

Effect of the *Bolsa Familia* on Education Expenditures: A Case for Conditional Cash Transfer Programs in Brazil

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Introduction

In the 1990s, a conditional cash transfer program was established in Brazil whereupon families under a certain income level would be eligible to receive a transfer payment in exchange for sending their children to school. This research assesses the correlation between the percentage of school aged children who are beneficiaries of the conditional cash transfer (CCT) program and the share of public expenditures dedicated to education in Brazilian municipalities between 2004 and 2006. A significant concern with the CCT program has been that the rise in enrolment caused by the CCT would lead to a reduction in education expenditure per student, thereby lowering the overall quality of education. This research aims to determine if there exists a link between increased enrolment rates due to CCT and political support for education expenditures.

Bolsa Familia

The *Bolsa Familia* is a social welfare program in Brazil first introduced in 2004 by then-president Luiz Inácio Lula da Silva. It had evolved from its predecessor, the *Bolsa Escola*, which was established in the 1990s and had a much narrower scope. The *Bolsa Familia* is currently the largest conditional cash transfer program in the world. Though it is a federal program, it is administered by each municipality and nearly 12 million families in Brazil are affected by this program. The *Bolsa Familia* distributes monthly stipends to families in exchange for sending their children to school and ensuring that they are properly vaccinated. This program is both a short term and a long term solution to the problem of poverty in Brazil. In the short-term, it offers financial aid to mitigate immediate hardships resulting from poverty, and in the long term, it incentivizes investment in human capital such as education and health.



Data

For this research project, a series of simple linear regression models were used to conduct a statistical analysis of the data.

Data was obtained from the following governmental sources:

- Brazilian Ministry of Social Development
- IPEA data
- 2000 Brazilian federal census

Variables identified in the statistical analysis:

- School-aged children receiving CCT as a percentage of all children eligible for CCT per municipality
- Gross enrolment rates for grades 1 to 8 per municipality
- Public expenditure spent on education grades 1 to 8 as a percentage of total public expenditure per municipality

These variables were identified for all 5,564 municipalities, among the 26 states.

Regression Analysis

Regression analysis is a method used in statistics and economics to model and analyze the relationship between a dependent variable and one or more independent variables. In this project, three types of regressions were used to analyze the data. They are as follows:

1. Simple linear regressions, employing ordinary least squares (OLS).
2. Fixed-effect regressions were introduced in order to control for municipality heterogeneity.
3. Instrumental variable regressions to determine the effect of enrolment rates due only to CCT on education expenditures. The instrumental variable ensures that the only effect captured for enrolment rates is the portion caused by the CCT.

Results: Table

Dependent variable Estimation method	Gross enrolment rate		Percentage of public expenditure			
	OLS (1)	Fixed-Effect (2)	OLS (3)	Fixed-Effect (4)	IV (5)	Fixed-Effect IV (6)
Percentage of school age children receiving CCT	0.300*** (0.0171)	-0.0744* (0.0413)				
Gross enrolment rate			0.0290*** (0.00237)	0.00208 (0.00249)	0.494*** (0.0302)	0.352 (0.217)
Dummy 2006	-0.0970*** -0.009	-0.002 -0.012	-0.0126*** -0.002	-0.0131*** -0.001	-0.003 -0.004	-0.006 -0.005
Constant	1.089*** (0.00841)	1.231*** (0.0163)	0.211*** (0.00312)	0.243*** (0.00310)	-0.349*** (0.0364)	-0.177 (0.261)
Municipality fixed effect	no	yes	no	yes	no	yes
Instrument	no	no	no	no	Percentage of school age children receiving CCT	Percentage of school age children receiving CCT
Observations	10,030	10,030	10,030	10,030	10,030	10,030
R-squared	0.031	0.003	0.020	0.024		
Number of municipalities		5,015		5,015		5,015

Standard errors are shown in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: Discussion

In the simple OLS regression with no fixed effect (1), there is a positive and significant relationship between the percentage of school-aged children receiving CCT and gross enrolment rates. However, the effect becomes negative and less significant in the fixed effect regression (2), indicating that the increase in enrolment did not occur once the analysis was controlled for municipality heterogeneity.

Similarly, there is a positive correlation between gross enrolment rates and the share of public expenditures dedicated to education in regression (3), but the effect also becomes insignificant with the introduction of municipalities fixed-effects as shown in regression (4).

In regression (5), an instrumental variable method was used to determine the relationship between public expenditures on education and change in enrolment rates due only to CCT. In this regression, the positive relationship is significant at 1% and has a noticeably larger coefficient than the result of the OLS regression (3). In the fixed-effect IV (6), the results lose statistical significance, indicating large standard errors, but the coefficient remains of a similar magnitude in contrast to the other fixed-effect regressions.



Conclusions

These results indicate a positive correlation between enrolment caused by CCT and the public expenditures dedicated to education. However, the introduction of fixed-effects leads to less clear-cut results suggesting that part of the effects measured may be due to municipality heterogeneity rather than the CCT policy. In order to obtain more robust results, it will be necessary to find more time-variant variables to control for in the statistical analysis.

References

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Photos from Children at Risk Foundation Brazil
Map from mapsof.net



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