

Lazily Informed: Consumer Inertia and News Diets*

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Abstract

This paper studies the effect of entertainment content on the propensity to consume news through consumers' inertia on outlet choice. It uses the legally-induced cancellation of the game-show Pasapalabra in 2019 to study audience inertia around news-broadcasts. The cancellation of this popular show is estimated to have decreased news audience by about 28% on the largest Spanish news broadcast, which was emitted on the same channel directly after the canceled show. This paper estimates a dynamic discrete demand model for audience with consumer inertia to show the impact of entertainment programming on subsequent news broadcasts. It employs a high frequency panel-dataset on individual viewer choices to disentangle heterogeneous preferences from inertia. Additionally, it uses data from the 2019 Spanish national elections that happened before and after the cancellation to provide suggestive evidence that the decrease in viewership of Telecinco's news broadcast can be associated to a decrease in voter participation.

Keywords: Consumer Inertia, Media, News, Voter Participation, Demand Estimation

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1 Introduction

On TV, radio, and social media, hard news is often surrounded by non-informative entertainment content. Individuals frequently consume entertainment content and remain on the same media outlet for news content. This raises questions about the role entertainment content plays in determining individuals' news diets. News media outlets vary in both political slant and quality; where people inform themselves, if at all, can have a large impact on political outcomes.¹

In this paper, I demonstrate that entertainment media and the inertia to stay on the same media outlet play a pivotal role in the information decisions of consumers. I estimate a structural model of viewer behavior using a panel dataset of high-frequency choices of individual viewers in a setting with an exogenous shock to programming. I am thereby able to disentangle viewers' heterogeneous preferences for programming from their structural dependence of remaining on the same outlet. My results demonstrate that inertia is present on different levels of the television market: on the show level, on the channel level, and on the level of the entire television market. The strength of this inertia is often greater than the difference in preferences for different programs for a given viewer, showing that inertia plays a pivotal role in content choice. This is relevant in both the news diets of voters as well as general competition dynamics between different media outlets. This paper is the first to empirically model the direct effect of inertia and entertainment content on the choice of news outlets. It is also the first to structurally model inertia across different levels of the television media market, separating the inertia to continue watching a specific channel from the inertia to continue watching television across all channels.

The tendency for individuals to continue consuming the same media platform can be the result of two separate mechanisms. Consumers' preferences for content for a given platform may be correlated over time. Alternatively, individuals' choices in one period may depend on previous choices, such as is the case with switching costs. In many settings, programming changes are endogenous to viewer preferences, complicating the identification of structural state-dependence and heterogeneous preferences. This paper analyzes inertia and its effect on news diets using variation in viewing behavior in response to the legally induced cancellation² of a popular Spanish game show³ which was emitted Monday through Friday directly preceding the most watched news broadcast. The show that was broadcast in

¹Some key papers documenting this are DellaVigna and Kaplan (2007) and Enikolopov et al. (2011). A more extensive review of this literature can be found below.

²The cancellation was the result of a ruling by the Supreme Court in relation to a copyright infringement lawsuit by an English media company.

³The show, *Pasapalabra*, had a peak viewership above 5 million viewers, more than 10% of the Spanish population.

its place was less popular, leading to a large decrease in viewership before the most watched prime-time news broadcast. There was no notable change to the structure of competitors' programming, nor the structure of any of the main primetime news broadcasts, including the one following the show. This provides a unique opportunity to study inertia and its effect on news viewership, since cancellations and other changes in programming made by media companies usually affect a smaller portion of viewers and are endogenous to viewer demand.

This setting provides additional advantages. Unlike other media types, television markets have detailed data on all the options available to the consumer at a given time, as well as data on consumer choices at a very granular level. This setting is a natural starting point for measuring the impact of inertia on news diets. From a news media perspective, television remains one of the key information sources in modern society. In recent months, 18-34 year olds in the US watched over two hours of TV news broadcasts a week Nielsen TV Measurement (May 2023-June 2024). In Europe in 2023, the majority of adults received most of their information on European politics from TV news, with over 88% of adults watching TV at least once a month Eurobarometer (2023).

In the first part of the paper, I document the effect of the cancellation on the viewership of the channel with the programming change. Additionally, I analyze how the change in viewership in the time-slot before the mainstream prime-time news broadcast effected the viewers' news watching behavior in the following time-slot. I estimate a drop in news viewership of 28% on the largest mainstream news broadcast. In addition, I show that the increase in other mainstream news broadcasts was only a fraction of this size, implying a general decrease in the consumption of mainstream national TV news. These large changes in viewership further motivate the structural analysis of inertia and its role in news consumption.

In the second part of the paper, I estimate viewer behavior using a discrete choice model with structural state dependence. Observed persistence in choices can be the result of both a structural dependence on past choices as well as unobserved correlation in preferences Heckman et al. (1981). I take advantage of a panel of high-frequency individual viewing behavior of over 15,000 viewers in order to disentangle heterogeneous preferences for content from structural dependence of past behavior. In the model, I estimate the distribution of preferences for content. I also estimate structural inertia, which I decompose into different parts, to differentiate between inertia for watching any television channel, inertia for specific channels, and inertia for specific shows.

The estimated preferences for the mainstream news channels show that the main news broadcasts have similar average appeal with heterogeneity across consumers for which news channel is their most preferred. The estimates for channel inertia is large enough to overcome the difference in preferences for the different news broadcast for the majority of viewers.

I use the estimated structural model to show that between 36% to 56% of aggregate viewership of the main news broadcasts can be attributed to channel inertia, depending on the channel. Additionally, I show that increasing the popularity of entertainment programming preceding a news broadcast increases its market share and increases overall news consumption. This demonstrates that subsidizing entertainment programming preceding the news can be an effective policy tool to increase overall TV news consumption across all main prime time news channels. It also shows that media outlets with possible persuasive motives can use entertainment programming to increase the reach of their news broadcasts.

In the final part of the paper, I connect the programming shock to changes in voter participation. The cancellation, along with its effect on TV news diets, occurred 6 weeks before the Spanish national elections in November 2019. These elections were the second national elections to occur that year, since no party was able to form a government after the elections held in April of the same year. This provides voting outcomes in a very similar context, with one election just before the shock and the other after the shock. Using a viewer panel data set as well as census data, I estimate the popularity of the show in over 35,000 Spanish voting sections. I regress this estimated popularity on the difference in voting outcomes and show that being a frequent Pasapalabra viewer was related to a 5-10% drop in voter participation. These results are robust to the inclusion of a variety of different controls for general political engagement; voter fatigue from repeated elections; and political dynamics and strategic voting changes. This provides suggestive evidence that the shock to entertainment programming, which changed viewers news diets, is tied to changes in voter participation.

This paper's main contribution is analyzing how entertainment media effects consumers' news consumption through a structural dependence in outlet choice. It is related to multiple strands of literature. The first strand empirically analyzes consumer inertia. The main contribution of this paper to this strand is the decomposition of inertia to different market levels. In this paper, inertia is split into show level, channel level, and television/platform level inertia. In contrast, most papers in the literature only have inertia on the product or brand level. Inertia often takes other names such as brand loyalty or switching costs. Inertia and switching costs have been found to be relevant in many industries such as consumer packaged goods (Shum 2004, Dubé et al. 2010), health insurance Handel (2013), auto insurance Honka (2014), consumer electricity markets Hortaçsu et al. (2017). Bronnenberg et al. (2012) and Eizenberg and Salvo (2015) study habit formation in the grocery and soft drink market respectively. Shcherbakov (2016) uses aggregate data to estimate switching costs in cable television subscriptions. MacKay and Remer (2024) estimate inertia in gas stations

and show the importance of including inertia in merger counterfactuals.⁴

This paper contributes to the more specific literature documenting inertia in television markets. In this paper, I utilize panel data, using individual choices at a higher choice frequency to accurately disentangle inertia from heterogeneous preferences for content. Esteves-Sorenson and Perretti (2012) document consumer inertia in the Italian TV market using reduced form techniques. Yeo (2017) disentangle intrinsic contractions in demand from endogenous scheduling of shows to explain the drop in TV viewership on the weekend, including an inertia component in their viewer demand model. Both of these papers rely on aggregate audience data, further aggregating viewership to a show level. Additionally, unlike this paper, these papers do not distinguish between show, channel, and general television inertia.

This paper further relates to other papers that estimate structural models of television demand. Ivaldi and Zhang (2021) and Ivaldi and Zhang (2022) study the effect of a merger on the advertiser side of the French TV market and estimate audience demand using aggregate viewer data and the nested logit demand model from Berry (1994). Wilbur (2008) study viewer and advertiser preferences for content, to better understand how networks balance the preferences of viewers and advertisers in two-sided television markets. They model viewer demand using aggregate viewer data and a random coefficient logit model from Berry et al. (1995). Ferrer et al (2024) estimate viewers idiosyncratic distaste for advertisement, accounting for demographic level variation in preferences for programming. They show advertisers value advertisement slots that capture more ad-adverse individuals.

Another related strand of literature focusing on how citizens choose what news to consume. The main focus of this literature is on how individuals' preferences for the political slant or bias of the news programs are related to where they inform themselves. This paper contributes to this literature by showing that the choice of news channels is partially influenced by factors unrelated to the content of the news programming. More specifically, the structural model estimates the importance of individual level inertia and preferences in viewers' choices; the strength of viewers' inertia is often greater than the difference in preferences for viewers' first and second program choices at a given time. Therefore, inertia plays a pivotal role in content choice. Key papers from the theoretical literature include Calvert 1985, Suen 2004, Mullainathan and Shleifer 2005, Che and Mierendorff 2019. On the empirical side, Gentzkow and Shapiro (2010) and Gentzkow et al. (2014) document that the slant of newspapers consumed in an area is related to the political preferences of that area. Durante and Knight (2012) analyze changes in slant in Italian TV news following a change in control over certain news channels. They document that some consumers responded to

⁴This is just a small subset of papers that empirically estimate consumer inertia and switching costs. The empirical study of inertia can be traced back to at least as far as Frank (1962).

changes in news slant by switching to other news channels.

A related strand of the literature studies the persuasive effects of news media. DellaVigna and Gentzkow (2010) provide a review of empirical papers studying these persuasive effects. This persuasive effect may be used by governments, or other entities, to try to influence or control the population. The influence of a particular media outlet is referred to as “Media Power.” The attempt to control the media to influence individuals is often referred to as “Media Capture.” Prat (2015) and Enikolopov and Petrova (2015) provide a review of the theoretical and empirical literature on these topics respectively. This paper contributes to this literature by demonstrating that entertainment programming plays a pivotal role in the amount of media power a certain outlet may have, with popular entertainment programming before the news increasing the number of people that the news broadcast can influence. This opens up the ability for an entity to strategically change entertainment programming to try and control the level of influence of certain news outlets. Kennedy and Prat (2019) empirically investigate where people inform themselves to gauge the media power of different news media. They show that in today’s media context, television news media has the greatest amount of media power. This further highlights the importance of studying news diets in the television context.

This paper shows that shock to entertainment programming changed the news diet of the average Spanish citizen. It provides suggestive evidence that this shock, which is seemingly not politically motivated, is related changes in voter participation. This is related to other papers that document changes to media markets and their political implications. Gentzkow (2006) uses historic data to connect the entry/increased popularity of television to drops in voter turnout. He shows this effect is seen mainly in local elections which received more media coverage in newspapers than television. Angelucci et al. (2024) further document the competitive effect the entry of television had on newspapers through a decrease in readership as well as increased competition for advertisers. Gentzkow et al. (2011) show that the entry of the first newspaper in a market increases voter turnout. Cagé (2020) shows that further increasing the number of newspapers competing in the same market decreases news quality and decreases voter turnout. Djourelouva et al. (2024) show that the entry of Craigslist in the market for advertisements decreased the profitability of newspapers, which they connect to a decrease in voter turnout. Barone et al. (2015) analyze the entry of digital TV channels in Italy, which increased the free-to-view channels tenfold. They show that this entry, whose timing varied geographically, was related to drop in vote share for Berlusconi’s party, with a stronger effect in areas with older less educated voters. Their main underlying mechanism is that increased competition makes viewers less likely to watch and be influenced by the pro-Berlusconi channel, run by Mediaset.

Finally, this paper contributes to the literature on the effect of the consumption of entertainment media on political outcomes. It explicitly documents that entertainment content plays a pivotal role in what news sources viewers consume through outlet choice and inertia. The main paper in this literature tying entertainment tv to political outcomes is Durante et al. (2019). In their paper they look at the staggered entry of Berlusconi’s Mediaset channel in Italy and show that areas that were exposed to the channel earlier were more likely to vote for Berlusconi’s party. This channel originally had only entertainment programming. They argue that the main underlying mechanism for younger viewers is that increased exposure to entertainment TV in childhood created less cognitively-sophisticated and civic minded adults increasing their tendency to vote for populist parties. For older viewers, they argue the increased attachment to the channel increased the likelihood to watch the news on that channel, when Mediaset introduced newscast in later years. In this paper, I explicitly show that preferences for entertainment content can change viewers news diets, even if they have a higher preference for news shows on other channels.

2 Setting

This paper studies how entertainment content impacts where people inform themselves, through the tendency to consume entertainment and news programs on the same platform. This phenomenon is present across many different types of media, from online streaming platforms, to radio. This paper demonstrates the relevance of the mechanism, focusing on a programming shock to the Spanish television market. The TV setting provides detailed data on choices available to consumers as well as consumers’ behavior. This rich data along with a shock to programming, that is exogenous to consumer preferences, allows one to see how relevant inertia and entertainment content are to consumer news diets in this setting.

2.1 General Market Characteristics

Free-to-air TV remains one of the main forms of media consumption in Spain, with around 85% of the adult population watching TV on an average day in the time frame of the analysis. An even larger portion, 96% of the adult population, watches TV at least once a month⁵. On any given day, the peak viewership is between 8pm and midnight. The TV News programs of the most popular channels are broadcast towards the beginning of primetime, around 9 pm. TV News is still the most widely used medium for political information in Spain today; it is relied on more than radio, social media, or the traditional press in either print and digital

⁵These numbers refer to the propensity to watch TV on a physical TV set.

formats.⁶

Consumers can choose between close to a hundred different channels free of charge. Despite this large selection, only a handful of channels capture the majority of the audience share. Many of these channels are commonly owned by a small number of large media conglomerates. The two largest media conglomerates are Atresmedia and Mediaset España. The channels controlled by Atresmedia and Mediaset account for more than half of all viewership. The majority of this 60% market share can be attributed to the 4 main private TV channel; Mediaset España controls Telecinco (14%) and Cuatro (6%); Atresmedia controls Antenna 3 (12%) and La Sexta (7%). In addition to the big private channels, the Spanish TV market also has public TV on both the regional and national level. The public broadcasting agency captures 17% of the market, with the majority of that coming from their main channel, La 1 (10%). Regional channels capture about 10% of the national viewership, however, the tendency for viewers to watch regional channels has some geographic variation. In Catalonia, for example, the Catalan TV channel, TV3, is the most watched channel, with a market share of over 14% viewers in the region. A table with more detailed market shares can be found in Appendix A (Section: 7).

2.2 National TV News Broadcasts in Spain

The three most watched TV news broadcasts in Spain are the evening news of La 1, Antenna 3, and Telecinco. All three channels start broadcasting their evening news around 9pm. During the time of the analysis, no major change was made to news anchors, or the format of the news on these channels. The aim of this paper is to find what impact the programming before the news has on TV news consumption using the forceful cancellation of the popular TV show *Pasapalabra*. It estimates consumers' heterogeneous preferences for the different news broadcasts, but stays agnostic on the drivers of these preferences.

The political slants of a news broadcast is one possible driver of the heterogeneity in preferred news broadcast. It may also explain changes in viewers' voting behavior that result from a change in their news diet. Telecinco News, the news broadcast emitted on the channel directly after the canceled show, is politically central relative to the other two mainstream 9pm news broadcasts. Menendez (2024) ties Spanish viewers' political preferences to their preferred news broadcast. They show that watching La 1 News is related to left leaning political beliefs, watching Antena 3 is related to right leaning beliefs, and that Telecinco's news is related to a more central political position. Menendez (2024) further study the slant of the different news broadcasts by classifying the transcripts of the different news broadcasts

⁶From CIS Political Survey

and analyzing the tone of the news when covering left or right leaning parties. They show La 1 News uses a more negative tone when in news reports regarding right parties whilst Antena 3 News uses a more negative tone when reporting on left leaning parties. Finally, they show that Telecinco’s tone does not preference either side of the political spectrum.

2.3 The Cancellation of Pasapalabra

Before October 2nd, 2019, Telecinco broadcast the show Pasapalabra right before their news programming every single weeknight.⁷ Pasapalabra was, by far, the most successful show in its programming slot, with average daily viewership numbers of over 3.5 million viewers (nearly 10% of the Spanish population).⁸ Pasapalabra is a game show consisting of two parts: in the first part two contestants complete different challenges to win time for the second part; in the second part contestants are given hints and must guess words starting with each letter of the alphabet in the limited time they earned in the first part. This format allows viewers to enjoy watching the show, even if they missed prior parts of the show. It is common for viewers to only watch the second part of the show, with the peak viewership occurring in the last 10 minutes.⁹

The success of the show drew the attention of the British media company ITV Global, who sued Telecinco for copyright infringement, claiming Pasapalabra violated the copyright for the British TV show “The Alphabet Game.” This case went all the way to the Spanish Supreme Court, who forced Telecinco to cease broadcasting Pasapalabra less than a week after the ruling. In response, Telecinco had to find a show to fill the slot of Pasapalabra. The show replacing Pasapalabra, “Salvame Banana”, was not nearly as popular, causing an exogenous change in programming quality. This replacement show already existed, but was usually shown at a less competitive time-slot. Other large competing channels, such as Antenna 3, La 1, and La Sexta, did not change their programming in response to the change in Telecinco’s programming. Creating new shows and large programming changes usually requires months of prior planning. After the shock, the resulting programming changes remained unchanged for the remainder of the year. This cancellation provides a shock to programming which is reasonably unrelated to unobserved audience demand characteristics. In the following sections, I use this programming change to estimate the impact that popular programming can have on the viewership of subsequent TV news programs.

⁷The show is purely made for entertainment purposes, and does not include any information related to current political events.

⁸On record breaking days, viewership numbers reached almost double this amount.

⁹Aggregate viewing patterns are discussed in more detail in the data section below

3 Data

In my analysis I use datasets on the Spanish TV Market from Kantar Media for the months of September to December for 2018, and 2019. This data contains high frequency information on both the channels and viewers.

For viewership, the data consists of minute by minute viewing behavior for a panel of viewers over time. It tracks the minute-level viewing behavior of over 19,000 viewers over the time-period of the dataset, as well as the demographics of the viewer at a daily level¹⁰. When an individual watches multiple channels in a minute, the data attributes the viewing behavior to the longest watched channel in that minute. Additionally, this data includes individual viewer weights, which are calibrated in order to be able to aggregate viewer behavior to estimate national viewership behavior. The data collection process is very rigorous; viewers are contacted anytime there seems to be any anomalous viewing behavior to confirm whether data was collected accurately¹¹.

For channels, the data consists of second-by-second¹² programming data for the whole time period of the dataset for all channels available in the Spanish free-to-air TV market. This includes the title of the programming as well as a classification of the programming into different genres. In addition, the programming data also contains advertising data for the different channels. This includes information on what companies are advertising, when, on what channels, and for how long. The second-by-second channel data is aggregated to the minute level, in order to later match it with the minute-level viewing data.

Viewers behavior is affected by factors not captured in the programming or viewer data from Kantar. The analysis further uses external data sources to control for possible factors impacting viewers news watching behavior. Weather had a large impact on whether people stay home and watch TV or if they go out. Daily wind, temperature, and precipitation data from a viewers province are used to control for the effect of weather on viewing behavior. Popular football matches are sometimes broadcast at the same time as primetime news. Data on the dates of these football matches is included to control for variance in news watching coming from these matches. Finally, there is daily variation on the types of stories presented in the news. Some days have important events which may attract more viewers, whilst other days have less notable events to report on. The topic of these stories may also be more or less interesting or relevant to viewers. This paper uses data that classifies news segments into

¹⁰Demographics characteristics that change over time, such as age or education, are recorded at a daily level.

¹¹Erroneous data is not included in the dataset, creating an unbalanced panel. The weights of individual is adjusted accordingly to maintain accurate estimates of aggregate viewing behavior

¹²This means the data contains channel information at any given second of time in the period of the dataset.

different categories, from a leading audiovisual consultancy, GECA. The daily proportion of time spent on each topic controls for variation in the type of news reported on each day.

In the final part of the paper I relate the programming shock to changes in election outcomes. For this analysis, I combine Kantar’s viewing behavior with data on voting outcomes and demographics for Spain’s 35,000+ voting sections. The data comes from Spain’s national statistics agency, INE.

3.1 Descriptive Overview of the Shock

In later sections of this paper, I use both structural and reduced form methods to analyze the effect canceling Pasapalabra had on the viewership of the following news broadcast. The figure below motivates this analysis by showing the raw data of audience differences with respect to the start of the affected time slot. In November 2018, Telecinco broadcast Pasapalabra before the news and in November 2019 it broadcast its replacement, Salvame. In Figure 1 below, one can see how the differences in Audience flows before the news carry over into the news timeslot.

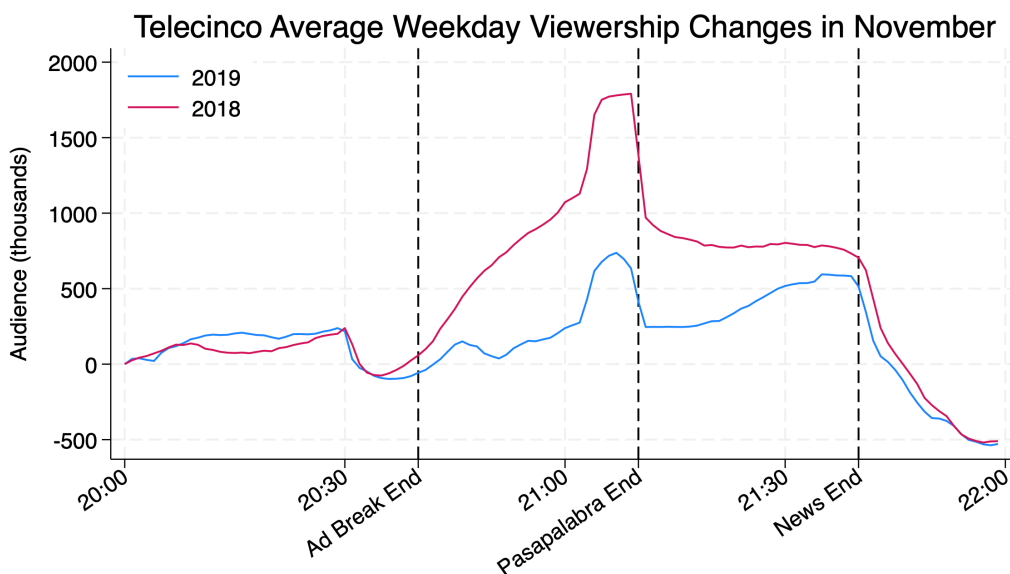


Figure 1: Minute-by-minute Telecinco audience averages of Nov 2018 and Nov 2019 (difference with respect to audience at 20:00)

In the figure, one can see that many viewers switched to Pasapalabra after the advertisement break ending around 20:40. This corresponds to the main attraction of the show, where contestants attempt to solve the Alphabet Disc. At 21:00, Telecinco has a jump in viewership as other shows end, and more viewers switch to Telecinco’s programming. This

spike at 21 is larger in 2018, further supporting the claim that Pasapalabra was more popular than its replacement, Salvame. In both years, Telecinco started its news broadcast at 21:10, directly following Pasapalabra and Salvame.¹³ Although many viewers switched away from the news, one can see that a part of the difference in audience in the time before the news carries over into the news, affecting total news viewership.

At the end of the news broadcast at 21:40, many people switched away from Telecinco. This switching behavior shows that viewers are still actively consuming TV and don't just have the TV running in the background. The large difference in audience during the news appears to come from the shock to the previous programming and consumer inertia. Generally, consumers who aren't engaged in the content would not switch in general, and would therefore not contribute to any of the changes shown in the figure.

The viewer patterns in Figure 1 described above are qualitatively the same for October and December¹⁴. Additionally, unlike the months after the shock, viewer switching patterns for September¹⁵ are qualitatively identical in 2018 and 2019. This further indicates that the differences are likely to be the result of changes in pre-news programming.

4 Documenting the Effect of the Programming Shock

In this section, I estimate the impact the cancellation of Pasapalabra had on the news watching behaviors of Spanish consumers. In the first part of this section, I estimate the drop in viewership of Telecinco, the channel that was showing Pasapalabra before the cancellation. I consider both the time frame where Pasapalabra was shown, as well as the time slot of the news broadcast that was emitted directly afterwards. At the end of the section, I estimate the effect of the shock on other channels, including the remaining mainstream news channels; this shows the substitution patterns of viewers, as well as the effect of the shock on viewership of mainstream TV news broadcasts.

4.1 The Effect of the Cancellation on Telecinco Viewership

This section estimates the overall effect that canceling Pasapalabra had on the viewership of Telecinco, the channel that originally broadcast the canceled show. In order to estimate the effect of the shock, I compare viewership after the shock to a counterfactual level of viewership absent the shock. This counterfactual level of viewership is constructed using viewership

¹³Telecinco, like its main competitors, often did not show advertising between the News and the preceding show. The frequency of advertisements in each minute during the time depicted is shown in the appendix.

¹⁴The equivalent figures for November and December are included in the appendix

¹⁵The equivalent figure for September is included in the Appendix

time trends from the year before, 2018, as well as other variables effecting television viewership, such as weather¹⁶ and football games.¹⁷ With the exception of the cancellation of Pasapalabra, all of the leading channels broadcast the same programs at the same time periods across both years during the months included in the sample, at the time surrounding the prime time news. The average minute by minute trends for Telecinco in September are extremely similar between 2018 and 2019, as seen in Figure 8 in the appendix. I test the robustness of this approach by applying it to Telecinco viewership on weekends, whose programming was unaffected by the Pasapalabra shock.¹⁸ The week-level specification shows whether this counterfactual matched observed viewership closely in the weeks before the shock and shows the effect of the shock over time in the weeks following the cancellation.

4.1.1 Specification

The estimation of the effect of the shock on a given time slot is done using individual daily viewing data with the following specification:

$$W_{it} = \alpha + \beta \mathbb{1}_{Shock} + \psi T_t + \gamma X_{it} + I_{it} + \varepsilon_t. \quad (1)$$

$$W_{it} = \alpha + \sum_{\tau=35}^{52} \beta_{\tau} \mathbb{1}_{\tau}^{2019} + \psi T_t + \gamma X_{it} + I_{it} + \varepsilon_t. \quad (2)$$

Equation (1) estimates the average effect of the shock across all treated weeks and Equation (2) estimates the magnitude of the effect of the shock week by week¹⁹. The dependent variable W_{it} is the proportion of the time-slot that a specific viewer i watched Telecinco on day t . Vector I_{it} contains individual viewer fixed effects; the baseline results use individual by day-of-week fixed-effects to control for each individuals viewing patterns across different weekdays. Vector T_t , contains time controls; the baseline specification includes year fixed effects and week of year fixed effects. Vector X_{it} , contains other factors that are related to changes in TV watching behavior around prime-time news, such as whether there is a national football game or the weather in the province of the viewer on the day of the observation, and

¹⁶Weather variables, including rain, wind, and temperature, are matched to observations by the day of the observation and the province of the viewer.

¹⁷In Spain, the football (soccer) games of the national team are broadcast on the public channel and often happen at the same time as the prime time news. There is a significant change in viewer behavior during these games.

¹⁸Pasapalabra was only shown on weekdays, and weekend programming was not changed as a result of the cancellation. On weekends, where there were no programming changes, there was no significant difference between the viewership predicted by the counterfactual and actual viewership.

¹⁹Weeks are defined so that the first day of the shock happens at the beginning of the week.

proxies for news content.²⁰ In equation (1), $\mathbb{1}_{Shock}$ is an indicator of whether Pasapalabra is canceled. The analysis uses all viewers in the panel, even the ones that never watched Telecinco. It also includes all observations where viewers are not watching television at all. The coefficient β captures the average treatment effect across all possible viewers, even the ones choosing to not watch television. Therefore, the coefficient can be interpreted as the average percentage drop in Telecinco viewership across the entire viewing population²¹. In equation (2), the indicators, $\mathbb{1}_{\tau}^{2019}$, are 1 for week τ in 2019. They estimate the average difference in viewing behavior between a given week in 2019 and the counterfactual, predicted viewing behavior.²² In the weeks before the shock, these coefficients should be insignificant if the counterfactual predicts actual viewing behavior well. In the weeks during the shock, these coefficients estimate the effect of the shock during that week in 2019.

4.1.2 Estimated Changes in Telecinco Viewership

The results of the specification shown in equation (1) applied to Telecinco viewership are shown in the Table 1. The first column shows the estimated percentage point drop in average viewership for Telecinco in the 10 minutes preceding the news. As seen in Figure 1 above, these ten minutes are the peak viewership time for the Pasapalabra program, with many viewers switching to watch only this section of the show. I also focus on this time slot directly preceding the news, since it is the relevant slot to see the what portion of the shock carries over into the news slot²³. The second column shows the estimated percentage point drop in average viewership for the first part of Telecinco’s news broadcast, which includes a summary of the news as well as the main political news for the day. By comparing the two numbers, one can see the portion of the shock that carries over to the news slot.

In the first column of Table 1, one can see the estimated drop in viewership in Telecinco’s pre-news programming is 2.44 percentage points of all possible viewers above the age of

²⁰The presenters and the general format of the news broadcast does not change in the timeperiod of the data. However, there are daily fluctuations in what how much newsworthy stories there are every day. This is controlled for using data on the proportion of the news broadcast spent on soft news vs hard news.

²¹In Spain in 2019, 96% of the population above the age of 15 watched TV on a physical TV set at least once a month. The viewer panel data is constructed so that the adults in the panel are to representative of this 96% of the adult Spanish population.

²²The observations used for the analysis are on a daily level. However, a subset of viewers do not watch TV daily and tend to watch TV on certain weekdays more than others. Coefficients on a daily level would therefore suffer from selection effects and depend on the subset of viewers that watch TV on that weekday. By focusing on week-level effects, the specification better captures the average effect across all viewers over an average week without selection coming from weekday viewing habits.

²³Viewers who switch to Telecinco early purely to view the news would also be included in this time slot. However, viewers that have no interest in the previous programming should not be effected by the programming shock, and therefore would not change before and after the shock. This means they would be included in the predicted counterfactual viewership and not effect the coefficient of the shock indicator.

Changes in Average Weekday Telecinco Viewership (% of all Viewers Aged 15+)

	Weekday		Weekend (Placebo)	
	Before News	News	Before News	News
Programming Shock	-2.4401*** (0.0617)	-1.8949*** (0.0598)	-0.0516 (0.0813)	-0.1323 (0.0857)
Week FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
News Content Controls		✓		✓
Football Match FEs	✓	✓	✓	✓
Weather Controls	✓	✓	✓	✓
Viewer X Day of Week FEs	✓	✓	✓	✓
R-squared	0.4325	0.3981	0.3146	0.3113
Number of individuals	15,863	15,863	15,863	15,863
Number of observations	1,847,825	1,847,825	755,514	755,514

Note: This table shows the estimated changes in average viewership for Telecinco. The programming shock variable captures the estimated change in viewership during the time period where Pasapalabra was canceled. The left column shows estimated change in average viewership for the time slot before the News, which showed Pasapalabra before the cancellation. The second column shows the estimated change in viewership for the first part of the news, which was shown directly following the time slot where Pasapalabra was shown. The right two columns show the results for the weekend, which was not affected by the programming shock. Observations are at an individual by day level. The outcome variable is in terms of average market share of all possible viewers, including those choosing not to watch TV on a certain day. *** : $p < 0.01$, ** : $p < 0.05$, * : $p < 0.1$.

Table 1: Baseline Results and Placebo Results

14. This is the estimated drop in average watch time for all of these Spanish television consumers on a given day, *not conditional on watching TV*²⁴. This would imply a drop in average viewership of about 1 million people aged 15 years or older.²⁵ This is the average effect across all weekdays.

In the second column of Table 1, one can see the estimated drop in viewership Telecinco’s news broadcast is 1.89 percentage points of all viewers. As above, this is the average drop on an average weekday across all consumers. This coefficient would suggest a drop in average viewership of about 730,000 people²⁶. Using the estimates from the analysis, I compare the predicted viewership expected absent the shock, to the actual viewership. The estimates state that the cancellation lowered the viewership of Telecinco’s news broadcast by 28% of what would have been expected absent the shock²⁷. This is a very large drop in viewership on the largest Spanish national news channel. Comparing the size of the shock to the American

²⁴Consumers who don’t watch TV on a day are included to also capture viewers choosing to not watch TV due to the shock

²⁵The Spanish population aged 15+ in 2019 was 40 million. Of this subsection of the population, 96% watched TV on a physical TV set at least once a month. Of this population, there was an average drop of 2.44% during the peak viewing time of the programming preceding Telecinco news.

²⁶Calculated just as in the previous footnote

²⁷This was calculated in the following way $\frac{\Delta\text{shock}}{T5 \text{ News Viewership During Shock} + \Delta\text{shock}}$

News context, the size of the drop in viewership is larger than the total average prime time viewership of Fox News, CNN, and MSNBC combined in the same year normalizing for total population size²⁸.

Comparing the sizes of the drop from one period to the next is very indicative of the level of inertia present in this context. The drop in T5 news viewership is 78% the size of the drop in viewership in the previous slot. This suggests that consumer inertia plays a very large role in television audience.

4.1.3 Placebo Test

Although, there was no change to the format of Telecinco’s news broadcast, nor to the other main competing channels, there may still be other unobserved factors affecting Telecinco viewership. Pasapalabra was broadcast only on weekdays. Therefore, the analysis above uses only weekday observations. Telecinco’s news broadcast on the weekends was not preceded by Pasapalabra, so it’s audience should not change during the time of the shock. To test the validity of the analysis, a placebo regression was done, repeating the analysis for the weekend news time-slots, instead of weekdays. The results of this placebo regression are shown in the left two columns in Table 1 above.

When only focusing on the weekend time-slots the coefficients indicating the time period where Pasapalabra was canceled become statistically indistinguishable from 0²⁹. This shows that it is unlikely that there was any other taste shock to Telecinco News that drives the main result. It also supports the validity of the counterfactual control, since, there was no statistical difference between predicted and actual viewership on untreated days in 2019 for Telecinco news broadcasts.

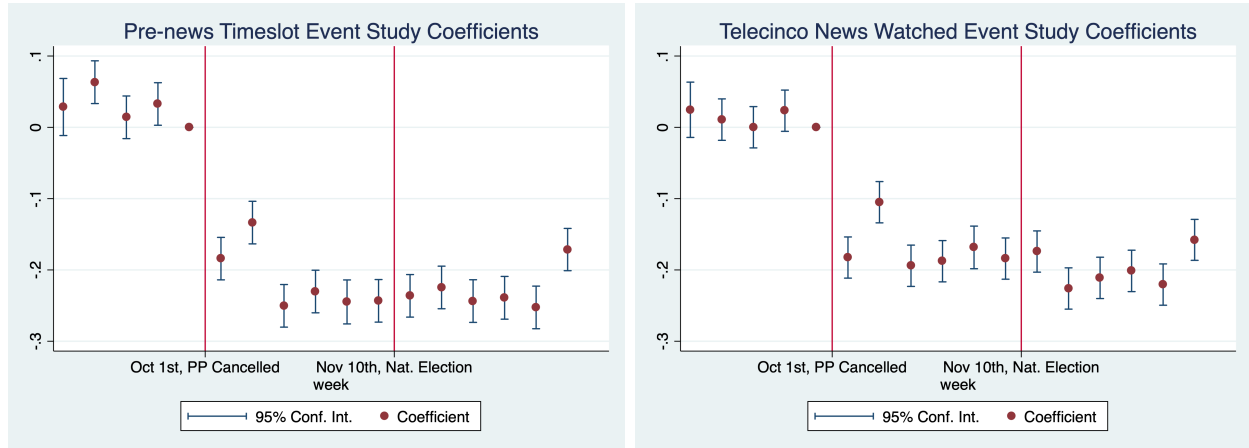
4.1.4 Telecinco Viewership Week-by-Week Results

In the following figures one can see the week-level coefficients for both the Pasapalabra time-slot, and Telecinco News in the time-slot right after. The coefficients preceding the shocks are all close to zero, showing that the counterfactual predictions do well at predicting actual viewership in 2019 in the untreated weeks. After the cancellation of Pasapalabra, there is a very clear drop in Telecinco viewership in both the Pasapalabra time-slot as well as the following Telecinco news broadcast. The drop persists at a stable level for the weeks after

²⁸According to Pew Research, average primetime news viewership in 2019 for Fox News, CNN, and MSNBC was 1.92, 1.05, and 1.25 million viewers respectively. According to the US Census, the American population above the age of 14 in 2019 was 267 million. This would imply an average viewership of 1.58%. The actual proportion of viewers is even lower since the viewership numbers include viewers below the age of 15.

²⁹Not only do the coefficient become insignificant, they also shrink by more than 10 fold in magnitude

the cancellation. This is consistent with what is expected, since Telecinco did not make any further changes in programming after they switched from showing “Pasapalabra” to the shows replacement, “Salvame.”



Note: Graphics showing week level event study coefficients for Telecinco viewership on weekdays. The left figure shows results for the time period right before the news, where Pasapalabra was shown before the cancellation. The right figure shows the time period of the News, corresponding to the time right after the time slot where Pasapalabra was emitted before it was cancelled. The first red line indicates the time where Pasapalabra stopped being shown. The second red line indicates the time of the Spanish national election.

Figure 2: Event study graph for main prime time news channels

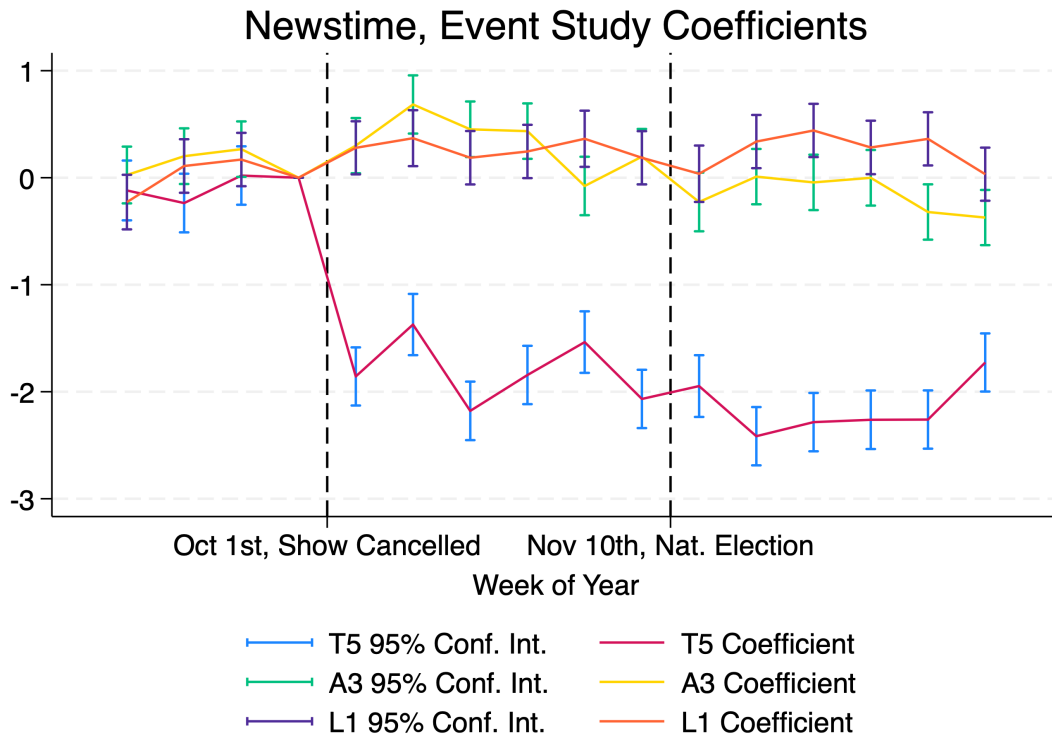
4.2 Changes in Viewership of Other Channels

The results above indicate a clear sustained drop in Telecinco News viewership after the shock. They show that a large portion of the Spanish audience switched away from watching the Telecinco news broadcast. In this subsection, I focus on the changes in viewership in other channels. This shows whether viewers switched to an activity other than watching TV, or if they just switched to watching a different channel. Moreover, I look at the changes to other mainstream News channels, to see if, on aggregate, people switched to other news broadcasts or if they decreased their propensity to watch mainstream TV news broadcasts.

4.2.1 Event Study of Prime-time News Channels

To analyze the general effect on the shock on the main prime time news channel, I employ the event study specification in Equation 2 above applied to the viewership of the prime time news broadcasts. This specification used viewing trends from the previous year as well as weather and football match controls to predict counterfactual viewership absent the shock. The event study coefficients show the estimates of the deviation of this counterfactual from

actual viewership on a weekly level, which captures the effect of the shock. The event study coefficients for these news broadcasts are depicted in Figure 3 below.



Note: Graphic showing week level event study coefficients for viewership of the main TV news channels on weekdays. The first dashed line indicates the time where Pasapalabra stopped being shown. The second dashed line indicates the time of the Spanish national election. The drop in viewership in Telecinco News is not compensated by an increase in viewership in the other two news programs.

Figure 3: Event study graph for main prime time news channels

The figure above depicts the event study coefficients for the public news broadcast, La 1; Telecinco; and the competing private news broadcast, Antenna 3. In the weeks before the shock, the coefficients for all three news broadcasts are insignificant, showing that the counterfactual predictions do a good job estimating viewership absent the shock. After the cancellation of Pasapalabra, the viewership for the Telecinco news broadcast dropped by around 2 percent of all possible Spanish viewers, as discussed above. However, the viewership of the other two main news broadcasts did not change at the same magnitude. The viewership of the public channel, La 1, increased a slight amount, about a quarter of a percent, in all of the weeks following the shock. The other competing private news channel, also had a slight increase in viewership in the first month after the programming change, however, in the remaining weeks of the year it did not have a significant increase in viewership. This event study graph shows that the shock had a negative impact on overall viewership of mainstream prime time news broadcasts.

In order to quantify the average effect on the other news channels, I apply the specification in Equation 1 to the other news channels. Additionally, I look at the effect on overall Television viewership, in order to see if viewers are watching less TV during the programming shock, or whether they switch to other channels not showing national news broadcasts. The results are shown in Table 3 below.

Changes in Viewership of News Channels (% of all Viewers Aged 15+)						
	All TV	9pm News			8pm News	
		T5	A3	La 1	La Sexta	Cuatro
Program Shock	-0.1666 (0.1283)	-1.8949*** (0.0598)	-0.0515 (0.0568)	0.2706*** (0.0546)	0.1975*** (0.0403)	-0.0125 (0.0251)
Week FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Football FEs	✓	✓	✓	✓	✓	✓
Weather	✓	✓	✓	✓	✓	✓
Ind X DoW FEs	✓	✓	✓	✓	✓	✓
R-squared	0.3820	0.3981	0.3438	0.3196	0.2617	0.0713
# individuals	15,863	15,863	15,863	15,863	15,863	15,863
# observations	1,847,825	1,847,825	1,847,825	1,847,825	1,847,825	1,847,825

Note: This table shows the estimated changes in average viewership over all possible Spanish TV viewers above the age of 14 for weekdays during the News time slot. The programming shock variable captures the estimated change in viewership during the time period where Pasapalabra was cancelled. The first column corresponds overall viewership across all TV channels. The A3 column shows the results for Antena 3 News viewership and the La 1 column shows results for the public channels News viewership. The La Sexta and Cuatro columns show results for the lesser watched 8pm prime time news broadcasts. Observations are at an individual by day level. The outcome variable is in terms of average market share of all possible viewers, including those choosing not to watch TV on a certain day. *** : $p < 0.01$, ** : $p < 0.05$, * : $p < 0.1$.

Table 2: Estimates of All News Channels

In Table 2, one can see that the public channel had an average increase in viewership of 0.27% of all possible Spanish viewers 15 years or older in the time of the programming change. The other large privately run news broadcast, A3, did not have a significant difference in viewership across the time of the programming shock. Overall, TV viewership did not differ significantly from the counterfactual predicted viewership in the time period of the shock. This analysis suggests that the programming shock did not have a significant impact on whether people watched TV or not. Instead, it suggests that viewers continued watching TV, with a higher propensity to watch channels that did not emit mainstream national news coverage. The analysis shows a significant change in where viewers inform themselves. It is also very plausible that consumers who watch news due to passive choices, would not put in active effort to seek out additional information to offset the decrease in mainstream TV news consumption from the shock.

5 Structural Analysis of Viewing Choices

In the analysis above, I show the effect the cancellation of Pasapalabra had on news diets. The drop in news viewership after the shock demonstrates that a significant portion of Telecinco News viewers were watching as a result of preferences for the preceding show, Pasapalabra, and viewing inertia. This raises the question of what portion of remaining news audiences across all the mainstream news channels is attributable to the popularity of shows preceding the news and viewing inertia. In other words, how many people are watching the news as a result of the preceding shows, instead of their actual preferences for the different news programs? To which extent would content choices change under lower (or higher) inertia? The results also indicate that changes to entertainment programming may impact overall news consumption. This means investment into entertainment programming can be used to draw viewers to specific news broadcasts. This could motivate subsidizing entertainment television possible policy tool to increase overall news consumption. However, it could also be used in order to increase the reach and influence of a specific news channel by entities with persuasive motives. In this section, I estimate a structural model of viewer behavior to better understand the strength of inertia surrounding the news and evaluate the impact of increasing the popularity of entertainment programming on the public channel.

When studying economic agents with choice persistence, correlated preferences can often be erroneously interpreted as structural state-dependence Heckman et al. (1981). This is especially relevant when analyzing inertia and content preferences in the setting of media demand. Expressed differently, it is not always immediately clear if people continue watching a channel across shows because of a structural dependence on previous choices or because preferences for shows on the same channel are correlated. I employ a random-utility discrete-choice model, accounting for preference heterogeneity, to disentangle viewers' inertia from their preferences for news and other programming.

5.1 Description of Viewer Choice Model

Viewers are only able to watch one channel at a time. I model viewers' discrete-choice watching decisions using a random utility framework. I assume that consumer i receives utility $u_{i,c,t}$ from consuming channel c at time t . At any given time during prime-time viewing hours, the consumer faces a choice set $\Omega_{i,t}$. This choice set includes the three main channels³⁰, which all show news in the prime time slot, a composite regional channel, a composite channel capturing all other channel, and the option of not watching free-to-air

³⁰These channels are the public channel, La 1, and the private channels Antena 3 and Telecinco. These are the channels with the largest market share and are available everywhere across Spain

TV.³¹ In every time period, the viewer chooses the option that provides them with the highest utility, given the other options that are in their choice set at that time. Given this setting, the utility of the composite good represents the utility of the most liked channel included in the composite good. Choices are defined for 10 minute time blocks, where the consumers choice is the most watched option in those 10 minutes. Focusing on 10 min blocks ensures that the viewer is consuming a significant portion of the news or other tv-show in their defined choice.³²

The aim of the analysis is to properly identify preferences and inertia surrounding and including prime-time news broadcasts in order to see what portion of news viewership is attributable to inertia and the popularity of preceding shows. I focus on choices made between 8:50 and 9:20 to capture the preferences and inertia surroundings the news in detail. In the time period of the analysis, all three of the main channels do not have any significant advertisement breaks.³³ As is standard in discrete choice demand models, I assume that viewers are aware of all the alternatives in their choice set, as well as their preferences for those alternatives. This assumption is made given the popularity of the main channels, along with the repetitive nature of their programming in the time period of the analysis.³⁴

The utility that viewer, i , would receive from watching one of the main channels during time, t , is modeled as:

$$U_{ict} = \underbrace{\Lambda_{ict}}_{\text{inertia}} + \underbrace{\Gamma_{ict}}_{\text{preference}} .$$

The first part, Λ_{ict} , captures the structural dependence of the viewers choice on the previous time-period, and the second part, Γ_{ict} , corresponds to viewer i 's individual preference/base utility for consuming channel c , and does not depend on past choices.

One can interpret the inertia component as a threshold for how much more a consumer must like a different alternative over their current channel choice before they switch.³⁵ I

³¹This option includes related activities such as online streaming as well as completely different activities, such as grabbing drinks with friends.

³²If a viewer switches to a channel right before a show starts, this would not show up as watching the slot right before the show they were intending to watch. Additionally, if a viewer switches away from a show in the first couple minutes, they would not be registered as watching that show. This also excludes observations from viewers who are quickly browsing through channels.

³³There are no ad-breaks longer than two minutes, and often these channels do not show any ads during this time period. The public channel does not show advertisement by law.

³⁴As explained in the sections above, the only programming change from the fall of 2018 to 2019 on the main channels was the cancellation of Pasapalabra.

³⁵If one were to remove the inertia component, choices would be made purely on the preferences for the shows in the choicset, with no dependence on past choices. The viewer would pick the channel with the highest utility. When adding a positive inertia component to the channel chosen in the last period, the consumer now only switches away from the channel if another option beats the current option by at least the amount of the inertia.

am agnostic on the underlying cause of this inertia. Other papers in the literature studying inertia also model inertia as an additive component in a random utility choice model.³⁶ As is done in these papers, I assume that consumers are myopic in their decisions and do not consider the effect of their current choice on their future choices.

The structural dependence of behavior on past choices exists on different levels of the market: viewers' inertia of watching television in general; viewers' inertia to continue watching the same channel; and viewers' inertia to continue watching a specific show. The model accounts for inertia on different levels of the market by decomposing the inertia component in the following way:

$$\Lambda_{ict} = \mathbb{1}_{i,t-1}^{TV} \lambda_i^{TV} + \mathbb{1}_{i,c,t-1}^{chan} \left(\lambda_i^{chan} + \mathbb{1}_{ct}^{show} \lambda_i^{show} \right),$$

where $\mathbb{1}_{i,c,t-1}^{chan}$ indicates whether consumer i was watching channel c in the previous period, $t - 1$; $\mathbb{1}_{ct}^{show}$ indicates whether channel c showed that same show in the previous period as in period t ; and $\mathbb{1}_{i,t-1}^{TV}$ indicates whether consumer i was watching TV in the previous period.

Once viewers start watching TV on a given day, they have the tendency to continue watching TV in general across all channels. This can be thought of inertia for television. A viewer's TV inertia component, λ_i^{TV} , is constant across all TV channels. It only impacts the comparison between TV channels and the outside good; it does not affect utility comparisons between different TV channels. This inertia component captures the general tendency to continue watching TV after switching it on.

Shows are longer than the 10 minutes blocks of time on which choices are modeled. In the data, there are times when a channel is showing the same programming in consecutive time slots as well as times where one show ends and another begins. Viewers may have a preference for continuity, where they prefer to continue watching a show that they started watching, implying a higher inertia during a show compared to at the end of the show. The model captures the inertia to remain on the same channel at the end of a show with the channel inertia component, λ_i^{chan} . This component captures the general resistance to switching away from the channel the viewer is watching. The model captures the additional taste for continuity with the show inertia term, λ_i^{show} . This is the additional resistance on top of the channel inertia for viewers to switch away from a channel when the channel the viewer is watching continues broadcasting the same show across consecutive time slots.

The second part of the utility, Γ_{ict} , capturing consumer preferences, is further broken up into a consumer i 's preference for the show, s , being emitted on channel c at time t and a

³⁶E.g. MacKay and Remer (2024), Dubé et al. (2010), Shum (2004), Erdem (1996), Johannesson and Lundin (2000)

taste shock, ϵ_{ict} , in the following way:

$$\Gamma_{ict} = \gamma_{si} + \epsilon_{ict}.$$

Each consumer i has show specific preferences for all shows that are emitted on the main channels.³⁷ Additionally, at each time period, t , consumers have an additional taste shock, ϵ_{ict} , for each channel.

There are almost 100 different channels available that with a lower market share much lower than the main three channels. For the sake of parsimony, minor channels are grouped together into national and regional composite channels with utilities:

$$u_{i,reg,t} = \mathbb{1}_{i,reg,t} \lambda_i^{reg} + \mathbb{1}_{it}^{TV} \lambda_i^{TV} + \gamma_{i,reg,t} + \epsilon_{i,reg,t}.$$

$$u_{i,comp,t} = \mathbb{1}_{i,comp,t} \lambda_i^{comp} + \mathbb{1}_{it}^{TV} \lambda_i^{TV} + \gamma_{i,comp,t} + \epsilon_{i,comp,t}.$$

The first term, λ^{comp} , captures inertia of choosing a channel within the group of channels in the composite channel. This differs from the previous inertia components, since switching between channels within the group of channels in the composite good is considered as choosing the same option. Additionally, consumers may exhibit a different level of inertia for less popular channels. Since watching the composite good is still watching TV, the composite alternative also has the same TV inertia component, λ^{TV} as the main channels. The last two terms capture an individuals preferences for the composite channel. The penultimate term, $\gamma_{i,comp,t}$, captures viewer i 's individual preferences for shows on the composite channel. It represents the average utility of the most liked channel in the composite good for consumer i . The preferences for the composite goods, $\gamma_{i,comp,t}$ and $\gamma_{i,reg,t}$, are allowed to change across time slots, and captures trends in general attractiveness of the composite goods across time slots. The last term, $\epsilon_{i,comp,t}$, captures choice specific taste shocks for the composite channel.

The utility of not watching any television is

$$u_{i,0,t} = \beta_i^0 X_{0,t} + \epsilon_{i,0,t}.$$

The first term captures the value of alternative choices to watching TV. The vector X_0 includes the weather, the time slot, the day of the week, the month of year, and the year. This captures seasonal changes to the propensity to watch television as well as within week habits of watching television.

³⁷The model allows for consumer heterogeneity in preferences for Telecinco News, Pasapalabra, and Salvame, which are all shows broadcast by the channel Telecinco as well as shows broadcast by the other main channels such as Boom!, Antena 3 News, La 1 News, etc.

5.2 Estimation Procedure

In the model above, an individual viewer’s inertia is captured by

$$\lambda_i = (\lambda_i^{chan}, \lambda_i^{cont}, \lambda_i^{comp}, \lambda_i^{reg}, \lambda_i^{TV}).$$

The changes of the outside good over time are captured by β_i^0 . Viewers have heterogeneous preferences across shows captured by the vector γ_i , of all of the show specific preferences, γ_{si} , as well as time slot specific preferences for the composite goods, $\gamma_{i,comp,t}$, $\gamma_{i,comp,t}$. Given these preferences and assuming that $\epsilon_{i,0,t}$, $\epsilon_{i,reg,t}$, $\epsilon_{i,comp,t}$, $\epsilon_{i,c,t}$ are all independent idiosyncratic shocks independently distributed type I extreme values, this model turns into a conditional logit. Explicit probabilities that an individual i chooses each alternative in the choice set given the vector of parameters $(\beta_i^0, \gamma_i, \lambda_i)$ are shown in the appendix.

In order to do counterfactual calculations about the whole population of viewers, I estimate heterogeneous β_i^0 , λ_i , as well as preferences γ_i . In order to accurately estimate these 30 parameters, I group viewers into 324 different demographic cohorts, and estimate the parameters for each of these many cohorts, d . This assumes that individual preferences can be estimated using choice data of very close peers, $(\beta_i^0, \gamma_i, \lambda_i) = (\beta_d^0, \gamma_d, \lambda_d)$. To ensure people in the same cohort are sufficiently similar, cohorts are created using demographic characteristics across many dimensions including gender, age, socioeconomic status, geographic region, and municipality size of their residence. The model captures consumer heterogeneity by estimating separate preferences across a large panel of individuals using the conditional logit model from McFadden (1972) for each individual. This methodology to model consumer heterogeneity is similar to the one employed by Dubois et al. (2020) to model the differential effect of sugar taxes on consumers with heterogeneous preferences.

I estimate the model above using Maximum Likelihood estimation. Let $y_{i,t}$ denote the choice of viewer i at time t , and y_i be the vector of all the choices made by viewer i . Then the likelihood of observing the choices in the data of one viewer i in cohort d conditional on his or her $(\gamma, p, \lambda, \beta)$ is:

$$\mathcal{L}_i(\beta_d^0, \gamma_d, \lambda_d | y_i) = \prod_{t \in T_i} P_{i,t}(y_{i,t} | \beta_d^0, \gamma_d, \lambda_d)$$

The likelihood of the full model is:

$$\mathcal{L}(\beta^0, \gamma, \lambda | y) = \prod_{i \in N} \mathcal{L}_i(\beta_d^0, \gamma_d, \lambda_d | y_i)$$

Parameters are estimated by numerically maximizing this likelihood function, which is glob-

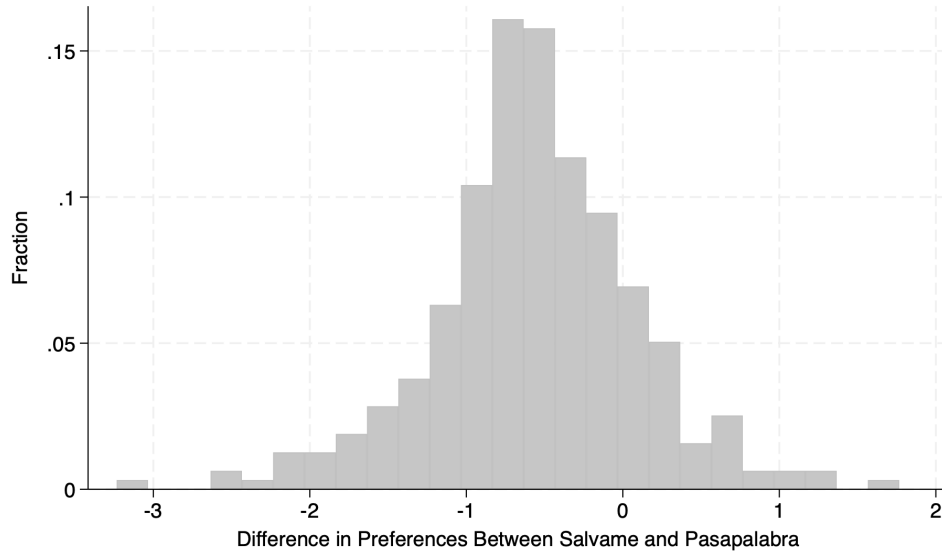
ally concave with respect to the parameters.

5.3 Parameter Estimates

In the structural model, viewers make choices based on the preferences of each alternative in the choice set at a given time. The probability that a given channel is watched depends both on the preferences the viewer has for that channel as well as on the preferences for the other options in the choice set at that time. Hence, the relationship between a given preference parameter and viewership choices is not constant and heavily dependent on the choice set. This is taken into consideration when predicting viewer behavior in counterfactual scenarios, as is done in the following subsection. However, this limits the direct interpretability of the cardinality of the coefficients related to actual choice behavior. The changes in predicted viewer behavior in the counterfactual scenarios shown in the following subsection provide better illustration of what role inertia plays in the actual decisions of viewers. The parameter estimates still provide information about the relative importance of different factors in the model and the heterogeneity present across demographic cohorts.

5.3.1 Estimated Preferences for the Canceled Show vs its Replacement

The estimated coefficients for each show represent how much viewers like shows compared to the others emitted at the same time on other channels. The model estimates preference parameters for both the canceled show, Pasapalabra, as well as its replacement, Salvame. These coefficients capture the preference for Telecinco in the time before its news broadcast. The difference in the coefficients for Salvame and Pasapalabra represents the change in preferences for Telecinco's pre-news programming, due to the programming change. The figure below shows this estimated difference across viewers. The more negative coefficients correspond to viewers who have a strong preference for Pasapalabra compared to Salvame. These are the viewers who are predicted to have the largest drop in Telecinco viewing due to the programming shock. The estimated difference in preferences is positive for a small portion of viewers; these viewers seem to prefer Salvame over Pasapalabra, and are predicted to increase their Telecinco after the programming change. The coefficients show there is a great amount of heterogeneity across different viewers. Overall, the majority of viewers prefer Pasapalabra over Salvame, which is in line with the reduced form results that show an overall decrease in Telecinco viewership after the cancellation of Pasapalabra.



Note: Graphic showing the distribution of the change in estimated preferences for the shows preceding Telecinco Prime-time News. Negative numbers imply that the canceled show is preferred to the replacement.

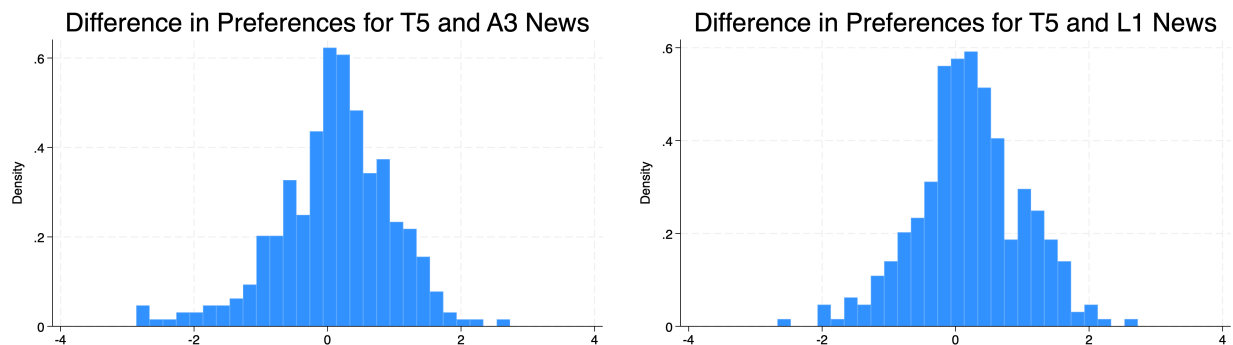
Figure 4: Estimated Change in Preferences for Telecinco’s Pre-news Content

5.3.2 Differences in Estimated Preferences for Prime-time News Broadcasts

The market shares of different news broadcasts are influenced by shows preceding the news and viewer inertia. Therefore, market shares do not simply reflect preferences for news content. The coefficients for shows are estimated whilst accounting for inertia and what channels viewers were watching in the previous periods. Therefore, one can view the show coefficients for news broadcasts as representing viewers’ actual preference for different news broadcasts. The figure below depicts the distribution of differences in preferences between Telecinco prime-time News and its main competitors. The distribution both have a positive mean, signifying that on average Telecinco is preferred to the other mainstream news broadcasts. However, a large fraction of viewers prefer the competing broadcasts, showing a mainly horizontally differentiated market.

5.3.3 Inertia Coefficients

In the model, the shows proceeding prime-time news impact news viewership through channel inertia. The channel inertia coefficient captures how much being on a channel in the previous period affects the channel choice in a given period. The distribution of the channel inertia coefficient is shown in the table below. The distribution is right-skewed with a mean of 3.4. Comparing this to the magnitudes of the differences in preferences shown above, one can see that the channel inertia component is larger than the difference in preferences between



Note: Graphics showing the difference in estimated preferences for Telecinco News compared to its main competitors. Positive coefficients suggest a preference for Telecinco News, and negative coefficients suggest a preference for the competing channel. The left graph compares Telecinco to the more right-leaning private channel, Antena 3. The right graph compares Telecinco to the more left-leaning public channel, La 1.

Figure 5: Distributions of the Differences in Estimated Preferences for News Broadcasts

Telecinco news and its competitors. This means that channel inertia plays at least as large of a role in the choice of news channels as viewers' preference for the broadcast content itself.

The channel inertia coefficient itself captures the channel inertia when one show ends and the next one begins, e.g. how much watching Pasapalabra impacts the channel choice when Telecinco starts showing its news broadcast. This channel inertia is allowed to be different when a channel continues to show the same programming, e.g. considering two consecutive time slots where Telecinco showed Pasapalabra. Viewers may have a taste for continuity where when they start watching a show, the value of seeing how it continues in the next period goes up. This would imply an increase in channel inertia when a channel continues emitting the same show in consecutive time blocks. The Table below shows the distribution of estimated same show inertia coefficients. These coefficients capture the change in channel inertia when the show stays the same across two time slots. The mean of the distribution is 0.92, which means that, on average, channel inertia increases by 28% when a channel continues to broadcast the same show. A very small portion of viewers have negative coefficients. For these viewers, when a channel continues broadcasting the same show, it negatively impacts their predicted chance of staying on the same channel. This could be interpreted as individuals with a taste for variety who may get bored of watching the same content over multiple time slots. Overall, this is only the case for 3% of viewers and is never large enough to have a negative overall channel inertia component (i.e. the channel inertia is still positive after adding the same show adjustment).

The final layer of inertia captured by the model, is the inertia to continue watching television. It captures the fact that once a viewer starts watching television, there is a cost or resistance to stop watching and switch to a different activity. One would expect

this cost/resistance to be larger than channel inertia, since switching a channel with the remote is generally lower effort than switching activities overall. The Table below shows the distribution of estimated television inertia coefficients. As expected, TV inertia coefficients are larger than channel inertia. The distribution also has more variance than channel inertia, meaning viewers are more heterogeneous in their cost to turn of the television than to switch the channel.

Inertia Parameter Estimates						
		Mean	SD	5 pth	Median	95 pth
Channel Inertia	λ^{chan}	3.4195	0.7621	2.3343	3.3577	4.7872
Show Inertia	λ^{show}	0.9262	0.5519	0.1246	0.9094	1.8522
TV Inertia	λ^{TV}	4.7516	0.5141	3.9196	4.804	5.5322

Table 3: Summary Statistics of Estimated Inertia Parameters

5.4 Model Predictions and Counterfactuals

In this section I use the estimated parameters to predict viewer choices in two counterfactual scenarios. First, I simulate what viewers choices would be absent of channel inertia. This exercise helps expose what role channel inertia plays in the audiences of the mainstream news broadcasts and the average news diets of Spanish television viewers. Second, I simulate changes in news viewership if the public channel increased the popularity of the program preceding its news broadcast. This shows the viability of investment into entertainment programming as a policy tool to increase news consumption.³⁸

5.4.1 Predicting Viewer Choices

When simulating viewing behavior in a given time block, the model requires the information on what channel the viewer was watching in the previous time block. The simulation of a viewer’s choice is dependent on what they were doing in the previous period due to the inertia components of the model. In this section, I take as given the viewers choice in the period right before the news broadcasts and predict future choices conditional on this starting point. This allows me to focus on the role of the channel inertia at the crucial time where programming switching from entertainment to news content.

³⁸This also shows that any entity with persuasion motives could effectively use entertainment content to distort information choices.

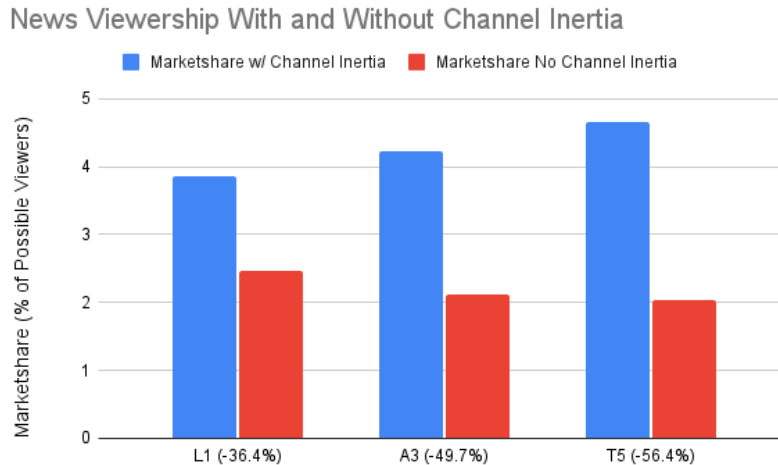
I simulate viewer choices in the news time period for each viewer individually given the each viewer's estimated parameters and his/her actual choice observed in the data in the time period before the news.

5.4.2 The Role of Channel Inertia in News Watching Choices

Choices of viewers depend on preferences, inertia, as well as choices leading up to the time period being studied. Therefore, the parameters for inertia by themselves do not provide a clear picture on how large of an impact the shows preceding the news and inertia have on news audiences. To get a better understanding of the role of these shows and inertia in this choice context, I predict how consumer behavior would change if channel inertia was 0, whilst show and TV inertia stay unchanged. This would be as if viewers were forced to choose what they want to watch next at the end of each show, with no ties between shows on the same channel. This removes any viewership coming from people who watched the news due to the preceding show.

Figure 9 below shows the simulated change in viewership for the three news broadcast when channel inertia is set to 0. The height of the blue bar represents the market share with inertia, and the red bar is the market share without inertia. The market shares are the average probability that a consumer was simulated to watch a given news channel. The percentages next to the channel labels represent the percentage drop in viewership after removing channel inertia. The three channels varied in their drop in viewership, with the public channel, La 1, having the smallest drop of 36.4%. Antena 3 and Telecinco had drops in their news viewership of 49.7% and 56.4% respectively. These differences show that inertia does not boost all news shows equally, and depends highly on viewers' idiosyncratic preferences for content and the other options in the viewers choiceset. The three channels differ in the popularity of the show preceding the news, with the public channel having the least popular pre-news programming of the three channels. Additionally, Telecinco's decision to start their news broadcast 10 minutes later differentiates them from their competitors.

Figure 6 above shows the effect removing channel inertia has on overall viewership of each news broadcast. The counterfactual simulations are made on an individual level, allowing the model to simulate actual switching behavior of viewers. Figure 7 and 8 show viewer flows when Antena 3's and La 1's 9:00 news broadcasts start. Figure 10 depicts actual viewer behavior, while Figure 11 shows counterfactual viewer switching behavior absent channel inertia. By comparing flows, one can see that removing channel inertia does not just have viewers switching away from news broadcasts, but also among them. This shows that channel inertia makes some viewers watch a different news broadcast than they would watch otherwise.



Note: Graphic showing simulated viewership changes for primetime news channels for the average individual on an average day in the weeks preceding the November 19 elections. The units are the average simulated probability of choosing to watch each news broadcast across all viewers. The percentages next to the channel name corresponds to the percentage drop in viewership between the two cases.

Figure 6: The Role of Channel Inertia in News Viewership

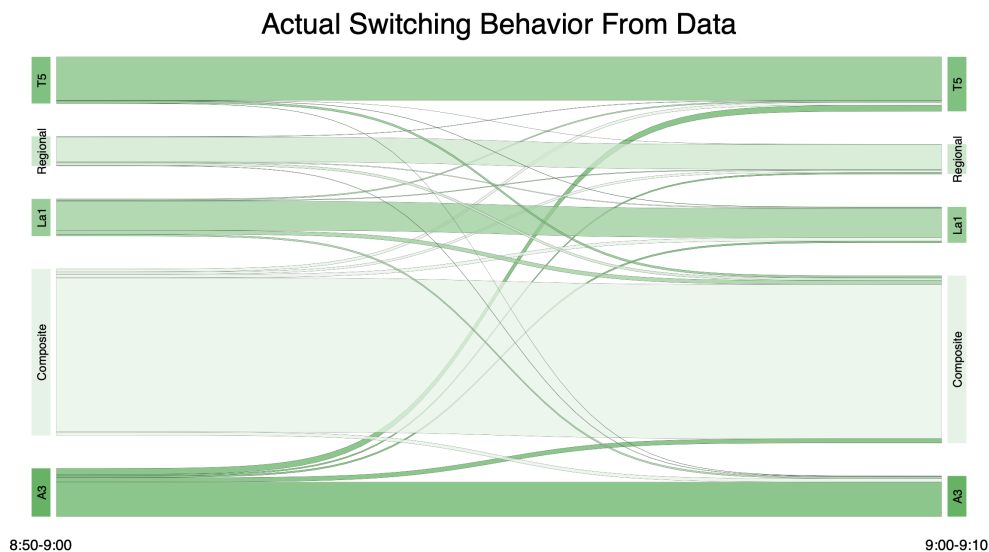
5.4.3 Subsidizing Entertainment Programming

The results above show that the shows before the news play a large role in how people inform themselves. Changes to entertainment programming preceding the news can have large effects on news viewership. This further evidenced by the effects the unplanned cancellation of *Pasapalabra* had on Telecinco news. In that case a negative shock decreased overall news viewership, making viewers watch less of Telecinco news. This raises the question if one could increase news viewership by increasing the popularity of the show preceding the news broadcast. This would support subsidizing entertainment programming as a possible policy tool to increase news consumption. It also demonstrates the ability of channels to use entertainment programming to increase the reach of their news programs.

I use the model to predict how news diets would change if the public channel invested in its pre-news programming and increased the market share of the show preceding the news by one percentage point.³⁹ This counterfactual scenario is calculated by increasing the chance of watching the public channel in the slot right before the news by one percent for every viewer and then predicting their choice in the news slot, given those updated pre-news market shares and the estimated parameters of the model.

Figure 5 shows the predicted change in viewership for the three main news channels during the prime time new slot. These numbers are focusing on the time period surrounding

³⁹This increase would correspond to an increase in viewership of about 25%, and would still be lower than the past viewership of *Pasapalabra*.



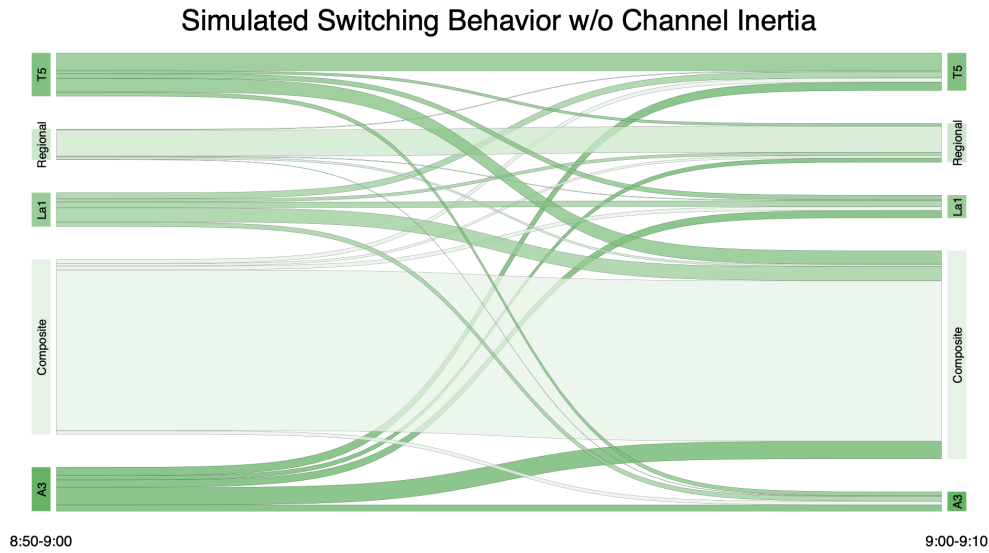
Note: Graphic showing viewer switching behavior from the original data. The width of the bar on the left represents viewers choosing each channel in the 8:50-9:00 block. The width of the bar on the right represents viewers choosing each channel in the 9:00-9:10 block. The width of the connecting line between the left and right represents the number of viewers who started on the channel at the left and switched to the channel on the right.

Figure 7: Actual viewership flows from 8:50-9:00 to 9:00-9:10

the November 2019 elections, after the cancellation of Pasapalabra. The height of the red bar represents the market share after increasing the popularity of the show on the public channel (L1), and the red bar is the market share without any changes. The market share of the news on the public channel increased by 0.29 percentage points. This means 29% of the viewership increase carried over into the news.

The news viewership for Antena 3 and Telecinco both decreased 0.03 percentage points. The viewership of Antena 3 and Telecinco is effected in two ways by changing the popularity of the public channel's pre-news programming. On one hand, the increased popularity of the public channel decreases viewership of the programming preceding their news broadcasts, decreasing their news audiences. On the other hand, the increased popularity of the public channels show pulls more people to watch TV overall in the time period before the news, which then switch to either news broadcast. The effects go in opposite directions, nearly canceling out.

If one aggregates the changes in viewership of all three channels, one can see that the 1 pp increase in pre-news entertainment viewership on the public channel led to a 0.23 pp increase in aggregate mainstream news viewership in the primetime slot. This demonstrates that investment into entertainment shows by the public broadcasting agency is a viable strategy to increase the news exposure of viewers. This could also be used in situations where the government wants to have greater media power when they want to push a certain

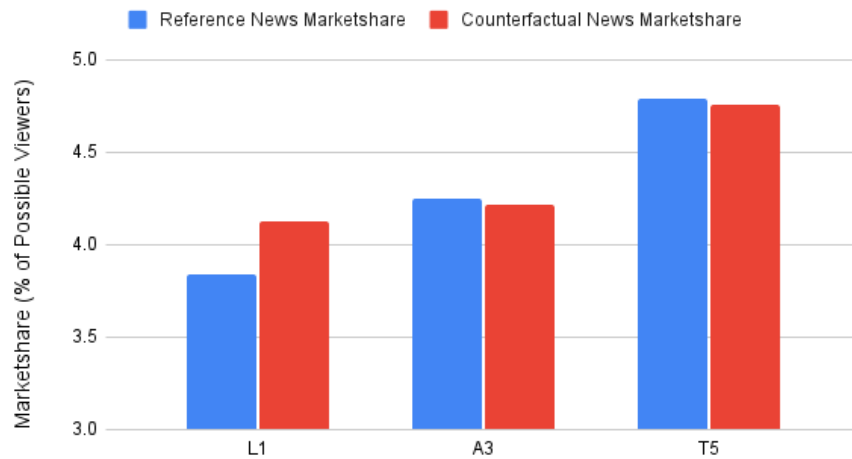


Note: Graphic showing predicted viewer switching behavior without channel inertia. The width of the bar on the left represents viewers choosing each channel in the 8:50-9:00 block. The width of the bar on the right represents viewers choosing each channel in the 9:00-9:10 block. The width of the connecting line between the left and right represents the number of viewers who started on the channel at the left and switched to the channel on the right.

Figure 8: Counterfactual viewership flows from 8:50-9:00 to 9:00-9:10

narrative.

Increasing Public Preenews Programming Popularity by 1pp



Note: Graphic showing news viewership for the main channels with additional investment into the pre-news programming of L1. The heights of the bars is the average predicted probability of choosing to watch each news broadcast across all viewers. The red bars correspond to the viewership with the increased popularity of the public entertainment programming and the blue are viewership with the observed data.

Figure 9: Public Investment in Entertainment Programming

6 The Programming Shock and Election Outcomes

In section 4, I document that the cancellation of Pasapalabra changed the news viewing behavior of a large portion of the Spanish population. There was a decrease in the viewership of Telecinco News of approximately 30%. The remaining national primetime news broadcasts only saw a minor increase in viewership, implying an overall decrease in national mainstream television news consumption. This raises the question of whether this had any measurable effects on political outcomes.

Telecinco broadcasted Pasapalabra the last time on Oct 1st, 2019. Six weeks later, on November 10th, 2019, Spain held national elections. These were not the first elections that year. In April 2019, Spain had held national elections, however, these elections needed to be repeated in November due to the inability of any party to form a government, providing voting outcomes before as well as shortly after the programming shock. In an ideal setting, one would have data on an individual level, with both an individual's daily viewing habits and his/her voting behavior. However, the TV audience dataset does not have information on voting behavior. As a second best option, I use the viewership data to predict the probability of being treated⁴⁰ for every Spanish citizen using their gender, age, province, and the size of the municipality where they reside. Using aggregated Spanish census data on census-tract-level demographics⁴¹, I aggregate these individual level predictions to estimate the expected proportion of people in each census tract who regularly watched Pasapalabra. This census-tract-level Pasapalabra popularity is then connected to changes in voting behavior after the shock using census-tract-level differences in voting behavior.⁴²

The empirical strategy in this section predicts the popularity of Pasapalabra in each census tract/voting section and tests whether census tracts with a higher predicted popularity experienced a greater drop in voter turnout. If cancellation of Pasapalabra had an effect on voting outcomes, one would expect to see a greater effect on overall turnout in census tracts with higher Pasapalabra popularity. It relies on predicting Pasapalabra viewership using geographic and demographic variation, which naturally brings selection issues into the analysis. Geographic and demographic groups that watch Pasapalabra may have inherent differences in voting behavior with respect to groups that don't watch Pasapalabra. In my analysis below, I connect Pasapalabra viewership to changes in voting outcomes controlling for many other possible alternative drivers in voting turnout that may come from this in-

⁴⁰The treated population are people who regularly watch Pasapalabra

⁴¹The closest census data to the shock that is publicly available is from 2021. The ages in the census data were adjusted to reflect this change. However, the higher death rates for the older population may introduce a small amount of bias into the estimates

⁴²In Spain voting sections and census tracts are the same units, providing a direct map from demographic data to voting data.

herent selection.⁴³ The results of the analysis, connecting predicted Pasapalabra popularity to voting outcomes, provide suggestive evidence that the programming shock may have impacted voting outcomes. However, the inherent selection present in the analysis restrain any causal interpretations of the results.

6.1 Expected Changes in Voter Participation and Party Vote Shares

As discussed in Section 2, Telecinco’s news is politically central compared to the other mainstream TV news channels. In Section 4, I document a large decrease in the consumption of this politically central news source that was not offset by increase in other mainstream TV news sources. Other sources, such as La Sexta and La 1 saw a small increase in their viewership. Literature on media and voting participation provide evidence that a decrease in news media consumption decreases voter turnout; some examples are Gentzkow (2006), Gentzkow and Shapiro (2009), Djourelouva et al (2024). In this section I study whether the shock to entertainment programming and its overall effect on primetime TV news viewership is related to a drop in voter participation.

The shock could have impacted voter participation through multiple possible channels. Voter participation may have decreased due to reduced awareness about the upcoming election and actions taking by political actors; a decrease in political engagement; or greater perceived costs of becoming sufficiently informed to vote.⁴⁴

The shock may have also had an impact on the vote shares of different political parties. It may have decreased voter participation for viewers of Pasapalabra, decreasing the vote share of parties that were supported by a typical Pasapalabra viewer. Alternatively, the viewers may have relied more on other sources of information, with different political slant. The effect this has on party vote shares is highly dependent on the remaining news sources each affected viewer relies on for their vote, which I am unable to observe. A decrease in information on parties’ current position may have voters vote more in line with their “default” party, which is also not observable in the data. This may also have voters making decisions on older information, not updating their vote to current party dynamics. I am unable to disentangle these mechanisms and make any clear predictions on how the programming shock due to the ambiguity on the direction and strength of each mechanism. Therefore, I focus the analysis of this section on voter participation. Results on party vote shares are included in the appendix.

⁴³A detailed description of controls are described in the specification section 6.3 below.

⁴⁴These are some possible mechanisms in which the shock could affect voter participation. The list is not exhaustive. In the analysis I link the shock to changes in voter participation, but am not able make any claims on the underlying mechanism.

6.2 Predicted Pasapalabra Popularity

I use the viewing behavior of viewers in the months before the cancellation to classify them as Pasapalabra viewers or not and calculate the proportion of viewers who are considered regular viewers in each region. In the analysis below a viewer is a regular viewer if they watched Pasapalabra at least once a week on average⁴⁵. This provides a proxy for the overall interest in the Pasapalabra in the area; the results are also robust to different cutoffs for the classifying people as regular Pasapalabra watchers. After classifying the $\tilde{12,000}$ viewers in my dataset who are old enough to vote, I then estimate a logit model using the age, sex, province, and municipality size of the viewer. The results are shown in the appendix C. As discussed in Section 3 above, the typical Pasapalabra viewer is female, older, and living in a rural area or a mid-sized city. I use the estimated logit model to predict whether a person was a Pasapalabra viewer for each person within each census tract. I took the average prediction to get a Pasapalabra popularity index on the census-tract-level for each of the $\sim 30,000$ Spanish census-tracts. The distribution of the popularity index across all the different census tracts is shown in the figure below.

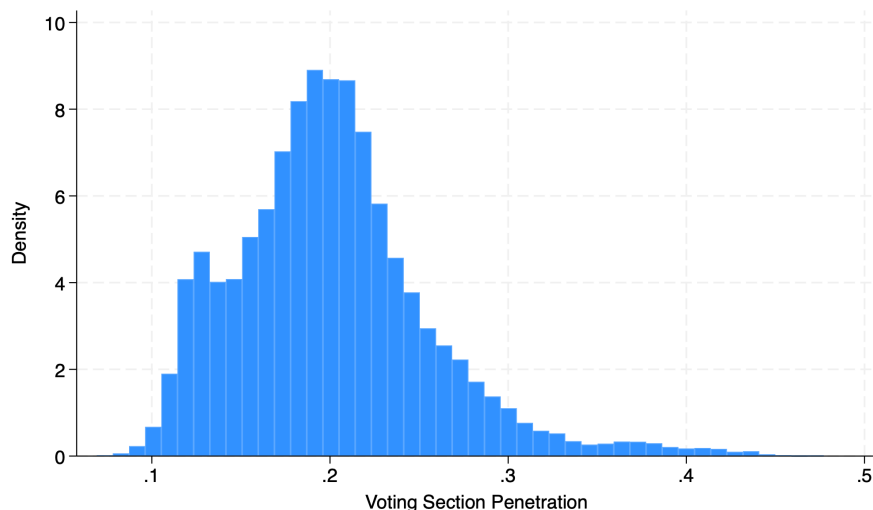


Figure 10: Histogram of estimated Pasapalabra popularity across voting sections in Spain

A part of the variation in popularity comes from regional differences at the province level.⁴⁶ The maps in the figure below show the variation in Pasapalabra popularity across the different Spanish provinces, as well as the drop in voter turnout in the 2019 elections in those provinces. In the map on the right, you can see the geographic variation in Pasapalabra

⁴⁵Results are robust to different frequency cutoffs

⁴⁶The finest geographical indicator in the television viewer dataset is viewer province. Therefore geographic differences in the popularity index.

penetration across the different Spanish provinces. There seems to be plenty of variation across provinces as well as within Autonomous Communities.⁴⁷ There also appears to be some relation to the drop in voter turnout, which is shown in the map to the left.

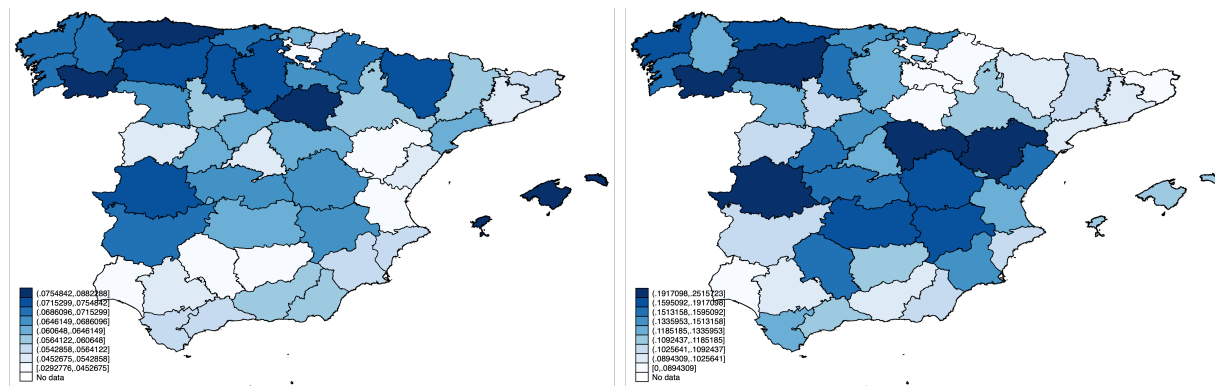


Figure 11: Left: 2019 Drop in Voter Turnout, Right: Pasapalabra Popularity
Darker shades correspond to a greater drop in turnout and higher Pasapalabra Popularity

6.3 Specification

The empirical strategy relies on variation in predicted Pasapalabra popularity across different census tracts⁴⁸. When regressing the predicted proportion of people who are regular viewers onto the difference in vote outcomes, the coefficient of the penetration variable can be interpreted as the difference between someone who is predicted to be a regular consumer of Pasapalabra with respect to someone who is not. A more conservative interpretation sees the popularity variable as a general proxy to treatment intensity with the sign of the coefficient representing the direction of the relationship between Pasapalabra and changes in turnout. The regression below is employed for this analysis.

$$V_{c,Nov19} - V_{c,Apr19} = \gamma P_c + \beta X_c + \varepsilon_c,$$

where $V_{m,Nov19}$ is the percent voter turnout in November 2019 in census tract c , P_c is the Pasapalabra popularity in census tract c , and X_c are census-tract-level controls. Many census tracts are in the same cities and may therefore have large geographic correlation in unobservables. To account for this, standard errors, ε_c , are clustered at the municipality

⁴⁷In Spain there are 52 provinces which are subsets of 19 Autonomous Communities

⁴⁸More specifically it relies on variation in popularity across provinces as well as variation in popularity across the demographics of age, gender and municipality size.

level.⁴⁹

Taking the difference in voter turnout between the November and April elections removes all census-tract-level factors that remain constant across the two elections. However, there still may be other factors that effect the change in voter turnout from one election to the other. Party dynamics between the elections as well as strategic voting may influence people to change their voting behavior. This could include the decision to not vote as well as changing to another party. To control for this, the original vote shares of all the major political parties⁵⁰ in each census tract were individually included as controls. Additionally, the percentage point drop in voter turnout may be related to general differences in political engagement. The average voter participation in the past 3 national elections for each census tract are included to control for general differences in political engagement.

6.4 Results: Differences in Voter Participation in 2019 Elections

The table below show the results of the regressing Pasapalabra penetration onto differences in voter turnout. Overall, voter participation dropped in all provinces. There is a strong relationship with the magnitude of the drop and the predicted popularity of Pasapalabra in the region. The results in the table below show the difference in the drop in turnout between a person predicted to watch Pasapalabra regularly and a person predicted not to watch the show. The first column shows the coefficient without any controls; the estimated difference is 5.6 percentage points. The second and third column show results added in controls for political engagement and party dynamics separately. The fourth column shows the results that include both controls. Based on the results, being a regular Pasapalabra viewer was related to a 6.95 percentage point drop in the probability of voting in the November elections after the cancellation relative to an individual who is not classified as a regular Pasapalabra viewer, while controlling for previous voter turnout and political party vote shares.

The final column shows the results excluding census tracts in Catalonia. The region differs from other parts of the country due to the presence of multiple regional parties as well as an active independence movement. In the time between the 2019 elections Spanish courts convicted Catalan politicians for their role in the independence referendum of 2017. This shock may have had effect on the region, however, should not have a differential effect on voters living outside of the region. The results excluding Catalan census tracts has a coefficient of -0.054 which signifies that predicted Pasapalabra viewers had a 5.4 percentage

⁴⁹For robustness, the analysis is also performed clustering at a province level. This drastically reduces the power of the analysis due to the limited number of provinces. These results can be found in the appendix.

⁵⁰This include PSOE, PP, Cs, Podemos, VOX, which accounted for 85% of all votes in the April 2019 election

point drop in participation compared to citizens not predicted to watch the show. Given the turnout of November election, this would correspond to a persuasion rate of about 15%⁵¹. This persuasion rate falls within the range of persuasion rates found in the literature on empirically estimating persuasive forces for voter participation, Dellavigna and Gentzkow (2010).

These results relate predicted Pasapalabra popularity to changes in voter turnout. Although the analysis controls for many alternative factors that impact turnout, it relies on demographic variation to predict the popularity of Pasapalabra. The results could be driven by some unobserved shock that differentially affected the same demographics as Pasapalabra viewers. Despite the exogeneity of the shock and the focus on local differences across elections, the reliance on demographics to predict the popularity of Pasapalabra restrains the causal interpretation of the analysis, as there may be other confounding factors that differentially affected the voting behavior of the demographics that watched Pasapalabra.

Difference in Voter Participation, April/November 2019 Elections					
	(1)	(2)	(3)	(4)	(5)
Pasapalabra Pen.	-0.0558*** (0.0131)	-0.0812*** (0.0120)	-0.0474*** (0.0138)	-0.0695*** (0.0138)	-0.0542*** (0.01520)
Prev. Turnout		✓		✓	✓
Past Vote Share w/o Catalonia			✓	✓	✓
R-squared	0.0078	0.0384	0.0454	0.0659	0.0664
N	36,035	35,684	35,471	35,120	30,103

Note: Regressing Predicted Pasapalabra Popularity onto differences in voter turnout between November and April 2019 elections at the census tract level. Standard errors are clustered at the municipality level. Results with errors clustered at the province level are shown in the appendix.

Regarding voter turnout in the three prior elections, it was positively correlated with the difference in voter turnout. One would expect census tracts with a higher political engagement to have a less severe drop in voter turnout. This is supported by the results, if one interprets prior voter participation as a proxy for how politically engaged a census tract is.

Regarding the political parties, the difference in voter participation was significantly correlated to the vote share of some of the political parties. The drop in voter turnout was higher in census tracts that had a higher vote share for the center right (PP) and center left (PSOE) parties; these are the largest parties in Spain. The vote share for the far left

⁵¹Persuasion rates is a standardized metric developed in Dellavigna and Kaplan (2007) to measure how many people change their action due to a persuasive force

party (Podemos) and the liberal party (Cs) were not significantly correlated to drops in voter turnout across census tracts. The vote share for the far right party (VOX) was correlated with a low drop in turnout.

6.5 Trends, Repeated Elections and Voter Fatigue

In repeated elections, there is a general decrease in voter participation in the second election. The results above show that the magnitude of this drop is related to the predicted popularity of Pasapalabra in a census tract. This could be the result of demographics who like Pasapalabra having higher tendency to not vote in repeated elections. For example, older voters and voters living in more rural areas may have a higher level of vote fatigue that is unrelated to the shock. These demographics also have a higher probability of having watched Pasapalabra regularly.

To control for this voting fatigue, I difference the difference in voting outcomes in the previous national elections, which were also repeated elections that were spaced about 6 months apart. Differencing out this past election results controls for census-tract-level trends resulting from fatigue from repeated elections. Additionally, in the previous repeated elections, Pasapalabra was broadcast for both elections. If this increased general engagement and decreased voter fatigue for treated viewers, one could observe even more negative coefficients in this specification. In the table of results below, one can see coefficients remain negative and significant. In all of the specifications that include Catalonia, the coefficients increase in magnitude, while the specification excluding Catalan census tracts is statistically indistinguishable from the estimate in the results above.

Triple Difference in Election Turnout: (Nov '19 - Apr '19) – (Jun '16 - Dec '15)					
	(1)	(2)	(3)	(4)	(5)
Pasapalabra Pen.	-0.1659*** (0.0215)	-0.1886*** (0.0209)	-0.0799*** (0.0179)	-0.1118*** (0.0175)	-0.0550*** (0.0179)
Prev. Turnout		✓		✓	✓
Past Vote Share			✓	✓	✓
w/o Catalonia					✓
R-squared	0.0323	0.0430	0.0599	0.0796	0.0371
N	35,685	35,684	35,121	35,120	30,103

Note: Regressing Predicted Pasapalabra Popularity onto triple differences in voter turnout in national elections at the census tract level. Triple difference is difference in difference of turnout from repeated elections. Standard errors are clustered at the municipality level. Results with errors clustered at the province level are shown in the appendix.

7 Conclusions

This paper studies the impact entertainment programming has on the news diets of citizens through viewers' tendency to remain on the same media outlet. I estimate a structural model of viewer behavior using a panel dataset of high frequency choices of individual viewers. This allows me to disentangle viewers heterogeneous preferences for programming from their structural dependence of remaining on the same outlet. The structural model considers inertia on different levels of the television market: on the show-level, on the channel-level, and on the level of the entire television-market. The strength of this inertia is often larger than the variance in preferences for different shows, demonstrating that inertia plays a pivotal role in content choice. I further employ this model to demonstrate that a large portion of news viewership is attributable to channel-level inertia and the entertainment programming preceding the news. Furthermore, I demonstrate that entertainment programming can be used to increase news consumption and overall media power of a given news outlet.

To complement the structural analysis of viewer behavior, the paper studies the forceful unplanned cancellation of the popular game show *Pasapalabra*, which was shown every week-day directly preceding the news. I document a 28% decrease in the most watched Spanish primetime news broadcast show on the same channel after the cancellation. I show that other competing news channels experienced minor to no increases in their viewership. This shock happened in between two repeated national elections. Using demographic and geographical variation in *Pasapalabra* popularity, I show that voting sections with higher predicted *Pasapalabra* popularity experienced a larger drop in voter participation, controlling for other possible mechanisms such as political engagement, differences in voter fatigue, and strategic voting and party dynamics. This provides suggestive evidence that the programming shock may be tied to changes in turnout.

This paper focuses its analysis on the role inertia plays in news diets on television markets. This is a natural place to start due to the relevance TV news still has today. Additionally, the television setting provides rich data on the options available to the consumer as well as the individuals' choices at a high frequency. However, the linear bundling of entertainment and news is also present on other platforms to varying extents. Youtube often includes a banner of breaking news and social media such as Facebook or Instagram include news shared by friends or news account a user follows. As shown in this paper, the inertia on television may induce an overall increase in news consumption. This might mean that consumers may become less informed as broadcast television becomes less popular and consumers switch to other platforms for entertainment.

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Appendix A.

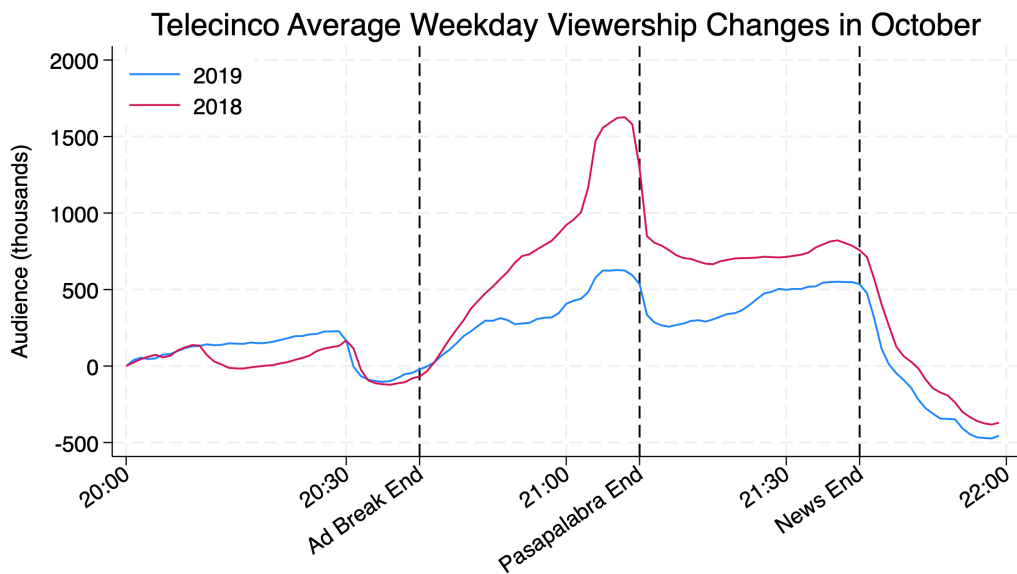


Figure 12: Minute-by-minute Telecinco audience averages of Oct 2018 and Oct 2019 (difference with respect to audience at 20:00)

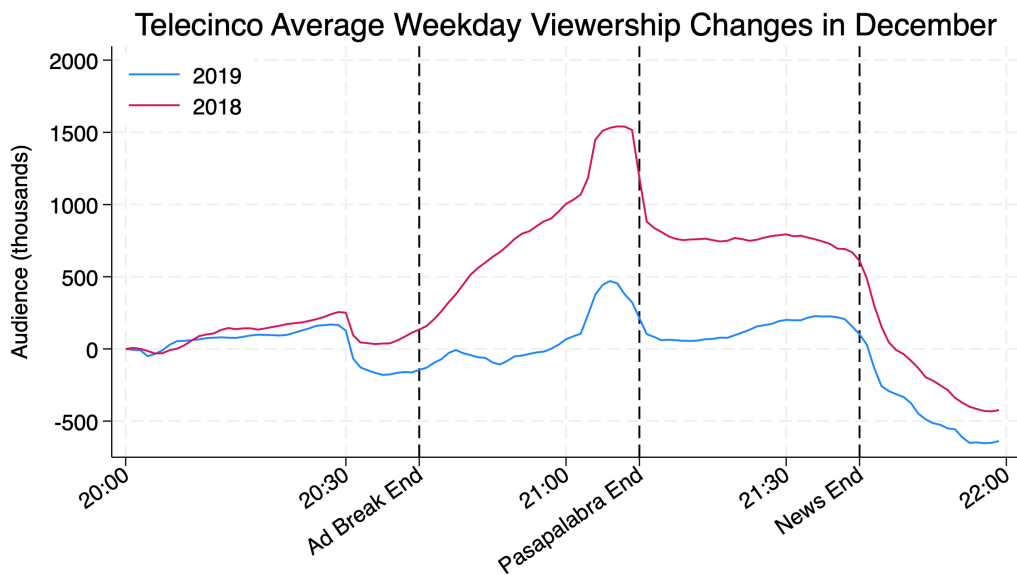


Figure 13: Minute-by-minute Telecinco audience averages of Dec 2018 and Dec 2019 (difference with respect to audience at 20:00)

Telecinco Ad Frequency in November. The proportion of time Telecinco played an advertisement at each minute.

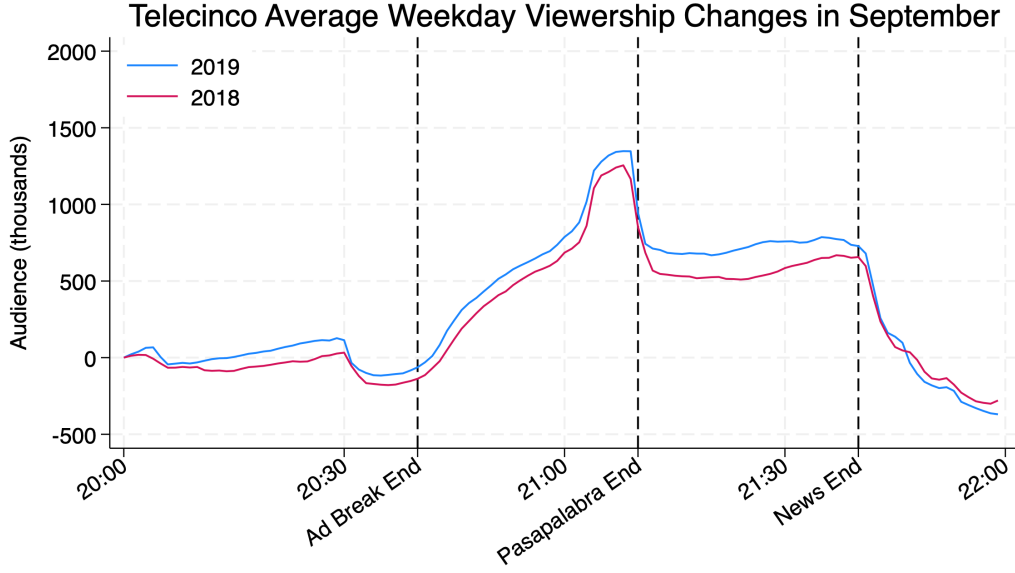
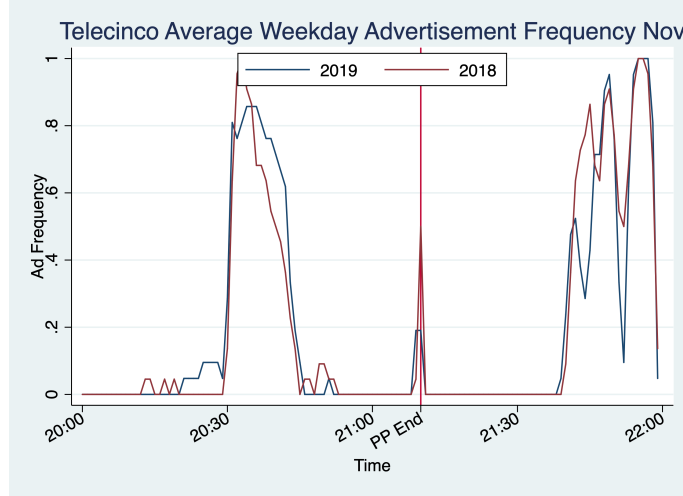


Figure 14: Minute-by-minute Telecinco audience averages of Sep 2018 and Sep 2019 (difference with respect to audience at 20:00)



Appendix B.

The probability of choosing one of the main channels, c , is

$$\mathbb{P}_{i,t}(c|\beta_i^0, \beta_i, \gamma_i, \lambda) = \frac{\exp(\Lambda_{ict} + \gamma_{i,c,t})}{\exp(\beta_i^0 X_{0,t}) + \exp(\lambda_3 1_{i,C,t}^v + \gamma_{i,C,t}) + \sum_{j \in \Omega_{it}} \exp(\Lambda_{i,j,t} + \gamma_{i,j,t})}.$$

The probability of choosing the composite channel is

$$\mathbb{P}_{i,t}(C|\beta_i^0, \beta_i, \gamma_i, \lambda) = \frac{\exp(\lambda_3 1_{i,C,t}^v + \gamma_{i,C,t})}{\exp(\beta_i^0 X_{0,t}) + \exp(\lambda_3 1_{i,C,t}^v + \gamma_{i,C,t}) + \sum_{j \in \Omega_{it}} \exp(\Lambda_{i,j,t} + \gamma_{i,j,t})}.$$

The probability of choosing the outside option is:

$$\mathbb{P}_{i,t}(0|\beta_i^0, \beta_i, \gamma_i, \lambda) = \frac{\exp(\beta_i^0 X_{0,t})}{\exp(\beta_i^0 X_{0,t}) + \exp(\lambda_3 1_{i,C,t}^v + \gamma_{i,C,t}) + \sum_{j \in \Omega_{it}} \exp(\Lambda_{i,j,t} + \gamma_{i,j,t})}$$

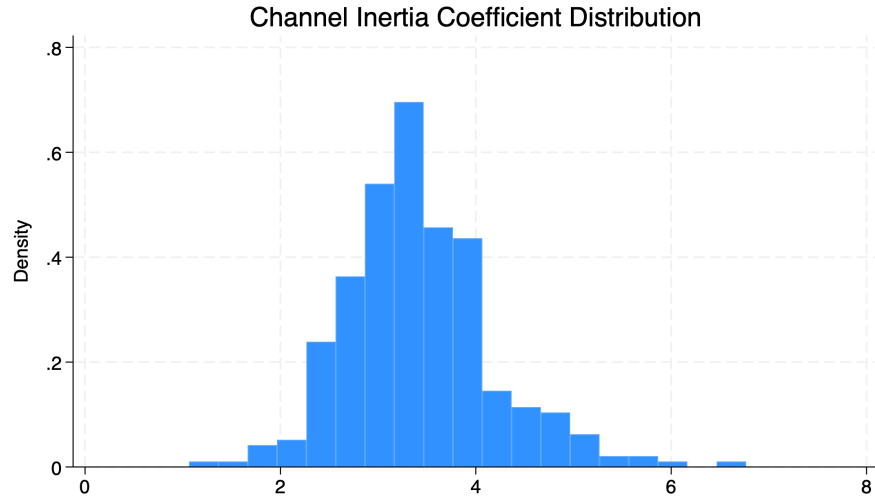


Figure 15: Distribution of Estimated Channel Inertia

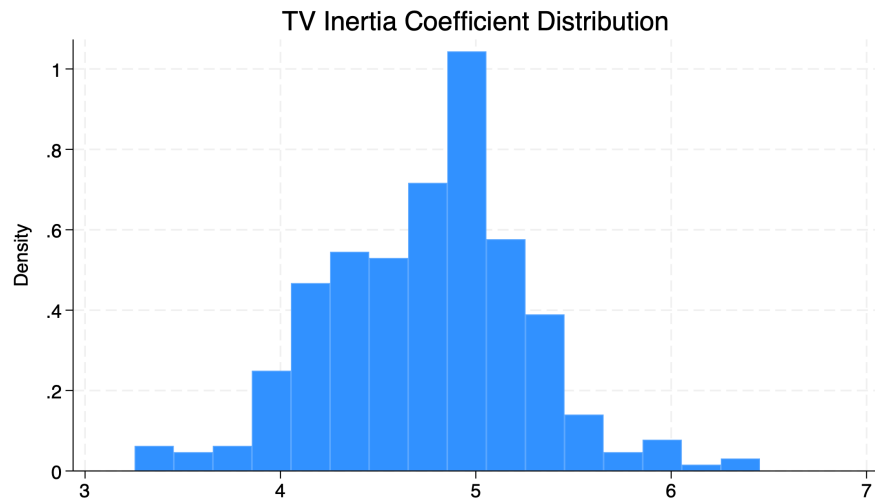


Figure 16: Distribution of Estimated Television Watching Inertia Coefficients

Appendix C

	Pasapalabra Viewer
Female	0.4069*** (0.0496)
24 < age < 35	0.6509*** (0.1625)
34 < age < 45	0.7757*** (0.1527)
44 < age < 55	1.3598*** (0.1471)
54 < age < 65	1.8241*** (0.1462)
age ≥ 65	2.2088*** (0.1417)
2,000 ≤ Mun. Pop. < 10,000	-0.2998*** (0.1123)
10,000 ≤ Mun. Pop. < 50,000	-0.2589** (0.1066)
50,000 ≤ Mun. Pop. < 200,000	-0.1746 (0.1073)
200,000 ≤ Mun. Pop. < 500,000	-0.0610 (0.1212)
500,000 ≤ Mun. Pop.	-0.3368*** (0.1280)
Province FEs	YES
Constant	-3.3023*** (0.3119)
R-squared	
Number of individuals	11,671
Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.	

Difference in Voter Participation, April/November 2019 Elections

	Pen. Alone	Prev Turnout	Vote Shares	Main	w/o Catalonia
Pasapalabra Pen.	-0.0558*** (0.0038)	-0.0812*** (0.0040)	-0.0474*** (0.0043)	-0.0695*** (0.0044)	-0.0542*** (0.0050)
Prev. turnout		0.0792*** (0.0031)		0.0738*** (0.0034)	0.0709*** (0.0037)
PSOE share			-0.0447*** (0.0019)	-0.0298*** (0.0020)	-0.0274*** (0.0022)
PP share			-0.0243*** (0.0030)	-0.0317*** (0.0031)	-0.0257*** (0.0035)
Podemos share			-0.0137*** (0.0037)	-0.0097*** (0.0035)	-0.0028 (0.0043)
VOX share			0.0591*** (0.0045)	0.0815*** (0.0047)	0.0958*** (0.0050)
Cs share			0.0145*** (0.0043)	-0.0223*** (0.0042)	-0.0222*** (0.0045)
Constant	-0.0467*** (0.0008)	-0.0997*** (0.0022)	-0.0377*** (0.0010)	-0.0874*** (0.0025)	-0.0932*** (0.0030)
R-squared	0.0078	0.0384	0.0454	0.0659	0.0664
N	36,035	35,684	35,471	35,120	30,103

Note: *** : $p < 0.01$, ** : $p < 0.05$, * : $p < 0.1$.

Difference in Party Vote Share: Elections: (Nov '19 - Apr '19)

	Left		Center	Right	
	Podemos	PSOE	Cs	PP	VOX
Pasapalabra Pen	-0.0272*** (0.0016)	0.0330*** (0.0023)	-0.0385*** (0.0013)	0.0031 (0.0026)	-0.0344*** (0.0025)
Previous Vote Shares	✓	✓	✓	✓	✓
Previous Turnout	✓	✓	✓	✓	✓
R-squared	0.3226	0.2121	0.9089	0.4449	0.2858
Number of individuals	35,120	35,120	35,120	35,120	35,120

Difference in Voter Participation, April/November 2019 Elections					
	(1)	(2)	(3)	(4)	(5)
Pasapalabra Pen.	-0.0558*	-0.0812***	-0.0474	-0.0695**	-0.0542
	(0.0300)	(0.0258)	(0.0322)	(0.0294)	(0.0334)
Prev. Turnout		✓		✓	✓
Past Vote Share w/o Catalonio			✓	✓	✓
R-squared	0.0078	0.0384	0.0454	0.0659	0.0664
N	36,035	35,684	35,471	35,120	30,103

Note: *** : $p < 0.01$, ** : $p < 0.05$, * : $p < 0.1$.

Table 4: Results Clustering Standard Errors at the Province level

Triple Difference in Election Turnout: (Nov '19 - Apr '19) – (Jun '16 - Dec '15)					
	(1)	(2)	(3)	(4)	(5)
Pasapalabra Pen.	-0.1659**	-0.1886***	-0.0799*	-0.1118**	-0.0550
	(0.0663)	(0.0633)	(.0472)	(0.0416)	(0.0433)
Prev. Turnout		✓		✓	✓
Past Vote Share w/o Catalonia			✓	✓	✓
R-squared	0.0323	0.0430	0.0599	0.0796	0.0371
N	35,685	35,684	35,121	35,120	30,103

Table 5: Results Clustering Standard Errors at the Province level

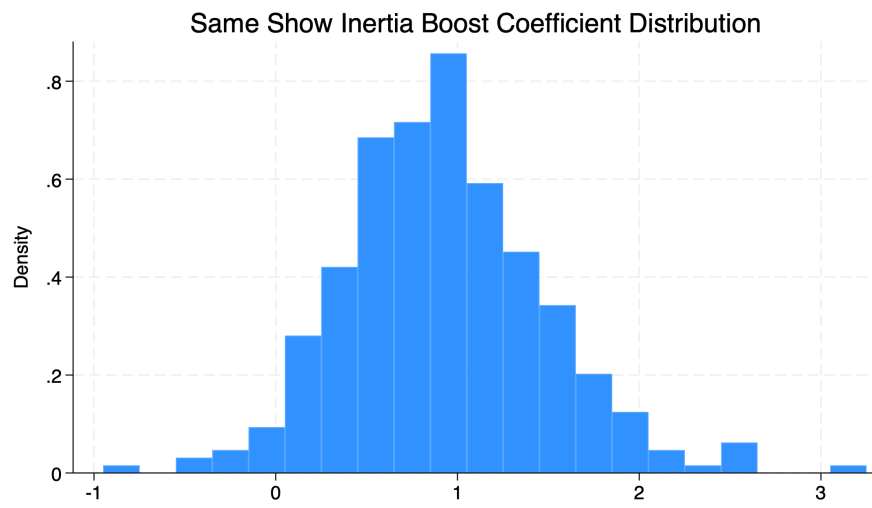


Figure 17: Distribution of Estimated Same Show Inertia Coefficients