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

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Two main questions:

- Does conversion to Protestantism lead to higher earnings for men?
- Is there is such an effect, does it vary by age and education, and does it vary through time?

Why might Protestants earn more?

- Classical Sociology – Weber
- Emphasis on the written word, and literacy in a country with very low levels of education
- Social networks, social capital …
- Abandoning vices, particularly alcohol

This is what contemporary journalists say about the impact of Protestantism…

Thu May 3, 2007 2:47pm EDT
By Todd Benson

CARAPICUIBA, Brazil (Reuters) - 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.

Data

- Microdata from the 1970, 1980, 1991, y 2000 censuses—long form questionnaire applied to 10% or 20% of households (25% in 1970)
- Unlike the US, a question on religious affiliation with increaslingly detailed coding in successive censuses
- And one on the income earned by each member of the household

A quick look at the growth of Protestantism in Brazil since 1970

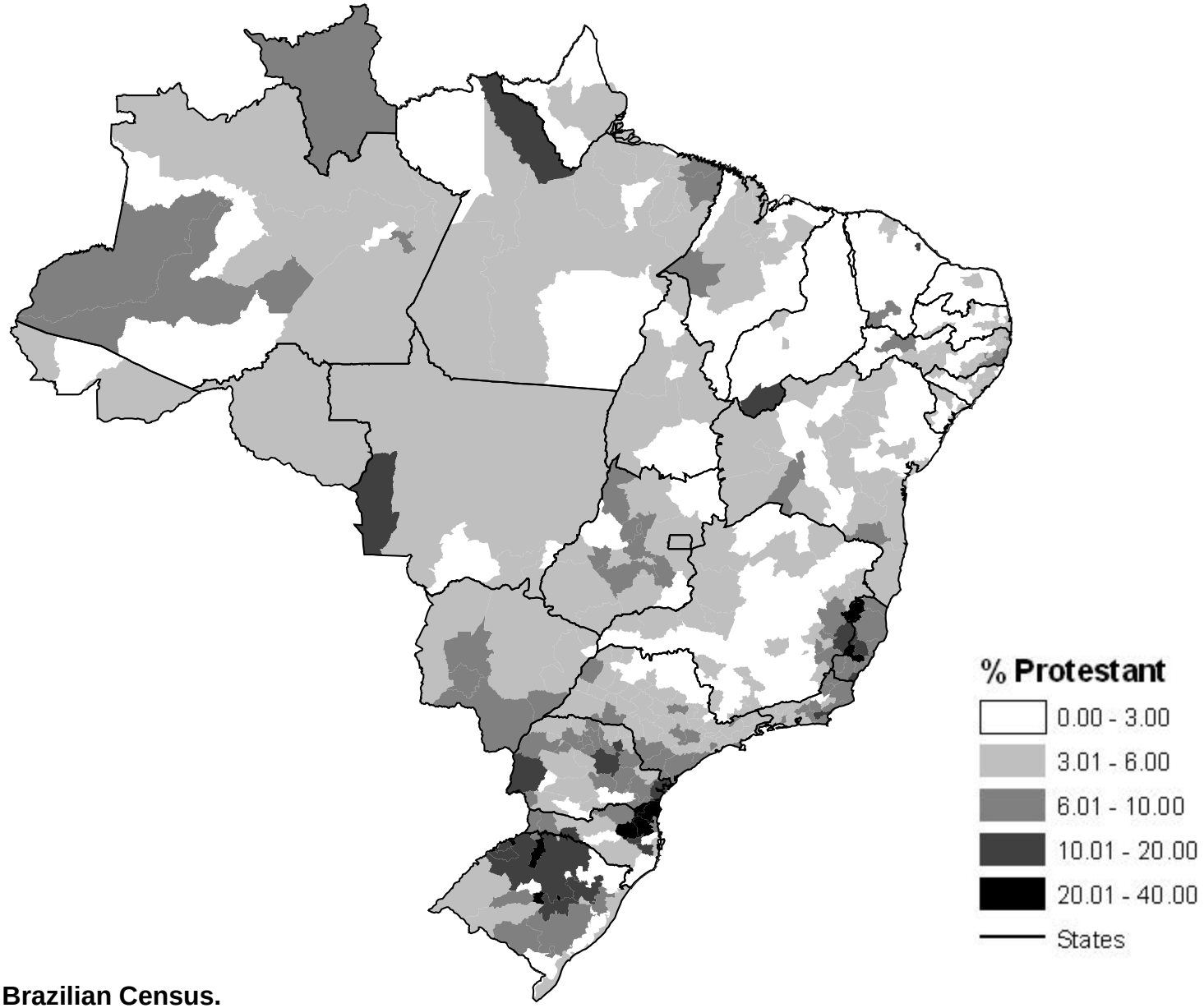
Table 1. Percent Protestant of the Male Labor Force (15–64 years of age) by Year, 1970–2000.

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.

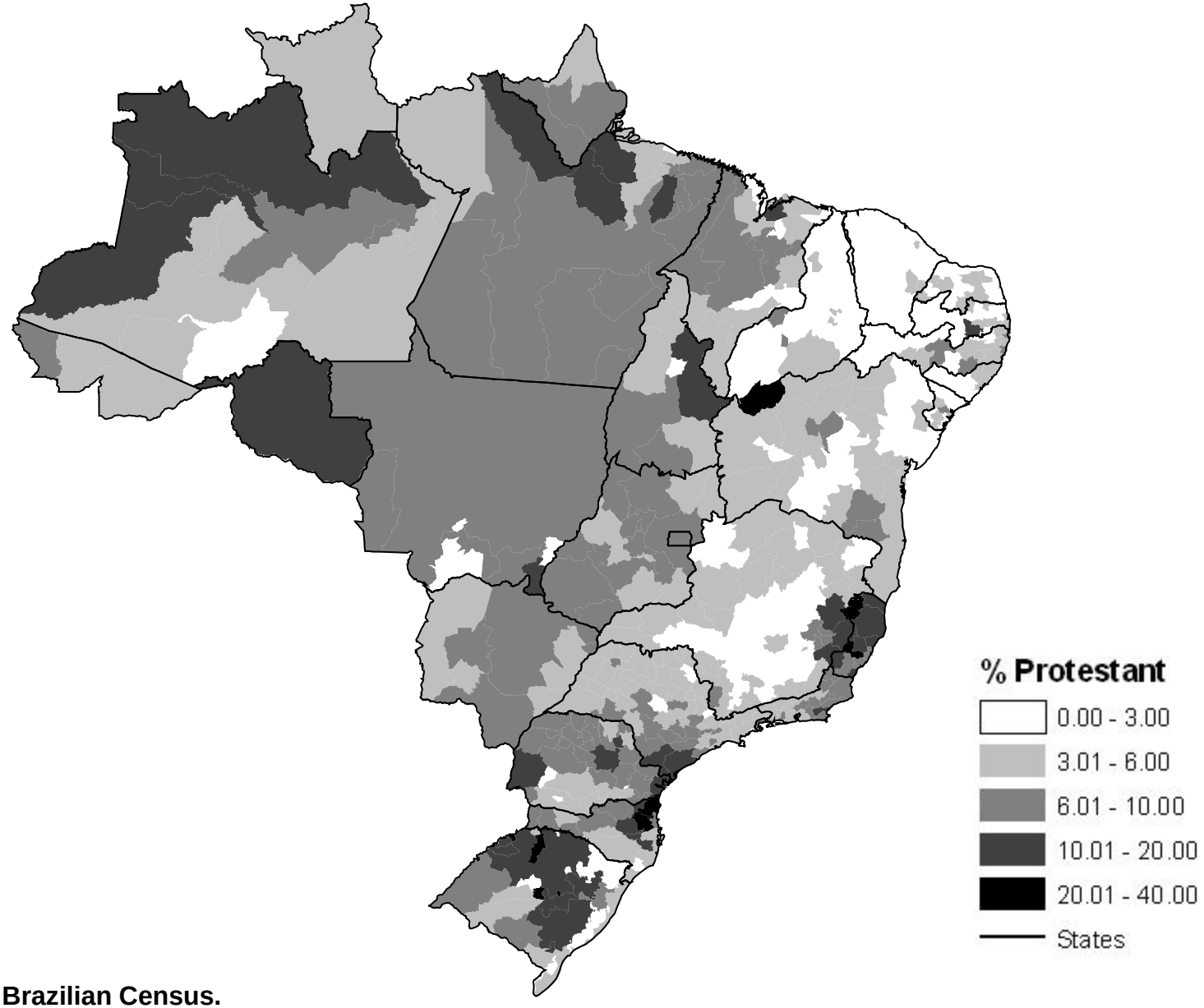
Then, dividing Brazil into 502 consistent microregions (agglomerations of municipalities), you can see the spatial variation in this growth …

1970



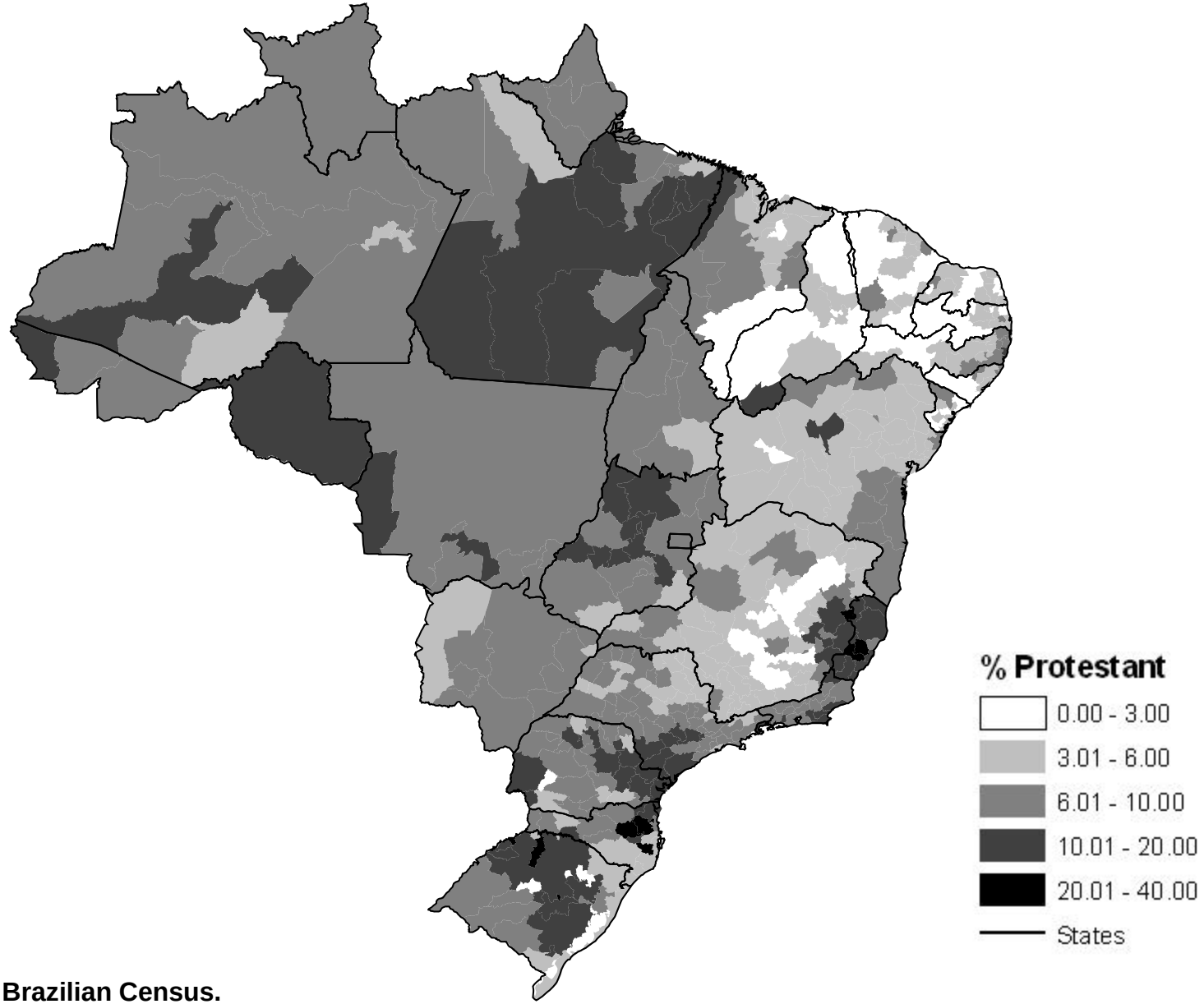
Source: 1970 Brazilian Census.

1980



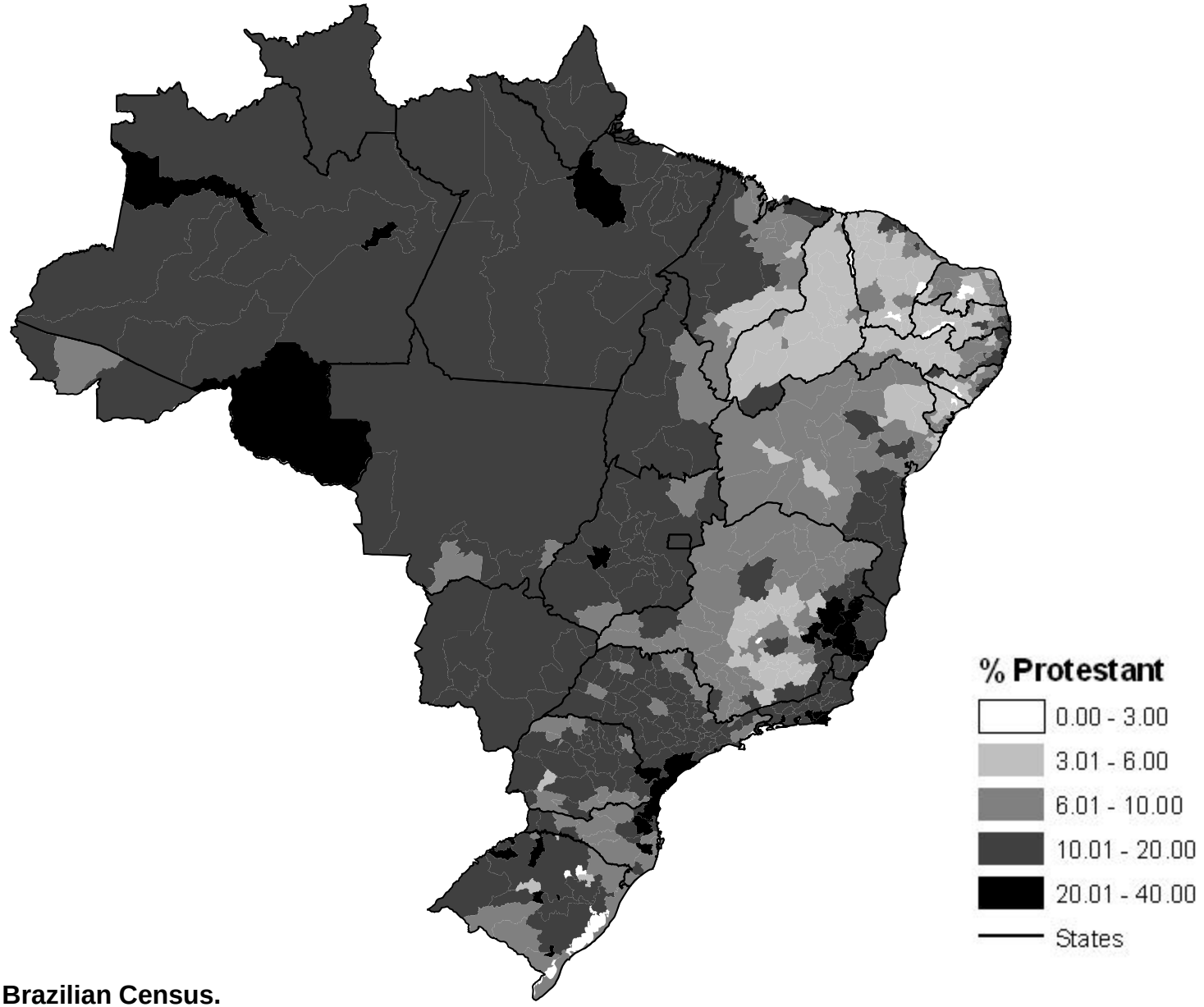
Source: 1980 Brazilian Census.

1991



Source: 1991 Brazilian Census.

2000



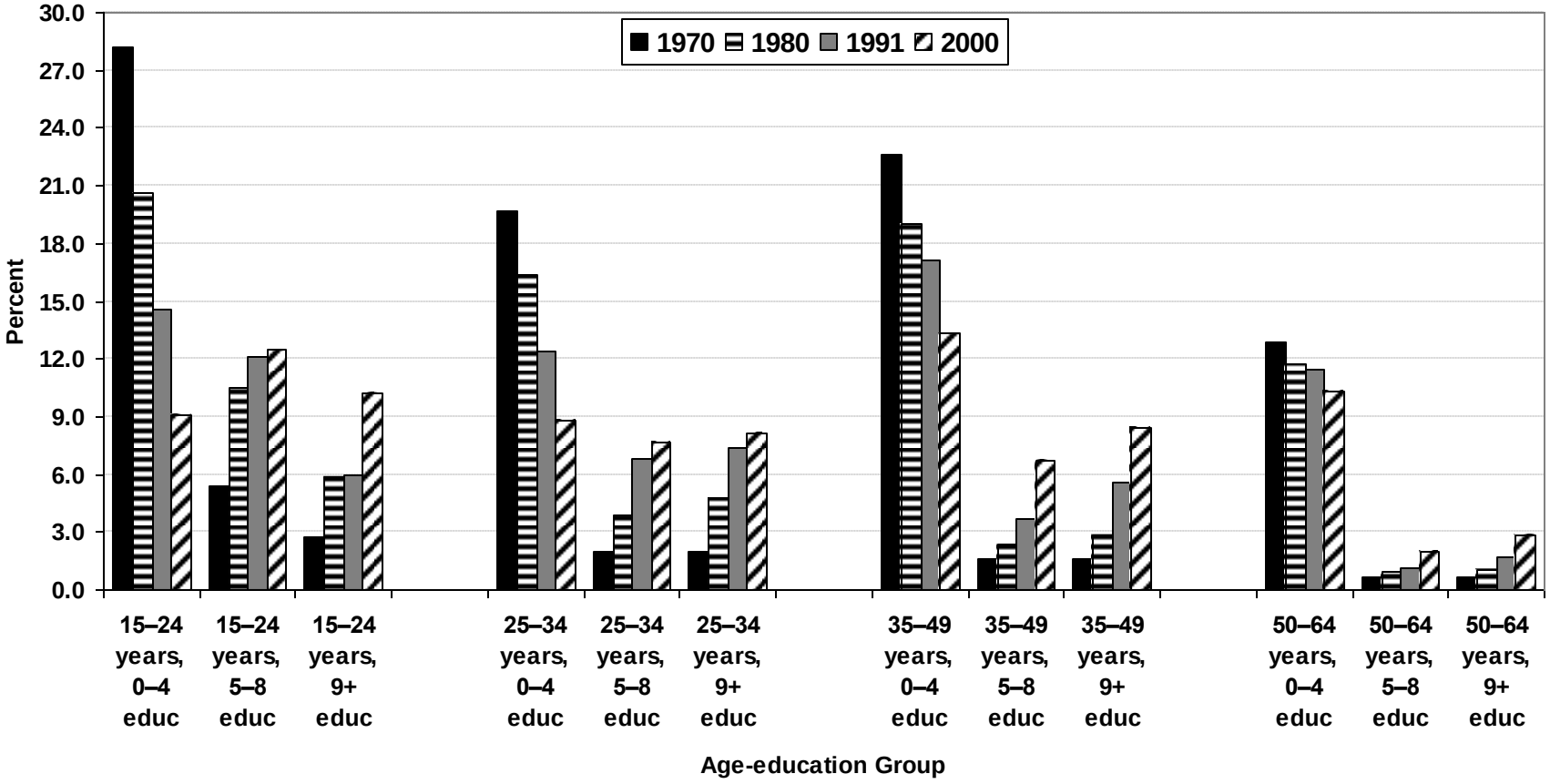
Source: 2000 Brazilian Census.

Methods

- A major challenge is the problem of selectivity. Someone who converts to the Asamblea de Deus or the Igreja Universal is not a randomly selected individual. How can we assess the effect of the “treatment” in such a case? The way we attempt to overcome this difficulty is by looking at **groups rather than individuals**.

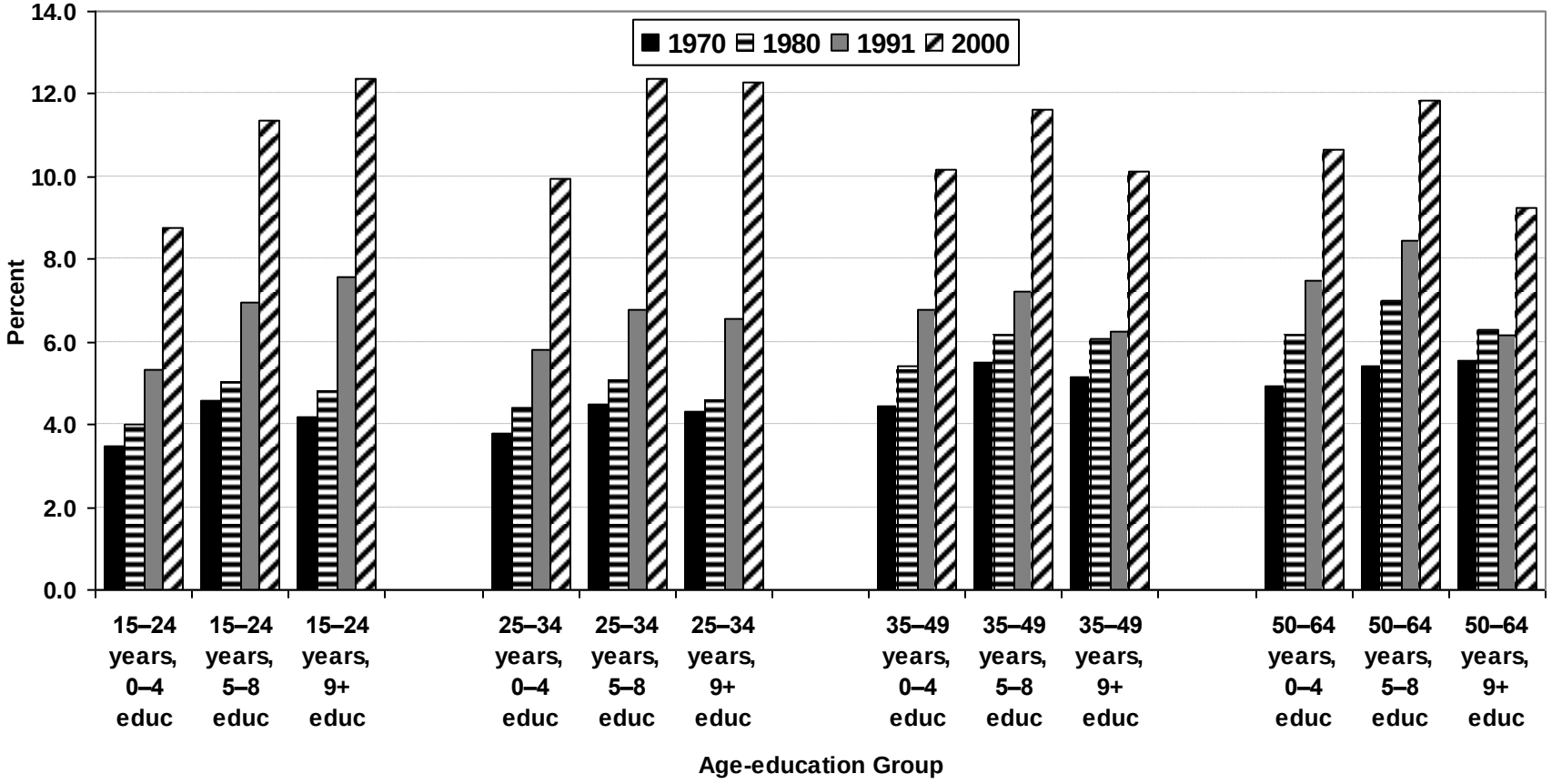
The groups we will use are defined by both age and education…

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



Source: 1970–2000 Brazilian Censuses.

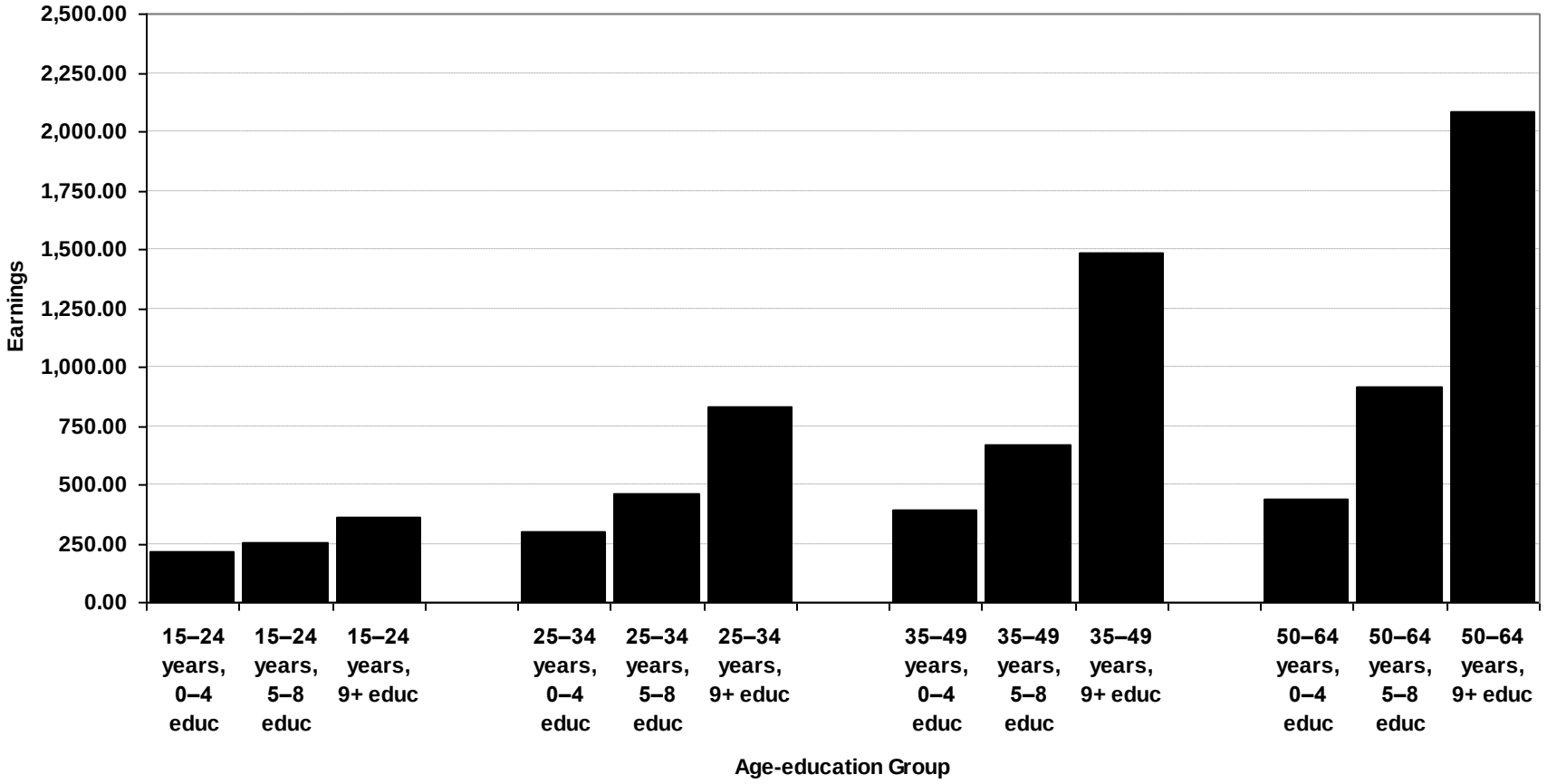
Percent Protestant of the Male Labor Force (15–64 years of age) by Year and Age-Education Group, 1970–2000



Source: 1970–2000 Brazilian Censuses.

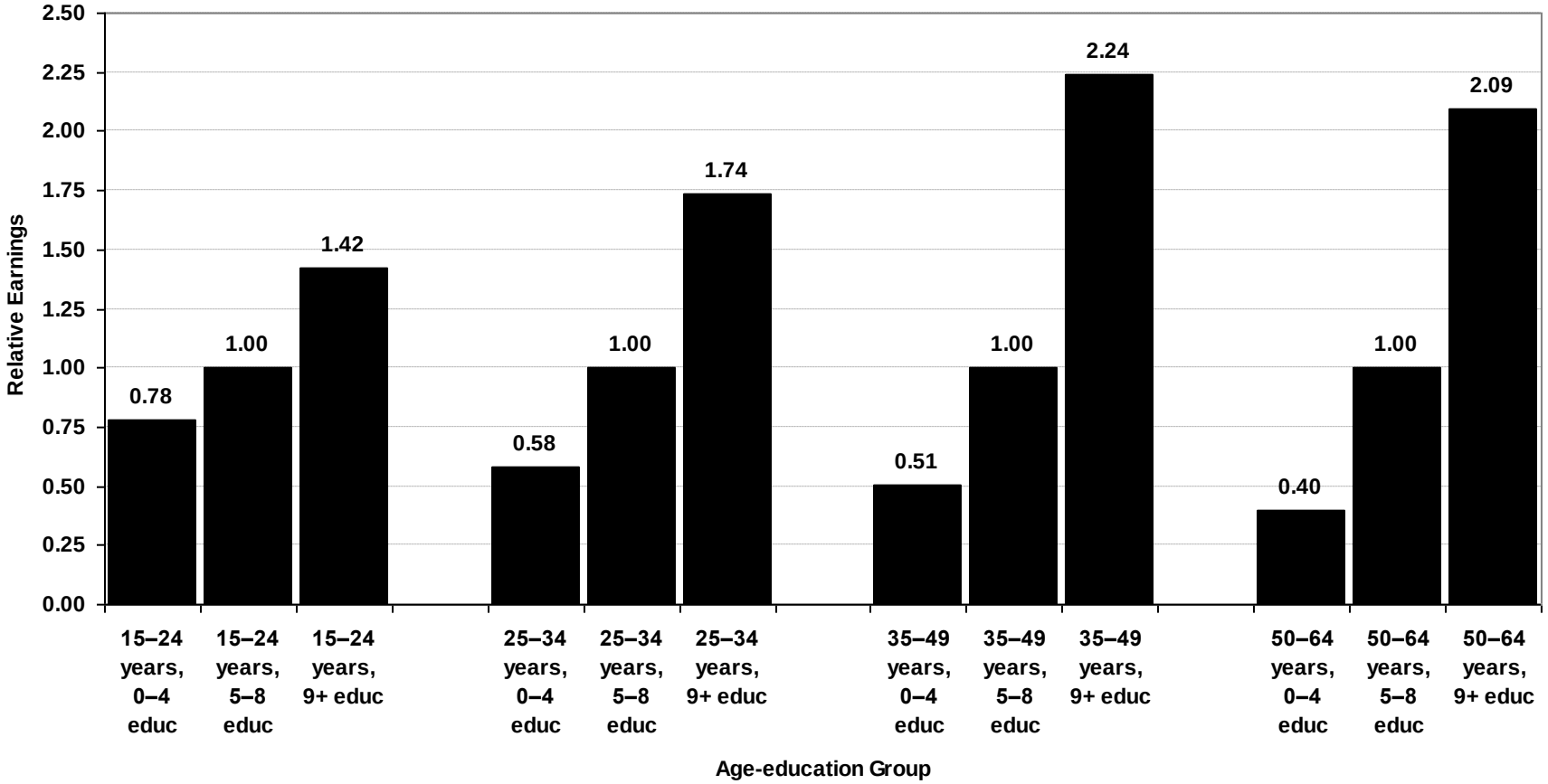
Now, to give you an idea of the strategy we have adopted, I am going to show a simple exercise using these 12 groups…

Mean Real Monthly Earnings of Male Population (15–64 years of age) by Age-Education Group, 2000



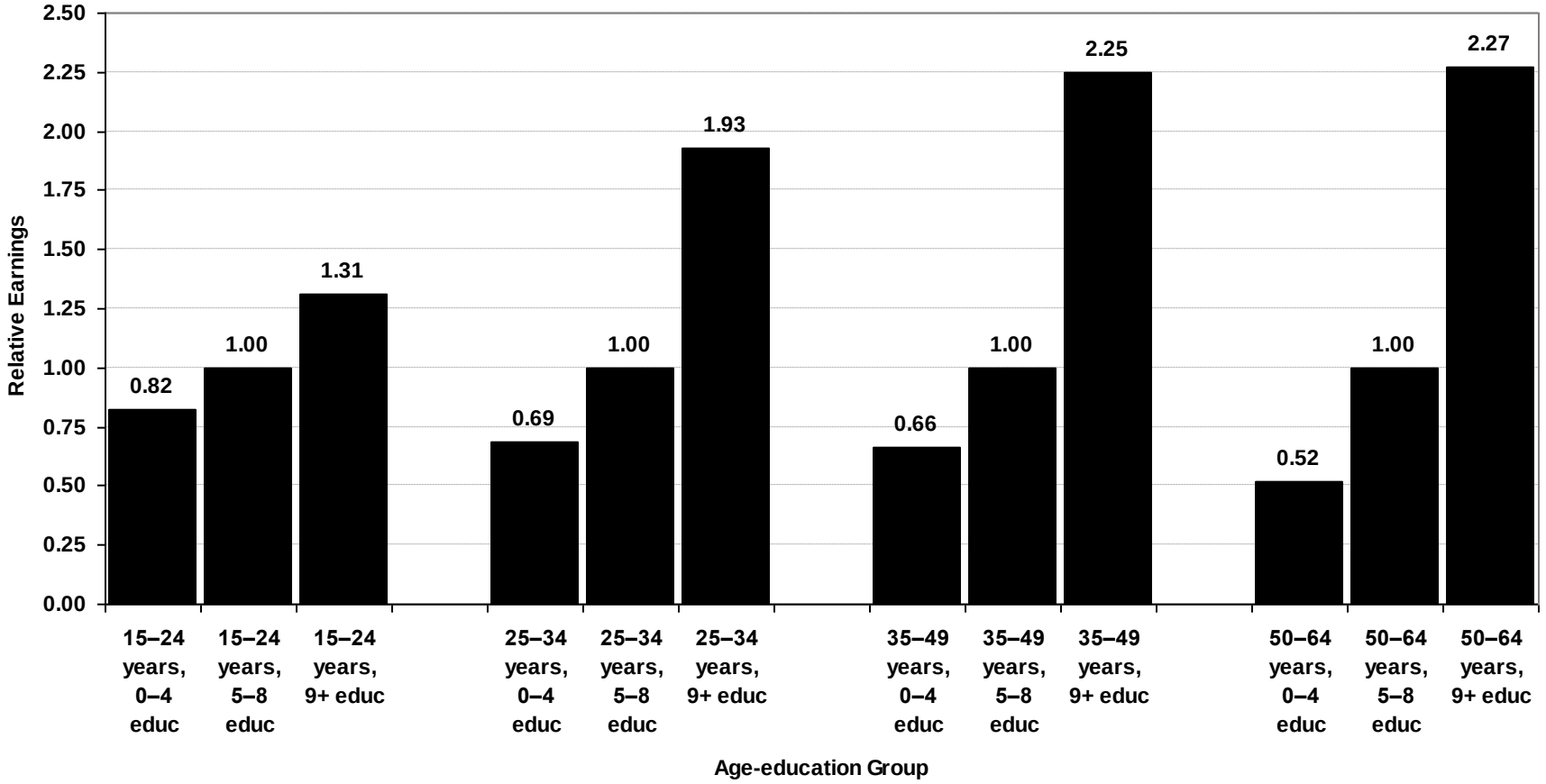
Source: 2000 Brazilian Census.

Relative Earnings to the 5–8 Education Group for Micro-Regions on the 10th Percentile of Protestants by Age-Education Group, 2000



Source: 2000 Brazilian Census.

Relative Earnings to the 5–8 Education Group for Micro-Regions on the 90th Percentile of Protestants by Age-Education Group, 2000



Source: 2000 Brazilian Census.

Statistical Modeling

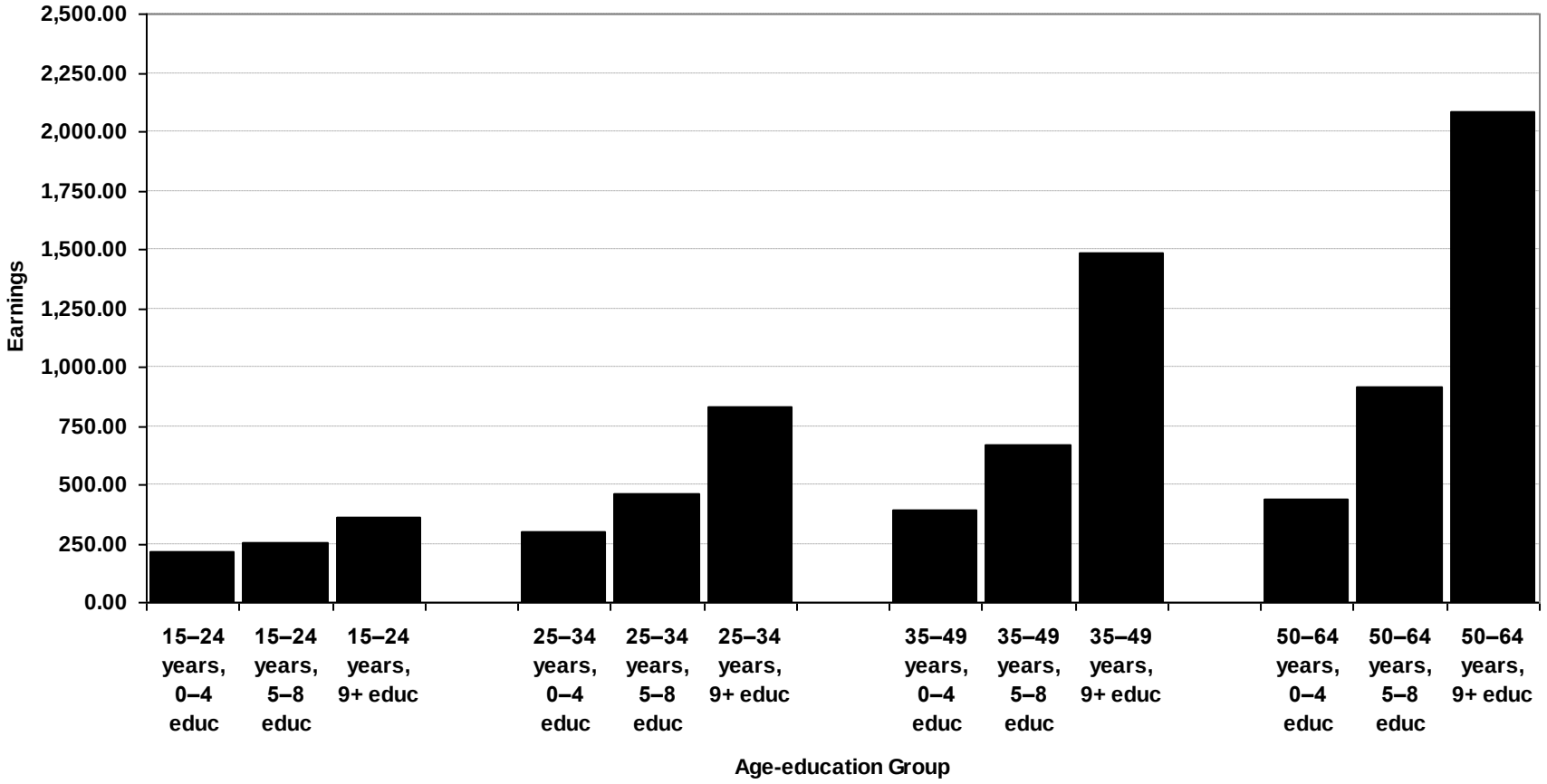
- Unit of analysis: the group defined by age, education, and microregion—12*502 units.
- Dependent Variable: logarithm of mean income of the members of the group in the microregion.
- Independent Variables: indicators for age and education and year, the proportion of Protestants in the group, plus fixed effects for each microregion in each period.

What we estimate:

- Age*Education*Year
- Region*Year
- %Protestant*Age*Education

- And then
- %Protestant*Age*Education*Year

Mean Real Monthly Earnings of Male Population (15–64 years of age) by Age-Education Group, 2000



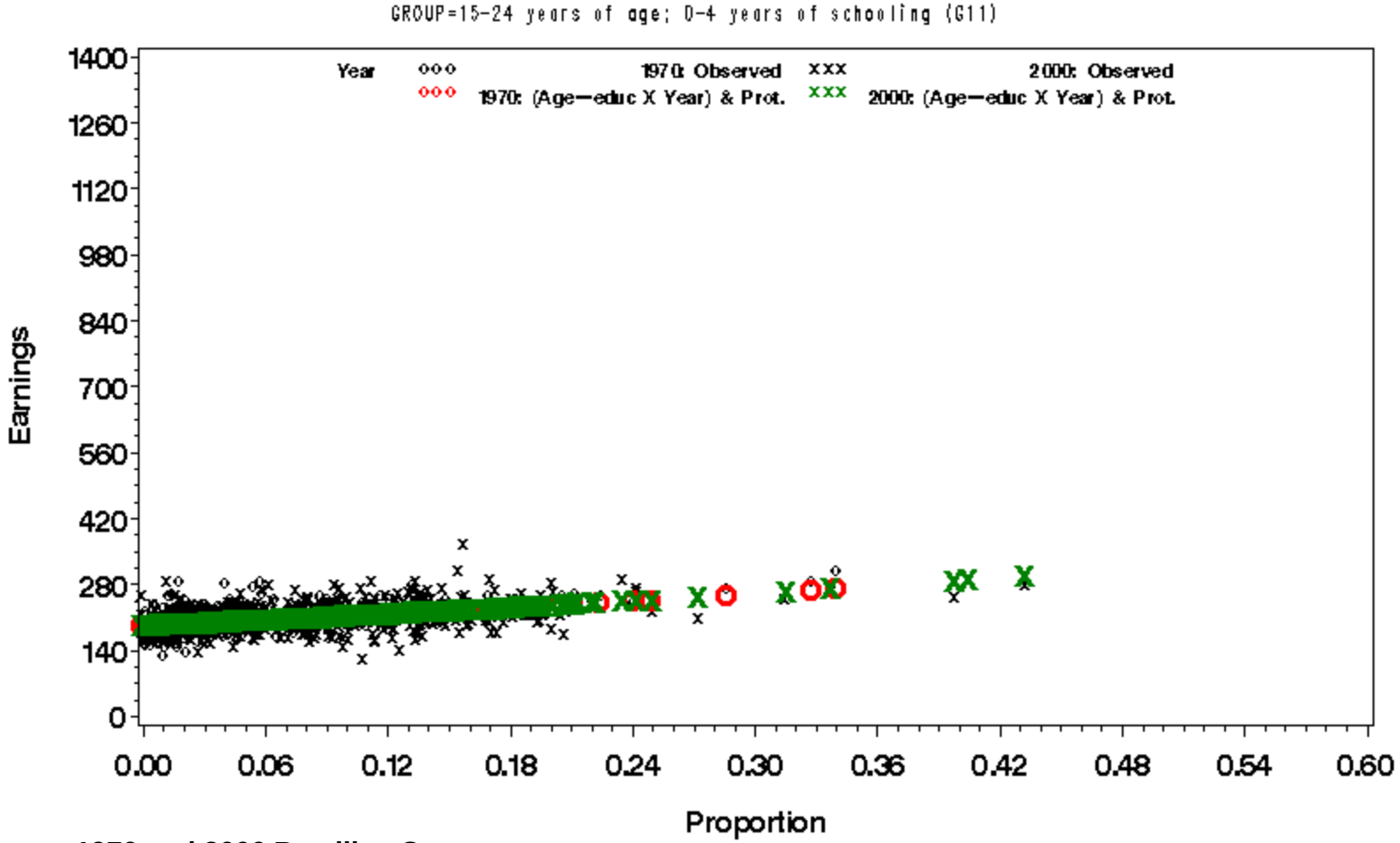
Source: 2000 Brazilian Census.

The results are…

- That there is a substantial effect of Protestantism on the earnings of those with 0-4 years of education.
- However, there is a much smaller (often neglible) effect in the other education groups.

Model with Age-education Group Indicators Interacted with Year, and Proportion of Protestants

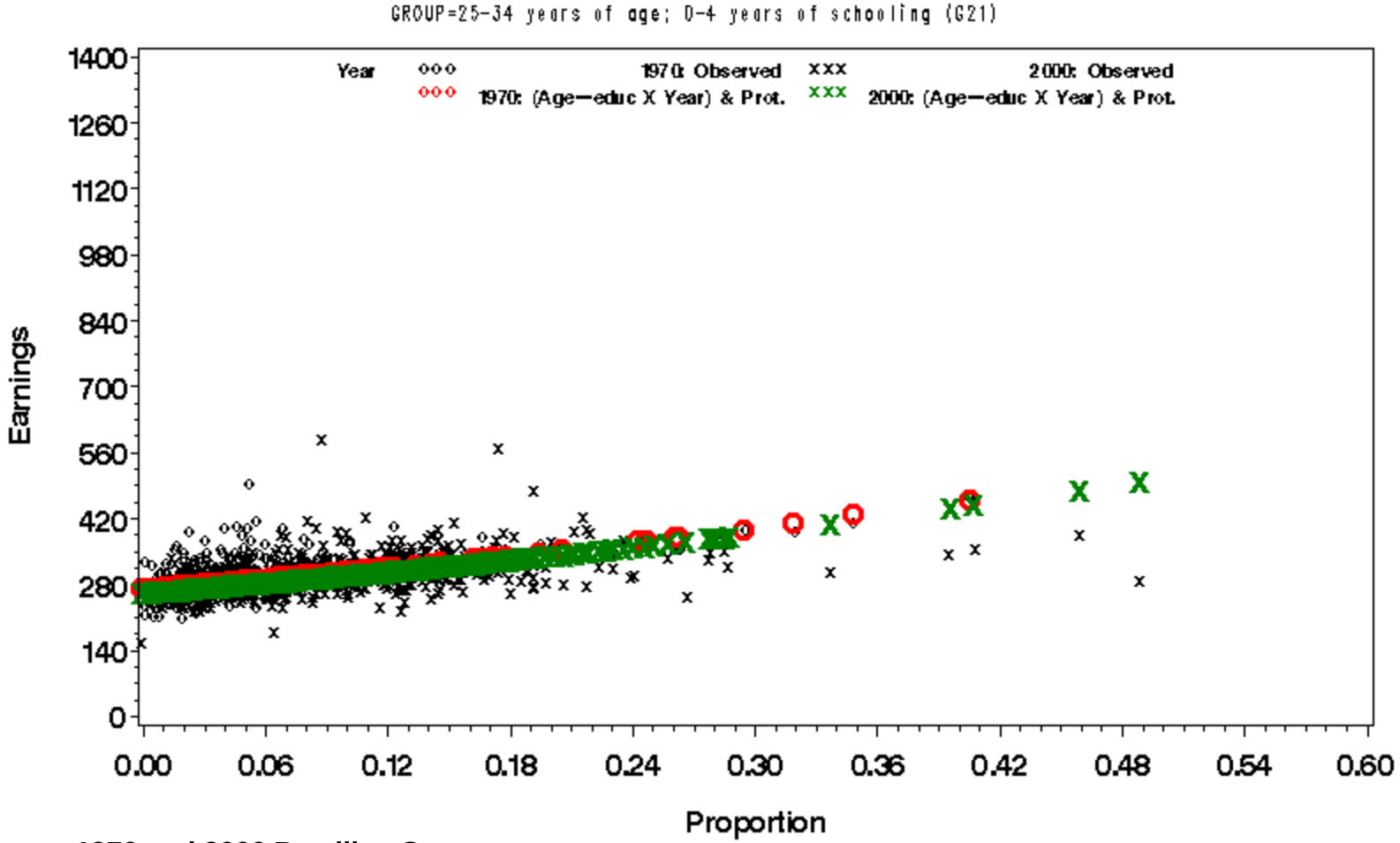
Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects for 15–24 Age Group and 0–4 Education Group by Proportion of Protestants, 1970 and 2000



Source: 1970 and 2000 Brazilian Censuses.

Model with Age-education Group Indicators Interacted with Year, and Proportion of Protestants

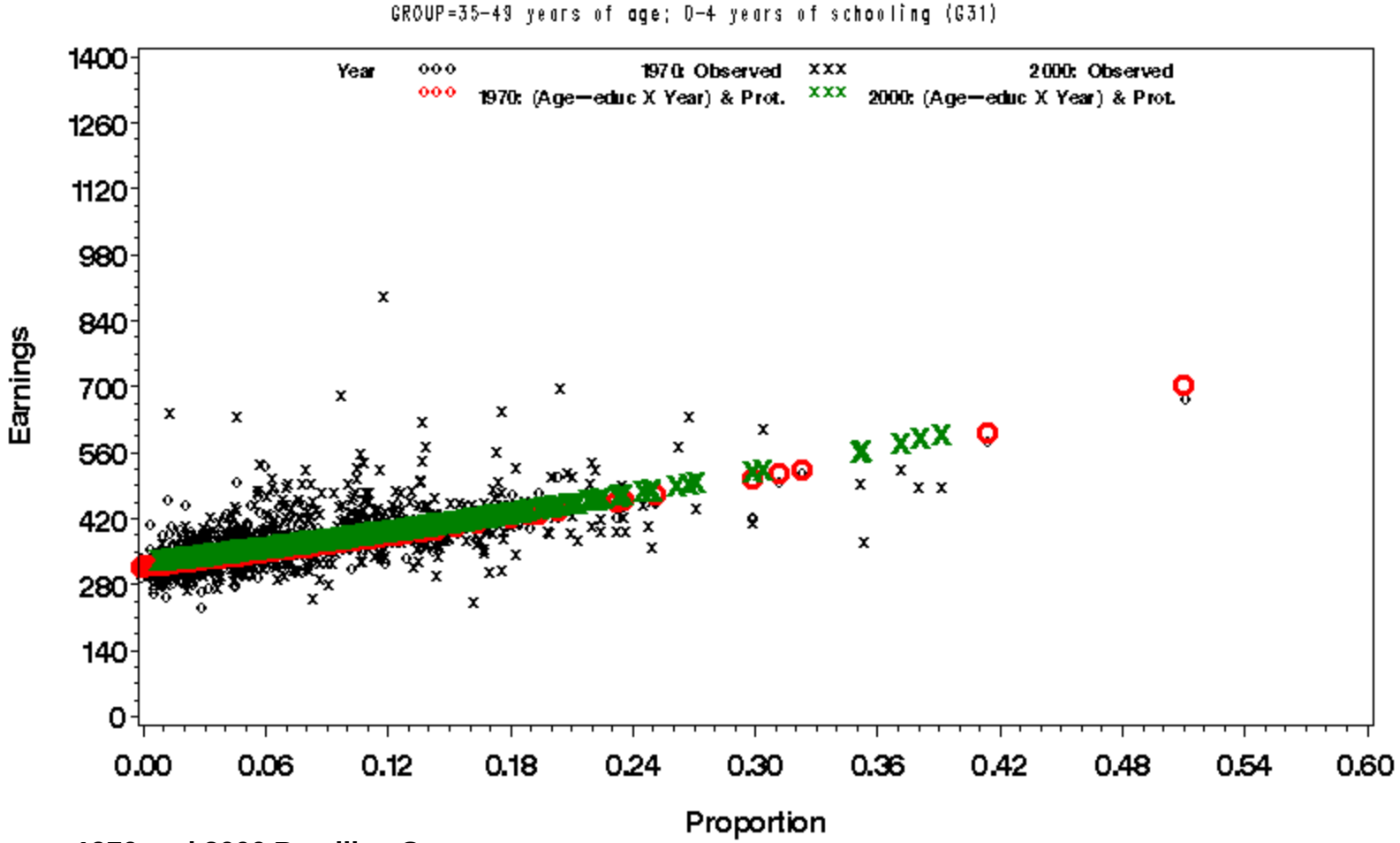
Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects for 25–34 Age Group and 0–4 Education Group by Proportion of Protestants, 1970 and 2000



Source: 1970 and 2000 Brazilian Censuses.

Model with Age-education Group Indicators Interacted with Year, and Proportion of Protestants

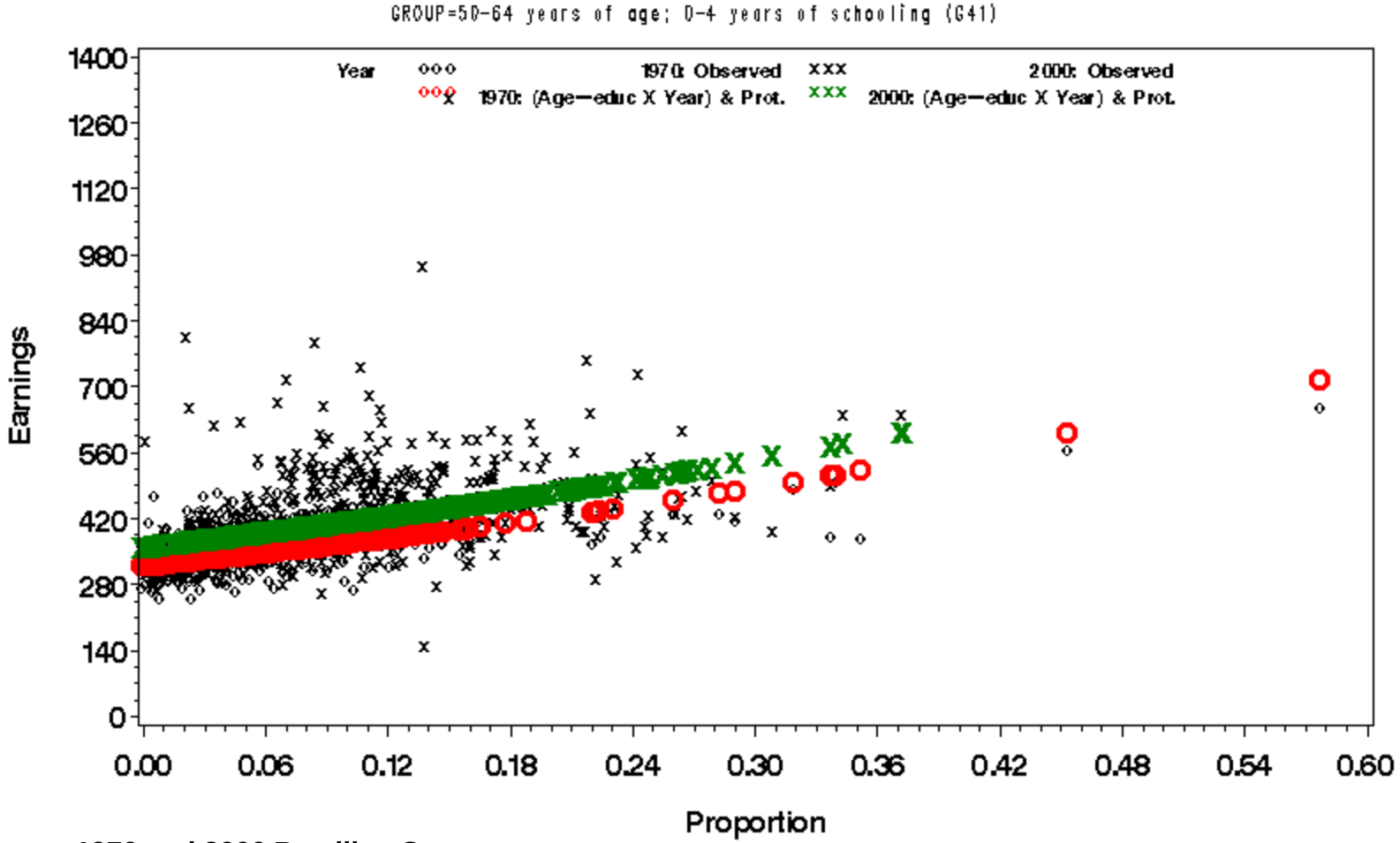
Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects for 35–49 Age Group and 0–4 Education Group by Proportion of Protestants, 1970 and 2000



Source: 1970 and 2000 Brazilian Censuses.

Model with Age-education Group Indicators Interacted with Year, and Proportion of Protestants

Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects for 50–64 Age Group and 0–4 Education Group by Proportion of Protestants, 1970 and 2000



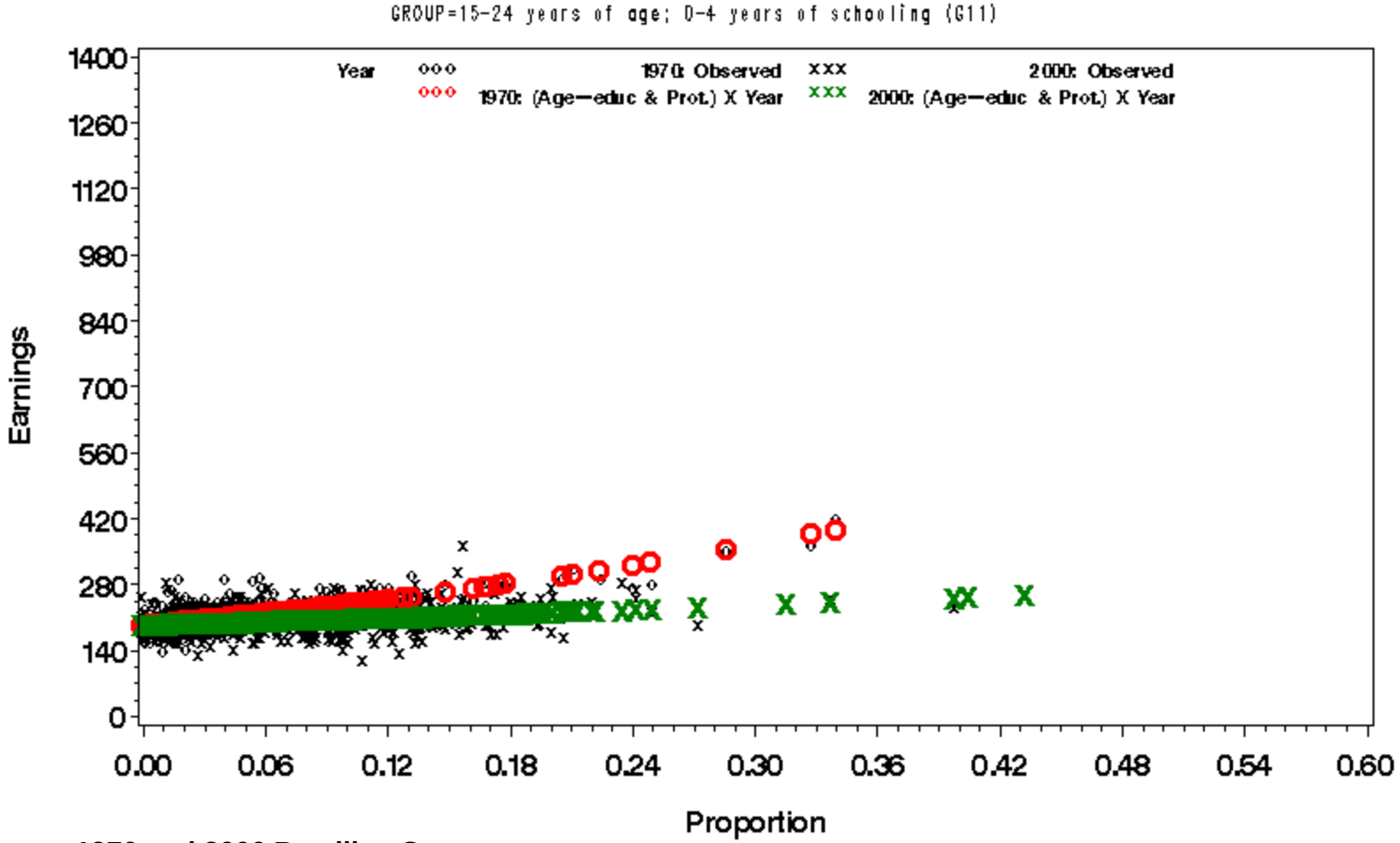
Source: 1970 and 2000 Brazilian Censuses.

Why might the impact change through time?

- The mix of Protestant Churches changes, advent of neopentecostal churches which are said to be less strict.
- Because the first to convert are those who benefit most from conversion.

Model with Age-education Group Indicators and Proportion of Protestants Interacted with Year

Observed and Predicted Real Mean Earnings Without Area and Time Fixed Effects for 15–24 Age Group and 0–4 Education Group by Proportion of Protestants, 1970 and 2000



Source: 1970 and 2000 Brazilian Censuses.

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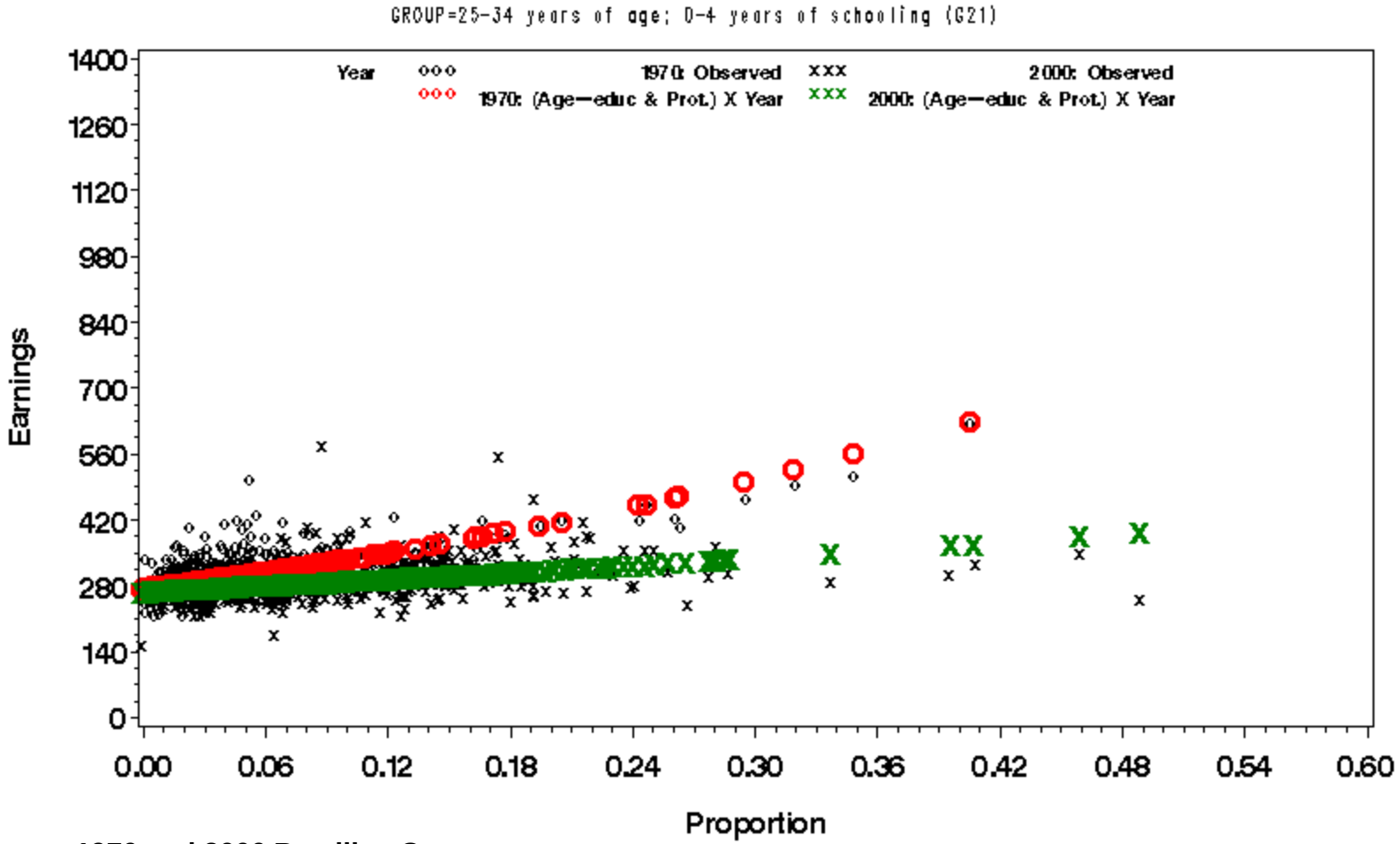

Source: 1970 and 2000 Brazilian Censuses.

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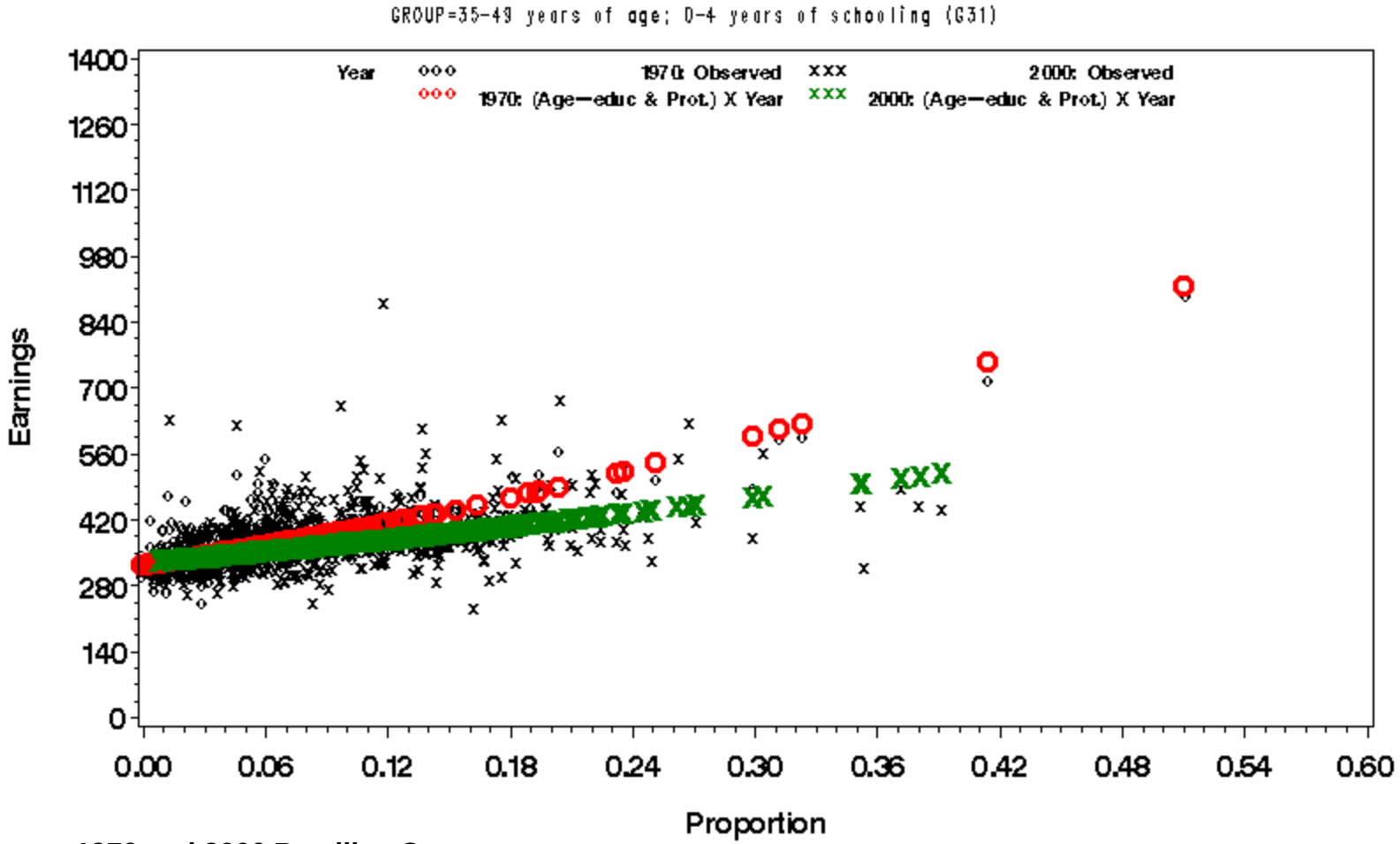

Source: 1970 and 2000 Brazilian Censuses.

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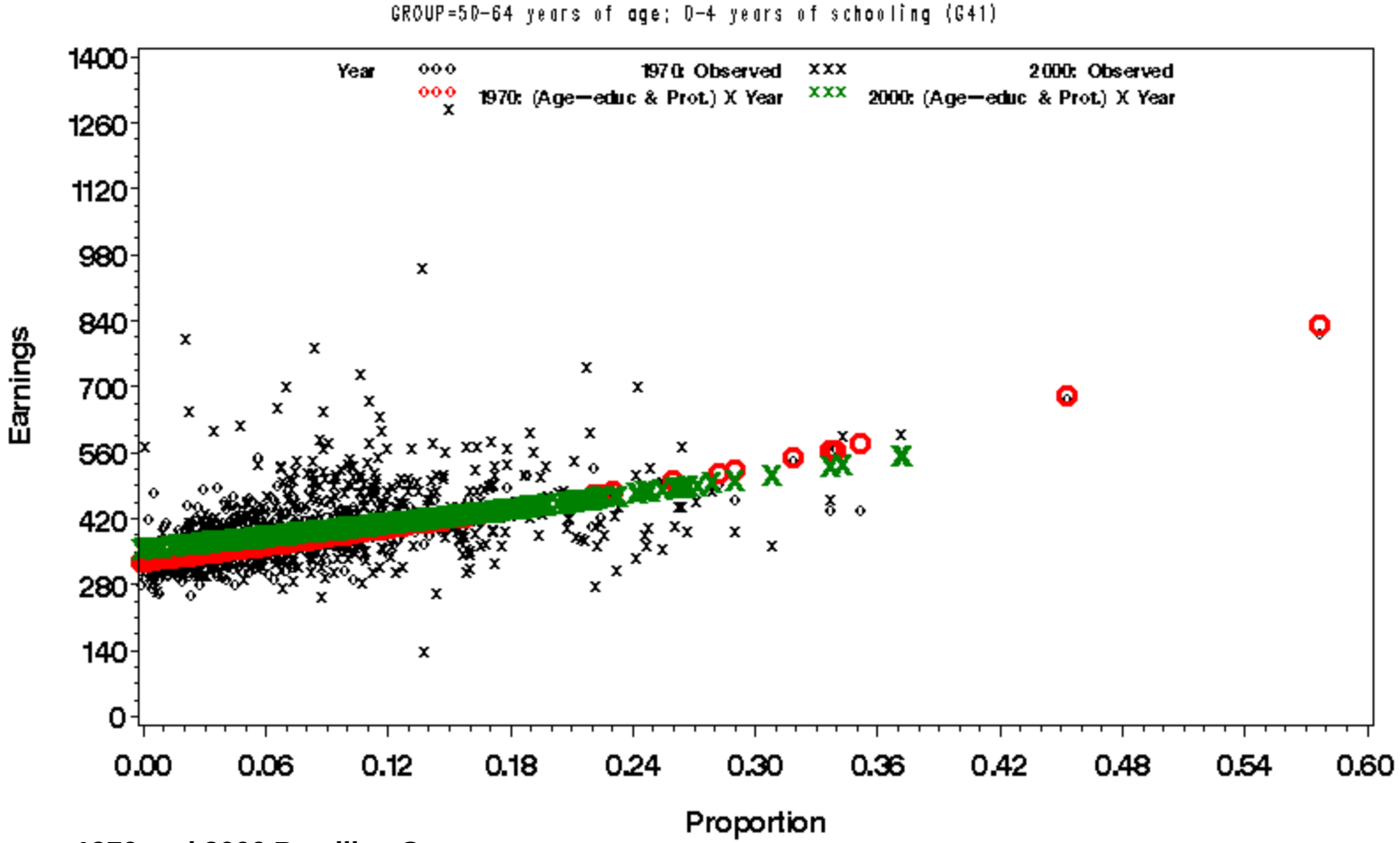

Source: 1970 and 2000 Brazilian Censuses.

Model with Age-education Group Indicators and Square Root of Proportion of Protestants Interacted with Year

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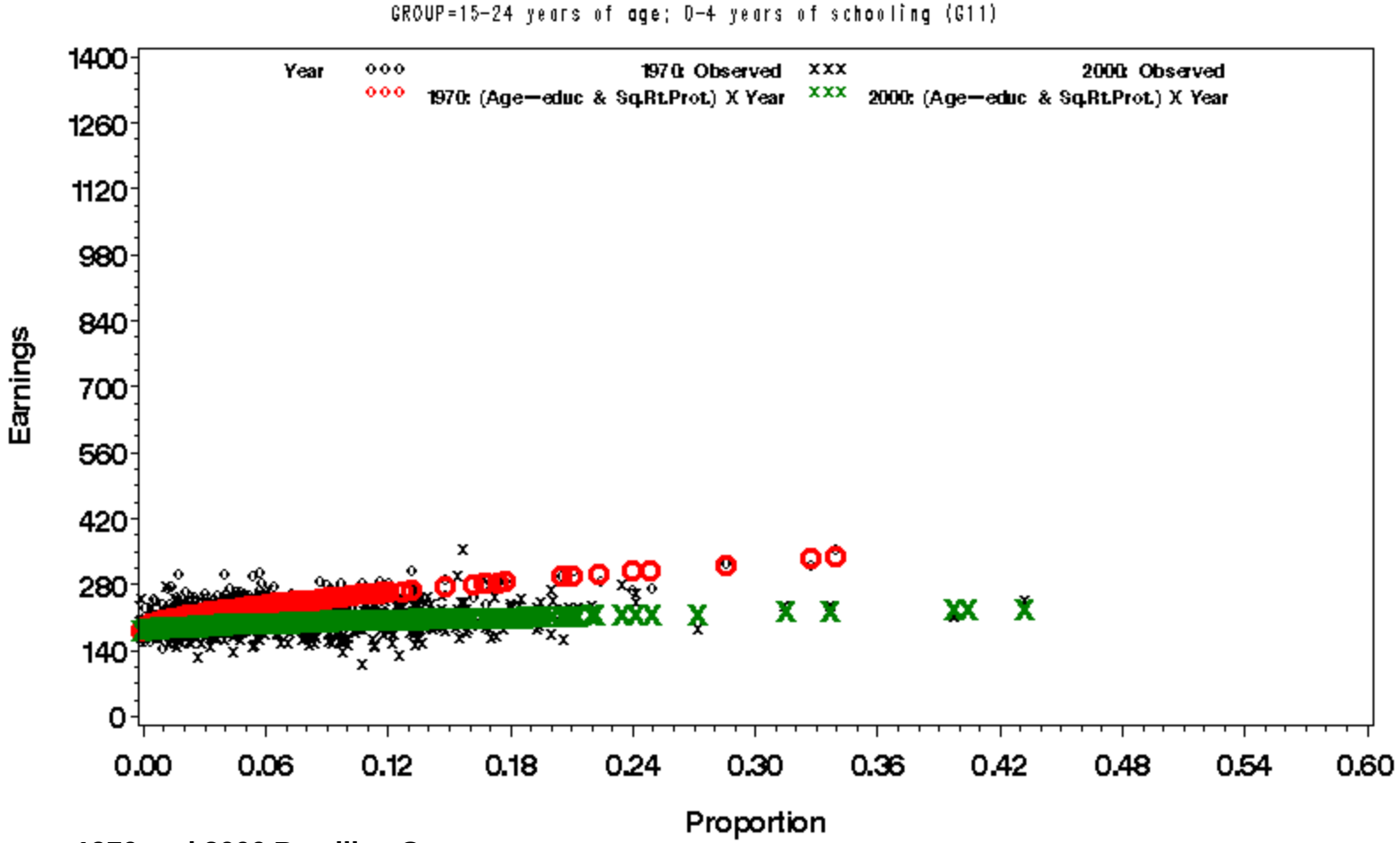

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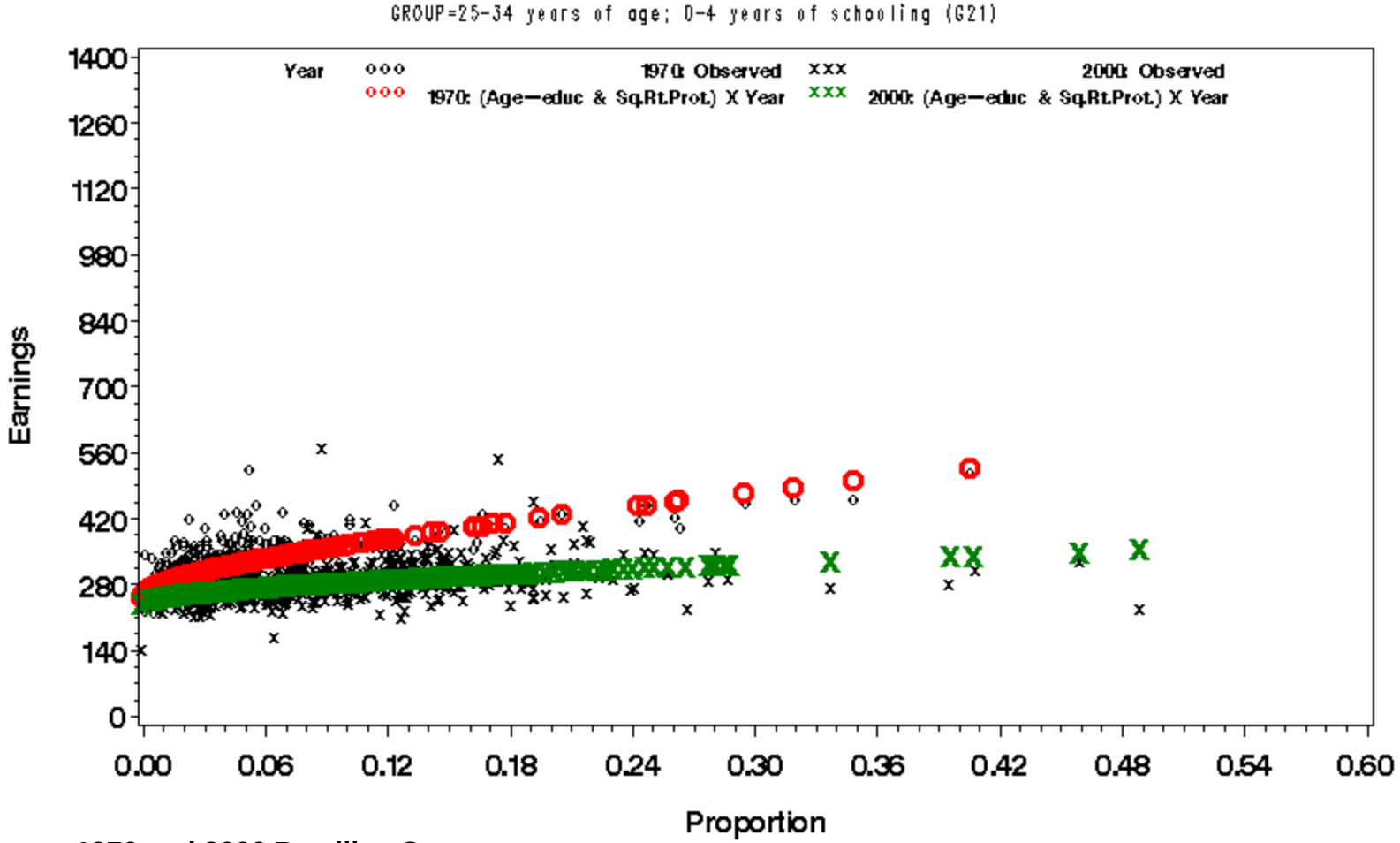

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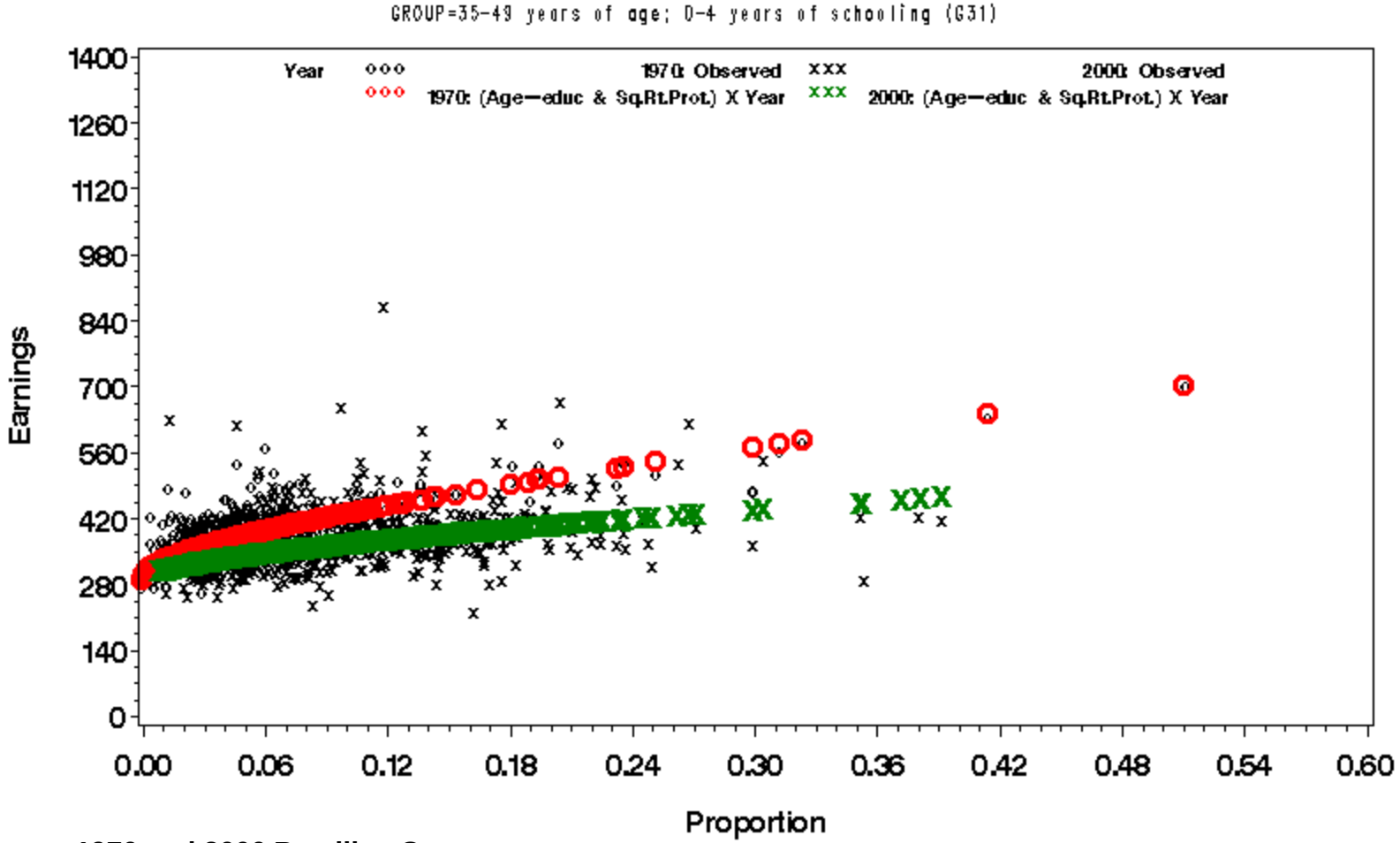

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Model with Age-education Group Indicators and Square Root of Proportion of Protestants Interacted with Year

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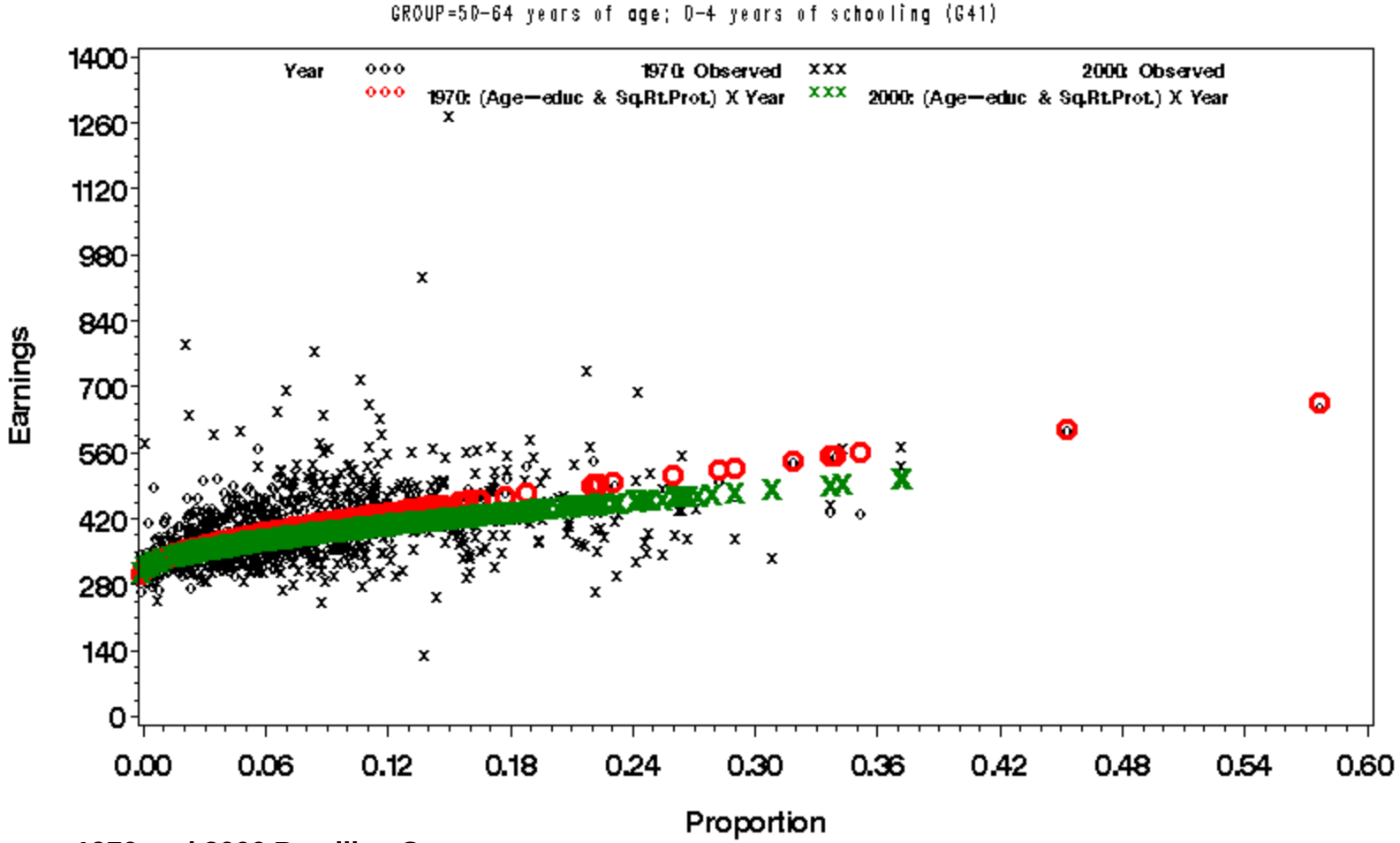


Source: 1970 and 2000 Brazilian Censuses.

How to interpret these results?

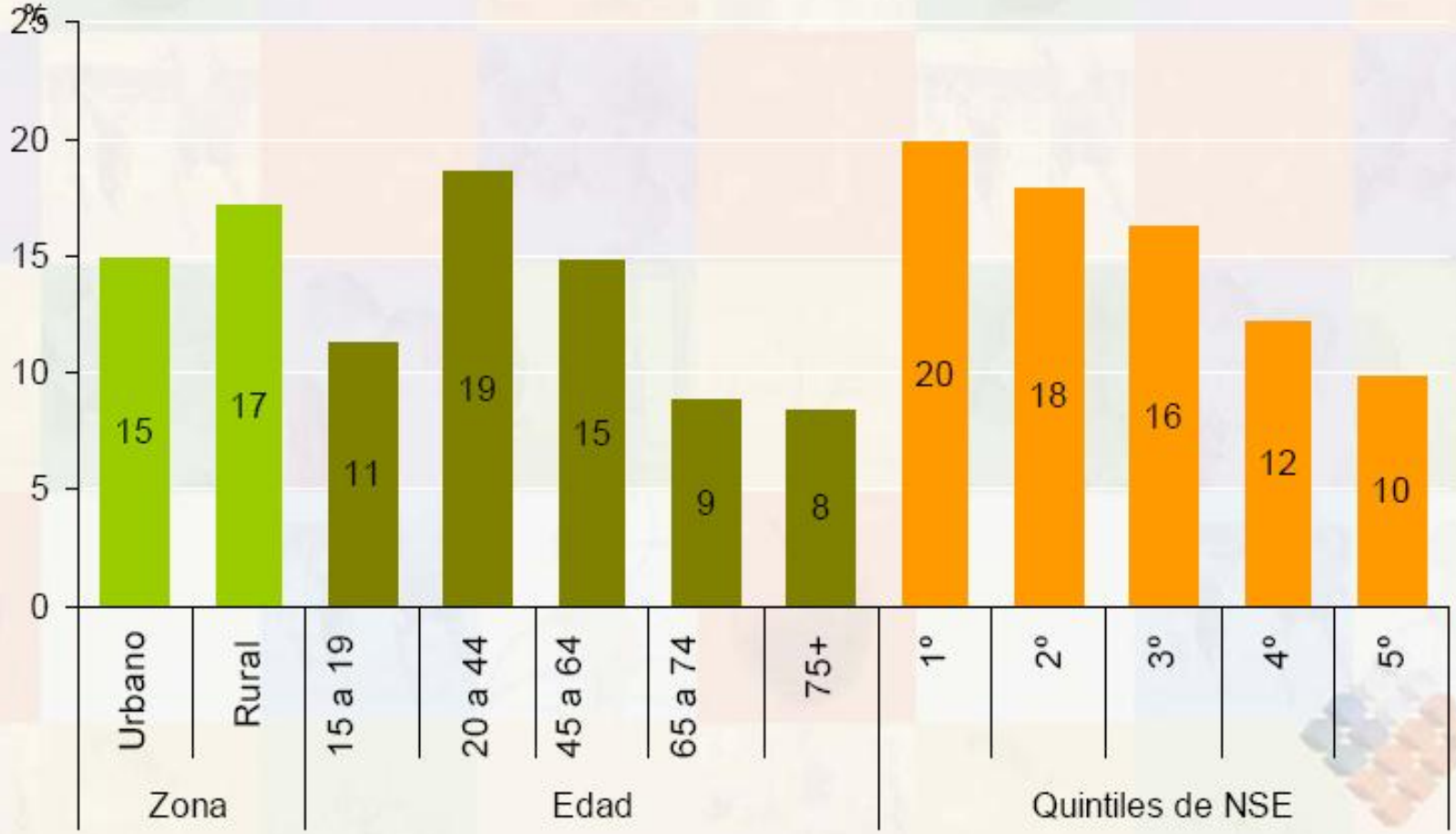
- Could selectivity or some unobserved variable(s) account for the results?
- The modeling tells us that the effect is concentrated in those groups with the least education, and that it was larger in 1970 than in 2000.
- However, it says nothing about what might account for the impact.

Might it be alcohol?

- There is little information on the prevalence of alcoholism and problem drinking in Brazil, but I did find a nice graph for Chile. The graph shows the incidence of problem drinking for both men and women, but this incidence is four times higher for men than for women.

Consumo de Alcohol

Prevalencia de bebedores problema



What else could produce such a pattern?

- Could there be something else going on in the places where there are lots of Protestants that would lead to those with low education having higher incomes?
- For instance, could the Protestant Churches be targeting those areas in which those with low education have relatively high incomes?

I don’t think so…

- It seems to me that the Ronaldo da Silva story is a more plausible explanation, and that, yes, the effect did decline through time for both of the reasons mentioned earlier, but I am eager to have your reactions!