

Regional attributes associated with youth school enrolment in Brazil

Abstract:

In this paper we evaluate the regional attributes associated with school enrolment for youth between 15 and 17 years old in Brazil using a spatiotemporal approach. School enrolment for this specific age group is far from ideal in Brazil. Although access to school is almost universal for children aged 6 to 14, enrolment rates for youth were 82,6% in 2014 (Inep, 2015). In spite of the recent gains in enrolment rates for this age group, their school participation is marked by high age grade mismatch. The effect of socioeconomic and individual characteristics on enrolment rates are well documented in the literature. In addition to these well know determinants, we look at the influence of regional characteristics and the effect of neighbouring and urban hierarchy over enrolment rates at a municipal level for years 1991, 2000 and 2010. We assess the stability of the coefficients over time, thus analysing the evolution of the degree of influence of each one of the factors.

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Introduction

In this paper we evaluate the regional attributes associated with school enrolment for youth between 15 and 17 years old in Brazil using a spatiotemporal approach. School enrollment grew during the past decades for all levels of education. Major gains were made in the 90's, when school coverage became almost universal for the population between 6 and 14 years old (Inep, 2015). In this paper, our objective is to evaluate the evolution of enrolment rates under three different perspectives: i) education; ii) demographic; iii) regional.

From an education perspective, the improvements made in enrollment rates of primary education were followed by the shortage in the provision of secondary education. However, this shortage was not random, neither individually or regionally. Unmet demand for secondary education was associated with (i) individual characteristics, with lower enrollment rates for those with lower socioeconomic status, and (ii) regional attributes, with lower school coverage in deprived areas.

From a demographic perspective, along with the educational transition, Brazil is going through a rapid demographic transition. Age structure is becoming older at a fast pace (Wong & Carvalho, 2006). Age groups 0-4 and 5-9 are already decreasing in absolute size, whilst group 15-19, which contemplates the demand for secondary education, grew rapidly during the 90's and 2000's. Sustained fertility decline helped the country to improve primary school rates, by reducing the pressure over the system (Riani & Rios-Neto, 2007). This "demographic dividend" in education also started to work in provision of secondary schooling in the recent years (Soares, 2008). Due to the historical shortage in provision, Brazil has not felt such demographic benefits at the secondary level. In spite of the fact that demand was scaled down by lower population growth in the 15-19 age group, a significant proportion of youth in this age group was out of the school system, diminishing the possible "bonus" on enrollment rates. Additionally, improvements in grade progression

in primary school level have increased the number of children reaching further in the schooling trajectory, contributing to inflate demand at the high school level.

From a regional perspective, provision of primary and secondary education is planned separately. Primary education is provided mostly at the municipality level whereas secondary education is planned and financed mostly at the state level. Despite the leveling effect on educational spending promoted by Fundeb, inequalities in the provision of secondary education are associated with disparities in states' revenue. Nonetheless, as we aim to show in this paper, local differences in enrollment rates within states also exist. These local inequalities can be associated with differences in socioeconomic attributes, which develop into lower educational attainment for poorer municipalities.

Methods

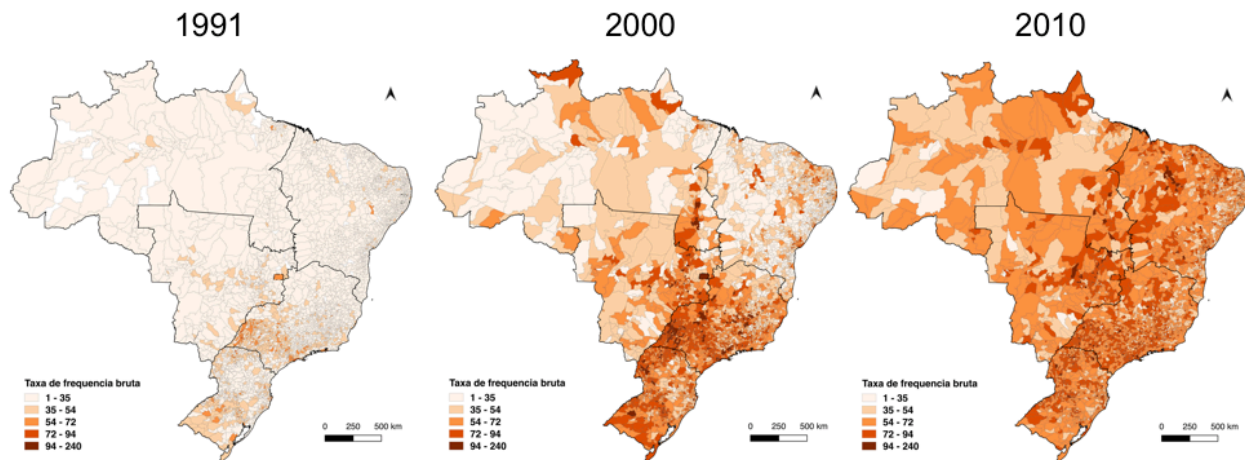
As enrollment rates at the primary level reached a maximum in Brazil, and therefore exposed the shortage in provision of secondary education, this paper analyzes what are the local attributes associated with enrollment rates at the secondary level between 1991 and 2010. Data was provided by the Demographic Censuses of 1991, 2000 and 2010.

We measure enrollment rate at the secondary level as the population enrolled in secondary education over total population between 15 and 17 years old. It is worthy to highlight that this ratio can be inflated by high grade retention rates. The correlate variables are: i) In-house bathroom, which average goes from 67% in 1991 to 87% in 2010; ii) Fertility rate, which average goes from 2.9 in 1991 to 1.9 in 2010; iii) Aging rate, which average goes from 4.8% in 1991 to 7.4% in 2010; iv) Rate of 6 to 14 years old attending school, which average goes from 76% in 1991 to 97% in 2010; v) Rate of 6 to 14 years old lagging at least 2 years at school, which average goes from 33% in 1991 to 16% in 2010; vi) Poverty level, which average goes from 38% in 1991 to 15% in 2010; vii) Population size, to capture the scale effect; and viii) Income per capita.

The models are estimated using a spatiotemporal approach provided by Spatial Seemingly Unrelated Regressions (SSUR).

Results and Discussion

Figure 1 - Enrollment rate at the secondary level



As shown on Figure 1, Brazil has increased provision of secondary education considerably for the past decades. Average enrolment rates were of 34% in 1991, 67% in 2000, and 71% in 2010. The enrolment rate is significantly lower in Northern and North-eastern regions of Brazil in 1991. However, by 2010, the Low-Low cluster was considerably smaller, especially in the Northeast. High enrolment rates are significantly clustered in the Southern and South-eastern regions. But yet again, these clusters are significantly smaller in 2010. These results indicate a greater spatial randomness in the more recent years.

Our results show that regional differences in enrollment rates mimic Brazilian internal disparities in the demographic transition. Shortage in provision of secondary education is associated with demographic pressure in localities with higher fertility rates and younger age structures. The regression confirms that spatial dependence has decreased in the period considered, while school coverage at the secondary level became widespread. However, enrollment rates are far from ideal for several of the country's municipalities. Since demand pressure due to demographics is associated with several socioeconomic attributes, municipalities with poor outcomes might have other constraints in the provision of secondary education.

Figure 2 - Local Moran's I - Enrolment rate at the secondary level

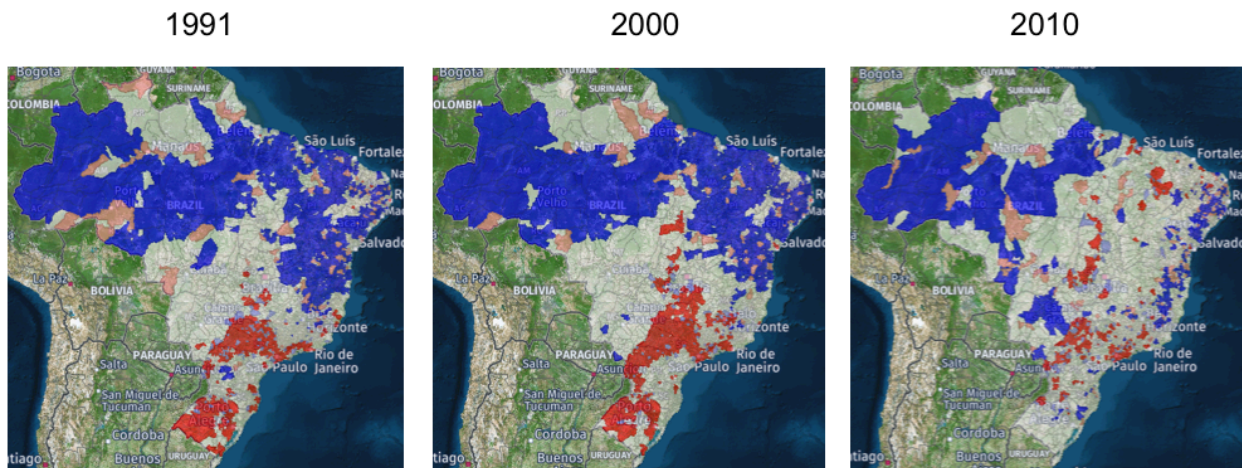


Table 1 – Regression results, dependent variable: enrolment rate

	1991		2000		2010	
	Coef.	p-value	Coef.	p-value	Coef.	p-value
Constant	-7.4437	0.0093	1.0395	0.8770	-19.7288	0.0396
%_bathroom	0.0516	0.0000	0.1375	0.0000	-0.0035	0.8643
ln_pop	2.6768	0.0000	2.0364	0.0003	2.6024	0.0000
fertility	-0.6358	0.0014	-2.1150	0.0000	-2.5178	0.0000
aging	1.0741	0.0000	-0.2229	0.1337	0.1897	0.1060
%_6_14_school	0.2745	0.0000	0.6771	0.0000	0.9788	0.0000
%_6_14_lagging	-0.2142	0.0000	-0.5822	0.0000	-0.6884	0.0000
income_pc	0.0270	0.0000	0.0072	0.0055	0.0016	0.3181
%_poverty	-0.0001	0.9976	-0.1046	0.0018	0.0655	0.0589
W_enrolment	-0.1663	0.0000	-0.0359	0.3228	-0.1034	0.0598
spatial multiplier	0.8574		0.9654		0.9063	

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