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Television and Voting in Catalonia

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Abstract

To what extent can be electoral results in Catalonia explained by the exposure of individuals to television? This paper sheds light on this question by looking into the effect of TV3 on two distinguished political outcomes in the 1984 Catalan Parliamentary election. The outcomes of interest are voter turnout and the vote share of *Convergència i Unió* (CiU), one of the strongest political forces in Catalonia who has mainly driven the channel since its creation. We resort to a natural experiment based on the geographically differentiated expansion of TV3 in Catalonia. Using a Difference-in-Differences Kernel matching method, we found that the introduction of TV3 caused an increase both in the voter turnout and the CiU vote share in the 1984 Catalan parliamentary elections.

Key Words: Media, Elections, Voting behavior, Natural experiment, Difference-in-Differences

JEL: L82, D72, C99

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1 Introduction

Media have a strong effect on politics. They can largely shape perception of individuals and political leaders about the political world, and these perceptions become in turn the basis for political beliefs and actions. That is why media are particularly important during periods of rapid political changes, elections, and in times of political tensions (violent or non-violent) when political leaders try to control and frame what media covers (Graber, 2007). Thus, the understanding of how media can influence political outcomes enables us to better understand politics.

This paper contributes to the existing literature on the effect of media on politics by identifying to what extent voting results in Catalonia can be explained by the exposure of individuals to TV3 (Catalan public television). The literature on the political economy of media has grown rapidly in the last decade and addresses a wide range of research questions. Various excellent surveys have already been written (DellaVigna and Gentzkow, 2010; Prat and Strömberg, 2013; Sobbrio, 2014; Strömberg, 2015). Nevertheless, so far most of the empirical research have focused on the media effect in countries with the most consolidated democracies (e.g. the USA and Scandinavian countries) and some authoritarian countries (e.g. Russia and East Germany). As Sobbrio (2014) claims, additional academic contributions are needed to provide empirical evidence on the effects of media in less explored institutional settings. The Spanish political context characterized by a long-standing separatist conflict amongst some of its regions turns out to be an interesting and newfangled case study to analyze the effect of a sub-national media on political outcomes, which ultimately might have consequences on whole country. In particular, the case of Catalonia where TV3 might favor nationalist and separatist political agendas.

Although we still do not have precise measures of media bias such as those proposed by Groseclose and Milyo (2005); Gentzkow and Shapiro (2010) and Puglisi and Snyder (2012), anecdotal evidence suggests that in recent years TV3 has shown a Catalan

nationalist and separatist bias, which has apparently favored the Catalan nationalist coalition *Convergència i Unió* (CiU) and poorly affected opposite standpoints. For instance, on January 8, 2014, *The Wall Street Journal* in an article entitled "Catalan TV Network Reflects Separatist Fervor" by David Román, summarizes the criticisms of TV3 regarding the alleged separatist bias. The article starts off with strong opinions like "If you are a thug, a prostitute or a lowlife in a show aired on the Catalan-language TV3 network, chances are you speak Spanish". And continues with opinions collected from current employees and former executives like Alfons Quintà, who was TV3's managing director in the 1980s, who says that "Sometimes TV3 is worse than Soviet TV was". Other leading opinions on the TV3 bias can be readily found in Spanish and Catalan newspapers by the time of the citizen consultation about the Catalonia independence in November 9, 2014 (better-known as 9N). For instance, "It has been given an oversized coverage to 9N while the 'case Pujol' hides" stated by TV3 Journalist Union (*Consejo Profesional de TV3*), referring to the corruption scandal in which Jordi Pujol, one of the historical leaders of CiU and the channel TV3, was involved in the early 80's related to the bankruptcy of *Banca Catalana*, one of the biggest banks in Catalonia by that time and whose crisis affected thousands of people (Baiges et al., 1985; Ríos, 2015)[1]. And "No cause should we throw away the impartiality" claims the Catalonia Journalist Union also referring to the alleged oversized coverage of the 9N[2].

Given this increasing political tension in which TV3 seems to play a main role, it raises the question of to what extent voting results in Catalonia can be explained by the exposure of individuals to TV3. Providing empirical support to this answer on the last decade political tension in Catalonia is still a challenge, due to the fact that TV3 covered whole Autonomous Community since the mid 80s, thereby impeding to sort out the self-selection problem. However, there is the possibility of conducting a natural experiment, taking advantage of the geographically differentiated expansion of

[1] *El Diario*, August 3, 2014.
[2] *El Economista*, September 9, 2014.

the channel in the early years. Although it is true that the separatist movement has been more vehement in the last decade, this conflict is long-standing and the effect of TV3 on Catalan politics may be traced back to the early 80s.

Originally, the emergence of the public service broadcasting in the Spanish autonomous communities in the late 70s and early 80s was intended to make the system of public media in Spain more pluralist. Although after the end of the Francoist dictatorship Spanish Radio and Television (RTVE, the national public media) started introducing programmes in other sub-national languages like Catalan and Basque, the cultural and linguistic diversity of other Spanish regions were largely repressed and neglected for national media (Jones, 2007). Hence, the creation of the Catalan Corporation of Radio and Television (CCRT)[3] in 1983 was aimed to help to restore the social use of Catalan language, and, albeit there was a consensus amongst most Catalan political parties as to the need for an autonomous media differentiated from the Spanish one, the CiU was the one who mainly undertook this project and has mostly driven the Corporation since then (Argelaguet, 1999; LoCascio, 2008).

In the light of this facts, it is noteworthy that the TV3 emergence in Catalonia in 1983 precisely coincided with the consolidation of the CiU as the strongest political force in the region: the number of its votes in the Catalan Parliamentary elections rose from 754,448 in 1980 to 1,345,513 in 1984, which represents an increase in the vote share from 27,83% to 46.80% (Table 2). This was so even given the corruption scandals of *Banca Catalana* in which Jordi Pujol -the top leader of the CiU- was involved by the same years, between 1982 and 1984. Other two important political parties, *Partit dels Socialistes de Catalunya* (PSC) and the right-wing *Partido Popular* (PP), also presented an increase in the number of votes, especially the latter whose votes almost quadrupled; however, they are a minority in terms of the vote share.

The coincidence between the emergence of TV3 and strengthening of the CiU is

[3]In 2007, it changed its name to Catalan Corporation of Audiovisual Media.

even more salient given the good reception of the channel by population. The Catalan Corporation of Radio and Television, made up of TV3 and Catalunya Ràdio, meant a big change for the society. It was the first time that population was exposed to a media system totally spoken in Catalan, which it would have been politically impossible some years ago under the Francoist dictatorship. However, it could be said that television rather than radio was the one that apparently meant a greater impact, this is proved by figures of media audience. According to Jones (2007, p. 521), the audience of Catalunya Ràdio was about 249,000 individuals in 1986, whereas the audience of TV3 was about 2,047,000 (34% of the total population of Catalonia), namely almost nine times larger than the radio audience.

This paper looks into the effect of TV3 on the electoral results of the very early Catalan Parliamentary elections (1980-1984), which allows us to exploit a natural experiment based on the geographically differentiated timing in the entry of TV3 during 1983 and 1984. In particular, the political outcomes of interest are voter turnout and the CiU vote share, and we implement a standard two-periods Difference-in-Differences (DD) model with Propensity Score Matching (PSM). The identifying assumption is that such geographically differentiated timing is unrelated to other factors that influence political outcomes once we take into account relevant initial conditions of TV3 placement and controls.

In line with most of the empirical literature on political persuasion in other countries, we found that the introduction of TV3 caused an increase both in the voter turnout and the CiU vote share in the 1984 Catalan parliamentary elections. Specifically, we found that municipalities exposed to TV3 present a higher change both in voter turnout and the CiU vote share between 1980 and 1984. For the former the effect is about 5.3 percentage points on average, whereas for the latter is about 9.9 percentage points. These results are robust to several econometric specifications and two distinct placebo tests. Furthermore, we found a duration treatment effect of the introduction of TV3:

those municipalities exposed longer (between 4 and 8 months) present a higher effect in comparison to those less exposed (less than 4 months). Finally, the persuasion rate of TV3 on the voter turnout is from 15.15% with the least restrictive measure of exposure rate (100% of the treated population) to 50.51% with the most restrictive measure (real audience of 30%). Similarly, the persuasion rate of TV3 on the CiU vote share is from 27.27% with the least restrictive measure to 90.91% with the most restrictive one. These persuasion rates are large in comparison to previous studies.

The rest of the paper is organized as follows. Primarily, we shortly survey the literature on media and political persuasion. Secondly, we review the historical context and the timing of the entry of TV3 in Catalonia, which allows us to take advantage of a natural experiment to analyze the causal effect of the TV3 exposure on voting. Thirdly, we present the available data and explain how we build the treatment variable. Fourthly, we explain the empirical strategy and the main econometric results. And finally, we present some final remarks and policy implications.

2 Political Economy of Media

The literature on the political economy of media is growing rapidly and addresses a wide range of research questions. This paper, in particular, is located on two branches: Firstly, the literature that attempts to establish whether or not there is an effect of media on voter turnout, which is related to the insight that better informed individuals are more likely to turnout. And secondly, this paper is also located on the literature that seeks to identify the effect of biased media on electoral results of specific political parties or particular political views. The review shows that additional academic contributions are needed to provide empirical evidence on the effects of media outside the most consolidated democracies (the USA and Scandinavian countries) and authoritarian regimes (Russia or East Germany). Until now, the effect of media in other political

or institutional context has not been explored enough, e.g. the effect of sub-national media on democratic countries undergoing separatist conflicts amongst their regions such as the case of Catalonia in Spain where TV3 might play a crucial part in fueling the political tension.

2.1 Media and Voter Turnout

Why could voter turnout be affected by media? The role of media is intrinsically providing information, thus there are at least three distinct theoretical perspectives that could explain this relationship. Firstly, the basic Downs (1957) model states that a voter, in deciding whether or not to vote, calculates the expected utility of either action and votes if benefits exceed costs. There are various costs associated to voting, and part of these are related to obtaining information about the candidates and policies (Geys, 006a, p. 18). Then, it would be expected that the entry of a new media reduces these costs making voting less expensive. Nevertheless, it is well-known that this rational view is not enough to explain voter turnout since the benefits of voting are very close to zero (in part because the probability of affecting the outcome is almost non-existent). This inconsistency between the theory and the stylised facts on turnout rates is known as the paradox of (not) voting. Secondly, a Downs complementary perspective suggests that the decision to vote does not solely lie on a rational choice, but also individuals can see voting as a "civic duty" and thus feel morally obliged to do so (Geys 006a, p. 19; Geys 006b, p. 648). From this perspective, media, especially when it comes to public media, may enlarge the feeling of civic duty and thus make voting more feasible (Sørensen, 2015). And thirdly, both decision-theoretical (Matsusaka, 1995) and game-theoretical models (Feddersen and Pesendorfer, 1996, 1997) suggest that better informed individuals are more likely to turnout. Matsusaka (1995) argues that the probability of turning out increases with the individual's information level. The reason is that 'the value of changing the election outcome is higher when the voter

is more confident that she is voting for the right candidate' Matsusaka (1995, p. 93). Employing a game-theoretic model, Feddersen and Pesendorfer (1996, 1997) found that uninformed voters have an incentive to abstain and – as such – to delegate their vote to those who are better informed. As informed voters are assumed to vote for what they see as the best option, uninformed voters are only able to affect the outcome by voting for the 'wrong' candidate. Thereby, uninformed voters are better off if they abstain. Nevertheless, as Geys (006a, p. 25) points out, the central problem of the these "information models" is that they cannot explain the mere existence of voter turnout as they assume predisposition to vote to achieve positive turnout levels.

Either way, the empirical evidence brings up a different perspective: the effect depends upon the content of the media, which might lead to either a positive or negative effect on voter turnout. On the one hand, whether it be radio, newspaper or television, some empirical studies looking at the link between voters' information levels and turnout find a positive correlation. For instance, Strömberg (2004) shows that a higher share of households owning a radio in a given county was associated with a 5.5 percent increase in turnout in the US gubernatorial elections between 1920 and 1930.

A similar positive effect of news media on electoral participation has been found when it comes to newspapers. Snyder and Strömberg (2010) find that a higher level of congruence between newspapers markets and congressional districts (i.e., share of a newspaper's readership that lives in a given congressional district) is associated with a larger number of newspaper articles about the congressmen belonging to the local congressional district, a higher level of voter information, and a higher level of electoral participation. Also Gentzkow et al. (2011) show that newspapers have a robust positive effect on participation in congressional elections. Newspapers entry increases electoral participation in congressional and presidential elections by 0.3 percent. The effect on presidential turnout is statistically more significant in the period 1869-1928 (i.e., before the introduction of other news media such as radio and television). Drago et al. (2013)

look at the impact of changes in the supply of local news provided by different types of newspapers (i.e., local and national newspapers) on a broad range of electoral and public policy outcomes in a sample of medium-large Italian municipalities (i.e., over 15,000 inhabitants) in the period 1993-2010. Their results show that an expansion in the supply of local news increases turnout in municipal election by 0.46 percentage points.

With regards to television, Oberholzer-Gee and Waldfogel (2010) show that the availability of Spanish-language local TV news programs leads 27 percent of Hispanic non-voters to turnout in non-presidential election years. And Sørensen (2015), drawing on the timing of the introduction of state television in Norway during the 1960s and 1970s, finds that state television instantly became the main source of information on national politics (it caused a major shift away from the radio), and it led to an increase in political interest, which caused comparable increases in voter turnout in the national and local elections.

On the other hand, some contributions point out that an increase in the supply of news media may lead to a negative effect on electoral participation due to a *crowding-out* effect on the existing (and more informative) media. Gentzkow (2006) analyzes how the different timing of the entry of television in the US counties impacted changes in the electoral participation. The author shows that television reduced turnout in electoral years with no presidential elections. Gentzkow also shows that this effect is quite large, i.e., it accounts for half of the total drop in turnout (in years with no presidential elections) observed in the US since the 1950s. Moreover, the author provides convincing evidence that the mechanism leading to the effect is based on the introduction of television crowding-out the existing news media (i.e., newspapers and radio) and the consequent decrease in the level of political information of citizens. George and Waldfogel (2008) looking at the expansion of home delivery of the *New York Times* newspaper in one hundred cities in the US. The study shows that this expansion

lead to a decrease in political participation in congressional elections amongst highly educated voters. The authors argue that this effect was the consequence of highly educated voters shifting their consumption from local to national news.

The ambiguous effect of media on voter turnout leads to ask what was the TV3 effect (if there was) in Catalonia by the 1984 parliamentary election. That is, if given the media context at that time (TVE, news papers, etc.), TV3 provided more information which translated into better informed individuals and an increase in the voter turnout, or instead, it yielded a crowding-out effect.

2.2 Media Bias and Political Persuasion

Theoretically speaking, the existing models of persuasion effects can be divided broadly into two categories (DellaVigna and Kaplan, 2008, p. 81). The first captures rational learning and predicts that exposure to the media may have an impact on beliefs and voting only in the short-run since voters, sooner or later, are able to filter out any bias provided by media. The second channel captures non-rational persuasion and implies that exposure to the media may affect beliefs and voting also in the long-run. Then, understanding the media impact on voting behavior is of interest not only for politics, but also for models of belief updating, and, from a policy perspective, if media bias modifies voting behavior, deregulation of media markets might have a large impact on political outcomes.

The general picture emerging from the empirical literature is that media bias has indeed an effect on political views. For instance, Gerber et al. (2009) randomly selected three groups of people in a county in Virginia at the time of the 2005 gubernatorial elections in the U.S. in order to study the effect of biased newspapers on voting. The first group was assigned a free subscription to *The Washington Post* (a left-leaning newspaper), the second group received a free subscription to *The Washington Times* (a right-leaning newspaper), and the third group did not receive any subscription. The

authors found little statistically significant evidence on the impact of media bias on knowledge or viewpoints, but they did find a significant impact on self-reported voting.

Regarding television, Albertson and Lawrence (2009) analyzed two field experiments in which survey respondents were randomly encouraged to view two Fox News debates (this channel has been considered as having a Republican bias) on the eve of the 1996 presidential election in the U.S. The authors found that one of the television programs affected viewer attitudes, even weeks after it aired, while the second one did not. DellaVigna and Kaplan (2007) take advantage of the entry timing of the Fox News Channel in local cable markets and consider the impact on voting. They find a positive and sizable effect of the introduction of this channel on the Republican vote share in the Presidential elections in the U.S. between 1996 and 2000. White et al. (2005) find a great effect of the public television in the Russian parliamentary and presidential elections of December 1999 and March 2000, which according to authors was not available for everybody (p. 203). Kern and Hainmueller (2009), drawing on the uneven availability of West German television in East Germany, in particular in the Dresden district, analyze whether such television had an effect on the support for the authoritarian regime in the East. They find that West television was taken as a fashion of entertainment rather than a window toward a distinct model of life that could undermine the support for the Soviet government in Germany. Enikolopov et al. (2011) compare electoral outcomes and votes reported by survey respondents during the 1999 parliamentary elections in Russia for those geographical areas that had access and had no access to the only national TV channel independent from the government ("NTV"). The presence of the independent TV channel decreased the aggregate vote for the government party by 2.5 percentage points and increased the combined vote for major opposition parties by 2.1 percentage points. Barone et al. (2012) analyze how the increase of free-view channels in Italy due to the entry of digital TV between 2008 and 2012 affected the political support for Silvio Berlusconi, who had mostly controlled

television until that time. The author found that the switch caused a drop in the Berlusconi's coalition vote share by 5.5 to 7.5 percentage points.

With regards to the case of Catalonia, Hierro (2012, p. 160) draws on a panel data in order to identify whether TV3 induced changes in national identity from 2004 to 2005 examining whether those who self-identified as both Spanish and Catalan in 2004 are more likely to self-identify more in one way or another in 2005 -that is, shaping a clearer national identity- as a result of the exposure to TV3 or TVE. The author does not find any effect of media exposure on national identity, however it is important to call attention on two points: Firstly, due to that all individuals were able to watch any channel as they were available almost in the entire Catalonia at that time, the exposure either to TV3 or TVE is established according to the preferences of individuals to media broadcasters, therefore this methodological approach introduces a bias. Secondly, the group of individuals with no clear national identity is likely to be made up of those who do not care so much about political issues (including national identity); therefore, regardless of what TV channel they watch, they do not become more Spanish or Catalan from one year to another.

3 Brief History of the Entry of TV3

As we will document below, although exogenous economic and technical constraints presumably caused a delay in the *timing* of TV3 introduction across municipalities, this did not necessarily change the *ordering*. In other words, the initial assignation to TV3 is not random. Hence, a potentially important source of endogeneity bias is that initial conditions are likely to determine TV3's placement. The key identifying assumption is therefore that the TV3 exposure is unrelated to other factors that influence political outcomes (voter turnout and CiU vote share) once we take into account initial conditions of TV3 placement and relevant controls.

3.1 CiU Governments and Language Normalization Policies

The political system sets up in 1939 by Francisco Franco was one of the longest-lasting dictatorships in Western Europe, characterized by limited political pluralism, political demobilization, and, with regards to communication media, systematic suppression of the pluralism of information, rigid system of censorship, and denial of freedom of expression (Gunther et al., 2000, pp. 28-29). In this political context, Catalan identity, as well as Catalan language as an essential part of it, was heavily repressed. However, once the dictatorship ended in 1975, there was a transition not only from authoritarianism to democracy, but also from a highly centralized state to autonomous regional governments that provided a breeding ground for the strengthening of the Catalan nationalism[4].

In the late seventies, while the PSC (Catalan socialist political party associated to the Spanish Socialist Workers' Party, PSOE) dominated the general elections[5], the CiU rose as the ruling party in 1980 in the regional ones[6]. Since then, this nationalist coalition has in great extent kept its dominance in the Catalan elections celebrated every four years, only interrupted by another coalition of three left-wing parties: the *Partit dels Socialistes de Catalunya* (PSC), the *Esquerra Republicana de Catalunya* (ERC), and the *Iniciativa per Catalunya-els Verds* (ICV) between 2003 and 2010 (Table 2).

Early on, Jordi Pujol, leader of the CiU and president of the *Generalitat* (Catalan government) from 1980 until 2003, established as one of his government's priorities the promotion of Catalan identity (LoCascio, 2008, p. 103), for which the recuperation of the Catalan language was essential (Argelaguet, 1999; LoCascio, 2008; Woolard and Gahng, 1990; Miley, 2002). As Pujol (1976, p. 83) claims "(Language is) the decisive

[4]According to Balcells (2013), unlike other areas historically under the influence of the Catalan culture like the South of France, Catalan nationalism has been highly persisting in Catalonia due to the absence of a scholastic revolution in Spain prior to the beginning of the 20th century.

[5]The general elections aim to choose the members of the Spanish National Congress, which is made of two chambers: The Congress of Deputies (lower chamber) and Senate (higher chamber).

[6]The Spanish constitution of 1978 established the regional elections as a part of the political autonomy of each community. The aim of this election is thus to select the members of the autonomous parliament.

factor in the integration of the immigrants in Catalonia. It is the most definitive. A man who speaks Catalan to his children, is a Catalan through and through" (Cited by Hierro, 2012, p. 89). Then by 1982, building on the idea that the Catalan population should become a single community where Catalan was the usual vehicle of communication, the CiU promoted two laws that intended to increase the level of knowledge and use of Catalan in whole Catalonia as soon as possible: the Law on Language Normalization, that regulates the presence of Catalan in teaching[7], and the Law that created the Catalan Corporation of Radio and Television (Hierro, 2012, p. 90), which it would be autonomous from the Spanish public broadcaster (RTVE) (Baget, 2003).

Needless to say, the idea of implementing a policy of Catalan language normalization and the creation of a channel did not only come from the CiU. With some nuances this aim was also shared by parties from the whole political spectrum in Catalonia, however the CiU was the one who ultimately led this project. Since then, this nationalist coalition has mostly driven the Catalan Corporation of Radio and Television and, thus, the public television broadcaster (TV3) (Table 3). The social impact of TV3 was apparently strong on Catalan society by that time, not only because the new experience of watching television in Catalan, but also because the TV supply was basically made of one national Spanish channel. As Hierro (2012, p. 154) points out, over time TV3 has been considered to be one of the main instruments for the normalization of the Catalan language use which has been possible through the representation of a monolingual culture that contrasts with the bilingual Catalan society. That is so in the extent that media helps to forge national identity whether it be by means of the Barcelona F.C. football matches, international TV series dubbed into Catalan (e.g. 'Dallas' was very successful in TV3 in the 80s), nationally produced fictional series (Castelló, 2009), advertisement (MacGregor, 2003; O'Donohoe, 1999), or news (Mihelj et al., 2009).

[7]See Clots-Figueras and Masella (2013) and Woolard and Gahng (1990) about the effect of teaching in Catalan on the nationalist sentiment.

3.2 The Timing of the Entry of TV3

The first broadcasting of TV3 took place on September 10, 1983, through the Tibidabo broadcast center. People living in Catalonia watched some chapters of a famous American TV serie dubbed into Catalan, a football match, and a Jordi Pujol's message, the president of the Generalitat and leader of the CiU, about the importance of TV3 as a tool for getting the linguistic normalization. Although CiU wanted to take TV3 to whole Catalonia -and even to other Catalan-speaking regions outside Catalonia- as soon as possible, the first broadcasting just reached out Barcelona (the capital city) and some surrounding districts, which however represented the most populated areas: between 64% and 70% of the total population by that time (Baget, 1994, p. 94). Then, subject to the economic and technical framework that a project of this magnitude faces, the remainder of Catalonia was gradually covered during the next two years by setting new broadcasts and transposer centers[8]. It is important to say that because it was often difficult to foresee if a main transmitter would provide suitable signal strength in a particular area, a network of local transposer centers was gradually required to receive the signals. Thus, plausible exogenous variation in the timing of the entry of TV3 arises from the fact that the channel was conceived as a "national" plan for whole Catalonia, but given the economic and technical framework and the difficulties to foresee the provision of adequate signal, TV3 did not reach out an important part of Catalonia by the date of the 1984 Catalan parliamentary election, that is the election analyzed in this article.

Drawing on information provided by Montero (1987) and a variety of newspaper articles from *La Vanguardia* from 1983 to 1985 on the TV3 coverage (Table 4 in Annex), we identify the timing of the entry of TV3 in the municipalities of Catalonia. TV3 set three important broadcast centers before April 1984, the Catalan parliamentary election

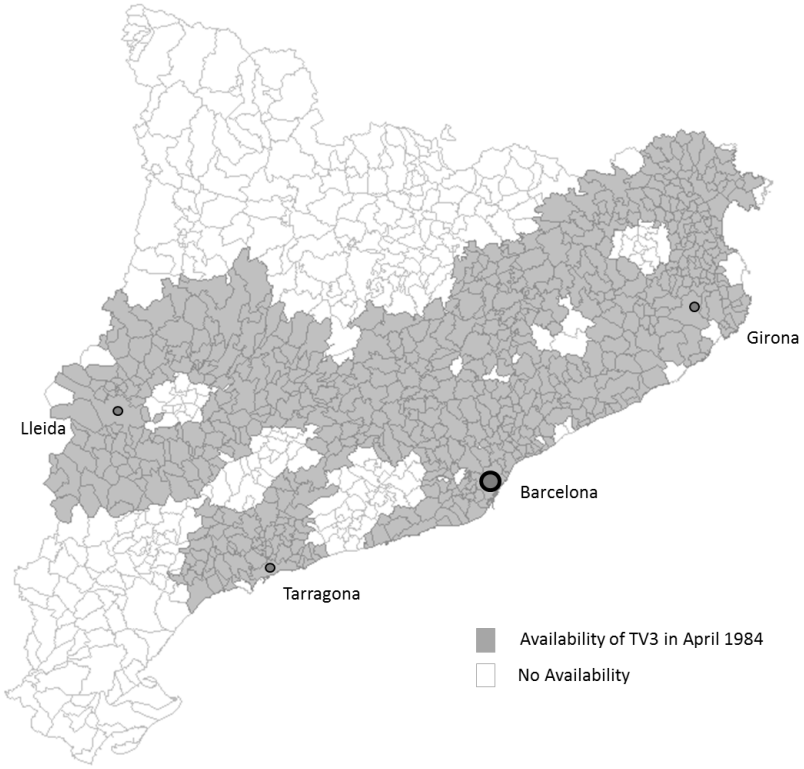
[8]The network television of TV3 is made of broadcast centers, which are the main broadcasting centers and cover the most important and populated areas; transposer centers, whose capacity is lower and aim to cover shadow areas of broadcast centers; and mobile centers, which allow to do direct broadcasts.

month: *Alpicat* on 31st December 1983 to cover the districts of Garrigues, Noguera, Segarra, Segrià, and Urgell. *Rocaborda* on 16th January 1984 to cover Alt Empordà, Baix Empordà, Gironès, and Selva. And *La Mussara* also on 16th January 1984 to cover Alt Camp, Baix Camp, and Tarragonès. Furthermore, TV3 set some transposers centers in order to cover some shadows in these areas.

By April 1984 Parliamentary elections, some important broadcast centers and transposer centers had not yet been installed: *Montcaro*, which would cover Ribera d'Ebre, Terra Alta, Baix Ebre, and Montsià in the Tarragona province, and the transposers center *Pic del O'rri i Vaqueira*, which would cover the Pirineos area: Val D'Aran, Pallars Sobirà, Pallars Jussà, and Alt Urgell. Moreover, many other transposer centers were set to cover shadows areas.

To sum up, by April 1984 Parliamentary elections, 67% (635 out of 941) of municipalities and 92% of population (or 77% excluding Barcelona) was covered by TV3 (Figure 3.1).

Figure 3.1: Availability of TV3 in Catalonia in April 1984



Source: Prepared by the author based on Montero (1987) and *La Vanguardia* (Table 4 in Annex)

4 Data

4.1 Dependent Variables

The dependent variables in our analysis are the change in voter turnout and the change in the CiU vote share between the 1980 and 1984 Catalan Parliamentary elections at municipality level. Voter turnout is defined in this study as the share of population that has cast its vote with respect to the total number of people registered to vote, and the CiU vote share is defined as the number of votes for CiU with respect to the total number of votes. The information source is the Statistical Institute of Catalonia (Idescat).

4.2 Treatment Variables

The availability of TV3 in April 1984 is, in the jargon of impact evaluation, the treatment variable of this study. Drawing on the information from Montero (1987) and *La Vanguardia* newspaper (Table 4 in Annex) presented in the preceding section (Figure 3.1), we code as 1 whether the municipality was covered by TV3 before April 1984 (month of the 1984 Catalan parliamentary election), and 0 otherwise. Furthermore, in other to carry out a duration treatment analysis as well as check the validity of the empirical strategy by including placebo treatments, we also code three treatment variables more: i) Duration: using just treated municipalities, we code as 1 if the municipality i was exposed to TV3 between 4 and 8 months, and 0 if less than 4 months; ii) First placebo: The availability of TV3 in December 1984; iii) Second placebo: A fake treatment randomly assigned on the untreated municipalities.

4.3 Controls

Despite that information on social, demographic and economic characteristics of the Catalan municipalities by that time is scarce, we collect a set of variables from Idescat both for matching initial conditions that determine TV3 placement and control for time-variant variables. These are: i) Total population in 1981 and 1984; ii) Share of men with respect to total population in 1981 and 1984; iii) Share of non-native people with respect to total population in 1981 and 1986; iv) Share of people who speak Catalan with respect to total population in 1981 and 1986; v) Share of people that get BUP-COU[9] with respect to total population in 1981 and 1986; vi) Share of people that get a medium graduate with respect to total population in 1981 and 1986; vii) Share of people that have a professional diploma with respect to total population in 1981 and 1986; ix) the distance from municipality i to Barcelona; and x) Financial institutions in 1981 and

[9] *Bachillerato Unificado Polivalente* (BUP) and *Curso de Orientación Universitaria* (COU) correspond to the four study years previous to higher education, namely the High School in some anglo-saxon countries.

1984 in the municipalities. Note that although the analysis in this study focuses on the elections results from 1980 to 1984, the control variables of total population and share of men are just available for the period 1981-1984, and variables related to education and Catalan speaking knowledge are for the years 1981 and 1986. The reasoning of the inclusion of these co-variates in the econometric analysis is theoretically justified in the next section.

Table 5 in the annex includes some summary statistics. As we can see, the vote share for CiU went from 34% in 1980 to 65% in 1984 in both control and treatment group, giving the impression that there was not a differential effect in these two groups as to electoral results. Voter turnout also rose in this period in the two groups, but a bit less (about 2% less) in the areas non-exposed to TV3. For the treatment group, voter turnout rose from 58% to 70%, whereas in the control group from 58% to 68%. With respect to demographic variables, we see that municipalities exposed to TV3 correspond to the most populated, 8,703 inhabitants in average in 1980 and 8,815 in 1984, whereas those non-exposed have 1,550 inhabitants on average in 1980 and 1,567 in 1984. The share of Catalan speakers presents an outstanding variation in the exposed areas, going from 88% in 1980 to 97% in 1984, whereas it holds around 90% - 92% in non-exposed areas. Finally, variables related to education do not present large differences between exposed and non-exposed TV3 areas.

5 Empirical Strategy

We consider the impact of the entry of the TV3 channel on two political outcomes related to electoral results of the Catalan parliamentary elections: the change in voter turnout and the change in the CiU vote share between 1980 and 1984 at municipality level. To do so, we resort to a natural experiment based on the geographically differentiated expansion of TV3 in Catalonia. This strategy exploits the timing of the entry

described in the preceding section. The key identifying assumption is that the TV3 exposure is unrelated to other factors that influence political outcomes (voter turnout and CiU vote share) once we take into account relevant initial conditions and time-variant controls that plausibly determine the assignation to TV3.

In particular, we combine a standard two-periods Difference-in-Differences (DD) methodology with Propensity Score Matching (PSM) in that it compares the change over time (first difference) for the municipalities exposed to TV3 channel versus those "comparable" non-exposed used as a control group (second difference). In particular, the DD strategy can be summarized in the following table 1.

Table 1: Empirical Strategy: Difference-in-Differences

	Municipalities T (TV3)	Municipalities NT (No TV3)	Causal Effect
Period 1 (Before entry of TV3)	y_1^T	y_1^{NT}	
Period 2 (After entry of TV3)	y_2^T	y_2^{NT}	
	$A = y_2^T - y_1^T$	$B = y_2^{NT} - y_1^{NT}$	$A - B$

Column 1 in Table 2 shows that the difference between y_2^T and y_1^T captures the effect of TV3 on the outcome variable plus any other effect. Also, column 2 displays that the difference between y_2^{NT} and y_1^{NT} captures any other effect than TV3. Thus, the difference of these two differences (Column 3) captures just the effect of TV3 on the outcome variable, that is the causal effect.

Nevertheless, inasmuch as the assignation to TV3 was not random, a potentially important source of endogeneity arises when initial conditions of municipalities are likely to determine TV3 placement and influence the subsequent electoral results. This does not make plausible to hold the parallel trend assumption; that is, the assumption that in the absence of the intervention, both treated and non-treated populations would have shared the same trends on the outcomes of interest. So, we cannot estimate accurately

the impact of TV3 by simply comparing areas that experienced this channel and those that did not.

To address these concerns we combine the DD estimator with PSM, as proposed by Heckman et al. (1997). The estimated probability of participation (or propensity score) can be used to match participant and control units in the base (pre-program) year, and the treatment impact is calculated across participant and matched control units within the common support (Khandker et al., 2010, p. 80). Then, in order to obtain the propensity scores needed to define the common support and match municipalities, we first implement a Logit model of the availability of TV3 as follows:

$$TV3_{i,April1984} = \beta_0 + \beta_1 X_{i,1980} + \beta_2 X_{i,1981} + \varepsilon_i \tag{5.1}$$

Where the dependent variable $TV3_{i,April1984}$ is the availability of TV3 in municipality i by April 1983. $X_{i,1980}$ and $X_{i,1981}$ are a set of initial conditions (some for 1980 and others for 1981 given the availability of information) that might affect the TV3 placement as well as the subsequent trajectories of municipalities' political outcomes. For $X_{i,1980}$, these are: i) voter turnout in 1980, ii) CiU vote share in 1980, and for $X_{i,1981}$, iii) Log of total population in 1981, iv) Share of men with respect to total population in 1981, v) Share of non-native people with respect to total population in 1981, vi) Share of people who speak Catalan with respect to total population in 1981, vii) Share of people that get BUP-COU with respect to total population in 1981, viii) Share of people that get a mid graduate with respect to total population in 1981, ix) Share of people that have a professional diploma with respect to total population in 1981, and x) Financial institutions in 1981 [10]. The standard errors are clustered at district level.

The inclusion of both the previous voter turnout and the CiU vote share is justified as voting may be habit-forming, namely individuals who voted in the past are more

[10] Although the distance from municipality i to Barcelona might affect turnout and political views, we rule it out as it badly affect the balancing test, that is does not perform well to make comparable groups. Furthermore, it is deleted in the DD strategy since is a time-invariant variable.

likely to vote again in future elections and for similar political agendas (Geys, 006b, p. 646). The inclusion of population size is also suggested by the probability of casting the decisive vote in the election (i.e. making or breaking a tie). The share of men is included to control for possible differences in political participation related to sex. The share of non-native people and Catalan speakers can also have a effect on electoral outcomes due to differences on political views related to individuals' origin. Educational variables can also influence the electoral participation in the extent that more sophisticated individuals are more likely to turnout. And finally, the presence of financial institutions (banks or saving banks) in the municipalities is intended to capture two things: First, it is a measure of how modern the municipality economy is, and second, it measures some kind of overlapped interest since *Banca Catalana*, the biggest bank by that time, was owned by Jordi Pujol, the top of the CiU.

Based on the estimated propensity scores obtained from the previous analysis, with panel data over two time periods $t = \{1, 2\}$, the average treatment effect on the treated (ATT) in the common support is given by (Khandker et al., 2010, p. 61):

$$ATT = \frac{1}{N_T}\left[\sum_{i \epsilon T}\left(y_{i,2}^{T} - y_{i,1}^{T}\right) - \sum_{j \epsilon NT} W(i,j)\left(y_{j,2}^{NT} - y_{j,1}^{NT}\right)\right] \tag{5.2}$$

Where T and NT denote exposure to TV3 (treatment) and no exposure to TV3 (control) respectively, $y_{2,i}^{T} - y_{1,i}^{T}$ is the change in the outcome measure for municipality$i$ exposed to TV3, $y_{2,i}^{NT} - y_{1,i}^{NT}$ is the change in the outcome measure for control municipality j, N_T represents the size of the treatment group, and $W(i,j)$ represents the weights assigned to each control municipality j, which depends on the particular matching estimator employed. We use a kernel matching as it has more advantages than other matching methods. In particular, it uses a weighted average of all untreated observations in order to construct the counterfactual match for each treated so that it gives more weight to those control municipalities that are closer matches and less weight to farthest observations. Also, Kernel matching reduces the estimation variance insofar as

it uses more observations than other matching algorithms.

Specifically, the weights are obtained by the following function (Khandker et al., 2010, p. 60):

$$W(i,j) = \frac{K\left[\frac{p_j - p_i}{a_n}\right]}{\sum_{k \epsilon NT} K\left[\frac{p_k - p_i}{a_n}\right]} \tag{5.3}$$

where $K(\cdot)$ is a kernel function, a_n is a bandwidth parameter, and p_i is the estimated propensity score of the treated municipalities. p_j and p_k are the estimated propensity scores of municipalities in the control group.

Although combining DD and PSM has advantages such as reducing the self-selection bias by matching comparable treatment and control areas as well as removing time invariant unobserved characteristics that might affect outcomes, the estimator could still be biased if there are any time variant observed characteristics that affect the outcomes over time. For instance, if social-demographic characteristic like the total population or the average education years change differently for treated and control groups in the period of analysis, this would affect the parallel trend assumption. To reduce the risk of such a bias, we control for the change in the co-variates used to match on initial conditions since they might vary over time and influence the political outcomes.

In terms of a regression framework, we estimate a weighted least squares regression by means of a first-difference equation as follows.

$$\Delta Y_{i,t}(W_i) = \beta_1 TV3_{i,April1984} + \beta_2 \Delta X_{i,t} + \beta_3 Banks_{i,1984} + \nu_j + \eta_p + \varepsilon_{i,t} \tag{5.4}$$

Where $\Delta Y_{i,t}$ is the change between 1980 and 1984 in the political outcomes of interest, that is the voter turnout and the CiU vote share for municipality i. $TV3_{i,April1984}$ is

the availability of TV3 in the municipality i in April 1984, thus the regression coefficient β_1 measures the difference-in-difference estimator. $\Delta X_{i,t}$ is the change between 1980 and 1984 for time-variant controls. These are: i) Log of total population, ii) Share of men with respect to total population, iii) Share of non-native people with respect to total population, iv) Share of people who speak Catalan with respect to total population, v) Share of people that get BUP-COU with respect to total population, vi) Share of people that get a mid graduate with respect to total population, and vii) Share of people that have a professional diploma with respect to total population. $Banks_{i,1984}$ is a dummy variable that takes the value 1 if there were financial institutions in the municipality i in 1984 and 0 otherwise. This co-variate measures the exposure of the municipalities to the financial system, and is intended to capture if there was an effect of the financial crisis caused by the bankruptcy of *Banca Catalana* since, as previously documented, the leader of the CiU owned this bank. Finally, ν_j are fixed effects at district j, η_p are fixed effects at province p, and $\varepsilon_{i,t}$ is the disturbance term. The standard errors are clustered robust at the district level for all econometric specifications except when including district fixed effects, in this case the standard errors are just robust.

Another source of endogeneity for omitted time-variant variables might come from the effect of other media such as radio or newspapers that came out over the same period of time. Nevertheless, scarce information does not allow yet to control for the coverage of other type of media in the municipalities.

Regarding radio, however, the concern can be minimized given the higher audience of TV3 in comparison to Catalunya Ràdio. As mentioned in the introduction, the Catalan Corporation of Radio and Television was initially made up of one television channel (TV3) and one radio station (Catalunya Ràdio). However, it was TV3 the media who apparently had a greater impact in Catalan society by that time, this is evident for instance through the figures about media audience. According to Jones (2007, p. 521), the audience of Catalunya Ràdio reached out 249,000 individuals in

1986 (4% of the total population of Catalonia), whereas TV3 was about 2,047,000 (34% of the total population), that is almost nine times larger than the radio audience.

With regards to newspapers, we still do not count with figures about subscribers at municipality level, then we do not know the geographical differences in the number of readers. These differences could affect the political outcomes so that the results of the effect of TV3 might be biased, future research therefore should be focused on looking into the effect of newspapers. Some important newspapers available by the time that TV3 was created are *Avui*, *Diari de Barcelona*, *La Vanguardia* and *El Periódico*. *Avui* came out in April 1976 and circulated until July 2011. This was the first newspaper with an independence political ideology written in Catalan after the end of the Francoist regime. The *Diari de Barcelona*, one of the oldest newspapers in Europa (founded in 1792), was written both in Spanish and Catalan between 1982 and 1984, when it was closed for one year until it was acquired by the Barcelona government. And the two main newspapers today in Catalonia are *La Vanguardia* y *El Periódico*, the former was founded in 1881 and started to be written in Catalan since 2011, and the latter was founded in 1978 and presented its first Catalan version in 1997.

6 Results

6.1 Propensity Score Matching

Firstly, we estimate the propensity scores of areas exposed and not exposed to TV3 using a Logit model. In this model we include co-variates as initial contidions that jointly influence the likelihood of treatment and outcomes. Following the literature on political participation and given the availability of information, these baseline characteristics are: i) Voter turnout in 1980, ii) the CiU vote share in 1980, iii) Log of total population in 1981, iv) Share of men with respect to total population in 1981, v) Share of non-native people with respect to total population in 1981, vi) Share of people who speak Catalan

with respect to total population in 1981, vii) Share of people that get BUP-COU with respect to total population in 1981, viii) Share of people that get a mid graduate with respect to total population in 1981, ix) Share of people that have a professional diploma with respect to total population in 1981, and x) Financial institutions in the municipality i in 1981.

Table 6 displays the results from the marginal effects of the Logit regression. It is noteworthy that those municipalities with larger population and presence of banks are more likely to be exposed to TV3. We estimate the scores ensuring they satisfy the balancing property within the region of common support, which is built by dropping treatment observations whose propensity score is higher than the maximum or less than the minimum propensity score of the controls. 30 treated municipalities are off the common support, whilst no control municipality is off (Table 8). Then, we match the treatment and control areas using the default Stata Software specifications, namely Epanechnikov kernel matching with a bandwith of 0.06.

Table 7 shows the balancing test for co-variates used to estimate propensity scores. It displays the mean differences for the treatment and control groups before and after being matched. As we see, there was a significant difference in six co-variates between those municipalities exposed to TV3 and those not exposed before matching, which affects the comparability of the two groups. These are: the log of total population, share of men, share of non-native from Catalonia, share of Catalan speakers, share of people with a mid graduate, and share of people with higher education. Once matched, these statistical differences on the average value no longer exist, the treatment and control groups are then more comparable in terms of the co-variates included in the PSM. Then, we move on to apply the DD model with the weights $W(i, j)$ assigned to each control municipality j arising from the kernel matching method.

6.2 The Effect of TV3 on Political Outcomes

Table 10 displays the results for the change in voter turnout, and table 11 for the change in the CiU vote share. We found evidence that the TV3 entry caused an increase both in voter turnout and the CiU vote share in the 1984 Catalan parliamentary election. These results are robust to several econometric specifications including district and province fixed effects as well as two distinct placebo tests.

With regards to voter turnout (Table 10), municipalities exposed to TV3 present a higher change in voter turnout between 1980 and 1984. All the econometric specifications are statistically significant as to the variable *Availability of TV3 in April 1984*. We first implement a simple difference-in-difference model and estimate the equation 5.2 without controls, the effect is about 10.5 percentage points (Column 1). In column 2 we add control variables and find that the effect is about 3.8 percentage points, and the R^2 raises from 0.20 to 0.36. When including district fixed effects (Column 3), the effect is about 7.8 percentage points and the R^2 increases until 0.47. Finally, with province fixed effects (Column 4), the effect is about 3.1 percentage points and the R^2 is 0.37. Then, it can be said that the effect of TV3 on voter turnout is positive and statistically significant. On average, including just the estimations with controls and fixed effects, the effect is about 4.9 percentage points.

In addition to favoring the increase in voter turnout, TV3 also seemingly favored the increase in the CiU vote share (Table 11). All the econometric specification are statistically significant. With no controls, the effect is about 31 percentage points (Column 1). When including control variables (Column 2), the effect is about 13.6 percentage points, and the R^2 raises from 0.41 to 0.65. With fixed effects at district level (Column 3) the effect falls until 6.6 percentage points and the R^2 is 0.81. And with province fixed effects (Column 4), the effect is about 9.6 percentage points and the R^2 is 0.73. Then, it can be concluded that the effect of TV3 on the CiU vote share is statistically significant and is on average 9.9 percentage points.

On the other hand, it is noteworthy that some co-variates have a significant influence in all econometric specifications. In particular, regarding voter turnout there is a negative effect of the change in the total population on the electoral participation; that is to say, those municipalities who present a larger increase in the total population present lower turnout. The effect is about 16 percentage points on average. On the contrary, there is a positive influence of the change in the share of non-native population on voter turnout, that is those municipalities that present a larger increase in the share of non-native population go out to vote in a greater extent. And there is also a positive effect of the banks presence in the municipalities, that is those municipalities more exposed to the Catalan financial system go out to vote in a greater extent as well.

Regarding the CiU vote share, there is also a positive effect of the change in the share of non-native population on the vote share of this Catalan nationalist coalition, which could turn out to be counter-intuitive since one would expect that municipalities with more Catalan natives to go out to vote in a greater extent for the CiU. And more interestingly, there is a positive impact of the presence of banks in the municipalities. That is, in spite of the corruption scandal related to the bankruptcy of *Banca Catalana*, those municipalities more exposed to the financial system cast its vote for CiU. This can be explained by how people perceived the nature of such scandal. Seemingly, it was seen as an attack of the Spanish government against the interests of Catalonia and CiU causing a greater support for this nationalist coalition instead of reducing the intention to vote for it (Baiges et al., 1985; Ríos, 2015).

6.3 Placebo Tests

We use two placebo tests to assess the robustness of our findings. The first placebo treatment is a "lead" that uses data on TV3 diffusion between April and December 1984 (i.e. eight months later than the initial treatment variable). In April 1984, 613 municipalities were treated and 323 untreated, which are the size of our main treatment

and control groups. To December 1984, TV3 had reached out 163 municipalities more; that is, 776 were treated and 164 untreated. If the exposure to TV3 is indeed causing the effects in the outcome, then the lead should not be significant (otherwise they will capture anticipatory effects or pre-existing trends).

Columns 1 and 2 of the tables 12 and 13 display the results of that placebo test. The results show that the lead, *Availability of TV3 in December 1984* (Column 1), is not significant neither for the change in the voter turnout nor the CiU vote share. Further, by including the *Availability of TV3 in April 1984* (Column 2), the placebo remains no significant while the latter turns out to be significant. These results give support to the idea that there are not pre-existing trends in the DD model, thus the outcome trends are plausibly parallel.

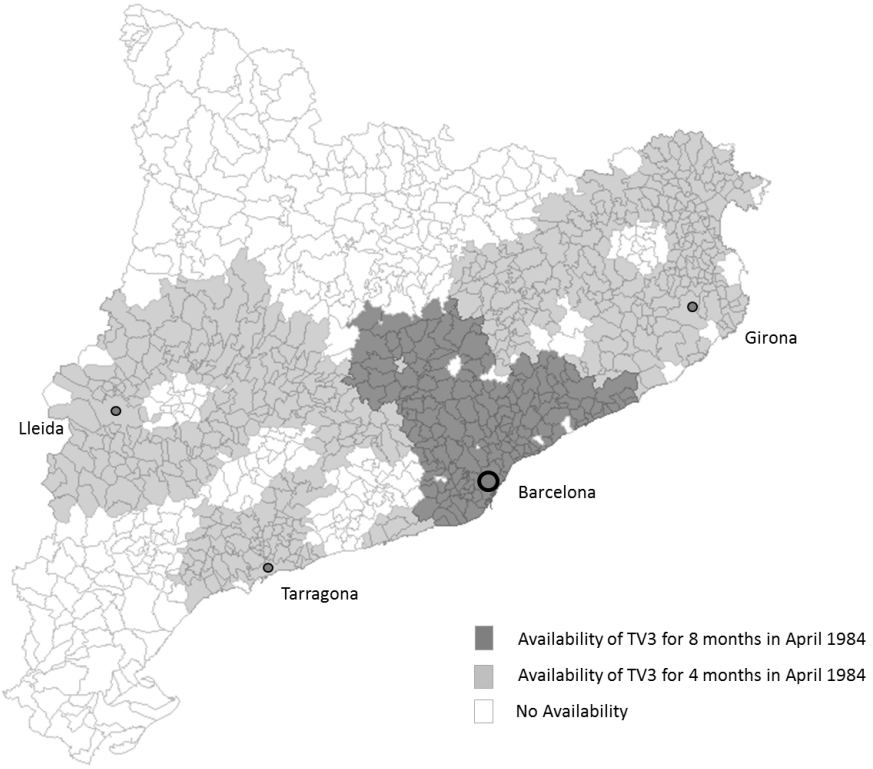
The second placebo randomly assigns the area used as control group to a fake placebo treatment. We produce this random placebo treatment in order to stay with the same ratio of areas in the control and placebo treated as the one found between our treated and control areas, namely 65.64% of treated with respect to the total number of municipalities, that means 211 treated and 110 untreated. And similarly, a DD strategy is combined with PSM in order to have more comparable groups. Once obtained the propensity scores, two treated municipalities are off the common support, then in sum we count on 209 treated and 110 untreated.

Column 3 of the tables 12 and 13 shows the results of the fake placebo treatment test. As we can see, the fake treatment has no effect on the political outcomes neither for the change in the voter turnout nor the CiU vote share. In line with the previous placebo test, these results also contribute to support the idea that there are not pre-existing trends in the DD model.

6.4 Duration Treatment Effect

In addition to estimating the effect of TV3 on those municipalities exposed to the channel, we also analyze the duration of the treatment. That is to say, the difference in the effect of the exposure to TV3 according to how long the municipalities have been exposed. Eight months passed since TV3 began the transmissions until the Catalan parliament elections in April 1984, but not all treated municipalities were assigned to have TV3 at the same time. We then split the treatment group in two: those who received TV3 for a period between 4 and 8 months and those who received it for less than 4 months. The figure 6.1 summarizes the geographically distinct intensities of the exposure to TV3.

Figure 6.1: Availability of TV3 differentiated by duration in Catalonia by April 1984



Source: Prepared by the author based on Montero (1987) and *La Vanguardia* (Table 4 in Annex)

When reducing the sample to those municipalities exposed to TV3 in April 1984,

we have 235 municipalities treated between 4 and 8 months, and 378 municipalities treated for less than 4 months. Similarly, we combine a DD strategy with PSM in order to have more comparable groups. Then, once obtained the propensity scores 5 treated municipalities are off the common support, thus we finally count on 230 treated and 378 untreated.

As we can see in the econometric results presented in tables 14 and 15, the change both in voter turnout and the CiU vote share are higher on those municipalities treated longer. i.e, there is a statistically significant difference related to the duration of the exposure, and these results are robust to all the econometric specifications.

Regarding voter turnout (Table 14), without controlling for any variable (Column 1), the effect is about 16.7 percentage points and the R^2 is 0.23. Including control variables (Column 2), the effect is 4.6 percentage points and the R^2 raises to 0.48. When including district fixed effects (Column 3), the coefficient gives an effect of 34.8 percentage points and the R^2 goes up to 0.52. And with province fixed effects (Column 4), the impact is about 5.1 percentage points and the R^2 is about 0.49.

Also, there is a duration treatment effect on the CiU vote share (Table 15). With no controls (Column 1), the effect is about 30 percentage points and the R^2 is 0.42. Including control variables (Column 2), the effect is 9.2 percentage points and the R^2 raises to 0.73. When including district fixed effects (Column 3), the coefficient is 17.7 percentage points and the $R^2$is 0.80. And finally with province fixed effects (Column 4), the impact is about 16.1 percentage points and the R^2 is 0.78.

6.5 Persuasion Rates

According to DellaVigna and Gentzkow (2010), wherever possible is important to report results in terms of the "persuasion rate". This is a measure of the percentage of receivers that change the behavior amongst those that receive a message and are not already persuaded. The persuasion rate is defined as follows:

$$f = 100 * \frac{y_T - y_C}{e_T - e_C} \frac{1}{(1 - y_0)} \tag{6.1}$$

where e_i is the share of group i receiving the message, y_i is the share of group i adopting the behavior of interest, and y_0 is the share that would adopt if there were no message. Due to that y_0 is not observed, we can approximate it by y_c, the turnout in the control group, as long as the exposure to TV3 of the control groups is zero ($e_C = 0$), which is the case in this study[11].

The persuasion rate captures the effect of the persuasion treatment on the relevant behavior ($y_T - y_C$), which is the estimated effect of the change in the political outcomes $\hat{\beta}_1$, adjusting for exposure to the message ($e_T - e_C$) and for the size of the population left to be convinced ($1 - y_0$).

For the case of voter turnout, the value of ($y_T - y_C$) is on average 0.05 (taking the average of $\hat{\beta}_1' s$ estimated with controls and fixed effects). Due to the fact that $y_0 \approx y_C$, then $y_0 = 0.68$, which is the turnout in the control group in the 1984 Catalan Parliamentary election. And the exposure rate can be $(e_T - e_C) = (34\% - 0)$ if we follow the figures about TV3 audience provided by Jones (2007) for 1986 and we assume that this audience is very similar in 1984 and $e_C = 0$. Using the equation 6.1, the persuasion rate of TV3 on voter turnout in the 1984 Catalan parliamentary election is about 46%. It can be said that about 46% of those who were not already persuaded in the treated population changed their behavior and went out to vote in due to the influence of TV3.

For the case of the CiU vote share, the value of ($y_T - y_C$) is 0.09 and $y_0 = 0.65$, which is the CiU vote share in the control group in the 1984 Catalan Parliamentary election

[11] DellaVigna and Gentzkow (2010, p. 5) provides a demostration of such approximation. Assuming random exposure and a constant persuasion rate f, the share in group i who adopt the behavior is $y_i = y_0 + e_i f (1 - y_0)$. Rearranging this expression gives equation (6.1). Solving the system for y_0, it can be obtained $y_0 = y_C - e_C (y_T - y_C) (e_T - e_C)$. The approximation $y_0 = y_C$ is valid as long as the exposure rate in the control group is small ($e_C \approx 0$) or the effect of the treatment is small ($y_T - y_0 \approx 0$).

and we assume the same TV3 audience. Using the equation 6.1, the persuasion rate of TV3 on the CiU vote share in the 1984 Catalan parliamentary election is about 75.6%. It can be said therefore that about 75.6% of those who were not already persuaded in the treated population changed their behavior and decided to go out to vote for CiU due to the exposure to TV3.

Persuasion Rates in the Literature: How large is the persuasion rate? DellaVigna and Kaplan (2007) and DellaVigna and Gentzkow (2010) provide a summary of the persuasion rates obtained by different salient studies. According to DellaVigna and Kaplan (2007), regarding voter turnout, the field experiment carried out by Gerber and Green (2000) (Canvassing, Telephone Calls and Direct Mail) presents the largest persuasion rate: 26.30%, also Green and Gerber (2001) (Phone call or face-to-face contact) with 20.50%. With regards to the effect of biased media on voting behavior, DellaVigna and Kaplan (2007) (FOX News) presents a persuasion rate of 11.60%; Enikolopov et al. (2011) (Non-governmental TV), 10.20%; and Gerber et al. (2009) (Washington Post), 20%. Then, it can be regarded that the persuasion rate of TV3 both on the voter turnout and the CiU vote share of the 1984 Catalan parliamentary election is comparatively larger with respect to other case studies.

7 Final Remarks

This paper studies the impact of media on voting. We consider one of the most important changes in the Catalan media system in the last decades, the introduction and expansion of TV3 between 1983 and 1984. We resort to a natural experiment induced by the timing of the entry of TV3 in the Catalan territory in order to identify the effect of this channel on the voter turnout and the vote share of the nationalist coalition CiU, who has mainly driven the channel since then, in the 1984 parliamentary election.

The main conclusion arising from this study is that TV3 caused an increase in the

voter turnout as well as favored the CiU vote share in the 1984 Catalan parliamentary election. Thus, this study contributes to the discussion on the media effect on electoral outcomes using Catalonia as a case study.

Regarding voter turnout, unlike some studies like Gentzkow (2006) finds a negative effect of TV on voter turnout as a result of a crowding-out effect, it can be said that TV3, instead of reducing the level of political information, actually complemented the information provided by the traditional media by that time such as TVE, newspapers and radio and make more individuals go out to vote. This finding is congruent with other studies surveyed above (Strömberg, 2004; Oberholzer-Gee and Waldfogel, 2010; Snyder and Strömberg, 2010; Gentzkow et al., 2011; Drago et al., 2013), which defend the insight that media promote electoral participation by making better informed individuals. Thus, TV3 indeed boosted an increase in electoral participation in the 1984 Catalan parliamentary election.

With respect to the CiU vote share, the TV3 effect is in line with most of the related literature on political persuasion (DellaVigna and Kaplan, 2007; Gerber et al., 2009; DellaVigna and Gentzkow, 2010; Enikolopov et al., 2011; Hierro, 2012).We found evidence that the increase in the CiU vote share -the political party who created and has mostly driven this channel since then- by that time was a phenomenon attributable to TV3. As mentioned in the introduction, providing empirical support on the effect of TV3 on the political tension of the last decade in Catalonia is still a challenge. However, this paper showed that the effect of TV3 can be traced back to the early 80s when the channel was initially settled.

Further, we found that the duration of the exposure is also significant. i.e. those municipalities exposed longer (between 4 and 8 months) present a higher effect both in the voter turnout and the CiU vote share in comparison to those less exposed (less than 4 months).

Finally, the persuasion rate, which is a measure of the percentage of individuals

that change the behavior amongst those that receive a message and are not already persuaded, on the voter turnout is about 46%, and the persuasion rate on the CiU vote share is about 75.6%. In comparison to other case studies, these persuasion rates are quite large which makes evident the important role of TV3 in the early 80's Catalan politics.

Many questions are still opened for future research. Firstly, what and how large is the actual bias of TV3 today? Secondly, has TV3 favored the CiU vote share in more recent years? And thirdly, has TV3 fueled citizen mobilizations in favour of separatism in Catalonia? Further, another topic of great significance is the role of competition. The insight that competition amongst media can limit the scope of persuasion has important implications for regulation and public policy, but it has not been explored enough yet. Does TV3 still have an influence on political attitudes in the context of a wider range of media today (TV, radio and internet)? Providing a convincing answer to these questions will help us to understand to a greater extent the role of media in the Catalan politics today.

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Annex

Table 2: Results of Regional Elections in Catalonia (Vote share in parenthesis)

Year	CiU	PSC	PP	IC	ERC	C's	CUP	Others	Total	Elected President
1980	754,448	608,689	64,119	509,014	241,711	-	-	516,005	2,693,986	Jordi Pujol (CiU)
	(28.00)	(22.59)	(2.38)	(18.89)	(8.97)			(19.15)		
1984	1,345,513	865,449	221,697	160,586	126,865	-	-	142,011	2,862,121	Jordi Pujol (CiU)
	(47.01)	(30.24)	(7.75)	(5.61)	(4.43)			(4.96)		
1988	1,230,356	800,999	143,062	208,689	111,276	-	-	178,741	2,673,123	Jordi Pujol (CiU)
	(46.03)	(29.96)	(5.35)	(7.81)	(4.16)			(6.69)		
1992	1,218,.831	726,099	157,395	171,455	209,881	-	-	122,320	2,605,981	Jordi Pujol (CiU)
	(46.77)	(27.86)	(6.04)	(6.58)	(8.05)			(0.47)		
1995	1,314,548	797,422	420,341	312,371	304,833	-	-	28,720	3,178,235	Jordi Pujol (CiU)
	(41.36)	(25.09)	(13.23)	(9.83)	(9.59)			(0.09)		
1999	1,172,721	1,177,777	295,765	78,213	270,176	-	-	87,084	3,081,736	Jordi Pujol (CiU)
	(38.05)	(38.22)	(9.60)	(2.54)	(8.77)			(2.83)		
2003	1,018,164	1,026,396	390,882	240,235	542,046	-	-	44,018	3,261,741	Pasqual Maragall (PSC)
	(31.22)	(31.47)	(11.98)	(7.37)	(16.62)			(1.35)		
2006	928,936	789,956	313,368	281,405	414,044	89,544	-	68,640	2,885,893	José Montilla (PSC)
	(32.19)	(27.37)	(10.86)	(9.75)	(14.35)	(3.10)		(0.24)		
2010	1,198,193	570,405	384,470	229,853	218,152	105,884	-	314,503	3,021,460	Artur Mas (CiU)
	(39.66)	(18.88)	(1.27)	(7.61)	(7.22)	(3.50)		(10.41)		
2012	1,112,605	523,537	470,759	358,860	496,466	274,652	126,198	209,729	3,572,806	Artur Mas (CiU)
	(31.14)	(14.65)	(13.18)	(1.00)	(13.90)	(7.69)	(3.53)	(5.87)		

Source: Idescat

Table 3: Directors of Catalan Broadcasting Corporation

Director	Years	Political Party
Pere Cuxart Bartolí	1983-1984	CiU
Josep Caminal Bahía	1984	CiU
Joan Granados Llevarán	1984-1995	CiU
Jordi Vilajoana	1995-1999	CiU
Luis Oliva Vázquez de Novoa	1999-2000	CiU
Miquel Puig Raposo	2000-2002	CiU
Vicenç Villatoro	2002-2004	CiU
Joan Majó Cruzate	2004-2008	PSC
Albert Sàez Casas	2008-2010	ERC
Enric Marín Otto	2010-2012	ERC
Brauli Duart Llinares	2012-presente	CiU

Source: Corporación Catalana de Medios Audiovisuales

Table 4: Information on TV3 coverage from newspaper *La Vanguardia*

Date	Page	Article
Monday, January 02, 1984	42	TV Catalana 1983: un año de grandes esperanzas
Friday, January 06 1984	19	TV3 llegó a las comarcas de Lleida
Friday, January 13 1984	25	El repetidor de TV3 en Rocacorba no cubrirá todas las comarcas de Girona
Thursday, April 05 1984	23	Los hoteleros de la Vall d'Aran se quejan de las anomalías de TV
Saturday, April 07 1984	6	Las islas Baleares quieren "conectar" con TV3
Thursday, June 13 1985	29	TVE y TV3 estudian la cobertura del Pallars Sobira y la Vall d'Aran
Wednesday, June 26 1985	23	A partir de septiembre, TV3 se captará en buenas condiciones en toda la zona del Pirineo
Saturday, July 27 1985	19	La po1ítca de reemisores de TV3 perjudica los acuerdos con TVE, según Calviño
Saturday, July 27 1985	40	Calviño inauguró ayer un centro emisor en el Pirineo leridano

Table 5: Summary Statistics

Variables	All Municipalities	TV3 in April 1984	No TV3 in April 1984	Difference	Variables	All Municipalities	TV3 in April 1984	No TV3 in April 1984	Difference
CiU Vote Share 1980	0.338	0.341	0.330	0.010	Share Non-Native	0.152	.169 (.135)	0.118	0.056***
	(0.187)	(0.190)	(0.181)		Catalan 1981	(0.126)		(0.099)	
CiU Vote Share 1984	0.648	0.645	0.653	-0.008	Share Non-Native	0.229	0.253	0.183	0.077***
	(0.158)	(0.151)	(0.172)		Catalan 1986	(0.163)	(0.172)	(0.130)	
Voter Turnout 1980	0.582	0.577	0.592	-0.008	Share BUP COU 1981	0.038	0.038	0.037	0.002
	(0.171)	(0.185)	(0.137)			(0.024)	(0.022)	(0.027)	
Voter Turnout 1984	0.691	0.697	0.681	0.019**	Share BUP COU 1986	0.044	0.045	0.041	0.006**
	(0.088)	(0.078)	(0.100)			(0.022)	(0.023)	(0.022)	
Total Population 1981	6,370	8,878	1,595	7,145*	Share Mid Graduate	0.016	0.016	0.014	0.002*
	(59,971)	(73,929)	(3,071)		1981	(0.017)	(0.018)	(0.013)	
Total Population 1984	6,465	9,000	1,621	7,244*	Share Mid Graduate	0.018	0.019	0.016	0.003**
	(60,376)	(74,384)	(3,085)		1986	(0.013)	(0.013)	(0.013)	
Log Total Population	6.807	6.984	6.468	0.588***	Share Superior 1981	0.014	0.015	0.012	0.002**
1981	(1.560)	(1.644)	(1.324)			(0.014)	(0.012)	(0.016)	
Log Total Population	6.828	7.013	6.476	0.610***	Share Superior 1986	0.018	0.018	0.017	0.001*
1984	(1.567)	(1.649)	(1.331)			(0.013)	(0.014)	(0.013)	
Share Men 1981	0.505	0.503	0.509	-0.006***	Distance to Barcelona	4,781	4,283	5,736	-1,523***
	(0.024)	(0.020)	(0.028)		(Km)	(3,112)	(2,906)	(3,287)	
Share Men 1984	0.505	0.503	0.509	-0.006**	Log Distance to	8.105	7.959	8.385	-0.450***
	(0.026)	(0.023)	(0.030)		Barcelona	(1.084)	(1.139)	(0.907)	
Share Catalan	0.888	0.883	0.903	-0.022**	Banks 1981	0.465	0.484	0.429	0.054
Speakers 1981	(0.122)	(0.110)	(0.137)			(0.499)	(0.500)	(0.495)	
Share Catalan	0.954	0.964	0.929	0.037***	Banks 1984	0.496	0.517	0.459	0.057*
Speakers 1986	(0.179)	(0.138)	(0.115)			(0.500)	(0.500)	(0.499)	
Total Observations	941	635	306						

Source: Idescat. Standard errors in parenthesis.

Table 6: Logit Model of the Availability of TV3 in April 1984

Co-variates	Marginal Effects
Voter Turnout 1980	0.412
	(1.028)
CiU Vote Share 1980	1.879
	(1.144)
Log Total Population 1981	0.363**
	(.178)
Share of Men 1981	-7.895*
	(4.083)
Share of Non-native 1981	3.533
	(2.307)
Share of Catalan Speakers 1981	0.081
	(0.878)
Share of BUP COU 1981	-2.246
	(4.681)
Share of Mid Graduate 1981	4.485
	(5.476)
Share of Professional Diploma 1981	9.167
	(7.073)
Banks 1981	-0.943**
	(0.329)
Constant	1.062
	(2.940)
Prob > chi2	0.000
Pseudo R^2	0.065
N	934

Note: *** 99% of confidence level, ** 95%, and * 90%.
Clustered standard errors at district level in parenthesis.

Table 7: Balancing test for co-variates used to estimate propensity scores

		Kernel Matching					
		Mean		%Bias	%Reduct Bias	p>|t|	
		Treated	Control				
Voter Turnout 1980	Unmatched	0.577	0.592	-9.1		0.208	
	Matched	0.595	0.596	-0.7	92.7	0.905	
CiU Vote Share 1980	Unmatched	0.340	0.331	4.8		0.488	
	Matched	0.348	0.354	-3.3	32.5	0.574	
Log Total Population 1981	Unmatched	6.985	6.479	34.0		0.000	***
	Matched	6.821	6.754	4.5	86.7	0.413	
Share of Men 1981	Unmatched	0.503	0.509	-23.2		0.000	***
	Matched	0.503	0.504	-0.8	96.5	0.723	
Share of Non-native 1981	Unmatched	0.169	0.118	42.5		0.000	***
	Matched	0.156	0.153	2.3	94.6	0.695	
Share of Catalan Speakers 1981	Unmatched	0.883	0.903	-16.4		0.015	**
	Matched	0.890	0.900	-5.7	65.1	0.264	
Share of BUP COU 1981	Unmatched	0.038	0.037	6.3		0.395	
	Matched	0.037	0.038	-3.9	37.4	0.472	
Share of Mid Graduate 1981	Unmatched	0.016	0.014	12.3		0.089	*
	Matched	0.015	0.016	-0.6	94.8	0.897	
Share of Professional Diploma 1981	Unmatched	0.015	0.012	15.9		0.016	**
	Matched	0.014	0.014	3.4	78.5	0.543	
Banks 1981	Unmatched	0.484	0.429	11.0		0.112	
	Matched	0.464	0.452	2.5	77.4	0.672	

Note: *** 99% of confidence level, ** 95%, and * 90%.

This "bias" is defined as the difference of the mean values of the treatment group and the (not matched / matched) non treatment group, divided by the square root of the average sample variance in the treatment group and the not matched non treatment group.

Table 8: Number of municipalities included as control and treated (Part I)

District	Number Municipalities	Treated			Control		
		Total Treated	On Common Support	Off Common Support	Total Control	On Common Support	Off Common Support
Alt Camp	23	23	23	0	0	0	0
Alt Empordà	68	65	65	0	3	3	0
Alt Penedès	27	27	27	0	0	0	0
Alt Urgell	19	0	0	0	19	19	0
Alta Ribagorça	3	0	0	0	3	3	0
Anoia	33	33	31	2	0	0	0
Bages	35	34	33	1	1	1	0
Baix Camp	28	26	26	0	2	2	0
Baix Ebre	12	0	0	0	12	12	0
Baix Empordà	36	34	34	0	2	2	0
Baix Llobregat	29	29	22	7	0	0	0
Baix Penedès	14	0	0	0	14	14	0
Barcelonès	5	5	1	4	0	0	0
Berguedà	30	0	0	0	30	30	0
Cerdanya	16	0	0	0	16	16	0
Conca de Barberà	22	0	0	0	22	22	0
Garraf	6	6	6	0	0	0	0
Garrigues	24	24	24	0	0	0	0
Garrotxa	21	21	21	0	0	0	0
Gironès	25	25	24	1	0	0	0
Maresme	30	28	26	2	2	2	0

Table 9: Number of municipalities included as control and treated (Part II)

District	Number Municipalities	Treated			Control		
		Total Treated	On Common Support	Off Common Support	Total Control	On Common Support	Off Common Support
Montsià	12	0	0	0	12	12	0
Noguera	30	29	29	0	1	1	0
Osona	51	50	50	0	1	1	0
Pallars Jussà	14	0	0	0	14	14	0
Pallars Sobirà	15	0	0	0	15	15	0
Pla d'Urgell	16	0	0	0	16	16	0
Pla de l'Estany	11	0	0	0	11	11	0
Priorat	23	0	0	0	23	23	0
Ribera d'Ebre	14	0	0	0	14	14	0
Ripollès	20	0	0	0	20	20	0
Segarra	21	21	21	0	0	0	0
Segrià	37	36	34	2	1	1	0
Selva	25	22	22	0	3	3	0
Solsonès	15	0	0	0	15	15	0
Tarragonès	20	20	18	2	0	0	0
Terra Alta	12	0	0	0	12	12	0
Urgell	20	20	20	0	0	0	0
Val d'Aran	9	0	0	0	9	9	0
Vallès Occidental	22	22	17	5	0	0	0
Vallès Oriental	42	40	36	4	2	2	0
Total	935	613	583	30	323	323	0

Table 10: The Effect of TV3 on Voter Turnout in the 1980-1984 Catalan Parliamentary Elections

	Change in Voter Turnout 1980-1984			
	(1)	(2)	(3)	(4)
Availability of TV3 in April 1984	0.105***	0.038**	0.078***	0.031**
	(0.010)	(0.010)	(0.015)	(0.009)
Control Variables				
Change in Total Population 1981-1984		-0.179*	-0.194**	-0.133
		(0.092)	(0.086)	(0.087)
Change in Share of Men 1981-1984		0.0815	0.154	0.158
		(0.255)	(0.245)	(0.249)
Change in Share of Non-native 1981-1986		0.645***	0.211**	0.564***
		(0.108)	(0.103)	(0.096)
Change in Share of Catalan Speakers 1981-1986		0.006	0.048	0.018
		(0.041)	(0.032)	(0.032)
Change in Share of BUP COU 1981-1986		-0.658**	-0.689***	-0.672**
		(0.202)	(0.173)	(0.198)
Change in Share of Mid Graduate 1981-1986		-0.103	-0.338	-0.246
		(0.300)	(0.311)	(0.353)
Change in Share of Professional Diploma 1981-1986		0.432	0.183	0.254
		(0.258)	(0.327)	(0.383)
Banks 1984		0.045***	0.026**	0.044***
		(0.011)	(0.009)	(0.008)
District Fixed Effects			X	
Province Fixed Effects				X
R^2	0.202	0.361	0.469	0.369
Prob>F	0.000	0.000	-	0.000
N	904	904	904	904

Note: *** 99% of confidence level, ** 95%, and * 90%.
Clustered robust standard errors at district level (in parenthesis) except for Column 3 where we instead include district fixed effects and robust standard errors.

Table 11: The Effect of TV3 on CiU Vote Share in the 1980-1984 Catalan Parliamentary Elections

	Change in CiU Vote Share 1980-1984			
	(1)	(2)	(3)	(4)
Availability of TV3 in April 1984	0.311***	0.136***	0.066**	0.096***
	(0.006)	(0.021)	(0.022)	(0.011)
Control Variables				
Change in Total Population 1981-1984		-0.420**	-0.149	-0.116
		(0.195)	(0.124)	(0.156)
Change in Share of Men 1981-1984		-0.981	-0.354	-0.381
		(0.621)	(0.443)	(0.577)
Change in Share of Non-native 1981-1986		1.932***	0.272*	1.197***
		(0.253)	(0.161)	(0.168)
Change in Share of Catalan Speakers 1981-1986		-0.237**	-0.054	-0.157*
		(0.111)	(0.048)	(0.083)
Change in Share of BUP COU 1981-1986		0.231	0.141	0.136
		(0.444)	(0.312)	(0.353)
Change in Share of Mid Graduate 1981-1986		0.342	-0.474	-0.392
		(0.682)	(0.422)	(0.480)
Change in Share of Professional Diploma 1981-1986		1.693**	-0.398	0.427
		(0.560)	(0.447)	(0.506)
Banks 1984		0.076**	0.034**	0.065***
		(0.023)	(0.015)	(0.016)
District Fixed Effects			X	
Province Fixed Effects				X
R^2	0.418	0.651	0.816	0.734
Prob>F	0.000	0.000	-	0.000
N	904	904	904	904

Note: *** 99% of confidence level, ** 95%, and * 90%.

Clustered robust standard errors at district level (in parenthesis) except for Column 3 where we instead include district fixed effects and robust standard errors.

Table 12: Placebo Tests on Voter Turnout in the 1980-1984 Catalan Parliamentary Elections

	Change in Voter turnout 1980-1984		
	(1)	(2)	(3)
Availability of TV3 in April 1984		0.077	
		(0.015)	
Placebo 1: Availability of TV3 in December 1984	-0.126	-0.125	
	(0.087)	(0.087)	
Placebo 2: Fake Treatment Group			-0.002
			(0.012)
Control Variables			
Change in Total Population 1981-1984	-0.210**	-0.210	-0.030
	(0.085)	(0.085)	(0.151)
Change in Share of Men 1981-1984	0.205	0.191	0.954
	(0.237)	(0.239)	(0.649)
Change in Share of Non-native 1981-1986	0.212**	0.221	0.160
	(0.105)	(0.104)	(0.176)
Change in Share of Catalan Speakers 1981-1986	0.047	0.047	0.075
	(0.032	(0.032)	(0.071)
Change in Share of BUP COU 1981-1986	-0.731***	-0.694	-0.497**
	(0.172)	(0.172)	(0.246)
Change in Share of Mid Graduate 1981-1986	-0.379	-0.340	-0.674*
	(0.313)	(0.311)	(0.397)
Change in Share of Professional Diploma 1981-1986	0.123	0.179	-0.192
	(0.327)	(0.326)	(0.523)
Banks 1984	0.020**	0.024	0.024*
	(0.009)	(0.009)	(0.013)
District Fixed Effects	X	X	X
R^2	0.468	0.476	0.536
Prob>F	-	-	-
N	904	904	319

Note: *** 99% of confidence level, ** 95%, and * 90%.
Robust standard errors (in parenthesis).

Table 13: Placebo Tests on CiU vote share in the 1980-1984 Catalan Parliamentary Elections

	Change in CiU Vote Share 1980-1984		
	(1)	(2)	(3)
Availability of TV3 in April 1984		0.066**	
		(0.022)	
Placebo 1: Availability of TV3 in December 1984	-0.000	0.001	
	(0.086)	(0.086)	
Placebo 2: Fake Treatment Group			-0.000
			(0.019)
Control Variables			
Change in Total Population 1981-1984	-0.148	-0.149	-0.167
	(0.125)	(0.123)	(0.264)
Change in Share of Men 1981-1984	-0.343	-0.354	-0.364
	(0.441)	(0.444)	(1.262)
Change in Share of Non-native 1981-1986	0.264	0.272*	0.223
	(0.160)	(0.161)	(0.262)
Change in Share of Catalan Speakers 1981-1986	-0.053	-0.054	0.040
	(0.048)	(0.048)	(0.076)
Change in Share of BUP COU 1981-1986	0.110	0.141	0.768
	(0.315)	(0.312)	(0.715)
Change in Share of Mid Graduate 1981-1986	-0.508	-0.474	-1.186
	(0.421)	(0.422)	(0.883)
Change in Share of Professional Diploma 1981-1986	-0.445	-0.398	-2.012**
	(0.450)	(0.448)	(0.998)
Banks 1984	0.031**	0.034**	0.057**
	(0.014)	(0.015)	(0.024)
District Fixed Effects	X	X	X
R^2	0.815	0.816	0.836
Prob>F	-	-	-
N	904	904	319

Note: *** 99% of confidence level, ** 95%, and * 90%.
Robust standard errors (in parenthesis).

Table 14: Duration Treatment on Voter Turnout in the 1980-1984 Catalan Parliamentary Elections

	Change in Voter Turnout 1980-1984			
	(1)	(2)	(3)	(4)
Duration Treatment	0.167***	0.046**	0.348***	0.051**
	(0.020)	(0.014)	(0.037)	(0.017)
Control Variables				
Change in Total Population 1981-1984		-0.569**	-0.482**	-0.550**
		(0.232)	(0.183)	(0.233)
Change in Share of Men 1981-1984		-0.796	-0.438	-0.702
		(0.547)	(0.575)	(0.536)
Change in Share of Non-native 1981-1986		1.279***	1.090***	1.267***
		(0.193)	(0.268)	(0.213)
Change in Share of Catalan Speakers 1981-1986		0.004	-0.033	0.022
		(0.093)	(0.085)	(0.092)
Change in Share of BUP COU 1981-1986		-1.695**	-1.938***	-1.766**
		(0.546)	(0.488)	(0.545)
Change in Share of Mid Graduate 1981-1986		-0.442	-0.587*	-0.378
		(0.357)	(0.340)	(0.352)
Change in Share of Professional Diploma 1981-1986		-0.426	-0.351	-0.718
		(0.469)	(0.498)	(0.435)
Banks 1984		0.042**	0.013	0.034**
		(0.011)	(0.015)	(0.012)
District Fixed Effects			X	
Province Fixed Effects				X
R^2	0.231	0.479	0.522	0.485
Prob>F	0.000	0.000	0.000	0.000
N	608	608	608	608

Note: *** 99% of confidence level, ** 95%, and * 90%.
Duration Treatment: 1: between 4 and 8 months, and 0: less than 4 months.
Clustered robust standard errors at district level (in parenthesis) except for Column 3 where we instead include district fixed effects and robust standard errors.

Table 15: Duration Treatment on CiU Vote Share in the 1980-1984 Catalan Parliamentary Elections

	Change in CiU Vote Share 1980-1984			
	(1)	(2)	(3)	(4)
Duration Treatment	0.300***	0.092**	0.177***	0.161***
	(0.010)	(0.023)	(0.031)	(0.030)
Control Variables				
Change in Total Population 1981-1984		0.313	0.113	0.229
		(0.191)	(0.160)	(0.173)
Change in Share of Men 1981-1984		-0.377	0.701	0.226
		(0.580)	(0.489)	(0.520)
Change in Share of Non-native 1981-1986		1.986***	0.985***	1.362***
		(0.204)	(0.198)	(0.285)
Change in Share of Catalan Speakers 1981-1986		-0.570***	-0.330***	-0.403**
		(0.107)	(0.081)	(0.112)
Change in Share of BUP COU 1981-1986		0.391	-0.762*	-0.234
		(0.576)	(0.421)	(0.511)
Change in Share of Mid Graduate 1981-1986		0.928**	0.595	0.841**
		(0.289)	(0.435)	(0.318)
Change in Share of Professional Diploma 1981-1986		0.279	-0.391	-0.476
		(0.695)	(0.516)	(0.631)
Banks 1984		0.086***	0.015	0.046**
		(0.020)	(0.016)	(0.017)
District Fixed Effects			X	
Province Fixed Effects				X
R^2	0.421	0.736	0.806	0.780
Prob>F	0.000	0.000	0.000	0.000
N	608	608	608	608

Note: *** 99% of confidence level, ** 95%, and * 90%.
Duration Treatment: 1: between 4 and 8 months, and 0: less than 4 months.
Clustered robust standard errors at district level (in parenthesis) except for Column 3 where we instead include district fixed effects and robust standard errors.

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