

Decentralization and Education Performance: A First View to the Brazilian Process

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Abstract

This paper analyses the impact of the decentralization in educational system that is taking place in Brazil as a result of laws encouraging municipalities to invest in fundamental education. The proficiency tests undertaken by students of public schools enable us to create an experimental group with students of schools that were municipalized and a control group with the ones that remained under state system. Using a fixed effect panel data analysis, controlling for students characteristics, we estimated a difference in difference estimator that shows that still there is no significant changes in students' performance between the two groups of schools.

JEL Classification: I21, I28.

Keywords: schooling performance, educational decentralization

1. Introduction

As it is well known, by any international or national standards the quality of public education in Brazil is very poor. This is probably a consequence of the fast and disorganized increase in educational coverage that took place along the last decades. Decentralization of the educational system is viewed as one of the several possible policies to handle this problem, since it can turn the system more flexible and transparent, improve its accountability and governance and promote family and community participation. In Brazil decentralization is associated with the transfer of control to the municipalities of the fundamental education, 1st to 8th grades, which used to be, at least partially, under the control of the states administration. During the 1990s several laws² consolidated this process, among them FUNDEF plays a fundamental role as it induces the municipalities to invest in fundamental education. A large amount of resources have been spent in this process in the last ten years but very few studies have been made to assess its effectiveness. The purpose of this paper is to evaluate the impact of this decentralization on student's performance. We do this comparing the difference in the students performance at school level between two periods of time comparing three groups of schools: those that were already under the municipality control at the time of the SAEB exam; those that were under the states control in the SAEB exam and remained in it by the time of Prova Brasil and; those that migrated from the state to the municipality control between the two periods exams. The analysis is restricted to students in the 4th grade since it is the first cycle of the fundamental school the main goal of the decentralization.

2. School Performance in Brazil

Like in the most part of the world, students performance in Brazil is determined by family characteristics, institutional factors and school resources: classroom hours, access to books, teacher experience and teaching methods (e.g., Fuller, 1990; Fuller and Clarke, 1994

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² Lei de Diretrizes e Bases da Educação Nacional 9394/96, Emenda Constitucional 14/96 (FUNDEF), Lei 9424/96 and Decreto Federal 2264/97 are the most importants.

and Hanushek, 1995). Those resources are intimately related to the school management and, consequently, to the educational system to which the school belongs. In Brazil public schools can be under federal, state or municipal control, that correspond roughly to the degree of decentralization and autonomy of decisions at school level. The research on the impact of decentralization on education in Brazil has two approaches: the first one are case studies (Gil and Arelano, 2004, Araújo, 2005, Oliveira 1999, Oliveira , 1997, Pinto 2000) that highlight the absence of coordination between the state and municipal educational systems that resulted in a miscellaneous of pedagogical policies; the absence of scale economies that turned the system unnecessarily expensive and the administrative inexperience of the municipalities in this subject.

The other approach are quantitative studies that, using econometrics methods, try to understand the impact on the student's perform of several factors such as family background, school facilities, community resources, opportunity cost of education, and the educational system to which the school belongs to: private or public and among the public: municipal or state. School performance is usually measured by years of schooling, enrolment and abandon rates, age-grade distortion and, more recently, by the proficiency scores in the national exams promoted by the federal government.

One of the first studies to take into account those factors is Barros, Mendonça, Santos and Quintaes (2001). Using the Brazilian Household Surveys, PNAD and PPV it finds that even taking into account all above mentioned variables, still the most important determination of years of schooling is the family background, mainly parents schooling and family per capita income. Community resources, measured by average schooling and income of the population, school resources, measured by number of schools and commuting time have a positive but inexpressive impact while schooling of the teachers had an ambiguous effect: positive for fundamental school and negative for high school. Albernaz, Ferreira and Franco (2002), also include school's information in the analysis of the determinants of students performance as measured by the proficiency scores of the SAEB tests in a HLM model. Apart from the usual results they found that the socioeconomic level of the student's peers are also important determinants of educational performance and that students in private schools perform better than those in public schools. Riani (2004) studying age-grade distortions found that family background and school resources are also the most important factors but among the community resources the percentage of public schools, and particularly of municipal schools, plays a positive role in reducing distortion in the fundamental cycle.

Those studies take into account the school, community resources and other administrative issues on the students' performance but only as control variables and not as the central issues of the analysis. The studies of D'Atri (2007) and Madeira (2007), on the other hand focus on the impact of decentralization on students performance. The first one, using data from the School Census, analyzes the impact of FUNDEF on students' enrolment, abandon and age-grade distortion rates comparing two periods: 1998 and 2004. Controlling for students and schools characteristics, the main result is that students in municipal schools still presented a lower perform than those in state schools. The paper also finds that this lower performance is more related to the expansion of the municipal system than to the migration of schools from state to municipal system. The study by Madeira (2007) is restricted to the state of São Paulo where, previously, fundamental education was mostly state responsibility and a huge effort is being made to municipalize the system. Using data from the School Census from 1996 to 2003 he analyzes the impact

of the control transfer to municipalities on abandon, enrolment and age-grade distortion as well as in the use of schools inputs such as number of hours in the classroom, size of the classroom, and equipment utilization. The results are ambiguous: they show a significant positive impact on the use of school inputs but a negative impact on students` performance indicators, confirming D`Atri results. The results of both studies are very interesting but present some limitations mainly the use of performance indicators such as enrolment, abandon and age-grade distortions that may be tainted by issues not directly related to it. Another drawback, specifically to D`Atri study, is the use of data at the municipal level that apart from the limitations of this level of aggregation, it doesn`t control for the fixed effects of the schools that is a possible source of bias in the analysis. In our study we try to overcome those limitations using a panel data study that allows us to compare the results of the students in schools before and after the change in control to the municipalities takes place with the results of students in schools that remained under the states control in both periods.

3. Descriptive Analysis

The proficiency results of the 4th grade students along the years show that students in private schools perform better than those in the public system, either municipal or state managed. Their score was 30% higher on average but, on the other hand they also presented a higher variance 40% in math and 30% in reading.

Table 1

Proficiency Scores: SAEB e Prova Brasil										
4 ^a grade	Math					Reading				
Math	1997	1999	2001	2003	2005	1997	1999	2001	2003	2005
State	178,8 (37,2)	173,0 (36,3)	172,8 (39,9)	176,9 (40,2)	177,7 (42,2)	174,4 (39,8)	159,8 (38,8)	162,0 (43,3)	168,1 (42,8)	168,5 (41,0)
Municipal	174,9 (36,4)	169,4 (35,2)	165,9 (38,8)	171,3 (39,1)	172,5 (41,7)	170,5 (37,7)	156,2 (37,6)	155,2 (42,7)	164,5 (42,1)	163,8 (40,7)
Private	225,1 (49,3)	217,6 (44,0)	223,8 (48,1)	225,1 (45,9)	227,8 (47,6)	219,2 (50,5)	208,9 (48,5)	209,7 (48,0)	215,2 (45,4)	213,9 (43,6)
Total	189,0 (45,4)	183,7 (43,5)	185,8 (49,3)	190,7 (48,2)	193,6 (50,9)	184,4 (46,7)	171,9 (47,2)	174,0 (50,6)	182,2 (49,1)	182,9 (47,7)

SD in parenthesis

Within the public system, the students in the state schools presented a better performance than those at the municipal schools, but the difference is very small although significant: 2% on average in both, math and reading.

Table 2

Score Difference between State and Municipal Schools $\Delta(S-M)$					
	1997	1999	2001	2003	2005
Math	3,91	3,64	6,86	5,66	5,19
	(0,734**)	(0,779**)	(0,754**)	(0,621**)	(0,739**)
Reading	3,87	3,61	6,75	3,63	4,66
	(0,789**)	(0,835**)	(0,825**)	(0,666**)	(0,723**)

SD in parenthesis

The data bases from SAEB and Prova Brasil, on the other hand, allow us to make a more detailed comparative analysis since we can follow some of the schools at least in two periods of time: the year the school participated in the SAEB test and the year of Prova Brasil, which is mandatory for almost all schools in the public system. We can also track schools that belonged to the state system in the SAEB test but at the time of Prova Brasil had already moved to the municipal system. Therefore we can have the results of the same schools in at least two points in time under the same system, either state, which we will call the S-S schools or municipal, the M-M schools, or under the two different systems the S-M schools.³ As a consequence we have 4 panels for each school cohort: 1997-2005; 1999-2005, 2001-2005 and 2003-2005, taking into account each group of schools. Unfortunately we don't know exactly when the change of control to the municipalities occurred. For instance for a school that was under the state control when it participated in the SAEB exam in 1997 and was under the municipality in 2005 in Prova Brasil, the transfer may have occurred in any of those eight years.

The school panel, i.e. the number of schools that matched SAEB and Prova Brasil, represents 63% of the total schools of the SAEB data base as can be seen in Table 3.

Table 3

Match of Schools SAEB and Prova Brasil 2005 4th Grade						
	SS	SM	MM	MS	Total	%
1997	216	8	233	3	460	55%
1999	554	43	738	6	1341	48%
2001	670	50	859	9	1588	67%
2003	744	21	798	4	1577	78%

Source: INEP

The number of schools that migrated from the state to the municipal system represents on average for the period 5% of the state schools and yet in a year such 2003, when the match was high, only 3% were in this category. We have proportionally more schools in this category in 1999 and 2001, when they were around 7%.

As can be seen in table 4, in all years those schools that migrated were located mainly in the Northeast and Southeast of the country

³ There is also the possibility of the school moving from the municipal to the state system, but in practice we don't observe this kind of movement.

Table 4

Regional Distribution of Schools by Schools' Groups 2001-2005

Regional	1997		1999		2001		2003	
	SS	SM	SS	SM	SS	SM	SS	SM
North	94	1	145	5	158	5	137	1
North-East	42	3	184	17	229	24	239	6
South-East	22	4	70	10	85	9	116	11
South	21	0	71	9	104	12	139	2
Central-West	37	0	84	2	94	0	113	1
Brazil	216	8	554	43	670	50	744	21

Specifically in Bahia, in the Northeast, Parana and Espirito Santo, in the Southeast, as can be seen in Table 5.

State Distribution of SM Schools

Estado	1997	1999	2001	2003	Total
Rondônia	0	0	0	0	0
Acre	0	0	0	0	0
Amazonas	0	0	0	1	1
Roraima	0	3	4	0	7
Pará	1	1	0	0	2
Amapá	0	0	0	0	0
Tocantins	0	1	1	0	2
Maranhão	1	0	2	1	4
Piauí	0	0	0	0	0
Ceará	0	4	2	0	6
Rio Grande do Norte	0	1	0	0	1
Paraíba	0	0	1	0	1
Pernambuco	0	1	3	1	5
Alagoas	1	2	1	0	4
Sergipe	0	0	0	0	0
Bahia	1	9	15	4	29
Minas Gerais	1	0	0	0	1
Espirito Santo	3	6	5	8	22
Rio de Janeiro	0	3	2	2	7
São Paulo	0	1	2	1	4
Paraná	0	9	12	2	23
Santa Catarina	0	0	0	0	0
Rio Grande do Sul	0	0	0	0	0
Mato Grosso do Sul	0	0	0	0	0
Mato Grosso	0	0	0	0	0
Goiás	0	2	0	1	3
Distrito Federal	0	0	0	0	0
Total	8	43	50	21	122

The performance of the two groups of schools in the proficiency tests can be seen in Table 6.

Table 6
Proficiency Score by Groups of Schools 4th Grade
(SAEB Exams)

	1997	1999	2001	2003
Math				
SS	177,08 (15,822)	173,43 (19,444)	169,38 (20,071)	173,02 (21,094)
SM	173,32 (20,24)	175,39 (20,526)	175,87 (26,977)	168,70 (20,947)
SS-SM	3,76 (26,183)	-1,96 (5,240)	-6,49 (7,578)	4,32 (10,746)
Reading				
SS	173,48 (16,599)	162,01 (21,926)	159,11 (20,735)	166,12 (20,632)
SM	176,89 (22,968)	166,77 (24,364)	161,88 (24,656)	155,08 (23,051)
SM-SS	3,41 (8,199)	4,76 (3,830)	2,77 (3,487)	-11,04 (5,031)

SD in parenthesis

The differences in performance oscillate in favor of one or the other system but they are significant only in 2003 cohort when the schools that latter moved to the municipality control presented a clear and significant inferior result in both math and reading.. For the other cohorts, although we observe some higher differences like in the 1997, they were not significant at 5% level.

The average profile of the students in both groups of schools when they were still under the state system is also not very different, as can be seen in Table 7.

Table 7
Characterisitcs 4th Grade

%	1997		1999		2001		2003	
	SS	SM	SS	SM	SS	SM	SS	SM
Students 10 and 11 Years Old	0,52	0,44	0,52	0,54	0,59	0,59	0,65	0,67
Skin Color (White and Yellow)	0,45	0,40	0,45	0,45	0,42	0,42	0,39	0,41
Mother's Schooling (High School or More)	0,18	0,19	0,14	0,18	0,20	0,17	0,21	0,15
Father's Schooling (High School or More)	0,16	0,16	0,13	0,14	0,19	0,18	0,18	0,13
Principal's Schooling (College or More)	0,75	0,75	1,12	0,77	1,15	0,94	1,09	0,71

The largest difference, between the students in the two groups of schools, is with respect to the skin color. We observe a significant higher presence of non whites in the schools that were latter under the municipality control. With respect to age and parents' schooling the cohorts of both groups of schools were, on average, very similar..

Probit: Decentralization

Variáveis	1997		1999		2001		2003	
	dy/dx	P valor	dy/dx	P valor	dy/dx	P valor	dy/dx	P valor
Proficiency	0,0001	0,602	0,0002	0,472	0,00052	0,374	-0,0005**	0,013
Age 8 or less	0,0271	0,599	-0,0992	0,255	0,02448	0,848	-0,0086	0,811
Age 9	-0,0056	0,709	-0,0480	0,375	-0,03243	0,654	-0,0087	0,743
Age 10	0,0190	0,568	-0,0863	0,113	-0,1519*	0,073	-0,0475	0,155
Age 11	0,0147	0,582	-0,1315	0,034	-0,1581*	0,096	-0,0462	0,224
Age 12	0,0009	0,947	-0,0845	0,187	0,00780	0,948	-0,0554	0,262
Age 13	0,0347	0,569	-0,1705	0,028	-0,19914	0,155	-0,0966	0,122
Age 14	-0,0016	0,845	-0,0314	0,338	-0,06349	0,263	-0,0092	0,631
Mother's Schooling (Elementary School)	0,0113	0,688	-0,0582	0,346	-0,00861	0,943	-0,0217	0,48
Mother's Schooling (Middle School)	-0,0033	0,842	-0,0122	0,851	0,05081	0,694	-0,0021	0,955
Mother's Schooling (High School)	-0,0081	0,754	0,0544	0,501	0,10836	0,442	-0,0020	0,961
Mother's Schooling (College)	-0,0099	0,782	0,0267	0,745	-0,01275	0,946	-0,0588	0,306
Mother's Schooling Unknown	0,0030	0,85	-0,0772	0,257	0,04988	0,704	-0,0111	0,724
Father's Schooling (Elementary School)	0,0063	0,769	0,0827	0,188	-0,05340	0,657	0,0079	0,831
Father's Schooling (Middle School)	0,0440	0,547	0,0164	0,81	-0,12415	0,339	-0,0332	0,46
Father's Schooling (High School)	0,0275	0,587	0,0935	0,303	-0,03028	0,824	0,0397	0,392
Father's Schooling (College)	-0,0122	0,824	-0,0366	0,697	-0,4592**	0,027	0,0054	0,922
Father's Schooling Unknown	0,0256	0,559	0,0610	0,327	0,00146	0,99	0,0213	0,517
Principal's Schooling (High School)	0,7911***	0,000	0,983***	0,000	0,02939	0,739	0,0126	0,524
Principal's Schooling (College)	0,0578	0,452	0,37079*	0,001	-0,02166	0,791	-0,0014	0,891
North	-0,0005	0,883	-0,035**	0,012	-0,05069	0,012	-0,0095	0,124
Southeast	0,0386	0,498	0,0232	0,431	0,00452	0,892	0,0433	0,11
South			0,0237	0,516	0,03486	0,429	0,0003	0,979
Center west			-0,037***	0,005			-0,0085	0,191

Y predicted

0,0011026

0,03667

0,059989

0,01

Omitted variables: Women, Non white, 15 years old or more, Parents Schooling =0, Principal's Schooling less than High School

4. The Model and Data

To analyze the impact of the municipal school management in the students performance as measured by the scores test in math and reading we estimated the following equation

$$(1) y_{isrt} = \beta_0 + \beta_1 M_{is} + \beta_2 T_{is} + \beta_3 M_{is} * T_{is} + \varphi_s + \sum \delta_i x_i + \varepsilon_{ist}$$

where y_{isrt} is the score of the student i , in the school s , that belongs to the system r in the year t . M is a dummy variable with $M=1$ if the school was under the state system in the SAEB test and migrated do the municipal system by the time of Prova Brasil in 2005, $M = 0$ otherwise; T is a time dummy with $T = 1$ if the year of the test is 2005, of Prova Brasil, and $T = 0$ if any other year (1997, 1999, 2001 and 2003). x_i is the vector of control variables for each student: age, sex, skin color, father's and mother's education. φ_s is the fixed effect estimator for the schools

First notice that:

- (i) $Ey_{ist} / SM = 0, T = 0, \varphi_s^{SS}) = \beta_0 + \varphi_s^{SS}$
- (ii) $Ey_{ist} / SM = 0, T = 1, \varphi_s^{SS}) = \beta_0 + \beta_2 + \varphi_s^{SS}$
- (iii) $Ey_{ist} / SM = 1, T = 0, \varphi_s^{SM}) = \beta_0 + \beta_1 + \varphi_s^{SM}$
- (iv) $Ey_{ist} / SM = 1, T = 1, \varphi_s^{SM}) = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \varphi_s^{SM}$

Therefore, if we subtract equations (i) and (ii) we get the estimator of the difference in performance of the state schools that remained as such in both periods:

$$(vii) \Delta_{SS} = \beta_2$$

If we subtract equations (iii) and (iv) we get the estimator of the difference in performance of the state schools that migrated to the municipalities between the two periods:

$$(viii) \Delta_{SM} = \beta_2 + \beta_3 ;$$

Therefore the DID estimator between the state schools that moved to municipality control and those that were already under it

$$\Delta_{SM} - \Delta_{MM} = \beta_3$$

As discussed before we used the data from the 1997, 1999, 2001 and 2003 SAEBs and 2005 Prova Brasil from INEP- MEC. We used information only of schools that matched in both tests. We restricted the analysis to the results of the math and reading tests of the students of the 4th grade.

5. Results

Equation 1 was estimated by ordinary least square and fixed effects separately for the reading and the math tests for the four matching years. Therefore we have a total of 16 panels, one for each of the 4 years of SAEB, 1997, 1999, 2001 and 2003, compared to Prova Brasil-2005, for each subject, math and reading, and for the estimation methods, OSL and FE.

Table 11 and 12 show the results for the math and reading test. The constant captures the omitted dummies: female, non white/yellow individuals, older than 15 years, with parents with no schooling in state managed schools in the base year. With respect to the control variables the first thing to notice is that the classical result of girls doing better than boys in reading and boys better than girls in math is also true for Brazil. As for the remaining variables, the expected result also holds: the older the student the lower the score, the more educated the parents the better the results and whites tend to perform better but not always than non whites. What is interesting is that although the coefficients are not very different, except for sex, FE estimators tend to be lower than OLS ones.

Table 11

Panels SAEB Prova Brasil 2005 Proficiency Scores - Math								
	1997		1999		2001		2003	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Municipal	-2.88 (2.60)	0.00 (0.00)	0.03 (2.00)	0.00 (0.00)	5.80*** (1.51)	0.00 (0.00)	-9.94*** (2.08)	0.00 (0.00)
T 2005	0.14 (0.55)	-0.50 (0.55)	2.23*** (0.59)	0.56 (0.60)	3.85*** (0.40)	3.42*** (0.39)	5.31*** (0.37)	4.54*** (0.36)
Municipal*T 2005	-3.21 (2.93)	-0.50 (2.74)	-0.46 (2.11)	0.58 (2.09)	-3.66** (1.65)	-3.78** (1.50)	5.64** (2.35)	4.32* (2.30)
Man	3.93*** (0.44)	3.71*** (0.43)	2.39*** (0.36)	2.31*** (0.35)	2.91*** (0.31)	2.70*** (0.30)	3.14*** (0.31)	3.00*** (0.29)
White	0.94** (0.48)	-0.32 (0.46)	0.98** (0.39)	0.72* (0.38)	1.89*** (0.33)	0.93*** (0.32)	2.42*** (0.33)	1.18*** (0.32)
Age 8 or Less	-7.34** (3.05)	-7.12*** (2.71)	-8.51*** (2.01)	-5.25*** (1.94)	-7.53*** (1.69)	-5.85*** (1.60)	-3.13 (2.08)	-0.72 (1.91)
Age 9	16.49*** (1.66)	14.41*** (1.61)	12.99*** (1.34)	15.47*** (1.28)	14.47*** (1.19)	15.16*** (1.13)	18.63*** (1.23)	19.95*** (1.21)
Age 10	17.68*** (1.28)	13.95*** (1.30)	13.92*** (1.11)	14.26*** (1.07)	15.89*** (0.99)	14.77*** (0.96)	21.49*** (1.08)	19.66*** (1.07)
Age 11	9.53*** (1.28)	6.93*** (1.30)	6.17*** (1.12)	6.45*** (1.08)	8.02*** (1.00)	7.60*** (0.97)	12.93*** (1.09)	11.53*** (1.08)
Age 12	0.69 (1.31)	-0.19 (1.35)	-0.58 (1.15)	0.70 (1.12)	0.82 (1.03)	1.69* (1.00)	3.20*** (1.11)	3.98*** (1.11)
Age 13	-0.82 (1.40)	-1.00 (1.44)	-1.97 (1.22)	-0.80 (1.20)	-0.23 (1.09)	1.02 (1.07)	2.23* (1.18)	3.18*** (1.19)
Age 14	-1.53 (1.56)	-1.34 (1.60)	-1.70 (1.38)	0.01 (1.35)	-1.89 (1.21)	-0.31 (1.20)	0.77 (1.33)	2.62** (1.31)
Mother's Schoolig - Elementary School	2.79*** (0.90)	2.27** (0.89)	2.68*** (0.70)	2.27*** (0.69)	3.15*** (0.60)	2.77*** (0.59)	3.29*** (0.58)	3.08*** (0.57)
Mother's Schoolig - Middle School	4.26*** (0.98)	3.33*** (0.96)	4.45*** (0.80)	3.47*** (0.77)	5.38*** (0.67)	4.28*** (0.65)	4.28*** (0.66)	2.82*** (0.64)
Mother's Schoolig - High School	11.34*** (1.00)	8.50*** (0.96)	12.41*** (0.81)	10.03*** (0.78)	12.20*** (0.69)	9.29*** (0.66)	12.68*** (0.66)	9.00*** (0.64)
Mother's Schoolig - College	7.91*** (1.12)	4.63*** (1.08)	7.50*** (0.91)	4.93*** (0.87)	9.75*** (0.78)	6.11*** (0.75)	10.31*** (0.76)	4.76*** (0.71)
Mother's Schoolig - Unknown	3.12*** (0.93)	1.99** (0.91)	3.47*** (0.74)	2.19** (0.73)	3.97*** (0.64)	2.39*** (0.63)	2.90*** (0.60)	0.89 (0.59)
Father's Schooling - Elementary School	2.55*** (0.95)	2.16** (0.94)	2.19*** (0.73)	1.48** (0.72)	3.46*** (0.63)	2.25*** (0.62)	3.30*** (0.62)	2.76*** (0.61)
Father's Schooling - Middle School	1.73* (1.01)	1.07 (1.01)	2.45*** (0.82)	1.12 (0.79)	3.85*** (0.68)	2.41*** (0.67)	2.91*** (0.69)	1.91*** (0.66)
Father's Schooling - High School	5.39*** (1.05)	3.71*** (1.01)	5.64*** (0.86)	3.36*** (0.82)	7.00*** (0.71)	4.29*** (0.69)	7.94*** (0.72)	5.17*** (0.68)
Father's Schooling - College	5.02*** (1.13)	2.24** (1.09)	5.22*** (0.89)	2.61*** (0.86)	6.84*** (0.76)	3.18*** (0.74)	7.77*** (0.75)	3.36*** (0.72)
Father's Schooling - Unknown	4.72*** (0.91)	3.45*** (0.90)	4.20*** (0.71)	2.58*** (0.70)	6.75*** (0.61)	4.74*** (0.61)	5.84*** (0.59)	4.59*** (0.58)
Constant	157.00*** (1.54)	166.44*** (1.52)	153.68*** (1.31)	162.90*** (1.29)	147.59*** (1.14)	157.61*** (1.11)	142.58*** (1.19)	154.59*** (1.18)
R-squared	0.11	0.03	0.10	0.03	0.11	0.03	0.14	0.03
N	26196	26196.00	38819	38819.00	55626	55626.00	57263	57263

* p<0.10, ** p<0.05, *** p<0.01

Table 12

Panels SAEB Prova Brasil 2005 Proficiency Scores - Reading

	1997		1999		2001		2003	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Municipal	10.17*** (3.33)	0.00 (0.00)	5.35** (2.35)	0.00 (0.00)	1.59 (1.59)	0.00 (0.00)	-11.77*** (2.31)	0.00 (0.00)
T 2005	-3.55*** (0.60)	-3.56*** (0.59)	5.69*** (0.66)	4.28*** (0.65)	6.37*** (0.44)	5.87*** (0.42)	5.75*** (0.40)	4.66*** (0.38)
Municipal*T 2005	-14.26*** (3.67)	-14.66*** (2.98)	-4.36* (2.46)	-3.72* (2.22)	0.09 (1.74)	1.08 (1.61)	9.76*** (2.58)	9.12*** (2.44)
Man	-5.88*** (0.48)	-6.47*** (0.46)	-7.02*** (0.39)	-7.46*** (0.37)	-7.32*** (0.33)	-7.74*** (0.32)	-7.72*** (0.33)	-8.37*** (0.31)
White	1.55*** (0.51)	-0.87* (0.49)	3.39*** (0.41)	0.74* (0.40)	4.06*** (0.35)	1.43*** (0.34)	4.89*** (0.35)	1.54*** (0.33)
Age 8 or Less	-1.36 (3.13)	-2.87 (2.92)	-1.79 (2.20)	-0.77 (2.11)	-2.25 (1.82)	-2.95* (1.75)	2.92 (2.20)	2.99 (2.02)
Age 9	21.45*** (1.76)	17.65*** (1.74)	18.21*** (1.42)	17.68*** (1.38)	20.13*** (1.23)	18.41*** (1.21)	23.77*** (1.29)	21.78*** (1.27)
Age 10	23.37*** (1.36)	17.15*** (1.42)	20.33*** (1.15)	15.78*** (1.16)	23.01*** (1.03)	17.97*** (1.03)	27.17*** (1.12)	20.68*** (1.12)
Age 11	13.38*** (1.37)	8.98*** (1.42)	10.67*** (1.16)	7.67*** (1.17)	12.76*** (1.04)	9.67*** (1.03)	15.33*** (1.13)	11.63*** (1.13)
Age 12	4.35*** (1.41)	3.01** (1.47)	1.31 (1.20)	0.54 (1.21)	3.10*** (1.07)	2.65** (1.07)	4.40*** (1.16)	3.17*** (1.17)
Age 13	1.38 (1.50)	1.38 (1.56)	-0.82 (1.27)	-0.94 (1.29)	2.07* (1.14)	2.30** (1.15)	2.73** (1.24)	2.34* (1.25)
Age 14	-0.42 (1.67)	-0.07 (1.76)	-0.10 (1.47)	0.58 (1.45)	-0.52 (1.27)	0.39 (1.29)	2.13 (1.37)	2.11 (1.38)
Mother's Schoolig Elementary School	4.95*** (0.97)	3.74*** (0.95)	4.80*** (0.74)	3.42*** (0.73)	3.70*** (0.64)	3.06*** (0.63)	3.94*** (0.62)	3.02*** (0.61)
Mother's Schoolig - Middle School	5.74*** (1.07)	4.05*** (1.04)	5.42*** (0.83)	3.38*** (0.81)	5.64*** (0.72)	3.94*** (0.70)	4.36*** (0.70)	2.75*** (0.68)
Mother's Schoolig - High School	13.23*** (1.08)	9.91*** (1.03)	13.82*** (0.86)	10.71*** (0.82)	13.03*** (0.73)	9.85*** (0.71)	12.25*** (0.71)	8.49*** (0.68)
Mother's Schoolig - College	9.84*** (1.22)	5.97*** (1.16)	8.58*** (0.97)	5.00*** (0.92)	9.34*** (0.84)	6.11*** (0.80)	7.92*** (0.81)	4.52*** (0.76)
Mother's Schoolig - Unknown	4.42*** (1.01)	2.38** (0.98)	4.61*** (0.79)	2.60*** (0.77)	5.04*** (0.69)	3.24*** (0.67)	2.77*** (0.65)	0.76 (0.63)
Father's Schooling - Elementary School	3.26*** (1.02)	2.11** (1.01)	3.37*** (0.78)	1.40* (0.76)	4.94*** (0.67)	2.90*** (0.66)	5.04*** (0.65)	2.94*** (0.64)
Father's Schooling - Middle School	3.41*** (1.10)	1.30 (1.08)	3.73*** (0.86)	0.75 (0.84)	5.27*** (0.73)	2.24*** (0.72)	5.43*** (0.72)	2.69*** (0.71)
Father's Schooling - High School	8.84*** (1.14)	5.35*** (1.09)	9.39*** (0.93)	5.18*** (0.87)	9.06*** (0.77)	4.81*** (0.74)	10.68*** (0.76)	6.19*** (0.72)
Father's Schooling - College	7.85*** (1.22)	3.51*** (1.17)	7.65*** (0.95)	3.19*** (0.91)	9.44*** (0.82)	3.89*** (0.79)	9.16*** (0.79)	4.51*** (0.76)
Father's Schooling - Unknown	6.90*** (0.99)	4.87*** (0.97)	6.46*** (0.76)	3.73*** (0.74)	8.92*** (0.66)	5.89*** (0.65)	7.90*** (0.62)	5.76*** (0.61)
Constant	155.23*** (1.60)	165.00*** (1.65)	145.57*** (1.39)	155.87*** (1.40)	140.91*** (1.20)	150.27*** (1.18)	140.66*** (1.23)	152.07*** (1.24)
R-squared	0.08	0.04	0.09	0.04	0.10	0.05	0.11	0.05
N	26043	26043	38760	38760	55377	55377	56308	57123

* p<0.10, ** p<0.05, *** p<0.01

The estimators of equations (vii) and (viii) computed from the coefficients of table 11 and 12 are shown in Table 13 that presents the difference in the proficiency between Prova Brasil and each SAEB exam for the groups of schools. We observe that that schools in the state system presented a less volatile behavior between the years than the schools that migrated from the state to the municipal systems in both subjects.

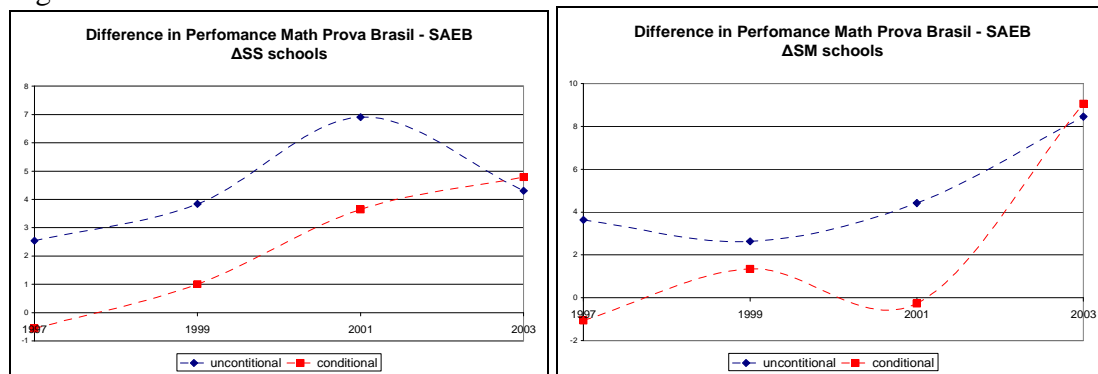
Table 13
Differences in Proficiency Scores Between Group of Schools

	2005-1997	2005-1999	2005-2001	2005-2003
Math				
Δ SS	-0.56 (0.55)	1.01* (0.58)	3.65*** (0.40)	4.79*** (0.36)
Δ SM	-1,06 (6,63)	1,35 (3,07)	-0,26 (8,67)	9,05*** (0,557)
Reading				
Δ SS	-3.55*** (0.59)	4.90*** (0.65)	6.08*** (0.43)	5.13*** (0.39)
Δ SM	-18,1*** (6,12)	0,62 (8,86)	6,79*** (0,41)	14,18*** (0,42)

SD in parenthesis * 10%, ** 5%, *** 1% of significance.

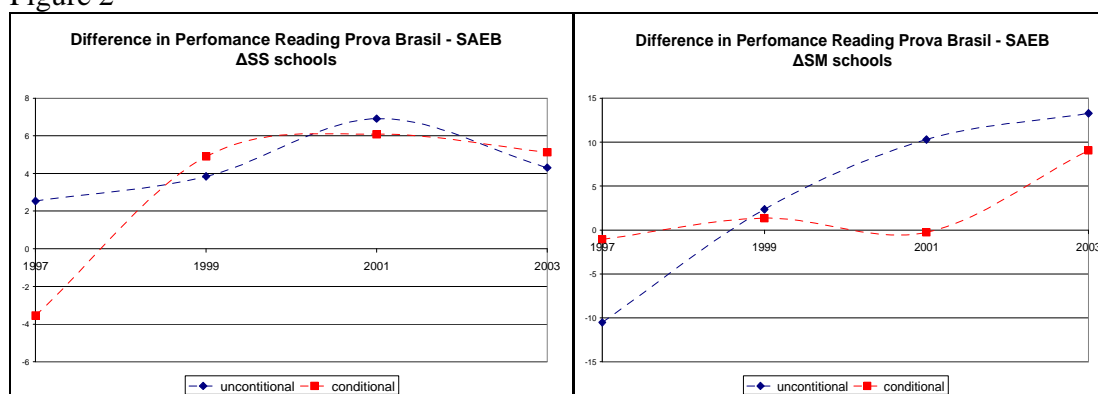
Comparing with the unconditional differences plotted in Figure 1 for math, we observe that for 1997, 1999 and 2001 the difference of results between Prova Brasil and the SAEBs exams for both groups of schools is smaller and even negative, when we take into account the control individual and family characteristics and school fixed effect. For 2003 there is almost no difference in the results.

Figure 1



For the reading tests the results are more unstable mainly for the schools that remained in the state system in 2005, as can be seen in figure 2. Controlling for individual differences and school fixed effects the difference between the Prova Brasil and Saeb is smaller for 1997 and 2001, but higher for 1999 and 2003. For the schools that moved to the municipal system unlikely what is suggested by the unconditional differences, the difference between the two exams is much better in 1997 but much smaller in 2001. For the other two years the results are similar.

Figure 2



Finally, with respect to the difference in difference estimator, first we observe that the difference in difference estimators that were not significant in the math exams, become significant for 2001 and 2003., but the results are highly volatile with a negative difference in 2001 and a positive in 2003.. For the reading exams controlling for individual characteristics and school fixed effects does not change the results substantially. Again we have mixed effect, a decline in 2005 with respect to 1997 and 1999 exams and an increase with respect to 2001 and 2003, although not significant for 2001.

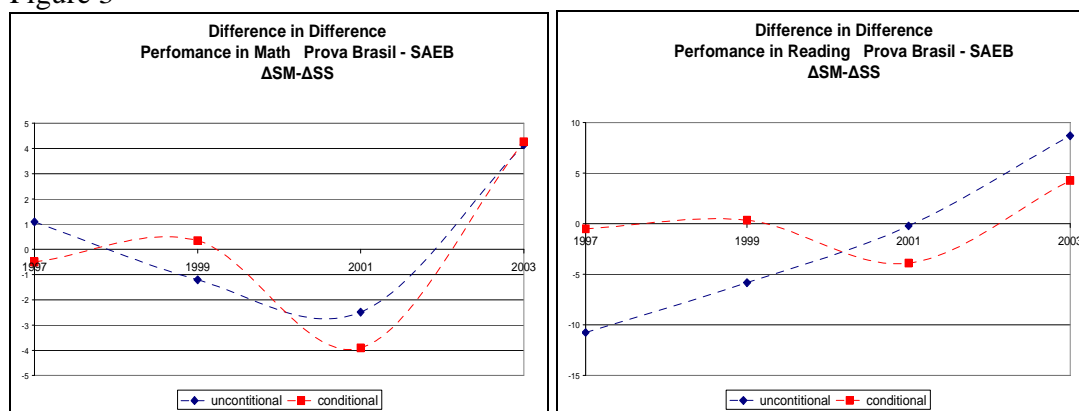
Table 13

Differences in Difference Estimators

	2005-1997	2005-1999	2005-2001	2005-2003
Math				
Conditional	-0.50 (2.72)	0.34 (2.11)	-3.91** (1.65)	4.26* (2.26)
Unconditional	1.09 (2.95)	-1.21 (2.23)	-2.49 (1.52)	4.14 (2.54)
Reading				
Conditional	-14.55*** (3.35)	-4.28* (2.42)	0.71 (1.72)	9.05*** (2.46)
Unconditional	-10.77*** (3.12)	-5.84** (2.38)	-0.22 (1.62)	8.69*** (2.63)

SD in parenthesis

Figure 3



6. Conclusions

This paper analyses the impact of the decentralization of educational system that is taking place in Brazil in the last decade, as a result of several laws that encourage municipalities to invest in fundamental education. This process take several forms: increase in the number of students attending pre existent schools, construction of new schools and the migration of schools previously under the state control to the municipalities. During this same period the Brazilian government started to evaluate the students: first with SAEB for a sample of schools and more recently Prova Brasil, for the universe of public schools. With these tests we can follow several public schools in two points in time the year of SAEB and later in Prova Brasil and create an experimental group of schools that were under state control in the SAEB exam and have migrated to the municipality control by the time of Prova Brasil, and a control group of schools that were under the state system all the time. Comparing ex ante the students in these two groups we observe that the results in terms of the proficiency tests were very similar as they were in their personal characteristics: similar proportion of boys and girls, of whites and non whites, about the same age and parents schooling. Comparing ex post we observe that the change in the proficiency results of the two groups, the DID estimator varies a lot depending on the year of comparison and the subject of the test. We find a positive significant result for math in 2003 but a negative in 2001. For reading the differences were negative or insignificant except for 2003 when the estimator shows a highly positive difference in favor of the municipalization.

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