A Evaluation of Brazil's Public Expenditure on Education by it's Impact on the Education Index of HDI

Júlia Ferreira Tessler*, Johan Hendrik Poker Jr., Rafael Damasco Silveira

Abstract

Understanding the quality of public expenditure is key to discussing and creating social programs and public policies. To better comprehend the return of such expenditure on education under the Brazilian optic, the variation of the Education Index of HDI between 2010 and 2000 was explained by multiple linear regression with robust errors for independent and intervening variables.

Key words:

HDI, public expenditure, education.

Introduction

Human capital refers to knowledge, information, health and ability (Becker, 2002)¹. The Human Capital Theory estates that investment in human capital will impact on financial return and Becker (1993)² explained that education is one of the most important ways to invest on human capital.

As an extension of the work done by Poker Jr, Costa Nunes and Peres Nunes (2013)³, this work presents a qualitative approach to public expenditure on education (*Bolsa Família*, municipal and state public spending on education and culture). It's understood that the correlation between economic growth and public expenditure relies on the quality of such expenditure. To better understand this relation, we analyzed how much influence these factors (and also the distance between the city and the state capital, rural population percentage and number of public agents) have on variation of the Education Index of HDI⁴ between 2010 and 2000.

Results and Discussion

The database used was assembled with Brazilian cities public data, mainly found in IPEA⁵, IBGE⁶ and INEP⁷. Due to incomplete data 126 cities were deleted from the final analysis, resulting in 5,468 cities. To avoid bias of the data, all expenditure on the database was converted to American dollars according to the average dollar exchange rate of the year.

Chart 1. Variables per city and their classification.

Variable	Classification
Sum of municipal expenditure on education and culture from 2000 to 2009 per habitant in 2000	Independent Variable
Sum of state expenditure on education and culture from 2000 to 2009 per habitant in 2000	Independent variable
Sum of expenditure on <i>Bolsa Família</i> from 2000 to 2009 per habitant in 2000	Independent variable
Distance from city to the state's capital	Intervening variable
Percentage of rural population	Intervening variable
Total HDI in 2000	Intervening variable
State's public agents per habitant in 2007	Intervening variable

With the Stata software version 14.0 (StataCorp LP, 2015)⁸, a regression analysis was conducted with the data, using the variation of the Education Index of the HDI as dependent variable. Chart 1 presents the independent and intervening variables and their classification. Due to residual heteroscedasticity (White's test statistic with p-value < 0.0001), it was necessary to fit a model with robust errors. Collinearity between the variables was not considered due to VIF (Variance Inflation Factor) smaller than 6.

Conclusions

Although it cannot be assumed that the variables are independent of each other, since state expenditure focuses on high school and higher education while municipal expenditure focuses on elementary and primary education, the results found are still meaningful and help to understand public expenditure on education in Brazil. Results show that state expenditure on education has the highest positive significance on the variance of the Education Index of HDI. For US\$1,000.00 of state expenditure invested per habitant, there is an increase of 1.05% of the Education Index of HDI. Also, results show that cities with higher HDI in 2000 need to invest more money (49.71%) to increase their development.

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¹ Becker, G. S. (2002). The Age of Human Capital. In: E. P. Lazear: *Education in the Twenty-First Century*. Palo Alto: Hoover Institution Press. (pp. 3 – 8).

² Becker, G. S. (1993). Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education. The University of Chicago Press, 3rd edition.

³ Poker Jr., J. H.; Costa Nunes. R.; Peres Nunes, S. P. (2013). Uma Avaliação de Efetividade e Eficiência do Gasto em Educação em Municípios Brasileiros. In: *Caderno de Finanças Públicas* (13).

⁴ Human Development Index, found in the annual Human Development Report by the United Nations Development Program. In: <http://hdr.undp.org/en/content/human-development-index-hdi>

⁵ Institute of Applied Economic Research. In: <http://www.ipeadata.gov.br/>

⁶ Brazilian Institute of Geography and Statistics. In: <http://www.ibge.gov.br/english/>

⁷ Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. In: <http://portal.inep.gov.br/> (website in Portuguese).

⁸ StataCorp LP. (2015). In: <http://www.stata.com/>