

## THE MARKET VALUE OF PUBLIC EDUCATION

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This article estimates the market value of public education by comparing standardized test scores of students in public and private schools. If what people pay for when they pay for education is learning (as measured by test proficiency), the prices paid to private schools can be matched for a given number of proficiency points measured on whatever scale being used. Once the price in dollars (or other currency unit) per proficiency point is available, it is easy to impute this same value to free public education provided by the state, thus calculating its market value.

In order to do this for Brazil, we use the POF Consumption Surveys, which contain data on educational expenditures as well as income distribution, and the various standardized tests carried out by the Federal Education Evaluation Institute, INEP. These tests include the SAE-Prova Brasil, for 5<sup>th</sup> and 9<sup>th</sup> grades, the ENEM for the end of secondary, and the ENC for higher education. Since the POF does not provide identifiers the matching process was to use a match code made up of observable data such as state in which a student lives, his or her sex and birth date, as well as some of their household characteristics, such as the existence of a computer, car, or television.

Using this match code and regression analysis, it was possible to estimate the relationship between tuition and school quality as measured by test scores, thus assigning a monetary value to a given quality of schooling. The match code also allowed test scores to be assigned to each of the public school students in the POF consumption survey. Finding a value for public education is then quite trivial: multiply each student's test score by the regression coefficients. With this new "income source" now in the POF consumption survey, all eth standard distributional analysis can be undertaken.

The results can be found in the table and figure below.

The first interesting result refers to the total market value of all public education. According to our estimates, it was worth R\$ 35.13 per person in Brazil. Annualized and multiplied by the 176 million people who lived in the country in 2003, we have R\$ 74 billion total market value. This is 2.8% higher than the R\$ 72 billion that the government spent producing it, indicating that Brazilian public expenditures in education were (slightly) welfare producing and not welfare reducing in 2003. These are only notional values, but interesting nevertheless.

TABLE 1  
Incidence and concentration analysis for the market value of public education

Source	Population (millions)	Average values				Incidence coefficient	Concent. coefficient
		<i>Ex-ante</i>	% of income	<i>Ex-post</i>	% of Income		
<i>Per cap</i> Income	176	499.93	100.0%	535.06	100.0%	0.5919	0.5532
Public education	176	35.13	7.0%	35.13	6.6%	-0.0521	0.0533
Pre-school	176	3.31	0.7%	3.31	0.6%	-0.0968	0.0126
Lower primary	176	11.51	2.3%	11.51	2.2%	-0.1930	-0.0752
Upper primary	176	11.46	2.3%	11.46	2.1%	-0.1276	-0.0156
Secondary	176	6.86	1.4%	6.86	1.3%	0.1329	0.2195
Higher	176	1.99	0.4%	1.99	0.4%	0.6333	0.6886

Source: POF, SAEB, ENEM, and ENC (2003).

The second result is that the imputation of public education at market value reduces the Gini coefficient by a hefty 3.9 Gini points (from 0.592 to 0.553). The direction of the reduction is hardly news, since it has long been known that children are concentrated in the lower deciles of the population. The magnitude, however, is relevant, particularly considering that public education is a universal, non-targeted service, and that poorer students usually study in worse schools.

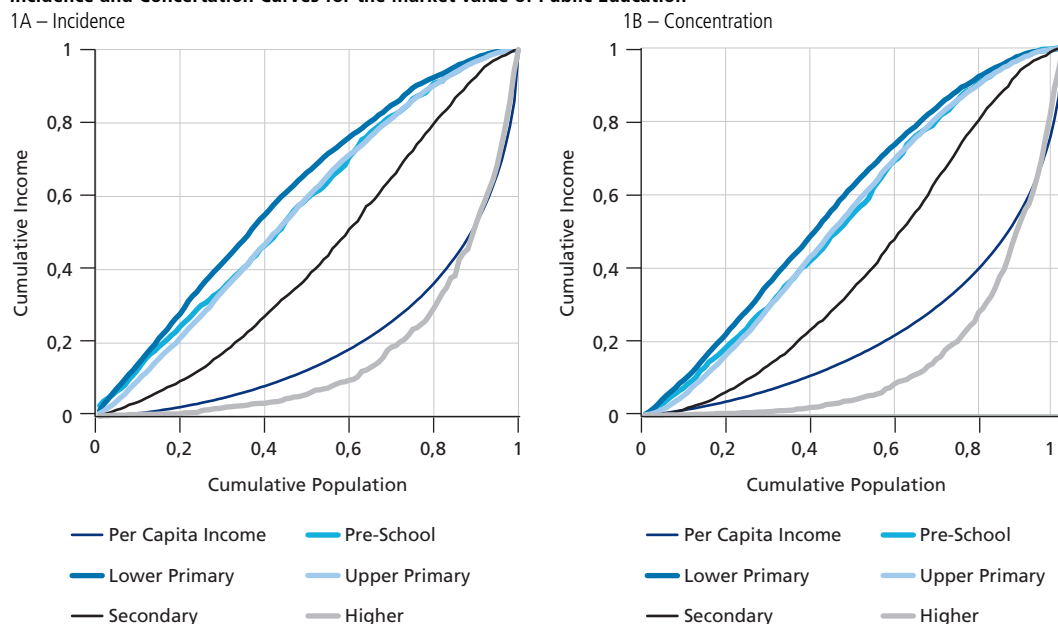
More important than just the Gini coefficient are the incidence and concentration curves shown in the figure below and their associated coefficients.

The Incidence coefficients (calculated using *per capita* incomes that do not take into consideration the

value of public education) are negative up to secondary education. Higher education is highly regressive with an Incidence coefficient of 0.633. Luckily, its value is only about 6% the value of all public education. For public education as a whole, the Incidence *c* is negative at -0.0521, which is very progressive. The Concentration coefficients (calculated sorting by *per capita* income with the value of public education incorporated) are somewhat less progressive. The Concentration coefficients range from -0.075 for lower primary public education to 0.689 for higher education.

The conclusion is that public education is a slightly welfare enhancing transfer with significant distributive impact reducing inequality.

FIGURE 1  
Incidence and Concentration Curves for the Market Value of Public Education



Source: POF, SAEB, ENEM, and ENC, 2003