

Stop Suffering: Economic Downturns and Pentecostal Upsurge

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April 2017

[PRELIMINARY AND INCOMPLETE]

Abstract

This work estimates the effect of downturns in local labor markets on Pentecostal growth in Brazil, in the period from 1991 to 2000. We observe how impoverishment in the form of expected earnings losses affects Pentecostal affiliation in local labor markets. In order to handle endogeneity in the relationship between local earnings and Pentecostal affiliation, we explore 1990's trade liberalization in Brazil, using tariff reductions as an instrument for earnings changes. We find that a 10 percentage decrease in expected earnings led approximately to 1.5 percent increase, on average, in the share of Pentecostal individuals in Brazilian micro-regions. Increasing Pentecostal share was accompanied by a decreasing Catholic share. We find no evidence corroborating the standard secularization hypothesis - changes in expected earnings had no impact on the share of religious population in general.

Key Words: Religion, Labor Market, Pentecostalism, Club Goods.

JEL Codes: Z12, O15, F16.

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1 Introduction

The debate over how income, as a facet of modernization, affects religiosity has been generally framed by the theory of secularization, which explains religion as an elaborate reflection of more basic realities and a painkiller for frustration, deprivation and suffering (Fink and Stark (2003)). The advocates of this thesis have ranked secularization together with urbanization, rationalization and bureaucratization as key historical factors that transformed agrarian societies (Inglehart and Norris (2004)). As one of the key components of modernity, secularization raised expectations that religions would fade away in increasingly urbanized and industrialized societies. Development would therefore necessarily lead to the “modern secular democratic state”, a common endpoint to different societies. Empirical observation, however, has identified numerous exceptions to the secularization story in context-specific situations and in complex historical processes. In fact, while religion seems to have its position diminished in advanced industrialized societies, various countries have experienced an increase in its populations holding religious values and practicing religious habits (Inglehart and Norris (2004)). The rise and fall of religiosity at different periods, in different societies, could be otherwise fueled by specific factors other than economic downturns. As Inglehart and Norris (2004) argue, the charisma of particular leaders or mobilization of faith-based movements might determine the upsurge of religiosity. The authors claim that the popularity of pentecostal evangelicalism in Latin America is an example of this phenomenon. In this sense, the answer to whether religiosity upsurge is a result of either economic downturns or idiosyncratic triggers is still empirically wide open.

In this paper we study whether economic downturns have led to an expansion of pentecostal evangelicalism in Brazil. The country experienced a substantial growth of pentecostal affiliates during the 1990s, amidst a decade of poor economic and labor market performance. Brazilian localities experienced an average increase of 70% in the number of Pentecostal affiliates per capita, while pentecostal churches have grown in number and political influence. More specifically, we develop a two-stage least squares estimation using the reduction of trade tariffs in the 1990s, during the process of economic liberalization, as a source of exogenous variation for labor market expected earnings. Tariff reduction was a top-down decision by the federal government at the time, following a regional trend towards economic opening. The most protected sectors experienced the greatest tariff reductions, signaling that specific sectors were not specially benefited by this trade reform. Variation in tariffs weighted by sectoral employment composition at the micro-region level is thus an arguably valid instrument for changes in labor market conditions over the 1990s

(Hirata and Soares (2015), Dix-Carneiro et al. (2016)).

We use census data to construct both dependent (the number of Pentecostals, Catholics and other religious affiliates per capita) and independent (labor market outcomes and other covariates) variables, for 1991 to 2000. Kume et al. (2003) provides us with tariff information. We obtain data from the Brazilian National Accounts to construct aggregated industries that match with information available for tariff changes. Information regarding Brazilian geography and comparable areas across years was obtained from Reis et al. (2011).

We find no statistically significant effect of changes in expected earnings on the number of religious individuals per capita in general. On the other hand, economic downturns lead to an increase in the number of Pentecostals per capita, and a decrease in the number of Catholics per capita. In addition, we find a consistent pattern of substitution effects between Pentecostal and Catholic affiliation across different sub-samples. Alternative specifications reveal that the results are robust to different measures of trade opening and that the results are not driven by selective migration. Reduced form estimates resemble two-stage estimates. This indicates that labor markets are the main channel through which tariff changes affect religious affiliation.

We also find evidence on heterogeneity by gender groups and age. Pentecostal affiliation among women responds relative more, on average, to economic downturns than among men. The main age sample (15 to 64 years) also responds relatively more than the 64-years-old-or-more. We find no statistically different effects by race (black vs white). These findings corroborate to some extent the theoretical predictions that different opportunity costs determine distinct religious practices. Finally, we find no effects of economic downturns on the supply of Pentecostal preachers per capita. This finding suggests that economic downturns have had a non-trivial role in the Pentecostal upsurge in Brazil, irrespectively of any supply side effects.

The empirical literature on the relationship between income and religious affiliation is dense at various fronts, particularly in sociology and other branches of social science. However, there is extremely scant causal evidence. In fact, despite the great number of existing studies on the topic, only recently scholars started to explore exogenous shocks in order to claim causal identification. Chen (2010) explores the exogenous shock provided by the Indonesian financial crisis, as a kind of economic distress, on religious intensity, namely, communal study of Koran and Islamic school attendance. The results suggest that economic distress significantly increases religious intensity, whereas those that suffer less significantly decrease religious intensity. Buser (2015) analyses how quasi-exogenous government cash transfers explain the consumption of religious goods in Ecuador. The author

uses a sample households from poor neighborhoods, and a RDD strategy to estimate the effects of cash transfers on religiosity among beneficiaries and non-beneficiaries. The results indicate that recipients attend more religious services than non-recipients. In this paper we contribute to the literature in different ways. We provide some clear causal evidence by exploring macro shocks due to trade opening, which connects for the first time labor market conditions and religious affiliation. In particular, we do it so in a context of Pentecostal upsurge. We document a shift within religious affiliations, from a decline in the number of Catholic affiliates towards an increase in the number of individuals within the most devoted religious denominations, Pentecostal Evangelicals. These denominations offer the greatest rewards to faith against frustration, deprivation and suffering.

The remainder of this paper is structured as follows. Section 2 provides a conceptual discussion and presents the context of the growth of Pentecostal Evangelicalism and the trade liberalization process in Brazil, during the 1990s. In Section 4, we describe our empirical strategy. Section 3 contains a description of the data and samples. Section 5 presents the results, and Section ?? concludes.

2 Conceptual Discussion and Empirical Context

2.1 Conceptual Discussion

The debate over how income, as a facet of modernization, determine religiosity dates back to earlier sociological literature. Since the 18th century, the study of the determinants of religiosity has been mostly framed by the theory of secularization, which explains religion as an elaborate reflection of basic realities and a painkiller for frustration, deprivation and suffering (Fink and Stark, 2003). In particular, secularization can be defined as a “decline in the the time, energy and resources which [individuals] devote to super-empirical concerns”, gradually leading to a “replacement of a specifically religious consciousness [...] by an empirical, rational, instrumental orientation” (Fink and Stark, 2003, p.97). As one of the key components of modernity, secularization raised expectations that religions would fade away in increasingly urbanized and industrialized societies.

Secularization ideas have been otherwise challenged empirically. They implicitly embody the idea that development would necessarily lead to the “modern secular democratic state”, a common endpoint to different societies. Empirical observation, however, has recognized numerous exceptions to that prediction. While religiosity seems to have diminished in

some advanced industrialized societies, it continues enduringly to persist both within and across countries. In fact, the rise and fall of religiosity at different times and in different societies can be fueled by triggers such as the charisma of particular leaders or the upsurge of context-specific faith movements. More generally, however, existential security might raise susceptibility to religious rhetoric (Inglehart and Norris, 2004). The core idea of human, or existential, security denotes freedom from various risks and dangers. Risks concerning environmental degradation, natural and manmade disasters, threat of epidemics, violation of human rights, humanitarian crisis and poverty would threaten human security. In this sense, regardless of the specific nature of the risks, the absence of existential security should be instrumental for religiosity no matter time or place.

Religiosity might be thus responsive to fluctuations in income and living conditions, and individuals might be particularly more susceptible to the influence of religious rhetoric in times of scarcity and risk. According to Inglehart and Norris (2004), all major religions assure that, if one follows the rules, a higher power will guarantee that things work out well – during the lifetime or the afterlife period (Azzi and Ehrenberg, 1975). Freud (1989) argues that in the face of danger and angst, individuals have the need to perceive a strong, benevolent and god-like authority, with whom they can bargain, and that can grant them safety. Under stressful situations, religion should truly bring relief to individuals because this benevolent figure could grant them hope.

Último passo: fazer o link com religiões “extremas”, em particular neo pentecostais. Citar crescimento no mundo.

2.2 Pentecostal Evangelicalism in Brazil

3 Data

In this section, we describe the data and present the descriptive statistics. Our main data sources are the Brazilian Demographic Censuses from 1980, 1991 and 2000. These are comprehensive demographic surveys sourced from the Brazilian Institute of Geography and Statistics (IBGE). The main feature of this data is to contain economic situation and religious affiliation for each individual. A second attraction is that it covers all income sources, including wages from informal jobs or rents. We aggregate the household data to the ‘microregion’ level. A microregion consists of cluster of counties grouped by IBGE according to the integration of their local economies. We use microregions boundaries which are consistent over time – Minimum Comparable Areas (MCA) as Reis et al. (2011).

The main dependent variables are the share of working age population in each religious denomination. We classify individuals as pentecostals if she, or he, belonged to one of the churches listed on Table A1, in the Appendix. We define working age population as those individuals with age between 15 and 64 years.

Our variable of interest is households' average expected earnings at the microregion level. This measure captures economic downturns via microregion average earnings net of individuals' characteristics. We calculate it using the individual-level regressions as Hirata and Soares (2015); Dix-Carneiro et al. (2016) for each census year. First, we regress individual log earnings on age, age squared, and dummies for gender, education (literate, basic education, high school, college and above) and microregion. The microregion dummies estimates capture the microregion log average earnings in the microregion that are not explained by these characteristics. Second, we regress a dummy if the individual has non-zero earnings on the same set of variables. Finally, we get the local log average expected earnings by multiplying the microregion-year-specific log earnings to the microregion-year specific non-zero earning estimate and taking its log.

We construct all controls using Census data. All individual-level exercises and aggregations use sample weights from the Census.

Our instrument is the microregion exposure to the early-90s tariff changes. We construct this exposition to tariff shock using the compilation of average nominal tariffs by sector of activity presented in Kume et al. (2003) and the IBGE's 1991 National Accounts. We use data from *Tabela de Recursos e Usos* (IBGE) for the year of 1991 to assess the value added by each sector and total labor earnings by sector. We get in Kume et al. (2003) the average tariffs faced by each sector. Yet, as the sectors compiled in Kume's (2003) differed from the census data, we concorded both sector definitions. Following Hirata and Soares (2015), we are left with 20 tradable sectors, plus a non-tradable sector.¹ With this new sectoral categories, we build the tariff of the new concordade sectors. Using the 1991 census data, we classify individuals employed in one of these sectors calculating the local exposition to the trade liberalization shock.

In section 2, we gave intuition on the differential consumption pattern of pentecostals and other christians. We used microdata from the Brazilian Household Expenditure Survey, conducted by IBGE.

¹The sectoral classification used in Kume et al. (2003) is the same used in the Census data and in *Tabela de Recursos e Usos*

3.1 Descriptive Statistics

Table 2 presents descriptive statistics of all the variables used in this work. It displays the mean and standard deviation in our main sample, for 1980, 1991 and 2000. Panel A presents the main variables. The main pattern that stands out is that the share of Pentecostal affiliates grew 79 percent between 1991 and 2000. This in a period when the share of religious people (individuals with some faith) shrank about 2.5 percent and Catholics fell about 9 percent. Looking at the twenty year trend, the share of Pentecostals went from 2.8 percent of the working age population in 1980 to 8.4 in 2000. While Pentecostals were growing three-fold in this period, the share of religious people fell more than 4.3 percentage points and the share of Catholics decreased 11.7 percentage points.

In Table A1 in the appendix, we present statistics by Pentecostal denomination. We see that every single denomination flourished between 1991 and 2000. We use a Herfindahl-Hirschman Index (HHI) to assess the concentration of Pentecostal denominations. We see that HHI dropped more than 10 percent, meaning lower ‘market’ concentration.

Panels B and C present the different control variables we use in our regression specifications. The bottom of the table, Panel D, presents the statistics of the average exposure to tariff reductions from 1990 to 1995. The mean exposure was small, about a 3.2 percent reduction in tariff. But, the variance of the shock is large, with standard deviation 3.8. The microregion most affected by the trade liberalization experienced a 14.5 percent reduction in trade tariffs. We explore such cross-sectional variation as a source of exogenous shock to local income and unrelated to local religiosity.

A brief look at the raw data corroborates the anecdotal evidence that impoverishment correlates with the surge in Pentecostal affiliation. In the following sections we aim to establish if one can make a causal claim about this relation.

4 Empirical Strategy

Our goal is to estimate the causal effect of economic downturns on Pentecostal affiliation. We, next, describe the empirical strategy used to elicit such relationship. Our baseline specification is the following first-difference equation:

$$\Delta ReligionShare_j = \alpha + \beta \Delta Earnings_j + W_j' \lambda + \varepsilon_j \quad (1)$$

where Δ means the change between 1991 and 2000, $ReligionShare_j$ is the share of a given religion in microregion j (e.g., pentecostals), $Earnings_j$ is the log average expected earnings in j (as described in the last section), W_j is a vector of controls and ε_j is the error term. The parameter of interest is β . It captures the average effect of changes of local expected earnings on the variation of the share of pentecostals in a microregion. In our preferred specification, the vector of controls includes baseline levels of: share of women in the workforce, share of white people in the workforce, quadratic polynomial of average age, share of workforce in five education categories, workforce size, income per capita, share of the workforce working in the manufacturing sector, state fixed effects and lagged dependent variable. This means that we are comparing microregions within states allowing for differential trends according to initial demographic, economic characteristics and pre-trends on the outcome of interest. We estimate heteroskedastic robust standard errors.

Even conditioning on all observables W_j , least squares estimates of (1) may not capture the causal relationship between earnings and the share of pentecostals if there are unobservables relevant for local earnings and religious choices. For example, some religious denomination may target opening new churches in impoverished areas. Other denominations may target expansion towards areas it expects the economy to develop faster. Following a longstanding literature since [Weber \(1904\)](#), religion might affect local income trajectory. Even political shocks, such as electing a mayor that is affiliated to one religious denomination, may also affect both religious conversion and the local economic status.

4.1 Instrumental variables

To overcome potential confounding factors, we adopt an instrument for local expected earnings. We follow the empirical strategy of [Hirata and Soares \(2015\)](#); [Dix-Carneiro et al. \(2016\)](#) and use the reduction in trade tariffs in the 1990s as our instrument. Our first stage regression equation is:

$$\Delta Earnings_j = \mu + \theta \Delta Tariff_j + W_j' \gamma + v_j \quad (2)$$

where the dependent variable $\Delta Earnings_j$ is the endogenous variable and $\Delta Tariff_j$ is the instrument, and W_j is the vector of controls as in equation (1). $\Delta Tariff_j$ is the microregion j exposure to the trade tariff changes between 1990-1995. Our identification assumption is that, conditional on the set of controls W_j , the change in trade tariffs affects local income but is uncorrelated with unobservables that influence religious choice ε_j . That is, trade tariffs affects religious choice only via local economic activity. In particular, by conditioning on

the size of manufacturing sector at baseline, we are comparing regions with similar size of tradable goods but where some tradable goods became more exposed to international competition (lower tariffs) than others. Hence, we are not comparing microregions with different degrees of industrialization, which could be related with religious choice (Weber, 1904).

We define the local tariff exposure as (Hirata and Soares, 2015; Dix-Carneiro et al., 2016):

$$\Delta Tariff_j = \sum_r \frac{L_{jr} \epsilon_{jr}}{\sum_{r \neq R} L_{jr} \epsilon_{jr}} [\ln(1 + Tariff_{r1995}) - \ln(1 + Tariff_{r1990})]. \quad (3)$$

The first term is the microregion j exposition to broad tariff change in sector r between 1990-1995. L_{jr} is the number of employed individuals in the sector r in the microregion j and ϵ_{jr} is the elasticity of the demand for labor. As Hirata and Soares (2015), $\epsilon_{jr} = \frac{\sigma_{jr}}{\theta_{jr}}$. The term σ_{jr} is the elasticity of substitution between inputs, and θ_{jr} is the share of capital in total capital cost. We assume certain features of the elasticity of substitution between inputs and share of capital cost. If technology is Cobb-Douglas, $\sigma_{jr} = 1$ and the share of capital cost will only vary across sectors, not across localities. Therefore, $\theta_r = (VA_r - LE_r) / (VA_r)$, where VA_r and LE_r are, respectively, the value added and the labor earnings in sector r . The value of θ_r is calculated with information from the National Accounts (IBGE), specifically the *Tabela de Usos e Recursos* for 1991.²

Table 2 Panel D present the descriptive statistics of $\Delta Tariff$. The mean microregion experienced a tariff reduction of -0.032 points, with standard deviation equal to 0.038 . Figure 1 show the correlation between the exposure to tariff change against the change in expected earnings between 1991 and 2000. The red line in the figure is the coefficient of our first-stage regression without any controls – as presented in Table 3 column 1.

Table 3 shows the results of the first-stage estimates. We see a positive correlation between the change in expected earnings and exposure to tariff change which is statistically significant at 1 percent. This same pattern holds when we control for 1991 levels' of demographic and economic characteristics in columns 2 and 3. Column 4 shows the results when we allow for state-specific trends, and column 5 presents the coefficients when we further control for the lag change of the dependent variable – between 1980 and 1991. In our preferred specification, the most flexible one which shown in column 5, the partial F-statistic of our first stage is equal to 16. This is above the usual thresholds of weak instruments' tests.

We run a placebo exercise in Table 3 column 6. We test if the exposure to the tariff changes

²Table A2 in appendix present the sector of activities and tariffs by year from based on Kume et al. (2003).

of the 1990s correlates with the trends in local expected earnings between 1980 and 1991. We find that the tariff changes are not correlated with the evolution of local earnings in the prior decade – partial F-statistic is equal to 0.3.³ This reassures us that our instrument is not capturing some spurious correlation with other local dynamics that could challenge its exclusion restriction.

5 Results

In this section, we present and discuss our main results. We show the causal impacts of local economic downturn on the evolution of the share of Pentecostals in the workforce, also secularization and other religions. We then investigate potential impacts on the market concentration of different Pentecostal denominations.

Table 4 presents the estimated effects of log expected earnings on the changes between 1991 and 2000 in the share of Pentecostals in each microregion as captured by β from equation (1). Panel A displays the OLS results. Panel B reports the 2SLS results instrumenting the change in log expected earnings by the local exposition to tariff variation – first-stage results are shown in Table 3. The OLS estimates in Panel A show that the evolution of the share of Pentecostals in each microregion correlates negatively with the local log expected earnings trends. In our preferred specification – Column (5) – we include baseline demographic and economic characteristics, state fixed effects and control for the lagged dependent variable. The magnitude of this correlation is very small and is not statistically significant in this specification.

The 2SLS estimates are shown in Table 4 Panel B. The magnitude of the coefficients increase relative to the OLS estimates in all specifications, and point estimates are all statistically significant at 5 percent confidence, at least. In our preferred specification, we find that a 10% decrease in expected earnings in a microregion leads to a 1.2% increase in the share of Pentecostals in the workforce in that microregion between 1991 and 2000. This is a first piece of evidence that economic distress intensifies the religiosity of the population, here captured by the conversion to a more demanding strict religion. This finding is in line with the mechanism suggested by [Chen \(2010\)](#).

In Table 5, in order to understand this conversion to Pentecostals religions, we investigate

³In Table 3 column 5, we control for the lagged local expected earnings to account for differential pre-trends. Comparing columns 4 and 5 we see that the F-statistic of our instrument changes marginally when we control for pre-trends. This also suggests that pre-trends are not correlated with exposure to the tariff shock.

how economic condition affect the evolution of other religions and atheism. This table presents only the 2SLS estimates. We assess the secularization hypothesis in Panel A by looking at the share of the workforce who declared to have no religion. Point estimates are positive but not statistically different from zero – except the specification without controls. This result should not come as a surprise. The Brazilian population is very religious, with less than 3.5% declaring to be atheists in the 1991 Census. The share of non-religious is even smaller among the poorer population, which is more exposed to economic distress – from all atheists only about 17% have income below the median earnings. Thus, not only the initial margin of atheists is small, but also it is particularly narrow among the most exposed section of population.

Panels B to D in Table 5 show the impact of economic downturn on the size of other religions. We find that changes in the local expected earnings affect the share of Catholics (Panel B) and Traditional Protestants (Panel C) in the opposite direction than the size of Pentecostals. Results in Table 4 and Table 5 Panel B suggest that economic downturn leads to a substitution between Pentecostal and Catholic affiliation. In our most flexible specification, we estimate that a 10% decrease in expected earnings cause a 1% decrease in the share of Catholics in a microregion. This is almost a one-to-one conversion from Catholic to Pentecostals. Yet, the impact of earnings on the fraction of Catholics is statistically significant in all but our main specification. In Panel C, we do not have information on Traditional Protestants for 1980, forbidding us to control for pre-trends. Looking at column 4, we find that a 10% reduction in expected earnings reduce the share of Traditional Protestants by 0.3%. This result is significant at 10 percent. In Panel D, we find economic distress have no impact on the share of all non-Christian religions.

Brazilian Catholic tradition may help explain the substitution between Catholic (and Traditional Protestants in a smaller extend) and Pentecostal Evangelical affiliations. In the 1980 Census, almost 92% of the population self-declared Catholic, see Table 2. A former Catholic looking for a new faith to renew his hope and adhere could find it easier to convert to another Christian religion. Hence, the most natural way to intensify your religiosity may be to look for other Christian religions than to convert into other non-Christian denomination with a different theological background.

Furthermore, this conversion is aligned with the idea that religion has its club goods component – see Iyer (2016) for a review. Iannaccone (1992) shows that it is efficient for sectschurches to impose strict behavioral norms and time intensive practices to its members in order to improve screening and to strengthen the group. Chen (2010) finds that during the 1997-1998 financial crisis in Indonesia, those most impacted by the crisis increased their religious

intensity as measured by the study of the Koran. He highlights that one important component of increased demand for religiosity was the social insurance dimension of religious sects thought as clubs. Among the Christian religions, the new Pentecostal denominations promise the relief from one's problems, to cease the suffering, at the expense of joining a more regulated and enforced religious practice. A deterioration of local economic conditions increase the value of the social insurance and networks provided by the Pentecostal churches. In this sense, our findings corroborate the lessons from [Chen \(2010\)](#) in a different religious background (Christianity vs Islamic) and a more comprehensive scale.

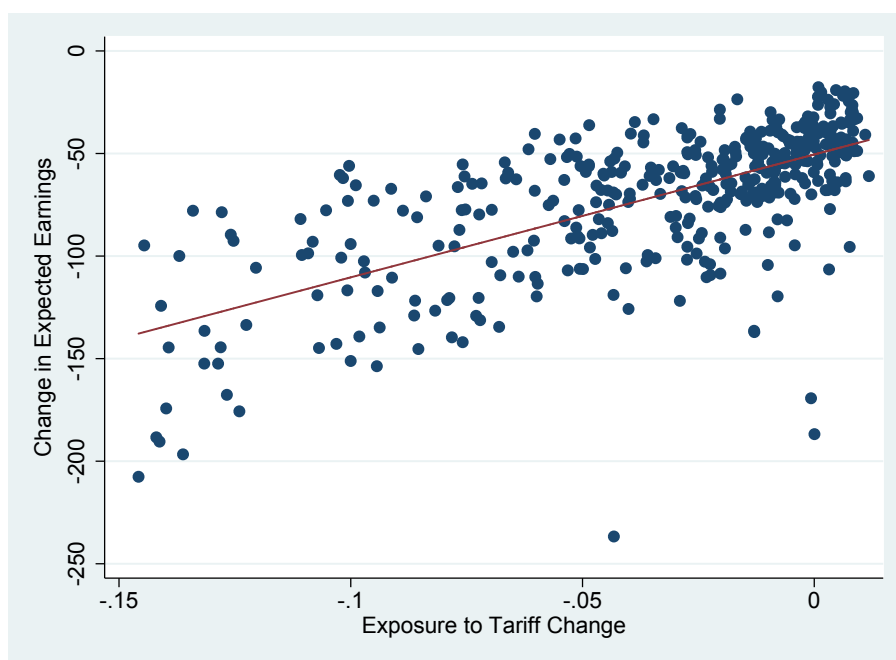
At last, we assess how economic distress affect the size distribution of different Pentecostal denominations. According to these club models, if bad economic outcomes make people seek social insurance in stronger networks. In this case, one should expect that the larger denominations – with larger networks – would grow more relative smaller ones – with smaller networks. We can follow nine denominations over time in the data, so we aggregate the remains ones in an 'Others' category. As an overall trend, we see that the average share of 'Other Pentecostals' among Pentecostals religious felt from about 45% to only 10% between 1991 and 2000 – see [Table A1](#) in Appendix. In [Table 6](#) column 1, we find that while no Pentecostal denomination shrank as a share of the workforce because of economic distress, the estimated effect is not homogeneous across denominations. The two churches that grew more (as a share of the workforce) with economic the downturn were *Assembléia de Deus* and Universal Church of the Kingdom of God (UCKG).⁴ [Table 6](#) column 2 shows the estimated impact of expected earnings in the share of each denomination among all Pentecostals. The most affected category is precisely 'Other Pentecostals'. Our estimates point that a 10% reduction in expected earnings (economic distress) reduced the share of smaller Pentecostal denominations by 7.2 percentage points, increasing the market concentration of the largest denominations. We create a Herfindahl-Hirschman Index (HHI) to capture "market concentration" among Pentecostals. [Table 6](#) column 3 show the result of expected earning on the market concentration of the Pentecostals denominations as measured by the HHI. The point estimate is negative, but not significant at conventional levels – the p-value is 12.6. Interpreting the point estimate, it would also pose that economic downturn increase market concentration among of Pentecostal religions.

⁴These are big and particularly influent churches. Recently, a bishop from UCKG was elected Mayor of Rio de Janeiro – the second largest city in the country.

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Figure 1: First Stage – Exposure to Tariff Change vs Change in Expected Earnings 1991-2000



This graph presents scatter plots of microregion-level change in expected earnings 1991-2000 ($\Delta Earnings_j$) against the instrumental variable exposure to tariff change ($\Delta Tariff_j$). The lines depict the results of simple regressions of $\Delta Earnings_j$ on $\Delta Tariff_j$ (coefficient 599, robust s.e. 41.4 and t-statistic 14.5).

Table 1: Differential Consumption Pattern Between Catholics and Pentecostals

	Dep. Var: Share of expenditures in each category			
	Sin goods	Luxury goods	Donations	Frivolous goods
	(1)	(2)	(3)	(4)
Pentecostal	-0.067 (0.016)***	-0.022 (0.005)***	0.023 (0.004)***	-0.089 (0.017)***
R-squared	0.015	0.052	0.010	0.038

This table presents the results of OLS regressions of shares of different types of expenditures on religion dummies. Unit of observation is an individual in the Brazilian Household Expenditure Survey (POF/IBGE) 2002/2003. *Sin goods* include XXX; *Luxury goods* include XXX; *Donations* are donations to XXX; *Frivolous goods* include XXX. Sample all individuals who self-declared a catholic or pentecostal; N=97,166. We present estimates of α from the following regression $y_{is} = c + \alpha Pentecostal_{is} + \gamma_s + \delta X_{is} + \varepsilon_{is}$, where Y_{is} is the expenditure share, $Pentecostal_{is}$ is a dummy equal to one if the individual is a pentecostal, γ_s are state fixed effects. All regressions include the following controls X_{is} : log of individual income, race dummy, gender dummy, dummies for years of study, age and age squared, urban dummy and a state fixed effects. Sample weights were used in the estimations. Robust standard errors. *** p < .01, ** p < .05, * p < .1

Table 2: Descriptive Statistics at the Microregion level

Variable	1980		1991		2000	
	Mean (1)	Std. Dev. (2)	Mean (3)	Std. Dev. (4)	Mean (5)	Std. Dev. (6)
Panel A. Religion and Expected Earnings						
Pentecostal (%)	2.78	2.31	4.71	3.07	8.43	4.63
Catholic (%)	91.78	6.13	87.66	7.89	80.1	10.27
Religious (%)	98.64	1.59	96.56	3.34	94.29	4.2
Expected Earnings	179.06	67.05	112.93	47.3	42.71	16.17
Panel B. Demography controls						
Age	32.71	0.85	33.26	0.97	33.96	1.22
Urban (%)	0.56	0.21	0.6	0.2	0.66	0.18
Woman (%)	0.5	0.02	0.5	0.02	0.5	0.01
Non white (%)	0.49	0.26	0.52	0.25	0.49	0.22
Primary school (%)	0.36	0.13	0.24	0.07	0.18	0.04
Elementary school (%)	0.11	0.05	0.29	0.05	0.44	0.05
High school (%)	0.04	0.03	0.09	0.04	0.2	0.07
College/University (%)	0.01	0.01	0.03	0.02	0.05	0.04
Panel C. Economic controls						
Log workforce	9.91	1.01	11.52	1.05	11.72	1.05
Share workforce in Manufacture (%)	0.1	0.07	0.06	0.05	0.06	0.04
Income per Capita						
Panel D. Tariff change (instrument)						
	Mean	sd	Min	Max		
Δ Tariff (1990-1995)	-0.032	0.038	-0.145	0.011		

This table displays descriptive statistics in 1980, 1991 and 2000, averaged at the microregion level. Columns 1, 3 and 5 present the means and Columns 2, 4 and 6 the standard deviation. Unless otherwise indicated, figures are shares of the total workforce.

Table 3: First Stage – Δ Log Expected Earnings

	Dep. Var.: Δ Log Expected Earnings Δ 1991-2000					PLACEBO Δ 1980-1991
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Tariff	599*** (41.43)	426.9*** (65.4)	204.2** (90.76)	205.9*** (54.68)	215.3*** (53.8)	35.88 (66.41)
Partial F-stat.	209	42.6	5.1	14.2	16	.3
Demographic Controls		Y	Y	Y	Y	Y
Economic Controls			Y	Y	Y	Y
State Fixed Effects				Y	Y	Y
Lag Dep. Var.					Y	

This table displays estimated effects of local exposure to tariff changes on changes in log expected earnings as captured by θ from equation (2). Columns 1 to 5 present changes between 1991 and 2000, our main specification. Column 6 presents results of our *placebo* exercise, with changes in log expected earnings between 1980 and 1991 regressed on 1991-2000 tariff changes. We explain how we create expected earnings in Section 3. Panel A present OLS estimates. Panel B presents 2SLS estimates instrumenting expected earnings with the local exposure to tariff change, detailed in section 4. Each column corresponds to a different regression with specification indicated. All regressions include a constant. Demographic controls include: share of women in the workforce, share of white in the workforce, quadratic polynomial of average age, and share of workforce in five education categories. Economic controls include baseline levels of workforce, income per capita and share of the workforce working in the manufacturing sector. Regressions in column (4) include state fixed effects and in column (5) include the lag of the dependent variable for the period 1980-1991. The unit of observation is a microregion according to Reis et al. (2007); N=412. Robust standard errors. *** $p < .01$, ** $p < .05$, * $p < .1$.

Table 4: Main Results – Δ Share Pentecostals

	Dep. Var.: Δ Share Pentecostals Δ 1991-2000				
	(1)	(2)	(3)	(4)	(5)
Panel A. OLS					
Δ Log Expected Earnings	-.0291*** (.0028)	-.0216*** (.0048)	-.0224*** (.0059)	-.0072 (.0079)	-.0075 (.0081)
Panel B. 2SLS					
Δ Log Expected Earnings	-.0365*** (.0041)	-.0549*** (.0108)	-.1397** (.065)	-.1246*** (.045)	-.1204*** (.0436)
Demographic Controls		Y	Y	Y	Y
Economic Controls			Y	Y	Y
State Fixed Effects				Y	Y
Lag Dep. Var.					Y

This table displays the estimated effects of log expected earnings on the changes between 1991 and 2000 in the share of pentecostals in each microregion as captured by β from equation (1). We explain how we create expected earnings in Section 3. Panel A present OLS estimates. Panel B presents 2SLS estimates instrumenting expected earnings with the local exposure to tariff change, detailed in section 4. Each column corresponds to a different regression with specification indicated. All regressions include a constant. Demographic controls include: share of women in the workforce, share of white in the workforce, quadratic polynomial of average age, and share of workforce in five education categories. Economic controls include baseline levels of workforce, income per capita and share of the workforce working in the manufacturing sector. Regressions in column (4) include state fixed effects and in column (5) include the lag of the dependent variable for the period 1980-1991. The unit of observation is a microregion according to Reis et al. (2007); N=412. Robust standard errors. *** $p < .01$, ** $p < .05$, * $p < .1$.

Table 5: 2SLS Results – Other Religions

	2SLS – Δ 1991-2000				
	(1)	(2)	(3)	(4)	(5)
Panel A. Dep. Var.: Δ Share Religious					
Δ Log Expected Earnings	-.008*	.0166	.0096	.0136	.0125
	(.0046)	(.0151)	(.0481)	(.0535)	(.0521)
Panel B. Dep. Var.: Δ Share Catholic (Non-Pentecostal)					
Δ Log Expected Earnings	.0454***	.0653***	.187*	.1575*	.1009
	(.0085)	(.0222)	(.1091)	(.0834)	(.0746)
Panel C. Dep. Var.: Δ Share Traditional Protestants					
Δ Log Expected Earnings	-.0024	.0149**	-.0053	.0332*	
	(.0027)	(.0063)	(.0199)	(.0185)	
Panel D. Dep. Var.: Δ Share Other Religions (Non-Catholic or Pentecostals)					
Δ Log Expected Earnings	-.0169***	.0062	-.0377	-.0192	-.0208
	(.0035)	(.0069)	(.0274)	(.0221)	(.0215)
Demographic Controls		Y	Y	Y	Y
Economic Controls			Y	Y	Y
State Fixed Effects				Y	Y
Lag Dep. Var.					Y

This table displays estimated effects of log expected earnings on the changes between 1991 and 2000 in the share of people with some religion (Panel A), catholics non-pentecostals (Panel B), traditional protestants (Panel C) and other religions (Panel D) as captured by β from equation (1). Regressions estimated using 2SLS instrumenting expected earnings with the local exposure to tariff change. We explain how we create expected earnings in Section 5.1. Each column corresponds to a different regression with specification indicated. All regressions include a constant. Demographic controls include: share of women in the workforce, share of white in the workforce, quadratic polynomial of average age, and share of workforce in five education categories. Economic controls include baseline levels of workforce, income per capita and share of the workforce working in the manufacturing sector. Regressions in column (4) include state fixed effects and in column (5) include the lag of the dependent variable for the period 1980-1991. The unit of observation is a microregion according to Reis et al. (2007); N=412. Robust standard errors. *** $p < .01$, ** $p < .05$, * $p < .1$.

Table 6: Pentecostal Composition – 2SLS Results By Denomination

	Dep. Var.:		
	Share of workforce (1)	Share of Pentecostals (2)	Concentration Index (HHI) (3)
IURD (UCKG)	-.0268*** (.0095)	-.0722 (.0719)	
Assembleia de Deus	-.1198** (.0463)	-.4016 (.2609)	
Congregação Cristã	-.0046 (.0095)	-.3319** (.1486)	
Brasil para Cristo	-.0084** (.0042)	-.0784** (.0358)	
Evangelho Quadrangular	.0111 (.0123)	.1891* (.0963)	
Casa da Bênção	.0018 (.0029)	.0126 (.0364)	
Casa da Oração	-.0019 (.0014)	-.0096 (.0122)	
Deus é Amor	-.0114** (.0044)	.0111 (.0497)	
Maranata	-.0061 (.0073)	-.0438 (.0359)	
Other Pentecostals	.0413 (.0261)	.7247** (.3455)	
HH Index			-.0031 (.002)
Demographic Controls	Y	Y	Y
Economic Controls	Y	Y	Y
State Fixed Effects	Y	Y	Y

IURD (Universal Church of the Kingdom of God), Brasil para Cristo (Evangélica Pentecostal O Brasil para Cristo). This table displays estimated effects of log expected earnings on the changes between 1991 and 2000 in the share of people with some religion (Panel A), catholics non-pentecostals (Panel B), traditional protestants (Panel C) and other religions (Panel D) as captured by β from equation (1). Regressions estimated using 2SLS instrumenting expected earnings with the local exposure to tariff change. We explain how we create expected earnings in Section 3. Panel A present OLS estimates. Panel B presents 2SLS estimates instrumenting expected earnings with the local exposure to tariff change, detailed in section 4. Each column corresponds to a different regression with specification indicated. All regressions include a constant. Demographic controls include: share of women in the workforce, share of white in the workforce, quadratic polynomial of average age, and share of workforce in five education categories. Economic controls include baseline levels of workforce, income per capita and share of the workforce working in the manufacturing sector. Regressions in column (4) include state fixed effects and in column (5) include the lag of the dependent variable for the period 1980-1991. The unit of observation is a microregion according to Reis et al. (2007); N=412. Robust standard errors. *** $p < .01$, ** $p < .05$, * $p < .1$.

A Appendix

Table A1: Pentecostal Composition – Descriptive Statistics

	Share of Workforce (%)	
	1991 (1)	2000 (2)
IURD (UCKG)	.0574 (.1377)	.6482 (.5571)
Assembleia de Deus	1.381 (1.157)	4.279 (3.207)
Congregação Cristã	1.074 (1.395)	1.438 (1.764)
Brasil para Cristo	.0302 (.074)	.0943 (.2148)
Evangelho Quadrangular	.138 (.2644)	.5684 (.8041)
Casa da Bênção	.0119 (.0399)	.0573 (.1426)
Casa da Oração	.0084 (.0677)	.0349 (.125)
Deus é Amor	.0979 (.1291)	.372 (.3356)
Maranata	.0416 (.1633)	.1324 (.4398)
Other Pentecostals	2.107 (1.977)	.8085 (.7383)
HH Index	.4264 (.157)	.4044 (.184)

This table displays the mean and standard deviation (in parentheses) of the shares of pentecostals denominations in Brazil in 1991 (column 1) and 2000 (column 2). Unit of observation is each 413 microregions.

Table A2: Sector of activities and tariff – 1990, 1995 and 1998

Sector	Nominal Tariffs			Weighted Tariffs			Weight in the Aggregated Sector in 1990	Aggregated Sectors	Theta	1991 Census Classification
	1990	1995	1998	1990	1995	1998				
Agriculture	5.9	7.4	9,9	5.9	7.4	9.9	1	Agriculture	0.84	11-37, 41, 42, 581
Mineral extraction	9.6	2.8	6,4	9.6	2.8	6.4	1	Mineral extraction	0.84	50, 53-59
Oil and coal extraction	3.3	0	0	3.3	0	0	1	Oil and coal extraction	0.73	51, 52
Non-metallic minerals	31.5	10.2	13,6	31.5	10.2	13.6	1	Non-metallic minerals	0.90	100
Metals	14.5	7.1	10,2	24.7	11.5	14.6	0.35	Metals	0.81	110
Non-metallic manufacturing	17.6	8.9	11,7	24.7	11.5	14.6	0.17	Metals	0.81	110
Other non-metallic manufacturing	34.8	15.8	18,9	24.7	11.5	14.6	0.48	Metals	0.81	110
Machinery and equipment	37.2	16.5	17,7	37.2	16.5	17.7	1	Machinery and equipment	0.48	120
Electric materials	44.1	21.3	19,5	42.1	20.2	18.3	0.45	Electric material and equipment	0.64	130
Electronic equipment	40.6	19.3	17,4	42.1	20.2	18.3	0.55	Electric material and equipment	0.64	130
Automobile and transportation	78.7	41	38,1	61.9	31.6	30.1	0.60	Vehicles and vehicles parts	0.76	140
Vehicle parts and other vehicles	37.4	17.9	18,5	61.9	31.6	30.1	0.40	Vehicles and vehicles parts	0.76	140
Wood and furniture	25.4	10.7	14	25.4	10.7	14	1	Wood and furniture	0.55	150, 151, 160
Paper, publishing and printing	23.6	9.8	14,2	23.6	9.8	14.2	1	Paper, publishing and printing	0.68	170, 290
Rubber	46.6	12.6	14,8	46.6	12.6	14.8	1	Rubber	0.68	180
Chemicals	24.8	7.6	21,1	23	7.6	15.2	0.42	Chemicals	0.67	200
Petroleum refining	19.4	3.8	5,4	19.4	3.8	5.4	1	Petroleum refining	0.79	201, 202, 352, 477
Other chemicals	21.8	7.6	10,9	23	7.6	15.2	0.58	Chemicals	0.67	200
Pharma and perfume	31.5	8	10,8	31.5	8	10.8	1	Pharma and perfume	0.67	210, 220
Plastic	39	15.3	18,2	39	15.3	18.2	1	Plastic	0.70	230
Textile	31.8	14.9	19,4	31.8	14.9	19.4	1	Textile	0.71	240, 241
Apparel	51.1	19.8	22,8	51.1	19.8	22.8	1	Apparel	0.75	250
Footwear	29.6	17.9	17,2	29.6	17.9	17.2	1	Footwear	0.64	190, 251
Coffee	28.9	10	15	27.63	12	15.9	0.14	Food processing	0.71	260, 261, 270, 280
Vegetables	34.6	12.1	14,8	27.63	12	15.9	0.07	Food processing	0.71	260, 261, 270, 280
Animal slaughter	19.7	8.4	12,2	27.63	12	15.9	0.32	Food processing	0.71	260, 261, 270, 280
Dairy	32.7	18.1	23	27.63	12	15.9	0.18	Food processing	0.71	260, 261, 270, 280
Sugar	25.7	16	19	27.63	12	15.9	0.09	Food processing	0.71	260, 261, 270, 280
Vegetable oils	16.6	8.3	11,5	27.63	12	15.9	0.08	Food processing	0.71	260, 261, 270, 280
Other food processing	45	14.6	17,9	27.63	12	15.9	0.12	Food processing	0.71	260, 261, 270, 280
Other manufacturing	41.6	13.5	16,4	41.6	13.5	16.4	1	Other manufacturing	0.72	300

Nominal tariffs per year (Kume et al, 2003), tariffs weighted by their respective sector's weight in the aggregated sector classification. The aggregated sector's weight and Theta (share of capital in total cost) were obtained using IBGE's *Tabela de Usos e Recursos* for the year of 1990. In this table we have also provided how we classified individuals accordingly to their sector of activity in the 1991's Census (IBGE).