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

Marcela Mello
with Giulia Buccione

Brown University

# Motivation

- All world religions endorse certain behaviors and uphold certain social norms
  - Marital norms, fertility
  - Political candidates and parties
  - Meaning to life
- Despite recent advance, we still know little about the causal effects of religion on behaviors
- Difficult to study the causal effect of religion on behaviors
  1) Ingrained to culture and institutions
  2) Endogeneity in affiliation and participation

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  - Political candidates and parties
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- Despite recent advance, we still know little about the causal effects of religion on behaviors
- Difficult to study the causal effect of religion on behaviors
  1) Ingrained to culture and institutions $\rightarrow$ Fast-growing new religious movements
  2) Endogeneity in affiliation and participation $\rightarrow$ Exogenous shocks to the probability of conversion

# This Paper

We study the rise of Pentecostal in Brazil

- One of the world's fastest-growing religious movement
  - Increased by 400% between 1991 and 2010 in Brazil
  - From 3% of the population in 1980, to 16.8% in 2010
  - Foster conservative values, particularly for women
- Quasi-random variation in exposure to religious media
  - Bankruptcy of a channel in a very concentrated $\rightarrow$ unique opportunity
  - Change of ownership of a TV channel $\rightarrow$ religious content
- Church-prescribed behaviors:
  - Traditional role of women: FLFP, fertility, education
  - Voting

# This Paper

Question

- Can *religious media* affect religious affiliation?
- If so, is this change in religious affiliation followed by changes in behaviors?

Empirical Strategy

- Quasi-random variation in exposure to religious media
- Compare the evolution of the outcomes of interest in regions exposed to religious content to those not exposed

Main Results

- Exposure to religious media increases Pentecostal affiliation
  - ⋆ Medium-term: 25% from baseline, 10% of 1991-2000 increase
  - ⋆ Long-term: 50% from baseline, 12% of 1991-2010 increase
- Adherence to church-prescribed behaviors:
  - ⋆ Traditional role of women: higher fertility, lower female labor force participation, lower school completion for girls in the next generation
  - ⋆ No effects on male labor force participation
  - ⋆ More votes to Pentecostal candidates

# Literature Review

1) Religion on Behaviors
   - Historical religions Bassi and Rasul 2017; Campante and d Yanagizawa-Dot, 2015; Fruehwirth, Yer, and Zhang, 2019; Gruber and Hungerman 2008; Squicciarini 2020
   - New religious movements Bryan, Karlan, and Choi 2018
     → **Contribution:** Effect of Pentecostalism on behaviors

2) Media on Behaviors
   - Non-religious media: Bursztyn and Cantoni 2016; Durante, Pinotti, and Tesei 2019; La Ferrara, Chong, and Duryea 2012; Gentzkow and Shapiro 2008; Olken 2009; Jensen and Oster 2009; Banerjee, La Ferrara, and Orozco-Olvera 2019; Braga 2007; DellaVigna, Enikolopov, et al. 2011; Yanagizawa-Drott 2014; Gentzkow 2006; Gentzkow, Shapiro, and Sinkinson 2011; DellaVigna and Kaplan 2007; Enikolopov, Petrova, and Zhuravskaya 2011; Adena et al. 2015; Chiang and Knight 2011; Wang 2020
   - Religious media: Grosfeld et. al 2023
     → **Contribution:** Effect of religious media on religious conversion and behaviors

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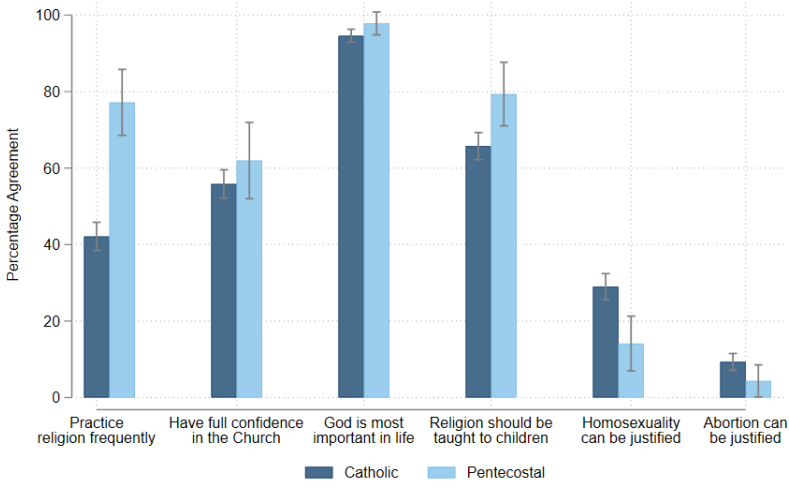
# Pentecostal Movement

- The Pentecostal movement is a part of Protestant Christianity
- They are more religiously observant than other Christians
- More literal interpretations of sacred texts
- Influential in Latin America and Africa, where it is followed by 13% and 12% of the population, respectively.

# Pentecostal's values

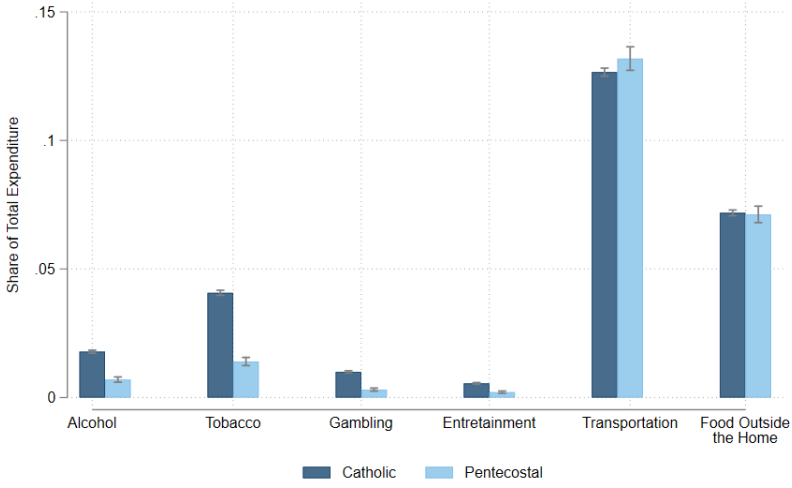
Table




2002 Latin Barometer.

# Pentecostal's values

Table




2002/2003 Brazilian Household Expenditure Survey (POF/IBGE).

# Background

## RecordTV

- Founded in 1953, but went bankrupt in late 1980s
- Pentecostal Bishop Edir Macedo bought RecordTV in 1990
  - Media market in Brazil is extremely concentrated
  - Only seven nationwide TV channels → Rare event
- RecordTV also has a clear political stance
  - RecordTV aired Bishop Edir Macedo blessing the candidate Jair Bolsonaro during the 2018 presidential campaign

"What is preached today is: "My daughter will never submit to a man." Then she will be submitted to unhappiness. Because there does not exist family, marriage, [...] or happiness when the woman is the head."

"I want my daughters to marry a *macho*. The man has to be the head. Because if they are not the head, the marriage is fated to fail."

– Bishop Edir Macedo

# Background

## RecordTV's Programming

- Started broadcasting **religious** content
- Amount of religious content per week (Campos, 1997):
  - RecordTV: 60 hours
  - Rede Globo: 1 hour
  - SBT: 12 minutes
- Religious shows include
  - Talk shows
  - Preaching
  - Moralizing soap operas
  - Biblical documentaries

# Background

## Example of RecordTV's programming

### Saturday

| 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 | Comedy |

### Weekday

| 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 |
| 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 - 25ª Hora | Religious |
| 01h30 - Palavra de Vida | Religious |

# Background

## Church's Merchandise during non-religious shows

If you are desperate and have never been to [Church], call [number]

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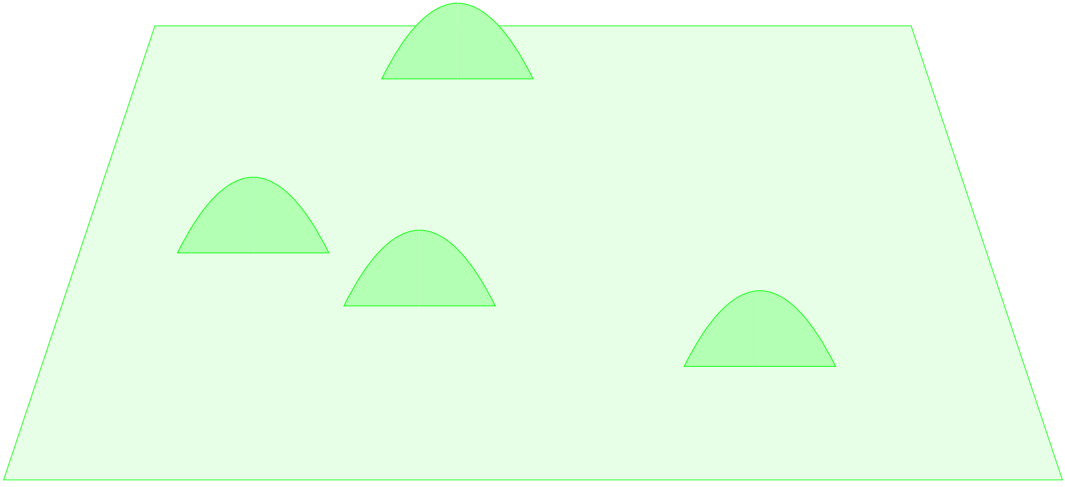
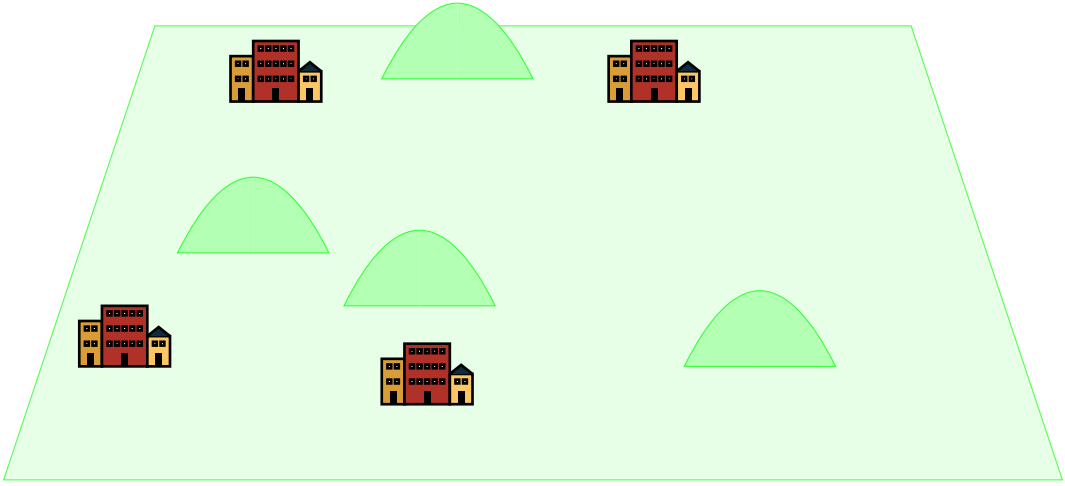
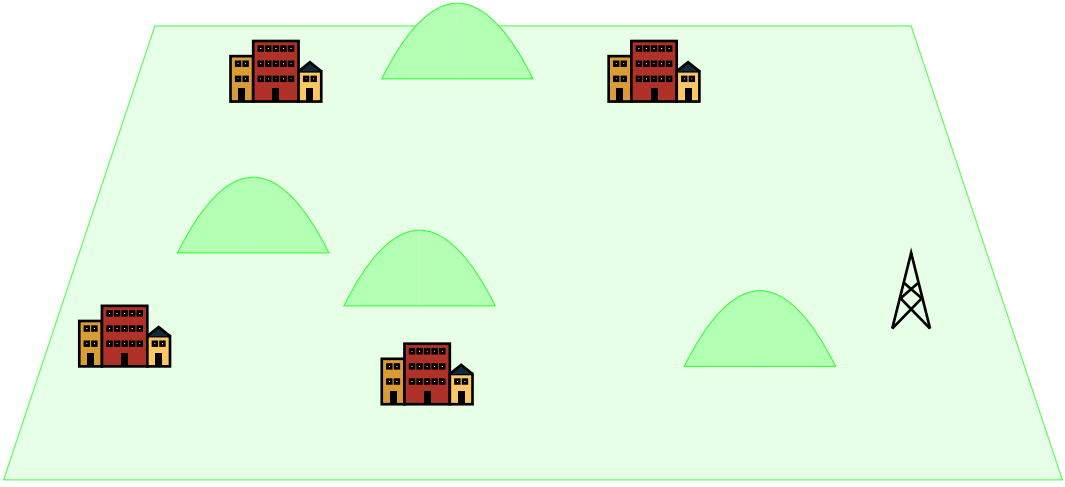
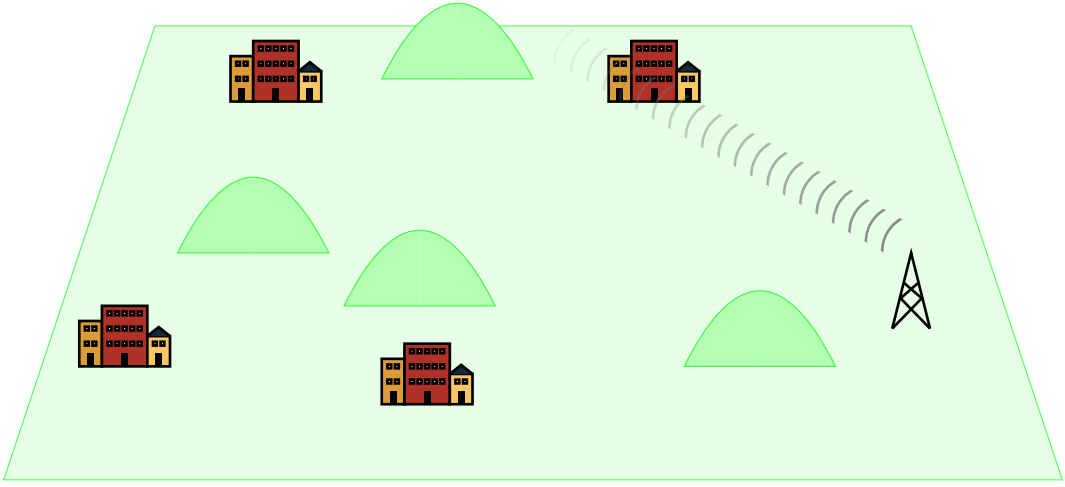
# Main Data

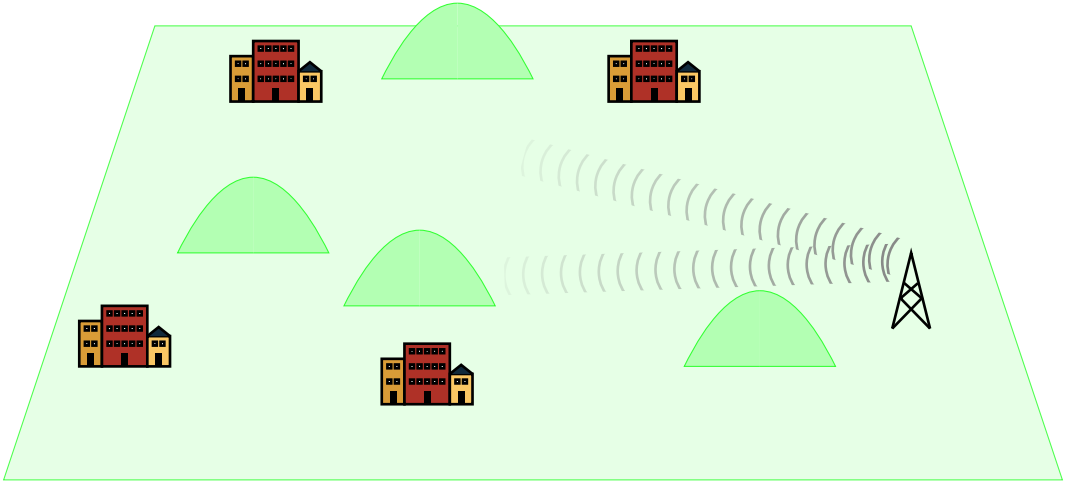
- TV coverage: National Telecommunication's Agency (ANATEL)
  - Transmitter's power, height, frequency, location, date of installation, owner
  - Irregular Terrain Model
- Religious and Behavioral Outcomes: Brazilian Census (1980, 1991, 2000, 2010)
  - Religious affiliation, Fertility, Labor force participation, Education
  - Other controls
- Votes for Pentecostal Candidates: Federal Electoral Authority, TSE (2002, 2006, 2010, 2014)
  - Candidates' profile, number of votes received from each municipality
  - Candidates' religion classification: hand-coded by Lacerda (2017)
- Other datasets: IBOPE (viewership)

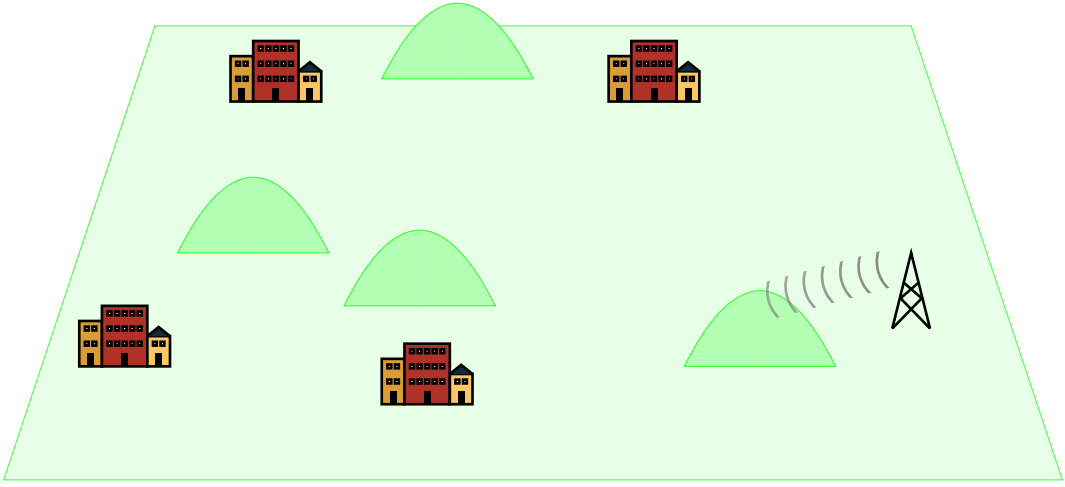


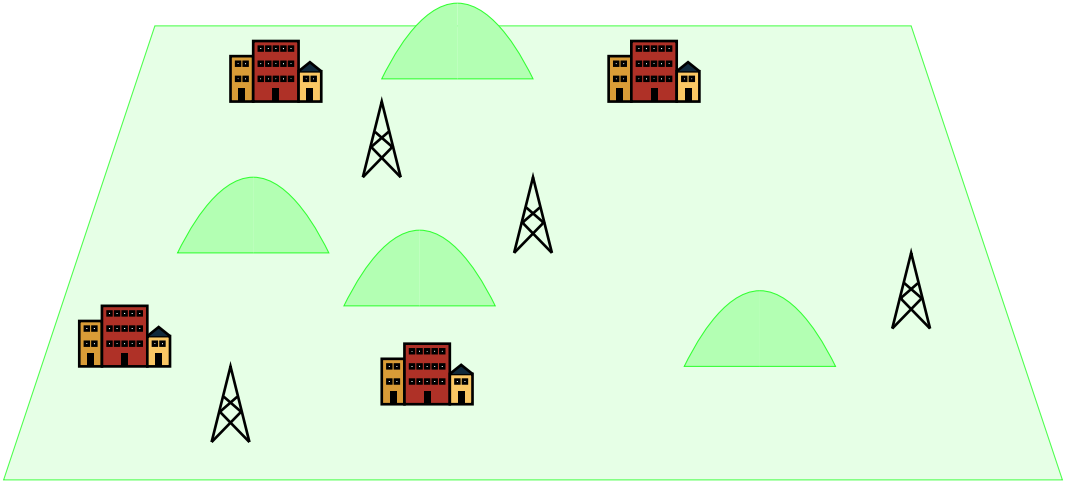


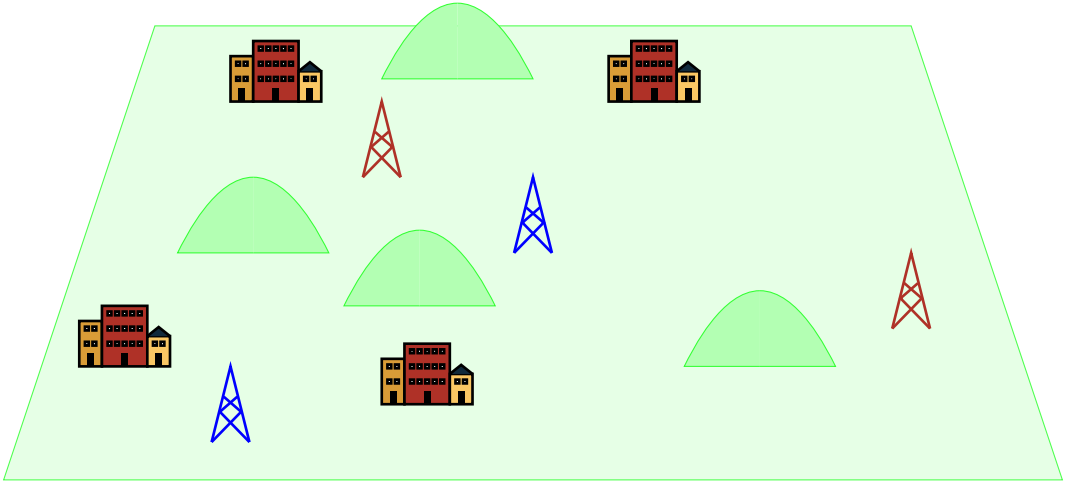


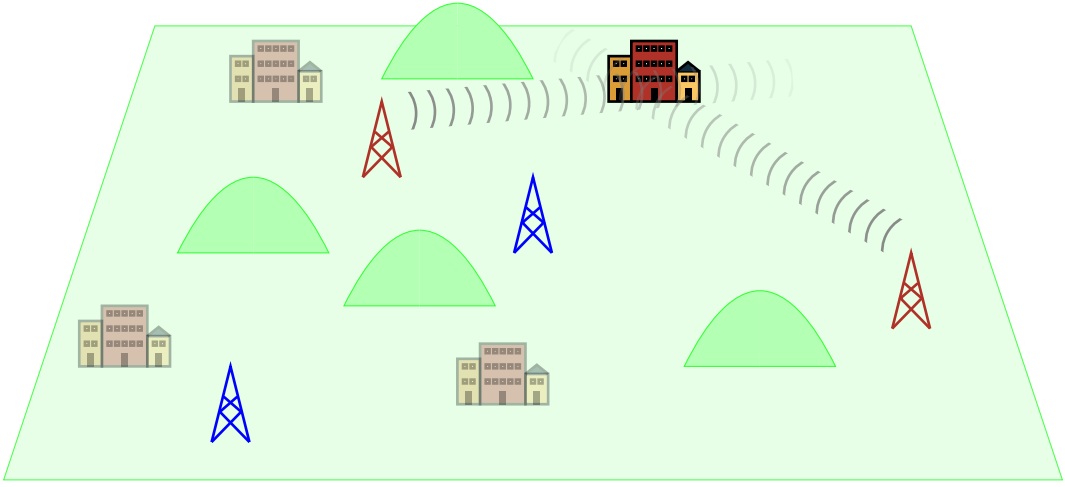


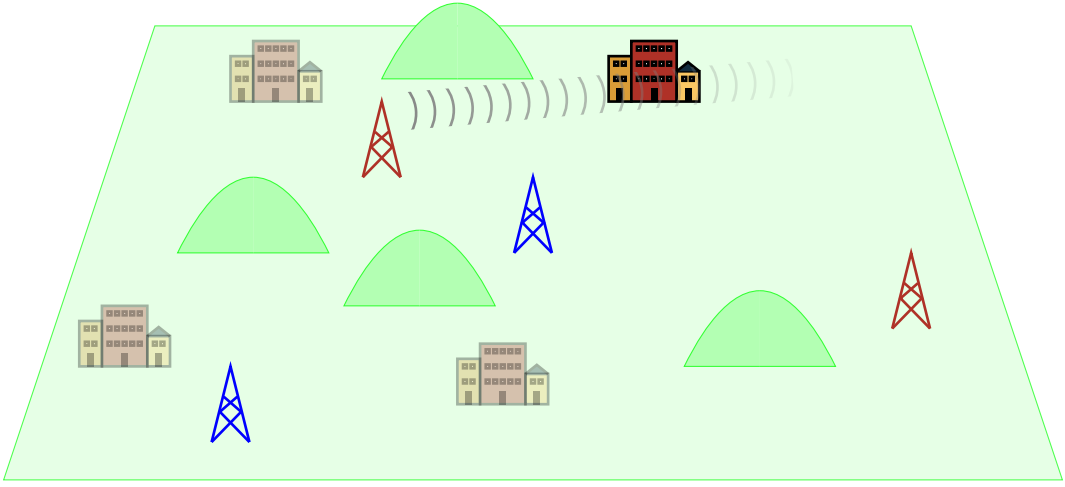












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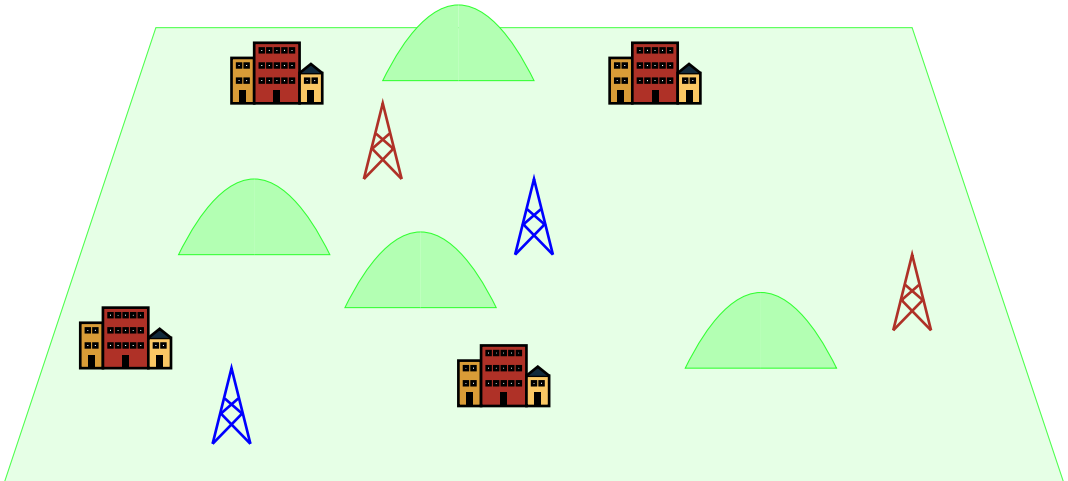
# Before Change of Ownership



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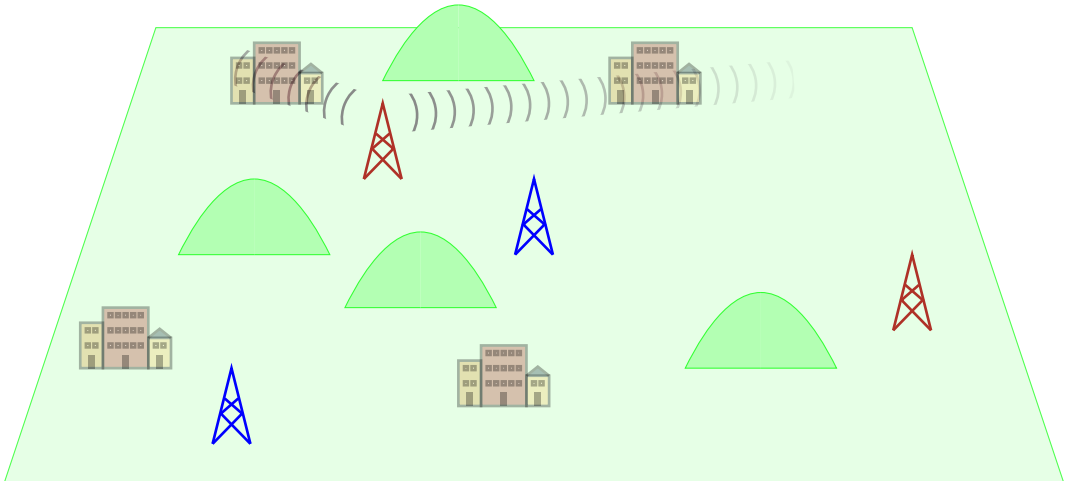
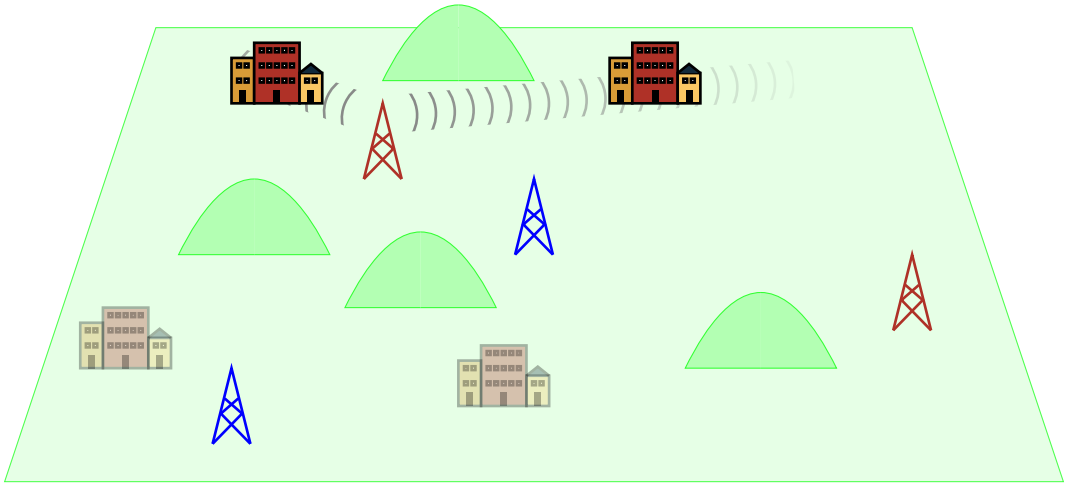
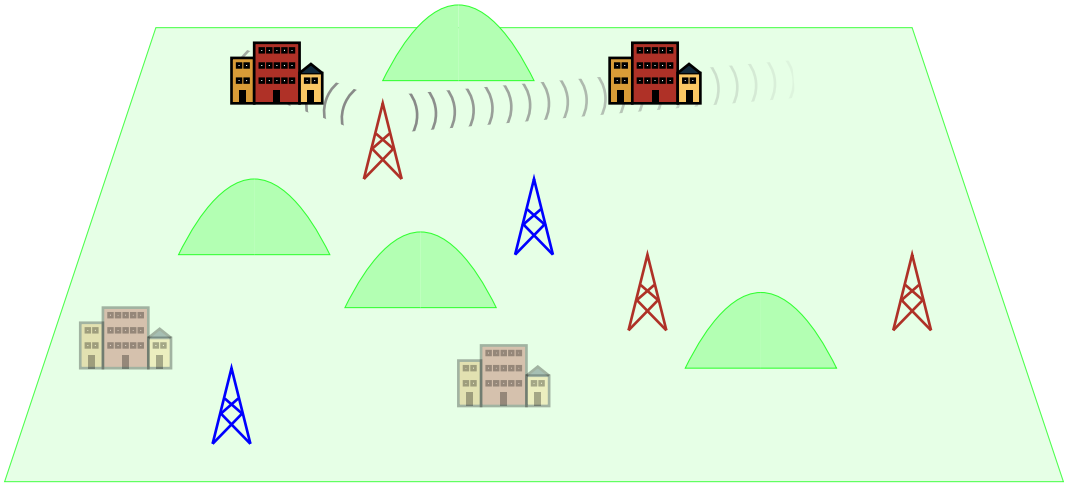


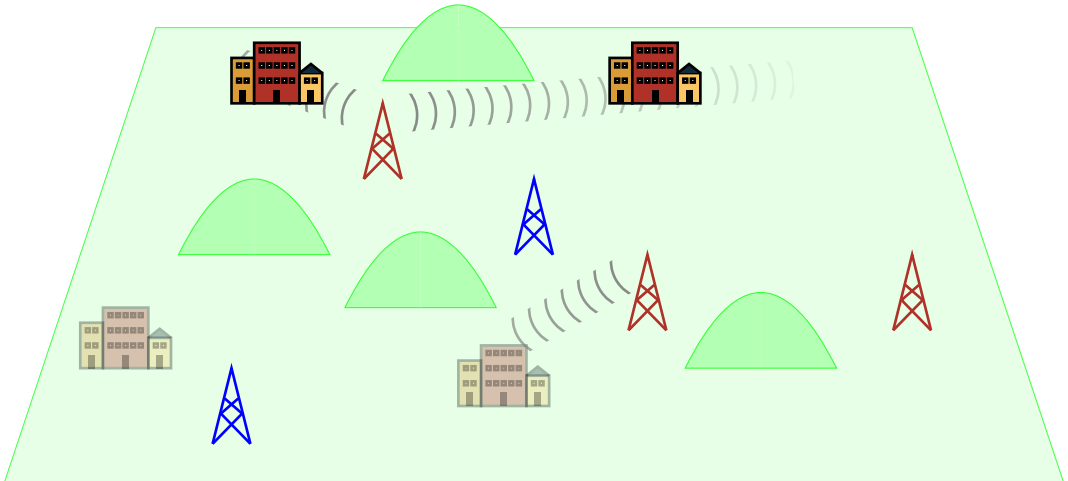
# After Change of Ownership - Initial Placement



# After Change of Ownership - Expansion



# After Change of Ownership - Expansion



# Baseline Empirical Strategy

- We compare the evolution of the outcomes of interest in regions exposed to religious content to those in regions not exposed to religious content
- We use only RecordTV's transmitters before the change of ownership
  - Placement of transmitters was exogenous to the expansion strategy of the church
  - Media market is very concentrated $\rightarrow$ unique opportunity to buy a TV channel
- Assumption: In the absence of changes in the content of the TV channel, the evolution of the outcomes of interest for exposed area would have been the same as for non-exposed areas

# Baseline Empirical Strategy

$$Y_{m,t} - Y_{m,91} = \beta_1 \cdot Signal_m^{1990} + \beta_2 \cdot Propagation\ Controls_m + \beta_3 \cdot X_m^{1991} + \delta_{mesoregion(m)} + \varepsilon_m,$$

- $\Delta_{91-t}$ $Y_m$: difference between the outcome on interest between 1991 and t, t $\in \{2000, 2010\}$
- $Signal_m^{1990}$: RecordTV Signal in 1990
- $Propagation\ Controls_m$: signal in free space, height, area, ruggedness, and their squares
- $X_m^{1991}$: log population, % tv, % radio, % high school
- $\delta_{mesoregion(m)}$: mesoregion fixed effects

▸ Characteristics

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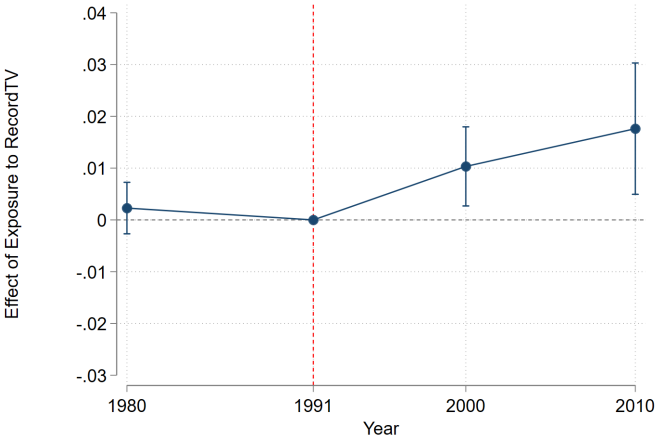
# Main Results

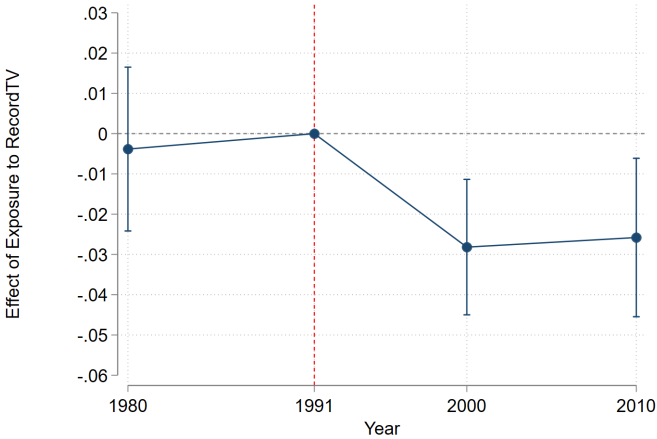
## Share of Pentecostals




▸ Table ▸ Pre-trend ▸ Other

# Main Results

## Female Labor Force Participation

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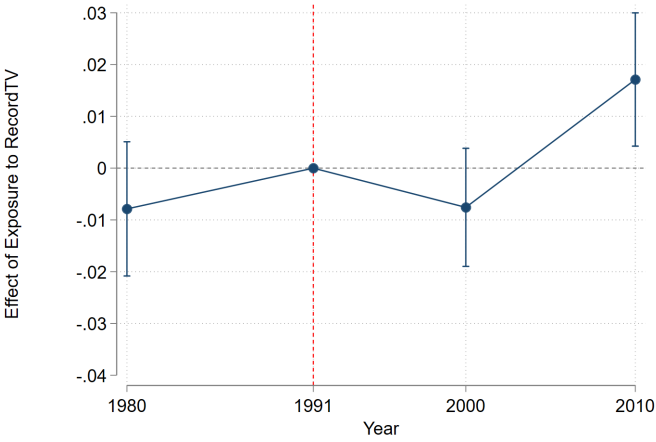
# Main Results

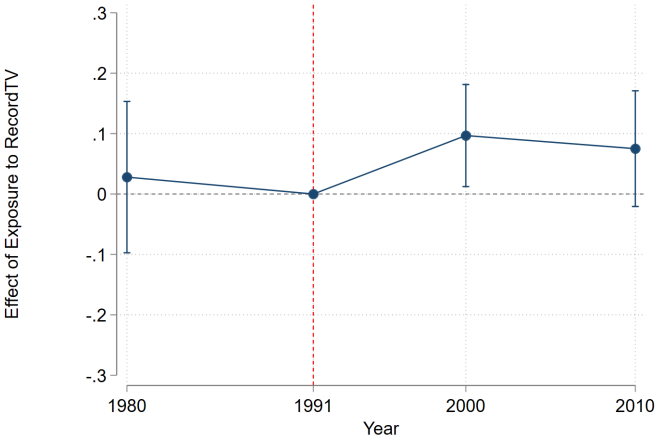
## Male Labor Force Participation




▸ Table ▸ Pre-trend ▸ Other

# Main Results

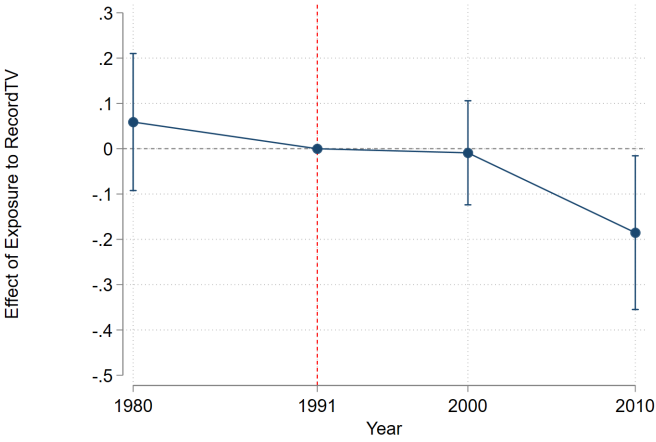
## Total Fertility




▸ Table ▸ Pre-trend ▸ Other

# Main Results

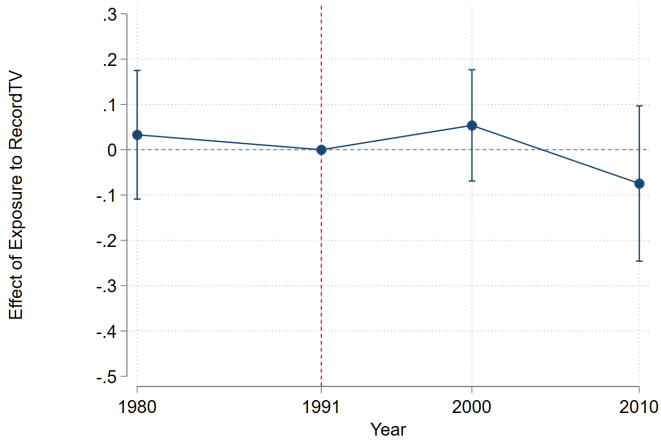
## Girls Education




▸ Table ▸ Pre-trend ▸ Other

# Main Results

## Boys Education

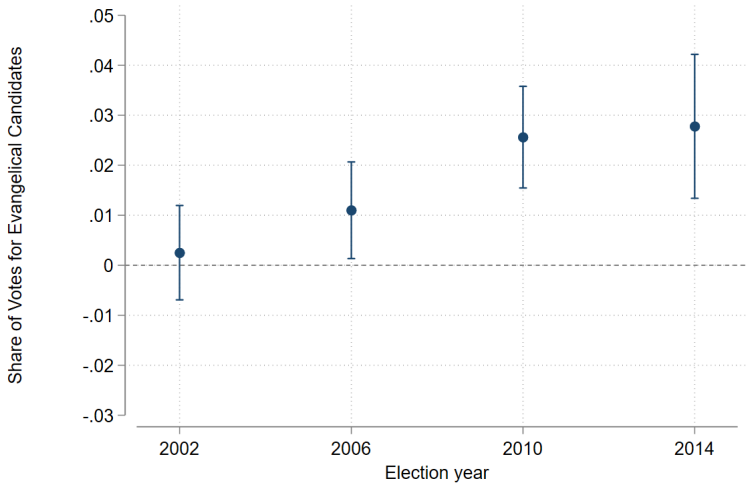


# Voting

- The Pentecostal church encourages followers to vote for their candidates
- Share of votes for religious-affiliated Congressman
  - Availability of information on religious affiliation
  - Candidates for Congress compete for votes in the entire state $\rightarrow$ exclude mechanical effect
- Lacerda (2017) hand-coded a list of Pentecostal candidates for the 2002, 2006, 2010, and 2014 elections
  - Religious references in candidacy names
  - Literature review matching candidates' names and churches
  - Online searches through prominent newspaper

# Results

## Voting



# Access to Other TV channels

## Main Result

| Dep. Var.: | Δ Share Pentecostals | Δ Number Children | Δ LFP Women | Δ LFP of Men | Δ Girls' Schooling | Δ Boys' Schooling | Δ Suicide Rate |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Panel A: 1991-2000** | | | | | | | |
| Signal RecordTV 1991 | .0074*** | .0015 | -.016*** | -.003 | -.0017 | -.0075 | -.098 |
| | (.002) | (.0015) | (.0039) | (.0028) | (.0049) | (.0047) | (.24) |
| Signal Globo 1991 | -.000039 | -.0062*** | -.0011 | -.0016 | -.0048 | .0011 | .19 |
| | (.0022) | (.0015) | (.0035) | (.0026) | (.0045) | (.0043) | (.2) |
| **Panel B: 1991-2010** | | | | | | | |
| Signal RecordTV 1991 | .015*** | .0047*** | -.014*** | .0027 | -.014** | -.007 | -.49* |
| | (.0032) | (.0017) | (.0045) | (.0038) | (.0057) | (.0057) | (.27) |
| Signal Globo 1991 | -.0017 | -.0066*** | -.0062 | -.0072** | -.0049 | -.0044 | .16 |
| | (.0033) | (.002) | (.0039) | (.0032) | (.0055) | (.0057) | (.22) |

**Notes:** Data sources: 1991 and 2000 Census, TSE, SIM/SUS, and ANATEL. Dependent variable are defined as: (1) Share of Pentecostals (2) female labor for participation, (3) male labor for participation (4) the average number of children had by 15-35 years-old women had between 1991 and 2000, (5) share of 15-18 years-old girls that finished at least middle school, (6) share of 15-18 years-old girls that finished at least middle school, (7) homicides per 100,000 inhabitants. Regressions are weighted by the 1991 population. Robust standard errors.level.

# Persuasion Rate

DellaVigna and Kaplan (2007)

Effect of the treatment on the relevant behavior, adjusting for exposure and population left to be convinced in the initial period :

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

- $y_T - y_C$: treatment effect ($\hat{\beta}_1$)
- $e_T - e_C$: effect of the coverage on viewership ($\hat{\gamma}_1$)
- $1 - y_0$: share of non-Pentecostals in 1991

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- $1 - y_0$: share of non-Pentecostals in 1991

Results: between 2.3%-8.5%

# Persuasion Rate

DellaVigna and Kaplan (2007)

$$\delta_{1991-2000} viewership_m = \beta \cdot Signal_m + u_m$$

Table: Caption

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# Expansion of RecordTV

- On limitation of the empirical strategy is lack of frequent data that allows us to better test for pre-trends
- We make use of
- After the change of ownership, RecordTV kept expanding
- Placement of transmitters is not random
- However, from year to year,

# Expansion of RecordTV

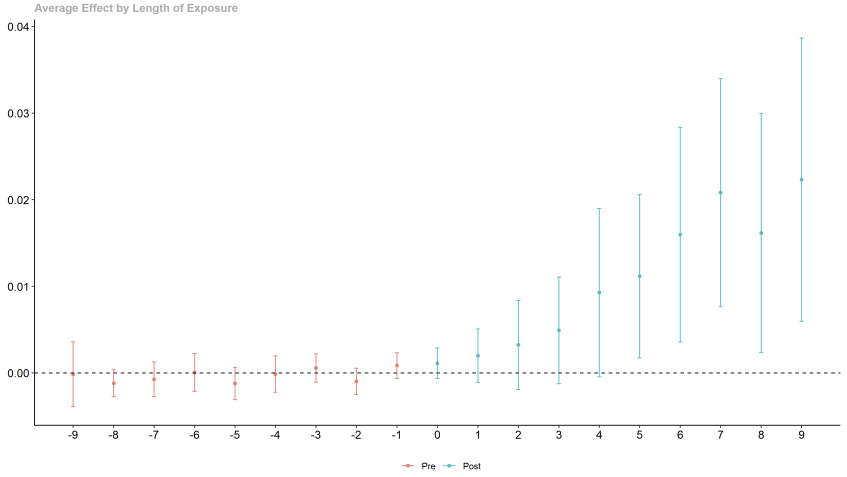
Sant'Anna and Callaway (2021)

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

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

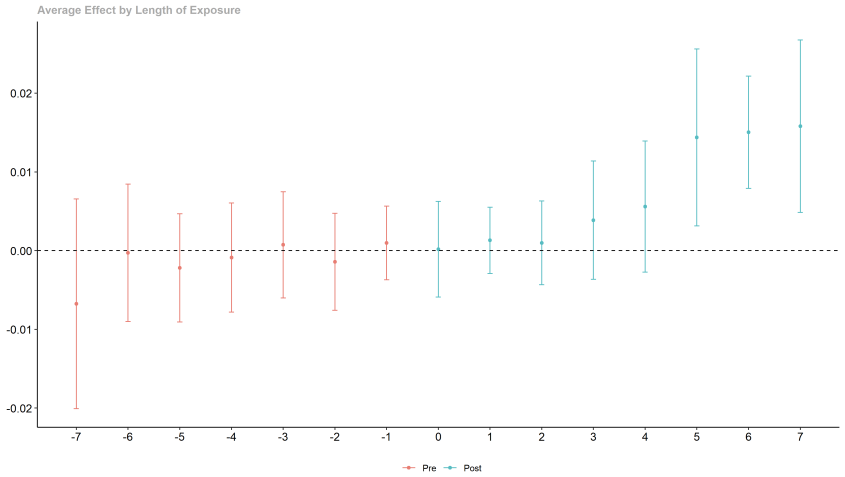
# Expansion of RecordTV

## Number of Pentecostal Churches per Capita



# Expansion of RecordTV

## Fertility



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# Conclusion

- Exposure to RecordTV increases adherence to the Pentecostal church
- Results suggest that the expansion of Pentecostalism lead to more conservative behaviors
- This paper emphasizes how the impact of technology is channeled through social norms and religious practices.
- 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.

Thank you!

Contact: marcela_mello_silva@brown.edu

# Main Outcomes: Pre

| Dep. Var.: | Δ Share of Pentecostals | Δ Number of Children | Δ LFP Women | Δ LFP Men | Δ Girls' Schooling | Δ Boys' Schooling | Δ Suicide Rate |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Panel A: 1980-1991** | | | | | | | |
| Signal RecordTV 1991 | .00042 | .0011 | -.006 | .004 | .00036 | -.00092 | -.099 |
| | (.0013) | (.0025) | (.005) | (.0027) | (.0043) | (.0041) | (.24) |
| Number of Obs | 3935 | 3935 | 3935 | 3935 | 3935 | 3935 | 3988 |
| Number of Clusters | 3935 | 3935 | 3935 | 3935 | 3935 | 3935 | 3988 |
| Propagation Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Munic. Controls Baseline | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State and MR FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean Dep. Var. Baseline | .03 | .17 | .41 | .88 | .26 | .2 | 3.5 |

**Notes:** Data sources: 1991 and 2000 Census, TSE, SIM/SUS, and ANATEL. Dependent variable are defined as: (1) Share of Pentecostals (2) female labor for participation, (3) male labor for participation (4) the average number of children had by 15-35 years-old women had between 1991 and 2000, (5) share of 15-18 years-old girls that finished at least middle school, (6) share of 15-18 years-old girls that finished at least middle school, (7) homicides per 100,000 inhabitants. Regressions are weighted by the 1991 population. Robust standard errors.level. *p<0.10,**p<0.05,***p<0.01

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# Sample Restrictions

| | (1) Pentecostal | (2) Female LFP | (3) Male LFP | (4) Gave Birth | (5) Girls' Schooling | (6) Boys' Schooling | (7) Suicide Rate | (8) Pentecostal Candidates |
|---|---|---|---|---|---|---|---|---|
| Benchmark | .0095*** | -.0092* | -.0053 | .027* | -.022*** | -.0096 | -.03 | .0054* |
| | (.0029) | (.0048) | (.0063) | (.016) | (.0069) | (.0088) | (.025) | (.0032) |
| State Capitals | .0091*** | -.011** | -.0071 | .025 | -.021*** | -.0074 | -.0087 | .0055* |
| | (.0029) | (.0047) | (.0063) | (.016) | (.0072) | (.0093) | (.023) | (.003) |
| State Capitals and Pop. > 1000K | .0089*** | -.011** | -.0072 | .026 | -.021*** | -.0072 | -.0079 | .006** |
| | (.003) | (.0047) | (.0063) | (.016) | (.0072) | (.0093) | (.023) | (.0028) |
| State Capitals and Pop. > 500K | .0087*** | -.0099** | -.0057 | .028* | -.021*** | -.0061 | -.013 | .0049* |
| | (.003) | (.0048) | (.0063) | (.016) | (.007) | (.0091) | (.022) | (.0026) |
| State Capitals and Pop. > 250K | .006** | -.0078 | -.01 | .029 | -.023*** | -.0026 | -.0032 | .0021 |
| | (.0027) | (.0052) | (.0064) | (.018) | (.0074) | (.0083) | (.017) | (.0028) |
| State Capitals and Pop. > 100K | .0035 | -.0061 | -.0061 | .038** | -.025*** | -.0053 | -.0017 | .0022 |
| | (.0027) | (.0058) | (.0069) | (.019) | (.0074) | (.0088) | (.011) | (.0019) |
| Transmitter | .0071** | -.0083 | -.0044 | .014 | -.022*** | -.0091 | -.028 | .007** |
| | (.0029) | (.0051) | (.0063) | (.017) | (.0074) | (.0095) | (.022) | (.0034) |
| Transmitter and Distance > 10km | .0077*** | -.0074 | -.0053 | .01 | -.02*** | -.0096 | -.029 | .0077** |
| | (.0027) | (.005) | (.0064) | (.018) | (.0074) | (.0095) | (.023) | (.0035) |
| Transmitter and Distance > 20km | .0071** | -.0051 | -.0069 | .0049 | -.019** | -.0094 | -.027 | .0077** |
| | (.0029) | (.005) | (.0065) | (.018) | (.008) | (.0095) | (.023) | (.0037) |
| Transmitter and Distance > 30km | .0068** | -.0041 | -.007 | .012 | -.019** | -.012 | -.036* | .0083** |
| | (.003) | (.0057) | (.0073) | (.02) | (.0079) | (.0098) | (.02) | (.0033) |

**Notes:** Data sources: 1991 and 2000 Census and ANATEL. *p<0.10,**p<0.05,***p<0.01

Table: Brazilian TV Channels (1950-1999)

| TV Channel | Year Established | Year Discontinued | Coverage |
|---|---|---|---|
| TV Tupi | 1950 | 1980 | Nationwide |
| RecordTV | 1953 | - | Nationwide |
| TV Continental | 1959 | 1970 | Nationwide |
| TV Excelsior | 1963 | 1970 | Nationwide |
| TV Itapoan | 1960 | - | Nationwide |
| TV Globo | 1965 | - | Nationwide |
| TV Bandeirantes | 1967 | - | Nationwide |
| SBT | 1981 | - | Nationwide |
| Rede Manchete | 1983 | 1999 | Nationwide |
| MTV Brasil | 1990 | - | Nationwide |

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# Pentecostal's values

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| Variable | Pentecostal Mean | Pentecostal SD | Catholic Mean | Catholic SD | P-C 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 |
| Entretainment (%) | .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).

# Interpretation

## Main Results

| Dep. Var.: | Δ Share of Pentecostals | | | | Δ Catholic | Δ Protestant |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Panel A: Medium term (1991-2000)** | | | | | | |
| Signal 1991 | -.0025 | .024*** | .019*** | .0077*** | -.011*** | .003*** |
| | (.0022) | (.0041) | (.0034) | (.0019) | (.0031) | (.0011) |
| **Panel B: Long term (1991-2010)** | | | | | | |
| Signal 1991 | -.0061** | .035*** | .026*** | .015*** | -.02*** | .0025** |
| | (.003) | (.0052) | (.0043) | (.0032) | (.0045) | (.0012) |
| Number of Obs | 3990 | 3990 | 3990 | 3989 | 3989 | 3989 |
| Propagation Controls | No | Yes | Yes | Yes | Yes | Yes |
| Baseline Controls | No | No | Yes | Yes | Yes | Yes |
| State FE | No | No | No | Yes | Yes | Yes |
| Mean Dep. Var. Baseline | .03 | .03 | .03 | .03 | .83 | .02 |

# Other Specifications

## Medium-term

| | Dependent Variables | | | | | | |
|---|---|---|---|---|---|---|---|
| Specification | Pentecostals | Fertility | FLPF | School Girls | MLPF | School Boys | Suicides |
| Signal | -.0025 | .0056*** | -.0065** | .019*** | .0056*** | .022*** | -.12 |
| | (.0022) | (.0014) | (.0031) | (.0063) | (.001) | (.0061) | (.077) |
| Signal FS | .02*** | -.0029 | -.0067 | -.024*** | -.0053* | -.019* | -.61*** |
| | (.0043) | (.002) | (.0053) | (.0088) | (.0027) | (.0099) | (.21) |
| Propagation | .024*** | .00018 | -.0093** | -.01 | -.00062 | -.0027 | -.46** |
| | (.0041) | (.0018) | (.0046) | (.0065) | (.0028) | (.0065) | (.19) |
| Controls | .019*** | .0012 | -.009** | .000011 | .0013 | .00064 | -.24 |
| | (.0034) | (.0017) | (.0037) | (.0068) | (.0028) | (.0068) | (.21) |
| MR FE | .0088*** | -.00074 | -.017*** | .0032 | -.0044* | .0016 | -.15 |
| | (.002) | (.0015) | (.0036) | (.0052) | (.0027) | (.005) | (.23) |
| State FE | .0077*** | .00057 | -.017*** | -.0024 | -.0033 | -.0071 | -.077 |
| | (.0019) | (.0015) | (.0039) | (.0048) | (.0028) | (.0047) | (.23) |
| Lagged outcome | .0077*** | .00071 | -.018*** | -.002 | -.0024 | -.0076 | -.11 |
| | (.0019) | (.0014) | (.004) | (.0048) | (.0028) | (.0047) | (.21) |

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# Other Specifications

## Long-term

| | Dependent Variables | | | | | | |
|---|---|---|---|---|---|---|---|
| Specification | Pentecostals | Fertility | FLPF | School Girls | MLPF | School Boys | Suicides |
| Signal | -.00093 | .012*** | .000028 | -.02** | .014*** | -.0045 | -.2** |
| | (.0034) | (.0019) | (.0048) | (.0097) | (.0018) | (.008) | (.095) |
| Signal FS | .03*** | -.0043 | -.015** | -.0068 | -.015*** | .0053 | -.42* |
| | (.0066) | (.0029) | (.0072) | (.012) | (.0041) | (.011) | (.25) |
| Propagation | .037*** | .00075 | -.01* | -.021** | -.0058 | .0044 | -.5** |
| | (.0062) | (.0026) | (.0061) | (.0095) | (.0041) | (.0088) | (.24) |
| Controls | .031*** | .003 | -.0063 | -.0024 | .0049 | .012 | -.3 |
| | (.0053) | (.0021) | (.0047) | (.0064) | (.0041) | (.0079) | (.24) |
| MR FE | .016*** | .0022 | -.012*** | -.011* | .0024 | -.0049 | -.27 |
| | (.0031) | (.0016) | (.0044) | (.0057) | (.004) | (.0061) | (.27) |
| State FE | .015*** | .0037** | -.015*** | -.015*** | .0018 | -.0078 | -.47* |
| | (.0032) | (.0017) | (.0045) | (.0057) | (.0038) | (.0058) | (.27) |
| Lagged outcome | .015*** | .004*** | -.017*** | -.015*** | .0033 | -.0084 | -.51** |
| | (.0032) | (.0014) | (.0044) | (.0054) | (.0037) | (.0056) | (.25) |

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# Characteristics by Coverage

| | Mean | Univariate | | State FE & Controls | |
|---|---|---|---|---|---|
| | (SD) | Coefficient | $R^2$ | Coefficient | $R^2$ |
| Population (log) | 4.912 | 0.200 | 0.010 | -0.345** | 0.652 |
| | (2.088) | (0.211) | | (0.159) | |
| Population Density | 1.341 | 0.267 | 0.015 | -0.159 | 0.735 |
| | (2.247) | (0.166) | | (0.130) | |
| Income per capita | 47,139.120 | 7,134.692*** | 0.059 | -1,702.973 | 0.701 |
| | (29,981.308) | (2,195.064) | | (3,158.080) | |
| Average Age | 26.010 | 1.391*** | 0.322 | 0.304 | 0.674 |
| | (2.504) | (0.184) | | (0.251) | |
| Share of White | 0.518 | 0.107*** | 0.192 | 0.025** | 0.864 |
| | (0.250) | (0.009) | | (0.011) | |
| Share of Women | 0.506 | 0.002* | 0.021 | -0.004*** | 0.454 |
| | (0.016) | (0.001) | | (0.001) | |
| Average Years Education | 4.139 | 0.470*** | 0.096 | -0.177 | 0.696 |
| | (1.546) | (0.119) | | (0.122) | |
| Share Urban Population | 0.746 | 0.054*** | 0.044 | 0.012 | 0.531 |
| | (0.262) | (0.014) | | (0.018) | |
| Share TV | 0.441 | 0.061*** | 0.089 | -0.015 | 0.711 |
| | (0.208) | (0.014) | | (0.017) | |
| Share Radio | 0.823 | 0.062*** | 0.210 | -0.005 | 0.777 |
| | (0.139) | (0.005) | | (0.006) | |
| Gini Index | 0.552 | -0.008* | 0.019 | -0.030*** | 0.219 |

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