

The Growth of Protestantism in Brazil and its Impact on Income, 1970-2000

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Introduction

Protestantism has expanded rapidly in Brazil in recent decades resulting in a substantial religious transformation in a country in which, not long ago, nearly all citizens were at least nominally Catholic. The churches that have grown the fastest have Pentecostal or neo-Pentecostal roots, such as the Assemblies of God or the Universal Church of the Kingdom of God. When the vibrancy and impact of these Churches are discussed in the popular press, reference is often made to former drunks who, after converting to Pentecostalism, have transformed their lives for the better. A typical description is found in a story filed by Reuters reporter, Todd Benson, shortly before the Pope's visit to Brazil in 2007:

“For years, Ronaldo da Silva's daily routine consisted of drinking himself into a stupor until he passed out on a sidewalk. Now he spends his days praying and singing with hundreds of fellow Christians at the Universal Church of the Kingdom of God in Carapicuiba, a sprawling shantytown on the outskirts of Sao Paulo where Pentecostal congregations are found on just about every block.

‘I'd probably be dead or in jail if it weren't for this church,’ said da Silva, a 38-year-old former Catholic who claims God cured him of epilepsy and helped him straighten out his life when he converted to Pentecostalism a decade ago.

Conversions like da Silva's are increasingly common all over Brazil, where a boom in evangelical Protestantism is steadily chipping away at the supremacy of the Roman Catholic Church.”

In this paper, we seek to assess whether the increase of Protestantism in Brazil has led to an increase in male income. If the type of experience described above is indeed widespread, we might expect to find an impact of Protestantism among the least fortunate segments of the population most afflicted by alcohol dependency, binge drinking, and drugs. But if conversion to Protestantism is especially likely to occur among those in the worst circumstances and who have a history of problematic behavior, it might well be that even after conversion Protestants might be no better off than other members of the population even though their personal lot had improved considerably. We tackle this problem of selectivity using microdata from the Brazilian censuses of 1970, 1980, 1991, and 2000, and analyzing the association between Protestantism and income at the group rather than the individual level.

Background

Protestantism in Brazil:

Protestant missionary activity began in Brazil in the mid-nineteenth century. Missionaries founded schools, hospitals, radio stations, printing presses, and clinics, yet made few converts until the second half of the 20th century (Ferriera 1959; Belloti 2000; Chestnut 1997). The number of Protestants also increased through immigration, particularly German immigration to southern Brazil. Yet, even today these mission/mainline Protestant denominations (Lutheran, Presbyterian, Anglican, and Baptist)¹ make up only about 4% of the population (Instituto Barsoileiro de Geografia e Estatística 2002).

The majority of Protestants in Brazil are Pentecostal. Pentecostals first came to Brazil in the early 20th century, but in the second half of the 20th century spread rapidly – particularly among the poor and in urban areas. Most Pentecostals are part of Brazilian initiated and controlled denominations and churches and have less connection with foreign missionaries. Leadership in Pentecostal churches typically requires less formal education and leaders are often recruited from the local community. Moreover, and highly

¹ Both the “mainline” and “mission” label can be misleading. “Mainline” can be misleading because the word comes from the United States and often has the connotation to being theologically liberal, whereas many of the “mainline” Protestants in Brazil are theologically conservative. “Mission” can be misleading since a significant portion of these Protestants are immigrants (particularly German Lutherans), and all these denominations are now firmly under indigenous leadership.

participatory services focusing on spiritual gifts are easily accessible and relevant to the felt needs of ordinary people (Vingren 1987; Chestnut 1997; Mariano 2004). According to the 2000 Brazilian census, 11.7% of the population now consider themselves Pentecostal.

Both mainline/mission and Pentecostal denominations are Protestant and both have traditionally emphasized abstaining from alcohol and drugs (or at most moderate use of alcohol), avoidance of sex outside of marriage, commitment to family, modesty in dress, avoidance of corruption, etc., (e.g., Chestnut 1997). Many Pentecostal groups are even more restrictive on the use of alcohol than other Protestants.

However, there are also significant differences between Pentecostal and non-Pentecostal Protestants. Non-Pentecostal Protestants in Brazil typically base religious authority primarily on the Bible and have a formally educated clergy (formal education is required for ordination). Thus, non-Pentecostal Protestants have traditionally put a strong emphasis in both literacy and formal education and are disproportionately educated for their class backgrounds (Chestnut 1997).

On the other hand, Pentecostals base religious authority both on the Bible and on the gifts of the Holy Spirit. Pastoral leadership is based more on perceived spiritual gifting and less on formal education or academic degrees than for non-Pentecostals. This enables Pentecostals to reproduce leaders quickly and keeps leadership closer to the conditions and understanding of marginalized congregants, but it may minimize the impact of Pentecostalism on educational outcomes relative to non-Pentecostal Protestantism. While Biblical literacy is important to Pentecostals, formal education may not be emphasized as much (Garrard-Burnett and Stoll 1993; Noll 2002). In recent years Pentecostals have founded schools all around Brazil (particularly elementary schools), however it is still not clear whether Pentecostals will have as important an influence on education as non-Pentecostal Protestants have.

Within Pentecostalism there are several distinct families of denominations/churches and a bewildering array of denominations. However, for our purposes the most important distinction is between

“traditional” Pentecostals and “neo-Pentecostals” (Cox 1995).² Neo-Pentecostals are also often called “Word of Faith” Pentecostals (by insiders) or “Health and Wealth” Pentecostals (by outsiders). Neo-Pentecostal theology emphasizes that God materially blesses those who have faith and serve him well. One common teaching is that if people want to become rich, they should give “seed money” to their local church. God will see this seed and bless contributors with a far greater financial harvest. In this context public displays of wealth are acceptable, even by pastors, since it reflects God’s material blessing not a lack of spirituality. One of the fastest growing (and most notorious) neo-Pentecostal denominations in the world is the Universal Church of the Kingdom of God (IURD) established in Rio de Janeiro in 1977. It now owns a TV station, has churches across Brazil, and has established branches in many other Latin American countries and Portuguese speaking regions of Africa (Mariano 2004; Freston 2001).

While both Protestant and Catholic clergy decry violence, premarital pregnancy, and abuse of drugs and alcohol, ethnographic evidence suggest that Pentecostals are more successful than the Catholic Church at recruiting young people and convincing them to make a more radical break from dominant cultural patterns with respect to alcohol use and sexual behavior (e.g., Burdick 1996).³ Unfortunately, there is less ethnographic evidence about the impact of neo-Pentecostal churches on alcohol consumption and other economically relevant behaviors. However, the impression of many observers is that neo-Pentecostals are less demanding than many traditional Pentecostals (e.g., Mariano 2004).

Protestants’ Impact on the Economy:

There are a number of mechanisms through which Protestantism may influence economic outcomes in Brazil. Some mechanisms are the result of distinct emphases within Protestantism relative to Catholicism or Afro-Brazilian religious traditions. Other mechanisms are the result of religiosity in general, and would apply equally to Protestants and Catholics. However, in the Brazilian context

² Other distinctions are between Unitarian and Trinitarian Pentecostals, whether speaking in tongues is an essential sign of being baptized by the Holy Spirit or merely a common sign of it, etc.

³ This evidence is consistent with ethnography and statistical research from other countries in Latin America (e.g., Brusco 1995; Sherman 1997).

Protestants are typically far more religiously active than Catholics and thus may accrue more of the benefits and costs.

First, Protestantism and religiosity may influence health which in turn influences economic outcomes. Internationally, there is substantial evidence that for Christian groups, religiosity is associated with greater health and longer life expectancies (e.g., Hummer et al. 1999; Lehrer 2004; Woodberry 2008a; 2008b). Research on religion and health within Brazil is limited. However, there is evidence that infant mortality is about 10 percent lower among Protestants than Catholics (holding all else equal) – although the reduction is greater for non-Pentecostal than for Pentecostals (Wood, Williams, and Chijiwa 2007). To the extent that health increases people's work efficiency and lower mortality increases their time horizons, this may influence economic outcomes, particularly for poor people.

Second, both religiosity and theologically conservative Protestantism may influence the investment fathers make in their families. Internationally, there is substantial statistical evidence for this (e.g. Waite and Lehrer 2003; Wolfinger and Wilcox 2008; Woodberry 2008a; 2008b). In Latin America, ethnographic evidence suggests a similar pattern (Burdick 1993; Brusco 1995; Sexton and Woods 1977; Sherman 1997; Robbins 2004). While this may influence the economic outcomes for children (particularly those from poor families), it is less likely to influence economic outcomes within the short time frame covered by this paper.

Third, there is substantial international evidence that both Protestantism and religiosity are associated with greater aversion to corruption and greater rule following behavior (Guiso, Sapienza and Zingales 2003; Stark 2001; Stack and Kposowa 2006; Woodberry 2008a; 2008b). Ethnographic evidence from Latin America suggests a similar pattern (e.g., Robbins 2004: 136). Protestants have their share of corruption, including some high profile corruption scandals by neo-Pentecostal leaders in Brazil (Freston 2001; Woodberry and Shah 2004). However, to the extent that the spread of Protestantism and religiosity minimizes corrupt behavior among the laity, it may foster development in communities with more Protestants and greater religiosity. Still, this is likely to help community-wide economic development, not individual economic attainment. Aversion to corruption may especially diminish incomes of those in the

middle and upper classes, at least in a society with high levels of overall corruption. However, it may make Protestants and religiously active people more attractive employees, and thus enhance their economic prospects – particularly from poor communities.

Fourth, in most societies, Protestantism has been central to the expansion of both the supply of and demand for education (Woodberry 2004; 2008). In societies with short histories of Protestant religious competitions, Protestants typically are disproportionately educated and have higher educational expectations for their children (Woodberry 2004; Garner 2000; Blunch 2008; Heaton, James, and Oheneba-Saky 2008; Zhai 2006; Roemer 2008). Ethnographic evidence from Latin America also suggests that Protestants are more likely to be literate and invest more in educating their children relative to others from their economic background (Tax and Hinshaw 1970; Early 1973; Sexton 1978; Annis 1987; Brusco 1995; Sherman 1997).

While Catholics have often founded and run some of the best schools (as they do in Brazil), prior to Vatican II (1965) Catholics did not invest heavily in education for non-elites except when competing with Protestants (Woodberry 2004). To the extent that Protestantism and religiosity increase the supply of private schools, increase the quality of schools available to the poor through educational competition (Gallego and Woodberry 2008a; 2008b), and increase the incentives of poor people to acquire literacy and formal education, they may increase long-term economic development for both communities with more Protestants and for the children of Protestant parents.

Fifth, international evidence suggests that both Protestants and highly religious respondents are more likely to volunteer both formally and informally. This is true both for religious and non-religious organizations (Woodberry 2004; 2008; Verba Schlozman and Brady 1995; Smidt 2003). To the extent that this voluntary activity provides economically relevant services, it may foster long-term economic development in communities where more Protestants and religiously active adherents are present. This may be especially relevant in poor communities where for-profit suppliers are less prevalent and less affordable to poor people.

Finally, since the 19th century conversionary forms of Protestantism have been consistently associated with lower-levels of alcohol consumption. This is economically relevant in communities where alcohol abuse is widespread. In the 19th century, revivalist Protestants helped spur the temperance movement in reaction to a rapid increase in the supply and consumption of distilled alcohol. Historians suggest that temperance was associated with economic uplift in both frontier and urban communities (Johnson 1978; Blocker 1989) and Protestant activists helped spread temperance worldwide (Woodberry 1996).

Contemporary statistical evidence from the US suggests that highly religious people are less likely to abuse alcohol (e.g., Bazargan et al. 2004; Ford and Kadushin 2002) ethnographic evidence from Latin American suggests that Protestantism diminishes alcohol and drug consumption as well (Burdick 1993; Brusco 1995; Sherman 1997; Robbins 2004). In elite circles abstaining from alcohol may diminish networking opportunities and thus hamper economic prospects, but in poor communities where alcohol and drug abuse are rampant, temperance may help people to work more consistently and effectively and to save a higher proportion of their income. Ethnographic research in Latin America suggests that as a result of refraining from alcohol, gambling, etc., Protestants are able to save more money to invest in cash crops, land, housing, and consumer durables (Brusco 1995; O'Conner 1979; Turner 1979; Aulie 1979).

Alcohol consumption and abuse in Brazil

Some studies have analyzed surveys on alcohol and drug consumption in Brazil providing a general descriptive overview of the epidemiology of alcohol use and dependence in the country (Cardim et al. 1986; Galduróz and Caetano 2004; Carlini 2006). The main analyses were carried out using national surveys on the use of alcohol and drugs which have been conducted by the National Anti-drug Secretariat (*Secretaria Nacional Antidrogas – SENAD*), an agency of the Brazilian federal government. In 2005, this agency conducted the Second Household Survey on the Use of Psychotropic Drugs in Brazil (*II Levantamento Domiciliar sobre o Uso de Drogas Psicotrópicas no Brasil*) in conjunction with the Brazilian Center for Information on Psychotropic Drugs (*Centro Brasileiro de Informações sobre Drogas*

Psicotrópicas – CEBRID) of the Federal University of São Paulo (*Universidade Federal de São Paulo – UNIFESP*).

The 2005 national survey was implemented in 108 Brazilian municipalities with more than 200 thousand inhabitants, interviewing 7,939 people between 12 and 65 years of age, corresponding to a population of more than 47 million people in this age range. The overall results indicate that 74.6 percent of the interviewed individuals consumed alcohol at least once during their lifetime, 49.8 percent used it during the last year, and 38.3 percent during the last month. Moreover, 12.3 percent of these individuals reported being dependent on alcohol. There were some regional differences on alcohol use and dependence, with higher rates of consumption in the Southeast, South and Center-West, and higher dependence in the Northeast (Carlini et al. 2006). The higher consumption in the Southeast and South might be due to the influence of Italian and German cultures in those areas, stimulating the production and moderate consumption of wine (Carlini 2006). In relation to sex differences, 83.5 percent of males indicated that they consumed alcohol at least once in their lifetime. For females, this percentage was 68.3. Moreover, 19.5 percent of males and 6.9 percent of females reported being dependent on alcohol (Carlini et al. 2006).

There is little work in Brazil which relates alcohol consumption and abuse to socio-demographic, clinical and cultural factors. This might be due to the lack of population-based studies that could correlate alcohol use and dependence to social and psychical variables (Barros et al. 2007). There is also not much information on drug and alcohol consumption in Brazil (Gorgulho and Da Ros 2006). Even with these difficulties, some studies on the social determinants and alcohol drinking patterns have been done in the country (Almeida and Coutinho 1993; Galduróz et al. 2003, 2004; Mendoza-Sassi and Béria, 2003; Almeida-Filho et al. 2004; Barros et al. 2007). However, these studies reach inconsistent results concerning the level of alcoholism across social classes, and are mostly based on small, local samples. For example, Barros et al. (2007) estimated multivariate logistic models using data from a survey conducted in the urban area of the southeastern municipality of Campinas in 2003. The survey had a total of 515 respondents. The prevalence of alcohol abuse and dependence was higher for people with better

socioeconomic status, but also for people with less than twelve years of schooling, and for people who had used illegal drugs during their lifetime. On the other hand, there was less alcohol abuse among Protestants.

Some studies are concerned about alcohol consumption and injury reduction in Brazil (Gorgulho and Da Ros 2006; Laranjeira and Romano 2004; Brazilian Ministry of Health 2004; Mariano et al. 2000). Gorgulho and Da Ros (2006) indicate that alcohol consumption is a health problem, and has to be addressed by several policies based on government, non-government organizations (NGOs) and university initiatives to deal with the issue. Laranjeira and Romano (2004) highlight the need to implement a series of public policies that would reduce the quantity of alcohol consumed by a community, inform the communities about healthy behaviors, and instruct health professionals about priorities related to alcohol policies. The Brazilian Ministry of Health (2004, p.73–84) emphasizes the need to implement campaigns in the workplace in order to reduce the abusive alcohol consumption. The campaign framework is that information has to be provided about responsible alcohol use, without prohibiting its consumption.

Finally, research on the causes of alcoholism is the subject of a bibliographic review by Mariano et al. (2000). They conclude that alcoholism is a complex phenomenon which has been interpreted by several medical theories. In the Brazilian context, there is also an increasingly widespread Pentecostal notion of alcoholism. In this view, the “disease” is not directly related to genetic, psychiatric, psychological or social determinants, but the cause of alcoholism is related to diabolic forces that are taking control of the alcohol-dependent person. Thus the pressure on the family is attenuated, which opens the way to utilize religious therapies to deal with this problem.

Data and Methods

One of the longest series of data on age, education, religion and income available to researchers comes from the Brazilian censuses taken in 1960, 1970, 1980, 1991, and 2000. Microdata from these censuses are available from long-form questionnaires administered to every fourth household (25% samples) in 1960, 1970 and 1980, and to every fifth (20%) or every tenth (10%) household in 1991 and 2000 depending on the size of the municipality. In all cases, there are records for every individual in the selected households that contain information on that person's age, sex, marital status, educational attainment, enrollment in school, religious affiliation and, if employed, occupation and earnings. Since the income data for 1960 are only coded categorically, we restrict the present analysis to 1970-2000. The coding of religion is progressively more detailed in each successive census, enabling one to look at a wide variety of Protestant churches in the later censuses. However, to permit a classification that is consistent across the four censuses used in this analysis, the variable we construct here is simply the proportion Protestant.

The lowest level geographic identifier on these records is the *município*. In previous work, Potter, Schmertmann and Cavenaghi (2002) established minimum comparable areas that account for the changing definitions and division of municipalities through the years, as the absolute number of municipalities has increased from approximately 2,300 in 1960 to 5,280 in 2000. Working with these census data, they found it convenient to aggregate municipalities to microregions, yielding 502 comparable areas across the five censuses. Thus, it is possible to calculate area means of income, education, and the proportion Protestant for each of these 502 areas at each of the five points in time.

Creating aggregate-level data

Before aggregating the data at the microregion level, we decided to further classify persons in the paid labor force into 12 age-education groups, with age categorized into four groups, and education into three groups. The decision to generate age-education groups in the analysis of earnings was based on previous labor market studies. With four census years (1970, 1980, 1991, and 2000), this procedure yielded 48 observations for each microregion. For each microregion, age-education, and year cell, the

mean income was calculated, correcting for currency changes and inflation. We also calculated the proportion Protestant among employed males in each age-education group. In this study, we restrict the analysis to males in order to avoid the possible endogeneity resulting from changing rates of female labor force participation.

Our educational attainment classification takes into account the specifics of the Brazilian population. The first group, zero to four years of schooling, includes illiterate people and those in the first phase of elementary school. The second group, five to eight years of schooling, contains people in the second phase of elementary school. The third and final group is comprised of people in high school (nine to eleven years of schooling), and people with some college education (at least twelve years of schooling). The four age groups we used were 15-24, 25-34, 35-49, and 50-64.

Regression framework

The variable we have chosen to analyze is the logarithm of the mean real income in a group defined by microregion, age-education, and year. Since there were changes in Brazilian currency across time, as well as dramatic inflation during the period, the nominal wage was converted to base one in January 2002. To correct for currency changes, wages in 1970 and 1980 were divided by 2,750,000,000,000; and in 1991, they were divided by 2,750,000. To correct for inflation, wages were divided by 0.000000000000264 in 1970; 0.000000000005778 in 1980; 0.000067602304350 in 1991; and 0.902716061809642 in 2000, as suggested by Corseuil and Foguel (2002).

Considering that there were four censuses, 12 age-education groups, and 502 consistent microregions, we had potentially 24,096 observations. The model we selected to explain variation in income across these observations included a large number of terms to account for the differences that might arise from the group (that is the combination of age group and education group), the year, the microregion, and the interaction between year and group as well as that between year and microregion. Apart from these “fixed-effects”, the only other predictor was the proportion Protestant of the individuals in the group, in the microregion, and in the particular census. We ran the regression without using

weights, and cells with fewer than 25 people receiving income in a specific microregion, age-education, and year group were not included in the regression.

The logic of this model hinges on identifying any influence that religion might have in altering the overall pattern of income differentials in a census year in a particular microregion. Such an effect could occur either if there was a difference in the proportion Protestant across the twelve groups in a microregion, or if the proportion Protestant had a different influence on income in different age-education groups.

Results

Table 1 shows the percent Protestant among the male population 15-64 years of age in each of the census years. These proportions are somewhat lower than for the whole population since the proportion Protestant is higher among women than men. Nevertheless, the proportion Protestant more than doubles over this 30 year period, and reaches about 11 percent in 2000. An interesting change takes place in spatial location of Protestants over the period. In 1970, the highest proportions Protestant are found in the Southern parts of Brazil where there was considerable immigration from Germany. Later on, as Traditional Protestant Churches are eclipsed by Pentecostal Churches, the highest proportions are found in large cities along the coast such as Rio de Janeiro and Sao Paulo, and in the North and Central-West regions of Brazil. (See Figure 1)

Over this period, there are also considerable shifts in the age distribution, and in educational attainment. Table 2 shows the proportion of the male population found in each of the twelve age-education groups in each of the four census years for all of Brazil. The proportion with 0-4 years of schooling falls dramatically, especially among those under age 50, while the proportion with nine or more years of education increases, mainly in those same age groups. The proportion Protestant in each of the age-education groups in each census year is shown in Figure 2. While there is some variation in the pattern seen across the different groups, there does not seem to be much variation by either age or

education in the proportion Protestant. This proportion also seems to increase quite uniformly through time in all twelve of the groups.

To provide some idea of the logic that underlies our regression model, we developed a simple exercise. Since we are not looking at individuals, but rather group means, what we are interested in is how that group mean changes as the proportion of the group which is Protestant varies. The top panel of Figure 3 shows the level of mean male earnings in each of the 12 age-education groups for the whole of Brazil in the year 2000. As would be expected, incomes increase with education, and also with age. The difference in earnings according to education is greater in the older as compared to the younger age groups. The next step in the exercise is construct that same figure, but instead of basing it on the entire population in 2000, we use only the 10 percent of microregions that had the lowest proportions Protestant. Also, in this case, for the vertical axis, we use the level of income relative to that of the group with 5-9 years of education in the same age group. Finally, in the third panel, we construct the same figure for the 10 percent of microregions with highest percent Protestant in 2000.

If the proportion Protestant were to be related to income in a similar way in each of the 12 age-education groups, we would not expect to see much of a shift between the second and third panels. However, if the proportion Protestant were to make a large difference in some groups but not in others, then we would observe a different pattern in the two panels. This is indeed what we see in Figure 2. Relative to those with 5-9 years of education, mean income is considerably lower among those with 0-4 years of education in all four of the age groups in the middle panel, with the greatest differences found in the oldest age groups. In the bottom panel for the microregions with the most Protestants, these differentials are considerably attenuated. On the other hand, the premium earned by those with 9 or more years of education is fairly similar. The differentials between 5-9 years of education and those with more education are about the same in the microregions with the least Protestants as they are in the microregions with the most Protestants. Such a contrasting pattern is consistent with the proportion Protestant positively impacting the earnings of those with the least education, but having little or no effect on those with five or more years of education.

The first regression model parallels the preceding exercise, but includes all census years and all 502 microregions. The coefficients of interest refer to the relation between the proportion Protestant in each age-education group and the mean wage for that group, adjusted for the time varying influence of the group on income, and the time varying influence of the microregion on income. These coefficients are shown in Table 3. There are very large and highly significant coefficients for all four of the groups with 0-4 years of education, but much smaller coefficients for the other eight groups with higher levels of education. Just what these coefficients imply regarding income can be seen in Figure 4 where the predicted and observed points for the four age groups with 0-4 years of education are plotted. In this diagram, the fixed effects for time*microregion have been subtracted out, removing the “noise” that pertains to each microregion as a whole at each point in time. Two predicted values are shown—one for 1970 and the other for 2000. The difference between them, in this case very small, is the result of the very slight variation through time in the estimated difference in earnings for these education groups deriving from age or experience.

The preceding model assumed that the influence of religion on income would be constant across the thirty year period of observation. However, as noted, there are various reasons why this effect might vary through time. On the one hand, the composition of the Protestant category varied considerably from 1970 to 2000. In 1970, although the census did not provide a break down, the category was largely made up of “traditional” or mainline Protestants such as Lutherans or Baptists. In 1980, the importance of Pentecostal Churches such as the Assemblies of God increased dramatically, while in 1991 and 2000 newer neopentecostal churches such as the Universal Church of the Kingdom of God gained importance. It is possible that the neo-Pentecostal churches were not as strict as the Pentecostal churches or the mainline Protestant churches that preceded them. There is also the likelihood that the first men to recruited into Protestant churches were the most desperate, and the ones who would most benefit from conversion. Later recruits might have fewer difficulties or problems such as severe alcoholism. Indeed, some might be children born into Protestant families rather than actual conversions.

To assess any change in the influence of Protestantism from one census to the next, we proceeded to fit models where this influence was allowed to vary through time. Table 4 shows the time varying coefficients of the proportion Protestant where the effect in 1970 is shown in the first column, and the differences in the coefficient for later censuses are shown in the successive columns. These results show a striking decline in the effect of the proportion Protestant from one census to the next in the groups with 0-4 years of education. Among those 15-24, the effect in 1991 and 2000 is much less than in the earlier censuses although still positive. In the older age groups, on the other hand, the decline appears mostly in the most recent census. The actual influence of the coefficients on wages in 1970 and 2000 is graphed in Figure 5, where a substantial difference between the two predicted curves may be seen in three of the four graphs.

In an attempt to distinguish between what might be called the composition effect and the absorption effect (the most desperate are the first to convert), we experimented with various transformations of the proportion Protestant as a predictor. One that seemed to fit well relative to others was the square root of the proportion Protestant. Coefficients from a model based on that transformation rather than the actual proportion Protestant are shown in Table 5 and Figure 6. While this model seemed to fit the data slightly better than the earlier model, providing some evidence for an absorption effect, it by no means eliminated the shift through time in the coefficients for the three age groups under age 50.

Discussion

These results are consistent with the hypothesis that men with low levels of education who convert to a Protestant church have considerably higher incomes than they had before conversion. The effect on income of conversion to Protestantism appears to be much less for those with five or more years of education. It also appears that the influence of later conversions is considerably less than that of earlier conversions. The census data give little indication of what might be driving these differentials since they do not include a detailed employment history. However, based on the limited historical and ethnographic evidence available for Brazil, our first guess is that the prohibition regarding alcohol in virtually all

Protestant religions in Brazil, especially the rapidly growing Pentecostal churches, has much to do with the result. Our guess as to the reason why the effect is much smaller or negative for those with higher levels of education is that religion, and perhaps abstaining from drinking alcohol, may have a cost in terms of social capital, limiting the scope of one's social relations.

Of course, a difficult question facing any study of the impact of religion on income is how to isolate a causal effect of an (endogenous) choice variable such as religious affiliation with another (endogenous) choice variable, income. Might it not be the case that the association one observes between them is, in fact, driven by some third characteristic or set of circumstances that influences both choices? In this analysis, we have attempted to side-step this difficulty by looking at groups rather than individuals, and also by including a larger number of fixed-effects to "mop-up" the influence of unobserved influences. The main remaining flank where this approach could be vulnerable is the possibility that there existed some aspects of particular microregions that were favorable both to the growth of Protestantism and to an unusually favorable ratio of the incomes of those with 0-4 years of education to the incomes of those with more education. We cannot rule out this possibility, but neither can we imagine a set of plausible circumstances or characteristics that might lead to both results.

The last question is what might account for the decline through time in the impact of Protestantism on the incomes of men with low education. There are several plausible and possibly complementary explanations. The first is that, as Protestant churches grew, their membership became less selective of people who had come on hard times and perhaps had severe problems with alcohol or other drugs. Newer members might have stable employment or, in fact, be children raised in the church. If so, the proportion of church members whose lot had recently improved dramatically as a result of their conversion might not be as large as it once was. The second explanation is that, throughout this thirty year period, there were major changes in the composition of the Protestant population. Early on, traditional or mainline denominations such as Lutherans and Baptists were important. In the 1980s, Pentecostal churches gained in representation, and, finally, in the 1990s, the largest increase was in neo-Pentecostal churches such as the Universal Church of the Kingdom of God. There is some reason to

believe that this latter group of churches may not have been as strict as the original Pentecostal churches such as the Assemblies of God, and even though the individual interviewed for the news story in the introduction had joined the Universal Church, perhaps not all of the conversions to that Church in the 1990s had as dramatic results.

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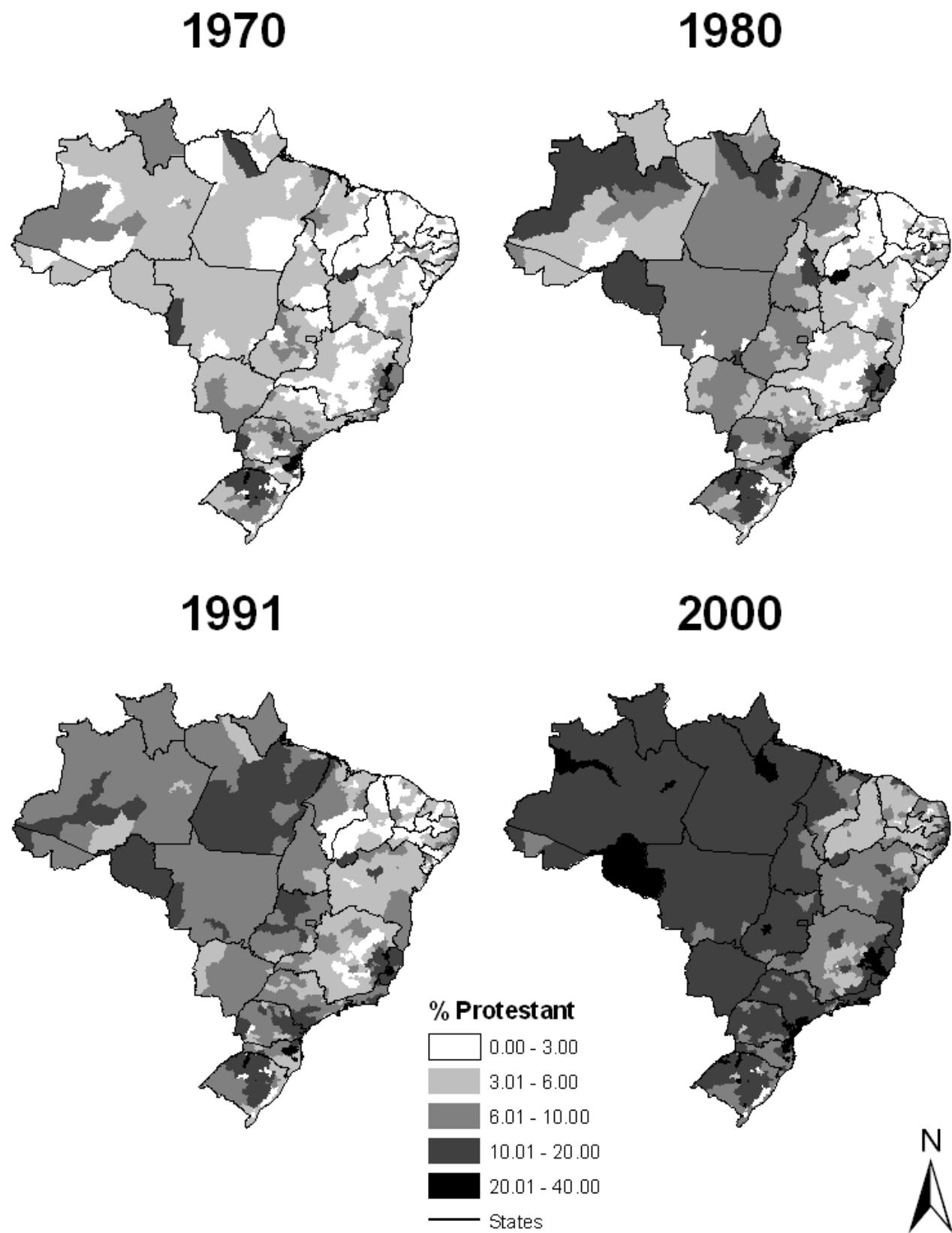
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Figure 1. Percent Protestants of the Male Labor Force (15–64 years of age) by Year and Micro-Region, 1970–2000.



Source: 1970–2000 Brazilian Censuses.

Table 1. Percent Protestant of the Male Labor Force (15–64 years of age) by Year, 1970–2000.

Region	Total Population	Total Protestant	Percent Protestant
1970	25,760,600	1,195,292	4.64
1980	32,613,947	1,764,415	5.41
1991	43,434,546	2,944,862	6.78
2000	53,177,953	5,796,397	10.90

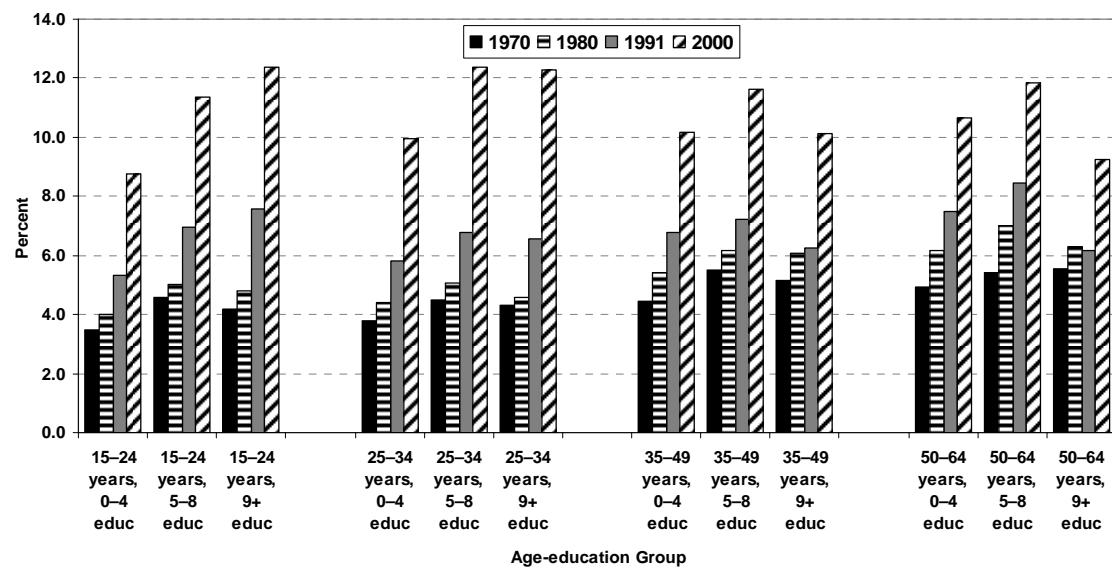
Source: 1970–2000 Brazilian Censuses.

Table 2. Percent of Male Population (15–64 years of age) by Year and Age-Education Group, 1970–2000.

Age-education Group	1970	1980	1991	2000
15–24 years				
0–4 years of schooling	28.19	20.59	14.61	9.04
15–24 years				
5–8 years of schooling	5.38	10.53	12.09	12.46
15–24 years				
9+ years of schooling	2.74	5.87	5.97	10.24
25–34 years				
0–4 years of schooling	19.71	16.39	12.41	8.82
25–34 years				
5–8 years of schooling	1.98	3.90	6.82	7.63
25–34 years				
9+ years of schooling	2.00	4.77	7.40	8.12
35–49 years				
0–4 years of schooling	22.66	19.02	17.11	13.32
35–49 years				
5–8 years of schooling	1.62	2.39	3.67	6.73
35–49 years				
9+ years of schooling	1.59	2.84	5.54	8.46
50–64 years				
0–4 years of schooling	12.84	11.72	11.49	10.36
50–64 years				
5–8 years of schooling	0.65	0.94	1.16	1.99
50–64 years				
9+ years of schooling	0.62	1.05	1.72	2.84
Total	25,760,600	32,613,947	43,434,546	53,177,953

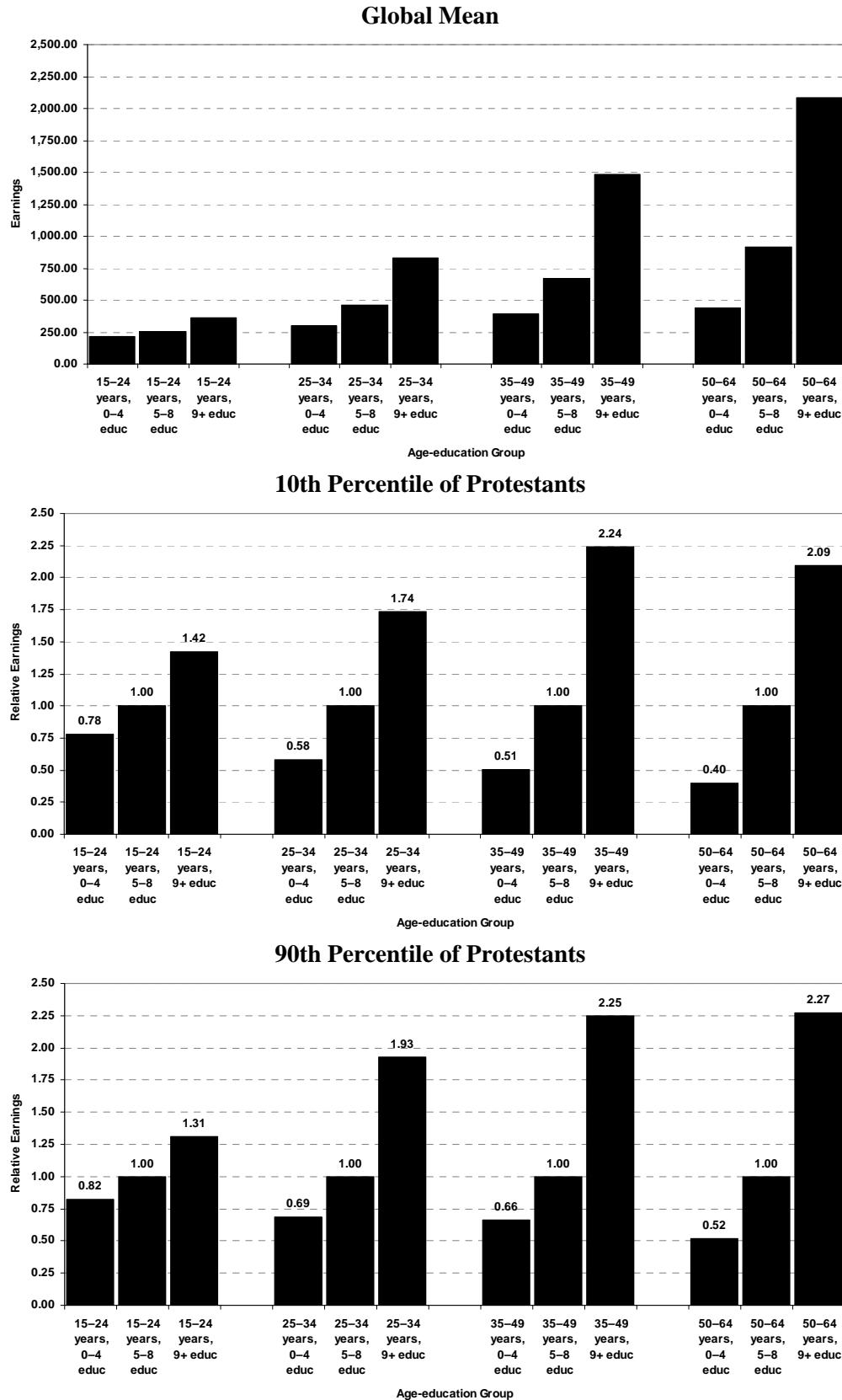
Source: 1970–2000 Brazilian Censuses.

Figure 2. Percent Protestant of the Male Labor Force (15–64 years of age) by Year and Age-Education Group, 1970–2000.



Source: 1970–2000 Brazilian Censuses.

Figure 3. Mean Real Monthly Earnings of Male Population (15–64 years of age) by Age-Education Group, and Relative Earnings to the 5–8 Education Group for Micro-Regions on the 10th and 90th Percentiles of Protestants, 2000⁺.



⁺ Nominal income was converted to base 1 in January 2002, taking into account changes in currency and inflation.
Source: 2000 Brazilian Censuses.

Table 3. Area and Time Fixed-Effects Estimates of Equation With Age-education Group Indicators Interacted with Year, and Proportion of Protestants, 1970–2000. Dependent Variable is log(Monthly Earnings)⁺.

Proportion of Protestants	Coefficients ⁺⁺
Ages 15–24 years; 0–4 years of schooling	1.005*** (0.0981)
Ages 15–24 years; 5–8 years of schooling	0.137 (0.1010)
Ages 15–24 years; 9+ years of schooling	0.112 (0.0915)
Ages 25–34 years; 0–4 years of schooling	1.308*** (0.0905)
Ages 25–34 years; 5–8 years of schooling	0.151 (0.0949)
Ages 25–34 years; 9+ years of schooling	0.312** (0.0968)
Ages 35–49 years; 0–4 years of schooling	1.543*** (0.0871)
Ages 35–49 years; 5–8 years of schooling	0.049 (0.0988)
Ages 35–49 years; 9+ years of schooling	0.238* (0.1044)
Ages 50–64 years; 0–4 years of schooling	1.386*** (0.0807)
Ages 50–64 years; 5–8 years of schooling	-0.214* (0.1041)
Ages 50–64 years; 9+ years of schooling	0.142 (0.1240)
N observations	19,727
N groups	2,008
Rho: Fraction of variance due to the v_i	0.8067
F (56; 17,663): All coefficients=0	4,532.69***
F (2007; 17,663): Area/time fixed effects=0	21.69***
R^2 (within)	0.9349
R^2 (between)	0.6897
R^2 (overall)	0.7861

* Significant at $p < .05$; ** Significant at $p < .01$; *** Significant at $p < .001$.

⁺ Nominal income was converted to base 1 in January 2002, taking into account changes in currency and inflation.

⁺⁺ Coefficients from constant, and age-education group indicators interacted with year are not displayed in this table.

Source: 1970–2000 Brazilian Censuses.

Table 4. Area and Time Fixed-Effects Estimates of Equation With Age-education Group Indicators and Proportion of Protestants Interacted with Year, 1970–2000. Dependent Variable is log(Monthly Earnings)⁺.

Proportion of Protestants	Coefficients ⁺⁺	Interaction With Year		
		1980	1991	2000
Ages 15–24 years; 0–4 years of schooling	2.124*** (0.2477)	−0.500 (0.3482)	−1.562*** (0.3193)	−1.476*** (0.2885)
Ages 15–24 years; 5–8 years of schooling	0.073 (0.2404)	−0.109 (0.3415)	0.118 (0.3164)	0.191 (0.2875)
Ages 15–24 years; 9+ years of schooling	0.447 (0.2801)	−0.830* (0.3570)	0.017 (0.3264)	−0.431 (0.3134)
Ages 25–34 years; 0–4 years of schooling	2.044*** (0.2249)	−0.139 (0.3077)	−0.638* (0.2975)	−1.256*** (0.2640)
Ages 25–34 years; 5–8 years of schooling	0.360 (0.2396)	−0.067 (0.3367)	−0.067 (0.3033)	−0.382 (0.2807)
Ages 25–34 years; 9+ years of schooling	0.415 (0.2656)	−0.485 (0.3476)	0.245 (0.3378)	−0.101 (0.3014)
Ages 35–49 years; 0–4 years of schooling	2.031*** (0.2030)	0.054 (0.2826)	−0.530* (0.2678)	−0.870*** (0.2496)
Ages 35–49 years; 5–8 years of schooling	0.097 (0.2374)	0.310 (0.3220)	−0.039 (0.3136)	−0.265 (0.2856)
Ages 35–49 years; 9+ years of schooling	0.370 (0.2795)	−0.682 (0.3536)	0.247 (0.3508)	−0.111 (0.3259)
Ages 50–64 years; 0–4 years of schooling	1.598*** (0.1791)	0.205 (0.2470)	−0.228 (0.2437)	−0.420 (0.2299)
Ages 50–64 years; 5–8 years of schooling	−0.178 (0.2612)	−0.130 (0.3460)	−0.026 (0.3425)	−0.016 (0.3076)
Ages 50–64 years; 9+ years of schooling	0.201 (0.2969)	−0.619 (0.4122)	−0.010 (0.3812)	0.192 (0.3598)
N observations	19,727			
N groups	2,008			
Rho: Fraction of variance due to the v_i	0.8080			
F (92; 17,627): All coefficients=0	2,776.12***			
F (2007; 17,627): Area/time fixed effects=0	21.62***			
R^2 (within)	0.9354			
R^2 (between)	0.6850			
R^2 (overall)	0.7880			

* Significant at $p < .05$; ** Significant at $p < .01$; *** Significant at $p < .001$.

⁺ Nominal income was converted to base 1 in January 2002, taking into account changes in currency and inflation.

⁺⁺ Coefficients from constant, and age-education group indicators interacted with year are not displayed in this table.

Source: 1970–2000 Brazilian Censuses.

Table 5. Area and Time Fixed-Effects Estimates of Equation With Age-education Group Indicators and Square Root of Proportion of Protestants Interacted with Year, 1970–2000. Dependent Variable is log(Monthly Earnings)⁺.

Square Root of Proportion of Protestants	Coefficients ⁺⁺	Interaction With Year		
		1980	1991	2000
Ages 15–24 years; 0–4 years of schooling	1.077*** (0.1086)	−0.263 (0.1512)	−0.792*** (0.1457)	−0.728*** (0.1381)
Ages 15–24 years; 5–8 years of schooling	−0.203* (0.1004)	0.123 (0.1408)	0.231 (0.1412)	0.305* (0.1420)
Ages 15–24 years; 9+ years of schooling	0.168 (0.1197)	−0.502** (0.1550)	0.004 (0.1514)	−0.256 (0.1530)
Ages 25–34 years; 0–4 years of schooling	1.162*** (0.1079)	−0.049 (0.1476)	−0.374* (0.1450)	−0.602*** (0.1393)
Ages 25–34 years; 5–8 years of schooling	0.056 (0.0982)	0.029 (0.1414)	0.031 (0.1362)	−0.111 (0.1381)
Ages 25–34 years; 9+ years of schooling	0.072 (0.1143)	−0.215 (0.1523)	0.272 (0.1505)	0.140 (0.1467)
Ages 35–49 years; 0–4 years of schooling	1.222*** (0.1054)	0.066 (0.1473)	−0.279 (0.1438)	−0.447** (0.1402)
Ages 35–49 years; 5–8 years of schooling	0.032 (0.1077)	0.235 (0.1503)	−0.068 (0.1480)	−0.153 (0.1479)
Ages 35–49 years; 9+ years of schooling	0.095 (0.1185)	−0.264 (0.1563)	0.101 (0.1557)	0.041 (0.1590)
Ages 50–64 years; 0–4 years of schooling	1.036*** (0.0969)	0.187 (0.1349)	−0.199 (0.1341)	−0.230 (0.1335)
Ages 50–64 years; 5–8 years of schooling	−0.183 (0.1208)	−0.009 (0.1636)	0.072 (0.1638)	0.036 (0.1583)
Ages 50–64 years; 9+ years of schooling	0.019 (0.1446)	−0.129 (0.1950)	0.070 (0.1872)	0.223 (0.1824)
N observations	19,727			
N groups	2,008			
Rho: Fraction of variance due to the v_i	0.8086			
F (92; 17,627): All coefficients=0	2,828.19***			
F (2007; 17,627): Area/time fixed effects=0	19.58***			
R^2 (within)	0.9366			
R^2 (between)	0.6727			
R^2 (overall)	0.7912			

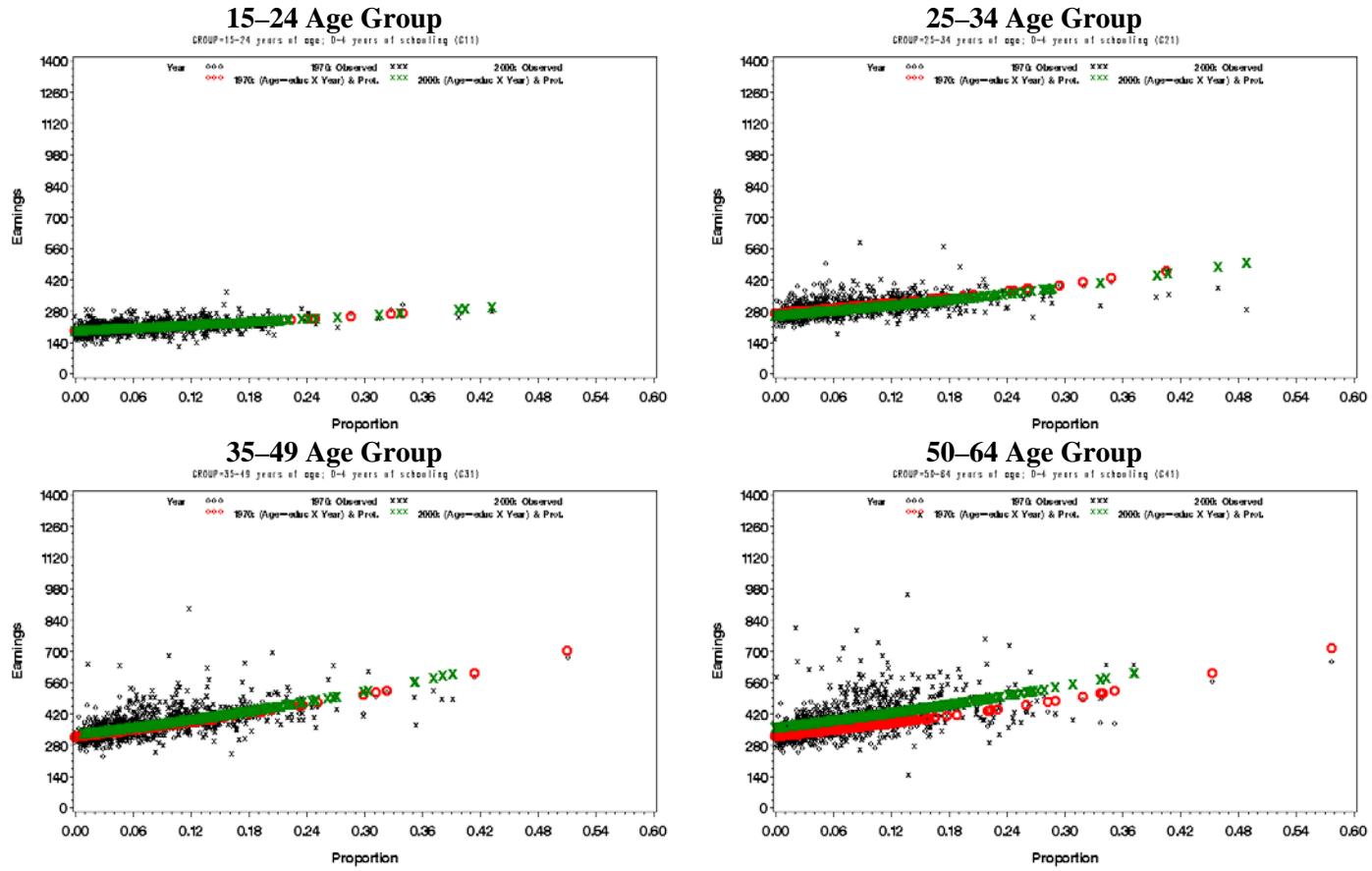
* Significant at $p < .05$; ** Significant at $p < .01$; *** Significant at $p < .001$.

⁺ Nominal income was converted to base 1 in January 2002, taking into account changes in currency and inflation.

⁺⁺ Coefficients from constant, and age-education group indicators interacted with year are not displayed in this table.

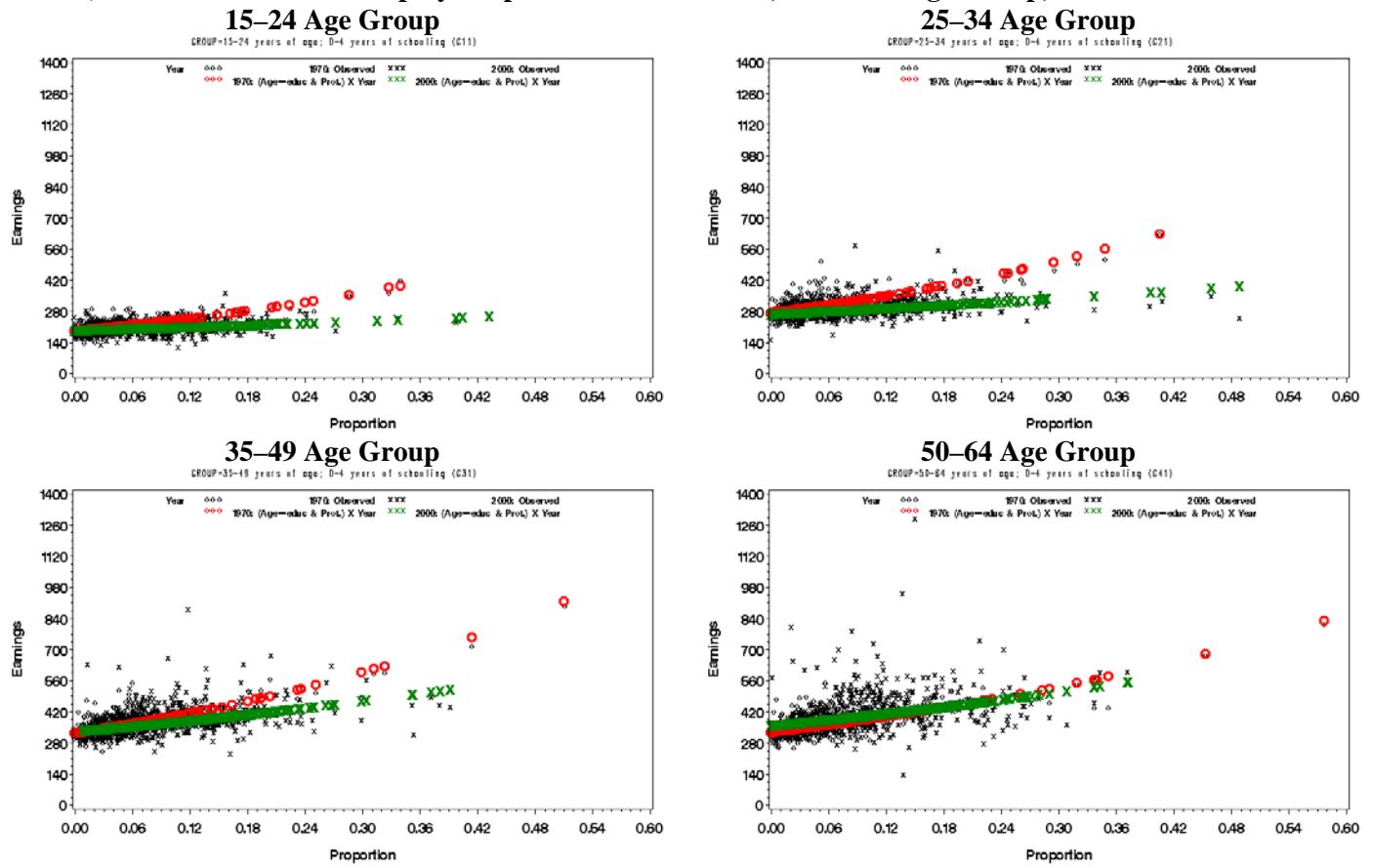
Source: 1970–2000 Brazilian Censuses.

Figure 4. Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects (Model from Table 3) for 0–4 Education Group by Proportion of Protestants, Year and Age Group, 1970 and 2000.



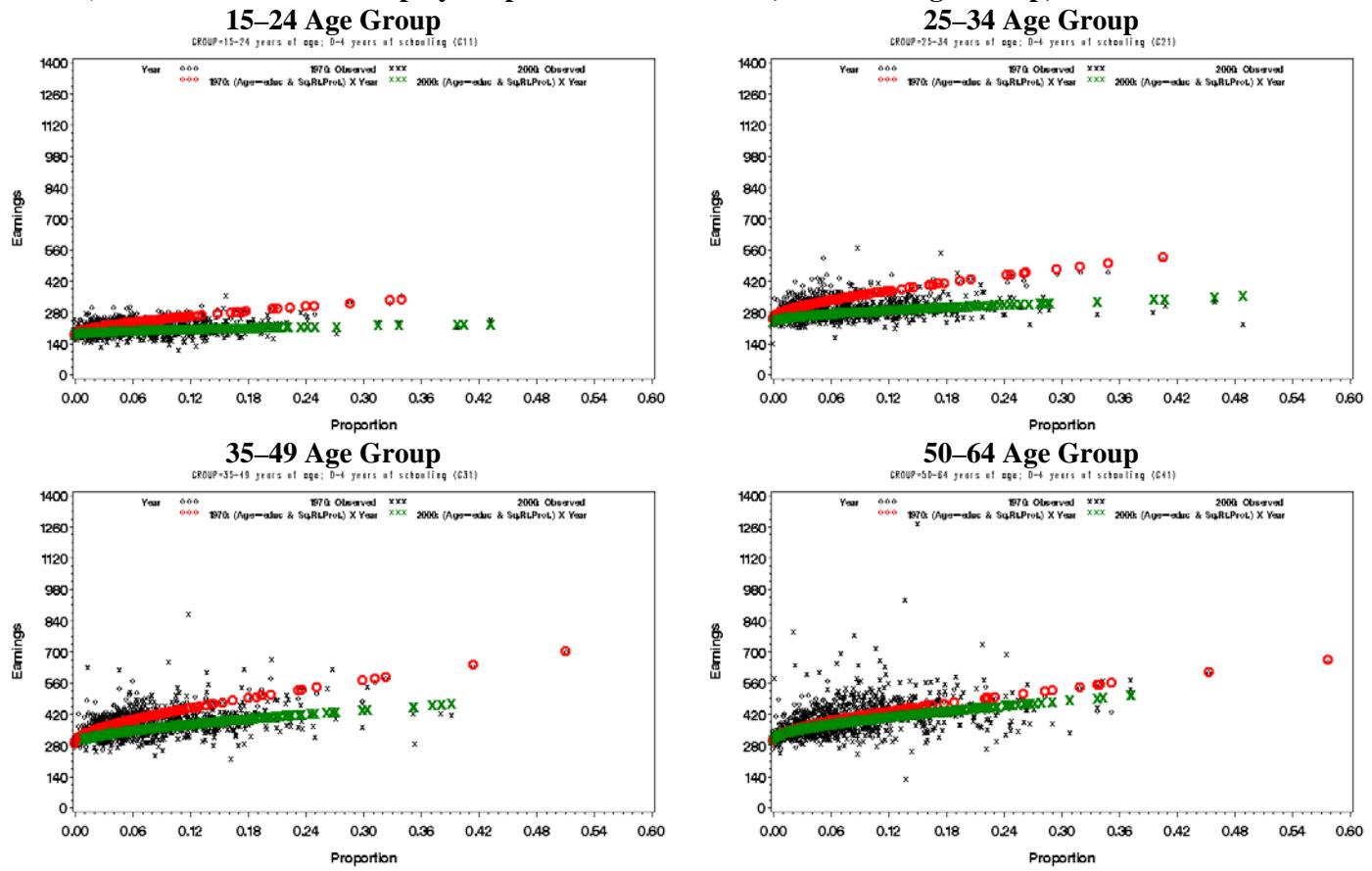
Source: 1970 and 2000 Brazilian Censuses.

Figure 5. Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects (Model from Table 4) for 0–4 Education Group by Proportion of Protestants, Year and Age Group, 1970 and 2000.



Source: 1970 and 2000 Brazilian Censuses.

Figure 6. Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects (Model from Table 5) for 0–4 Education Group by Proportion of Protestants, Year and Age Group, 1970 and 2000.



Source: 1970 and 2000 Brazilian Censuses.