

Affirmative Action Outcomes

Evidence from a Law School in Brazil

Ana Ribeiro

FEA - USP

03/23/2017

Why should we evaluate affirmative action policies?

No consensus over the policy effects, I look at specific questions:

- How much does it boost targeted people?
- Does it allow beneficiaries to catch up to high scoring candidates?
- What is the policy effect on (directly affected) non beneficiaries?

How: I evaluate UERJ's Quota Policy using data from the admission process for the university law school and OAB passage records.

Outcomes after college graduation:

India:

Bertrand, Hanna & Mullainathan (Journal of Public Economics - 2010)

US:

Rothstein & Yoon (University of Chicago Law Review - 2008)

Brazil:

Waltenberg & Carvalho (2012), Bittencourt et al (2015), Valente & Berry (2016)

- **Starting 2003: Quota Policy**

- Self-declared black candidates: 20%
- Public school students: 20%

Low income families only.

- **Admission Process:** Based on test scores

- **Data:** Identified individual data for law school applicants

2006-2010 period:

- admission scores,
- candidate ranking,
- admission status,
- placing type (Black quota, public school quota or Non-Quota),
- socioeconomic survey
- graduation status if admitted to UERJ

Periods 1997-2001 and 2003-2005 are also available but do not contain socioeconomic survey. Thus, I do not use them in this research

OAB Exam:

- High Stakes Exam: Lawyer certification
- Two rounds of examination

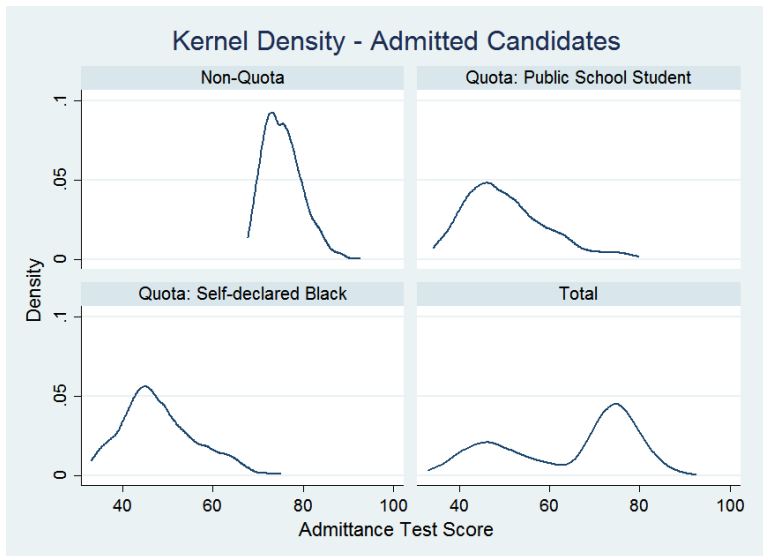
Data:

- Lists of approved applicants in each phase
- Period: 2010-2015
- Not available: List of all OAB exam applicants

Table: Descriptive Statistics

Admitted Placing Category	No			Yes		
	Non-Quota	Black	Public School	Non-Quota	Black	Public School
Admittance Test Score	47.76 (13.62)	30.20 (5.62)	30.58 (6.48)	75.49 (4.22)	48.02 (8.14)	50.27 (9.04)
Gender: Male	0.45 (0.5)	0.42 (0.49)	0.43 (0.5)	0.46 (0.5)	0.41 (0.49)	0.47 (0.5)
Father's Education: College	0.57 (0.5)	0.09 (0.28)	0.07 (0.26)	0.78 (0.41)	0.20 (0.4)	0.14 (0.35)
Mother's Education: College	0.57 (0.49)	0.07 (0.26)	0.06 (0.24)	0.78 (0.41)	0.16 (0.37)	0.14 (0.35)
Public School Education	0.24 (0.43)	0.59 (0.49)	0.97 (0.17)	0.20 (0.4)	0.44 (0.5)	0.99 (0.12)
Dayturn High School	0.96 (0.21)	0.76 (0.43)	0.80 (0.4)	0.99 (0.09)	0.87 (0.33)	0.85 (0.36)
Worked before 18 years old	0.13 (0.34)	0.38 (0.49)	0.40 (0.49)	0.06 (0.24)	0.29 (0.45)	0.28 (0.45)
Family Income: Less than 3 MW	0.13 (0.33)	0.63 (0.48)	0.66 (0.48)	0.02 (0.15)	0.51 (0.5)	0.54 (0.5)
Family Income: 3 to 5 MW	0.20 (0.4)	0.29 (0.46)	0.27 (0.44)	0.08 (0.27)	0.31 (0.46)	0.33 (0.47)
Family Income: 5 to 10 MW	0.27 (0.44)	0.06 (0.24)	0.07 (0.25)	0.22 (0.41)	0.15 (0.35)	0.12 (0.33)
Family Income: 10 to 20 MW	0.23 (0.42)	0.01 (0.11)	0.00 (0.06)	0.30 (0.46)	0.02 (0.15)	0.01 (0.09)
Family Income: 20 to 30 MW	0.11 (0.31)	0.00 (0)	0.00 (0)	0.19 (0.4)	0.00 (0)	0.00 (0)
Graduated Law School				0.84 (0.36)	0.77 (0.42)	0.81 (0.39)
OAB Phase 1 Approval	0.46 (0.5)	0.21 (0.4)	0.24 (0.43)	0.77 (0.42)	0.64 (0.48)	0.65 (0.48)
OAB Phase 2 Approval	0.41 (0.49)	0.17 (0.38)	0.21 (0.41)	0.70 (0.46)	0.54 (0.5)	0.57 (0.5)
Age	19.58 (5.68)	24.04 (7.78)	21.99 (6.56)	18.38 (3.08)	21.45 (5.18)	21.26 (4.91)
Observations	10656	282	353	923	331	361

Columns present the mean level of variables by placing category, separately for admitted and not admitted



Empirical Strategy: The Boost Effect

Sample composed of two groups, in which candidates scores fall in the range between Quota and non-Quota cutoff scores:

Group of interest:

Quota candidates admitted due to the policy (scored below non-Quota cutoff score)

Control group:

built from the pool of non-Quota candidates, restricting the sample to not admitted candidates that scored below the non-Quota cutoff score and above the Quota cutoff score.

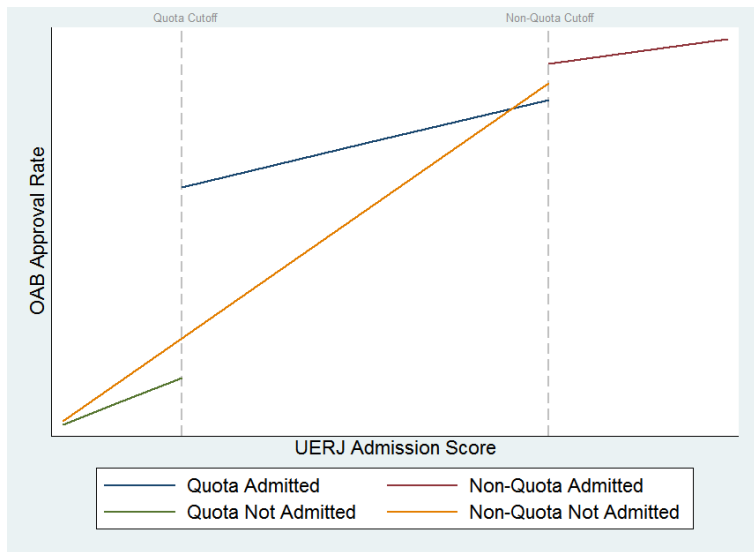
$$OAB_i = \beta_0 + \beta_1(Quota_i \times Admitted_i) + \beta_2 Score_i + \beta_3(Quota_i \times Admitted_i \times Score_i) + \phi X_i + \varepsilon_i \quad (1)$$

▸ Theoretic Graph

▸ Mean Difference

▸ Kernel

The Boost Effect: Theoretical Graph



Results: The Boost Effect

Table: The Boost Effect

	OAB Approval Rate								
	1st phase (1)	2nd phase (2)	2nd phase (3)	1st phase (4)	2nd phase (5)	2nd phase (6)	1st phase (7)	2nd phase (8)	2nd phase (9)
Quota Candidate (Admitted to UERJ) Score	0.0896*** (0.0194)	0.0547*** (0.0194)	-0.0401*** (0.0152)	0.3440*** (0.1146)	0.2630** (0.1147)	-0.0686 (0.0921)	0.4465*** (0.1179)	0.3362*** (0.1182)	-0.0712 (0.0980)
				0.0110*** (0.0006)	0.0111*** (0.0006)	0.0025*** (0.0006)	0.0092*** (0.0007)	0.0094*** (0.0007)	0.0023*** (0.0006)
Interaction Quota x Score				-0.0040* (0.0023)	-0.0030 (0.0023)	0.0009 (0.0018)	-0.0035 (0.0024)	-0.0022 (0.0024)	0.0011 (0.0019)
Observations	8,495	8,495	4,565	8,495	8,495	4,565	7,696	7,696	4,126
R-squared	0.0025	0.0009	0.0015	0.0388	0.0381	0.0068	0.0916	0.0887	0.0217
1st phase Sample restriction	N	N	Y	N	N	Y	N	N	Y
FE Vestibular Year	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	N	N	N	N	N	Y	Y	Y

Controls: Age, Squared Age, Gender (Male), Father's Education: College Degree, Mother's Education: College Degree, High School Type (Public), High School Classes Turn (dayturn), worked before the age of 18, Family Income ranges in Minimum Wages: less than 3, 3 to 5, 5 to 10, 10 to 20 and 20 to 30.

Standard Errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Empirical Strategy: Catching Up Effect

Sample composed of two groups of candidates that scored below the non-Quota cutoff score:

Displacer candidates: Quota candidates admitted due to the policy

Displaced candidates: non-Quota candidates, not admitted due to the policy

$$OAB_i = \alpha_0 + \alpha_1(Quota_i \times Admitted_i) + \gamma X_i + \epsilon_i \quad (2)$$

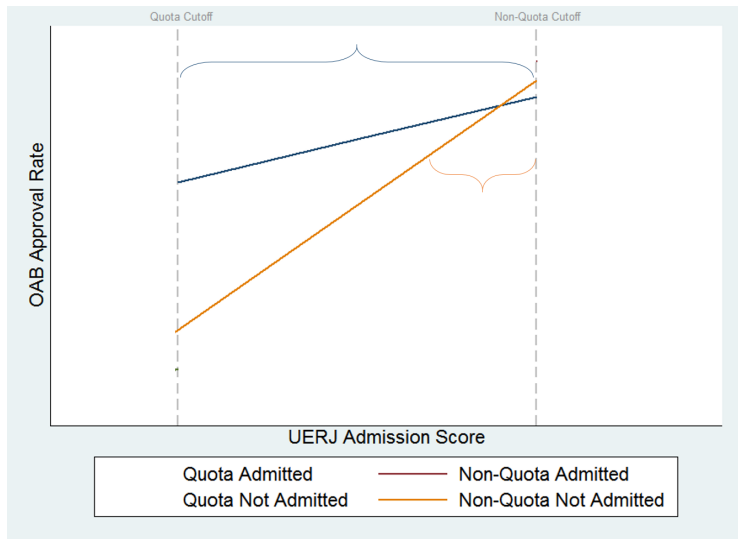
▸ Displaced Counterfactual

▸ Displaced Sample

▸ Mean Difference

▸ Kernel

Catching Up Effect: Theoretical Graph



Results: The Catching Up Effect

Table: The Catching Up Effect

	OAB Approval Rate								
	1st phase (1)	2nd phase (2)	2nd phase (3)	1st phase (4)	2nd phase (5)	2nd phase (6)	1st phase (7)	2nd phase (8)	2nd phase (9)
Displacer (Quota admitted candidate) Score	-0.0217 (0.0253)	-0.0666** (0.0260)	-0.0768*** (0.0199)	0.0835 (0.0532)	0.0465 (0.0545)	-0.0426 (0.0409)	0.1881*** (0.0639)	0.1646** (0.0655)	-0.0167 (0.0503)
				0.0052** (0.0023)	0.0056** (0.0024)	0.0017 (0.0018)	0.0039 (0.0024)	0.0046* (0.0025)	0.0016 (0.0019)
Observations	1,451	1,451	914	1,451	1,451	914	1,325	1,325	832
R-squared	0.0005	0.0045	0.0161	0.0040	0.0083	0.0171	0.0730	0.0770	0.0400
1st phase Sample restriction	N	N	Y	N	N	Y	N	N	Y
FE Vestibular Year	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	N	N	N	N	N	Y	Y	Y

Controls: Age, Squared Age, Gender (Male), Father's Education: College Degree, Mother's Education: College Degree, High School Type (Public), High School Classes Turn (dayturn), worked before the age of 18, Family Income ranges in Minimum Wages: less than 3, 3 to 5, 5 to 10, 10 to 20 and 20 to 30.

Standard Errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

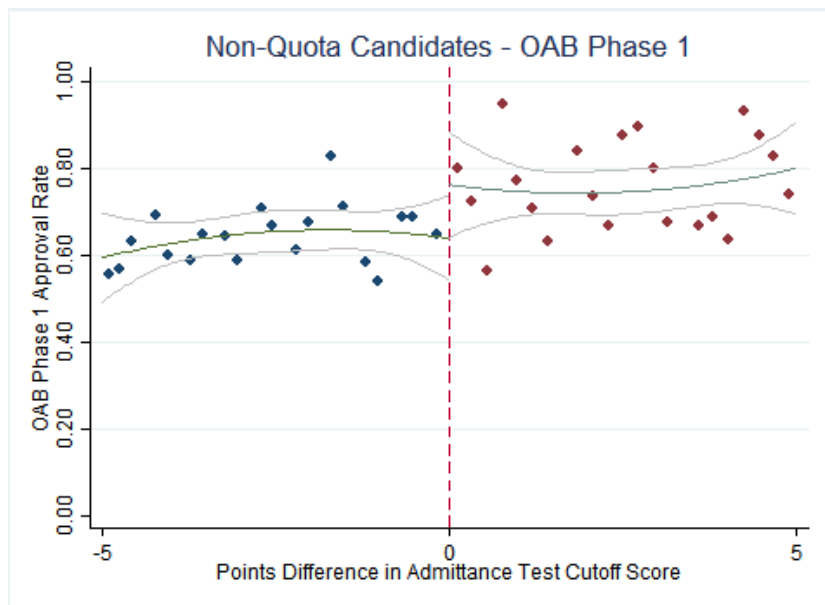
Regression Discontinuity Design approach:

Effect of the policy for admitted and not admitted candidates that scored close to the cutoff score.

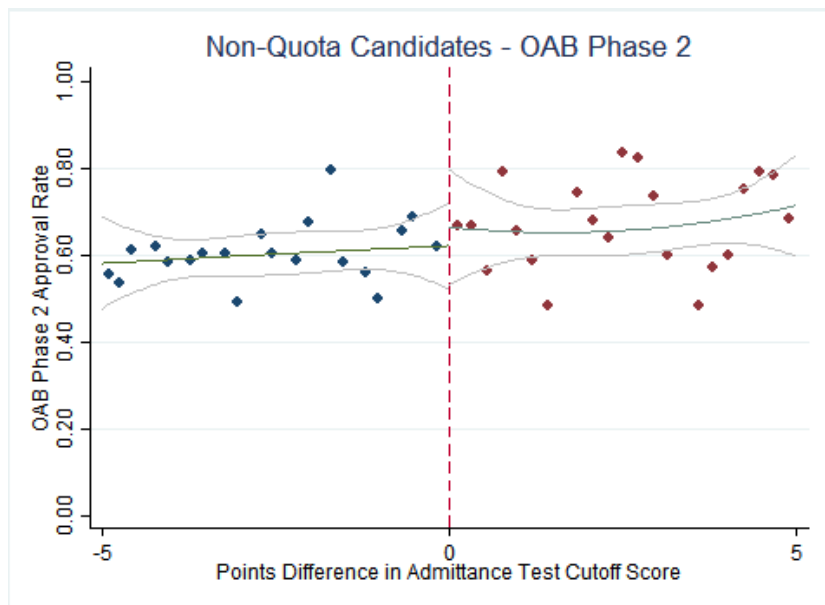
Separate analysis for each type of quota candidate and non-Quota:
Cutoff scores are specific for each placing type

$$OAB_i = \delta + \psi 1\{Score_i > 0\} + \varphi Score_i + \phi Score_i 1\{Score_i > 0\} + \xi_i \quad (3)$$

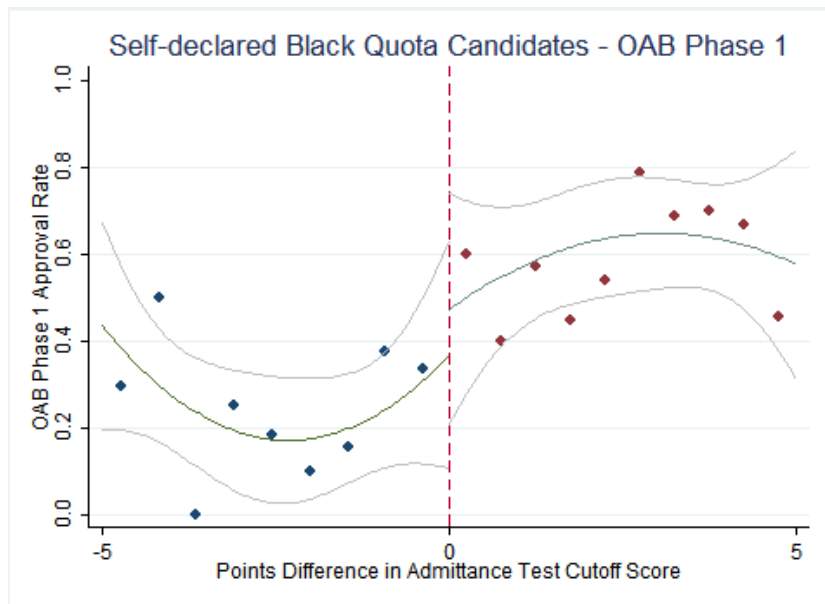
Results: The Diploma Effect



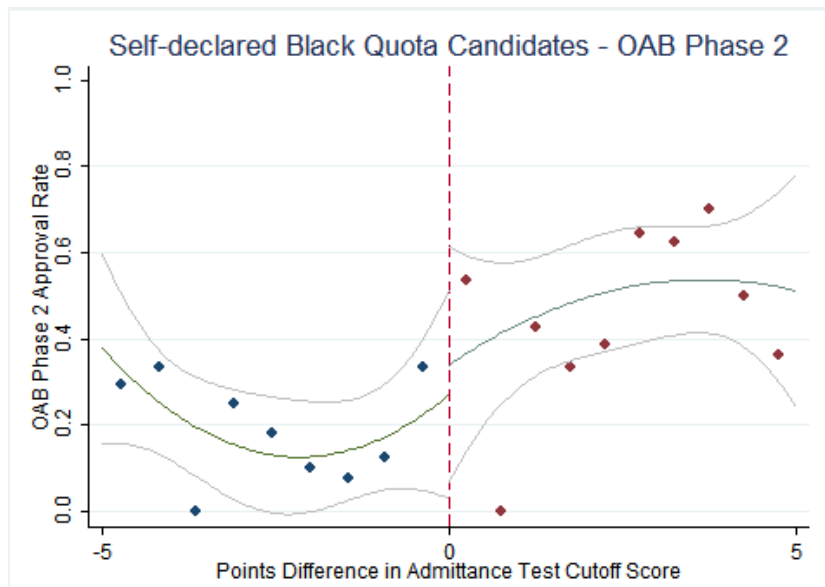
Results: The Diploma Effect



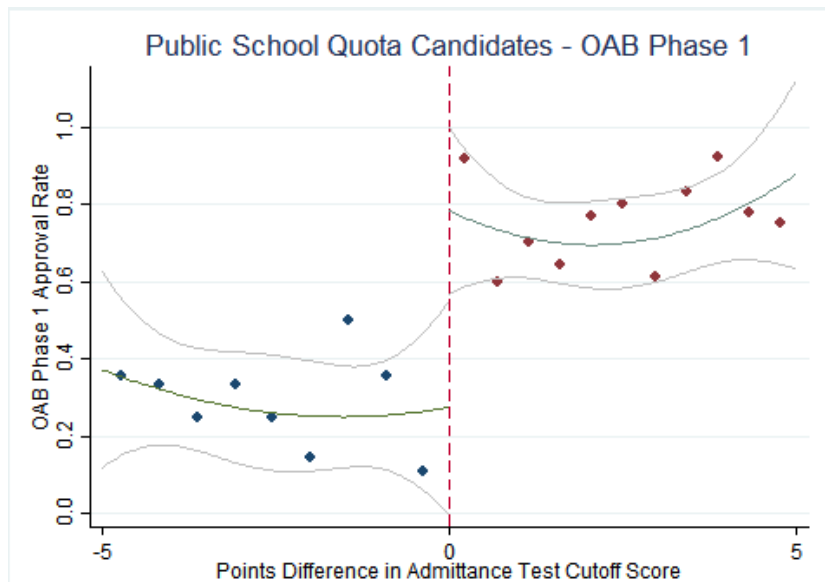
Results: The Diploma Effect



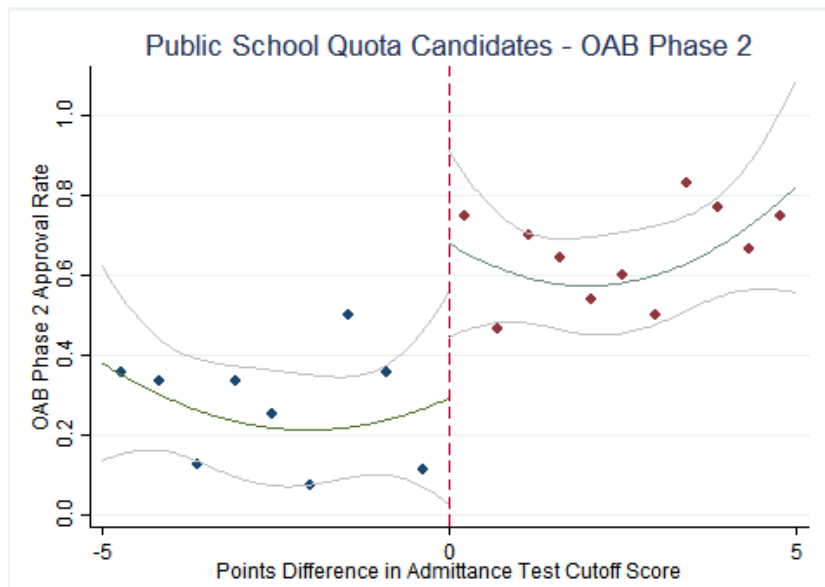
Results: The Diploma Effect



Results: The Diploma Effect



Results: The Diploma Effect



Results: The Diploma Effect

Table: Discontinuity in OAB Passage Rate – Bandwidth = 2

Panel A: Non-Quota Candidates												
	1st phase				2nd phase				2nd phase (restricted)			
Polynomial Order	1	2	3	4	1	2	3	4	1	2	3	4
Coefficient	0.04	-0.08	0.17	0.44	0.01	-0.06	0.26	0.49	-0.03	0.03	0.16	0.11
P-Value												
Obs (left of cutoff)	282	282	282	282	282	282	282	282	186	186	186	186
Obs (right of cutoff)	216	216	216	216	216	216	216	216	158	158	158	158

Panel B: Self-declared Black												
	1st phase				2nd phase				2nd phase (restricted)			
Polynomial Order	1	2	3	4	1	2	3	4	1	2	3	4
Coefficient	-0.16	-0.05	0	0.58	-0.15	-0.31	-0.23	1.14	-0.17	-0.73	-0.1	1.6
P-Value												
Obs (left of cutoff)	31	31	31	31	31	31	31	31	9	9	9	9
Obs (right of cutoff)	34	34	34	34	34	34	34	34	16	16	16	16

Panel C: Public School Students												
	1st phase				2nd phase				2nd phase (restricted)			
Polynomial Order	1	2	3	4	1	2	3	4	1	2	3	4
Coefficient	0.68	1.02	0.6	-0.02	0.52	0.96	0.42	0.11	-0.51	1.22	-4.56	14.89
P-Value	***	***			**	**						
Obs (left of cutoff)	29	29	29	29	29	29	29	29	9	9	9	9
Obs (right of cutoff)	56	56	56	56	56	56	56	56	37	37	37	37

*** p<0.01, ** p<0.05, * p<0.1

Results: The Diploma Effect

Table: Discontinuity in OAB Passage Rate – Bandwidth = 5

Panel A: Non-Quota Candidates												
	1st phase				2nd phase				2nd phase (restricted)			
	1	2	3	4	1	2	3	4	1	2	3	4
Polynomial Order												
Coefficient	0.06	0.06	0.04	-0.04	0.03	0.02	0.02	-0.03	-0.04	-0.05	-0.02	0.01
P-Value												
Obs (left of cutoff)	853	853	853	853	853	853	853	853	548	548	548	548
Obs (right of cutoff)	572	572	572	572	572	572	572	572	429	429	429	429

Panel B: Self-declared Black												
	1st phase				2nd phase				2nd phase (restricted)			
	1	2	3	4	1	2	3	4	1	2	3	4
Polynomial Order												
Coefficient	0.06	-0.17	-0.18	-0.16	0.05	-0.09	-0.21	-0.41	0.03	0.08	-0.4	-0.89
P-Value												
Obs (left of cutoff)	86	86	86	86	86	86	86	86	23	23	23	23
Obs (right of cutoff)	104	104	104	104	104	104	104	104	61	61	61	61

Panel C: Public School Students												
	1st phase				2nd phase				2nd phase (restricted)			
	1	2	3	4	1	2	3	4	1	2	3	4
Polynomial Order												
Coefficient	0.38	0.48	0.77	1.12	0.29	0.36	0.63	0.98	-0.14	-0.4	-0.59	-0.94
P-Value	***	**	**	***	*		**	**				
Obs (left of cutoff)	78	78	78	78	78	78	78	78	21	21	21	21
Obs (right of cutoff)	123	123	123	123	123	123	123	123	88	88	88	88

*** p<0.01, ** p<0.05, * p<0.1

To sum up, this paper findings are:

- Strong positive effect on certification for Quota students with evidence of no negative effect on non-Quota that are directly affected by the policy (displaced).
- Evidence of a persistent gap between Quota and displaced candidates.
- Clear positive effect for admitted public school Quota candidates scoring close to the cutoff score, but still uncertain for self-declared black candidates.

Socioeconomic Survey Variables

Table: Variables available per Year - UERJ

	1997	1998	1999	2000	2001	2003	2004	2005	2006	2007	2008	2009	2010
Name	x	x	x	x	x	x	x	x	x	x	x	x	x
Vestibular Score per subject	x	x	x	x	x	x	x	x	x	x	x	x	x
Total Score	x	x	x	x	x	x	x	x	x	x	x	x	x
General Ranking	x	x	x	x	x	x	x	x	x	x	x	x	x
Graduation year (if admitted)	x	x	x	x	x	x	x	x	x	x	x	x	x
If still enrolled in 2015.2	x	x	x	x	x	x	x	x	x	x	x	x	x
Admission Status	x	x	x	x	x	x	x	x	x	x	x	x	x
School Type (Public or Private)						x	x	x	x	x	x	x	x
Seat Type						x	x	x	x	x	x	x	x
Ranking per Seat Type						x	x	x	x	x	x	x	x
Bonus earned in the Qualification Fase						x	x	x	x	x	x	x	x
Date of Birth									x	x	x	x	x
Socioeconomic Profile:													
Daytime or nighttime school									x	x	x	x	x
Attended prep school									x	x	x	x	x
Took vestibular previously									x	x	x	x	x
Previously enrolled in college									x	x	x	x	x
Number of motorvehicles owned									x	x	x	x	x
Candidate contributes to family income									x	x	x	x	x
Family with more than 4 members									x	x	x	x	x
Knows how to use a computer									x	x	x	x	x
Owns a computer									x	x	x	x	x
Internet access									x	x	x	x	x
Has email account									x	x	x	x	x
Reads newspaper									x	x	x	x	x
Watches TV news									x	x	x	x	x
Exercises									x	x	x	x	x
Studied a foreign language									x	x	x	x	x
Opinion on quotas									x	x	x	x	x
Living Status									x	x	x	x	x
If worked before vestibular									x	x	x	x	x
Source of income									x	x	x	x	x
Family income ranges									x	x	x	x	x
Father and Mother education									x	x	x	x	x
Self-declared skin color									x	x	x	x	x
Amount of books read									x	x	x	x	x

Mean Difference - Boost

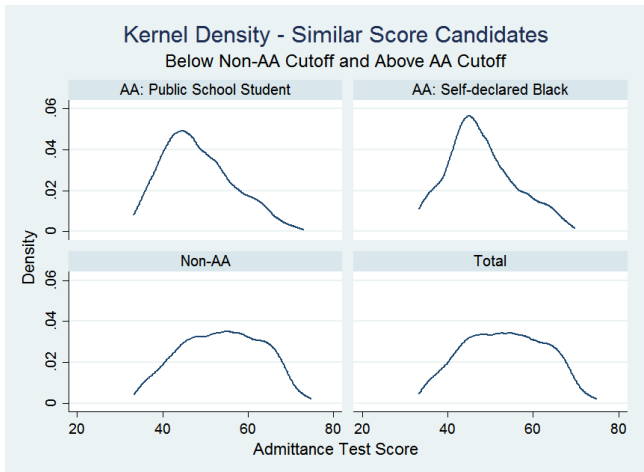
Empirical Strategy: Boost Effect

Table: Mean Difference: Quota and Non-Quota with similar scores

	Non-Quota Applicants	Quota Applicants	Mean Difference			Non-Quota Applicants	Quota Applicants	Mean Difference	
Passed Vestibular UERJ	0% (4546)	100% (686)							
Went to Public School	20.66% (4546)	71.72% (686)	-51.06	***	Family Income:	9.13% (4138)	53.22% (637)	-44.08	***
Went to dayturn high school	97.27% (4205)	85.63% (647)	11.64	***	Less than 3 minimum wages	18.32% (4138)	32.03% (637)	-13.71	***
Went to prep school	43.89% (4195)	47.43% (641)	-3.54	*	3 to 5 minimum wages	27.45% (4138)	12.87% (637)	14.58	***
Tried Vestibular before	74.23% (4198)	81.09% (640)	-6.87	***	5 to 10 minimum wages	25.23% (4138)	1.57% (637)	23.66	***
Went to a university before	8.54% (2412)	16.28% (393)	-7.74	***	10 to 20 minimum wages	12.45% (4138)	0% (637)	12.45	***
Contributes to Family Income	11.62% (4174)	27.86% (639)	-16.24	***	20 to 30 minimum wages	7.32% (4138)	0% (637)	7.32	***
Knows how to use a computer	98.3% (2405)	96.41% (390)	1.88	**	More than 30 minimum wages	26.49% (4156)	37.38% (642)	-10.89	***
Has computer at home	91.65% (4158)	62.17% (637)	29.49	***	Father's Education	60.88% (4156)	16.98% (642)	43.90	***
Has internet access	95.12% (2397)	89.51% (391)	5.60	***	High School	26.55% (4165)	41.72% (640)	-15.16	***
Uses internet as a mean of study	72.84% (2404)	55.61% (392)	17.22	***	Mother's Education	61.82% (4165)	15.31% (640)	46.51	***
Went to a foreign language course	82.06% (4147)	55.96% (638)	26.10	***	College	0.91% (4162)	2.04% (638)	-1.12	***
Lives in na Owned Home	74.21% (4184)	49.07% (642)	25.15	***	Amount of Books at home:	32.03% (4162)	10.5% (638)	21.53	***
Worked before the age of 14	1.89% (4176)	4.7% (638)	-2.81	***	None	0.91% (4162)	2.04% (638)	-1.12	***
Worked between the ages of 14 and 18	9.2% (4176)	23.82% (638)	-14.63	***	Amount of Books at home:	32.03% (4162)	10.5% (638)	21.53	***
Never worked	80.56% (4176)	51.57% (638)	28.99	***	More than 100	45.67% (4546)	44.17% (686)	1.50	
					Gender: Male	19.17% (4546)	21.402% (686)	-2.23	***

Standard Errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1



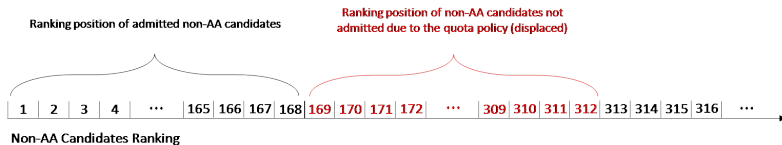
Vestibular of 2010: 1st round of call for admission from UFRJ and UFF contained 72 of the estimated 140 displaced candidates for that year.

On the other hand, only 10 quota students were offered admission at UFRJ or UFF.

◀ Empirical Strategy: Catching Up Effect

Catching Up: Sample

Empirical Strategy: Catching Up Effect



Mean Difference - Catching Up

Empirical Strategy: Catching Up Effect

Table: Mean Difference: Displaced vs Displacer

	Non-Quota (Displaced)	Quota (Displacer)	Mean Difference
Passed Vestibular UERJ	0% (715)	100% (724)	
Went to Public School	16.64% (715)	71.13% (724)	-54.49 ***
Dayturn high school	98.65% (665)	84.63% (683)	14.02 ***
Went to prep school	43.81% (662)	47.42% (677)	-3.61
Tried Vestibular before	74.21% (663)	81.07% (676)	-6.86 ***
Enrolled to a university before	10.53% (399)	16.63% (409)	-6.10 **
Contributes to Family Income	7.73% (660)	28.59% (675)	-20.87 ***
Knows how to use a computer	99.5% (399)	96.55% (406)	2.95 ***
Has computer at home	96.5% (657)	61.96% (673)	34.54 ***
Has internet access	99% (399)	88.94% (407)	10.05 ***
Uses internet as a mean of study	78.95% (399)	55.64% (408)	23.31 ***
Went to a foreign language course	90.95% (652)	55.64% (674)	35.31 ***
Lives in na Owned Home	79.21% (659)	49.12% (678)	30.10 ***
Worked before the age of 14	1.21% (659)	5.19% (674)	-3.98 ***
Worked between the ages of 14 and 18	7.44% (659)	24.04% (674)	-16.60 ***
Never worked	84.83% (659)	50.45% (674)	34.38 ***

	Non-Quota (Displaced)	Quota (Displacer)	Mean Difference
Family Income:	3.36% (654)	53.49% (673)	-50.13 ***
Less than 3 minimum wages	9.79% (654)	31.8% (673)	-22.01 ***
Family Income:	24.16% (654)	12.93% (673)	11.23 ***
3 to 5 minimum wages	32.11% (654)	1.49% (673)	30.62 ***
Family Income:	17.43% (654)	0% (673)	17.43 ***
10 to 20 minimum wages	13.15% (654)	0% (673)	13.15 ***
Family Income:	19.48% (657)	37.46% (678)	-17.98 ***
More than 30 minimum wages	74.43% (657)	16.96% (678)	57.47 ***
Father's Education	20.82% (658)	41.72% (676)	-20.90 ***
High School	74.62% (658)	15.24% (676)	59.38 ***
Father's Education	0.46% (655)	1.93% (674)	-1.47 **
College	45.04% (655)	10.39% (674)	34.65 ***
Mother's Education	48.67% (715)	44.48% (724)	4.20
High School	18.662 (715)	21.590 (724)	-2.93 ***

Standard Errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Kernel - Catching Up

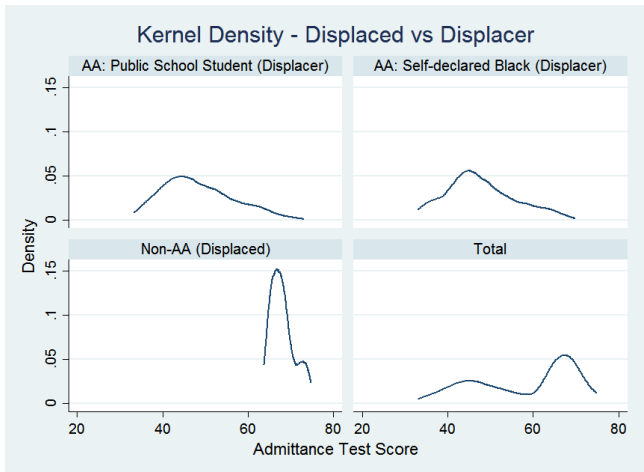


Table: OAB passage Rate for UERJ's Applicants and Mean Difference between Quota and Non-Quota

Panel A: Non-Admitted Applicants

OAB Phase 1					OAB - Phase 2					OAB - Phase 2 (Phase 1 sample restriction)			
Mean Non-Quota	Black	Mean and Difference	Public School		Mean Non-Quota	Black	Mean and Difference	Public School		Mean Non-Quota	Black	Mean and Difference	Public School
0.46	0.21	***	0.24	***	0.41	0.17	***	0.21	***	0.89	0.84		0.89
(10656)	(282)		(353)		(10656)	(282)		(353)		(4927)	(58)		(84)

Panel B: Admitted Applicants

OAB Phase 1					OAB - Phase 2					OAB - Phase 2 (Phase 1 sample restriction)			
Mean Non-Quota	Black	Mean and Difference	Public School		Mean Non-Quota	Black	Mean and Difference	Public School		Mean Non-Quota	Black	Mean and Difference	Public School
0.77	0.64	***	0.65	***	0.70	0.54	***	0.57	***	0.90	0.84	***	0.88
923	331		361		923	331		361		715	213		234

Number of observations in parenthesis