Executive Summary

The "Quality of Quantity": Achievement Gains from Adding a Year to Brazilian Primary Schooling

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In 2007, the Brazilian government initiated a national policy to increase the length of basic education from 8 to 9 years. The government reduced the legal entrance age into first grade from seven to six years old. Not all municipalities in Brazil were required to implement the policy immediately. They were given until 2010 to complete the process. Sixty-two percent of municipalities and their schools did sign on in 2007. In addition, a large number of schools in eight states had already implemented 9 year basic education beginning in 2004.

A major debate in educational policy, driven by the work of the Hoover Institution's Eric Hanushek, has emerged around the educational and economic value of additional years of schooling versus the value of improving the quality of a given year of schooling. In developing countries, where actual time spent on instruction in an academic year may be quite low, this debate is nested in the larger discussion about the value of adding instructional time in the form of more years of schooling.

The additional year intervention in Brazil is particularly interesting for the quality versus quantity debate because students there score relatively low on international tests such as the OECD's Program in International Student Assessment (PISA). This implies that the value added of an additional year of schooling is small, favoring the argument that investments in improved quality of each year of schooling would produce bigger achievement gains than investments in additional years.

Because of the staggered adoption process of the 9-year basic education reform and the availability of a national test, the *Prova Brasil*, given every two years to all public school students at the end of the primary and middle school cycles in schools with 20 or more students in the tests grades (4/5; 8/9), we were able to use the 2007, 2009, and 2011 applications of the test to estimate the effect on achievement in mathematics and Portuguese of an additional year of schooling.

Thus, we were able to compare the gain in academic achievement on the *Prova Brasil* between 2007 and 2011 in municipalities/schools that implemented the policy change in 2007 and those municipalities/schools that did not. We also estimated the effect of the policy change between students in the last year of primary school in 2007 and 2009 for municipalities/schools that did and did not implement the policy by 2005.

In 2007, all students taking the *Prova Brasil* in the final year of primary school were completing the 4th grade. In 2011, however, students taking the *Prova Brasil* in the municipalities/schools that implemented the new law in 2007 were completing 5 years of schooling; those students in non-implementing municipalities/schools taking the *Prova Brasil* were, as in 2007, completing only 4 years of schooling. That is, even if municipalities had implemented the reform in their schools in 2008, 2009, or 2010, their students tested at the end of primary school in the 2011 wave of *Prova Brasil* would still have entered at 7 years old and still been in 4th grade. Similarly, in those states that already had implemented the additional year basic education reform in a significant fraction of their municipalities/schools by 2005, students taking the *Prova Brazil* in 2009 at the end of primary school that were in such schools would have taken 5 years of schooling and those students in schools that had not implemented the reform would have taken the 2009 as 4th graders.

However, the schools in those municipalities that chose to implement the reform in 2005 or 2007 may have had greater increases in *Prova Brasil* scores at the end of primary school even if their students had not had the extra year of schooling. Implementing schools might have been the "better organized" schools that would have made higher gains in 2007-2011 anyway. To test for this possibility, we control for the gains in achievement of 8th grade students (newly named 9th graders) in the same school in 2007-2011.

The manner of implementing the reform and the timing of the waves of the *Prova Brasil* in 2007, 2009, and 2011 allowed us to use a "difference-in-difference-in-differences" (DDD) empirical strategy to approach an unbiased estimate of the extra year of compulsory education on Brazilian students' academic achievement. Our study is able, therefore, to identify the causal effect on students' educational achievement of a policy that changes the required number of years of compulsory education taken by students.

We find that Brazilian students with the extra year of education performed about 0.22 standard deviations higher in mathematics and about 0.26 standard deviations in Portuguese than students not yet affected by the change in the legislation. These are very large effect sizes in terms of the impact of educational interventions more generally.

We also find that students in the highest quintile of socioeconomic status and highest quintile of test scores benefitted more from the extra year of instruction than students in the bottom 80 percent of socioeconomic status and bottom 80 percent of test scores.

It may be true that achievement gains from an additional year of schooling in Brazil are generally lower in schools with students of lower average SES, although that does not appear to be the case in the United States. It also may be true that schools in Brazil with higher SES students were better organized to take advantage of the additional year of schooling, particularly since the Brazilian government did not provide any directives to schools regarding how to change the curriculum over the first five years of schooling as well as, eventually, the next four years of middle school.

Our finding that the highest SES and highest test score students benefit more from the additional year is somewhat surprising. One of the main goals of the policy was to privilege lower socioeconomic status families by offsetting the assumed positive achievement effects of higher social families' enrolling their children in private school kindergartens. Our results suggest that in the public school student population tested by *Prova Brasil*, the additional year of schooling failed to close the achievement gap between lower and higher SES students. If Brazilian policy makers intend to equalize access to the same opportunities in life for children starting from different social positions, apparently other policies will need to compensate for disadvantages at school entry.

One of the most important results of our study is that they contradict claims by the "quality more than quality" proponents that additional years in school fail to produce substantial learning gains. In 2015, the cohort that had access to the additional year of instruction in Brazil will finish the whole nine-year cycle of compulsory education. The *Prova Brasil* test will provide the achievement gains data to evaluate the longer term effects of an added year of schooling. This will be an important opportunity for researchers to examine whether the effect of the extra year of schooling in Brazil carries to the end of middle school (9^{th} grade) and whether the highest SES/highest scoring public schools continue to make larger gains.