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Can Television Bring Down a Dictator?
Evidence from Chile's "No" Campaign

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Abstract. Can televised political advertising change voting behavior in elections held in authoritarian regimes? We study the case of Chile, where the opposition used television campaigns weeks before the election that ended the Pinochet regime. We show that after campaigns were launched, firms linked to Pinochet lost stock market value, confirming the contemporaneous importance of television. Using national surveys conducted before the election and administrative electoral data, we provide evidence of a positive effect of television exposure on opposition votes. These results suggest that televised political campaigns can help to defeat dictators at the polls.

Keywords: television, dictatorship, elections, transition

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1 Introduction

Can political advertisement help to democratically defeat authoritarian regimes? Although electoral fraud is a major threat to elections under authoritarianism, history reminds us that dictators can indeed be defeated at the polls. The study of elections in authoritarian regimes, and the conditions under which democratization can occur, has seen a rapid increase in the last decade.[1] Research has pointed to a number of conditions for elections to lead to democratization – e.g. international pressure – but media-related variables have been relatively overlooked. The increasing number of elections in non-democratic regimes (Lindberg, 2009), together with increasing exposure to media outlets, calls for deeper attention to the role of a potentially powerful tool to defeat dictators: campaign advertising.

We study the case of Chile, where the opposition used television campaigns in the weeks preceding the election that ended the seventeen-year dictatorship known as the Pinochet regime. We find that televised political campaigns changed voting in this election, providing one of the first pieces of evidence that media can affect elections held in authoritarian regimes. There were two political alternatives in this election known as the "1988 plebiscite." The "Yes" option represented support for the incumbent regime of Augusto Pinochet and the "No" option represented a support for opposition parties. We confirm the contemporaneous importance of televised campaigns by showing that firms connected to the Pinochet regime experienced a significant decrease in their stock value in the days after the campaigns launched.

To test for the effect of television exposure on voting patterns, we combine national surveys conducted before the election with administrative voting data across counties. Our identification strategy relies on the differential television exposure of counties while controlling for unobserved heterogeneity in political preferences – derived from voting behavior in the 1970 presidential election – and other predetermined characteristics. The 1970 election was another critical point in Chilean history in which Salvador Allende was

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[1]See Schedler (2006), Howard and Roessler (2006), Lewitsky and Way (2010), Bunce and Wolchik (2010), Donno (2013), Schedler (2013), Pop-Eleches and Robertson (2015), and Morgenbesser (2016), among others. See Gandhi and Lust-Okar (2009) for a review of the early literature.

elected president of the country in a highly contended election. The explanatory power of the voting behavior in the 1970 election makes our approach particularly appealing. In addition, a collection of empirical exercises exploiting other media sources and particular features of the institutional context provide further evidence for the importance of television.

Our main result suggests that a one standard deviation increase in television exposure increased votes for the opposition by two percentage points. This result controls for unobserved heterogeneity in political preferences revealed by the vote shares for the left and right wing candidates in the 1970 presidential election and is robust to control for observable variables such as income, education, population, urbanization, and regional fixed effects. We formalize the importance of our control variables using the econometric framework proposed by Altonji et al. (2005b). The magnitude of the estimated coefficient implies that television campaigns were important for the opposition.

Two additional findings provide further evidence of the importance of television campaigns. First, we show that television exposure had no effect on the percentage of people voting, with the coefficient being a precisely estimated zero. This finding is reassuring because the voter registration process finished before television campaigns launched. Voting in the 1988 plebiscite without having previously registered to vote was not possible, an institutional feature that helps us to provide a causal interpretation to our previous result. Second, the effects of *radio* exposure – a different media outlet without particularly salient political campaigns – on vote shares and turnout are also precisely estimated zeros. Although radio exposure represents an imperfect placebo, we argue that its importance as media outlet in 1980s Chile makes it informative and allows us to rule out effects of overall media penetration. Taken together, these findings suggest that televised political campaigns can help to defeat dictators at the polls.

The last part of our analysis provides a discussion and interpretation of results by calculating the "persuasion rate" implied by our estimates (Enikolopov et al., 2011). Given that institutional features of the election under study constrain television's effect on turnout, the persuasion rate in our context corresponds simply to the percentage of voters that were exposed to television before the 1988 plebiscite and were persuaded to

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vote for the opposition ("No") instead of the regime ("Yes"). We calculate a persuasion rate between 10 and 13 percent, an estimate that lies within the upper range of previous estimates in the literature.

This paper contributes to the understanding of media and voting in authoritarian regimes. The empirical study of media and political preferences has been focused almost exclusively on democracies, where researchers have found that television, newspapers, and radio have significant effects on turnout and vote shares. For example, DellaVigna and Kaplan (2007) show that the entry of Fox News across U.S. cities in the late 1990s is associated with an increase in turnout *and* voter share for the Republican party. Previous research has also showed that free newspapers subscriptions increase support for the Democratic Party in the U.S. (Gerber et al., 2009), and exposure to independent television increase voting for opposition parties in Russia (Enikolopov et al., 2011).[2]

Empirical research on the role of media in authoritarian regimes is relatively more scarce. Our contribution is to provide one of the first estimates of television campaigns on voting in an election held in a non-democratic regime using administrative electoral data. One exception in the literature is Boas (2005), who uses a matching approach with post-election survey data in Chile and finds a positive effect of campaigns on self-reported, opposition votes. Given that retrospective data is subject to endogeneity problems, this paper exploits administrative voting data and national surveys *before* the election to estimate the effect of television on the 1988 plebiscite. Other work exploring the role of media in non-democracies include Yanagizawa-Drott (2014), who shows how radio increased violence during the Rwandan Genocide, and Adena et al. (2015), who show how radio affected votes for the Nazi party in Germany.

Our findings also contribute to debates about the importance of television in explaining the outcome of the 1988 plebiscite and Chile's return to democracy. Several authors have argued that television campaigns were crucial. For example, Hirmas (1993, p. 82) states that "Televised political advertising was pivotal to the results. Some analysts

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[2]See also Gentzkow (2006), George and Waldfogel (2006), Gentzkow et al. (2011), Hayes and Lawless (2015), Conroy-Krutz and Moehler (2015), and Spenkuch and Toniatti (2016) for the U.S. and Greene (2011), and Larreguy et al. (2016) for Latin America, among others. Strömberg (2015) provides a thorough review of the literature.

claimed it was the most important factor in producing the victory." Despite the importance of this election in Chilean history, and the potential role of televised campaigns, an empirical evaluation of the role of television has been elusive.

The next section provides details about the election that ended the Pinochet regime and provides stock market evidence for the importance of television campaigns. Section 3 presents the data and empirical strategy. Section 4 presents results, including placebo and robustness exercises. Section 5 discusses the interpretation and magnitude of our estimates. Finally, Section 6 concludes.

2   Background

This section presents background on the 1988 election that ended the Pinochet regime in Chile (1973–1990) and the televised political advertisements used by the incumbent regime and the coalition of opposition parties. We also present patterns in the stock market that suggest television campaigns were perceived as shifting political power from the incumbent regime to the opposition.

2.1   Television and the "1988 plebiscite"

After overthrowing Salvador Allende, Augusto Pinochet's regime ruled Chile between September 1973 and March 1990. Although the regime is popularly known for the implementation of market-oriented policies and the oppression of opposition parties, the role of media is less known. Television stations and newspapers were controlled by the regime during the entire period, pushing citizens to obtain unbiased information from radio stations (Leon-Dermota, 2003).

Following the 1980 constitution written by the regime, Pinochet attempted to validate his mandate at an election known as the "1988 plebiscite" (held on October 5, 1988). A victory would have put the regime in power for eight more years, while a defeat would result in an election with candidates from all parties. The opposition, a coalition organized under the name of *Concertación*, got their first opportunity to use television

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for political advertising for this election. The advertisements, known as *franja*, were presented by the regime as a signal of competitive elections.

The *franja* worked in the following way. The regime and the opposition produced fifteen-minute-long video recordings that were broadcast by all television stations daily from September 5th to October 1st of 1988 from 8:30 to 9 PM. The opposition's side of the *franja* consisted of a news show hosted by a popular anchorman that discussed important (and usually ignored) subjects (e.g. human rights violations). The regime's side of the *franja* emphasized the economic success of the 1980s and associated a potential opposition victory with the arrival of communism and the end of economic prosperity.[3]

The stakes at the plebiscite were large and consequently the regime tried to minimize the effect of the *franja*.[4] Despite the regime's attempts, "[the franja] had one of Chile's largest TV audience. It became the most discussed program on television and 'the' subject of conversation for the month it was broadcast" (Hirmas, 1993, p. 87). Although many doubted Pinochet would have acknowledged a defeat, official results showed that 54.7 percent of voters chose the opposition.

2.2 Stock prices and television campaigns

Financial investors are incentivized to accurately interpret events that affect firms' values. This fact was noted by Fisman (2001), who used changes in stock prices to calculate the value of political connections in Indonesia.[5] We study variations in stock prices after September 5, when political campaigns were launched. If financial investors perceived that the opposition was more likely to win because of the *franja*, we should observe a decrease in the value of firms connected to Pinochet.

To test for this hypothesis, we collect daily stock prices of listed firms from the news-

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[3]Examples of televised campaigns can be found in the following links: click <u>here</u> to watch the "No" campaign and <u>here</u> to watch the "Yes" campaign.

[4]Hirmas (1993, p. 85) notes that "[in the months before the plebiscite] a total of 7,302 spots were telecast [and] the opposition could not broadcast any message of its own." Huneeus (2006, p. 401) notes that the regime wanted the *franja* to be broadcast during low audience hours.

[5]Since then this approach has been used, for example by Ferguson and Voth (2008) for Nazi Germany, Fisman et al. (2012) for the U.S., and González and Prem (2017) for Chile, among others.

paper *El Mercurio*, available at the National Library. To classify firms between those that are and are not connected to the Pinochet regime, we match the name of listed firms with their board of directors available at the *Superintendencia de Valores y Seguros* (the U.S. equivalent is the Securities and Exchange Commission). Thus we classify a firm as politically connected if at least one member of the board of directors worked for the Pinochet regime before 1988. To determine if a director worked for the regime, we perform a Google search of directors. Given the extensive documentation of who participated in the regime, this search delivers reliable information.[6] We found that 60 of 80 firms in our data were connected to the regime.

Stock prices across firms may vary for reasons unrelated to the event we study. To account for these differences, we follow Campbell et al. (1997) and analyze abnormal stock returns, a measure that accounts for a firm's "typical" returns and its correlation with market returns before the event under study. To study the effect of the *launching* of campaigns we look at cumulative abnormal returns daily after the first advertisement. We also study the dynamic effect of advertisements by estimating the changes in abnormal returns one, two, three, and four weeks after September 5th. After four weeks we have covered all televised campaigns before the plebiscite.

Figure 1 compares cumulative abnormal returns of connected and unconnected firms the week following September 5. There is a negative and significant decrease in abnormal returns of connected firms the days after the *franja* started. As can be seen in this figure the change in abnormal returns varies over time. Given other events happening as a response to the campaigns – including reactions from the regime – this variation is unsurprising.[7] Table 1 presents regression estimates of dynamic effects. This differences-in-differences estimation across firms with and without connections to Pinochet the weeks before (August 20 – September 2) and after the campaigns reveals a *decrease* in abnormal returns of connected firms of approximately 1 percentage point. These results confirm the contemporaneous importance of televised political campaigns.

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[6]We cross checked the names of politically connected individuals using data from Mönckeberg (2015).

[7]For example, shortly after September 5th Pinochet prohibited the broadcast of the opposition campaign for one day because it failed to comply with the guidelines suggested by the regime.

3 Empirical Framework

The first challenge to estimate the effect of television campaigns on voting patterns in an authoritarian regime is to measure voters' exposure to the campaigns and voting behavior. The Chilean context allows us to overcome this measurement problem. Our analysis uses a large national survey implemented months before the plebiscite to measure differential television exposure across the country. We combine this survey with aggregate and individual voting data to test for the effect of campaigns on voting behavior. After describing the data, we discuss our empirical strategy in detail. The main challenge is to provide credible evidence showing that unobservable variables cannot explain the empirical relationship between television exposure and votes.

3.1 Voting data and television exposure

We measure votes in the plebiscite using two sources of information. The first source is administrative voting data at the county level. The Electoral Service of Chile publishes county level data for all elections since 1988. We use data for the 1988 election, i.e. votes in favor of the continuation of the Pinochet regime ("Yes" option) and votes for the opposition ("No" option). Given that voting booths in Chile were historically segregated by gender, we observe total male and female voting separately in all of the existing 345 counties. Although our primary interest is to understand variation in the *total* percentage of votes for the opposition, we also use votes by gender to discuss mechanisms.

The second source of information we use to measure votes in the plebiscite is a survey with individual self-reported votes. This is a retrospective dataset that comes from a survey conducted by the *Centro de Estudios de la Realidad Contemporánea* weeks after the plebiscite, and it contains self-reported votes for 1,700 Chileans in 26 cities across the country.[8]

We use two additional data sources to complement our analysis. First, we hand-

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[8]Boas (2015) analyzes this survey using a matching approach and finds positive effects of television on votes for the opposition. We use a different measure for television exposure, confirm results using placebo checks with radio exposure, and contrast self-reported votes with aggregate voting data.

collected county-level voting data in Chile's 1958 and 1970 presidential elections from the archives of the Electoral Service. The 1970 election was a crucial turning point in Chilean history in which the left-wing candidate Salvador Allende defeated right-wing candidate Jorge Alessandri and Christian Democrat candidate Radomiro Tomic to become the last president of Chile before the Pinochet regime. As we describe in the following section, we use these data to control for unobserved political differences across counties. We use 1958 election data in a falsification exercise.[9] Second, we use county-level population data from the 1992 national census to construct population weighted voting measures and to measure the percentage of people in each county that voted in the plebiscite, i.e. turnout.

To measure voters' exposure to television campaigns, we use data from the 1987 National Socioeconomic Survey, a representative survey conducted biannually by the Ministry of Planning since 1985. The survey contains information about households' asset ownership, and the main variables we use are television and radio ownership. In the survey, a total of 97,044 individuals in 146 counties were surveyed. We use these 146 counties throughout the paper. The counties included in the survey are larger in terms of population (71,175 versus 15,645, p-value$<$0.01) and supported the opposition relatively more (57.5% versus 51.2%, p-value$<$0.01) than the remaining counties.

Table 2 presents averages for the main variables we use in the analysis, separated by counties above and below the median television exposure. In the average county, approximately 38,000 people voted – which corresponds to 54.7 percent of the *total* population – 85 percent of households owned a television (s.d. 0.10), and 83 percent owned a radio (s.d. 0.07). Approximately 11 percent of households owned a radio but not a television.[10] Consistent with the political "three-thirds" that existed before the 1970 presidential election, in the average county Salvador Allende received 38 percent of votes (s.d. 0.10), 34 percent of voters supported the right-wing candidate (s.d. 0.09), and the remaining votes went to the Christian Democrat Radomiro Tomic (the omitted category).

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[9]More information about the 1958 and 1970 presidential elections in Chile can be found in Collier and Sater (2004) and González (2013).

[10]Individual surveys conducted by the *Centro de Estudios de la Realidad Contemporánea* reveal that 42 percent of individuals used radio as their primary source of information and 58 percent used television.

Table 2 also shows that counties with high television exposure were bigger, richer, more educated, had less rural areas, and were more exposed to radio. High-exposure counties were, however, similar to low-exposure counties in terms of political preferences as revealed by the 1970 elections.[11]

3.2   Empirical strategy

Our empirical strategy to estimate the effect of television exposure on voting behavior is composed by two parts. To facilitate the exposition of our strategy, consider the following linear regression equation:

$$v_i \;=\; \alpha + \beta t_i + x_i \gamma + w_i \delta + \varepsilon_i \tag{1}$$

where $v_i \in [0,1]$ is the opposition's vote share in county i, α is the parameter of a constant term, $t_i \in [0,1]$ is the percentage of households with television, x_i is a vector of observable variables, w_i is a vector of unobservable variables, and ε_i is an error term uncorrelated with x_i and w_i. To account for the differential size of counties, we always weight observations in equation (1) by number of voters and, in addition, our baseline specification controls for county size indicators. Because t_i and w_i could be correlated, an estimation that omits w_i could deliver biased estimates. Our strategy deals with this type of omitted variable concern.

3.2.1   Dependence of political preferences

The first part of our strategy is to control for unobserved differences across counties using strong predictors of votes for the opposition in 1988. We exploit the strong dependence of political preferences within counties over time and use vote shares for the left and the right wing parties in the 1970 presidential election to control for unobserved heterogeneity in voting patterns across counties. In addition, our baseline econometric specification also includes income and population as control variables. We formalize

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[11]Figure **??** presents partial correlations between television exposure and all of these variables.

this strategy using the method of Altonji et al. (2005b) who suggest that, if the estimated β does not change significantly from a regression without controls to a regression that includes controls, then omitted variables are unlikely to be a major concern (see also Altonji et al. 2005a, 2008).

The strength of this approach can be analyzed empirically by checking how much of the variation in the dependent variable of the regression can be explained with and without control variables. Oster (2017) uses this approach to show that the movements in the estimated β when controls are included, together with the changes in the R-squared, provide information about the magnitude of omitted variable bias. In particular, a consistent estimator of the causal parameter of interest is:

$$\widehat{\beta} \;=\; \beta_c - (\beta_{nc} - \beta_c)\frac{R_{max} - R_c}{R_c - R_{nc}} \tag{2}$$

where β_c, R_c, β_{nc} and R_{nc} are the estimated OLS coefficients and R-squared from a regression with and without controls respectively. The maximum R-squared that can be achieved (R_{max}) is an unknown quantity in the interval $[R_c, 1]$. González and Miguel (2015) show that the R_{max} quantity can potentially be bounded using a reliability ratio. We use the most conservative assumption of $R_{max} = 1$. To increase confidence in our approach, we use different sets of control variables for robustness.

3.2.2 Additional empirical regularities

The second part of our strategy consists on a collection of three empirical exercises embedded in the previous estimation strategy. The first exercise exploits radio exposure as a placebo, the second exercise uses turnout as dependent variable, and the third exercise uses vote shares in the 1970 and 1958 presidential elections as a falsification exercise. We now briefly discuss the rationale behind these three exercises.

Variation in radio exposure serves as a placebo check because radios were an important source of information that did not broadcast the *franja*.[12] If radio exposure also af-

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[12]Leon-Dermota (2003, p. 119-132) provides further details about the role of radio stations during the Pinochet regime.

fects votes for the opposition, then the effect of television may simply reflect unobserved differences related to media penetration across counties. Although we acknowledge radio exposure represents an imperfect placebo, we think it is an informative one given its importance as a media outlet. Econometrically, we measure the percentage of households with a radio at the county level using the 1987 national survey and include it as an additional variable in the right-hand side of equation (1). If television campaigns were different from other media sources, then we expect the coefficient of radio exposure to be statistically different from the coefficient of television, and presumably close to zero.

The rationale behind the second empirical exercise is that television exposure should not have affected the percentage of people voting (i.e. turnout). In 1988 voter registration was voluntary, and approximately 91 percent of the population eligible to vote registered before the plebiscite. However, conditional on registration, voting was mandatory. If somebody who registered did not vote, then she or he was exposed to a significant fine. Crucially, the registration process for the plebiscite ended *before* television campaigns launched. This institutional feature of the election implies that television exposure should not have an effect on turnout.

The third exercise corresponds to a falsification using votes in previous elections. In particular, we estimate equation (1) using vote shares in the 1970 presidential election as dependent variable and vote shares in the 1958 presidential elections as control variables. Given the lower penetration of television and the absence of televised political campaigns, the relationship between television exposure and votes in the 1970 elections should be close to zero.

4   Results

We present results following the order of our empirical strategy. After presenting and discussing the correlation between television and votes for the opposition, we provide evidence suggesting the estimate is causal. We also present robustness checks and additional results that serve as complementarity evidence supporting our interpretation.

4.1 Television and votes for the opposition

Table 3 presents OLS estimates of four different specifications of equation (1) – with and without controlling for vote shares in the 1970 presidential election and other predetermined variables – using the percentage of votes for the opposition and turnout as dependent variables. Recall that regressions are weighted by the number of voters. In addition, the variables measuring the percentage of households with television and radio have been standardized to facilitate the interpretation and comparison of coefficients.

To organize results we begin by estimating a regression without controls, but we emphasize that our preferred (and baseline) specification includes controls for 1970 vote shares, radio exposure, income, and population. Column 1 presents the partial correlation between television and opposition votes. The estimated coefficient implies that a one standard deviation increase in television ownership is associated with an increase of 2.5 percentage points in opposition voting. Section 5 discusses in depth the economic interpretation of this coefficient. However, given the potential existence of unobservable variables that are correlated with television ownership and opposition votes, this estimate might not represent the causal effect of television exposure on voting behavior in the plebiscite.

We now turn to the baseline specification in which we control for unobserved heterogeneity in political preferences using previous voting behavior and a set of other potential confounders, i.e. income and population. Column 2 presents the estimated coefficients. Remarkably, the R-squared increases significantly. Most of this increase comes from the predictive power of past voting behavior. As a result, the coefficient of television decreases slightly but is still statistically significant; a one standard deviation increase in television exposure is associated with an increase of 1.8 percentage points in votes for the opposition.

Figure 2-A presents a visual representation of results in Table 3 column 2. From the figure it is clear that the empirical relationship between opposition voting and television ownership is not driven by outliers. In addition, the relationship between these variables seems to be weaker for lower values of television ownership.

The next empirical exercise to understand television's effect involves making use of the coefficient stability approach first proposed by Altonji et al. (2005b). Given the powerful predictive power of past voting behavior, we believe this approach is particularly meaningful in our context. Column 2 presents the "coefficient stability estimate" of equation (2), i.e. the estimator proposed by Oster (2017). The effect of television decreases slightly to 1.2 percentage points. Overall, we conclude that the estimates in Table 3 suggest that television indeed increased votes for the opposition.

4.2   Empirical regularities

We now turn to the discussion of our empirical regularities. Table 3 and Figure 2-B present the effect of radio exposure on opposition votes, our placebo check. Both radio and television were relevant media sources during the Pinochet regime, but only television stations broadcasted particularly salient political campaigns. Therefore, if political campaigns were the reason why television exposure is associated with more votes for the opposition, we do not expect to find an effect of radio exposure on votes.

Reassuringly, estimates in Table 3 column 2 indicate that radio exposure had a precisely estimated zero effect on opposition votes. In fact, the precision of the estimate enables us to reject the hypothesis that a one standard deviation increase in radio exposure has an effect larger than one percentage point. We can also reject that the coefficient of television is statistically similar to the coefficient of radio exposure. Figure 2-B visually presents the lack of association between radio and votes.

Our second empirical exercise makes use of an institutional feature of the voting process: only people who registered to vote could vote in the plebiscite. Because the voting registration process ended before televised political campaigns began, we do not expect to find an effect of television on turnout. Table 3 columns 3-4 present results for the empirical association between television and turnout – defined as voters over total county population – in the plebiscite. Estimates in these columns are analogous to the estimates in columns 1-2, but we replace the dependent variable from votes for the opposition to turnout. The estimated coefficients indicate that the effect of television on

the percentage of people voting is not different from zero.

The last empirical regularity corresponds to results from a falsification exercise using votes in previous elections. Further supporting a role of television campaigns, we do not observe an empirical relationships between television exposure before the plebiscite and vote shares for the left and right wing candidates in the 1970 presidential elections. Table 4 presents regression results that replicate our main specification but using 1970 vote shares as dependent variables and 1958 vote shares as control variables.

The lack of a radio effect on opposition votes and the lack of an effect of television exposure on turnout suggest that the estimated effect of television on voting patterns is indeed related to televised political campaigns. We now implement and discuss a battery of robustness checks and additional results that provide additional empirical support for the importance of television.

4.3   Robustness and additional results

Several robustness checks and additional estimations confirm the previous results. We now discuss two sets of exercises. The first set is related to specification checks for the functional form we used. The second set is related to the inclusion of additional controls, patterns in women's vote, and the robustness of results to the use of a different non-aggregated dataset.

Previous results use the number of voters to weight regressions. The motivation behind this decision is to present results that are representative of individuals instead of counties. There are, however, other ways in which we could have accounted for differences in the size of counties. For this reason, we have repeated previous estimates using the number of people surveyed and total population as weights. Table **??** shows that results are similar to those found previously.

Up to this point, all standard errors of our estimated coefficients have been calculated to be robust to heteroskedasticity. However, the reader may worry about a potential spatial correlation in political preferences. To deal with this concern, Table **??** present estimates of our main regression equation accounting for spatially correlated errors using

the approach first proposed by Conley (1999). The same table also presents results using clustered standard errors by grouping counties in larger administrative units and correcting for small number of clusters (Cameron et al., 2008). Results in this table indicate that in both cases the statistical significance of our estimates is similar.

Table 5 checks for the robustness of results by adding controls progressively and controlling for other potentially relevant variables. Previous estimates already control for local development by including the logarithm of average household income in the county as additional control, dealing with a concern that television exposure simply acts as a proxy variable for differences in local development and does not reflect exposure to the campaigns. This income control has, however, little predictive power of votes for the opposition. In addition, Table 5 also controls for the rurality of a county and the share of the population with a high-school degree and results are again similar. The last column in this table includes regional fixed effects, administrative units that group several counties. Results are also robust when controlling for unobservable variables at the regional level. Figure 3 presents a summary of all the previously discussed robustness checks.

In addition to previous results, Table **??** in the appendix shows that television increased female opposition votes relatively more than male ones. Given that voting booths were segregated by gender, we simply test for voting differences between women and men controlling for county fixed effects. We believe this result serves as additional evidence for the importance of television campaigns. Indeed, based on focus groups and research by an international consulting firm before the election, the opposition concluded that their television campaign should target women, the largest group of undecided voters (Hirmas, 1993, p. 87). Although arguably speculative, we believe the larger impact of television on women's votes further suggests that campaigns worked as intended.

Finally, our last exercise uses individual self-reported votes combined with county-level data. Table 6 presents estimates of a cross-sectional regression of self reported opposition voting on television and radio ownership at the county level, controlling for individual characteristics. Not surprisingly, given the fewer number of counties included in this estimation – 26 counties instead of 146 – results are less precise. However, it is remarkable that the magnitude of the television coefficient is virtually the same as in

previous results and, again, there is no effect of radio ownership. Moreover, Table **??** in the appendix shows that, again, these patterns do not arise when using turnout as dependent variable. These individual results also support the previous county-level results in the sense that they make aggregation or ecological bias unlikely to be a concern.

5   Discussion and Interpretation

To improve our understanding of these results we now discuss the economic magnitude of our estimates in the context of the existing literature. Theoretically, the effect of television exposure on voting behavior can be mediated by two different mechanisms. On one hand, television may have persuaded people to "go out and vote" for the opposition. On the other hand, television could have persuaded supporters of the Pinochet regime to change their minds and vote for the opposition. In both cases we should observe a positive correlation between television exposure and votes for the opposition.

5.1   Persuasion rate

We now follow Enikolopov et al. (2011) and use the estimates of Section 4 to provide a calculation of how televised political campaigns changed voting behavior. Let y_0 be the share of voters supporting the opposition in a counterfactual scenario without televised campaigns. In addition, let p be defined as the "persuasion rate" of televised campaigns and e the percentage of people exposed to the campaigns. Thus the percentage of people who actually voted for the opposition can be decomposed as:

$$y \;=\; y_0 + (1 - y_0) \times e \times p \tag{3}$$

where $(1 - y_0) \times e$ represents the percentage of voters who planned to vote in favor of the Pinochet regime in a counterfactual world without campaigns and were exposed to the *franja*. We are interested in calculating the persuasion rate p, i.e. the percentage of people that were persuaded to vote differently because of televised campaigns.

To obtain an expression for the persuasion rate, we proceed in the following way. The

percentage of voters who would have voted for the opposition in the absence of televised campaigns (y_0) can be expressed as a function of turnout (t_0) and vote shares (v_0). Thus we can reorganize terms in equation (3) and differentiate with respect to e to obtain the following expression:

$$p \;=\; \frac{1}{1 - v_0 t_0} \times \left(v \frac{dt}{de} + t \frac{dv}{de} \right) \tag{4}$$

where v and t represent the observed vote share for the opposition and turnout in the election respectively. The persuasion rate is then a simple function of our estimates in Section 4.

5.2 Counterfactual results

We calculate the persuasion rate in equation (4) in the following way. As previously discussed, institutional constraints in the voter registration process imply that televised campaigns did not affect turnout, a fact that is supported by our estimates. In terms of equation (4) this means that $t_0 \equiv t$ and $\frac{dt}{de} = 0$. In addition, we have calculated that $\frac{dv}{de} = 0.18$ (s.e. 0.06).[13] Therefore, the only number missing to calculate the persuasion rate p is the opposition's vote share in the absence of television campaigns, i.e. v_0. We follow Enikolopov et al. (2011) and calculate this number using the mean predicted value from a regression in which television exposure is set to zero and covariates are set to their mean values. Results are, however, robust to the use of different values in the interval $v_0 \in [0.4, 0.7]$.[14]

Figure 4 presents the results together with persuasion rates in other studies for comparison. Our estimates imply that approximately 10-13 percent of registered voters who were exposed to the televised campaigns were persuaded to vote for the opposition. This estimate lies within the distribution of other persuasion rates in the literature. In

[13]This "baseline" estimate corresponds to the coefficient of a regression of opposition vote share on television exposure (without standardization), controlling for 1970 vote shares, income, and county size (equivalent to regression estimates in Table 3 column 2). The "full controls" estimate uses the same regression while controlling for all covariates (equivalent to regression estimates in Table 5 column 8).

[14]These alternative assumptions deliver persuasion rates in the range of 13-17 percent.

particular, we estimate a persuasion rate larger than DellaVigna and Kaplan (2007) but smaller than Gerber et al. (2009).

We conclude this section with a "back-of-the-envelope" calculation that we think also helps to interpret our results. The average county in our data had approximately 70,000 people, 40,000 voters, and 16,000 households. The average household was comprised of 4 people, 3 of whom were adults. Thus a one standard deviation increase in television exposure is equivalent to providing television to 1,600 households ($0.1 \times 16,000$), exposing 4,800 adults ($3 \times 1,600$) to television campaigns. Our results suggest that this increase in television exposure persuaded 400–800 voters ($0.01 \times 40,000$ or $0.02 \times 40,000$) to vote for the opposition. Therefore, we conclude that 8–17 percent of adults who were newly exposed to television ($400/4,800$ or $800/4,800$) were persuaded to vote for ending the Pinochet regime. This estimate is comparable in magnitude to the persuasion rates previously calculated.

6 Conclusion

We have shown that the launching of television campaigns before the 1988 election in Chile made financial investors concerned about the value of firms related to the Pinochet regime, evidence of the contemporaneous importance of campaign advertising. We have also shown that television exposure was positively associated with voting for the opposition in the election that ended the Pinochet regime. This positive association remains after controlling for a large set of meaningful variables – including unobserved political preferences revealed in previous elections, income, and population – and is not observed with radio exposure or turnout, evidence which we have argued provides support for a causal interpretation from television exposure to opposition votes.

These results complement the existing literature by showing that opposition coalitions can use campaign advertising to affect voting patterns in dictatorship and thus increase the likelihood of democratization by elections. When compared to similar estimates in the form of "persuasion rates," the magnitude of our estimates suggest that, at least in the case of Chile, campaign advertising seems to have had relatively large effects.

The increasing exposure to media outlets in the past three decades suggests that the importance of campaign advertising could be even greater nowadays. More research is needed to further understand the effect of campaign advertising in current authoritarian regimes.

Results in this paper also have implications for the theoretical and empirical literature studying elections in authoritarian regimes. Theoretically, our results suggest that any attempt to understand the behavior of voters in this type of elections needs to incorporate a role for information, social effects, or both. Campaign advertising can only affect voting behavior if it reveals information about candidates, and research has shown that information can spread rapidly through social networks (Alatas et al., 2016). Empirically, our analysis emphasizes that microeconomic dynamics have the potential to change the effect of macroeconomic factors such as the strength of international pressure. The revelation of information that occurs during campaign advertising may be ineffective if is not accompanied by contextual variables such as the previously mentioned.

Although our results suggest that campaign advertising is a potentially powerful tool to defeat dictators in elections, we emphasize that our analysis has to be interpreted with caution for at least two reasons. First, an incumbent authoritarian regime might (endogenously) react to the contemporaneous effect of campaign advertising, mitigating potentially unfavorable effects. For example, our analysis does not capture potential substitution in media consumption nor campaign strategies triggered by the incumbent. Second, contextual variables may be important to understand the effect of campaign advertising. What would happen if the probability of fraud is high? Existing research emphasizes the importance of international pressure. In this sense, it seems likely that this type of pressure is a precondition for campaign advertising to have an effect on voting patterns. The international community played a key role during the 1988 plebiscite (Ortega, 2010), as it did in other successful democratizations (Donno, 2013). Increasing global connections lead to the potential for increased scrutiny in elections in authoritarian regimes.

Finally, we emphasize that more research is needed to understand the mediating variables behind the effect of campaign advertising and voting in elections held in au-

thoritarian regimes. One possibility is that critical information is being revealed by the campaigns, which changes how citizens evaluate the incumbent regime. If so, what is the nature of this information? Are the campaigns revealing information about the incumbent, the opposition, or the current state of the world? Maybe campaigns trigger a revelation of citizens' "types" – which was previously suppressed by the incumbent – and this new information creates "prairie fires" among the population to vote for the opposition (Kuran, 1989). Knowledge of these mediating variables would enable opposition coalitions to develop strategies to maximize the impact of campaign advertising.

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Figure 1: Television campaigns and stock prices
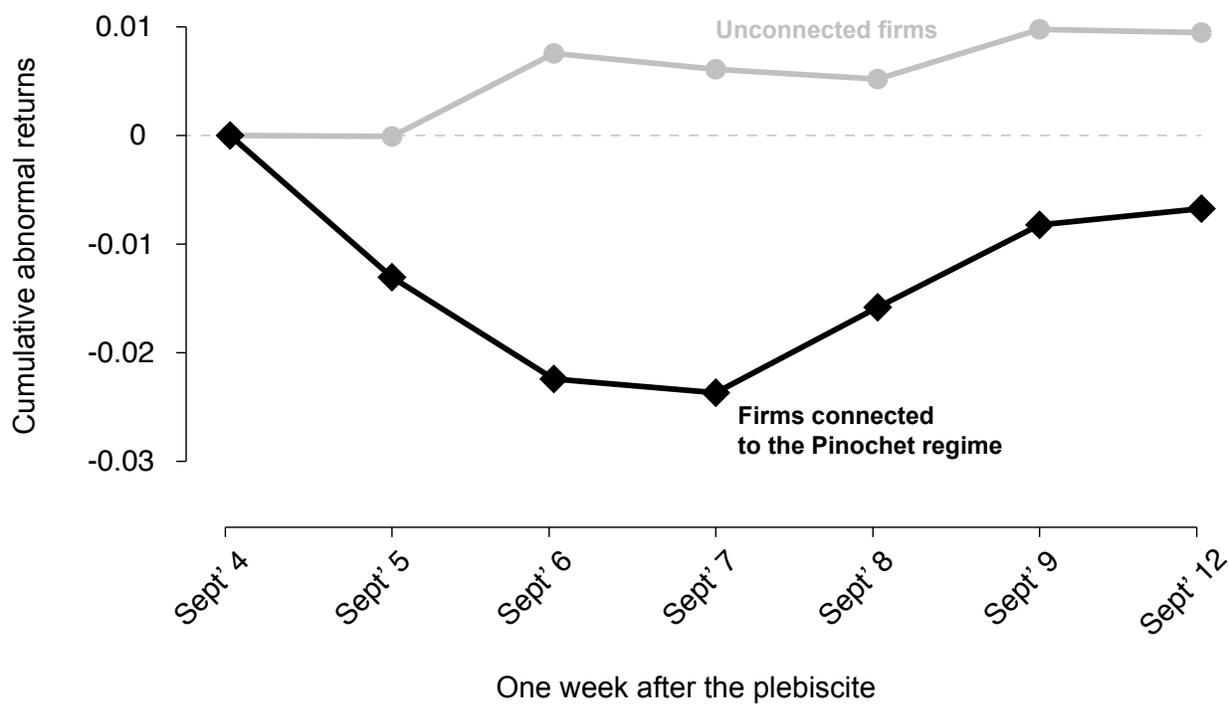
Notes: We construct abnormal cumulative returns of listed firms using the methodology proposed by Campbell et al. (1997). The stock prices data is own construction from newspaper "El Mercurio" and information about board of directors comes from the *Superintendencia de Valores y Seguros de Chile*.

Figure 2: Television and votes in the 1988 plebiscite
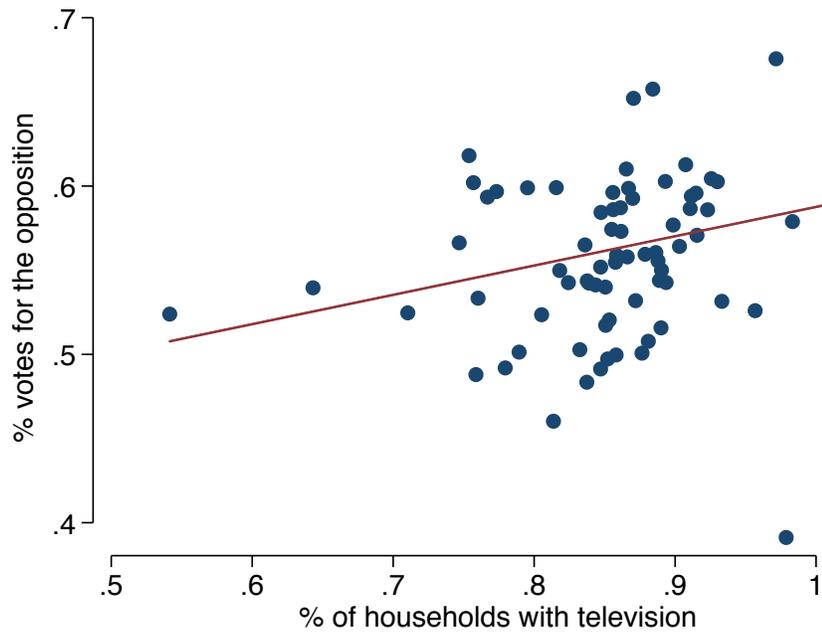
(a) Television
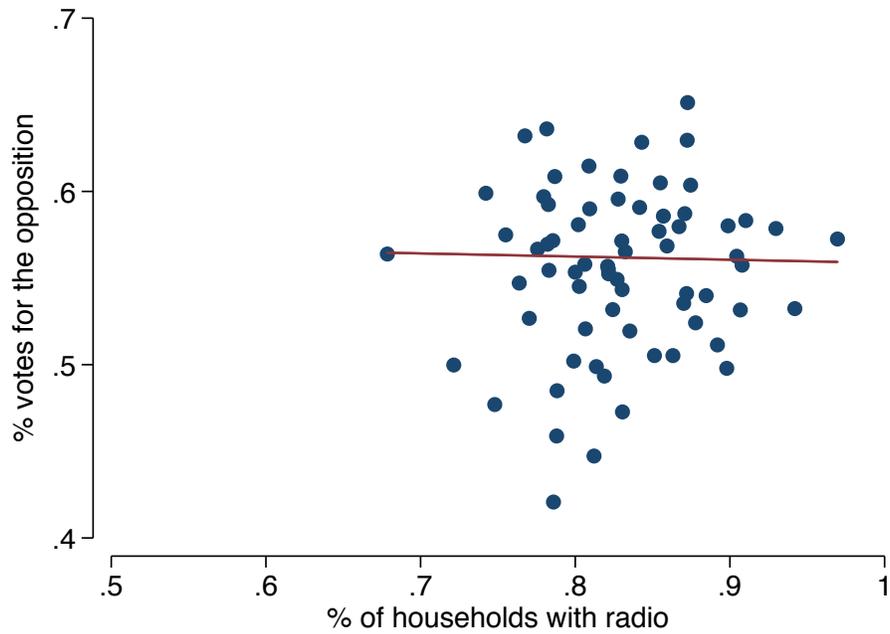
(b) Placebo

Notes: Linear fits are weighted by the number of voters and control for votes in the 1970 presidential election, log average household income, and population.

Figure 3: Main result and robustness checks
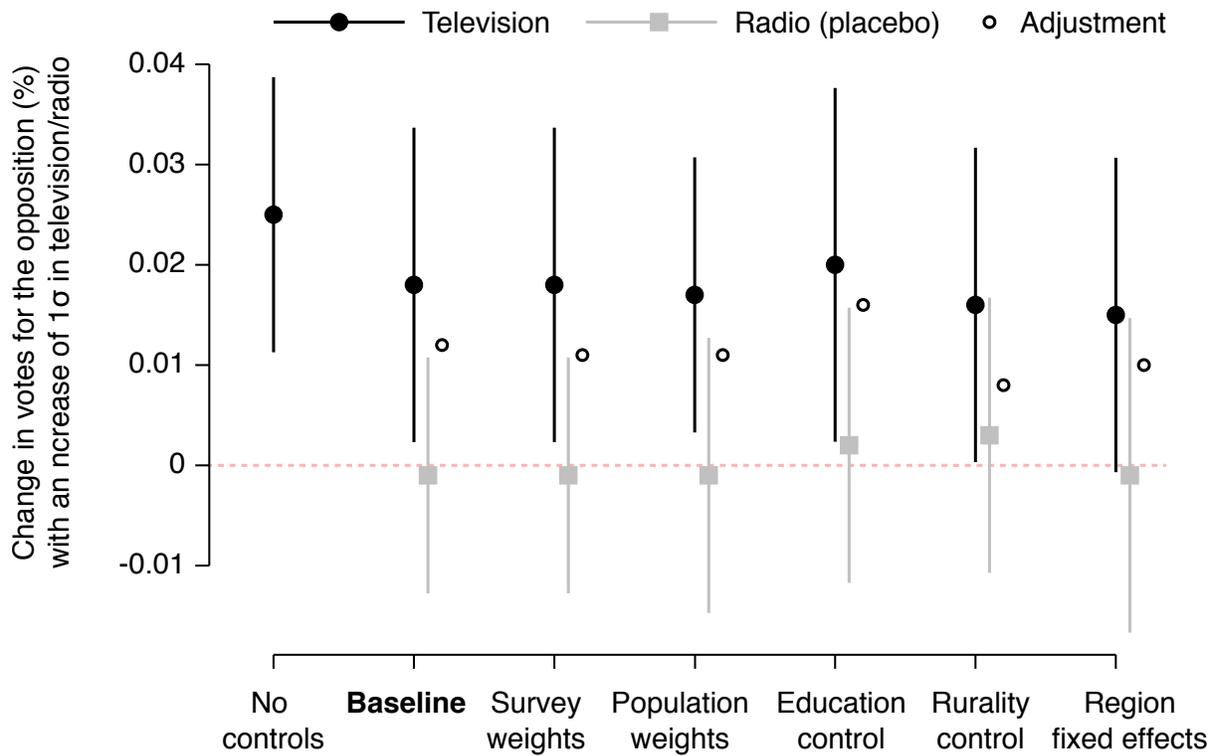
Notes: This figure presents OLS coefficients for television and radio exposure with their corresponding 95 percent confidence intervals. The "Baseline" specification controls for vote shares in the 1970 presidential election, log average household income, and population (Table 3, column 2). We calculate adjusted coefficients for television using the method proposed by Altonji et al. (2005b) and further developed by Oster (2017).

Figure 4: Persuasion
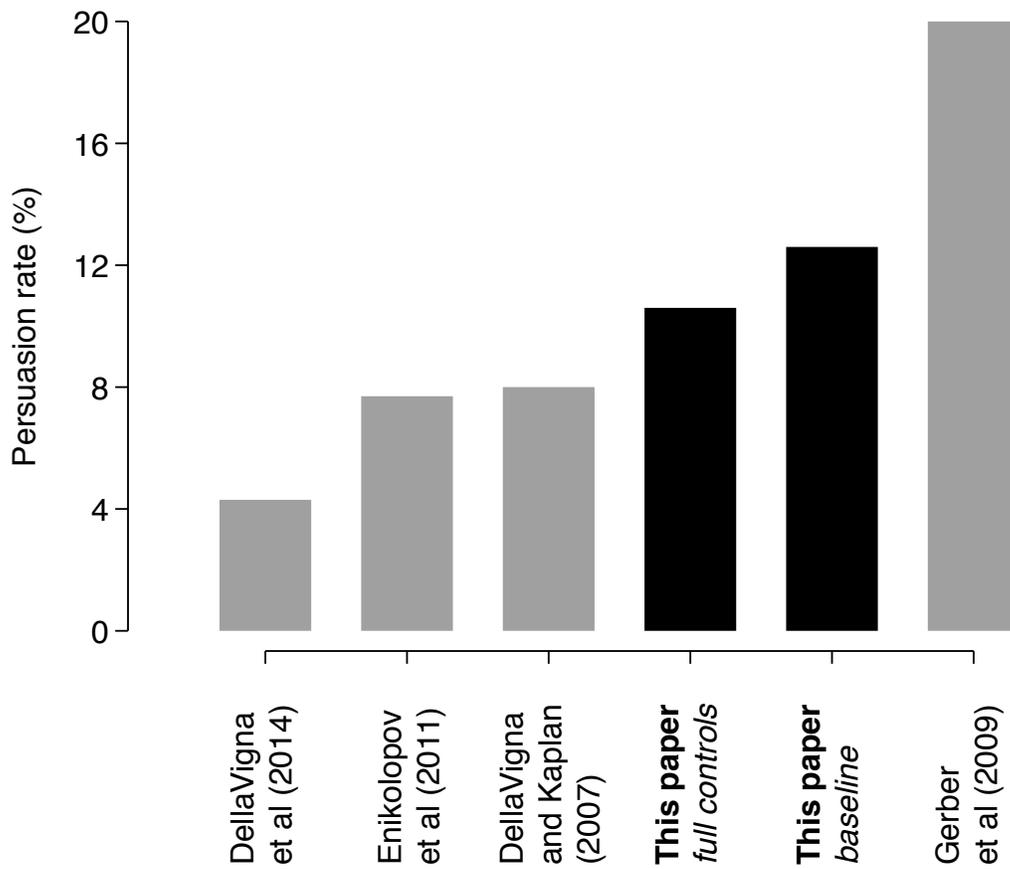
Notes: The persuasion rate corresponds to the percentage of voters who were exposed to television before the election and were persuaded to vote for a different party. See Section 5 for details.

Table 1: The effect of television campaigns on stock prices

Dependent variable is firm's daily abnormal stock return

	One week after first TV ad	Two weeks after first TV ad	Three weeks after first TV ad	Four weeks after first TV ad
	(1)	(2)	(3)	(4)
Linked to Pinochet × Post	-0.010*	-0.010**	-0.009**	-0.011**
	(0.005)	(0.005)	(0.004)	(0.004)
Firm fixed effects	x	x	x	x
Day fixed effects	x	x	x	x
Number of firms	80	80	80	80
Observations	560	960	1,280	1,680
R-squared	0.223	0.173	0.150	0.139

Notes: Data on stock prices comes from newspaper *El Mercurio*. The period before the first television advertisement is between August 20 and September 2 of 1988. Television campaigns aired daily in the period between September 5 and October 1 of 1988. Each column reports difference-in-difference results using as post period one week, two weeks, three weeks, and four weeks after the launch of television campaigns. More details in Section 2. Robust standard errors clustered at the firm level are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2: Descriptive statistics

| | All | Television exposure | | Difference |
		Low	High	
	(1)	(2)	(3)	(3) − (2)
% of households with television in 1987	0.853	-	-	-
% votes for the opposition in the 1988 plebiscite	0.575	0.541	0.585	0.044***
% voters in total population in the 1988 plebiscite	0.547	0.516	0.558	0.042***
% of households with radio in 1987	0.826	0.780	0.843	0.063***
% votes for the left wing in the 1970 elections	0.379	0.371	0.382	0.011
% votes for the right wing in the 1970 elections	0.341	0.349	0.337	-0.012
Population in 1988	71,175	41,440	100,909	59,469***
Voters in the 1988 plebiscite	37,899	21,016	54,782	33,766***
Log average household income	9.72	9.41	9.84	0.43***
% population with high-school degree	0.140	0.076	0.160	0.084***
Indicator for rural areas	0.388	0.788	0.234	-0.554***
Counties	146	73	73	-

Notes: Descriptive statistics for the main variables we use in the paper. Column 1 shows averages for the full sample, while columns 2 and 3 show averages for counties with low and high television exposure. We define high (low) television exposure as counties with television exposure above (below) the median. All statistics are weighted by the number of voters (except population and voters). Voting data comes from the Electoral Service. We estimate population using linear interpolations by county between census dates. Socioeconomic data was collected by the Ministry of Planning for the National Socioeconomic Survey.

Table 3: Television and votes in the 1988 plebiscite

	Opposition vote share		Turnout	
	No controls	With controls	No controls	With controls
	(1)	(2)	(3)	(4)
% of households with <u>television</u>	0.025***	0.018**	0.014*	0.001
	(0.007)	(0.008)	(0.008)	(0.012)
% of households with <u>radio</u>		-0.001		0.004
		(0.006)		(0.011)
% votes for the left wing in the 1970 elections		0.302***		0.092
		(0.105)		(0.203)
% votes for the right wing in the 1970 elections		-0.264		0.152
		(0.165)		(0.274)
Log average household income		-0.005		0.062**
		(0.019)		(0.030)
Indicator for large counties		0.073**		-0.064**
		(0.030)		(0.027)
Indicator for medium-size counties		0.016		-0.037
		(0.029)		(0.023)
Coefficient stability estimate	-	0.012	-	-0.079
R-squared	0.095	0.586	0.026	0.164
Counties	146	146	146	146

Notes: All regressions are weighted by the number of voters. "Opposition vote share" is the percentage of votes for the opposition in the 1988 plebiscite and "Turnout" is the percentage of *total* population that voted in the plebiscite. "Television" and "radio" are standardized to facilitate interpretation of coefficients. We calculate the "Coefficient stability estimate" for television using the method proposed by Altonji et al. (2005b) and further developed by Oster (2017). Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Television and votes in the 1970 presidential elections

Dependent variable is vote share for the left (Salvador Allende) or right (Jorge Alessandri) wing in the 1970 presidential elections

	Left (Allende)	Right (Alessandri)	Left	Right	Left	Right
	(1)	(2)	(3)	(4)	(5)	(6)
% of households with <u>television</u>	0.003 (0.009)	-0.003 (0.008)	0.005 (0.005)	-0.001 (0.004)	0.002 (0.004)	-0.004 (0.004)
% of households with <u>radio</u>			-0.008 (0.006)	0.001 (0.005)	-0.003 (0.005)	0.004 (0.005)
% votes for the right wing in 1970			-0.996*** (0.058)		-0.672*** (0.079)	
% votes for the left wing in 1970				-0.804*** (0.057)		-0.688*** (0.064)
% votes for the left wing in 1958					0.329*** (0.063)	0.005 (0.063)
% votes for the right wing in 1958					-0.052 (0.060)	0.152*** (0.055)
R-squared	0.001	0.001	0.829	0.826	0.876	0.839
Counties	146	146	146	146	146	146

Notes: All regressions are weighted by the number of voters. "Television" and "radio" are standardized to facilitate interpretation of coefficients. In the 1958 presidential elections the "left wing" candidates were Salvador Allende and Antonio Zamorano, and the "right wing" candidate was Jorge Alessandri (see González 2013 for details). Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Robustness checks

Dependent variable is the percentage of votes for the opposition in the 1988 plebiscite

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
% of households with <u>television</u>	0.025***	0.023***	0.023***	0.023***	0.020**	0.016**	0.020**	0.015*
	(0.007)	(0.005)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)
% votes for the left wing in the 1970 elections		0.320***	0.320***	0.321***	0.289**	0.264**	0.497***	0.444***
		(0.106)	(0.108)	(0.111)	(0.112)	(0.116)	(0.109)	(0.107)
% votes for the right wing in the 1970 elections		-0.264*	-0.264*	-0.260	-0.294	-0.330*	-0.259	-0.285
		(0.145)	(0.146)	(0.173)	(0.178)	(0.175)	(0.195)	(0.186)
% of households with <u>radio</u>			0.000	0.000	0.002	0.003	-0.000	-0.001
			(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Log average household income				-0.001	-0.041	-0.037	-0.019	-0.021
				(0.019)	(0.027)	(0.026)	(0.029)	(0.029)
% population with high-school degree					0.280*	0.249	0.238	0.211
					(0.154)	(0.151)	(0.156)	(0.159)
Indicator for rural areas						-0.015	0.018	0.009
						(0.012)	(0.013)	(0.013)
Indicator for large-size counties								0.039
								(0.031)
Indicator for medium-size counties								-0.009
								(0.031)
Coefficient stability estimate	-	0.021	0.021	0.021	0.016	0.008	0.018	0.010
Region fixed effects							x	x
R-squared	0.095	0.553	0.553	0.553	0.569	0.574	0.685	0.705
Counties	146	146	146	146	146	146	146	146

Notes: All regressions are weighted by the number of voters. "Television" and "radio" are standardized to facilitate interpretation of coefficients. We calculate the "Coefficient stability estimate" for television using the method proposed by Altonji et al. (2005b) and further developed by Oster (2017). Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Individual votes for the opposition

Dependent variable is an indicator for self-reported vote for the opposition in the 1988 plebiscite

	(1)	(2)	(3)
% of households with <u>television</u>	0.010	0.020	0.027
	(0.014)	(0.013)	(0.019)
% of households with <u>radio</u>			-0.009
			(0.027)
% votes for the left wing in the 1970 elections			-0.478
			(0.431)
% votes for the right wing in the 1970 elections			-0.899**
			(0.371)
Individual controls		x	x
Observations	1,313	1,313	1,313
Counties	26	26	26
R-squared	0.000	0.145	0.149

Notes: "Television" and "radio" are standardized to facilitate interpretation of coefficients. Individual controls include a female indicator variable, indicators for income brackets, an indicator for individuals who report being Catholic, and indicators for age and occupation categories. Robust standard errors clustered at the county level are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Online Appendix:

Can Television Bring Down a Dictator? Evidence from Chile's "No" Campaign

Felipe González[*]   Mounu Prem[†]

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Figure A.1: Television exposure and controls
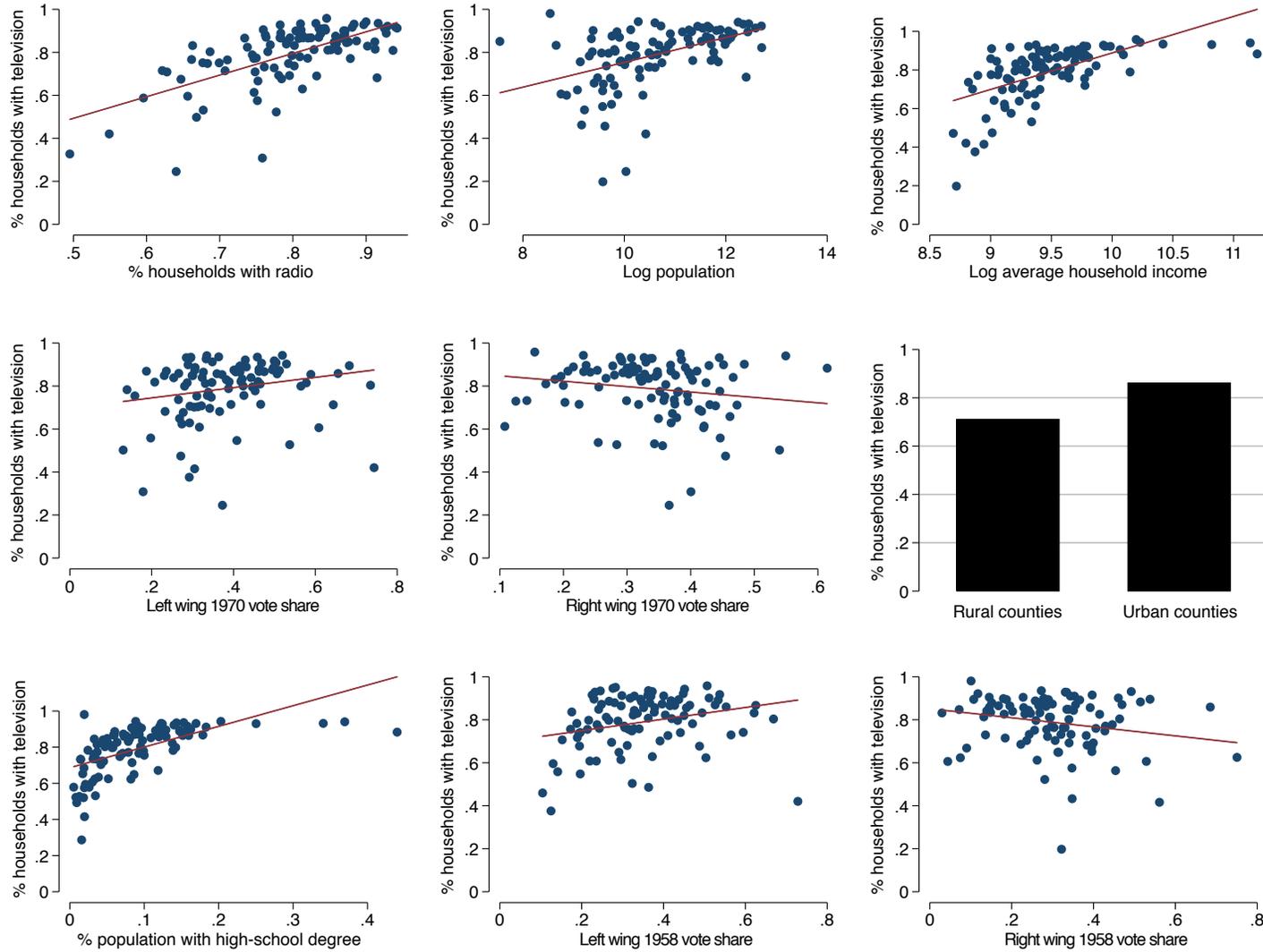
Notes: Partial correlation between television exposure and control variables.

Table A.1: Population and survey weights

Dependent variable is the percentage votes for the opposition in the 1988 plebiscite

	Survey weights		Population weights	
% of households with <u>television</u>	0.026***	0.018**	0.025***	0.017**
	(0.007)	(0.008)	(0.007)	(0.007)
% of households with <u>radio</u>		-0.001		-0.001
		(0.006)		(0.006)
% votes for the left wing in the 1970 elections		0.300***		0.299***
		(0.107)		(0.105)
% votes for the right wing in the 1970 elections		-0.255		-0.266
		(0.166)		(0.164)
Log average household income		-0.005		-0.005
		(0.019)		(0.019)
Indicator for large counties		0.076**		0.074**
		(0.029)		(0.029)
Indicator for medium-size counties		0.018		0.017
		(0.028)		(0.029)
Coefficient stability estimate	-	0.011	-	0.011
R-squared	0.105	0.575	0.099	0.586
Counties	146	146	146	146

Notes: "Television" and "Radio" are standardized to facilitate interpretation of coefficients. We calculate the "Coefficient stability estimate" for television using the method proposed by Altonji et al. (2005b) and further developed by Oster (2017). Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.2: Spatial correlation

Dependent variable is the percentage votes for the opposition in the 1988 plebiscite

	Spatial s.e.	
% of households with <u>television</u>	0.025***	0.018**
	(0.006)	(0.095)
	[0.000]	[0.124]
% of households with <u>radio</u>		-0.009
		(0.076)
		[0.914]
% votes for the left wing in the 1970 elections		0.302***
		(0.129)
		[0.005]
% votes for the right wing in the 1970 elections		-0.264
		(0.198)
		[0.131]
Log average household income		-0.005
		(0.023)
		[0.838]
Indicator for large counties		0.073***
		(0.30)
		[0.026]
Indicator for medium-size counties		0.016
		(0.031)
		[0.617]
Coefficient stability estimate	-	0.012
R-squared	0.095	0.586
Counties	146	146

Notes: All regressions are weighted by the number of voters. "Television" and "radio" are standardized to facilitate interpretation of coefficients. Conley (1999) standard errors are reported in parentheses. In square brackets we present p-values for coefficients using counties in larger administrative units as clusters (Cameron et al. 2008). We calculate the "Coefficient stability estimate" for television using the method proposed by Altonji et al. (2005b) and further developed by Oster (2017). Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.3: Television and changes in votes

Dependent variable is the vote share for the opposition in the 1988 plebiscite minus the vote share for the left wing (Salvador Allende) or the right wing (Jorge Alessandri) in the 1970 presidential elections

	Left wing	Right wing
	(1)	(2)
% of households with <u>television</u>	0.017*	0.028***
	(0.009)	(0.009)
% of households with <u>radio</u>	0.007	0.006
	(0.008)	(0.008)
% votes for the right wing in the 1970 elections	0.469***	
	(0.104)	
% votes for the left wing in the 1970 elections		1.209***
		(0.079)
Log average household income	-0.019	-0.061**
	(0.021)	(0.024)
Indicator for large counties	0.055	0.041
	(0.037)	(0.038)
Indicator for medium-size counties	0.002	-0.020
	(0.036)	(0.036)
R-squared	0.381	0.812
Counties	146	146

Notes: All regressions are weighted by the number of voters. "Television" and "radio" are standardized to facilitate interpretation of coefficients. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.4: Female opposition votes

	(1)
% of households with <u>television</u> × female	0.008**
	(0.003)
Indicator for female voting booth	-0.075***
	(0.004)
County fixed effects	x
Counties	146
R-squared	0.983
Observations	292

Notes: All regressions are weighted by the number of voters. "Television" is standardized to facilitate interpretation of coefficients. Standard errors clustered at the county level are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.5: Individual vote

Dependent variable is an indicator for individuals who voted in the 1988 plebiscite

	(1)	(2)	(3)
% of households with <u>television</u>	-0.007	-0.009	-0.022
	(0.008)	(0.009)	(0.014)
% of households with <u>radio</u>			0.023
			(0.019)
% votes for the left wing in the 1970 elections			0.138
			(0.315)
% votes for the right wing in the 1970 elections			0.207
			(0.297)
Individual controls		x	x
Observations	1,313	1,313	1,313
Counties	26	26	26
R-squared	0.000	0.087	0.089

Notes: "Television" and "radio" are standardized to facilitate interpretation of coefficients. Individual controls include a female indicator variable, indicators for income brackets, an indicator for individuals that report being catholic, and indicators for age and occupation categories. Robust standard errors clustered at the county level are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.