

Religious Media, Conversion, and the Socioeconomic Consequences: The Rise of Pentecostals in Brazil

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Abstract

We study the socioeconomic consequences of adherence to the Pentecostal movement in Brazil, using exposure to a church-affiliated TV channel as a source of quasi-random variation in religiosity. Our empirical strategy exploits the placement of transmitters prior to the channel becoming religiously affiliated. Results show that exposure to this TV channel increased the number of Pentecostals in Brazil (30% increase compared to baseline) ten years after change of ownership. Consistent with the church's prescriptions, municipalities exposed to this TV channel had higher fertility rates, lower female labor force participation, lower schooling for young women, and more votes for Pentecostal candidates. We find no effects on schooling for boys. Results persist in following 20 years. In an event-study framework, we exploit the expansion of RecordTV over time to show that the number of Pentecostal churches increases following the introduction of channel in the municipality.

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1 Introduction

Religion plays a major role in people’s lives, by shaping behaviors, prescribing norms of conduct, and fostering specific values. Important progress has been made in estimating the causal effect of religion, but such research remains empirically challenging because of the endogeneity in religious affiliation and participation (Squicciarini [2020](#); Bryan, Karlan, and Choi [2021](#); Iannaccone [1992](#); Bassi and Rasul [2017](#)). Since most traditional religions spread in the distant past, data limitations prevent the study of contemporaneous changes in individuals’ behaviors. Furthermore, these historical religions have long permeated the social contexts in which they spread, affecting dimensions such as institutions and culture. In these respects, the growth of new religious movements in the recent past offers an opportunity to study the effect of religion on individuals’ behavior in the aftermath of initial conversions.

The Pentecostal movement, a part of Protestant Christianity, is one of the world’s fastest-growing religious groups. It is especially influential in Latin America and Africa, where it is followed by 13% and 12% of the population, respectively. Pentecostals are notable for being more religiously observant than other Christians, for their belief in more literal interpretations of sacred texts, and for their convictions regarding more traditional moral values and doctrines, particularly for women. The movement emphasizes women’s roles as homemakers and encourages submission to their husbands, while discouraging girls and women from pursuing education beyond those roles. As a consequence, adherence to Pentecostal beliefs can affect female education, fertility, and participation in the workforce. Sociological studies suggest that the rapid growth of the Pentecostal movement is partly due to its extensive use of media for spreading core beliefs (Bastian and Cunneneen [1998](#)). Despite considerable research on media’s influence on human behavior and political outcomes, limited understanding exists regarding its impact on deeply ingrained

values such as religion.

In this paper, we study the socioeconomic effects of religious affiliation, using exposure to a church-affiliated TV channel as a source of quasi-random variation in religious affiliation. Our setting exploits the rise of the Pentecostal movement in Brazil, where membership grew roughly 300% over between 1970 and 2014. Our baseline empirical strategy exploits the initial coverage of RecordTV, a Brazilian TV channel that started broadcasting religious content in the 1990s. Because Pentecostals intensively use media to spread their message, access to this TV channel is a credible source of exogenous variation on people’s exposure to this movement. RecordTV started operating in 1953 as a commercial TV channel offering music and light entertainment shows. After going bankrupt in the late 1980s,¹ it was purchased in 1990 by Edir Macedo, a Pentecostal bishop. Since the media market in Brazil is dominated by a few large companies and is thus highly concentrated, the bankruptcy of a major TV channel such as RecordTV was a unique isolated event. The TV station was sold with its existing network of transmitters, which were placed prior to its purchase.

Following the purchase, RecordTV programming shifted from a secular to a religious platform, relying on the Pentecostal set of values to frame the content of its programming, which includes moralizing soap operas and Biblical documentaries. The programming is aimed at both trying to persuade people to join the church and encouraging the adoption of behaviors prescribed by the church. According to Campos (1997), in 1996, RecordTV aired 60 hours of religious programming weekly, while the two largest networks based on audience had less than an hour per week.

We exploit the cross-sectional variation in RecordTV coverage associated with the transmitters installed before Macedo purchased the channel in 1990 (i.e., the transmitters

¹RecordTV’s bankruptcy was attributed to mismanagement.

that were already in place at the time of sale). Our empirical strategy relies on the assumption that the placement of transmitters was exogenous to the expansion strategy of the church. However, RecordTV’s coverage in 1990 may still correlate with other local characteristics that could have affected religious affiliation and behaviors in ways other than through TV. To account for such possibilities, we control for a measure of distance to transmitters, which captures proximity to more important areas. We also control for baseline municipal characteristics, geological characteristics, and mesoregion fixed effects, which can account for shocks correlated with local economic conditions.

We focus on a set of socioeconomic outcomes that are likely to be influenced by the prescriptions of the Pentecostal church. For example, Pentecostals advocate for women to play a more traditional role in society as homemakers and have strict prohibitions regarding alcohol use and gambling by their members.² Thus, to investigate the adherence to behaviors prescribed by the church, we look at fertility rate, female labor force participation, and schooling completion by young girls. Beyond such direct effects on members’ attitudes, Pentecostals’ influence may also be extended through leveraging their increasing involvement in politics. To analyze the role of religiosity in shaping political beliefs, we estimate the effect of RecordTV on votes for Pentecostal candidates.

Our results show that exposure to RecordTV increases the number of adherents to the Pentecostal church. We show that exposure to RecordTV in 1990 leads to an increase of 1 percentage points in the share of Pentecostals in the population. This increase translates to 33% more adherents relative to 1991 and accounts for 15% of the total increase in Pentecostals between 1991 and 2000. Our results persist in the in the next decade, reaching 1.8 percentage points. Using data on viewership, our estimates imply that RecordTV convinced between 2.3% and 11.1% of viewers to convert to the

²Although Catholics also have similar guidance, most do not practice strict observance. As discussed in Section 2.1, Catholics attend church less often and have less conservative views about the role of women than Pentecostals.

Pentecostal church, depending on the audience measure used.

This large change in religious adherence allows us to study the behavioral consequences of adherence to the Pentecostal church. In the long run, exposure to RecordTV leads to an increase in the average number of children per woman by 0.1, a decrease in female labor force participation by 2.8 percentage points, and a reduction in the proportion of young girls finishing at least middle school by 1.1 percentage points. We do not find any effect on male labor force participation, boys' schooling, or suicides rate ten years (1991-2000) after the change in ownership. We also find an increase of 10 percentage points in the share of votes for candidates affiliated with the Pentecostal church in 2014. Results persist twenty years later (1991-2010). Taken together, our results suggest that the expansion of Pentecostalism leads to the adoption of more conservative behaviors.

We take several approaches to address the concern that the placement of RecordTV's transmitters prior to the ownership change in 1990 might be related to unobserved factors that affect our outcome variables. First, we provide evidence that diverging trends were not already present in covered municipalities, as we find no evidence that exposure to RecordTV in 1990 affected the evolution of our outcomes of interest in the past. Second, to show that our results do not reflect the effect of TV exposure in general, we test the impact of exposure to RecordTV against exposure to Globo, the largest Brazilian TV channel, and find that the former but not the latter is associated with a measurable impact.

In addition to our baseline strategy which uses only placement of initial transmitters for identification, we take advantage of the expansion of RecordTV to other municipalities during the 1990s. This specification requires an additional assumption that the exact time of expansion was not correlated with other trends. However, it allows us to better test for pre-trends. We observe that the number of churches per capita exhibits a

significant increase only after the exposure to RecordTV, but not before that. This result mitigates concerns that our main findings could be attributed to factors other than RecordTV’s expansion, such as the establishment of new Pentecostal churches. Furthermore, our analysis shows that fertility rates experienced an upsurge approximately five years following RecordTV’s coverage, corroborating the result from the baseline empirical strategy.

Our paper relates to three main strands in the literature. Primarily, our paper relates to studies on the influence of religion on a varied set of behaviors.³ While many of these studies focus on historical religions,⁴ we analyze the socioeconomic impacts of the expansion of the Pentecostal Church, a relatively new religion that is one of the fastest-growing religions worldwide. This is similar in spirit to Bryan, Karlan, and Choi (2021) who document the impact of Evangelical churches on some behaviors through the randomization of a religious education program in ultra-poor Filipino households. They find no effects along several socioeconomic outcomes but observe an increase in income and a decrease in perceived relative economic status.

This work can also be linked to the literature on the impacts of media on individuals’ behaviors.⁵ In general, very little is known quantitatively about the role that media

³Previous papers have shown that religion influences dimensions such as trust and cooperation (Iannaccone 1998; Iyer 2016), fertility and family (Bassi and Rasul 2017), physical and mental health (Ellison 1991; Campante and Yanagizawa-Drott 2015; Fruehwirth, Iyer, and Zhang 2019), crime rates and corruption (Freeman 1986; Xu, Li, Liu, and Gan 2017), drug and alcohol use (Gruber and Hungerman 2008; Bryan, Karlan, and Choi 2021), income (Gruber 2005; Bryan, Karlan, and Choi 2021), and educational attainment (Gruber 2005; Squicciarini 2020).

⁴See for instance Michalopoulos, Naghavi, and Prarolo (2018), Botticini and Eckstein (2014), Becker and Woessmann (2009), Cantoni (2015), Squicciarini (2020), and Grosfeld, Madinier, Sakalli, and Zhuravskaya (2021).

⁵Previous research has shown that advertising (Bursztyn and Cantoni 2016), light entertainment shows (Durante, Pinotti, and Tesei 2019), and soap operas (La Ferrara, Chong, and Duryea 2012) can have important and persistent effects on various types of behavior, such as education (Gentzkow and Shapiro 2008; Kearney and Levine 2019), civic engagement (Olken 2009; Putnam et al. 2000), gender attitudes (Kearney and Levine 2015; La Ferrara and Chong 2009; Jensen and Oster 2009), health (Banerjee, La Ferrara, and Orozco-Olvera 2019), conflict and migration (Braga 2007; DellaVigna, Enikolopov, et al. 2011; Yanagizawa-Drott 2014), political orientation (Gentzkow 2006; Gentzkow, Shapiro, and Sinkinson 2011; DellaVigna and Kaplan 2007; Enikolopov, Petrova, and Zhuravskaya 2011; Adena et al. 2015;

play in fostering religiosity and conformance to religious behaviors. An interesting exception is provided by Grosfeld, Madinier, Sakalli, and Zhuravskaya (2021), who show how, after a right-wing populist party came to power, exposure to an independent TV channel in Poland has a negative effect on religious participation relative to places receiving only the pro-government state TV. In this paper, we empirically document how religious media can directly affect religiosity and induce people to convert. In addition, our paper also documents how the promotion of specific socioeconomic behaviors endorsed by the Pentecostal movement are in fact adopted by the audience. This finding uncovers a clear religious channel that is usually difficult to disentangle when the media under study have broader, mixed messages.⁶

Finally, our findings also relate to the question on the determinants of religious affiliation and religiosity, given that religions often incorporate practices that are costly for the individual. Taking advantage of our context, we are among the first to empirically study the choice of religious affiliation as a main outcome. Several theoretical studies consider religious groups as social clubs and religious participation as insurance against adversities.⁷ However, empirical evidence on the conditions affecting religious participation and religiosity is mixed and rather scant, and it has primarily focused on economic causes.⁸ Related to our context, Costa, Marcantonio, and R. Rocha (2023) study the effect of economic downturns on the share of Pentecostals in Brazil. They find that regions more exposed to economic distress have increases in Pentecostals during the 1990s and in

Strömberg 2004; Chiang and Knight 2011; Wang 2020), and consumption choices (Bursztyn and Cantoni 2016).

⁶In an unpublished manuscript, Komatsu (2019) studies the impact of media produced by Macedo’s church, the Universal Church of the Kingdom of God (UCKG), on religious affiliation with the church in Brazil, exploiting cross-sectional variation in contemporaneous signal strength for identification. Our paper relies on a weaker identifying assumption and provides several robustness checks to deal with potential endogeneity in the placement of transmitters, including using only variation due to the pre-purchase set of transmitters.

⁷See for instance Iannaccone (1992), Berman (2000), Dehejia, DeLeire, and Luttmer (2007), Ager and Ciccone (2018).

⁸See Chen (2010), Chaney (2013), and Shofia (2020).

the vote share of Pentecostal candidates. Differing from previous research, our paper is focused on religious media, whose specificity might affect religious affiliation and believers’ behavior in ways that differ from those caused by economic recessions and financial distress.

The remainder of this paper proceeds as follows. Section 2 provides background information on the Brazilian context and the rise of the Pentecostal movement. Section 3 presents our data. In Section 4, we discuss our empirical strategy. Section 5 presents our main results and offers several robustness checks. Section 6 concludes.

2 Background

In this paper, we study the socioeconomic consequences of the rise of the Pentecostal movement in Brazil. This relatively new religious movement has grown rapidly over the past few decades in Latin America and Africa. We use exposure to RecordTV, a church-affiliated Brazilian TV channel bought by a Pentecostal bishop, as a source of quasi-random variation in religiosity.

2.1 Pentecostals

The Pentecostal movement is one of the fastest-growing religious movements in Latin America and Africa. Between 1970 and 2014, membership grew roughly 300% in Brazil, reaching 22% of the total population by the end of this period. Pentecostalism is a movement within Christian Protestantism that emphasizes the centrality of the gospel, conversion to its tenets, and a more personal relationship with Jesus Christ. It also stresses the authority of the Bible and the renewal of “gifts of the Holy Spirit,” such as speaking in tongues, divine healing, and prophesying.

In Brazil, Pentecostals tend to practice religion more often, are more conservative, and have higher actual compliance with church-related prescriptions than Catholics, the country's largest religious group. A survey by Pew Forum on Religion & Public Life (2006) shows that Pentecostals in Brazil are strictly observant, with 86% attending church every week in contrast to 32% of other Christians and 51% reading the Scripture daily in contrast to 10% of other Christians. The study shows that Pentecostals have more conservative views about women's roles, with 61% believing that a wife has to obey her husband and only 42% of other Christians holding the same view. They also have stronger preferences for political leaders with religious beliefs (73% vs. 63% for other Christians). Using data from the 2002–2003 Brazilian Household Expenditure Survey (POF/IBGE), Panel B of Table A1 shows that Pentecostals report spending less on alcohol, tobacco, gambling, and secular entertainment (i.e., night clubs) compared with Catholics. The two groups do not differ on average spending for goods unrelated to church prescriptions, such as food outside the home and transportation.

A particular feature of the Pentecostal churches is that they have intensively used a range of media channels to propagate their messages, a phenomenon known as televangelism. Several prominent scholars on Pentecostalism have emphasized that the churches' expert use of mass media can largely explain their growth in Brazil. P. Rocha (2000), for instance, noted that television was by far the preferred form of mass media employed by Brazilian Pentecostals. A survey by the Pew Forum on Religion & Public Life (2006) shows that 78% of believers use religious media (TV/radio) at least weekly, while just 34% of other Christians rely on these sources.

2.2 RecordTV: History

RecordTV, one of Brazil’s prominent television channels, was acquired by a Pentecostal church in 1990 following a period of financial turmoil for the channel. After the acquisition, a significant portion of its programming has been devoted to religious content.

RecordTV started in 1953 as a secular channel specializing in musical and light entertainment shows. The station met financial difficulties and declared bankruptcy in the late 1980s, after which Macedo, the founder and leader of the UCKG in Brazil, purchased it. The acquisition of RecordTV was part of the church’s expansion strategy, along with other investments, but the opportunity to purchase a TV station was unique. Because the media market in Brazil is highly concentrated and is dominated by a few large companies,⁹ the bankruptcy of a major TV channel is an infrequent event. Currently, RecordTV is the third-largest TV channel in the country in terms of audience size.

RecordTV also has a clear political stance. In the 2018 presidential campaign, RecordTV aired Macedo blessing the candidate Jair Bolsonaro in front of nearly 10,000 faithful at the Temple of Solomon in Sao Paulo, the main UCKG worship venue.

2.3 RecordTV: Content

After the change of ownership, RecordTV introduced a large amount of religious content into regular programming. Besides trying to persuade viewers to join the church, the shows also encouraged them to adopt the behaviors prescribed by the church. Even shows that were not explicitly religious promoted the values consistent with the faith and played a role in shaping behavior, particularly for women.

⁹In the mid-1990s, there were seven TV channels in Brazil operating nationwide. Table A contains the list of channels operating until 2000.

One particularity of RecordTV is the amount of religious content in its programming. In 1996, RecordTV aired 60 hours of religious content per week, which was significantly more than other networks. The two largest networks at the time allocated much less time to religious content in a week, one hour in the case of Globo and only 12 minutes for SBT (Campos 1997). Religious programming on RecordTV took various forms, including standard preaching, talk shows, and soap operas. Throughout these shows and during commercial breaks, viewers were invited to visit the UCKG temples. Appendix Tables A3 and A4 provide examples of weekday and weekend schedules, respectively.

RecordTV’s shows encourage the adoption of behaviors that accord with the church’s prescriptions. Many of the shows rely on testimonials contrasting individuals’ lives before and after joining the church that depict their change of behavior as leading to a better life. For instance, in an episode of *Fala que eu te escuto* (Speak that I will listen)¹⁰, one of most the influential shows, an ex-sex worker and former drug and alcohol user shared her testimonial about how the UCKG helped her transform her life and taught her how to be a wife.¹¹

The *Caminhos da Esperança* programming employed light entertainment to encourage viewers to embrace the UCKG. It showcased miniseries¹² centered around religious themes, biblical stories, and testimonials from the UCKG as a means of persuasion. The programming aired in the mornings and was replayed several times late at night. The majority of the miniseries shared a common element: the presence of a demon that manifested through various means, including substance abuse, witchcraft, and dark sorcery. This demon was ultimately overcome, which led to the characters’ redemption through the church.

¹⁰This episode was aired on February 2nd, 2011.

¹¹The Appendix contains more details on this specific episode and other examples.

¹²In the appendix, we summarize each miniseries, which included *A filha do Demônio*, *Olho da Terra*, *Direito de vencer*, *Por amor e ódio*, *Canoa do Bagre*, *Janela para o céu*, *Velas de sangue*, *A sétima bala*, *O desafio de Elias*, *Do fundo do coração*, and *Alma de Pedra*.

RecordTV also broadcasts nonreligious shows designed for women to reinforce their traditional societal roles (Pinheiro and Reckziegel 2006). In 1993, RecordTV introduced *Note e Anote*, a weekday program inspired by traditional women’s magazines. The show was mostly dedicated to typical women’s tasks, including culinary arts, decoration, and organization, and also talked about about fashion, beauty, celebrity gossip, and health. Unlike similar shows, it placed a strong emphasis on the concept of “making money from home,” teaching women how to create and sell handicrafts (Temer 2000), 2000). Its tremendous success gave rise to numerous other female-oriented programs across various networks, centered on cooking and handicrafts.¹³

3 Data

Our empirical work relates the exposure of RecordTV to religious affiliation and behaviors associated with the church’s prescriptions - fertility, female labor force participation, crime and voting. This section describes the data used to build the signal strength measure, as well as the main outcomes of the study.

3.1 Transmitters, Signal Strength, and Coverage

Data on transmitters are available at the Brazilian National Agency of Telecommunications (ANATEL). For each transmitter, we have information on its latitude, longitude, and technical characteristics, such as frequency, power, height, broadcaster owner, and installation date. We select all transmitters that belong to RecordTV, and we make use of a professional engineer-developed software based on the Longley-Rice Irregular Terrain Model (ITM) (Hufford 2002), following Olken (2009), to compute the signal strength

¹³<https://observatoriodatv.uol.com.br/critica-de-tv/melhor-da-tarde-parece-perdido-no-tempo>

received by each municipality in each year.

Signal transmission obeys the laws of electromagnetic propagation. In the absence of obstacles such as mountains, air particulates, etc., the signal strength decreases with the square of the distance from the transmitter. However, decay patterns are a much more complex function of these obstacles as they diffract the signal across the space. To take into account the impact of geography on actual signal propagation, the model considers the geographic location and height of the transmitters, the frequency of transmission, and several characteristics of the surface and air. Then, the ITM algorithm computes the signal loss between each transmitter and each receiving location.¹⁴

We validate our signal strength measure by comparing the minimum signal strength necessary to have a positive viewership for the first time, and compare it to values reported by the engineering literature.¹⁵ Our viewership data comes from the Brazilian Institute of Public Opinion and Statistics (IBOPE), and contains detailed information on the monthly audience for each Brazilian TV channel in the ten largest metropolitan areas over the period 1990-1999. We aggregate viewership yearly, restricting attention to the audience for RecordTV shows exclusively.¹⁶

Although signal strength is a strong predictor of reception (Olken 2009; Durante, Pinotti, and Tesei 2019), the quality of TV does not increase linearly with the signal strength but discontinuously. Figure A1 plots RecordTV daily average viewership against its signal strength. The dots represent the years before and after the event $t = 0$, which is the year when viewership becomes positive for the first time in the metropolitan region. The figure reveals that a rise in signal strength correlates with increased viewership only

¹⁴We use the centroid of each municipality as the receiving location.

¹⁵Lee et al. (2014) and Dagher et al. (2004), websites (<https://otadtv.com/>; <http://www.aa6g.org/DTV/Noise/noise.html>) and handbooks (ETSI 2014; NTSC 1994).

¹⁶Figure A5 shows the average RecordTV viewership in the ten metropolitan areas in 1999. Data is available from IBOPE.

within two specific thresholds of signal strength. Below the initial threshold, the signal quality is inadequate for watching RecordTV. Beyond the second threshold, a subsequent boost in signal strength does not lead to a rise in viewership, as the signal was already strong enough to ensure high-quality reception.

We use a continuous measure of treatment intended to replicate the actual likelihood of being exposure to as a function of signal strength. We construct this measure by fitting a generalized logistic function that best fit the parametric relationship between the signal and RecordTV’s viewership.

3.2 Outcome Variables

Our outcomes of interest are derived from the 1991 and 2000 waves of the Brazilian Census, the Federal Electoral Authority (*Tribunal Superior Eleitoral* – TSE), the Ministry of Health (DATASUS), and the Brazilian Internal Revenue Service (*Receita Federal*). The Census is conducted every ten years and contains detailed information on demographics, income, labor market participation, education, etc. TSE data provide information on candidates’ profiles, the seat they are running for, and the number of votes received in each municipality. The Brazilian IRS data contain information on the registry of companies at the time of incorporation.¹⁷

3.2.1 Behaviors

To construct our measure of adherence to a specific religion, namely Pentecostalism, Catholicism, and Traditional Protestantism, we create a dummy variable indicating the person’s unique self-declared religion. We keep only individuals between 15 and 60 years-

¹⁷Unfortunately, this dataset does not contain tax returns.

old, as they are more likely to choose their own religion than younger or older people.

As a measure of labor force participation, we construct a dummy that equals one if the person claimed to have a job at the reference period. We restrict the analysis to people between 18 and 60 years when they are more likely to have already finished school and not retired yet.¹⁸

Our measure of fertility is the total number of children born alive. Because we are primarily interested in the completed fertility, we restrict the analysis to women towards the end of their fertility life by the of the interview (35-50 years old). We also show the results using other age ranges.

We examine the total years of schooling by gender. We restrict the analysis to 18 to 25 year-old individuals, i.e. individuals that should have already finished secondary school but are not too old to have already completed it when exposed to the treatment.

3.2.2 Voting Data

We investigate the effect on electoral results by analyzing the percentage of votes obtained by candidates affiliated with any Pentecostal denomination in each federal representative election, using data from the Tribunal Superior Eleitoral (TSE). The data contains information on the number of votes received by each candidate and the characteristics of the candidates, which is public available for all states since 2002.

We restrict our analysis to candidates running for Congress (“Deputado Federal”)

¹⁸The definition of employment status changes between 1991 and more recent waves. While in the 1991 Census, the reference period is the 12 months before assessment, in 2000, it is the census reference week. We follow Dix-Carneiro and Kovak (2017), Dix-Carneiro, Soares, and Ulyssea (2018), and Hirata and Soares (2020) and define the employment status dummy as follows: in 1991, the dummy is equal to one if the person regularly worked during the previous 12 months; and in 2000 and 2010, the dummy equals one if the person, in the reference week, either worked (for pay or not) or had a job but did not work for any reason.

for two reasons. The first is because of availability of information on religious affiliation. Since the TSE does not provide any information regarding candidates' religion, to identify Pentecostal candidates, we rely on the data compiled by Lacerda (2017). He hand-coded a list of Pentecostal candidates, considering religious references in candidacy names, published biographical sources, and newspaper mentions. It is important to note that this classification method might be skewed towards candidates with higher popularity and those situated in regions with extensive media attention. The second reason is that, unlike in single-member district representation systems such as the United States, in Brazil candidates for Congress compete for votes in the entire state. Thus, we do not need to worry about a mechanical effect whereby higher share of Pentecostals lead to more Pentecostal candidates and thus higher share of votes for Pentecostals. Since the pool of candidates is chosen from the entire state, local differences in demographics should not affect candidate characteristics.

4 Baseline Empirical Strategy

We estimate the effect of exposure to RecordTV, a church-affiliated TV channel, on religiosity and behaviors consistent with the church's prescriptions. Our empirical strategy exploits the coverage of RecordTV before it being religious-affiliated. A feature of our empirical setting is RecordTV's switch in content from secular towards religious programs after the purchase by Bishop Edir Macedo in 1990. Therefore, it is unlikely that the previous placement of this original set of transmitters was especially advantageous for the expansion of the Pentecostal faith, since the pre-purchase channel had a secular platform.

However, the initial placement of these transmitters might still be correlated with different socioeconomic characteristics, such as income or economic activity, that could also influence our outcomes of interest. For instance, since RecordTV might have placed its

transmitters in more central areas, such as places with better infrastructure, the distance to these municipal centers could be affecting our outcomes through channels other than RecordTV coverage itself. To account for that, we control for the signal in the free-space, which is a function of the distance to the nearest transmitter. Moreover, we additionally control for a range of municipalities' socio-economic characteristics at baseline, including the outcomes.

Specifically, we estimate the following equation:

$$Y_{m,t} - Y_{m,1991} = \beta_1 \cdot Coverage_{m,1990} + \beta_2 \cdot Propagation\ Controls_{m,1990} + \beta_3 \cdot X_{m,1991} + \delta_{mesoregion(m)} + u_m, \quad (1)$$

where $Y_{m,t}$ is the outcome of interest in year t in municipality m , $Coverage_m^{1990}$ is the signal coming until 1990 in municipality m , with a non-linear transformation. $PropagationControls_{m,1990}$ includes municipal-level variables that influence the signal propagation: area, height, ruggedness, and signal in the free-space coming from RecordTV's transmitters in 1990, as well as their squares.¹⁹ We also control for mesoregions²⁰ fixed-effects, $\delta_{mesoregion(m)}$, to account for local shocks. Finally, we add a set of municipal-level characteristics measured at the baseline, $X_{m,1991}$, described in Table 1. u_m is the error term.

The coefficient β_1 captures the average causal effect of exposure to RecordTV on changes in religious affiliation and behaviors. Our identifying assumption is that the evolution in the potential outcomes would have been the same between in places exposed and not exposed to RecordTV if the channel had not become religious-affiliated. Although non-testable, we provide support to the parallel trends assumption through falsification

¹⁹We include squares to control for non-linear effects of our propagation controls (Wang 2020; Yanagizawa-Drott 2014)

²⁰Mesoregions are clusters of geographically contiguous municipalities within a state with similar geographical and socioeconomic characteristics, defined by the Brazilian Institute of Geography (IBGE). In 1976, there were 87 mesoregions.

a test.²¹ Specifically, we estimate the equation below:

$$Y_{m,1991} - Y_{m,1980} = \gamma_1 \cdot Coverage_{m,1990} + \gamma_2 \cdot Propagation\ Controls_{m,1990} + \gamma_3 \cdot X_{m,1991} + \delta_{mesoregion(m)} + u_m, \quad (2)$$

This falsification exercise, shown in Table 2, provides support to the hypothesis that changes in religiosity and behaviors were not related to factors correlated with coverage *per se* but to changes in content since the RecordTV started broadcasting religious content after the change of ownership in 1990.

Table 1 shows the correlation between RecordTV’s coverage in 1990 and municipal socioeconomic characteristics at the time. In Column (2), we regress coverage on these characteristics. As expected, the initial coverage is higher in places that are richer, more developed, and endowed with better infrastructure. When we control for state and metropolitan region fixed-effects, and for variables related to the propagation of the signal (area, height, ruggedness, and the signal in the free-space and their squares), coverage becomes balanced across municipal characteristics, as shown in Column (4). Jointly, these controls explain about 50-85 percent of the overall variation in most of the socio-economic variables in 1991.

5 Results

Using quasi-random variation on exposure to religious-affiliated TV channel, we find a large and persistent increase on the share of Pentecostals. This shift on religious affiliation allows us to investigate the effects on behaviors. We find that people adhere to the behaviors prescribed by the church, both in the medium- and long-term.

²¹We are unable to perform this exercise for voting because microdata is only available starting in 2002, as explained in the Data Section.

5.1 Pentecostal Affiliation

We find that exposure to RecordTV increases the share of self-identified Pentecostals both in the medium- and long-term. Our results indicate that the exposure to RecordTV accounts for 15% of the total expansion of Pentecostals in Brazil between 1991 and 2000.

Figure 3 shows the estimated effects of exposure to RecordTV relatively to 1991. After the change of ownership of RecordTV, there is an increase of 1 p.p. significant at 1% in the share of Pentecostals ten years later (2000), corresponding to an increase of one third with respect to the baseline level (3.01%). The effect persist in the next decade (2010), reaching 1.8 p.p. significant at 1%. Exposure to this TV channel accounts for 15% of the total growth of Pentecostal over the studied period.

We also report the results using alternative specifications. Table 3 shows the estimated effects of exposure to RecordTV on the share of Pentecostals. Panel A of Table 3 reports the results for the 1991-2000 period. Column (1) shows a negative unconditional association of 0.54 percentage points between RecordTV coverage and the share of Pentecostals, statistically not significant. In column (2), we control for mesoregion fixed effects, leading to a negative result of 1.2 percentage points. In column (3), we control for propagation variables (the distance to the nearest RecordTV transmitter, ruggedness, height, area, and their squares), which are important determinants of the placement of the transmitters, and find that getting covered by RecordTV increases the share of Pentecostals by 1 percentage points, significant at 10%. In column (4), we control for some demographic characteristics of the municipality level all measured in 1991, namely log population, share TV, share high school, average age. The inclusion of these controls increases the precision of the coefficient but does not affect the magnitude. Panel B reports the results for the 1991-2010 period. Coefficients are stable to the inclusion of propagation and demographic controls.

The literature suggests that most of the Pentecostals converted from Catholicism rather than from Traditional Protestantism, atheism, or agnosticism (Coutinho and Golgher 2014). According to a survey conducted in São Paulo by Data Folha in 1996, 60% of all Pentecostals were Catholic before, 22% did not have any religion, and 7% belonged to Afro-Brazilian religions. Also, 60% of all conversions happened within the previous six years.

Since the population of Brazil is largely Catholic, as a counterfactual, it is credible to assume that an individual would have remained Catholic had no conversion occurred. We test for this hypothesis by estimating the effect of exposure to RecordTV on Catholics and Traditional Protestants. Column (5) of Table 3 shows a negative effect of exposure to RecordTV on Catholic affiliation, although not statistically significant.

5.2 Behaviors

The large increase in the share of Pentecostal followers presents an opportunity to investigate the social and behavioral outcomes arising from the expansion of Pentecostalism. Our analysis reveals noteworthy trends: regions exposed to RecordTV exhibit a substantial and enduring decline in female workforce participation alongside an increase in fertility rates. Furthermore, the educational attainment of the subsequent generation of girls demonstrates a reduced likelihood of completing at least middle school, aligning with more conventional gender roles. Conversely, there are no significant impacts on male labor force participation or boys' education.

Figure 4 shows an increase of 0.1 in the total number of children by 35-49 year-old women from 1991 to 2000, significant at 5%. This increase corresponds to 2.5% in the total number of children. The magnitude of this result is comparable to the results found by La Ferrara, Chong, and Duryea (2012), which studies the effect of soap-operas on fertility

in Brazil, but with opposite sign. The result in the 1991-2010 period is similar in terms of magnitude, but is not statistically significant. The effect from the placebo exercise, i.e., in the 1980-1991 period, is very small and largely statistically insignificant.

Figure 5 shows that exposure that RecordTV yields to 2.8 percentage point reduction in female workforce participation in the 1991-2000 period, significant at the 1% level, and very similar result in the 1991-2010 period. This effect corresponds to a reduction of 7.5% with respect to the baseline rate of female labor force participation (37%). Again, we do not observe any evidence of pre-trends. Figure 7 shows that exposure that RecordTV did not affect male workforce participation in the 1991-2000 period. However, we do observe an increase of 1.7% in the 1991-2010 period. This result is consistent with man being the bread-winner of the household.

Despite variations in perspectives regarding education within Pentecostal churches, a number of denominations emphasize that women should not surpass their husbands in educational attainment. We investigate this phenomenon by examining the years of education of 18-25 year-old women. As anticipated, Figure 6 shows no changes for the 1991-2000 period, possibly because educational decisions were largely made before adherence to the Pentecostal church. Nonetheless, exposure to the channel led to a reduction of 0.2 years of education for girls. We find no evidence of effects for boys, as shown in Figure 8.

All the results reported in this section are also presented in Table 4. We provide the results from different specifications and clustering level in Table A5. Overall, our results are robust across specifications, and clustering level.

5.3 Voting

Lately, Pentecostal religious leaders have increased their participation in politics significantly. In 2021, 195 of 513 federal deputies in Brazil belonged to the Evangelical lobby. The large involvement of Pentecostals in politics may be motivated by their goals of opposing to gay rights, abortion, remaining tax-exempt, besides being a way to deal with religious competition (*The Economist* magazine, June 5th 2021 Edition).

We analyze how exposure to RecordTV affected votes for Pentecostal candidates, whose identification to Pentecostal churches is based on Lacerda (2017)’s classification. For this analysis, we are not able to estimate the effect in differences because the voting micro-data covering the whole country only is available starting in 2002. However, since the political presence of candidates associated with Pentecostal churches was virtually non-existent in the early 1990s (Kramer 2005), we follow Costa, Marcantonio, and R. Rocha (2023) and interpret the dependent variable as long-difference changes from a common zero baseline.

Figure 9 shows the effect of exposure to Record TV for 2002, 2006, 2010, and 2014 elections. The share of votes for Pentecostals candidates started increasing in the 2006 election (1 percentage point, significant at 5%), and kept growing for the 2010 election reaching 2.5 p.p. significant at 1%, and remained constant for the 2014 election.

5.4 Persuasion Rate

Given our findings, it is worth understanding what fraction of the overall increase in Pentecostals was attributable to exposure to RecordTV. We implicitly estimate the share of people induced by RecordTV to convert to the Pentecostal church by computing the persuasion rate (DellaVigna and Kaplan 2007). The persuasion rate captures the effect of

the treatment on the relevant behavior, adjusting for exposure to the message and for the size of the population left to be convinced in the initial period, according to the following expression:

$$f = \frac{y_T - y_C}{e_T - e_C} \cdot \frac{1}{1 - y_0},$$

where $y_T - y_C$ corresponds to the change in Pentecostal affiliation as a result of the expansion of RecordTV signal, which is captured by $\hat{\beta}_1$ in equation 2 and reported in Table 3; $e_T - e_C$ is the effect of the signal on viewership; finally, the denominator of the last term represents the non-Pentecostal population in 1991, which amounted to 96.5%.

This exercise is useful since it provides us with a measure that can be compared to other studies' results. However, the nature of our viewership data is somewhat different from what is often used in the literature, making such comparison difficult without some assumptions. While our viewership measure represents the monthly average share of households connected to a given TV channel during a two-hour time interval in a day of the week, most of the relevant studies make use of discrete measures, such as a dummy indicating whether the surveyed individual watched a given channel for a certain amount of time per day (DellaVigna and Kaplan 2007). In order to overcome this issue, we construct two alternative measures of viewership based on different assumptions, that allow us to compute an upper- and lower-bound of the persuasion rate.

First, we assume that people watch RecordTV at most two hours a day. Thus, in each two hours-time slot there are different viewers. We then construct our measure of viewership by summing all the households within a day that were connected to RecordTV, and taking the average across days of the week and months to obtain an annual estimate of viewership.²² Column (1) of Table 6 reports the estimated value of $e_T - e_C$ using this

²²Since we are assuming that these households are the only ones watching TV over this period, this measure might still underestimate the actual number of viewers, and thus the lower bound's persuasion rate might still be overestimated.

measure of viewership. The expression above gives us a persuasion rate equal to 2.4%, and is the lower bound of our persuasion rate.

Second, we construct an alternative measure of viewership by taking the maximum number of households across the two-hours slots within a day that were connected to RecordTV, and take the average across days of the week and months to obtain an annual estimate of viewership.²³ Using the estimated coefficient of $e_T - e_C$ for this alternative measure (column (2) of Table 6), the persuasion rate is equal to 11.1%, which is the upper bound of our persuasion rate. Both the lower and upper bound rates are comparable to values found by the relevant literature on persuasion (see DellaVigna and Gentzkow 2010).

6 Robustness

A potential concern about our empirical strategy is that it might fail to disentangle the effect of RecordTV from the effect of exposure to TV in general. To address this concern, we add exposure to the largest Brazilian TV channel, Globo, in our baseline regression for each outcome of interest. Table 5 reports these results, showing that the effects of exposure to Globo are much smaller in magnitude and statistically insignificant, while the estimates for exposure to RecordTV remain unremarkably similar in magnitude and statistically significant as in the baseline. We take this as evidence that exposure to RecordTV programming, instead of exposure to TV programs in general, is driving our results.

Another potential concern about our empirical strategy is the possibility that the church, in its expansion strategy, started investing additional resources, such as media other than TV, churches' premises, etc., prioritizing areas that were already covered by

²³This measure is very conservative, as we assume that the only people watching RecordTV were the ones connected during the time slot with the highest audience.

RecordTV in 1990. If this is the case, our results may not be driven by RecordTV’s content per se, but instead by a bundle of church’s investments to penetrate in treated areas. To mitigate the outlined concern of UCKG strategies complementary to RecordTV coverage, we include all Pentecostal denominations when studying effects on the number of churches or religious-affiliation, not only focusing on UCKG which is directly associated to RecordTV, as explained in the Data section.

We attempt to further mitigate this concern by showing, in an alternative empirical strategy with higher frequency data at the year level, that the increase of Pentecostal churches only took place a few years after the entrance of RecordTV in the municipality. We interpret this as evidence that, at least for a specific kind of church’s investment, there does not seem to be complementarities between RecordTV penetration and opening of churches in Pentecostal expansion strategy.

Since RecordTV expanded over the 1990s, we take advantage of this variation over time to estimate the effects of RecordTV exposure in an event-study framework. While some of our outcomes are measured at a few points in time, the number of Pentecostal churches and fertility are high-frequency data, available on an yearly basis. We therefore analyze the evolution of this set of high-frequency outcomes with respect to RecordTV’s expansion over time. Results from this alternative empirical strategy are aligned with baseline findings.

In this alternative empirical strategy, we rely on the additional assumption that the exact time of expansion was not correlated with other trends. After the change of ownership, new transmitters may have been placed in municipalities more functional to the church’s goals. Thus, our assumption here is that the evolution of the potential outcomes in places covered by RecordTV after the change of ownership would have been the same as in places not covered if RecordTV had not expanded.

6.1 Event Study

We use a staggered difference-in-differences strategy, and compare the outcomes of interest of municipalities that were covered by RecordTV for the first time during the 1990s with those covered after 2000²⁴ and that were not, therefore, treated during our study period. We exclude municipalities that were already covered in the pre-period, i.e. before 1990.

Recent evidence suggests that “staggered access” estimations might be biased by heterogeneous effects over time (Callaway and Sant’Anna 2021; De Chaisemartin and d’Haultfoeuille 2020). To address this concern, we estimate the parameter of interest following Callaway and Sant’Anna (2021). More formally and adopting Callaway and Sant’Anna (2021)’s notation, denote by C the group of municipalities that were not covered during the 1990s, and by G_g the group of municipalities that were covered at some point in the study period. Let g indicates in which period each municipality received the coverage. Let e denotes event-time, i.e., $e = t - g$ denotes the time elapsed since treatment was adopted. Our parameter of interest is given by

$$\theta(e) = \sum_{g \in \mathcal{G}} \mathbf{1}\{g + e \leq \mathcal{J}\} P(G = g | G + e \leq \mathcal{J}) ATT(g, g + e) \quad (3)$$

where

$$ATT(g, t) = E[Y_t - Y_{g-1} | G_g = 1] - E[Y_t - Y_{g-1} | C = 1]$$

and $P(G = g | G + e \leq \mathcal{J})$ indicates the probability of being treated for the first time at time g .

Thus $\theta(e)$ is the average effect of being exposed to RecordTV e time periods after the treatment was adopted across all municipalities that are observed to have ever participated in the treatment for exactly e time periods. We cluster the standard errors at

²⁴Nowadays, close to a hundred percent of municipalities are covered by RecordTV.

the municipal level, and weight observations by the population in 1991.

6.2 Outcomes

We derive the number of Pentecostal churches present in each municipality-year, using data from the Brazilian IRS. These data contain information on formal firms, including the initial date of operation, location, sector, and name. We classify a church as Pentecostal if its name matches any official Pentecostal denomination, such as “*Convenção da Assembleia de Deus no Brasil*”, “*Assembleia de Deus Vitória em Cristo*”, “*Igreja Pentecostal Deus é Amor*”, among others.²⁵

Our measure of fertility is the number of children a woman gave birth in the given period of time. Since the age of each child in the 2000 Census is not available, we follow an approach similar to La Ferrara, Chong, and Duryea (2012)²⁶ and reconstruct annual births as follows. We keep only households where there is a 15-45 year-old woman who is either the household head or spouse and assume she is the mother of all kids when there are any.²⁷ We retrieve the year of birth of each child by subtracting the child’s age from the census year. We keep only kids born between 1991 and 2000.²⁸ Finally, for each woman, we compute the total number of children conceived between 1991 and 2000, and between 1981 and 1990.

²⁵We use the list of Pentecostal denomination available at https://pt.wikipedia.org/wiki/Lista_de_denomina%C3%A7%C3%B5es_protestantes_no_Brasil.

²⁶Unlike the 1991 Census, the 2000 Census does not contain a variable that identifies the mother when she lives in the same household as her children. Thus, we are not able to use the same approach as La Ferrara, Chong, and Duryea (2012).

²⁷When there are kids in the household but the woman reports having had zero live births, we drop the household from the analysis

²⁸We exclude kids born before 1991 because pregnancy must have happened before RecordTV was religiously affiliated.

6.3 Results

To shed light on how other expansion strategies of the church may interact with RecordTV, we show that the number of churches per capita increased only a few years after the entry of RecordTV in the municipality. Using more detailed data on the timing of births, we see an increase fertility in years following the entry of RecordTV in the municipality.

Figure 10 displays the coefficients of a full set of dummies going from seven years before the introduction of RecordTV in a given municipality to seven years after. The findings show that the total number of per capita churches increases in the years following RecordTV coverage, and the rise takes several years to take off. This later effect provides evidence against the hypothesis that our results are driven by complementary Pentecostals' expansion strategies other than TV, such as opening of new churches. Also, there is no evidence of an effect in the pre-coverage period, suggesting that the rise in the number of Pentecostal churches did not predate RecordTV's arrival in a given municipality.

Figure 11 shows that exposure to RecordTV increases the chance of giving birth only after about four years from RecordTV entry in an area. Also, the rise in fertility does not occur before RecordTV coverage, since none of the coefficients for the years preceding the event is significantly different from zero. After that, there is a positive increase in fertility.

7 Conclusions

This paper sheds light on the influence of religious media, particularly within the context of the Pentecostal movement in Brazil. By examining the impact of exposure to a major

TV channel that transitioned to broadcasting religious content, the study provides insights into the dynamics of church affiliation and its consequences on societal behaviors. We find that exposure to RecordTV in the 1990s resulted in a large increase in Pentecostal affiliation. This shift in religious affiliation allows us to study the socioeconomic consequences of the expansion of the Pentecostal movement.

We find that religious media causes an alignment of social behaviors with the church's prescriptions. Exposure to RecordTV led to higher fertility rates and decreased female participation in the labor force, suggesting a shift towards traditional gender roles. We also find suggestive evidence of a decrease in the educational attainment of the next generation of girls. Finally, we find that areas with higher RecordTV exposure tended to yield greater vote shares for Pentecostal candidates, strengthening Pentecostal influence on society.

In a broader context, these findings underline the transformative power of new media technologies on deeply ingrained societal values and norms, such as religious affiliation, and its ripple effects on various aspects of society. The increasing use of media platforms for religious proselytization highlights the need for a deeper understanding of their implications on individual behaviors and even political outcomes. While economists have always been interested in the impact of changing technology on society, and increasingly in media technology in particular, this paper emphasizes how this impact is channeled through social norms and religious practices. On the other hand, it also highlights how the study of social norms has to account for the possibility of rapid change, as social movements can leverage changing technology to further their goals and quickly reshape the social landscape.

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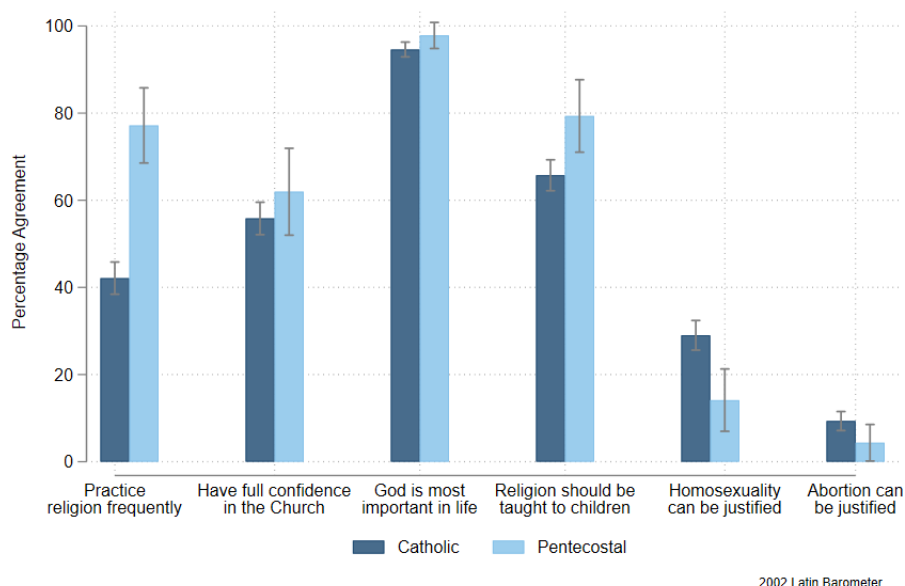
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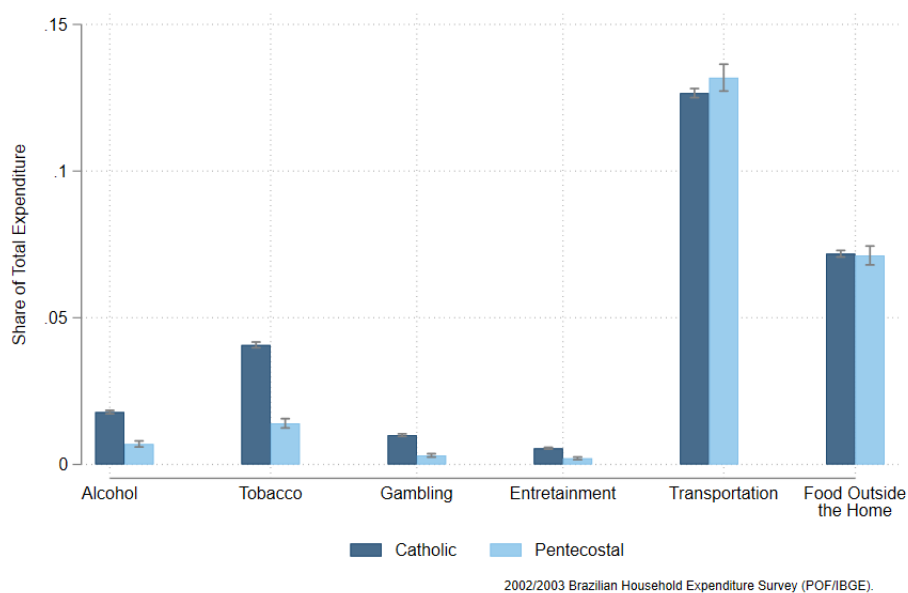
Figures

Figure 1: Practice Frequency and Opinion about Sensitive Topics by Religion



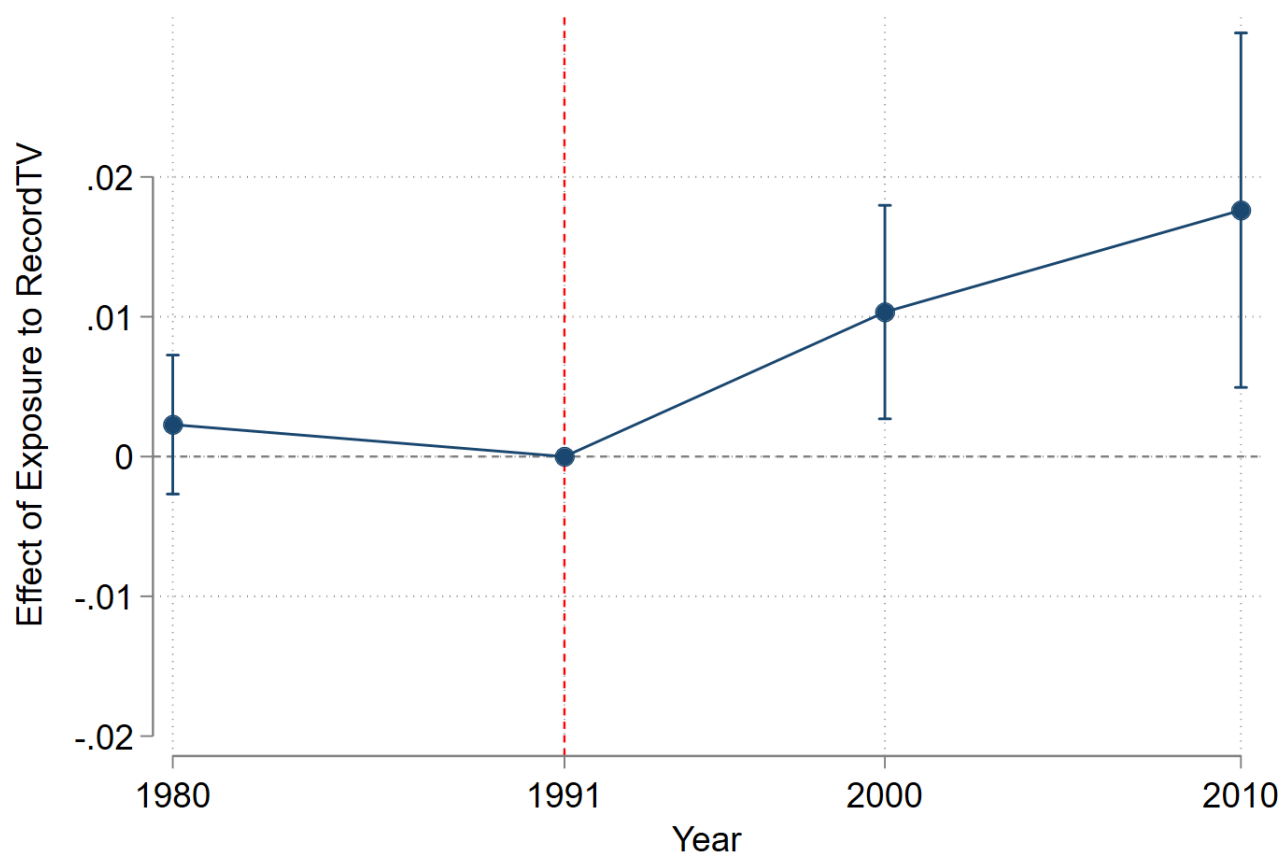
Notes: The figure compares the percentage agreement with each statement by Catholics and Pentecostals in Brazil, with a 95% confidence interval for sample.

Figure 2: Expenditure on Selected Goods by Religion



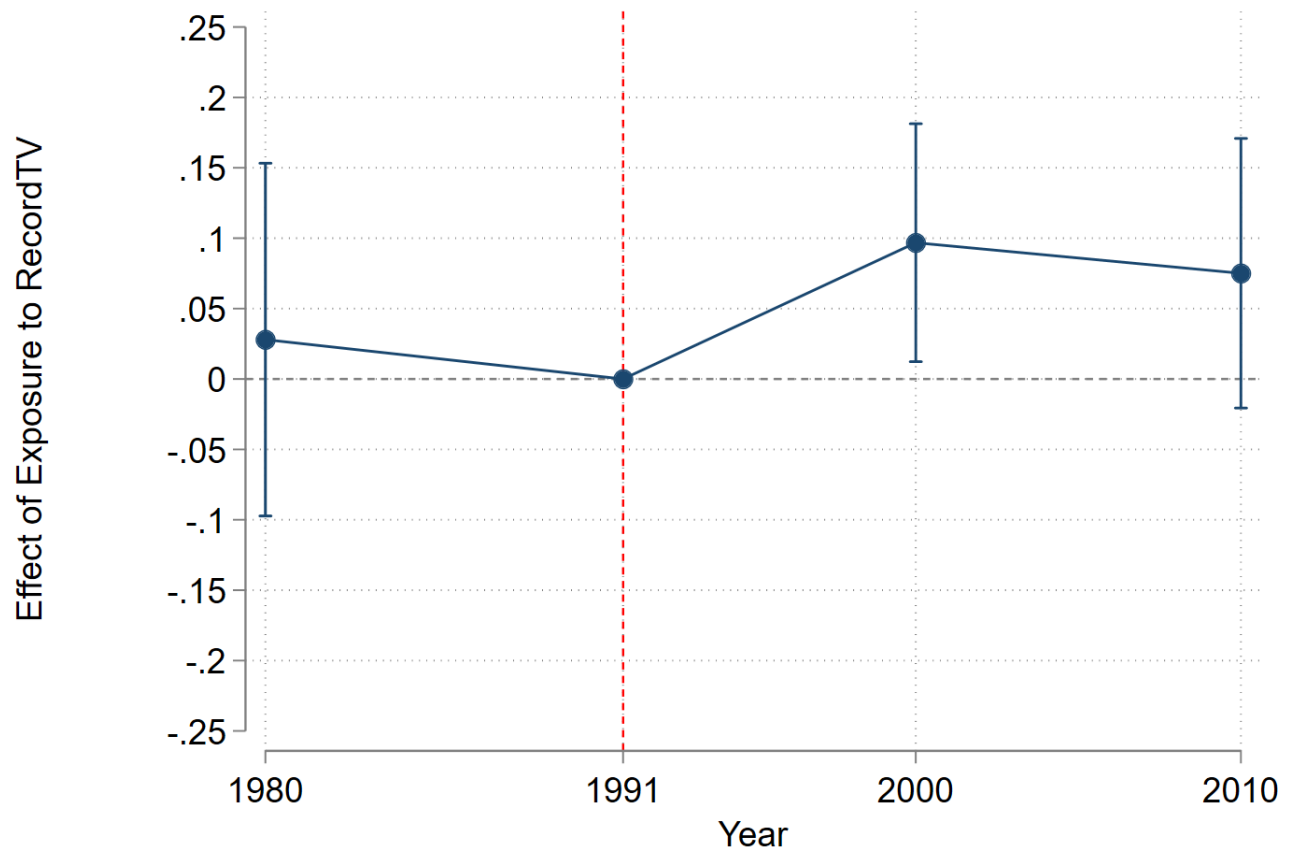
Notes: The figure compares the expenditure on the selected goods as a share of the total expenditure for Catholics and Pentecostals in Brazil, with a 95% confidence interval for sample.

Figure 3: Effect of Exposure to RecordTV on the Share of Pentecostals



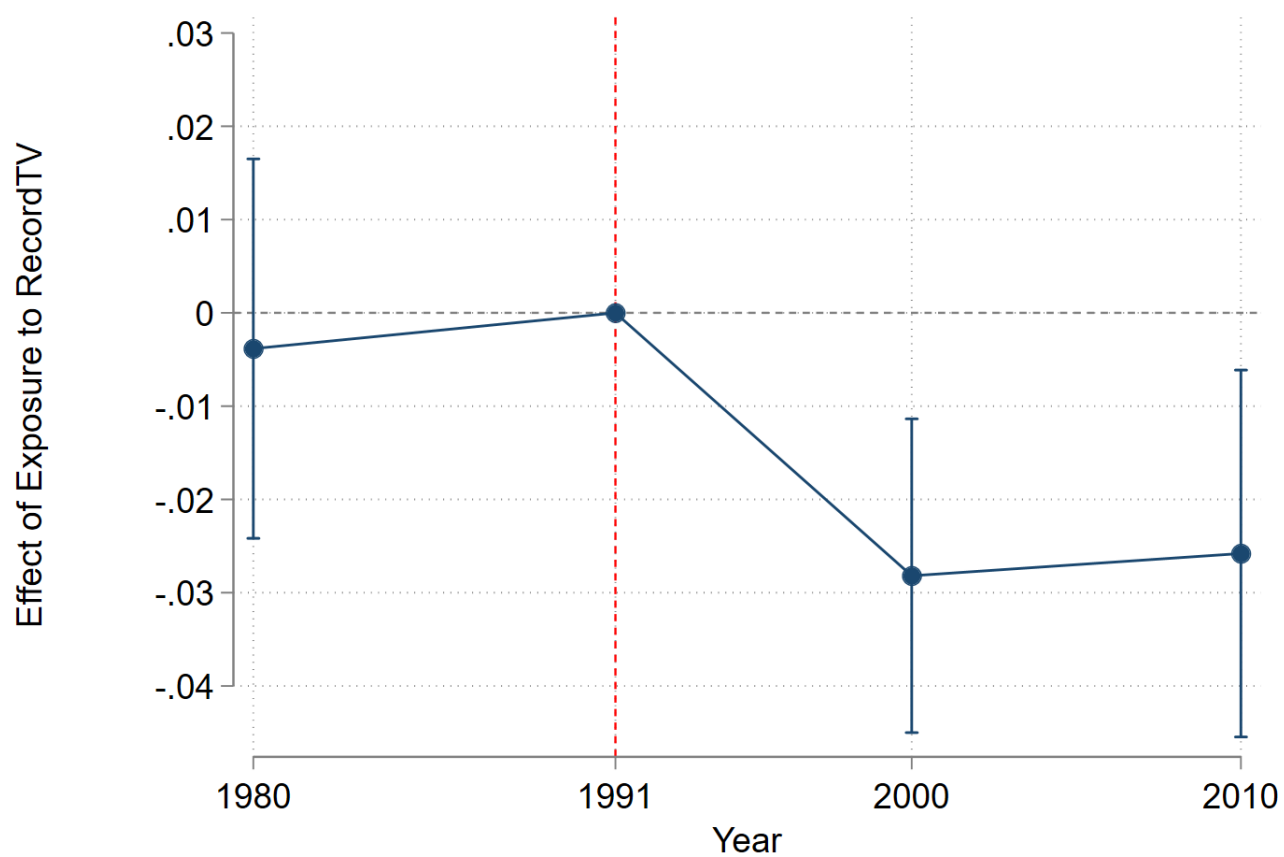
Notes: Data sources: ANATEL and 1980, 1991, 2000 and 2010 Census. The dots represent the effect of exposure to RecordTV on the difference in the share of Pentecostals with respect to 1991. The bars represent the 95% confidence interval.

Figure 4: Effect of Exposure to RecordTV on Fertility



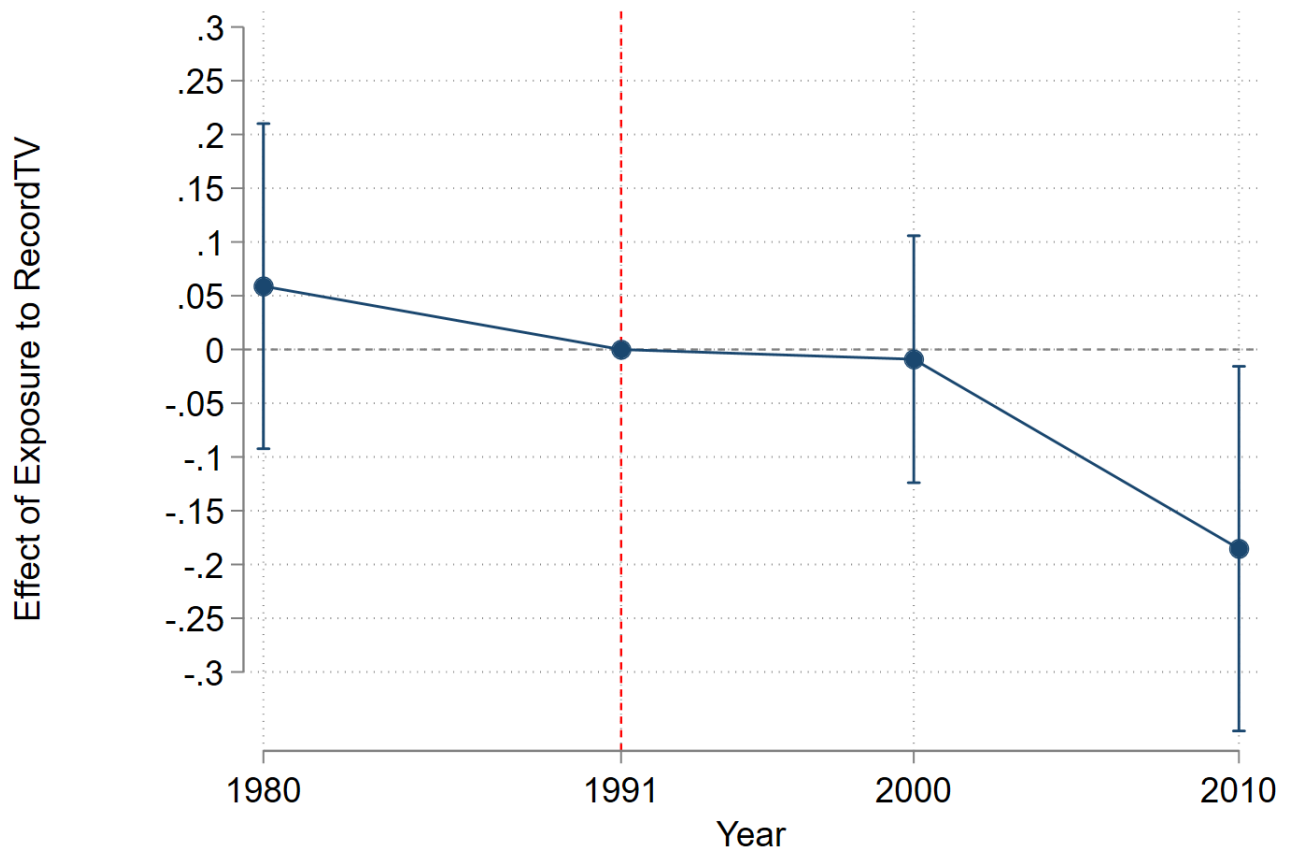
Notes: Data sources: ANATEL and Census. The figure plots effect of exposure to RecordTV on fertility over time.

Figure 5: Effect of Exposure to RecordTV on Female Labor Force Participation



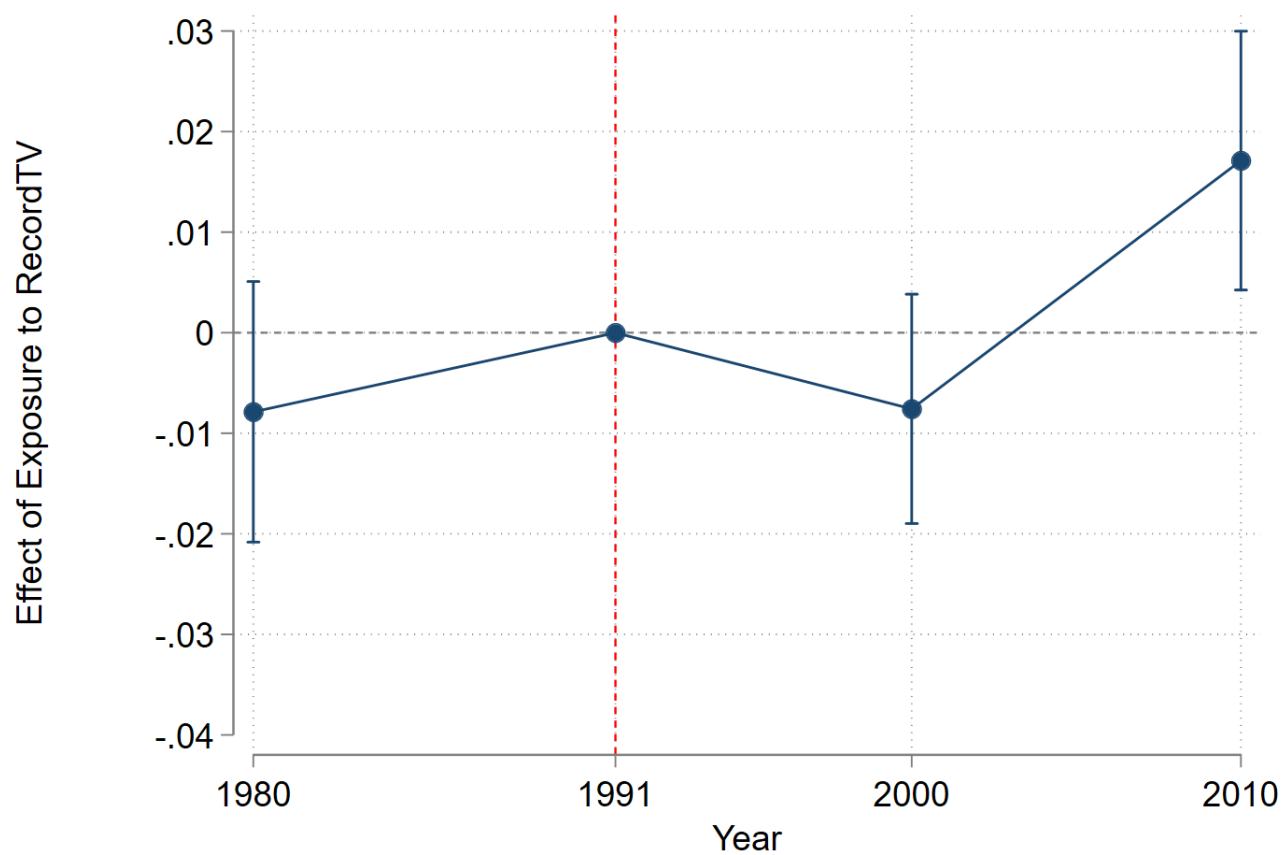
Notes: Data sources: ANATEL and Census. The figure plots effect of exposure to RecordTV on female labor force participation over time.

Figure 6: Effect of Exposure to RecordTV on Girls' Education



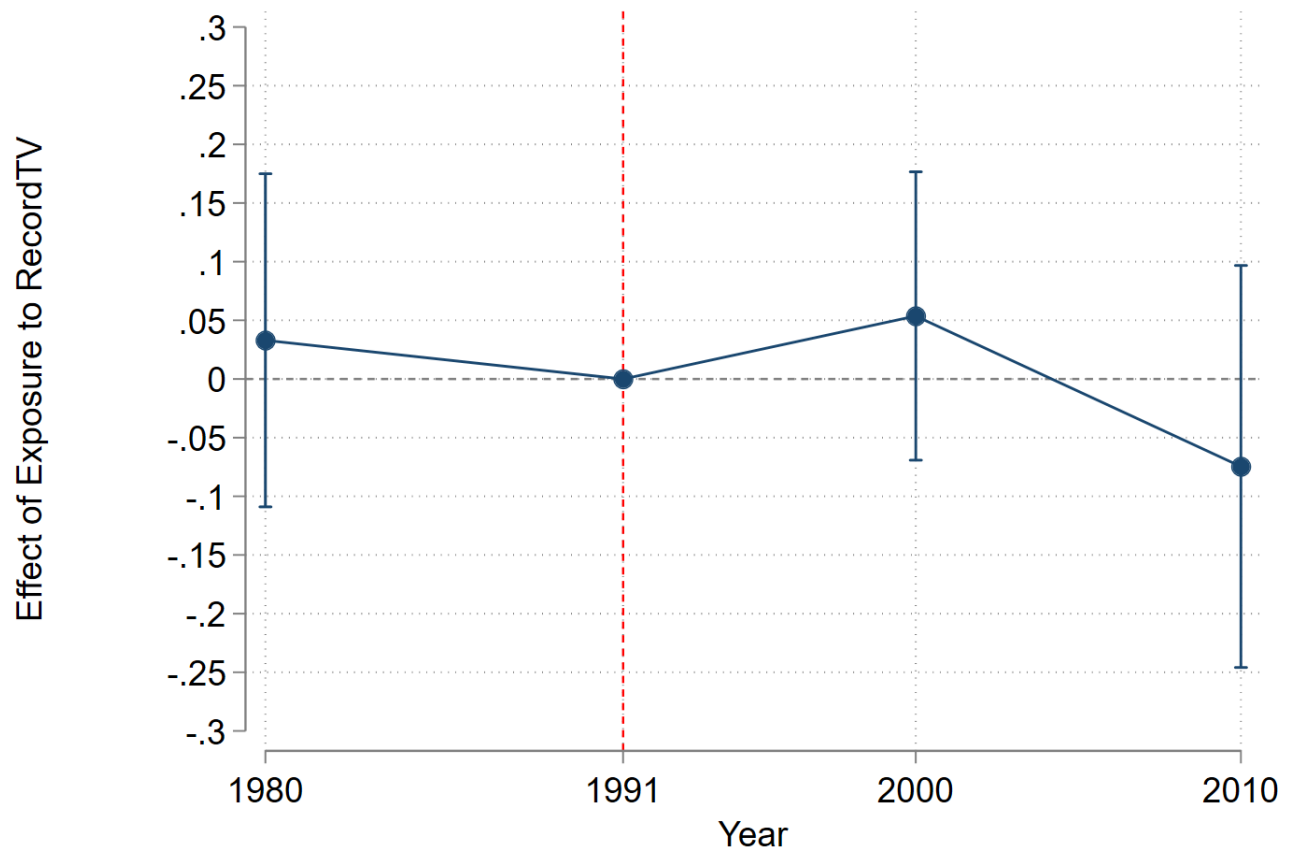
Notes: Data sources: ANATEL and Census. The figure plots effect of exposure to RecordTV on girls' years of education over time.

Figure 7: Effect of Exposure to RecordTV on Male Labor Force participation



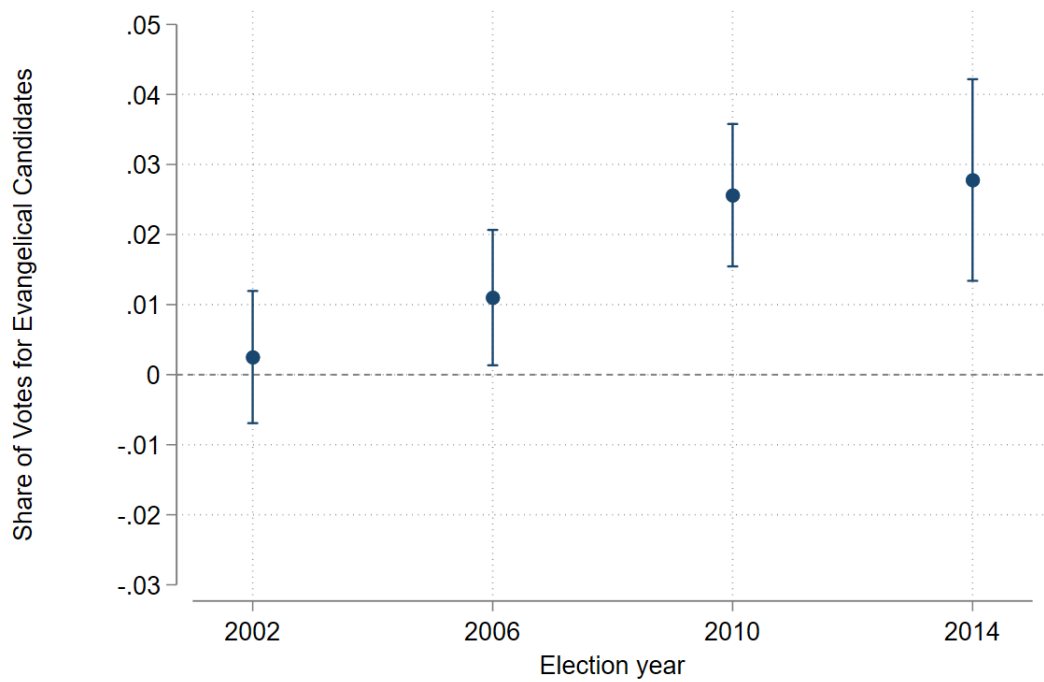
Notes: Data sources: ANATEL and Census. The figure plots effect of exposure to RecordTV on male labor force participation over time.

Figure 8: Effect of Exposure to RecordTV on Boys' Education



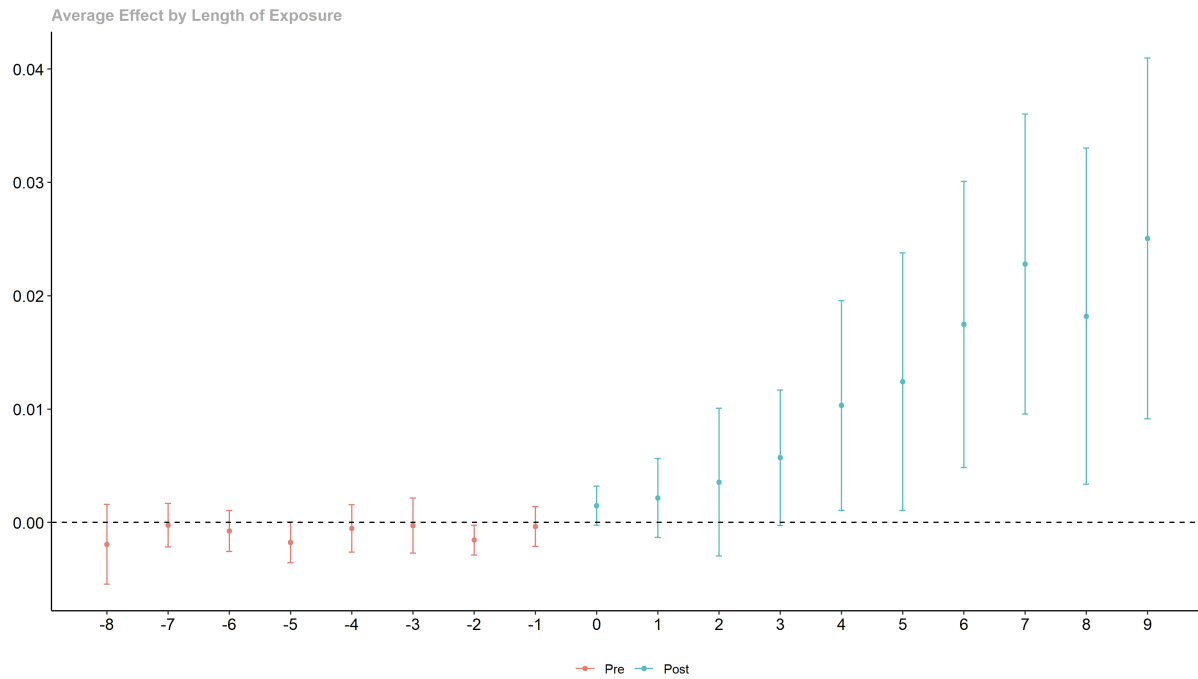
Notes: Data sources: ANATEL and Census. The figure plots effect of exposure to RecordTV on boys' years of education over time.

Figure 9: Effect of RecordTV on the share of votes to Pentecostal candidates



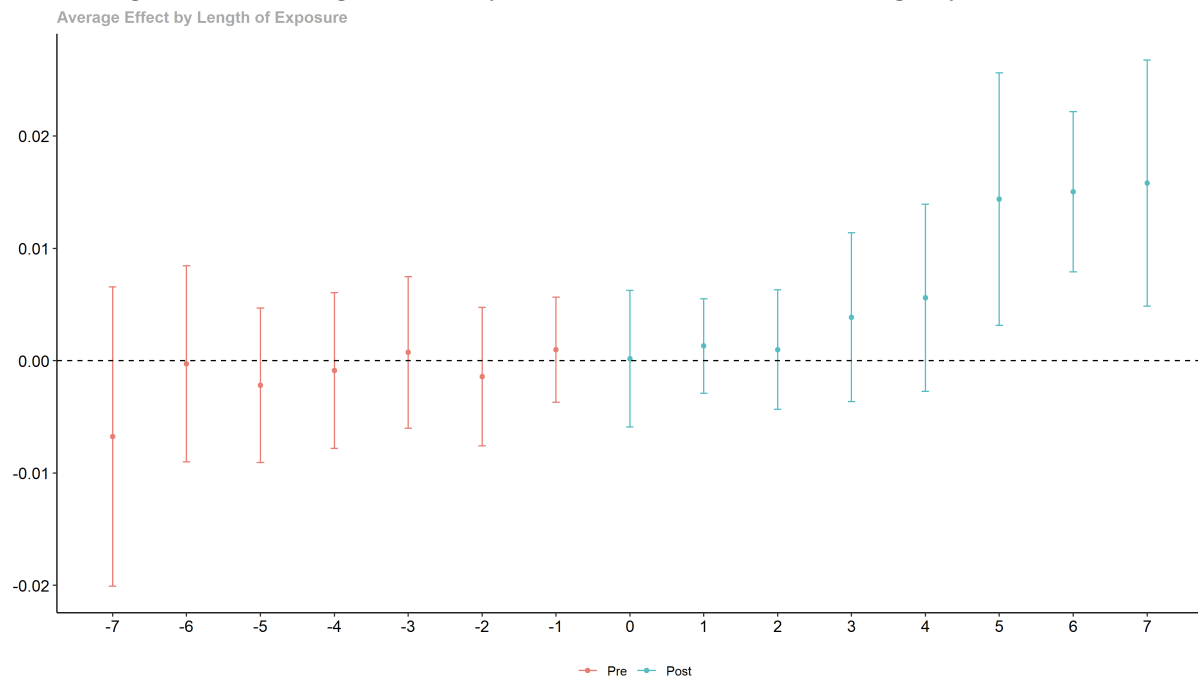
Notes: Data sources: ANATEL, TSE and Census. The figure plots effect of RecordTV exposure on the share of votes to Pentecostal candidates over time.

Figure 10: Number of Churches per Capita



Notes: Data sources: Brazilian IRS and ANATEL.

Figure 11: Timing of Fertility Rise around Year of Coverage by RecordTV



Notes: Data sources: 2000 Census and ANATEL.

Tables

Table 1: Descriptive Statistics and Balance Test of Exposure to RecordTV

| | Mean | Univariate | | Mesoregion FE & Propagation controls | |
|---------------------------|----------------------------|--------------------------|-----------------------|--------------------------------------|-----------------------|
| | (SD) (1) | Coefficient (2) | R ² (3) | Coefficient (4) | R ² (5) |
| Population (log) | 5.002 (2.033) | -0.100 (0.716) | 0.000 | -0.691 (0.428) | 0.513 |
| Population Density | 0.008 (0.041) | -0.001 (0.005) | 0.000 | 0.005 (0.009) | 0.088 |
| Income per capita | 47,139.120 (29,900.278) | 8,976.589 (8,663.065) | 0.012 | -11,220.270 (7,540.632) | 0.634 |
| Average Age (years) | 26.010 (2.494) | 2.652*** (0.671) | 0.156 | -0.186 (0.506) | 0.710 |
| Share of White | 0.518 (0.249) | 0.215*** (0.029) | 0.103 | -0.028 (0.021) | 0.894 |
| Share of Women | 0.506 (0.016) | 0.001 (0.004) | 0.001 | -0.003 (0.003) | 0.401 |
| Share High School or more | 4.139 (1.540) | 0.792** (0.399) | 0.036 | -0.319 (0.319) | 0.593 |
| Share Urban Population | 0.746 (0.257) | 0.058 (0.048) | 0.007 | -0.013 (0.045) | 0.480 |
| Share Manufacture Sector | 0.061 (0.047) | 0.021*** (0.006) | 0.029 | 0.015* (0.008) | 0.549 |
| Share TV | 0.441 (0.207) | 0.104** (0.051) | 0.034 | -0.053 (0.042) | 0.658 |
| Share Radio | 0.823 (0.138) | 0.111*** (0.018) | 0.089 | 0.029** (0.014) | 0.735 |

Notes: Data sources: 1991 Census and ANATEL. Regressions weighted by the 1991 municipal population.

Table 2: Exposure to RecordTV (Pre-Trends)

| Dep. Var.: | Δ Share of Pentecostal (1) | Δ Number of Children (2) | Δ LFP Women (3) | Δ LFP Men (4) | Δ Schooling Girls (5) | Δ Schooling Boys (6) |
|------------------------------|---|---------------------------------------|------------------------------|----------------------------|------------------------------------|-----------------------------------|
| Pre-trend (1980-1991) | | | | | | |
| Signal 1991 | -.0023 (.0025) | -.028 (.064) | .0038 (.01) | .0079 (.0066) | -.059 (.077) | -.033 (.072) |
| Number of Obs | 3986 | 3986 | 3986 | 3986 | 3986 | 3986 |
| Propagation Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Munic. Controls Baseline | Yes | Yes | Yes | Yes | Yes | Yes |
| Mesoregion FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean Dep. Var. Baseline | .03 | 3.86 | .37 | .88 | 6.34 | 5.72 |

Notes: This table shows the effect of RecordTV's coverage in 1990 on evolution of outcomes between 1980-1991. The dependent variables are: (1) share of Pentecostals, (2) female labor force participation, (3) male labor force participation, (4) average number of children per 15-49 year-old woman, (5) years of schooling of 18-25 year-old women, and (6) years of schooling of 18-25 year-old men. Data sources: 1980 and 1991 Census and ANATEL. Municipal controls measured in 1991 include: log population, share TV, share high school, average age. Regressions are weighted by the 1991 population. *p<0.10, **p<0.05, ***p<0.01

Table 3: Effect of RecordTV Exposure on Religious Affiliation

| Dep. Var.: | Δ Share of Pentecostals | | | | Δ Catholic |
|---|--------------------------------|--------------------|--------------------|--------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Panel A: Medium term (1991-2000) | | | | | |
| Coverage 1990 | -.0054 (.006) | -.012*** (.003) | .01* (.0056) | .01*** (.0039) | -.0077 (.0072) |
| Panel B: Long term (1991-2010) | | | | | |
| Coverage 1990 | -.017*** (.0063) | .02** (.0095) | .018*** (.0065) | .018*** (.0065) | -.0094 (.0091) |
| Number of Obs | 3988 | 3988 | 3986 | 3986 | 3986 |
| Propagation Controls | No | Yes | Yes | Yes | Yes |
| Baseline Controls | No | No | Yes | Yes | Yes |
| Mesoregion FE | No | No | No | Yes | Yes |
| Mean Dep. Var. Baseline | .03 | .03 | .03 | .03 | .83 |

Notes: This table shows the effect of RecordTV's coverage in 1990 on the share of Pentecostals and Catholics in 2000 (Panel A) . Data sources: 1991, 2000, and 2010 Census and ANATEL. Municipal controls measured in 1991 include: log population, share TV, share high school, average age. Regressions are weighted by the 1991 population. p<0.10, **p<0.05, ***p<0.01

Table 4: Effect of RecordTV Exposure on Behaviors

| Dep. Var.: | Δ Number of Children | Δ LFP Women | Δ LFP Men | Δ Schooling Girls | Δ Schooling Boys |
|---|--------------------------------|-----------------------|---------------------|-----------------------------|----------------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Panel A: Medium term (1991-2000) | | | | | |
| Coverage 1990 | .097** (.043) | -.028*** (.0086) | -.0076 (.0058) | -.009 (.059) | .054 (.063) |
| Panel B: Long term (1991-2010) | | | | | |
| RecordTV Coverage 1990 | .075 (.049) | -.026** (.01) | .017*** (.0066) | -.19** (.087) | -.075 (.087) |
| Number of Obs | 3986 | 3986 | 3986 | 3986 | 3986 |
| Propagation Controls | Yes | Yes | Yes | Yes | Yes |
| Munic. Controls Baseline | Yes | Yes | Yes | Yes | Yes |
| Mesoregion FE | Yes | Yes | Yes | Yes | Yes |
| Mean Dep. Var. Baseline | 3.86 | .37 | .88 | 6.34 | 5.72 |

Notes: This table shows the effect of RecordTV's coverage in 1990 on the outcomes in 2000. Dependent variable are defined as: (1) total number of children (2) female labor for participation, (3) male labor for participation (4) years of schooling of 18-25 year-old women, and (5) years of schooling of 18-25 year-old men Municipal controls measured in 1991 include: log population, share TV, share high school, average age. Regressions are weighted by the 1991 population. Data sources: 1991, 2000, and 2010 Census, TSE, and ANATEL. *p<0.10, **p<0.05, ***p<0.01

Table 5: Effect of RecordTV and Globo Exposure on Religiosity and Behaviors

| Dep. Var.: | Δ Share of Pentecostals | Δ Number of Children | Δ LFP Women | Δ LFP Men | Δ Schooling Girls | Δ Schooling Boys |
|---|-----------------------------------|--------------------------------|-----------------------|---------------------|-----------------------------|----------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel A: Medium term (1991-2000) | | | | | | |
| RecordTV Coverage 1990 | .0091** (.004) | .1** (.043) | -.027*** (.0087) | -.0073 (.0058) | -.014 (.058) | .043 (.062) |
| Globo Coverage 1990 | .0073 (.0052) | -.066* (.037) | -.012 (.0082) | -.0014 (.0061) | .042 (.064) | .095 (.063) |
| Panel B: Long term (1991-2010) | | | | | | |
| Signal 1991 | .016** (.0065) | .087* (.049) | -.025** (.01) | .018*** (.0066) | -.19** (.087) | -.085 (.087) |
| Signal Globo 1991 | .01 (.0092) | -.11** (.045) | -.0077 (.011) | -.0047 (.0069) | .063 (.096) | .12 (.092) |
| Number of Obs | 3986 | 3986 | 3986 | 3986 | 3986 | 3986 |
| Propagation Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Munic. Controls Baseline | Yes | Yes | Yes | Yes | Yes | Yes |
| Mesoregion FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean Dep. Var. Baseline | .03 | 3.86 | .37 | .88 | 6.34 | 5.72 |

Notes: This table shows the effect of RecordTV and Globo's coverage in 1990 on the outcomes in 2000. Dependent variable are defined as: (1) share of Pentecostals (2) total number of children (3) female labor for participation, (4) male labor for participation (5) years of schooling of 18-25 year-old women, (6) years of schooling of 18-25 year-old men, (7) suicide rate. Municipal controls measured in 1991 include: log population, share TV, share high school, average age. Regressions are weighted by the 1991 population. Data sources: 1991, 2000, and 2010 Census, SIM/SUS, and ANATEL. *p<0.10, **p<0.05, ***p<0.01

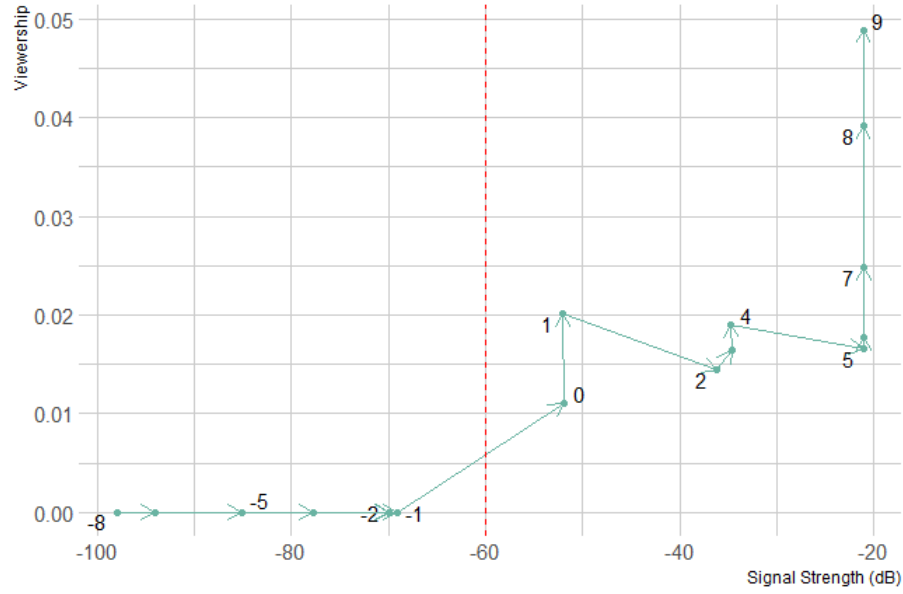
Table 6: Viewership

| | (1) | (2) |
|---------------|-------------|-----------------|
| | Measure 1 | Measure 2 |
| Coverage | .4 (.22) | .087* (.039) |
| Number of Obs | 10 | 10 |

Notes: Data sources: IBOPE and ANA-TEL. *p<0.10,**p<0.05,***p<0.01

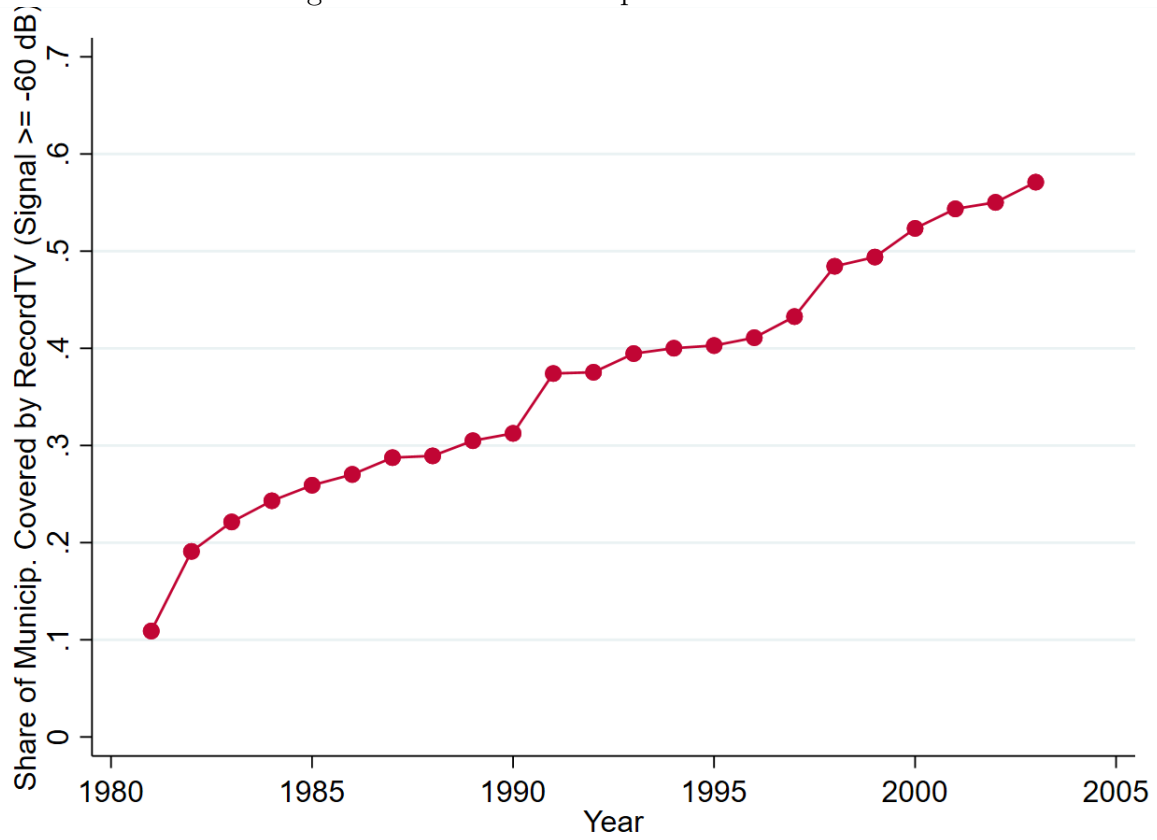
Appendix A

Figure A1: Signal Strength and RecordTV Viewership



Notes: Data sources: IBOPE and ANATEL. The x-axis represents the maximum signal strength received by the municipality. The y-axis is RecordTV's daily average viewership. The dots represent the years before and after the event $t = 0$, which is the year when viewership becomes positive for the first time in the metropolitan region.

Figure A2: RecordTV expansion over time



Notes: Data sources: ANATEL. The figure plots the share of municipalities that gets covered by RecordTV in a given year over the period 1980-2005. A municipality is considered covered if RecordTV signal strength goes above -60 dB in a given year.

Figure A3: Signal Strength across Brazilian Municipalities

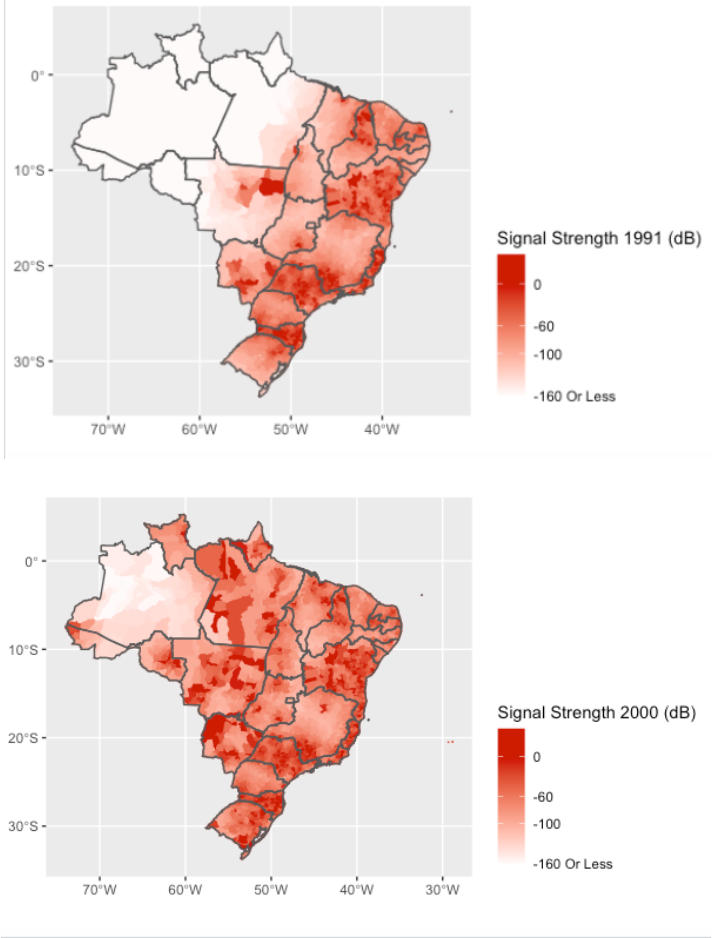


Figure A4: Share of Pentecostals across Brazilian Municipalities

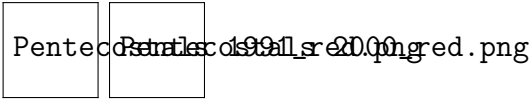
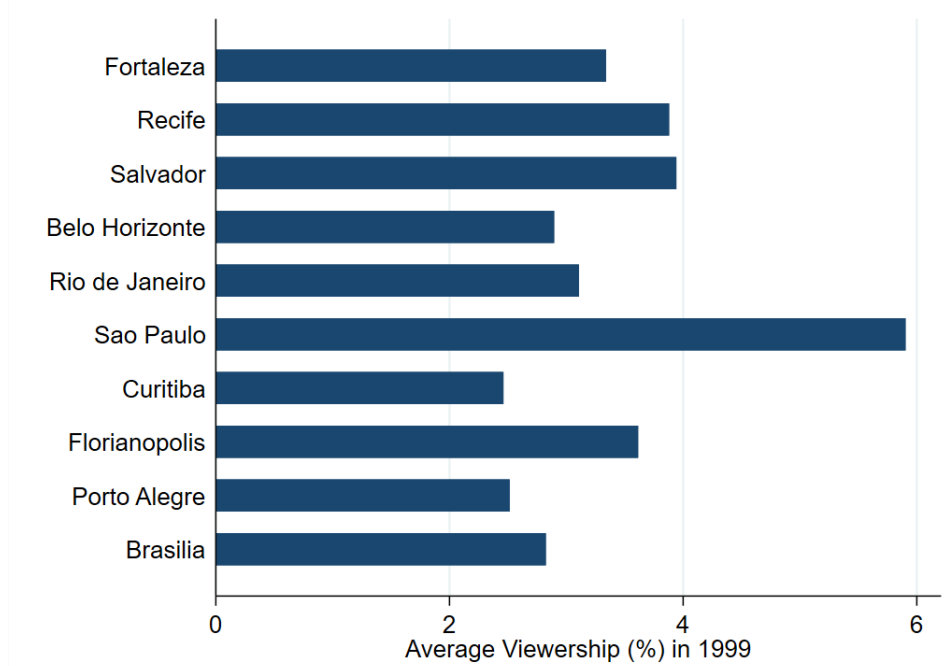


Figure A5: Average (%) RecordTV Viewership in 10 Metropolitan Regions in 1999



Notes: Data source: IBOPE. This graph shows the average viewership of RecordTV in 10 metropolitan areas where the data was available.

Table A1: Opinion about Sensitive Topics and Expenditure on Selected Goods by Religion

| Variable | Pentecostal | | Catholic | | P-C |
|---|-------------|------|----------|------|---------|
| | Mean | SD | Mean | SD | p-value |
| Panel A: Opinion about Sensitive Topics | | | | | |
| Practice Religion Frequently (%) | 77.2 | 42.2 | 42.1 | 49.4 | 0.00 |
| Have Full Confidence in the Church (%) | 62 | 48.8 | 55.8 | 49.7 | 0.26 |
| God is Most Important in Life (%) | 97.8 | 14.7 | 94.6 | 22.6 | 0.07 |
| Think Religion is Important to Teach to Children (%) | 79.3 | 40.7 | 65.7 | 47.5 | 0.00 |
| Homosexuality Can Be Justified (%) | 14.1 | 35 | 29 | 45.4 | 0.00 |
| Abortion Can Be Justified (%) | 4.35 | 20.5 | 9.33 | 29.1 | 0.04 |
| Panel B: Individual Monthly Expenditure on Selected Goods as Share of Total Expenditure | | | | | |
| Alcohol (%) | .699 | 5 | 1.78 | 8.25 | 0.00 |
| Tobacco (%) | 1.4 | 7.68 | 4.08 | 13.7 | 0.00 |
| Gambling (%) | .308 | 2.79 | .999 | 6.21 | 0.00 |
| Entertainment (%) | .208 | 2.23 | .553 | 3.9 | 0.00 |
| Transportation (%) | 13.2 | 22.1 | 12.7 | 21.9 | 0.26 |
| Food Outside the Home (%) | 7.12 | 15.5 | 7.18 | 15.7 | 0.87 |

Notes: Data sources: 2002 Latin Barometer and 2002/2003 Brazilian Household Expenditure Survey (POF/IBGE).

Table A2: Brazilian TV Channels (1950-1999)

| TV Channel | Year Established | Year Discontinued | Coverage |
|------------------------------|------------------|-------------------|------------|
| TV Tupi* | 1950 | 1980 | Nationwide |
| TV Rio | 1955 | 1977 | Local |
| RecordTV | 1953 | - | Nationwide |
| TV Continental* | 1959 | 1970 | Nationwide |
| TV Excelsior | 1963 | 1970 | Nationwide |
| TV Jornal do Comercio | 1960 | - | Local |
| TV Rádio Clube de Pernambuco | 1960 | - | Local |
| TV Itapoan | 1960 | - | Nationwide |
| TV Globo | 1965 | - | Nationwide |
| TV Bandeirantes | 1967 | - | Nationwide |
| TV Universitária | 1968 | - | Local |
| Rede Amazônica | 1972 | - | Local |
| SBT | 1981 | - | Nationwide |
| Rede Manchete | 1983 | 1999 | Nationwide |
| MTV Brasil | 1990 | - | Nationwide |
| RedeTV! | 1999 | - | Nationwide |

Notes: This table shows all TV channels that operated in Brazil from 1950 to 1999. It includes the year established and the year discontinued, if applicable. *TV Tupi and TV Continental were ordered to close by the military government.

Table A3: RecordTV Programming in a Saturday (10/05/1996)

| Show | Type |
|--|-----------------|
| 06h00 - Programa Educacional MEC | Educational |
| 06h30 - Jesus Verdade | Religious |
| 07h00 - Renascer | Religious |
| 07h30 - Reunião dos Milagres | Religious |
| 08h30 - Espaço Evangélico | Religious |
| 10h00 - Falando de Vida | Religious |
| 11h00 - Gospel Line | Religious |
| 12h00 - Brasil Feliz com Edson Moura | Talk-show |
| 14h30 - Mara Maravilha Show | Children's show |
| 16h00 - Quem Sabe... Sábado! | Comedy show |
| 18h00 - Circuito Mundial de Vôlei de Praia | Sport |
| 19h00 - Cidade Alerta | News |
| 20h00 - Jornal da Record | News |
| 20h45 - Informe Local | News |
| 21h00 - The Nanny | Sitcom |
| 21h30 - Programa Ana Maria Braga | Talk-show |
| 23h30 - Palavra de Vida | Religious |
| 03h00 - Sessão Transnoite: Família Adams | Series |

Notes: Data sources: <http://ehmbdeolhonatv.blogspot.com/2020/10/programacao-antiga-5-de-outubro-de-1996.html>.

Table A4: RecordTV Programming in a weekday (01/13/1998)

| Show | Type |
|----------------------------------|------------------------|
| 05h00 - O Despertar da Fé | Religious |
| 06h00 - Santo Culto em Seu Lar | Religious |
| 07h00 - Ponto de Fé | Religious |
| 08h30 - Caminhos da Esperança | Religious (soap-opera) |
| 09h15 - Forno, Fogão & Cia. | Cooking show |
| 09h45 - Desenhos da Vovó | Cartoons |
| 11h00 - O Mundo de Beakman | Children's show |
| 11h30 - Desenho Mania | Cartoons |
| 12h00 - Informe Local | News |
| 12h30 - Zorro | Series |
| 13h00 - Note & Anote | Cooking, art crafts |
| 17h30 - Cidade Alerta | News |
| 19h15 - Jornal da Record | News |
| 20h00 - Olho da Terra | Religious |
| 20h30 - Ratinho Livre | Variety show |
| 22h00 - Programa Ana Maria Braga | Talk-show |
| 24h00 - Jornal Onze e Meia | News |
| 24h25 - Programa de Negócios | Business show |
| 24h30 - 25 ^a Hora | Religious |
| 01h30 - Palavra de Vida | Religious |

Notes: Data sources: <http://ehmbdeolhonatv.blogspot.com/2020/01/programacao-antiga-13-de-janeiro-de-1998.html>.

Table A5: Alternative Specifications

| Specification | Dependent Variables | | FLPF | School Girls | MLPF |
|---|---------------------|------------------|---------------------|------------------|--------------------|
| | Pentecostals | Fertility | | | |
| Panel A: Medium term (1991-2000) | | | | | |
| Signal | -.0045 (.006) | .12 (.079) | -.0057 (.0091) | -.055 (.14) | .026*** (.0038) |
| Signal, FE | -.011*** (.0029) | -.011 (.037) | -.0059 (.01) | -.0051 (.089) | .0068 (.0049) |
| Signal, FE, Propagation | .011** (.0054) | -.0018 (.062) | -.017* (.0098) | .08 (.083) | -.0089 (.0065) |
| Benchmark | .011*** (.0038) | .097** (.042) | -.026*** (.0083) | -.009 (.057) | -.0075 (.0057) |
| Cluster Mesoregion | .011** (.0049) | .097* (.058) | -.026*** (.0093) | -.009 (.066) | -.0075 (.0071) |
| Benchmark, Lagged outcome | .0089** (.0038) | .093** (.043) | -.025*** (.0082) | -.028 (.057) | -.0067 (.0057) |
| Panel B: Long term (1991-2010) | | | | | |
| Signal | -.0017 (.0089) | .39*** (.13) | .0034 (.012) | -.23 (.26) | .039*** (.0061) |
| Signal, FE | -.016** (.0061) | -.0078 (.067) | -.0089 (.011) | .028 (.2) | .0075 (.013) |
| Signal, FE, Propagation | .021** (.0093) | -.04 (.086) | -.012 (.011) | .029 (.16) | .014 (.0087) |
| Benchmark | .018*** (.0064) | .073 (.048) | -.025** (.01) | -.18** (.086) | .014** (.0063) |
| Cluster Mesoregion | .018** (.008) | .073 (.058) | -.025** (.012) | -.18** (.088) | .014* (.0075) |
| Benchmark, Lagged outcome | .017*** (.0064) | .067 (.048) | -.023** (.0099) | -.2** (.086) | .016*** (.0062) |

Notes: This table shows the results of our main outcomes using different specifications. In the first line, we include on the signal in the specification. In the next line, we add mesoregion fixed effect. Next, we include also propagation controls. The benchmark is our main specification. In the following specification, we change the clustering level to mesoregion. Finally, we control for the outcome in the previous period (1980-1991).

A.1 Examples of specific shows

Example 1: The show aired in February 2nd, 2011 started by showing a short documentary about traffic of women for sex work. After that, telespectators were invited to give their opinion on the whether these women are victims or guilty for the situation. The pastor took the calls, listened to the person's opinion, and discussed it briefly. Then, an ex-sex worker and a drug and alcohol user gave her testimonial on how the UCKG helped her to transform her life. Here is an exert:

Woman: "I was in there [in the brothel], but I wanted to meet someone, to change my life. I wasn't there because I wanted to, because I liked it. Then the day came and it happened. I met my husband there. I got out, we talked and I left. Then we moved in together."

Narrator: "Despite recognizing that life had given her a very valuable gift, Sueli had left family values in the distant past and thus, her attitude put everything at risk."

Woman: "At home I didn't serve as a wife, I still didn't have wisdom, I didn't have direction. I lived a completely wrong life and then I came to change. Suddenly I couldn't. So I started to fight with him. I started arguing, cursing, not respecting the patience and unconditional love of a man without prejudice."

Narrator: "It reached the limit. Her husband's harsh words sounded like a bomb in Sueli's ears."

Woman: "And that's when he told me the right place for me was the brothel. I have had the opportunity to change to change. And I was throwing away this opportunity that our marriage was going to work out, even though I wasn't born to have a family, to marry, because that way there was no way for us to live."

Narrator: “Sueli knew that in that way she was destroying their relationship, that there was truth in every word she heard from her husband. She knew that she needed to assume the position of a married woman, but on the other hand, she also knew that she couldn’t do it alone. So, Sueli took the first step in seeking help.

Woman: “I had already been attending Universal Church programs for three months and I was proud. I didn’t want to go to church, I thought that wasn’t going to change anything. Then when I saw that either I would go to church or I would lose that opportunity, and I was afraid of I losing it. And that’s when I decided to go to church with a heart that wanted a change.”

Narrator: “Sueli arrived at the Universal Church of the Kingdom of God. From each meeting she attended, she took with her a new lesson, which reflected in changes in my marriage.”

Woman: “Today we live well, we have a good relationship, we understand each other.”

Narrator: “With the experience of those who knew firsthand the results of exercised faith, Sueli started a new stage in another area of her life.”

Woman: “I took a hairdressing course. Then I started working at my house, until over time I built a salon. So, today my financial life was transformed. We have our car, we have a beautiful, big house with several rooms, we have a comfortable house.”

A.2 TV Shows

25th Hour/Speak that I will listen (25a Hora/Fala que eu te escuto): “25th Hour” was a live show hosted by Pastors that was launched in 1992. Its content was strictly religious. At the end of the show, a glass of sanctified water was used to bless the

audience. In 1998, the show was replaced by “Speak that I will listen”, which followed a similar format although the content was expanded to topics other than religion. It was one of the most popular night shows on the Brazilian TV.

Mysteries (*Mistérios*): [...] The show had an section called ”Exorcism Sections”, where Pastors associated diseases and misconducts to the action of devil spirits of Afro-Brazilian religions. RecordTV faced a law suit because of this show.

Nosso Tempo: This show follows the true cases of people who overcame their problems thanks to their meeting with faith and succeed in changing their life.

O despertar da fé: at the beginning, this program was personally conducted by Edir Macedo. The logo used was that of two hands joined in a prayer position, gently cut by sunlight, and rigorously selected testimonies came to speak about their religious experiences.

In 1997, RecordTV started producing short soap operas with religious and moralizing content. Here, we briefly describe some of these shows.

The Devil’s Daughter (*A filha do Demonio*): Ana’s soul was sold to the Devil by her father, a poor man, for US\$100,000. While her father lived a frivolous life, Ana grew up angry and bitter because of the devilish pact. This rage turned her into a rebellious and mean adult. When the father decides to confess her about the pact, she gets a chance of changing her destiny.

The Eye of the Earth (*O olho da Terra*): Sara was a spiteful woman that used witchcraft to attack the wife of the man she loved. Her misdeeds ended when an evangelizing man arrived to the town. The show had the participation of a famous Brazilian gospel singer.

Soul of Stone (*Alma de Pedra*): Leandro was a bitter and disturbed man.

His life transformed when he decided to convert to the UCKG. This story was based on testimonies of the UCKG's believers.

Elias' Challenge (*O desafio de Elias*): this historical fiction gravitates around the struggle of Elijah, an ordinary man who received the divine call, to make the Word of the God of Israel prevail and to convince the Jewish people of their sins. Opposed by the proud King Ahab and his wife, the evil Jezebel, he fought to prove that the Lord is more powerful and stronger than the false god Baal.

A História de Ester: Ester, a Jewish girl, decided to marry a pagan king and became queen to protect the Jews from extermination, while hiding her religious identity.