

radio. Specifically, people who reported listening to Serbian radio were more likely to express preferences for Serbian music stating that they support the concerts of Serbian artists in Slavonia and are familiar with new songs of the Serbian artists etc. (see Online Appendix Table 3). While this is a simple correlation, it is interesting that we find no such correlation between reported listening to Croatian or Bosnian radio and preference for Serbian music. This evidence thus suggests that a preference for the entertainment content embedded in the RTS programming may be the main reason for the high exposure to Serbian radio, despite its nationalistic content.

3.2. Inflammatory radio content: experimental results. To provide evidence that certain types of Serbian radio have inflammatory content for Croats, we designed a laboratory experiment in which we exposed Croatian students from the region to different remixes of news and music from radio programs typically broadcast in the region.¹⁹

We randomized the students into three groups. Each group listened to a short radio remix consisting of three recordings of news broadcasts separated by two songs. The first two news broadcasts were common to all three groups and drawn from a Croatian radio station. In contrast, the two songs and the third news broadcast differed between group assignments: The first group listened to fragments from Croatian radio only and two popular Croatian songs. The second group listened to a fragment from the independent Serbian radio B92 and two popular Serbian songs. The third group listened to a fragment from the Serbian Public RTS radio (substantially more nationalistic than B92) and another two popular Serbian songs.²⁰ None of the news broadcasts mention the Serbo-Croatian conflict. More details about the experiment are available in the Online Appendix.

After the exposure to the radio broadcast, we asked the subjects a number of questions on attitudes toward different ethnic groups: Serbs, Bosnians, Hungarians, Rusini. Figure 3 displays the effect on a standardized measure, which aggregates the different attitudinal responses, with the disaggregated evidence presented in Online Appendix Figures 5a-e. The exposure to Serbian radio had a dramatic effect of inducing more negative attitudes towards Serbs. This effect is more pronounced for the exposure to the RTS Serbian public radio, which is the focus of our study, compared to the exposure to the less-nationalistic B92 Serbian private radio. There is no effect of either treatment on attitudes towards other ethnic groups, as expected.

The experimental findings suggest that even a short exposure to the type of content featured in the Serbian RTS radio (such as the song devoted to a Serbian alleged war criminal) affects attitudes towards Serbs in the direction of increased anti-Serbian sentiment. As subjects treated with Serbian public radio, openly hostile to Croatia, were substantially more affected

¹⁹ The experiment was held in the university of Vukovar, the main city in the region occupied by Serbs during the war.

²⁰ The songs were chosen to be representative of those typically played on Croatian radio, B92 radio, and RTS radio, respectively. The songs played in the two Serbian radio treatments are modern, but have direct references to Serbian national folklore, easily identifiable by Croats. In addition, one of the songs in the RTS treatment has a direct reference to the Serbo-Croatian conflict, as it is devoted to a former Serbian paramilitary commander accused of war crimes in Croatia.

compared to those treated with B92 Serbian radio, neutral towards Croats, the likely channel of the effect of Serbian radio exposure is through reminding Croats about current Serbian nationalism and anti-Croatian rhetoric rather than reminding just about the proximity to their former war enemy.

3.3. Determinants of radio availability. Turning to the analysis of the village-level data on Serbian radio reception and nationalism, we first document how the measures of availability of Serbian radio correlate with control variables, which may also be related to nationalistic sentiment.

In Panel A of Table 2, we estimate the OLS regression

$$Availability_of_RTS_radio_i = \beta_0 + \beta_1 \mathbf{X}_i + \phi_r + \varepsilon_i \quad (1)$$

where *Availability_of_RTS_radio_i* is a measure of availability of Serbian radio stations, \mathbf{X}_i is a vector of socioeconomic and demographic controls, and ϕ_r are county fixed effects. We first examine the predictability of hand-collected availability of Serbia radio. Column 1 shows that out of 15 non-geographic controls, only education has a statistically significant effect on the measured reception of Serbian radio in the villages in the baseline sample. Jointly, the non-geographic controls are not statistically significant predictors of Serbian radio availability (F-statistic of 0.99). We obtain similar results in Column 2 where we also control for signal strength, a strong predictor of radio signal. The joint lack of significance of the non-geographic controls is consistent with the availability of Serbian radio being idiosyncratic.

Columns 3 and 4 in Panel A of Table 2 focus on the predictors of the signal strength. The signal strength of Serbian radio is related significantly to several control variables, including the distance to Serbia, population, and the number of individuals disabled in the war of independence. Unlike in the case of measured availability, the non-geographic controls significantly predict radio availability measured by signal strength (F=3.1 and F=5.6). We address the identification concerns associated with such correlations below.

3.4. The effect of Serbian radio on Croatian nationalism. We test whether Serbian radio affects expressions of nationalistic feelings by Croats, such as voting behavior, and in particular, voting for Croatian extreme nationalist parties (HSP and its former factions, HCSP and HP-HPP) and ethnically-offensive graffiti. We estimate the OLS regression:

$$dep_var_i = \beta_0 + \beta_1 \cdot Availability_of_RTS_radio_i + \beta_2 \mathbf{X}_i + \phi_r + \varepsilon_i \quad (2)$$

in which *dep_var_i* denotes the a particular measure of nationalistic behavior in village *i*, *Availability_of_RTS_radio_i* is the measure of availability of Serbian radio stations, i.e., either an indicator variable for the measured availability or signal strength, \mathbf{X}_i is a vector of socioeconomic and demographic controls, and ϕ_r are county fixed effects. We weight the observations by the number of registered voters in 2007 and cluster the standard errors at the municipality (*općina*) level.

Table 3 presents the results of estimation of equation (2) for the vote share of extreme nationalistic parties in the baseline sample with only county fixed effects as controls (Column

1),²¹ with geographic and Census demographic controls (Column 2), and with all controls (Column 3). In the specification with most controls (Column 3), the availability of Serbian radio increases the vote share for the extreme nationalist parties by 2.6 percentage points relative to a baseline vote share of 7 percentage points, a statistically and economically significant effect. Online Appendix Table 4 reports the coefficient on all the control variables for this and other specifications.

A key concern is that the availability of Serbian radio could proxy for (unobservable) confounding variables that are positively correlated with nationalistic sentiment and hence bias upward the correlation between radio availability and nationalistic vote share. Above, we have shown that the observables are not significant determinants of the radio availability variable (Panel A of Table 2). A complementary test in the spirit of Altonji, Elder, and Taber (2005) is to examine how the introduction of control variables affects the results. If there is an upward bias in the estimates due to an omitted variable, adding controls should lower the point estimate, since they reduce the impact of the bias on the estimates. When we apply this test, we find no evidence that a bias drives the results upward. The point estimate of the effect of radio remains essentially identical with the addition of controls. While it is possible that our control variables are not positively correlated with the unobservables which bias the results, the controls include plausible correlates of nationalism (such as an indicator for importance during the war) and do a good job of predicting the nationalistic vote share, with an R-squared of 0.60 (Column 3).

One may worry that the estimated effect of exposure to Serbian radio reflects the impact of an outlier village, especially given the small sample of 139 villages in the baseline sample, of which 16 villages are identified as having reception of Serbian radios. To address this concern, Figure 4a provides a comparison of the c.d.f. of the vote share for the extreme nationalistic party in the villages with and without reception of Serbian radio, after taking control variables into account. (We regress the vote share on all the control variables in Column 3 except the radio reception, and plot the residuals evaluated at the mean; a similar plot, but without taking controls into account, is presented in Online Appendix Figure 6a). The vote share for the villages with Serbian radio nearly first order stochastically dominates the vote share for villages with no Serbian radio. A Kolmogorov-Smirnov test rejects the hypothesis of the equality of distributions with controls with a p-value of 0.006. Figure 4b provides evidence on the map of a positive correlation between the availability of Serbian radio and the residual vote share for the extreme nationalist parties (in deciles) after accounting for controls. Altogether, Figures 4a-4b show that the results are not due to a single outlier but rather to a pronounced pattern.

Returning to Table 3, the next specification (Column 4) decomposes the effect of availability of one Serbian radio versus multiple Serbian radios. In the 9 villages where multiple (RTS) Serbian radios are available, the audience is more likely to listen to Serbian content (intentionally or accidentally) and the reception of the Serbian channels is likely to be better. Indeed, these villages are associated with an (insignificantly) larger impact on nationalistic

²¹ There are two counties in our baseline sample, and five counties in our extended sample.

voting than the villages with one radio.

The estimates so far have made use of the hand-recorded measure of Serbian radio availability. In Columns 5-7 we present the parallel specifications using signal strength. In the most controlled specification, we again find a significant effect of signal strength on the nationalist vote share. Again, the addition of controls has a limited effect on the point estimates. In Figure 5 we plot for each village the residual signal strength and the residual vote share, after taking controls into account, and find a monotonic pattern.

One may argue that, while not jointly significant, the control variables associated with nationalism positively co-vary with radio availability. Panel B of Table 2 presents a test inspired by Altonji, Elder, and Taber (2005). We regress our outcome variable – nationalistic vote share – on an index of observables predicting the availability of RTS radio, i.e., fitted value from specification (1). This univariate regression allows for a higher-power test of how the observables that are correlated with radio availability are correlated with the outcome of interest. As reported in the Panel B of Table 2, we find no statistical evidence of a positive correlation, which could lead to an upward bias in the main specification (to the extent that the observables are positively correlated with the unobservable confounds). In Online Appendix Table 5, we implement the Altonji-Elder-Taber test separately by three groups of controls: geographic, census, and additional controls. Again, we find no evidence of a significant positive correlation. There is some evidence of a negative correlation between indices for some groups of controls and the nationalistic vote share. The fact that none of the three indices has positive correlation with nationalism irrespective of the Serbian radio measure used bolsters the view that the main estimates are unlikely to be biased upward.

Table 4 displays the results for other political outcomes, reproducing the baseline estimates from columns 3 and 7 of Table 3 in the first two columns, with the corresponding graphical evidence in Online Appendix Figures 6b-6d. The availability of Serbian radio has a negative effect on the vote share for the moderate nationalistic parties (Columns 3 and 4); the effect is especially pronounced in the specification with signal strength. There is some evidence that the exposure to Serbian radio increased the vote share for the Social Democratic party (Columns 5 and 6). An interpretation of this result is that exposure to Serbian radio made Croatian voters more nationalistic at the margin, shifting some voters from the moderate nationalist party to the extreme nationalist parties, while polarizing the electorate, which leads to higher vote share for the Social Democratic party. We find no evidence of an effect on turnout (Columns 7 and 8), though these results are more tentative, as the measure of listed voters is noisy.

So far, we presented evidence only on political outcomes. Anti-Serbian feelings among Croats can be expressed in various ways other than voting for extreme-nationalistic parties. As an alternative measure of nationalism, we use the presence of graffiti ethnically disparaging of Serbs in public spaces in the village (e.g. Online Appendix Figure 2). Using a probit specification with equal weighting (Table 5 and Online Appendix Figure 6e), we find that in

villages with Serbian radio the probability of ethnically offensive graffiti in the streets is 35 to 40 percentage points larger, that is, about double as compared to the villages with no Serbian radio, a statistically significant difference. The addition of controls has a small impact on the estimates. We find similar results using the continuous measure of signal strength, and the results are similar if we use a linear probability model (Online Appendix Table 6). These results provide evidence that Serbian public radio increases the expressions of Croatian nationalism beyond the voting booths.

To interpret the magnitudes of the impact of media availability on voting for extreme nationalist parties, we evaluate the results in terms of persuasion rate (DellaVigna and Kaplan, 2007). The persuasion rate is the fraction of the audience of a media outlet who are convinced to change their behavior (in this case, their vote) as a result of being exposed to this media outlet.

To compute the persuasion rates, one needs an estimate of the share of individuals listening to the media in question (Serbian radio) in the treatment group (villages with Serbian radio) and in the control groups (villages without Serbian radio). As not all residents in a village with reception of Serbian radio listen to it and some residents in villages with no reception of Serbian radio (according to our measure) do listen to it, we use survey responses to estimate the “first stage.” The estimates in Table 1 imply that the exposure to Serbian radio content is 31 percentage points higher in the villages with at least one Serbian radio available (Column 2 of Table 1). In addition, a unit increase in the signal strength of Serbian radio is associated with a 51-percentage point increase in exposure (Column 4 of Table 1).

To compute a persuasion rate based on the dichotomous measure of availability of Serbian radio, we use the following formula from DellaVigna and Kaplan (2007):

$$f = \frac{1}{1-v_0t_0} \left(t \frac{dv}{de} + v \frac{dt}{de} \right) f = \frac{v_T - v_C}{e_T - e_C} \frac{t_T}{1 - v_C}$$

v_T and v_C are the votes for ultra-nationalists in villages with and without Serbian radio, respectively, e_T and e_C are the exposures to Serbian radio in villages with and without Serbian radio, respectively, and t_T is the turnout in villages with Serbian radio. Turnout is not affected by Serbian radio and is equal to $t_T = t = 56.2\%$. The difference in exposure is estimated from the survey data and equals to $\hat{e}_T - \hat{e}_C = 0.313$ (Column 2 of Table 1). The impact on voting equals $\hat{v}_T - \hat{v}_C = 0.0226$ (Column 3 of Table 3) and the predicted share of vote for ultra-nationalists in the absence of Serbian radio is $\hat{v}_C = 0.057$. Thus, the persuasion rate is $f = (0.0226 * 0.562) / (0.313 * 0.943) = 4.3\%$.²²

Alternatively, we can compute the persuasion rate based on the continuous measure of signal strength using the formula from Enikolopov et al. (2011):

$$f = \frac{1}{1-v_0t_0} \left(t \frac{dv}{de} + v \frac{dt}{de} \right) = \frac{1}{1-v_0t_0} \left(t \frac{dv}{da} \frac{da}{de} + v \frac{dt}{de} \right)$$

$$f = \frac{1}{1-v_0t_0} \left(t \frac{dv}{de} + v \frac{dt}{de} \right) \quad (3)$$

Here v_0t_0 is the number of people who would vote for ultra-nationalists in the absence of

²² Note that because the change in exposure is estimated based on data from a non-representative survey, some bias is possible, so these results should be interpreted with caution.

Serbian radio; v and t are the vote share of ultra-nationalists and the voter turnout in places with e exposure to the Serbian public radio; $\frac{dv}{da}$ is the effect of da change in the signal strength of Serbian radio on the vote share; $\frac{de}{da}$ is the effect of a da change in the signal strength on the exposure; and $\frac{dt}{da}$ is the effect of de change in exposure on turnout. Our results with signal strength yield that $v_0 t_0$ equals 4.3 percent. This implies that 95.7 percent of Croats could, in principle, be convinced by the radio's message. From column 7 of Table 3, we get that $\frac{dv}{da}$ is equal to 2.404. The estimated effect of signal strength on the exposure $\frac{de}{da}$ is 51.3 (Column 4 of Table 1). As there is no effect on turnout, t does not depend on e and hence the second term in parentheses in equation (3) is 0. The implied persuasion rate is $f = 0.957 * 0.562 * (2.404 / 51.3) = 2.7\%$. These results are slightly smaller than the results obtained using a binary measure of radio availability above and are on the lower end of estimates in the literature of persuasion effects (DellaVigna and Gentzkow 2010).

4. Robustness.

Table 6 documents the results of various robustness checks, both for the manual measure of reception and for the signal strength measure.

First, we show that the results are unlikely due to the fact that towns with overall better radio reception may have unobservable features that are associated with nationalism. We examine the impact of reception of Hungarian radio on the nationalistic vote share. Given the lack of hostilities with Hungary and the fact that very few Croats speak or understand Hungarian, we expect no casual impact on nationalism. Indeed, we find no impact of this radio, and controlling for their availability does not affect the main estimates.

We also consider the impact of the signal strength of two major Croatian radios, the Radio HRT group and the Croatian Catholic Radio. One may worry that villages with reception of Serbian radio differ also in reception of Croatian radios (despite survey evidence suggesting that all villages have reception of Croatian radio). We find that controlling for the signal strength of these radios has no impact on the estimated effect of Serbian radio.²³

We then consider the impact of spatial correlation on our estimates. The level of clustering in our baseline estimation allows for arbitrary correlation of error terms among villages in the same municipality, but not across these geographical units. In order to account for spatial correlation, in Columns (5) and (6) we present the main results with standard errors corrected with the Conley (1999) procedure.²⁴ The corrected standard errors are if anything slightly lower once adjusted for spatial correlation and, thus, our results are robust.

We can also decompose the radio reception measure into the part that is driven by signal decay due to distance from the transmitter and the part that is driven by topography. After controlling for free-space signal strength (i.e., the signal strength that would have been obtained

²³ We find some evidence that stronger signal strength for the HR radio lowers the nationalistic vote share, with no such effect for the Catholic Croatian radio.

²⁴ The original method in Conley (1999) was extended to allow for weighting.

if there was a direct line of sight between the transmitter and the receiver), the manually-measured radio availability is no more significant (Column 7), but the signal strength remains significant (Column 8), though less precisely estimated.

In Online Appendix Table 7, we present an additional series of robustness checks. The results are essentially identical if we: (i) consider only the vote for the main nationalistic party HSP (without vote for HP-HPP and HCSP) as dependent variable (Columns 1 and 2); (ii) control for the intensity of past conflict by introducing a control for the location of the Serbian *Krajina* (Columns 3 and 4); (iii) control for the distance to the transmitters and for elevation (Columns 5 and 6); (iv) control for the vulnerability to potential Serbian attacks using driving time to Serbia and the number of conflict events within 3 km of each village according to *Armed Conflict Location and Event Dataset* (Columns 7 and 8); (v) estimate the results with a nearest-neighbor matching estimator, where we compute the average treatment on the treated by finding the 5 control villages which are the closest to each of the treated villages (that is, each village with radio reception) (Column 9); (vi) include all villages within a 35 km. range from the border (Column 10).

The analysis so far focused on the sub-sample of villages that we visited (baseline sample). We also analyze the extended sample of 417 villages within 75 kilometers of the Croatian-Serbian border. In this larger sample, we do not have a direct measure of radio availability and hence focus on the specification with signal strength. The results are largely robust to extending the sample as reported in Table 7. The signal strength of Serbian radio is associated with significantly higher vote share for the extreme nationalist parties (Column 2), a decrease in the vote share for moderate nationalist parties once controls are included (Column 4), an increase of the vote share for the social-democratic party (Column 6), and a decrease in turnout (Column 8). Regarding the main result on the vote share of extreme nationalist parties (Column 2), the estimate is somewhat smaller than the comparable estimate for the baseline sample (column 6 in Table 3), though not significantly so. Online Appendix Table 8 shows that the results are very similar if we restrict the sample to villages within 50 kilometers of the border.

To understand whether the results are consistent across elections, we examine the impact of exposure to Serbian radio (as measured in 2009 and 2010) on the 2011 and 2003 Parliamentary elections (Table 8). The results for the 2011 elections are consistent with the 2007 results: exposure to Serbian radio is associated with an increase in voting for the extremely nationalistic party, a results which is statistically significant in the baseline sample using both radio measures. The pattern of results on voting for other parties is similar too (Online Appendix Tables 9 and 10).

In contrast to the results for 2007 and 2011, there is no evidence of an effect of Serbian radio exposure measured in 2009 on the election results in 2003 in the baseline sample, with some evidence in the extended sample (see also Online Appendix Tables 11 and 12). The different results for the 2003 elections could be explained by the different degree of

measurement error. In 2003 the transmitters were still in the process of being repaired and, in addition, many people still lived and voted in refugee camps.

We also examine the heterogeneity of the impact of exposure to Serbian radio on voting by adding to specification (2) an interaction of the availability and signal strength variables with a particular control variable. As our sample is small, we include interactions with one variable at a time. Online Appendix Table 13, Panels A and B show that the only consistent pattern is that the effect tends to be smaller in villages with more disabled during the war of independence and more important role in the war. In these villages, nationalism is higher most probably because of the vivid memories of the war experience, and, therefore, the media message is likely to be infra-marginal.

Overall, we find the cross-border media effects to be robust.

5. Conclusion

This paper documents the effect of Serbian public radio on the voting behavior and nationalistic anti-Serbian sentiment of Croats in *Eastern Slavonia, Baranja and Western Srijem*, a post-conflict region of modern Croatia on the border with Serbia. We find that the exposure to the Serbian public radio convinces some Croats to switch to voting for ultra-nationalist parties from voting to moderate nationalist party. In addition, exposure to Serbian public radio increases the incidence of ethnically-offensive graffiti on public buildings in the center of their villages. The results of a laboratory experiment confirm that Serbian public radio causes an increase in anti-Serbian sentiment among Croats.

Our results indicate that media can have substantial cross-group effects in areas characterized by ethnic tensions with overlapping media markets and groups sharing similar languages. This suggests that peaceful relations between neighboring ethnic and religious groups depend in part on the content of media programming, and the extent of media overlap. Hence, nation-building efforts implicit in the nationalistic content of the group-specific media (in our case, the Serbian radio) can have important negative spillovers on the persistence of peace.

References

- Acemoglu, Daron, and Alexander Wolitzky (2012) "Cycles of Distrust: An Economic Model," working paper
- Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Perseus Books.
- Altonji J., T. Elder, and C. Taber (2005) Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools. *Journal of Political Economy*, 113(1), 151-184.
- Bellows, J. and Edward Miguel (2009) "War and local collective action in Sierra Leone," *Journal of Public Economics*, Elsevier, vol. 93(11-12), 1144-1157.
- Blattman, Christopher (2009) "From Violence to Voting: War and Political Participation in Uganda", *American Political Science Review* 103: 231-47.
- Blattman, C. and E. Miguel (2010). "Civil War," *Journal of Economic Literature*, American Economic Association, vol. 48(1): 3-57.
- Bursztyjn, L. and D. Cantoni (2011) Clueless? The Impact of Television on Consumption Behavior. Working paper.
- Butler, D. M. and A. L. De La O (2011) The Causal Effect of Media-Driven Political Interest on Political Attitudes and Behavior, *Quarterly Journal of Political Science*: Vol. 5:No 4, pp 321-337.

- Caselli, F., M. Morelli and D. Rohner (2012) "The Geography of Inter-State Resource Wars," mimeo, London School of Economics.
- Chassang, S. and G. Padró i Miquel (2010) "Conflict and Deterrence under Strategic Risk," *The Quarterly Journal of Economics* 125 (4): 1821-1858.
- Conley, T.G. (1999) GMM Estimation with Cross Sectional Dependence. *Journal of Econometrics* 92, 1-45.
- DellaVigna, S., and M. Gentzkow (2010) Persuasion: Empirical Evidence. *Annual Review of Economics* 2, 643-669.
- DellaVigna, S. and E. Kaplan (2007) The Fox News effect: Media bias and voting. *Quarterly Journal of Economics* 122(3), 807-860.
- Dube, Oeindrila, and Juan Vagras (forthcoming) "Commodity Price Shocks and Civil Conflict: Evidence from Colombia," *Review of Economic Studies*.
- Dube, Oeindrila, and Suresh Naidu (2011) "Bases, Bullets and Ballots: the Effect of U.S. Military Aid on Political Conflict in Colombia," working paper
- Durante, R., and B. Knight (2012) Partisan Control, Media Bias, and Viewer Responses: Evidence from Berlusconi's Italy. *Journal of European Economic Association*, 10(3), 451-481.
- Enikolopov, R., M. Petrova and E. Zhuravskaya (2011) Media and Political Persuasion: Evidence from Russia. *American Economic Review*, 101(7), 3253-85.
- Folke, O. (2011) *Shades of Brown and Green: Party Effects in Proportional Election Systems*. Mimeo, Columbia University.
- Gentzkow, M. (2006) Television and voter turnout. *Quarterly Journal of Economics* 121(3), 931-972.
- Gentzkow, M. and J. M. Shapiro (2004) Media, Education, and Anti-Americanism in the Muslim World. *Journal of Economic Perspectives*. 18(3).
- Gentzkow, M. and J. M. Shapiro (2011) Ideological Segregation Online and Offline, *Quarterly Journal of Economics*. 126 (4)
- Gerber A., Karlan D., Bergan, D. (2009) Does the media matter? a field experiment measuring the effect of newspapers on voting behavior and political opinions. *American Economic Journal: Applied Economics*, 1(2), 35-52.
- Glaeser, E.L. (2005) "The Political Economy of Hatred," *The Quarterly Journal of Economics*, 120 (1), 45-86
- Glaeser, E.L., and C. Sunstein (2009) "Extremism and Social Learning," *Journal of Legal Analysis*, 1(1), 263-324
- Greenberg, Robert D. (2004) *Language and Identity in the Balkans*. Oxford University Press.
- Grosfeld, I., Rodnyansky, A., and Zhuravskaya, E. (2013) Persistent Antimarket Culture: A Legacy of the Pale of Settlement after the Holocaust. *American Economic Journal: Economic Policy*, 5(3): 189-226.
- Hainmueller, J. and H. Kern (2009) Opium for the masses: How foreign free media can stabilize authoritarian regimes. *Political Analysis*, 17, 377-399.
- Hess, G. and A. Orphanides (1995) "War Politics: An Economic rational-voter framework," *American Economic Review*, 85: 4, 828-846
- Hislope, R. (1996) Intra-Ethnic Conflict in Croatia and Serbia: Flanking and the Consequences for Democracy. *East European Quarterly*, 30, pp. 471-494.
- Hockenos P. (2003) *Homeland Calling: Exile, Patriotism and the Balkan Wars*. Cornell University Press: Ithaca, NY.
- Hufford, G.A. (2002) The ITS Irregular Terrain Model, Version 1.2.2 the Algorithm. Available: <http://flattop.its.bldrdoc.gov/itm.html>.
- IREX (2010) *Media Sustainability Index 2010- Serbia*. International Research & Exchanges Board.
- Iyengar S, Hahn KS, Krosnick JA, Walker J. 2008. Selective exposure to campaign communication: the role of anticipated agreement and issue public membership. *Journal of Politics* 70:186-200.
- Jackson, M.O. and M. Morelli (2007) "Political Bias and War," *American Economic Review*, 97:4, 1353-1373.
- Jackson, M. and M. Morelli (2011) The Reasons for Wars - an Updated Survey. In the *Handbook on the Political Economy of War*, Chris Coyne and Rachel Mathers (eds.), Elgar Publishing, Cheltenham, the UK.
- Jha, S. (2013) "Trade, Institutions and Religious Tolerance: Evidence from India," *American Political Science Review*, Vol. 107, No. 4,
- Knight B., Chiang C. (2011) Media bias and influence: Evidence from newspaper endorsements. *Review of Economic Studies*, 78(3), 795-820.

- Kronja, I. (2004) Turbo Folk and Dance Music in 1990s Serbia: Media, Ideology and the Production of Spectacle. *The Anthropology of East Europe Review* 22(1), 103-114.
- Kurspahić, K. (2003) *Prime Time Crime: Balkan Media in War and Peace*. Washington DC: United States Institute of Peace.
- Laqueur, W. (1997) *Fascism: Past, Present, Future*. New York: Oxford University Press.
- Lawson, C. and J. A. McCann (2005) Television news, Mexico's 2000 elections, and media effects in emerging democracies. *British Journal of Political Science* 35(1), 1-30.
- MacDonald, David Bruce (2002) *Balkan Holocausts? Serbian and Croatian Victim-Centred Propaganda and the War in Yugoslavia*. Manchester: Manchester University Press.
- Nedeljkovic V., Dubravka, and Visnja Bacanovic (2007) Monitoring and analysis of TV news programs in Serbia-RTS, RUV and TV B92: From emotional approach to the fate of Kosovo to progressive civil activism. In *Indicator of Public Interest: TV prime time domestic news-monitoring and analysis of TV news programs in 10 SEENPM countries*, ed. Radenko Udovicic. Sarajevo: Media Plan Institute.
- Olken B. (2009) Do TV and Radio Destroy Social Capital? Evidence from Indonesian Villages. *American Economic Journal: Applied Economics* 1 (4), 1-33.
- Paluck, Elizabeth Levy, and Donald P. Green. 2009. Deference, Dissent, and Dispute Resolution: An Experimental Intervention using Mass Media to Change Norms and Behavior in Rwanda. *American Political Science Review* 103: 622-644.
- Peruško, Z. and Jurlin, K.(2006) *The Croatian Media Market: Regulation and Concentration Trends*, unpublished study for the Media Division of the Council of Europe.
- Rohner, Dominic, Mathias Thoenig, and Fabrizio Zilibotti (2012) "Seeds of Distrust: Conflict in Uganda" CEPR Discussion Paper No. DP8741.
- Skiljan, D. (2000) Semantics of war. In N. Skopljanac Brunner, S. Gredelji, A. Hodzic, & B. Kristofic (Eds.), *Media and war*. Zagreb, Croatia: Centre for Transition and Civil Society Research.
- Smajlović, L. (1997) *Media in the Federal Republic of Yugoslavia*, IREX Report.
- Snyder, J. and Strömberg, D. 2010. Press Coverage and Political Accountability" *Journal of Political Economy* 118(2), 355-408.
- Strömberg, D. (2004) Radio's impact on public spending. *Quarterly Journal of Economics* 119(1), 189-221.
- Sunstein, C. R. (2001) *Republic.com*. Princeton, N.J.: Princeton University Press.
- Thompson, M. (1994) *Forging War: The Media in Serbia, Croatia and Bosnia-Herzegovina*, London: Article 19.
- Udovicic R. (2005) *Battling political frustration*, mediaonline, Available: <http://www.mediaonline.ba/en/?ID=343>.
- UNCE (1994) *Final report of the United Nations Commission of Experts established pursuant to security council resolution 780 (Annex III.A Special forces)* Available : <http://www.ess.uwe.ac.uk/comexpert/anx/III-A.htm#III.D>.
- Valentino NA, Banks AJ, Hutchings VL, Davis AK. 2009. Selective exposure in the internet age: the interaction between anxiety and information utility. *Political Psychology* 30:591-613
- Voigtländer, Nico, and Hans-Joachim Voth (2012) "Persecution Perpetuated: Medieval Origins of Anti-Semitic Violence in Nazi Germany," *Quarterly Journal of Economics*, 127(3): 1339-1392.
- Voors, Maarten J., Eleonora E. M. Nillesen, Philip Verwimp, Erwin H. Bulte, Robert Lensink, and Daan P. Van Soest. 2012. "Violent Conflict and Behavior: A Field Experiment in Burundi." *American Economic Review*, 102(2): 941-64.
- Yanagizawa, D. (2009) *Propaganda and Conflict: Theory and Evidence from the Rwandan Genocide*. Working paper.

Figure 1a. Map of the area with the baseline and extended samples of villages



Figure 1b. Map of the area with the baseline sample of villages showing both the measured and the predicted reception of Serbian radio.

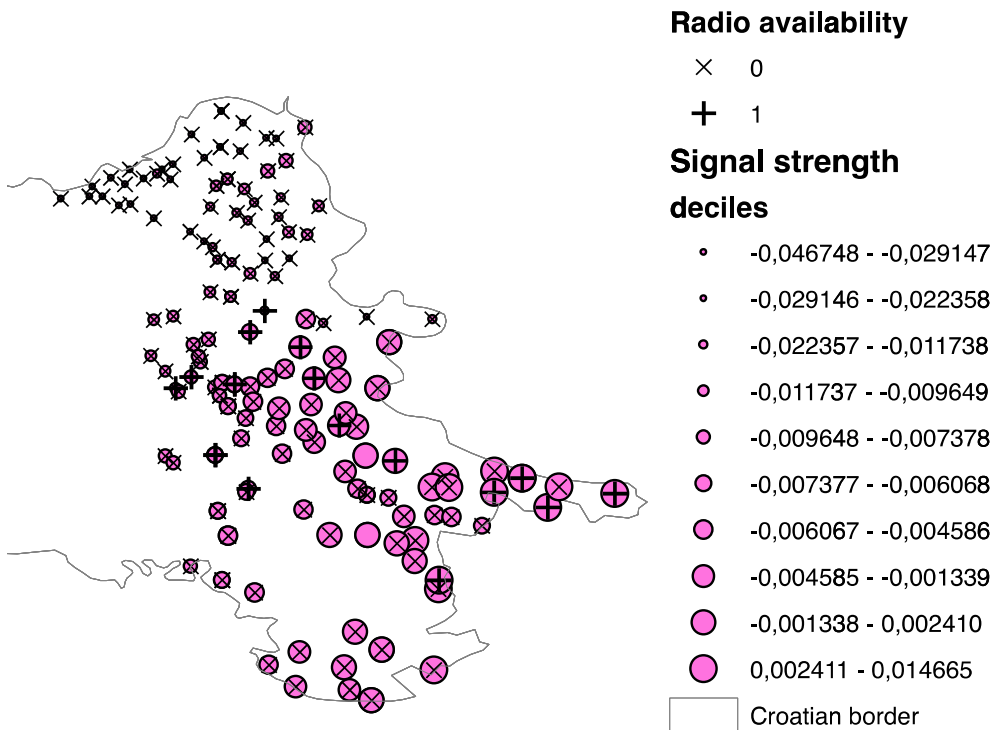


Figure 2a. Reported reception of Serbian radio (survey response), as function of availability of Serbian radio in village.

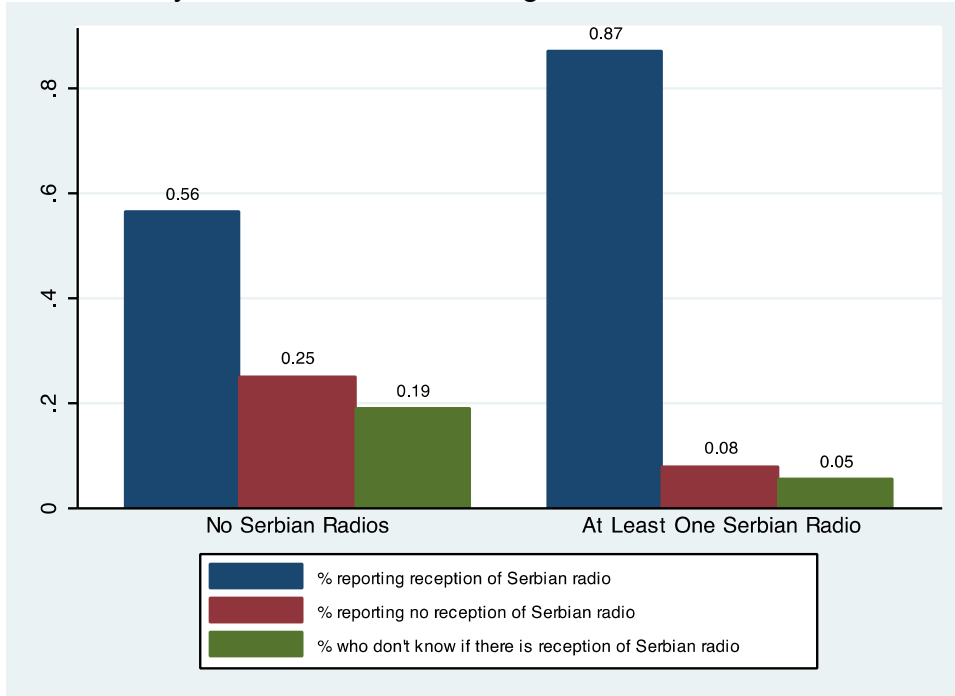
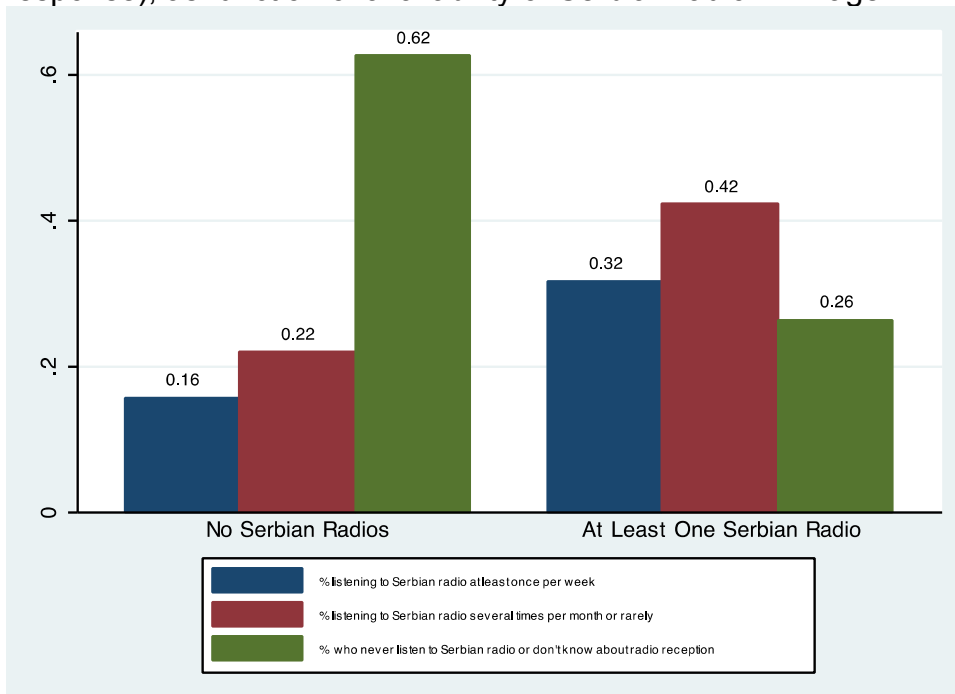
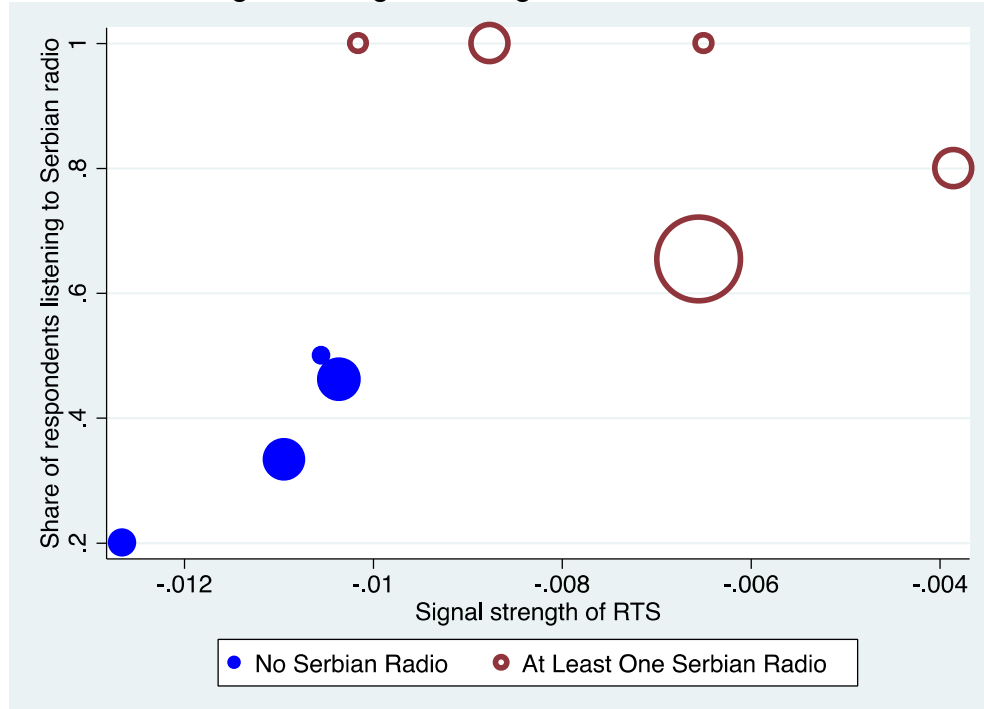


Figure 2b. Reported frequency of listening to Serbian radio (survey response), as function of availability of Serbian radio in village



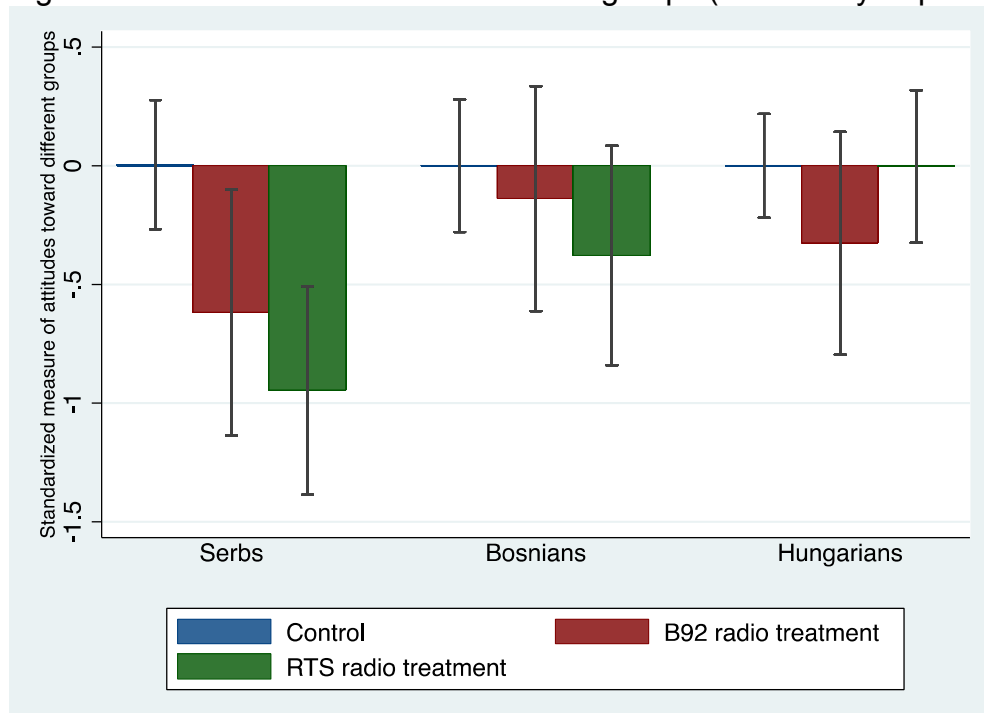
Notes: Figures 2a and 2b tabulate the responses to two questions of an in-person survey undertaken in Dec. 2010 and Jan. 2011 in 9 of the Croatian villages in the baseline sample. We report the average responses separately for the 32 respondents in villages which we code as not having reception of Serbian radio, and for the 38 respondents in villages which we code as having reception of at least one Serbian radio.

Figure 2c. Reported incidence of listening to Serbian radio (survey response), as function of signal strength in village.



Notes: Figure 2c shows responses to a question on frequency of listening to Serbian radio in an in-person survey undertaken in Dec. 2010 and Jan. 2011 in 9 of the Croatian villages in the baseline sample. We report in solid circles the average responses for the 32 respondents in villages which we code as not having reception of Serbian radio, and with hollow circle for the 38 respondents in villages which we code as having reception of at least one Serbian radio. Size of the markers is proportional to the number of respondents in each village.

Figure 3. Attitudes toward different ethnic groups (Laboratory Experiment)



Notes: Difference for feeling towards Serbs between control and RTS treatment significant at 1% level, between control and B92 treatment at 5%. All other differences are not significant.

Figure 4a. Vote share for extreme nationalistic parties in villages with, and without, reception of Serbian radio (controls).

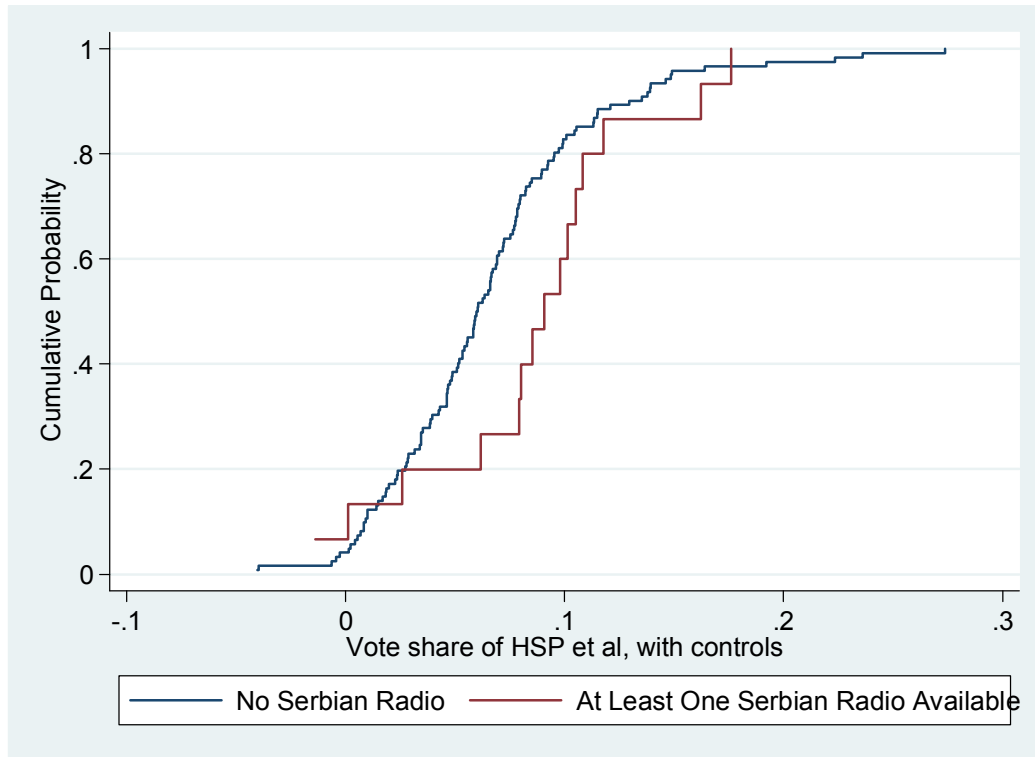


Figure 4b. Map of the vote share for extremely nationalistic parties (with controls) and the measured reception of Serbian radio.

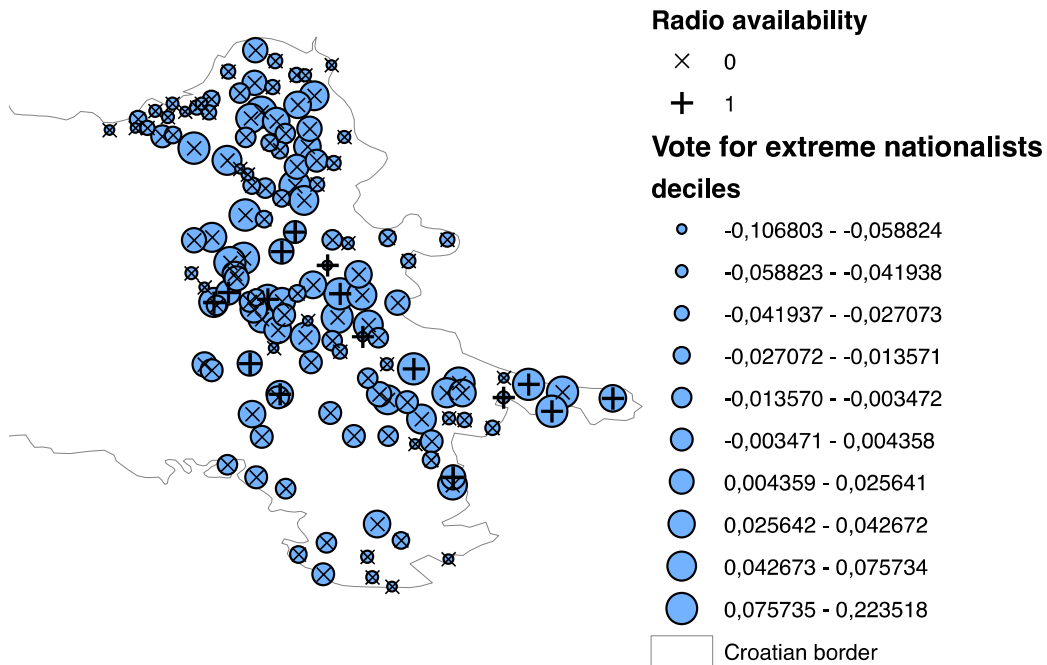
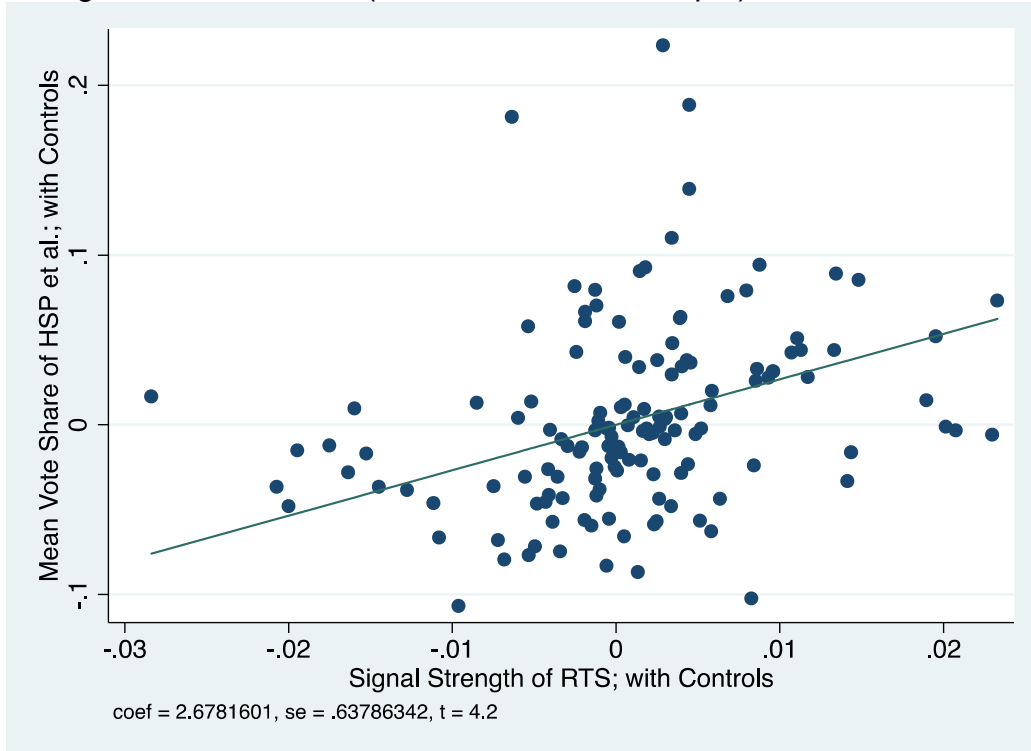


Figure 5. Vote share of extremely nationalistic parties as function of signal strength of Serbian radio (controls, baseline sample).



Notes: The picture shows share of votes for HSP et al. and predicted signal strength of Serbian radio after taking controls into account. Residuals are taken from the specification presented in column (3) of Table 3.

Table 1. Effect of Serbian radio availability on radio listenership: Survey Evidence

Dep. Var. in OLS Regression:	Indicator for Survey Respondent Who Reports Listening to Serbian Radio At Least Sometimes			
Panel A. Listening at all	(1)	(2)	(3)	(4)
At least 1 Serbian radio available	0.362*** [0.113]	0.313** [0.120]		
Signal strength of Serbian Radio			55.206** [23.820]	51.325** [22.673]
Constant	0.375*** [0.051]	0.405 [0.412]	1.098** [0.449]	1.098** [0.449]
Controls	No	Yes	No	Yes
Observations	70	70	70	70
R-squared	0.13	0.45	0.11	0.42
Effect of 1 st. dev. change			0.14	0.13
Dep. Var. in OLS Regression:	Indicator for Survey Respondent Who Reports Listening to Serbian Radio Often			
Panel B. Listening often	(1)	(2)	(3)	(4)
At least 1 Serbian radio available	0.160 [0.100]	0.144 [0.107]		
Signal strength of Serbian Radio			26.564 [22.532]	27.588 [19.415]
Constant	0.156* [0.077]	-0.266 [0.260]	0.076 [0.216]	0.076 [0.216]
Controls	No	Yes	No	Yes
Observations	70	70	70	70
R-squared	0.03	0.28	0.06	0.27
Effect of 1 st. dev. change			0.07	0.07

Notes: Data from a survey of 70 individuals in 9 villages. Respondents are asked how often, if at all, they listen to Serbian radio. They are considered to listen to Serbian radio often if they listen to it at least several times per week. Control variables include age, gender, occupation, education, and whether village was surveyed in 2011. Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 2. Determinants of the availability of Serbian radio and Altonji-Elder-Taber test

Panel A. Determinants of Serbian radio availability				
Dep. Var. in OLS Regression	Indicator for measured Availability of at least 1 Serbian (RTS) radio		Signal Strength for Serbian (RTS) radio	
	(1)	(2)	(3)	(4)
Signal strength of all Serbian RTS radios		9.183** [3.637]		
Distance to Serbia, logged	-0.056 [0.034]	-0.021 [0.032]	-0.0038*** [0.001]	-0.004*** [0.001]
Population (logged)	-0.026 [0.026]	-0.034 [0.029]	0.0009 [0.001]	0.001** [0.001]
% of male population	-1.312 [1.084]	-1.585 [1.142]	0.0298 [0.023]	-0.011 [0.012]
% of aged 21-40	-2.187 [1.732]	-2.273 [1.936]	0.0094 [0.061]	0.001 [0.016]
% of aged 41-60	-1.551 [1.118]	-0.916 [1.091]	-0.0692** [0.031]	-0.041*** [0.013]
% of aged 61+	-1.405* [0.835]	-1.138 [0.886]	-0.0291 [0.027]	-0.006 [0.010]
% of Croats	-0.189 [0.219]	-0.053 [0.184]	-0.0148* [0.008]	-0.003 [0.005]
% of people with higher education	4.544*** [1.663]	3.543** [1.424]	0.1091* [0.059]	-0.012 [0.050]
Economically active population (%)	-0.239 [0.927]	-0.209 [0.959]	-0.0032 [0.048]	0.047** [0.019]
Disabled after the war of independence (%)	-0.781 [2.327]	-3.714 [2.877]	0.3194*** [0.106]	0.255*** [0.085]
Large forest nearby	-0.120* [0.069]	-0.123* [0.065]	0.0004 [0.002]	
Was important during the war	0.057 [0.142]	0.100 [0.121]	-0.0047 [0.004]	
Monument in the honor of died defendants of the town	0.077 [0.075]	0.079 [0.076]	-0.0002 [0.002]	
Names of the streets in Cyrillic script	-0.162 [0.150]	-0.152 [0.134]	-0.001 [0.004]	
Names of the streets in Hungarian	0.058 [0.065]	0.051 [0.059]	0.0007 [0.003]	
Serbian beer in bars	-0.006 [0.124]	-0.024 [0.120]	0.002 [0.002]	
County fixed effects	Yes	Yes	Yes	Yes
R-squared	0.17	0.21	0.643	0.636
F-stat for joint significance of non-geographic controls	0.99	0.89	3.094***	5.655***
F-stat for all the controls	2.23**	3.12***	13.35***	122.81***
Sample	Baseline	Baseline	Baseline	Extended
Observations	139	139	139	417

Panel B. Altonji-Elder-Taber test of selection on observables				
Dep. Var. in OLS Regression:	Vote share for Extremely nationalistic parties			
	(1)	(2)	(3)	
Prediction (based on all controls) of availability of dummy for 1 Serbian radio	0.031 [0.062]			
Prediction (based on all controls) of signal strength of Serbian radio		-1.858 [1.279]	-0.001 [0.459]	
Controls	No controls	No controls	No controls	
Sample	Baseline	Baseline	Extended	
Observations	139	139	417	

Notes: Panel A reports the coefficient of OLS regressions of radio reception on all the control variables for the baseline sample (Columns 1-3) and for the extended sample (Column 4). The dependent variable is measured radio reception in Columns 1-2 and radio signal strength in Columns 3-4. Panel B regresses the dependent variable of Table 3 (vote share for extremely nationalistic parties) on the predicted radio reception based on all variables in Panel A. The univariate regression in Panel B provides information on the correlation between the predictors for the media variable and the political variable, indicating the potential for bias in the regressions in Tables 3. Observations in panel B are weighted by the number of eligible voters. In both panels, the standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Serbian radio and vote for extreme nationalists. Baseline sample.

Dep. Var. in OLS regression:	Vote share for extremely nationalistic parties						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
At least 1 Serbian (RTS) radio available	0.028** [0.011]	0.025*** [0.008]	0.026*** [0.008]	0.018* [0.009]			
At least 2 Serbian (RTS) radios available				0.025 [0.019]			
Signal Strength of Serbian (RTS) radio					3.671*** [0.975]	2.464*** [0.622]	2.678*** [0.617]
Distance to Serbia, logged	-0.006 [0.008]	-0.015* [0.008]	-0.016 [0.010]	-0.014 [0.010]	0.005 [0.007]	-0.006 [0.007]	-0.006 [0.008]
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Census controls	No	Yes	Yes	Yes	No	Yes	Yes
Additional controls	No	No	Yes	Yes	No	No	Yes
Mean of Dependent Variable	0.070	0.070	0.070	0.070	0.070	0.070	0.070
R-squared	0.36	0.60	0.60	0.60	0.48	0.63	0.64
Observations	139	139	139	139	139	139	139
Implied Persuasion Rates	0.05	0.05	0.05	0.03	0.043	0.03	0.03
Implied ATT	0.09	0.08	0.08	0.06	0.07	0.05	0.05

Notes: The specification reports the results of OLS specifications, with the observations weighed by the number of eligible voters. The baseline sample includes villages directly visited by the authors in 2009 and 2010 to measure the radio availability in the main street. Columns (1)-(4) use the measure of reception of RTS Serbian radio recorded on an in-person visit, while columns (5)-(7) use the signal strength computed using the transmitter location. The full set of control variables is listed in Table 2. Persuasion rates (DellaVigna and Kaplan, 2007) are computed according to the formula in the text. Implied Average Treatment on Treated effect (ATT) is computed as the ratio of the coefficient for the effect of radio on vote to the coefficient of the effect of radio on listenership from Table 1. The standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Serbian radio, vote for other parties and turnout. Baseline sample.

Dep. Var. in OLS regression:	Vote Share of		Vote Share of		Vote Share of		Turnout	
	Extreme Nationalists		Moderate Nationalists		Social-Democrats		(7)	(8)
	(1)	(2)	(3)	(4)	(5)	(6)		
At least 1 Serbian (RTS) radio available	0.026*** [0.008]		-0.041* [0.024]		0.009 [0.015]		-0.009 [0.017]	
Signal Strength of Serbian (RTS) radio		2.678*** [0.617]		-4.099*** [0.838]		1.884** [0.846]		-0.981 [1.067]
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Census and geographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manually collected controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Dependent Variable	0.070	0.070	0.362	0.362	0.251	0.251	0.550	0.550
R-squared	0.60	0.64	0.74	0.76	0.69	0.71	0.62	0.62
Observations	139	139	139	139	139	139	139	139
Implied Persuasion rates	0.05	0.03	-0.13	-0.06	0.02	0.02	-0.04	-0.02
Implied ATT	0.08	0.05	-0.13	-0.08	0.03	0.04	-0.03	-0.02

Notes: The specification reports the results of OLS specifications, with the observations weighed by the number of eligible voters. The baseline sample includes villages directly visited by the authors in 2009 and 2010 to measure the radio availability in the main street. The full set of control variables is listed in Table 2. First two columns reproduce columns (3) and (7) from Table 3. The standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Serbian radio and ethnically offensive graffiti.

Dap. Var. in Probit Regressior	Indicator for ethnically offensive graffiti in a village						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
At least 1 Serbian (RTS) radio available	0.364*** [0.139]	0.355** [0.171]	0.361** [0.161]	0.311 [0.245]			
At least 2 Serbian (RTS) radios available				0.076 [0.294]			
Signal Strength of Serbian (RTS) radio					10.883** [4.975]	8.559* [4.589]	10.288** [5.109]
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distance to Serbia, logged	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Census and geographic controls	No	Yes	Yes	Yes	No	Yes	Yes
Additional controls	No	No	Yes	Yes	No	No	Yes
Mean of Dependent Variable	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Observations	139	139	139	139	139	139	139

Notes: All estimations use probit model. All observations are equally weighted. The baseline sample includes villages directly visited by the authors in 2009 and 2010 to measure the radio availability in the main street. The dependent variable is an indicator for the presence of a graffiti offensive towards Serbs in the village streets, as measured on an in-person visit in 2009 and 2010. The full set of control variables is listed in Table 2. Marginal effects are reported. The standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Serbian radio and vote for extreme nationalists, Robustness Checks. Baseline sample.

Dep. Var.:	Vote share for extremely nationalistic parties							
Sample	Baseline							
Specification	Control for exposure to Hungarian radio		Control for exposure to Croatian radio		Standard errors corrected for spatial autocorrelation		Control for free-space signal strength	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
At least 1 Serbian (RTS) radio available	0.026** [0.010]		0.030*** [0.010]		0.026*** [0.008]		0.008 [0.010]	
Signal Strength of Serbian (RTS) radio		2.699*** [0.602]		2.446*** [0.675]		2.678*** [0.382]		1.7111** [0.818]
At least 1 Hungarian radio available	0.001 [0.023]							
Signal Strength of Hungarian radio		0.223 [0.941]						
Signal Strength of Croatian Catholic radio			0.16 [0.742]	0.216 [0.751]				
Signal Strength of Croatian HR radios			-1.221*** [0.341]	-0.810** [0.321]				
Free-Space Signal Strength of Serbian (RTS) radio	No	No	No	No	No	No	Yes	Yes
Standard errors corrected for spatial autocorrelation	No	No	No	No	Yes	Yes	No	No
Observations	139	139	139	139	139	139	139	139
R-squared	0.60	0.64	0.63	0.65	0.60	0.64	0.64	0.65
Implied Persuasion Rates	0.05	0.03	0.06	0.03	0.05	0.03	0.02	0.02
Implied ATT	0.08	0.05	0.10	0.05	0.08	0.05	0.03	0.03

Notes: The specification reports the results of OLS with the observations weighed by the number of eligible voters. The baseline sample includes villages directly visited by the authors in 2009 and 2010 to measure the radio availability in the main street. All specifications control for the full set of control variables listed in Table 2. The standard errors in brackets for OLS regressions are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Extended sample results (Villages within 75km of Croatian-Serbian Border).

Dep. Var. in OLS regression:	Vote share of extreme nationalists		Vote share of moderate nationalists		Vote share of social-democrats		Turnout	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Signal Strength of Serbian (RTS) radio	2.058** [0.880]	1.552** [0.623]	-0.931 [0.987]	-1.934** [0.934]	0.993 [1.404]	1.235 [0.908]	-1.504** [0.717]	-3.080*** [0.767]
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distance to Serbia, logged	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Census and geographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Mean of Dependent Variable	0.061	0.061	0.349	0.349	0.215	0.215	0.215	0.215
R-squared	0.27	0.40	0.53	0.61	0.030	0.50	0.11	0.33
Observations	417	417	417	417	417	417	417	417
Implied Persuasion Rates	0.026	0.019	-0.017	-0.028	0.015	0.017	-0.040	-0.052
Implied ATT	0.040	0.030	-0.018	-0.038	0.019	0.024	-0.029	-0.060

Notes: The specification reports the results of OLS specifications, with the observations weighed by the number of eligible voters. This extended sample includes villages in the broader Croatian region up to a 75 km. distance from the Croatian-Serbian border. The full set of control variables is listed in Table 2. The standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. Serbian radio, vote for extreme nationalistic parties in 2003 and 2011.

Dep. Var. in OLS regression: Elections: Sample	Vote Share of Extreme Nationalistic Parties					
	2003 Election			2011 Election		
	Baseline Sample	Ext. Sample		Baseline Sample	Ext. Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
At least 1 Serbian (RTS) radio available	-0.006 [0.008]			0.024*** [0.008]		
Signal Strength of Serbian (RTS) radio		-0.115 [0.505]	0.748* [0.384]		1.266*** [0.446]	0.484 [0.500]
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Census and geographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Manually collected controls	Yes	Yes	No	Yes	Yes	No
Mean of Dependent Variable	0.072	0.072	0.076	0.052	0.052	0.052
R-squared	0.44	0.44	0.19	0.40	0.39	0.36
Observations	121	121	369	123	123	375
Implied Persuasion rates	-0.01	0.00	0.01	0.05	0.01	0.01
Implied ATT	-0.02	0.00	0.01	0.08	0.02	0.01

Notes: The specification reports the results of OLS specifications, with the observations weighed by the number of eligible voters. The number of observations for the 2003 and 2011 elections differs somewhat from the one in the baseline sample because the electoral committee does not provide village-level data for polling places comprising more than one village in these other years. The sample in Columns 1-2 and 4-5 includes villages directly visited by the authors in 2009 and 2010 to measure the radio availability in the main street for which the voting data for the respective year is available. The sample in Columns 3 and 6 includes the extended sample used in Table 7. The full set of control variables is listed in Table 2. The standard errors in brackets are clustered by municipality, allowing for correlation between villages in the same municipality. * significant at 10%; ** significant at 5%; *** significant at 1%