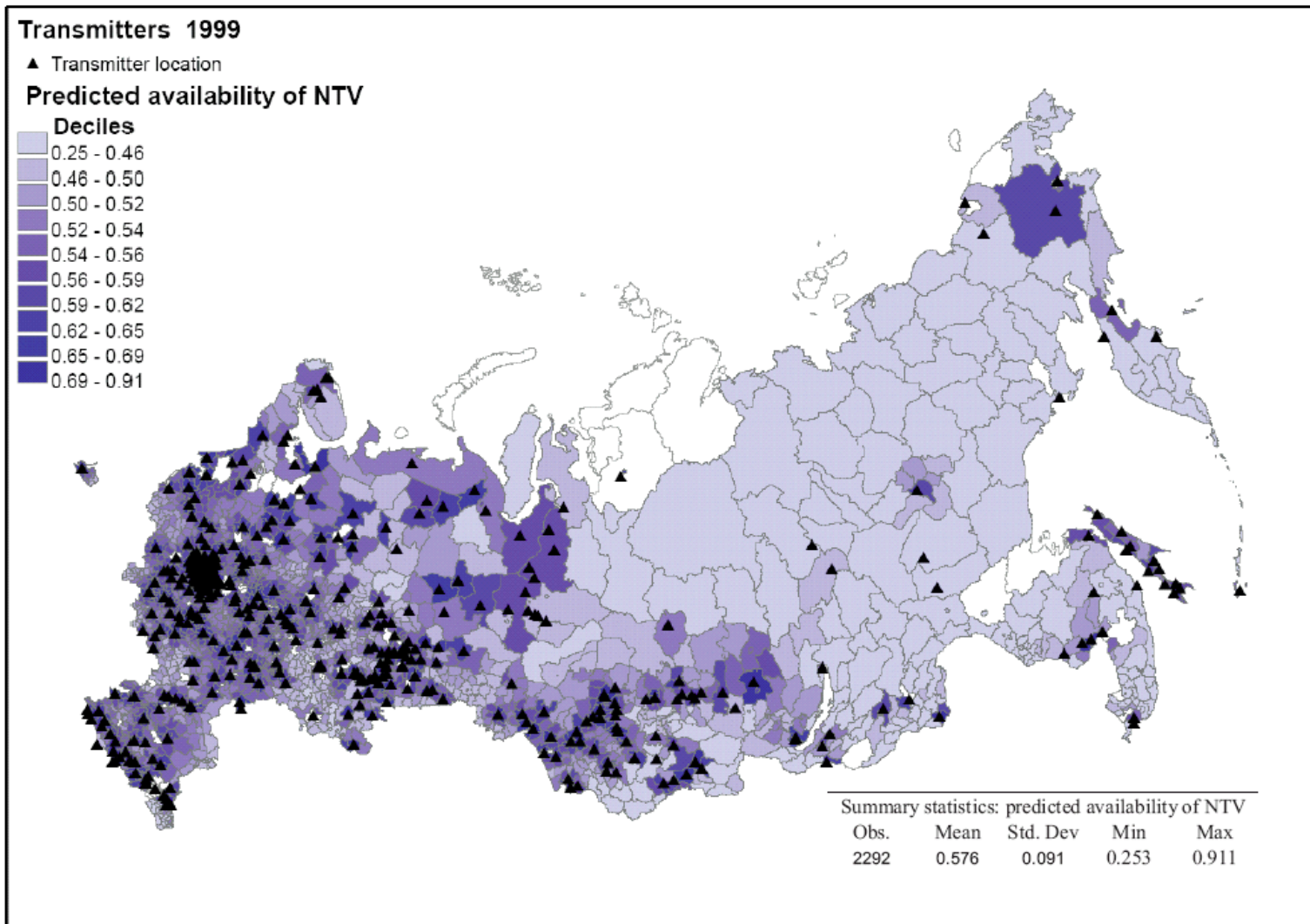
Figure A1. Predicted probability that NTV is available in 1999 by sub-region and the location of NTV transmitters. White areas indicate missing election data.
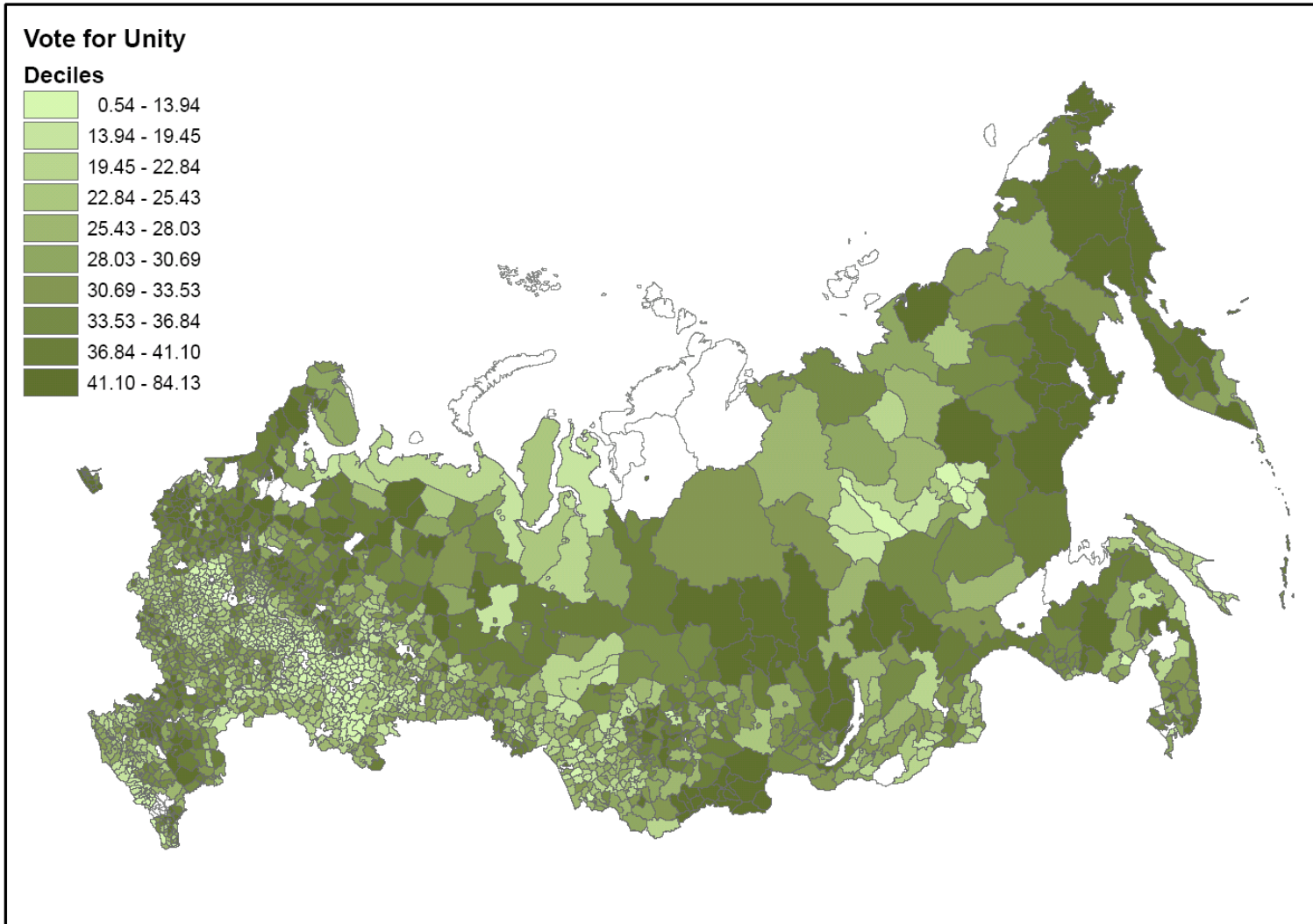
Figure A2. Vote for Unity (pro-government party opposed by NTV) by sub-regions, Russian parliamentary elections, 1999. White areas indicate missing election data.
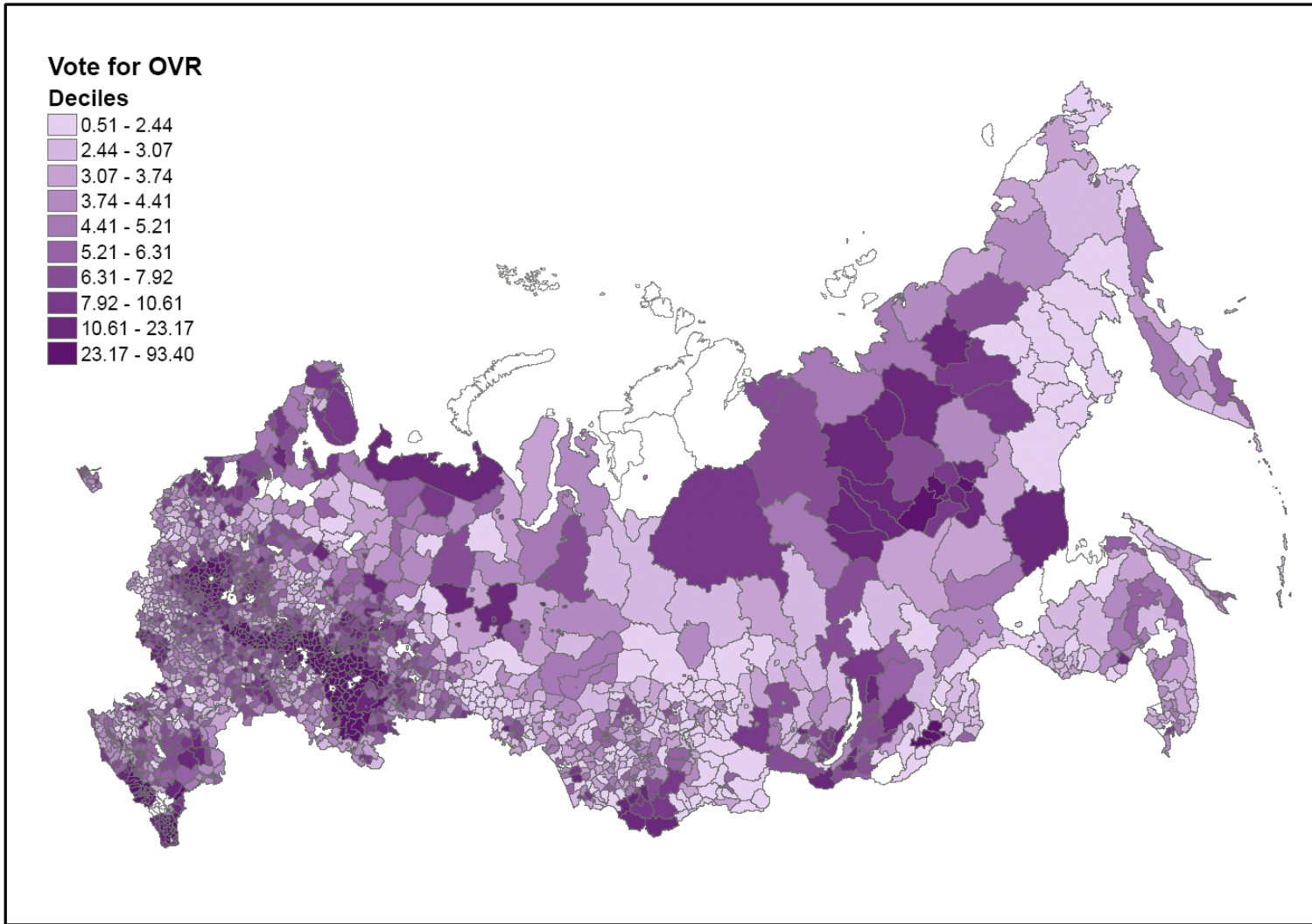
Figure A3. Vote for OVR (centrist opposition party supported by NTV) by sub-regions, Russian parliamentary elections, 1999. White areas indicate missing election data.

The calculation of the persuasion rates

For a positive message, the basic formula we start with is $y = y_0 + (1 - y_0)ef$, here y_0 is the number of people who would have voted for parties supported by a media outlet (DellaVigna and Gentzkow 2010), e is the exposure to the message. Like DellaVigna and Kaplan (2007) we implicitly assume that persuasion applies equally to supporters of other parties and to non-voters. What we do differently is that we do not apply the restriction that turnout should necessarily increase after receiving the message, i.e., some people who would have voted for other parties do not necessarily turn up to vote. In addition, we look at the infinitesimally small change in exposure, which is driven by our empirical approach.

From the baseline formula, it follows that $dy = (1 - y_0)def$, and, consequently, $f = \dfrac{1}{1 - y_0}\dfrac{dy}{de}$ (a corresponding formula in the discrete case is $f = \dfrac{1}{1 - y_0}\dfrac{y_T - y_C}{e_T - e_C}$). Note that as $y = vt$, where t is turnout and v is the share of the vote for supported parties, one can rewrite the formula as $f = \dfrac{1}{1 - y_0}\dfrac{d(vt)}{de} = \dfrac{1}{1 - y_0}\left(t\dfrac{dv}{de} + v\dfrac{dt}{de}\right)$. Thus, the persuasion rate is equal to the sum of the effects of the message on the vote share and on turnout. (The analogues formula in the discrete case is: $f = \dfrac{1}{1 - y_0}\dfrac{v_T t_T - v_C t_C}{e_T - e_C}$.)

For a negative message, $z = z_0 - z_0 ef = z_0(1 - ef)$ (here z is the number of people who would vote for parties opposed by NTV if exposure is e and persuasion rate is f), as persuasion affects those who would have voted for parties opposed by the media outlet in the absence of the message. Similarly, we obtain: $f = -\dfrac{1}{z_0}\dfrac{d(\mu t)}{de} = \dfrac{-1}{\mu_0 t_0}\left(t\dfrac{d\mu}{de} + \mu\dfrac{dt}{de}\right)$ (here μ is the share of vote for opposed parties). In the discrete case, this formula takes the form: $f = -\dfrac{1}{\mu_0 t_0}\dfrac{\mu_T t_T - \mu_C t_C}{e_T - e_C}$.

Comparison of aggregate- and individual-level results

In this section we compare the magnitude of the effects of NTV from the individual-level survey data and from the aggregate official election data (Table 2 vs. Table 7). The persuasion rate of the negative message estimated using individual data is similar to the one estimated using the aggregate-level data, whereas the persuasion rate of the positive message implied by the individual-level results is substantially higher. There are several potential methodological explanations for this discrepancy between the aggregate- and individual-level results.

First, in contrast to the aggregate-level analysis, in the individual-level regressions we cannot control for regional fixed effects as the survey typically was administered in only one sub-region of each region, so that there is no within-region variation of NTV availability in the individual-level sample. Unobserved regional variation is likely to play an important role, since there is a substantial difference in ethnic, religious, economic, and political characteristics among Russia's regions. For example, most regional governors were active supporters of either the main opposition party OVR or the pro-government party Unity. The political preferences of the governor could have had a noticeable effect on the outcome of the election in the respective region and on the preferences of the regional population over which TV channels to watch. The comparison of the aggregate-level results with and without regional fixed effects (not reported) indicates that the omission of regional fixed effects leads to a two-fold increase in the estimated effect of the NTV availability on the vote for OVR, Unity, and SPS, whereas the results for Yabloko remain similar in size. Therefore, omitting regional fixed effects can explain some of the difference in magnitude between aggregate and individual results.

Second, since the individual-level data are available only for a subsample of sub-regions, one should worry about whether the sample is representative, as the survey designers claim. To verify the representativeness of the sample of sub-regions included into the survey, we checked that aggregate-level results for the subsample of sub-regions where survey data were collected are only slightly larger as compare to the results for all sub-regions and, therefore, differences in the samples cannot explain differences in the estimated effects.

Panel and placebo regressions for individual-level results

Just as in the aggregate-level analysis for four parties we can use difference-in-difference approach for individual-level data. The data on voting in 1995 come from the survey, similar to the one conducted in 1999, but with different respondents and, sometimes, in different regions. Thus, unlike the aggregate-level analysis we cannot include fixed effects for individuals or regions and we estimate probit regression that includes as the dependent variables only the measure of NTV availability, constant, and dummy for the year 1999. We cluster the error term at the sub-regional level. As in the case of aggregate-level analysis we code NTV availability to be equal to zero in all sub-regions in 1995, as the NTV audience at that time was negligible. Thus, we estimate the effect of the differential increase in NTV availability on the election results from 1995 to 1999 on the probability of voting for different parties. Table A3 presents the results. Just as in the aggregate-level analysis, NTV has a significant positive effect on the probability of voting for the two liberal parties. In addition, the negative effect of NTV on voting for KPRF and positive effect of voting on voter turnout become significant in the individual-level panel results.

Also, as in the aggregate-level analysis, we estimate placebo regressions using survey data from 1995 to test the validity of our main identification assumption.

Table A4 reports the results of this placebo experiment. We estimate the effect of NTV availability in 1999 (defined in the same way as in the aggregate-level analysis) on the probability of voting for each of the major parties during the 1995 election using a probit model with the same set of controls as in all other individual-level regressions, except for the consumption index, which cannot be calculated using the data from 1995 survey. Consistent with our assumption of idiosyncratic NTV availability in 1999, the estimated coefficients of interest are never statistically significant and the marginal effects are very close to zero.

Table A3. Self-reported vote and NTV, survey data

	Supported by NTV in 1999		Similar coverage by NTV and state TV in 1999		
	Vote for SPS and its predecessor Democratic Russia's Choice (liberal)	Vote for Yabloko (liberal)	Vote for KPRF (communist)	Vote for LDPR (nationalist)	Voter turnout
	(1)	(2)	(3)	(4)	(5)
NTV Availability	1.667	1.278	-0.795	0.602	0.802
	[0.620]***	[0.505]**	[0.382]**	[0.620]	[0.369]**
Year dummy for 1999	0.16	0.14	-0.27	0.06	0.21
	[0.05]***	[0.06]**	[0.13]**	[0.06]	[0.10]**
Constant	-4.458	-2.986	-0.178	-1.363	0.22
	[0.469]***	[0.399]***	[0.327]	[0.407]***	[0.241]
Observations	1522	1522	1522	1522	1944

Probit model. Observations are weighted by sample survey weights. Vector of controls includes dummy variables for gender, age, marital status, education, logarithms of sub-regional population, and average wage. Robust standard errors adjusted for clusters by sub-region in brackets. *significant at 10%; ** significant at 5%; *** significant at 1%.

Table A4. Placebo regressions for self-reported vote in 1995, survey data

	Supported by NTV in 1999		Similar coverage by NTV and state TV in 1999			
	Vote for SPS and its predecessor Democratic Russia's Choice in 1995 (liberal)	Vote for Yabloko in 1995 (liberal)	Vote for KPRF in 1995 (communist)	Vote for LDPR in 1995 (nationalist)	Vote for NDR in 1995 (pro-government)	Voter turnout in 1995
	(1)	(2)	(3)	(4)	(5)	(6)
NTV Availability in 1999	0.175	-0.235	-0.113	0.589	0.554	0.429
	[1.015]	[0.673]	[0.617]	[0.879]	[0.756]	[0.777]
Marginal Effect	0.01	-0.03	-0.04	0.08	0.09	0.10
	[0.04]	[0.09]	[0.20]	[0.12]	[0.13]	[0.18]
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	552	552	552	552	552	672
Number of sub-regions	38	38	38	38	38	38

Probit model. Observations are weighted by sample survey weights. Vector of controls includes dummy variables for gender, age, marital status, education, consumption index, logarithms of sub-regional population, and average wage. Robust standard errors adjusted for clusters by sub-region in brackets. *significant at 10%; ** significant at 5%; *** significant at 1%. Survey weights are applied.