

REGIONAL DIFFERENCES IN LABOR INCOME AND CONSUMPTION PROFILES AND SUPPORT RATIOS: AN ANALYSIS IN BRAZILIAN STATES

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Abstract

Population aging is a fundamental source of socioeconomic changes. The changing age structure poses some challenges in the economic circumstances of countries by the potential increase in the levels of dependency. This paper aims to describe the regional differences in Brazilian labor income and consumption age profiles and to assess its consequences, along with population changes, on economic support ratios. Data from the 2017 Household Budget Survey (POF) and IBGE population projection by state were used. These data were used to estimate the age profiles of consumption and labor income. I calculated state economic support ratios (ESRs) for 2017 and used the population projection to project ESRs. Results show that each Brazilian state has a specific behavior in terms of labor income and consumption and there is a gradient in support ratios.

Keywords: labor income, consumption, support ratio, Brazil.

1 Introduction

Population aging is a fundamental source of socioeconomic changes regarding many life cycle characteristics such as education, labor market, retirement, health, among others (Bloom et al., 2021). Due to its multifactorial essence (Coile, Milligan & Wise, 2017), one cannot disentangle the demographic changes from its various interrelated variables.

The changing age structure poses some challenges in the economic circumstances of countries by the potential increase in the levels of dependency: a higher number of dependent people as a proportion of the total population (Bloom et al., 2021). In terms of the maintenance of transfer systems, such phenomenon is characterized by an increasing number of people receiving pension benefits *vis-à-vis* a decrease in the contribution density (Turra, Queiroz, & Rios-Neto, 2011).

In general, such analyses are performed at the national level. However, within countries differences in the aging process can produce different geographic aspects of support, i.e., the capacity of producers to sustain the consumption of those in dependency (Baerlocher, Parente, & Rios-Neto, 2019). In addition, such disparities can also reflect on labor income and consumption age profiles. In other words, regional differences translate into average labor income and consumption (that can be implied by the aging process), and on the so-called economic support ratios (Loichinger et al., 2017).

This phenomenon is particularly important in developing countries that experience rapid demographic changes and are characterized by incipient labor markets and high levels of inequalities in many aspects (gender, race, aging, education attainment, access to health services). I use data from Brazil to perform such an analysis on the levels of its states. Therefore, this article aims to describe regional differences in labor income and consumption age profiles and to assess its consequences, along with population changes, on economic support ratios.

2 Data and methods

I used data from the 2017 Household Budget Survey (POF), a nationally representative survey collected by IBGE on household information. These data were used to estimate the age profiles of consumption and labor income following aspects of the NTA manual (UN, 2013). Population projected by age and state was collected from SIDRA, a system of aggregate data organized by IBGE. It ranges from 2000 to 2060.

Labor income profiles by state were constructed following UN (2013) by deflating labor income and subtracting from it pension contributions, taxes, and 20% of patronal contributions. Household values were tabulated by age and smoothed using Lowess regressions. Private consumption was estimated from three subgroups: education, health, and others, each of which has a specific estimation method (UN, 2013). Public consumption was also considered in the calculations. Finally, data were submitted to aggregated macro-controls.

Labor income and consumption profiles also serve as weights in the calculation of economic support ratios (ESR), which are denoted by the ratio between effective producers and effective consumers. I calculated state ESRs for 2017 and used the population projection to project ESRs under two circumstances/scenarios: *i*) constancy of labor income and consumptions profile weights in 2017 level and, *ii*) convergence of the

weights to the Brazilian average in 2060. I also compare ESRs to Demographic Support Ratios (DSR) that rigidly imposes ages at which individuals are considered (in)dependent.

3 Results

Figure 1 shows labor income and consumption profiles for each Brazilian state. As reported by Turra, Queiroz and Rios-Neto (2011), these profiles follow a common behavior: labor income starts to rise around age 20 and decreases around 55-60 years. Consumption functions have an increasing behavior as the age goes on.

Some peculiarities deserve attention. In some states, labor income peaks in advanced ages. One can infer that this situation is due to a higher proportion of elderly people who remain on the labor market. This is the case of Federal District (DF), where the peak can be explained by a considerable number of public servants at high-status occupations. Other states are Goiás (GO), Paraíba (PB), Roraima (RR), and Tocantins (TO).

Consumption lines differ in level and, along with labor income, can produce differences in economic support ratios (ESRs). Figure 2 shows a map with the ESR for each Brazilian state in 2017. As pointed out by Loichinger et al. (2017) and Baerlocher, Parente, and Rios-Neto (2019), there is a regional difference in the economic capacity to support people in dependency.

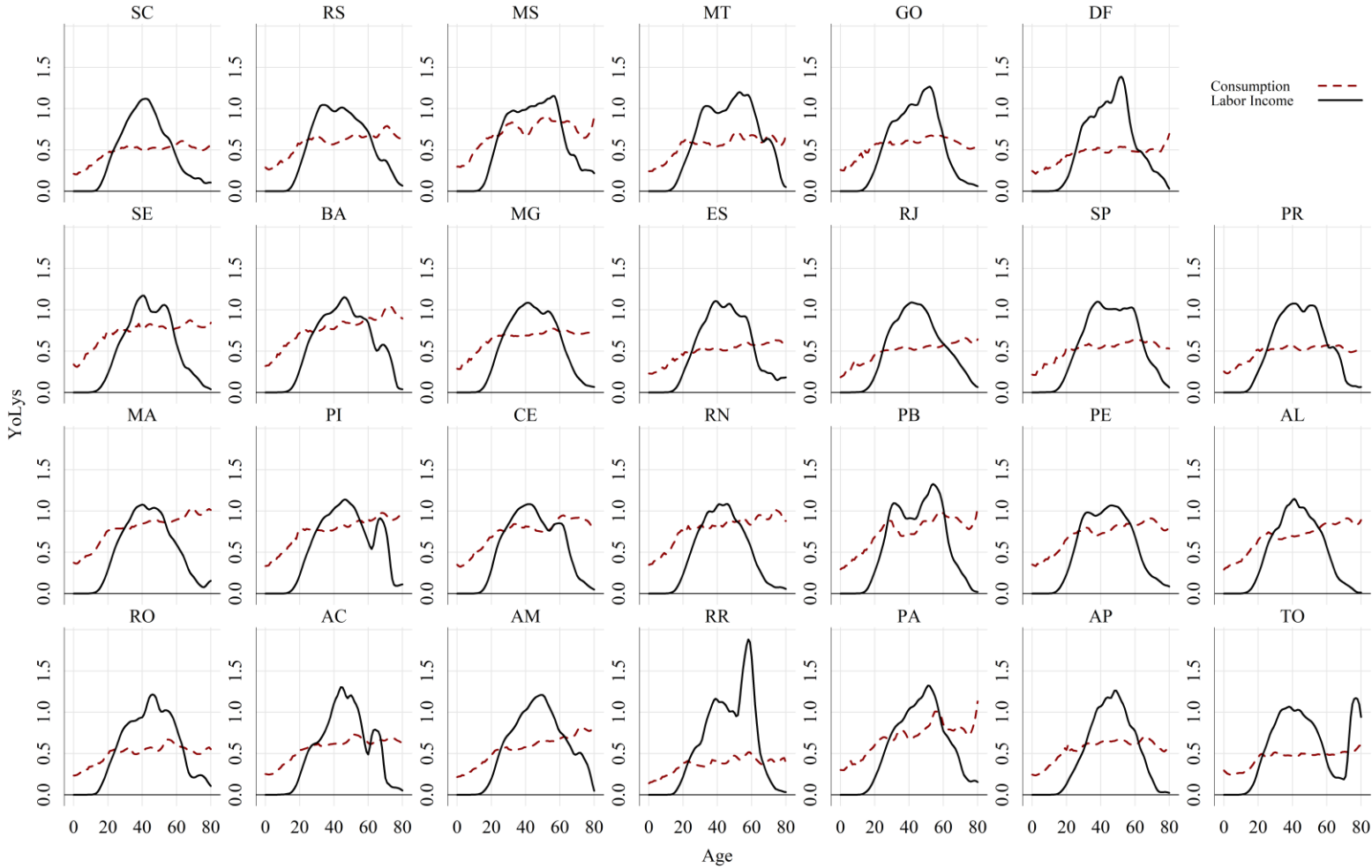
There are any apparent patterns, with the exception of northern states, those in the Amazon region (Acre – AC, Amazonas – AM, Amapá – AP, Pará – PA Roraima – RO), that show low levels of support ratios. This can be explained by the highest fertility levels in the region, which results in a high number of children as a proportion of the whole population. Table 1 shows the support ratios for some states (one by region).

Table 1: Demographic and Economic Support Ratios of Selected Brazilian States, 2020-2060

	2020	2030	2040	2050	2060
Panel A: Demographic Support Ratios					
Amazonas (AM)	0.6674	0.6883	0.6959	0.6859	0.6755
Bahia (BA)	0.7081	0.7032	0.6922	0.6604	0.6365
São Paulo (SP)	0.7111	0.6924	0.6823	0.6580	0.6432
Rio Grande do Sul (RS)	0.7046	0.6719	0.6684	0.6541	0.6302
Goiás (GO)	0.7124	0.7024	0.6942	0.6763	0.6642
Panel B: Economic Support Ratios - constant weights					
Amazonas (AM)	1.0138	1.0675	1.0884	1.0874	1.0761
Bahia (BA)	1.0897	1.1185	1.1017	1.0693	1.0348
São Paulo (SP)	1.1059	1.1021	1.0869	1.0627	1.0468
Rio Grande do Sul (RS)	1.1132	1.0936	1.0679	1.0484	1.0222
Goiás (GO)	1.1270	1.1295	1.1078	1.0829	1.0683
Panel C: Economic Support Ratios - convergent weights					
Amazonas (AM)	1.0136	1.0665	1.0876	1.0866	1.0766
Bahia (BA)	1.0898	1.1189	1.1030	1.0673	1.0353
São Paulo (SP)	1.1070	1.1057	1.0894	1.0636	1.0467
Rio Grande do Sul (RS)	1.1124	1.0928	1.0717	1.0545	1.0289
Goiás (GO)	1.1261	1.1264	1.1038	1.0813	1.0696

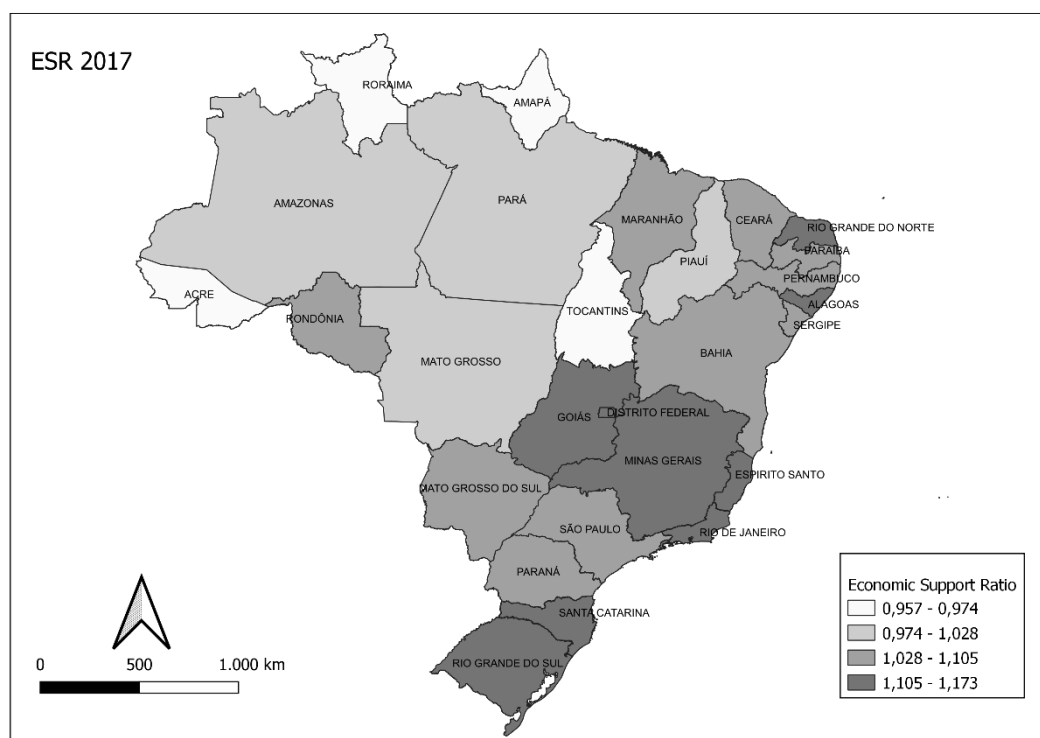
Source: POF (2017), and IBGE (2023).

Figure 1: Labor income and consumption age profiles for each Brazilian state, 2017



Source: POF (2017).

Figure 2: Brazilian states economic support ratios, 2017



Source: POF (2017).

4 Conclusions

Within country differences in the aging process can influence and be influenced by differences in other sociodemographic aspects. Each Brazilian state has a specific behavior in terms of labor income and consumption. In general, there are only differences in the level the curve of consumption, but considerable particularities in the labor income function.

This, in association with aging populations, produces a gradient in support ratios. In general, states with younger populations have a higher level of dependency. Those are in the amazon region. These differences have some impact on other aspects such as the labor market, health services, and the pension system.

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