Impact of School Day Extension on Educational Outcomes: Evidences from Mais Educação in Brazil

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Links for download

- Working Paper:
  - English and Portuguese versions (WP 147): International Policy Centre for Inclusive Growth (IPC/UNDP) - http://www.ipc-undp.org/

School and Education

- Albernaz et al. (2002) show that about 80% of the students' proficiency variance is explained by their socioeconomic status. Only 20% could be explained by school factors.
- Barros et al. (2001) estimates suggest that an additional year of schooling for parents translate into 0.3 years of schooling for their children.
- That does not mean schools are not important, but rather that they are equally ineffective in Brazil.
- School education is the most effective way to overcome students' bad initial condition and equalize opportunities.

We are trying to answer

- What is the impact of school day extension on educational outcomes?
- Did the new programme design correctly selected schools that are vulnerable?

School time definition

- One frequent suggestion to improve education quality consists of increasing the length of the school day.
- To understand the importance of additional time, Aronson et al. (1998) classifies the time spent on education in:
  - Allocated time: number of days or hours students are required to attend school.
    - Instructional time: time spent in class, whether for core academic subjects (e.g. math and language arts); or for non-core subjects (e.g. physical education);
    - Noninstructional time: portion of the day devoted to lunch and recess, to passing between classes, to school assemblies, and to other non-classroom activities.

School time definition

- Instructional time can be further divided in :
  - Engaged time: that time when students are participating in learning activities (excludes activities having little or nothing to do with learning, such as roll call, disciplinary issues, etc).
  - Academic learning time: that time when learning actually occurs.
- School time wasted on unimportant things — not related to learning — will affect students' education.

School time evidence

- Brown & Saks (1986) analyzes a panel of students to estimate the effectiveness of instruction time in mathematics and reading for two different grades (2nd and 5th).
  - Time has positive effects on both subjects for both grades but the elasticity of allocated time falls as student's initial score increases.
  - That is, time adds more to disadvantaged students

School time evidence

- DeCicca (2007) analyzes a panel of students and estimates that:
  - full day kindergarten substantially raises the math and reading achievement of children of all races.
  - but gains are much smaller just one year later.
  - declines are shallowest for whites.
  - home environment and poorer quality schools may contribute to the larger losses for minorities.

School time evidence

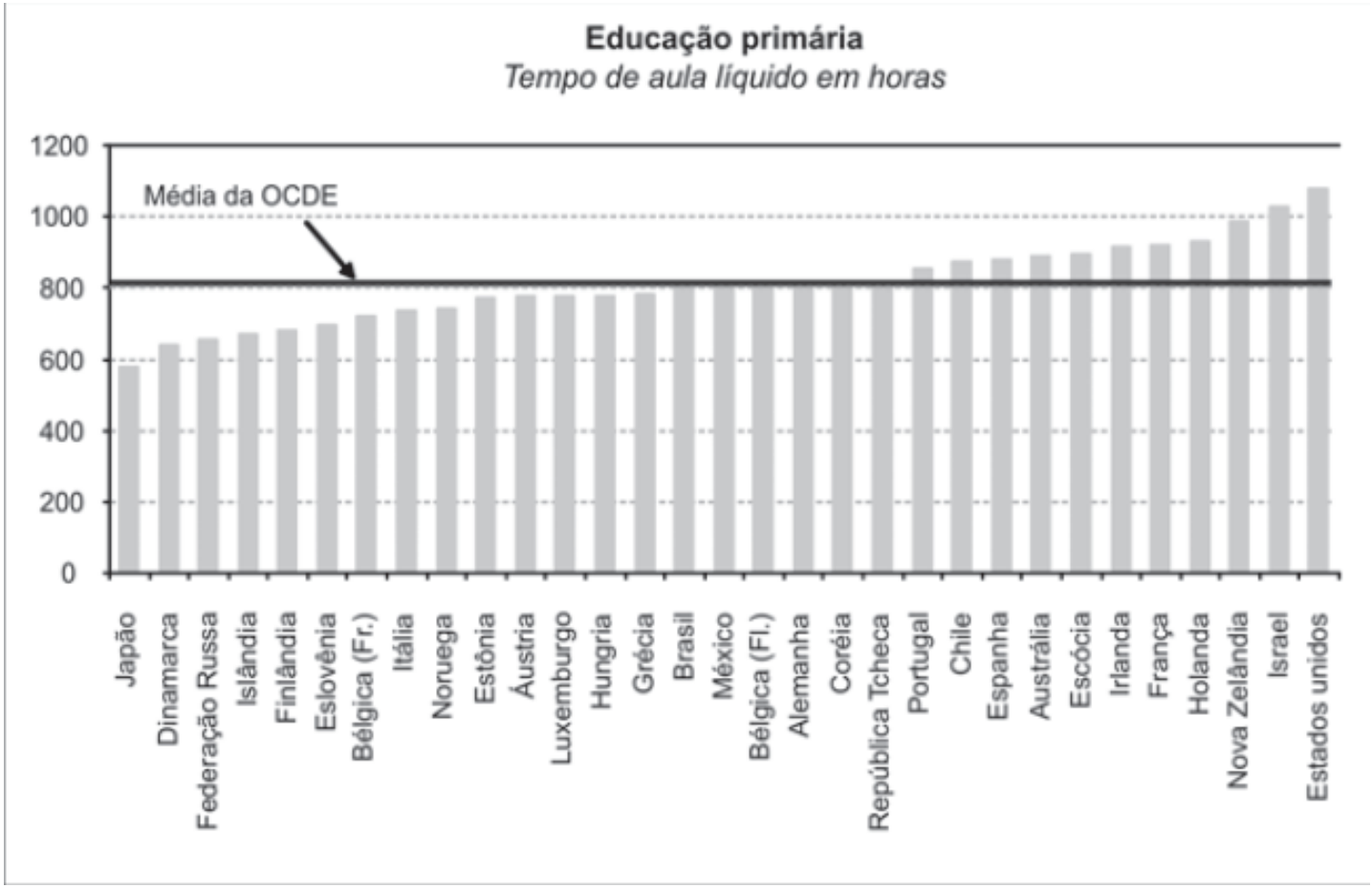
- Bellei (2009) explores a natural experiment with high school students in Chile and finds that:
  - The program had positive effects on students' achievement in both math and language;
  - the program effect has been constant over time.
  - the program had larger positive effects on rural students, students who attended public schools, and students in the upper part of the achievement distribution.

School time evidence

- Oliveira (2008) finds evidence for Brazil that one-hour increase in the school day length raises students proficiency by 0.20 standard deviation.
- Kassouf & Aquino (2011) does not find evidence of significant differences in terms of proficiency and pass rate of students enrolled at *Programa Escola de Tempo Integral* compared to those enrolled at traditional schools.
- See also Berliner (1990), Brown & Saks (1986); Carroll (1963, 1985), Hargreaves (1997), NEA(1987), NECTL(2000).

School time in Brazil

Figure: Total teaching hours, by school level, in Brazil and OECD countries, 2005.



Source: Oliveira (2008) . Adapted from OCDE, Table D4.1.

School time in Brazil

Figure: Proportion of enrollments at the Fundamental Education, by school length, in Brazilian States, 2006 (in %)

	Menos de 4 horas	4 horas	Mais de 4 até 5 horas	Mais de 5 horas
Total Brasil	**4,55**	**34,92**	**52,79**	**7,74**
Amazonas	18,93	43,83	36,64	0,59
Pernambuco	12,14	21,62	64,84	1,40
Bahia	11,24	51,84	35,91	1,01
Alagoas	10,85	34,14	53,11	1,90
Ceará	9,74	82,96	6,87	0,43
Maranhão	8,87	48,90	41,67	0,55
R. G. do Norte	8,08	11,44	80,11	0,37
Paraíba	7,76	37,92	53,27	1,06
Piauí	6,44	62,60	28,90	2,06
Sergipe	5,18	18,92	75,38	0,53
Goiás	4,64	16,46	74,02	4,88
Pará	3,31	52,32	43,14	1,23
Santa Catarina	3,21	77,26	18,31	1,21
M. G. do Sul	2,59	35,16	61,37	0,88
Rio de Janeiro	2,35	26,65	58,56	12,43
Paraná	1,60	48,06	48,69	1,65
Mato Grosso	1,42	84,44	13,80	0,35
Tocantins	1,23	39,40	58,20	1,17
R. G. do Sul	1,06	60,46	37,41	1,07
Espírito Santo	0,95	1,91	95,66	1,47
Rondônia	0,90	20,27	76,12	2,71
Acre	0,84	18,12	80,56	0,48
Roraima	0,56	4,71	94,15	0,59
Minas Gerais	0,49	3,67	93,36	2,48
Amapá	0,17	38,44	60,63	0,77
Distrito Federal	0,16	3,08	87,36	9,41
São Paulo	0,15	15,94	52,53	31,38

School time in Brazil

- Study by the Brazilian Institute of Public Opinion and Statistics (IBOPE 2011).
  - random sample of 36 high school classrooms distributed in 18 schools
  - Researchers attended classes.
  - Found that the average time spent learning after discounting interruptions, teacher and student absences and time spent organizing the classroom and enforcing students to pay attention is, on average, less than 2 hours (out of an average of 5 official hours).

Mais Educação (PME)

- It is one of the actions of the Cash Direct to School Programme (PDDE, Dinheiro Direto na Escola of the Fundo Nacional de Desenvolvimento da Educação, FNDE) implemented over twenty year ago. PDDE is a tool to strengthen self-management and autonomy in schools.
- *Mais Educação (PME)* is carried on by the Basic Education Department (SEB-MEC, Secretaria de Educação Básica). Started in 2008 and later underwent changes that sought both to expand and redefine its target audience.
- Mais Educação extends the school day by financing extra activities performed before or after the regular class time.

Allowed Expenses

- Spending with the activities' monitors, including meals and transportation.
- Small services and material acquisition for the extra shift.
- Pedagogical material in various disciplines (such as reading, mathematics and others) and extra activities (such as sports, human rights, environment, etc.)
- Acquisition of consumable and/or durable goods, as well as capital goods.

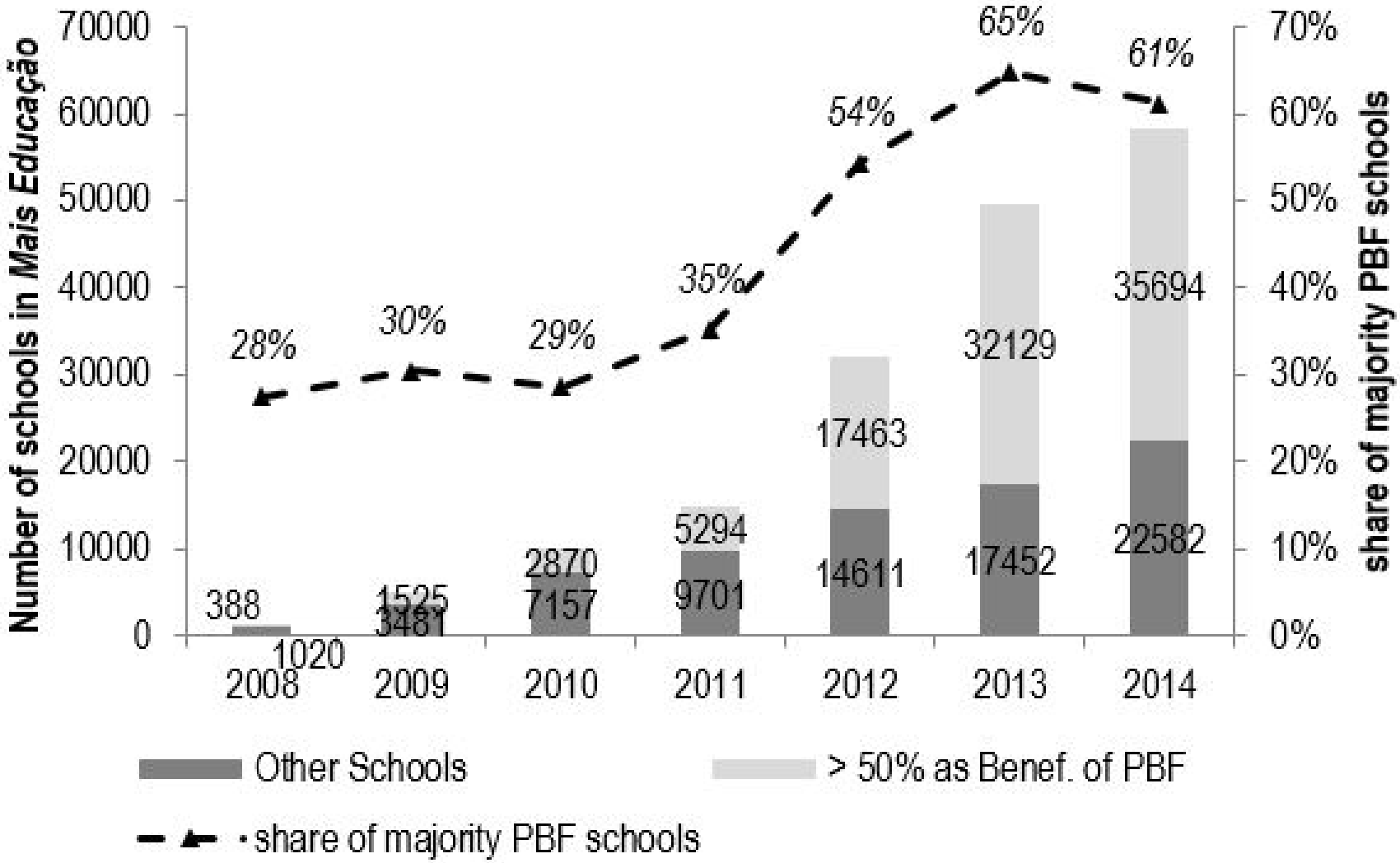
Recommended Areas

- MEC organizes PME activities in areas such as :
  - Pedagogical supervision; environmental education; sports and leisure; education in human rights; culture, arts; digital culture; health promotion; communication and uses of media; research in natural sciences; economic education / creative economics.
- Each school can choose three or four areas. Within each area, it can opt for five or six activities to be developed with students.
- The pedagogical supervision area is mandatory.

Targeted students

- "socially vulnerable" students,
- "grade-repeaters",
- 4^{th}, 5^{th}, 8^{th} and 9^{th} graders.
- New school eligibility status in 2012. Schools that had more than 50% of the students as beneficiaries of *Programa Bolsa Família* (according to SENARC-MDS).
- Schools where more than 50% of its students receive PBF lie to the right of the cutoff rule, the remaining lying to the left.

Partnership MEC/MDS in 2012



Resources

Table: Financial Resources directed to *Mais Educação* (R$):

Year	Paid	Increase
2008	29.208.276,40	
2009	133.160.503,56	103.952.227,16
2010	370.427.152,01	237.266.648,45
2011	523.093.673,76	152.666.521,75
2012	894.941.872,59	371.848.198,83
2013	1.152.334.965,12	257.393.092,53
2014	1.096.020.462,06	- 56.314.503,06

Source: FNDE - Educational Actions System

Data

Database	Institution
Dropout, failure and approval	INEP – School Census
IDEB, Maths and Portuguese proficiency	INEP – Prova Brasil and School Census
Enrolment per school	(INEP, 2012)
Schools Infrastructure Index - covariates in the baseline	INEP
Percentage of PME students per school, participation in the Programme in previous years	MDS
Interactive PDDE System - number of students in the programme, activities to be developed	MEC
School Council	FNDE - Coordination of the Direct Cash to School Program

Data

- The conditionalities' Departament — within the Social Development Ministry — gathers information on the *Bolsa Família* through *Projeto Presença*.
- The identification of participating schools since 2008 allowed us to focus only on new schools that paticipate in PME in 2012.
- The MDS officials defined a rule that allowed participation in PME whenever the school presented the majority of its students in PBF at least on year in the last couple of years. $max\{PBF2010, PBF2011\}$

Data

- MEC granted access to PDDE data, which gathers information on schools participating in PME, such as the number of students enrolled and activities carried out in each school, etc.
- Unfortunately, we don't have access to information at the student level, only at the school level.

Mais Educação (PME) targeted students

- The infrastructure index — based on a principal-component analysis (according to Soares & Sátyro (2010))—encompass the following variables : filtered water supply, public water system, energy generator, other types of energy sources, non-existent energy, public sewage collection system, sewage (septic tank), nonexistence waste disposal, waste collection, burning disposal , disposal of waste in another area, recycling waste disposal, buried the waste disposal, principal's office existence, teacher's office existence, sanitary facilities (special needs), computer and science labs, dependencies for attending people with special educational needs, kitchen facilities, library, children's playground, health center (outside the building), tv, VCR, dvd, parabolic, copier, projector, printer, computers, internet and school meals for students.

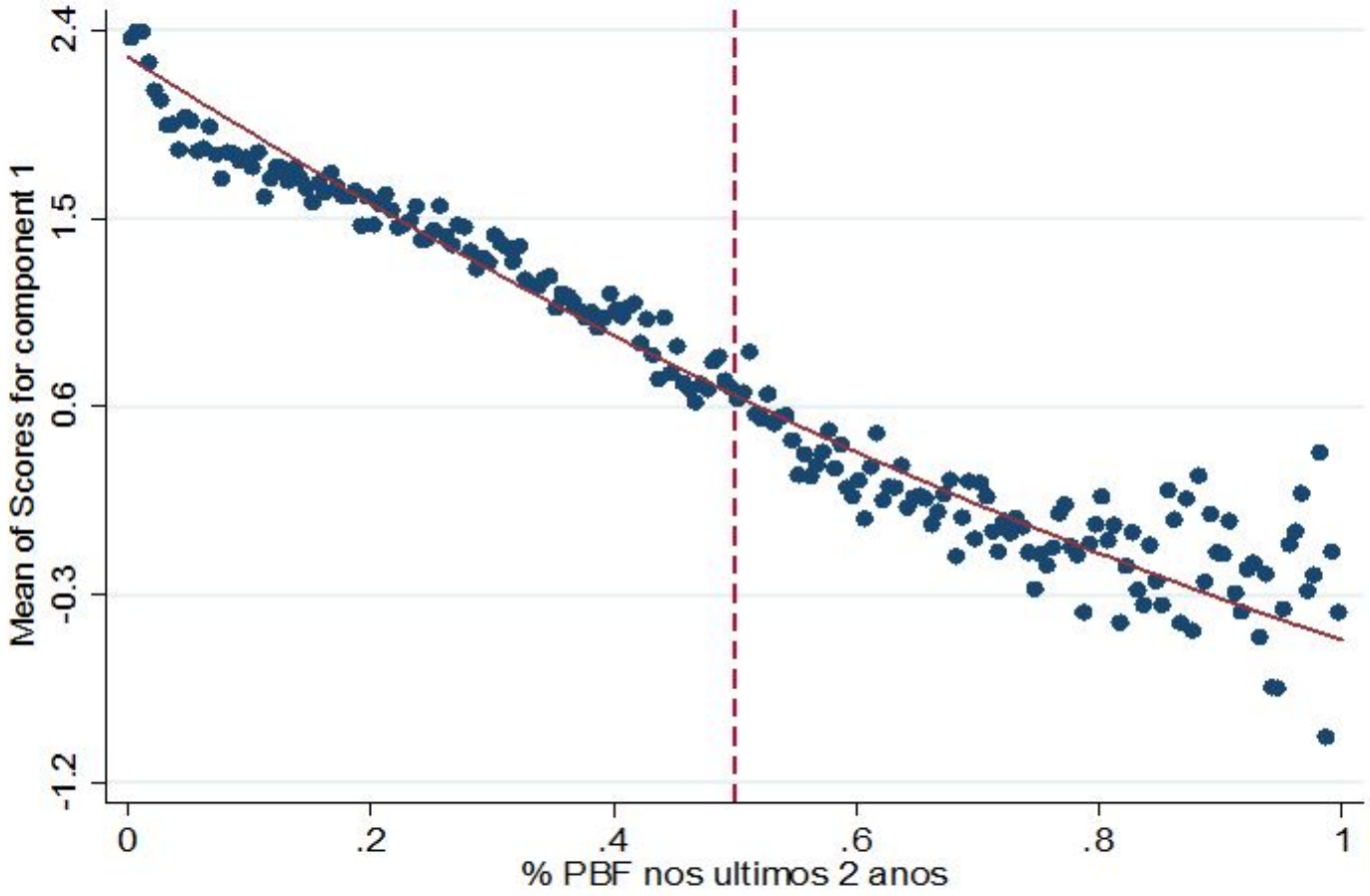
Preliminary analysis: Mean difference between PBF-minority and PBF-majority urban schools in different bandwidths

General Mean	h = 0.1000	h = 0.0500	h = 0.0250	h = 0.0125	h = 0.0050
			Region		
2.91	0.346***	0.160***	0.0470	-0.0244	0.0463
	(0.000)	(0.000)	(0.417)	(0.767)	(0.722)
			Infrastructure		
1.23	0.390***	0.133**	0.0918	-0.000551	0.0523
	(0.000)	(0.005)	(0.169)	(0.995)	(0.736)
			Number of employees		
50.05	2.277***	1.401	1.110	-0.406	-2.284
	(0.000)	(0.052)	(0.269)	(0.773)	(0.309)
			Number of rooms		
12.54	1.060***	0.298	-0.522	-1.229**	-1.551*
	(0.000)	(0.161)	(0.075)	(0.008)	(0.017)
			Number of computers		
20.71	2.171***	1.313	1.010	1.181	1.476
	(0.000)	(0.186)	(0.077)	(0.102)	(0.218)
			Existence of Principal's Room		
0.95	0.00259	-0.000914	0.0128	0.00727	0.0192
	(0.667)	(0.915)	(0.284)	(0.675)	(0.413)
			Existence of Teacher's Room		
0.87	0.0776***	0.0590***	0.0574**	0.0660*	0.0617
	(0.000)	(0.000)	(0.002)	(0.014)	(0.147)
			Power from public utility		
1	-0.000243	-0.000533	-0.00108	0	0
	(0.386)	(0.348)	(0.351)	(.)	(.)
			Internet		

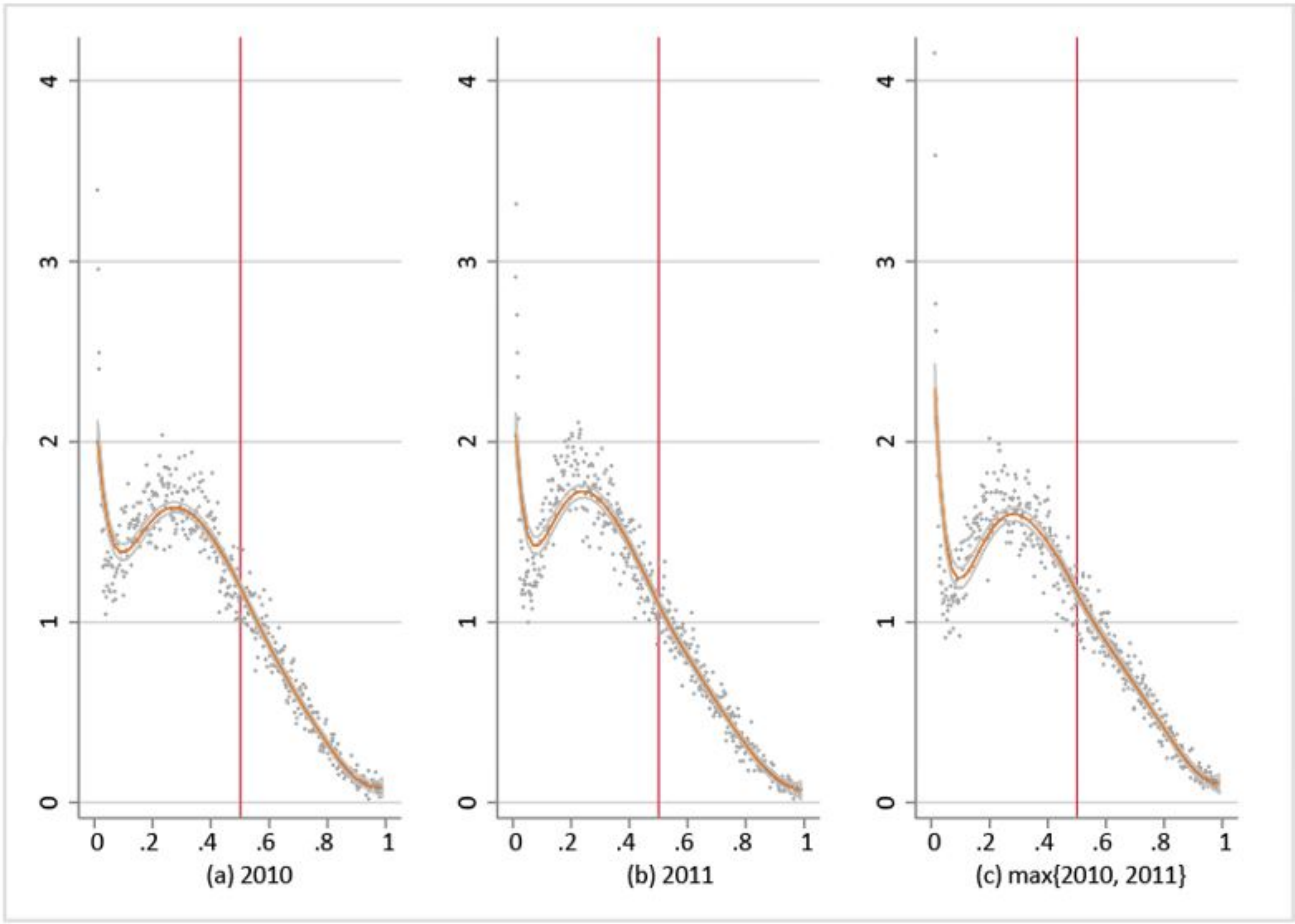
Preliminary analysis:Mean difference between PBF-minority and PBF-majority urban schools in different bandwidths (cont.)

	Periodic garbage collection				
0.99	0.00743** (0.008)	-0.000182 (0.961)	-0.00672 (0.156)	-0.0145* (0.036)	-0.0225 (0.081)
	Water from public utility				
0.93	0.0121* (0.047)	0.000545 (0.949)	-0.00140 (0.905)	-0.0222 (0.170)	0.0235 (0.392)
	Sewage (public utility)				
0.65	0.0756*** (0.000)	0.00978 (0.562)	-0.0176 (0.465)	-0.0354 (0.300)	-0.0344 (0.531)
	Library				
0.59	0.0376** (0.002)	0.0157 (0.349)	0.00507 (0.832)	-0.00239 (0.944)	0.00605 (0.912)
	Open-air sports court				
0.29	0.0624*** (0.000)	0.0278* (0.039)	0.0166 (0.390)	0.0176 (0.503)	0.0233 (0.550)
	School meal availability				
0.8	-0.0169*** (0.000)	-0.00474 (0.330)	0.00507 (0.447)	0.00451 (0.555)	0.0179 (0.122)

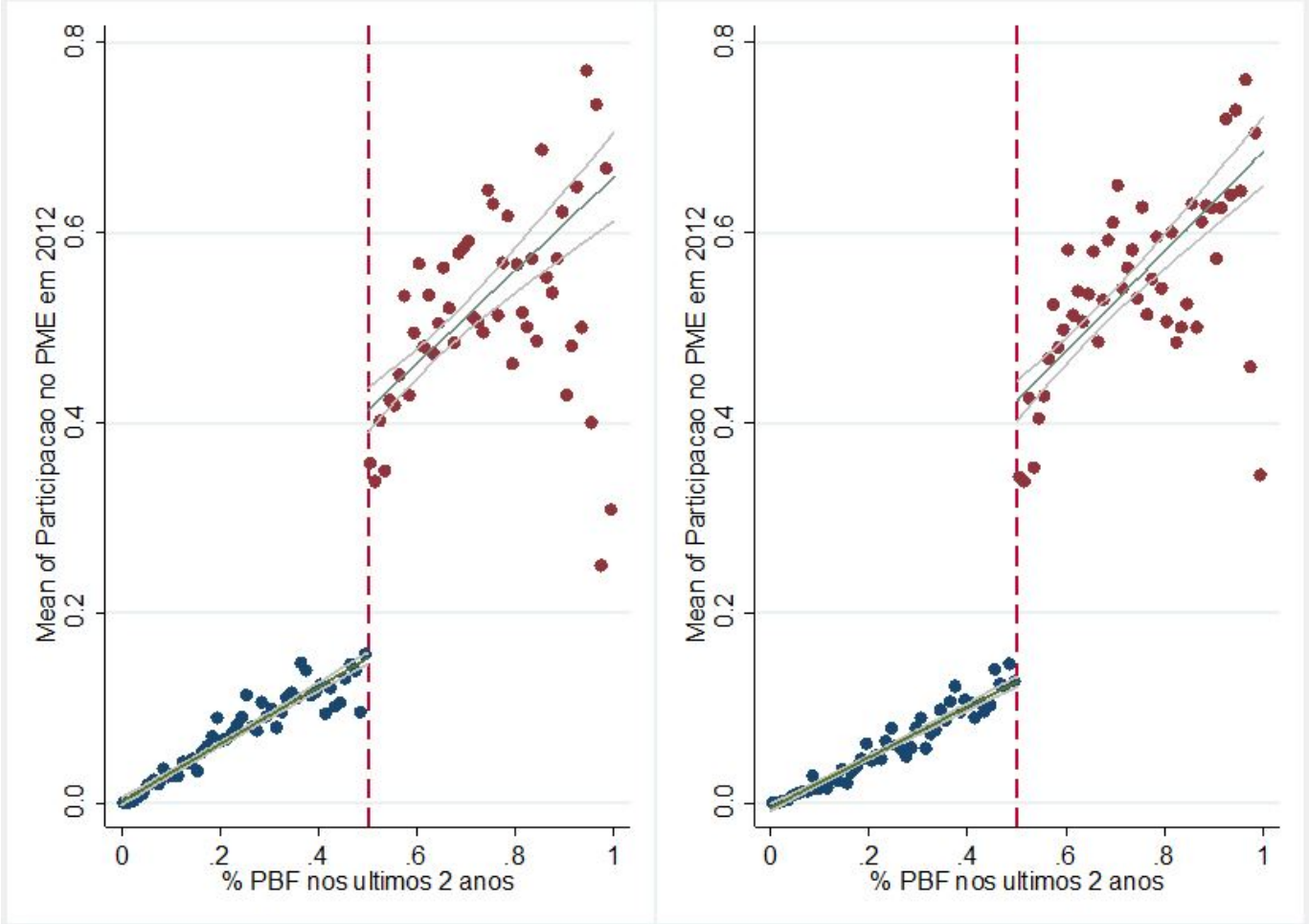
Preliminary analysis:Infrastructure indicator in 2011 throughout the PBF distribution



Preliminary analysis: Continuity of assignment variable (McCrary's Test)



Preliminary analysis: Probability of treatment throughout the PBF distribution



Preliminary analysis: conclusion

- Apparently, we have a discontinuity in the probability of treatment.
- Since the jump in the probability at the cutoff is smaller than one, we have a Fuzzy Regression Discontinuity Design.

Empirical Framework

- Fuzzy RDD

  2nd stage

$$Y = \alpha + \tau D + \beta_1(X - c) + \beta_2 D(X - c) + \epsilon \tag{1}$$

  1st stage

$$D = \gamma_1 + \delta_1 T + \delta_2(X - c) + \delta_3 T(X - c) + \upsilon_1 \tag{2}$$

$$D(X - c) = \gamma_2 + \delta_4 T + \delta_5(X - c) + \delta_6 T(X - c) + \upsilon_2 \tag{3}$$

Results: First Stage

	modelo sem interação					modelo com interação				
D	*h=0.1000*	*h=0.0500*	*h=0.0250*	*h=0.0125*	*h=0.0050*	*h=0.1000*	*h=0.0500*	*h=0.0250*	*h=0.0125*	*h=0.0050*
T	0.193 ***	0.193 ***	0.188 ***	0.198 ***	0.113	0.183 ***	0.188 ***	0.181 ***	0.216 ***	0.098
	(0.020)	(0.030)	(0.042)	(0.059)	(0.090)	(0.020)	(0.030)	(0.042)	(0.061)	(0.109)
(X-c)	1.061 ***	0.913 *	1.068	-0.214	22.776	0.492 **	0.214	-0.155	3.712	20.602
	(0.174)	(0.513)	(1.440)	(4.150)	(15.186)	(0.226)	(0.695)	(1.888)	(5.364)	(17.426)
T(X-c)						1.392 ***	1.540	2.923	-9.768	9.112
						(0.353)	(1.031)	(2.919)	(8.462)	(35.678)
constante	0.219 ***	0.203 ***	0.197 ***	0.180 ***	0.238 ***	0.189 ***	0.186 ***	0.182 ***	0.201 ***	0.233 ***
	(0.011)	(0.016)	(0.023)	(0.030)	(0.044)	(0.014)	(0.020)	(0.027)	(0.036)	(0.047)
N	7205	3530	1738	866	356	7205	3530	1738	866	356
D(X-c)										
T						-0.002 **	-0.001	-0.001	0.000	0.000
						(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
(X-c)						0.142 ***	0.175 ***	0.197 ***	0.183 ***	0.166 ***
						(0.013)	(0.020)	(0.028)	(0.038)	(0.050)
T(X-c)						0.418 ***	0.288 ***	0.256 ***	0.156 ***	0.358 ***
						(0.020)	(0.030)	(0.043)	(0.060)	(0.103)
constante						-0.001	0.000	0.000	0.000	0.000
						(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
N						7205	3530	1738	866	356

Results: Second Stage (early years)

	abandono - ef 1ºao 5º	abandono - ef 4º	abandono - ef 5º	reprovação - ef 1º ao 5º	reprovação - ef 4º	reprovação - ef 5º	aprovação - ef 1º ao 5º	aprovação - ef 4º	aprovação - ef 5º	matemática - ef 5º	português - ef 5º	ideb iniciais
						h=0.1000						
D (estimado)	0.012	0.011	0.01	0.01	0.015	0.036	-0.022	-0.026	-0.047	-0.167	-2.567	-0.292
	(0.008)	(0.010)	(0.011)	(0.018)	(0.028)	(0.025)	(0.022)	(0.032)	(0.030)	(7.322)	(6.327)	(0.303)
(X-c)	0.037 *	0.049 *	0.054 *	0.132 ***	0.225 ***	0.111 *	-0.17 ***	-0.274 ***	-0.165 **	-98.319 ***	-79.716 ***	-3.395 ***
	(0.022)	(0.027)	(0.028)	(0.047)	(0.071)	(0.065)	(0.058)	(0.081)	(0.076)	(19.258)	(16.600)	(0.789)
Constante	0.012 ***	0.012 ***	0.015 ***	0.075 ***	0.08 ***	0.069 ***	0.913 ***	0.908 ***	0.916 ***	205.19 ***	189.168 ***	4.97 ***
	(0.003)	(0.003)	(0.003)	(0.006)	(0.009)	(0.008)	(0.007)	(0.010)	(0.010)	(2.347)	(2.022)	(0.097)
N	5819	5526	5528	5819	5526	5528	5819	5526	5528	4620	4620	4620
						h=0.0500						
D (estimado)	0.011	0.022 *	0.002	0.008	0.021	0.029	-0.019	-0.043	-0.031	4.963	0.363	-0.102
	(0.012)	(0.013)	(0.015)	(0.027)	(0.039)	(0.039)	(0.033)	(0.043)	(0.045)	(10.615)	(9.277)	(0.439)
(X-c)	0.048	-0.005	0.109	0.145	0.191	0.162	-0.193	-0.187	-0.271	-126.442 ***	-97.091 **	-4.549 **
	(0.050)	(0.056)	(0.068)	(0.115)	(0.160)	(0.164)	(0.140)	(0.179)	(0.189)	(43.904)	(38.387)	(1.822)
Constante	0.013 ***	0.008 **	0.017 ***	0.077 ***	0.08 ***	0.074 ***	0.91 ***	0.911 ***	0.908 ***	203.187 ***	187.848 ***	4.891 ***
	(0.004)	(0.004)	(0.005)	(0.008)	(0.012)	(0.012)	(0.010)	(0.013)	(0.013)	(3.204)	(2.792)	(0.132)
N	2873	2731	2719	2873	2731	2719	2873	2731	2719	2260	2260	2260
						h=0.0250						
D (estimado)	0.014	0.005	0.006	0.023	-0.011	0.035	-0.037	0.006	-0.04	9.354	9.851	0.298
	(0.015)	(0.019)	(0.019)	(0.040)	(0.060)	(0.055)	(0.046)	(0.066)	(0.063)	(15.861)	(14.024)	(0.654)
(X-c)	0.011	0.142	0.065	0	0.483	0.167	-0.012	-0.625	-0.231	-179.714	-198.51 *	-8.693 *
	(0.117)	(0.148)	(0.156)	(0.291)	(0.430)	(0.405)	(0.344)	(0.475)	(0.461)	(121.125)	(106.479)	(5.003)
Constante	0.011 ***	0.013 **	0.015 ***	0.073 ***	0.091 ***	0.073 ***	0.915 ***	0.896 ***	0.912 ***	202.519 ***	185.57 ***	4.806 ***
	(0.004)	(0.005)	(0.006)	(0.012)	(0.017)	(0.016)	(0.014)	(0.019)	(0.018)	(4.571)	(4.018)	(0.188)
N	1406	1339	1339	1406	1339	1339	1406	1339	1339	1096	1096	1096
						h=0.0125						
D (estimado)	0.029	0.027	0.013	0.022	-0.049	-0.029	-0.051	0.021	0.016	35.076 *	36.338 **	1.247
	(0.019)	(0.023)	(0.027)	(0.054)	(0.082)	(0.080)	(0.063)	(0.089)	(0.090)	(20.278)	(17.990)	(0.867)
(X-c)	-0.178	-0.291	-0.009	-0.013	1.231	1.269	0.191	-0.939	-1.26	-593.089 **	-643.29 ***	-23.8 **
	(0.259)	(0.293)	(0.339)	(0.729)	(1.059)	(1.096)	(0.850)	(1.168)	(1.236)	(262.631)	(231.311)	(11.277)
Constante	0.006	0.006	0.013 *	0.073 ***	0.098 ***	0.089 ***	0.921 ***	0.895 ***	0.899 ***	196.188 ***	179.334 ***	4.595 ***
	(0.005)	(0.006)	(0.007)	(0.015)	(0.023)	(0.022)	(0.017)	(0.025)	(0.025)	(5.572)	(4.920)	(0.236)
N	716	678	677	716	678	677	716	678	677	562	562	562
						h=0.0050						
D (estimado)	0.044	-0.017	0.04	0.017	-0.016	-0.176	-0.061	0.033	0.136	91.645 *	88.213 *	4.01 *

Second Stage Results (final years)

	abandono - ef 6º ao 9º		abandono - ef 8º		abandono - ef 9º		reprovação - ef 6º ao 9º		reprovação - ef 8º		reprovação - ef 9º		aprovação - ef 6 ao 9º		aprovação - ef 8º		aprovação - ef 9º		matemática - ef 9º		português - ef 9º		ideb finais	
	h=0.1000																							
D (estimado)	-0.018		-0.018		-0.018		-0.013		-0.013		-0.013		0.031		0.031		0.031		-4.679		-1.462		0.032	
	(0.021)		(0.021)		(0.021)		(0.032)		(0.032)		(0.032)		(0.041)		(0.041)		(0.041)		(7.497)		(6.860)		(0.329)	
(X-c)	0.182	***	0.182	***	0.182	***	0.209	**	0.209	**	0.209	**	-0.391	***	-0.391	***	-0.391	***	-32.321	*	-38.948	**	-2.578	***
	(0.056)		(0.056)		(0.056)		(0.085)		(0.085)		(0.085)		(0.109)		(0.109)		(0.109)		(19.417)		(18.091)		(0.848)	
Constante	0.055	***	0.055	***	0.055	***	0.136	***	0.136	***	0.136	***	0.809	***	0.809	***	0.809	***	240.848	***	234.987	***	3.782	***
	(0.007)		(0.007)		(0.007)		(0.010)		(0.010)		(0.010)		(0.013)		(0.013)		(0.013)		(2.374)		(2.150)		(0.104)	
N	4001		4001		4001		4001		4001		4001		4001		4001		4001		2978		2978		2978	
	h=0.0500																							
D (estimado)	-0.031		-0.031		-0.031		0.026		0.026		0.026		0.004		0.004		0.004		-1.282		-2.366		0.028	
	(0.028)		(0.028)		(0.028)		(0.044)		(0.044)		(0.044)		(0.056)		(0.056)		(0.056)		(10.473)		(9.591)		(0.469)	
(X-c)	0.221	*	0.221	*	0.221	*	0.016		0.016		0.016		-0.237		-0.237		-0.237		-50.511		-34.279		-2.423	
	(0.115)		(0.115)		(0.115)		(0.184)		(0.184)		(0.184)		(0.232)		(0.232)		(0.232)		(43.013)		(39.860)		(1.940)	
Constante	0.059	***	0.059	***	0.059	***	0.128	***	0.128	***	0.128	***	0.813	***	0.813	***	0.813	***	239.359	***	234.588	***	3.752	***
	(0.009)		(0.009)		(0.009)		(0.013)		(0.013)		(0.013)		(0.017)		(0.017)		(0.017)		(3.130)		(2.842)		(0.141)	
N	1949		1949		1949		1949		1949		1949		1949		1949		1949		1450		1450		1450	
	h=0.250																							
D (estimado)	0.007		0.007		0.007		0.021		0.021		0.021		-0.028		-0.028		-0.028		-17.874		-19.045		-0.451	
	(0.043)		(0.043)		(0.043)		(0.066)		(0.066)		(0.066)		(0.085)		(0.085)		(0.085)		(15.374)		(13.811)		(0.670)	
(X-c)	-0.143		-0.143		-0.143		0.043		0.043		0.043		0.099		0.099		0.099		90.726		116.795		2.12	
	(0.332)		(0.332)		(0.332)		(0.499)		(0.499)		(0.499)		(0.650)		(0.650)		(0.650)		(112.619)		(103.958)		(5.019)	
Constante	0.049	***	0.049	***	0.049	***	0.13	***	0.13	***	0.13	***	0.82	***	0.82	***	0.82	***	244.48	***	239.67	***	3.899	***
	(0.013)		(0.013)		(0.013)		(0.019)		(0.019)		(0.019)		(0.025)		(0.025)		(0.025)		(4.502)		(4.024)		(0.195)	
N	966		966		966		966		966		966		966		966		966		722		722		722	
	h=0.0125																							
D (estimado)	0.031		0.031		0.031		0.072		0.072		0.072		-0.103		-0.103		-0.103		-2.508		-0.03		-0.323	
	(0.053)		(0.053)		(0.053)		(0.089)		(0.089)		(0.089)		(0.114)		(0.114)		(0.114)		(20.174)		(18.772)		(0.887)	
(X-c)	-0.467		-0.467		-0.467		-1.262		-1.262		-1.262		1.728		1.728		1.728		-173.514		-212.836		0.304	
	(0.772)		(0.772)		(0.772)		(1.263)		(1.263)		(1.263)		(1.619)		(1.619)		(1.619)		(274.371)		(253.830)		(12.608)	
Constante	0.042	***	0.042	***	0.042	***	0.115	***	0.115	***	0.115	***	0.843	***	0.843	***	0.843	***	241.098	***	235.374	***	3.902	***
	(0.015)		(0.015)		(0.015)		(0.024)		(0.024)		(0.024)		(0.031)		(0.031)		(0.031)		(5.655)		(5.276)		(0.250)	
N	477		477		477		477		477		477		477		477		477		358		358		358	
	h=0.0050																							
D (estimado)	0.165		0.165		0.165		0.07		0.07		0.07		-0.235		-0.235		-0.235		-7.147		0.723		0.015	

Heterogeneous effects

- We test two other variables as treatments.
- First, we use a treatment variable that measures the percentage of students participating at PME.
- Second, we considered treated those schools that chose more than two areas.

Heterogeneous effects: first stage results

	% alunos no Mais Educação				Dois ou mais macrocampos de Acompanhamento Pedagógico			
	h=0.0250		*h=0.0125*		*h=0.0250*		*h=0.0125*	
T	0.08	***	0.086	**	0.095	***	0.132	**
	(0.028)		(0.039)		(0.036)		(0.052)	
T(X-c)	3.442	**	-1.112		2.398		-2.821	
	(1.486)		(4.153)		(1.875)		(5.589)	
(1-T)(X-c)	-0.341		3.862		1.038		0.801	
	(1.261)		(3.404)		(1.591)		(4.581)	
constante	0.093	***	0.113	***	0.118	***	0.119	***
	(0.018)		(0.023)		(0.023)		(0.031)	
N	1738		866		1738		866	

Het. effects for early years: 2nd stage (early years)

	abandono - ef 1º ao 5º	abandono - ef 4º	abandono - ef 5º	reprovação - ef 1º ao 5º	eprovaçãoo - ef 4º	reprovação - ef 5º	aprovação - ef 1º ao 5º	aprovação - ef 4º	aprovação - ef 5º	matemática - ef 5º	português - ef 5º	ideb iniciais
	h=0.0250											
% alunos PME	0.019	0.012	-0.003	0.046	-0.063	0.044	-0.066	0.051	-0.042	15.021	18.809	0.529
	(0.036)	(0.049)	(0.049)	(0.091)	(0.142)	(0.134)	(0.108)	(0.157)	(0.153)	(37.223)	(32.289)	(1.542)
T(X-c)	0.067	0.113	0.176	-0.028	0.955	0.223	-0.039	-1.068	-0.399	-124.535	-208.239	-9.381
	(0.285)	(0.416)	(0.371)	(0.630)	(1.018)	(0.915)	(0.776)	(1.134)	(1.072)	(261.860)	(226.072)	(10.851)
(1-T)(X-c)	-0.035	0.104	0.032	-0.03	0.412	0.196	0.065	-0.516	-0.228	-166.124	-148.686	-6.236
	(0.134)	(0.115)	(0.172)	(0.320)	(0.490)	(0.457)	(0.377)	(0.533)	(0.503)	(133.385)	(117.123)	(5.481)
Constante	0.011 **	0.013 **	0.016 **	0.073 ***	0.095 ***	0.075 ***	0.915 ***	0.893 ***	0.908 ***	202.968 ***	186.121 ***	4.839 ***
	(0.004)	(0.006)	(0.006)	(0.012)	(0.019)	(0.018)	(0.014)	(0.021)	(0.020)	(4.954)	(4.278)	(0.203)
N	1370	1307	1305	1370	1307	1305	1370	1307	1305	1069	1069	1069
	h=0.0125											
% alunos PME	0.076	0.073	0.028	0.076	-0.062	-0.127	-0.151	-0.011	0.099	75.216	79.287 *	2.856
	(0.050)	(0.054)	(0.064)	(0.134)	(0.197)	(0.182)	(0.157)	(0.208)	(0.212)	(48.043)	(42.808)	(2.070)
T(X-c)	-0.503	-0.428	-0.242	-0.431	-0.657	2.034	0.935	1.085	-1.791	-301.132	-409.009	-18.665
	(0.448)	(0.420)	(0.510)	(1.062)	(1.732)	(1.539)	(1.296)	(1.836)	(1.768)	(386.614)	(351.996)	(16.653)
(1-T)(X-c)	-0.264	-0.463	0.044	-0.139	2.852	1.258	0.404	-2.389	-1.302	-999.29 **	-1023.04 **	-35.835 *
	(0.431)	(0.495)	(0.610)	(1.345)	(1.935)	(1.846)	(1.544)	(2.124)	(2.135)	(491.725)	(425.761)	(20.938)
Constante	0.004	0.004	0.013	0.069 ***	0.104 ***	0.095 ***	0.926 ***	0.892 ***	0.892 ***	193.383 ***	176.512 ***	4.491 ***
	(0.007)	(0.008)	(0.010)	(0.021)	(0.030)	(0.028)	(0.024)	(0.032)	(0.032)	(7.258)	(6.381)	(0.309)
N	701	666	663	701	666	663	701	666	663	552	552	552
	h=0.0250											
Acomp Pedag >2	0,016	0,01	-0,002	0,039	-0,053	0,037	-0,055	0,043	-0,035	12,648	15,838	0,446
	(0.030)	(0.041)	(0.041)	(0.077)	(0.120)	(0.113)	(0.091)	(0.132)	(0.129)	(31.343)	(27.189)	(1.299)
T(X-c)	0,095	0,13	0,172	0,037	0,866	0,286	-0,132	-0,996	-0,458	-103,162	-181,476	-8,628
	(0.240)	(0.353)	(0.311)	(0.519)	(0.843)	(0.751)	(0.643)	(0.939)	(0.883)	(215.804)	(186.035)	(8.940)
(1-T)(X-c)	-0,059	0,089	0,035	-0,086	0,489	0,143	0,145	-0,578	-0,177	-184,375	-171,54	-6,879
	(0.152)	(0.143)	(0.202)	(0.385)	(0.591)	(0.557)	(0.451)	(0.644)	(0.615)	(160.719)	(140.597)	(6.595)
Constante	0,011 **	0,013 **	0,016 **	0,073 ***	0,095 ***	0,075 ***	0,916 ***	0,892 ***	0,909 ***	202,873 ***	186,002 ***	4,836 ***
	(0.005)	(0.006)	(0.007)	(0.013)	(0.020)	(0.019)	(0.015)	(0.022)	(0.021)	(5.181)	(4.474)	(0.213)
N	1370	1307	1305	1370	1307	1305	1370	1307	1305	1069	1069	1069
	h=0.0125											
Acomp Pedag >2	0.049	0.047	0.018	0.049	-0.04	-0.082	-0.099	-0.007	0.064	48.979	51.63 *	1.86
	(0.033)	(0.035)	(0.042)	(0.087)	(0.128)	(0.118)	(0.103)	(0.135)	(0.138)	(31.285)	(27.876)	(1.348)
T(X-c)	-0.449	-0.375	-0.222	-0.376	-0.701	1.942	0.825	1.077	-1.72	-246.606	-351.531	-16.595
	(0.421)	(0.393)	(0.480)	(1.004)	(1.646)	(1.461)	(1.225)	(1.748)	(1.672)	(366.286)	(333.203)	(15.731)
Constante	-0.012	-0.219	0.136	0.114	2.646 *	0.835	-0.102	-2.427	-0.971	-748.073 *	-758.229 **	-26.295
	(0.334)	(0.389)	(0.464)	(1.035)	(1.484)	(1.435)	(1.189)	(1.657)	(1.659)	(385.572)	(330.895)	(16.310)
(1-T)(X-c)	0.007	0.006	0.014 *	0.072 ***	0.102 ***	0.091 ***	0.921 ***	0.892 ***	0.896 ***	196.05 ***	179.324 ***	4.592 ***
	(0.005)	(0.006)	(0.007)	(0.016)	(0.023)	(0.021)	(0.018)	(0.025)	(0.025)	(5.646)	(4.945)	(0.239)

Het. effects for early years: 2nd stage results (final years)

	abandono - ef 6º ao 9º	abandono - ef 8º	abandono - ef 9º	reprovação - ef 6º ao 9º	reprovação - ef 8º	reprovação - ef 9º	aprovação - ef 6º ao 9º	aprovação - ef 8º	aprovação - ef 9º	matemática - ef 9º	português - ef 9º	ideb finais
						h=0.0250						
% alunos PME	-0.001	-0.02	0.027	-0.001	0.184	0.11	0.001	-0.164	-0.137	-29.371	-30.373	-0.661
	(0.104)	(0.121)	(0.106)	(0.157)	(0.185)	(0.152)	(0.208)	(0.231)	(0.189)	-36.875	-33.872	-1.607
T(X-c)	0.125	0.31	-0.024	0.526	-0.786	-0.621	-0.651	0.476	0.645	-10.652	-0.312	-3.338
	(0.728)	(0.861)	(0.848)	-1.145	-1.382	-1.107	-1.491	-1.734	-1.434	-255.321	-236.480	-11.330
(1-T)(X-c)	-0.344	-0.226	-0.59	-0.203	-0.473	-0.702	0.547	0.699	1.292 **	194.1	219.615 **	6.663
	(0.381)	(0.416)	(0.385)	(0.515)	(0.513)	(0.484)	(0.693)	(0.677)	(0.637)	-121.896	-110.989	-5.369
Constante	0.048 ***	0.048 ***	0.042 ***	0.132 ***	0.089 ***	0.064 ***	0.82 ***	0.863 ***	0.894 ***	245.279 ***	240.432 ***	3.939 ***
	(0.014)	(0.017)	(0.013)	(0.021)	(0.023)	(0.019)	(0.027)	(0.029)	(0.024)	-4.827	-4.378	(0.211)
N	939	886	864	939	886	864	939	886	864	705	705	705
						h=0.0125						
% alunos PME	0.041	-0.061	0.073	0.098	0.352	0.045	-0.138	-0.29	-0.117	0.25	1.75	-0.437
	(0.129)	(0.151)	(0.135)	(0.216)	(0.231)	(0.205)	(0.280)	(0.281)	(0.256)	-46.969	-42.772	-2.105
T(X-c)	-0.18	0.708	-0.034	0.286	-1.741	1.872	-0.106	1.033	-1.837	-369.257	-341.545	-11.141
	(0.955)	-1.057	-1.084	-1.769	-1.939	-1.770	-2.297	-2.436	-2.122	-371.168	-357.879	-17.339
(1-T)(X-c)	-0.46	0.192	-1.156	-2.574	-3.186	-2.177	3.034	2.994	3.333	77.769	15.686	13.464
	-1.483	-1.878	-1.494	-2.228	-2.364	-2.234	-2.863	-2.933	-2.897	-510.265	-449.205	-22.593
Constante	0.043 **	0.055 **	0.034 *	0.111 ***	0.06 *	0.061 **	0.846 ***	0.885 ***	0.904 ***	241.933 ***	236.495 ***	3.965 ***
	(0.020)	(0.026)	(0.020)	(0.032)	(0.034)	(0.030)	(0.041)	(0.042)	(0.038)	-7.432	-6.623	(0.326)
N	467	446	429	467	446	429	467	446	429	350	350	350
						h=0.0250						
Acomp Pedag >2	-0.001	-0.017	0.022	-0.001	0.155	0.093	0.001	-0.138	-0.115	-24.732	-25.575	-0.556
	(0.087)	(0.102)	(0.090)	(0.133)	(0.156)	(0.128)	(0.175)	(0.194)	(0.159)	-31.051	-28.522	-1.353
T(X-c)	0.124	0.282	0.014	0.525	-0.525	-0.465	-0.649	0.242	0.45	-52.442	-43.528	-4.278
	(0.603)	(0.717)	(0.717)	(0.952)	-1.148	(0.920)	-1.234	-1.444	-1.202	-209.126	-193.788	-9.328
(1-T)(X-c)	-0.343	-0.202	-0.622	-0.202	-0.696	-0.836	0.545	0.898	1.458 **	229.787	256.519 *	7.465
	(0.462)	(0.518)	(0.451)	(0.628)	(0.628)	(0.584)	(0.840)	(0.831)	(0.754)	-148.516	-134.797	-6.510
Constante	0.048 ***	0.049 ***	0.042 ***	0.132 ***	0.088 ***	0.063 ***	0.82 ***	0.864 ***	0.895 ***	245.466 ***	240.625 ***	3.944 ***
	(0.015)	(0.018)	(0.014)	(0.022)	(0.024)	(0.020)	(0.029)	(0.031)	(0.025)	-5.051	-4.584	(0.220)
N	939	886	864	939	886	864	939	886	864	705	705	705
						h=0.0125						
Acomp Pedag >2	0.027	-0.04	0.047	0.064	0.229	0.029	-0.09	-0.189	-0.076	0.163	1.14	-0.285
	(0.084)	(0.098)	(0.088)	(0.140)	(0.151)	(0.134)	(0.182)	(0.183)	(0.166)	-30.585	-27.852	-1.371
T(X-c)	-0.15	0.663	0.018	0.356	-1.486	1.904	-0.206	0.822	-1.923	-369.076	-340.276	-11.458
	(0.902)	-1.014	-1.028	-1.670	-1.826	-1.670	-2.165	-2.310	-2.003	-354.168	-340.863	-16.506
Constante	-0.324	-0.013	-0.914	-2.248	-2.012	-2.027	2.572	2.025	2.941	78.603	21.531	12.004
	-1.195	-1.503	-1.208	-1.758	-1.892	-1.791	-2.274	-2.354	-2.347	-396.402	-349.467	-17.695
(1-T)(X-c)	0.045 ***	0.053 ***	0.037 **	0.115 ***	0.072 ***	0.063 ***	0.841 ***	0.875 ***	0.9 ***	241.942 ***	236.557 ***	3.95 ***
	(0.016)	(0.021)	(0.016)	(0.025)	(0.026)	(0.023)	(0.031)	(0.032)	(0.030)	-5.845	-5.185	(0.255)

Conclusions

- Conclusions.
  - It is not possible to conclude there is a statistical significant causal effect of the programme on 12 educational outcomes.
  - That is true for both 5th and 9th graders.
  - Relationship between local and federal governments (namely, the transfer of resources to the school without goals and accountability) needs to be updated.

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