Charters Without Lotteries:
Testing Takeovers in New Orleans and Boston
Online Appendix

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Data Appendix

New Orleans RSD

The New Orleans RSD grandfathering analysis file is constructed from student enrollment, demographic, and outcome data provided by RSD for school years 2007-2008 through 2013-2014. Enrollment and demographic data include information on all students enrolled in the New Orleans RSD. 4th and 8th grade test score outcomes are from the Louisiana Educational Assessment Program (LEAP); all other outcome grades measure achievement by the integrated LEAP (iLEAP) exam.

Student enrollment and demographics

RSD enrollment data include a June (end-of-year) file for school years 2007-2008 through 2012-2013, and an October file for school years 2011-2012 through 2013-2014. For school year 2013-2014, an additional February file is available. Each enrollment file is a snapshot of the enrollment records at each New Orleans RSD school, and contains information on the first and last dates of attendance of each student in each school and grade over the academic year up to the given month. Enrollment files also include a unique student identifier, the "student ID." We use information on student names and dates of birth to confirm consistency of student IDs across enrollment files. After resolving any inconsistencies, student IDs are used to match students to LEAP/iLEAP test score files.

Enrollment files contain information on student sex, race, special education status, limited English proficiency status, subsidized lunch eligibility, and school attended.[1] We construct a panel dataset capturing demographic and enrollment information for every student in each grade, keeping information from the first calendar year spent in each grade and recording the number of times a grade is subsequently repeated. A student is counted as attending a takeover charter if she enrolls in one for any amount of time. If a student attends multiple non-takeover charter schools within the same year and grade, she is counted as enrolled in the longest-attended school. Attendance duration ties are broken by giving preference to the most recent enrollment. All other attendance ties are broken randomly. Students classified as special education, limited English proficient, or eligible for a free- or reduced-price lunch in any record within a grade retain that designation for that grade.

[1] Race is coded as black, white, asian, hispanic, and other. In RSD these are not mutually-exclusive categories. Race and gender are grade-invariant characteristics, while SPED, LEP, and free/reduced price lunch status are grade-specific.

LEAP/iLEAP

The LEAP/iLEAP outcomes of interest are math, English Language Arts (ELA), sciences, and social sciences test scores for grades 5 through 8. Tests at the end of the legacy grade and at the end of the baseline matching grade are also used to calculate test score gains and as controls, respectively. The grade configuration of legacy and baseline tests is summarized in Table 1.

Each observation in the LEAP/iLEAP data files corresponds to a student's test results in a particular subject, grade, and year. For each grade, we use scores from the first attempt at a given subject test. The raw test score variables are standardized to have mean zero and standard deviation one within a subject-grade-year in the New Orleans RSD. The standardization excludes scores from students enrolled in alternative schools.

School Performance Scores

School Performance Scores ("SPS") for school years 2007-2008 through 2011-2012 are used to construct matching cells for New Orleans RSD grandfathered students. These scores are obtained from `http://www.louisianabelieves.com/resources/library/performance-scores`.

During the analysis sample years, SPS scores ranged from 0 to 200, where a score below 75 corresponded to an "F" letter grade, and a score above 120 corresponded to an "A" letter grade. Matched cells are constructed by splitting the 0 to 200 range into 5-point bins.

School and teacher characteristics

Class size, per-pupil expenditures (PPE), teacher experience, and average salary are obtained from the Louisiana Department of Education website (`http://www.louisianabelieves.com`).

RSD average class sizes – reported in Table A2 – are based on academic years 2010-2011 and 2011-2012, and are calculated using the midpoint of reported class size ranges, with the exception of the class category size of "34 +," which is coded as an average class size of 34 students. Class size figures reported in columns 3-4 of Table A2 include any full takeover or legacy school for which data were available, including charter-to-charter and high school full takeovers. In particular, schools included in column 3's class size figure are Sarah Towles Reed Elementary, Fannie C. Williams Elementary, Harriet Tubman Elementary School, Joseph S. Clark Senior High, McDonogh 42 Elementary Charter, Joseph A. Craig, Crocker Arts and Technology, H.C. Schaumburg Elementary, Abramson Science and Technology, Pride College Preparatory Academy, Paul B. Habans Elementary, and Murray Henderson Elementary. Column 4's class size figure includes SciTech Academy at Laurel Elementary,

Esperanza Charter, Edgar P. Harney Spirit of Excellence Academy, Gentilly Terrace Elementary, Batiste Cultural Arts Academy at Live Oak Elementary, and Reed Elementary.

RSD teacher experience and salary, also reported in Table A2, are based on operator-level data for the 2010-2011 academic year. PPE are averages over academic years 2008-2009 through 2010-2011. PPE in column 1 is based on aggregate figures reported for all RSD direct-run schools, and exclude one-time expenditures related to Hurricane Katrina. Schools included in column 3's PPE are Gentilly Terrace, E.P. Harney Spirit of Excellence Academy, Batiste Cultural Arts Academy at Like Oak Elementary, John Dibert Community School, SciTech Academy at Laurel Elementary, and Esperanza Charter. Schools included in column 4's PPE are AD. Crossman Esperanza Charter and Harriet Tubman. An adjusted PPE figure for column 1 is provided for better comparability. The adjusted figure excludes excess spending (relative to charters) in operations and management from the reported RSD direct-run figure, as RSD direct-run expenditures include spending on building insurance premiums for all buildings overseen by RSD, including those operated by charters (see **?**).

Grandfathering eligibility and matching

The grandfathering eligibility instrument is based on fall enrollment. For the New Orleans RSD, the instrument is coded by the enrollment designation procedure described above, using attendance data up to October 31. Students that leave a legacy school prior to October 31 are not considered grandfathering-eligible.

For each legacy school, grandfathering-eligible students are those enrolled in grades 4-7 in the fall immediately prior to takeover. These students are matched to grandfathering-ineligible students that share the sex, race, special education status, subsidized lunch eligibility, and SPS 5-point bin of the grandfathered student in their baseline grade and year. Students who are eligible for grandfathering into a takeover charter in multiple grades or who are matched to such a student are retained in the first grade by which they enter the analysis sample.

Table B2, below, describes the construction of the RSD grandfathering sample. We identify a total of 1,657 grandfathering-eligible students across all legacy grades of the 11 schools in our analysis. Excluding students without baseline information and those not enrolled in a direct-run school at baseline reduces this sample to 1,019. Matching these students and retaining the first grade observation produces our analysis sample of 763 grandfathering-eligible and 2,410 grandfathering-ineligible students.

Boston

Our analysis of the UP Charter School of Boston uses student enrollment, demographic, and outcome data provided by the Massachusetts Department of Elementary and Secondary Education for school years 2007-2008 through 2013-2014. We constructed two analysis files, one for the UP grandfathering analysis and one for the UP lottery analysis. Boston enrollment and demographic data come from the Student Information Management System (SIMS), a centralized database that covers all public school students in Massachusetts. Test score outcomes are from the Massachusetts Comprehensive Assessment System (MCAS). For the lottery sample, lists of first-time applicants and lottery winners are provided by UP.

Student enrollment and demographics

SIMS data include an end-of-year file and an October file for each school year. As with RSD, each observation in the SIMS refers to a student in a grade of a school in a year. While length of attendance is recorded, the data do not contain exact dates of enrollment. The SIMS also includes a unique student identifier, known as the SASID, which is used to match students to MCAS test score files.

SIMS variables used in our analysis include student sex, race, special education status, limited English proficiency status, subsidized lunch eligibility, and school attended.[2] We construct a panel dataset capturing demographic and enrollment information for every Massachusetts public school student enrolled in each grade, keeping information from the first calendar year spent in each grade and recording the number of repeated attempts. A student is counted as attending UP if she enrolls for any amount of time. If a student attends multiple schools within the same year and grade, she is counted as enrolled in the longest-attended school. All other attendance ties are broken randomly. Students classified as special education, limited English proficient, or eligible for a free- or reduced-price lunch in any record within a grade retain that designation.

MCAS

The MCAS outcomes of interest are math and ELA test scores in 7th and 8th grade for the UP grandfathering analysis sample, and in grades 6-8 for the UP lottery sample. For the grandfathering analysis, tests at the end of the legacy grade and at the end of the baseline matching grade are also used to calculate test score gains and as controls, respectively. The grade configuration of legacy

[2] Race is coded as black, white, asian, hispanic and other, and is mutually-exclusive.

and baseline tests is summarized in Table 1. For the lottery analysis, baseline tests (from 5th or 6th grade, depending on the application grade) are used as controls.

Each observation in the MCAS data files corresponds to a student's test results in a particular subject, grade, and year. For each grade, we use scores from the first attempt at a given subject test. The raw test score variables are standardized to have mean zero and standard deviation one within a subject-grade-year in Boston. The standardization excludes scores from students enrolled in alternative schools.

School and teacher characteristics

Boston student-teacher ratios are based on student data from SIMS and teacher data from EPIMS (Educational Personnel Information Management System). Teacher age and experience are from EPIMS, while PPE and average salary are from Massachusetts Department of Education websites (`http://www.doe.mass.edu`, `http://profiles.doe.mass.edu`, and `http://www.doe.mass.edu/finance/statistics/`).

Student/teacher ratios and teacher characteristics for BPS and Boston charters as reported in Table A2 are averages for academic years 2010-2011 and 2011-2012. Boston student/teacher ratios are based on academic year 2010-2011 for Gavin, Dearborn, Harbor, and Orchard Gardens, and on academic year 2011-2012 for UP. The student/teacher ratio is calculated based on the October SIMS and on teacher full-time equivalents obtained from EPIMS. Columns 5-6 in Table A2 include all Boston traditional public and charter schools serving grades 6-8. In particular, column 6 includes Academy of the Pacific Rim, Boston Collegiate, Boston Preparatory, Brooke Charter Roslindale, Excel Academy, MATCH, Neighborhood House, Roxbury Preparatory, and Smith Leadership Academy.

Boston PPE figures in columns 5-6 of Table A2 refer to fiscal year 2011-2012 and are enrollment-weighted, while adjusted PPE figures exclude special education expenses. PPE figures for Gavin, Dearborn, Harbor, and Orchard Gardens are calculated based on school-specific instructional spending, as reported on Schedule 3 of Boston's FY11 End of Year Financial Report, and on Boston's FY11 average spending on school administration, pupil services, operations and management, and insurance and retirement program. Average teacher salaries for Gavin, Dearborn, Harbor, and Orchard Gardens are calculated from school-specific expenditures on teacher salaries for the academic year 2010-2011, as reported in Schedule 3 of Boston's FY11 End of Year Financial Report, and on the total number of teachers at each school according to EPIMS.

Grandfathering eligibility and matching

The grandfathering instrument is based on fall semester enrollment. For UP the instrument is coded by the enrollment designation procedure described above using data from the October 2010 SIMS. Grandfathering-eligible students are those enrolled in 6th and 7th grade at Gavin Middle School, and are matched to grandfathering-ineligible students that share the sex, race, special education status, subsidized lunch eligibility, and 5th grade school and year.

We identify a total of 334 students eligible for grandfathering into UP. Excluding students without baseline information and those not enrolled in BPS at baseline reduces this sample to 290. These grandfathering-eligible students and their 913 ineligible matches constitute our Boston grandfathering analysis sample.

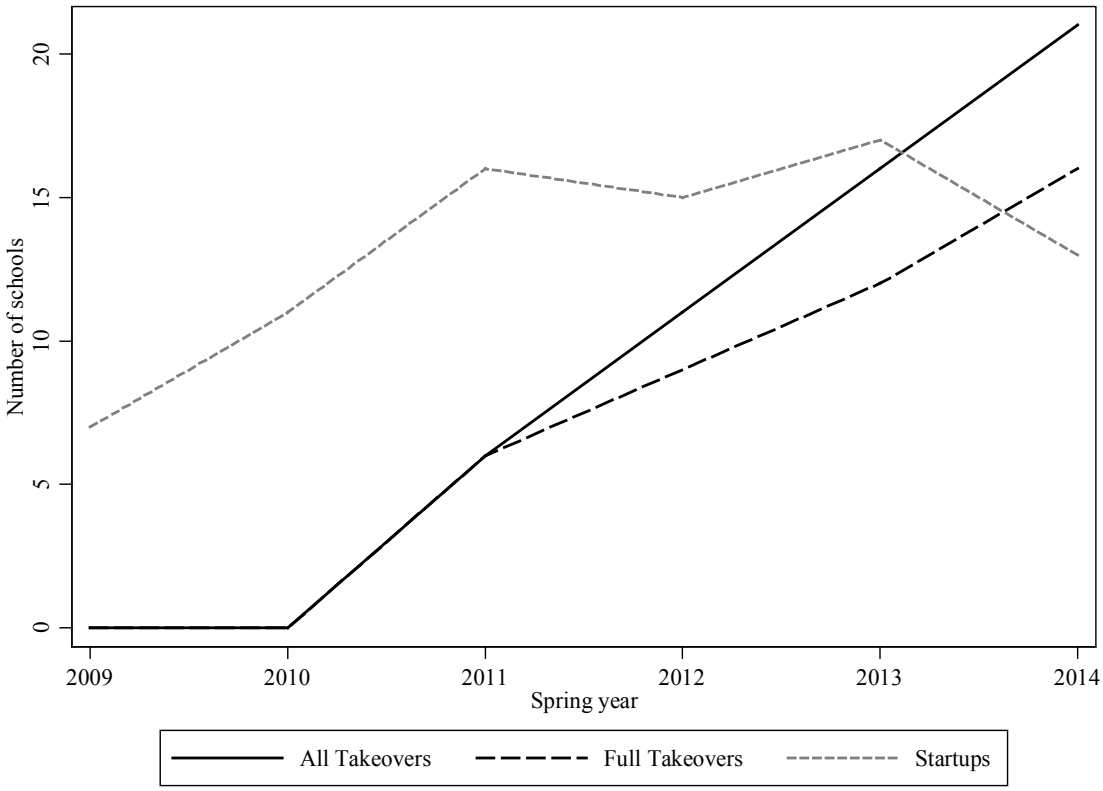
Lottery sample

We obtained a list of students applying to UP in Spring 2011 through Spring 2013 for entry in grades 6-8 from school officials. The raw lottery records include each applicant's name, date of birth, contact information, lottery priority group, and lottery number. Three of these admission cohorts were found to have been oversubscribed by first-time applicants: 6th and 7th grade entry in Spring 2011, and 6th grade entry in Spring 2012. Table B9, below, describes these cohorts: from a total of 1,418 student names we find 1,015 first-time, non-sibling BPS students whose admission to UP was determined solely by lottery number.

We use student lottery numbers to construct two indicator variables for whether applicants were eligible to receive an offer to attend UP. The *immediate offer* instrument indicates admission offers made on the day of the lottery in March. The *waitlist offer* instrument indicates that a student has a lottery number better than the student with the worst lottery number who was offered admission to UP from the waitlist by the end of September. Overall immediate and waitlist offer rates were 30 and 21 percent, respectively.

UP's lottery rosters do not include SASIDs; these records are matched manually to the SIMS by name, date of birth, application year and application grade. In some cases, this procedure did not produce a unique match and information on town of residence was used to break ties. Our matching procedure successfully located 96% (972) of UP Boston applicants in the SIMS/MCAS database. Excluding student not enrolled in BPS at baseline produces the UP lottery sample of 962 students.

Figure B1: Charter school expansion in RSD



Notes: This figure plots the number of New Orleans Recover School District charter schools (serving any grades) created between academic years 2008-09 and 2013-14 (excluding alternative schools). Takeovers are charter schools tied to closure of a legacy school, with seats reserved in the new school for legacy school students. Full takeovers are takeover schools (excluding charter mergers and principal-led conversions) that grandfather all grades at the legacy school in a single academic year. Startup schools are those not directly tied to a legacy school, with all seats filled in the first year through open enrollment.

Figure B2a: Test scores in the RSD charter-to-charter grandfathering sample

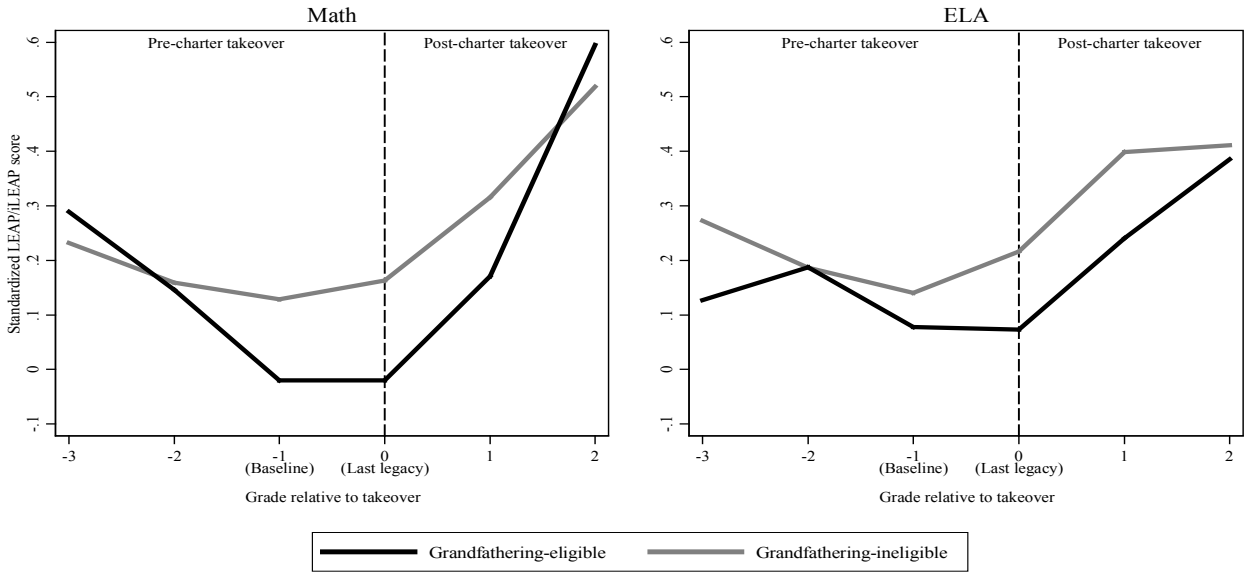
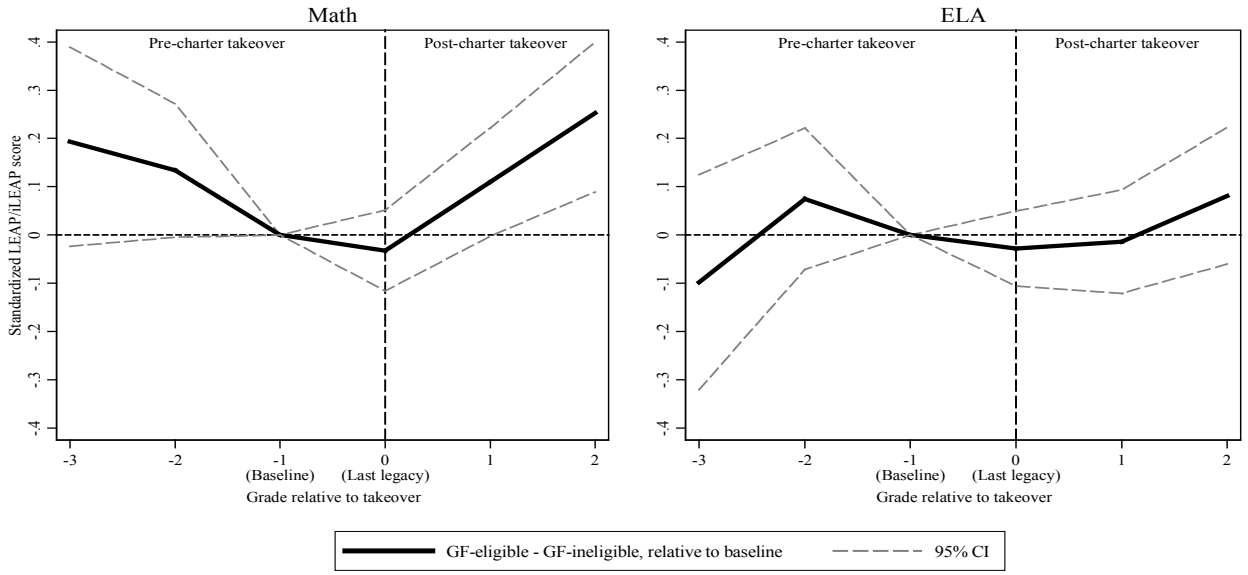
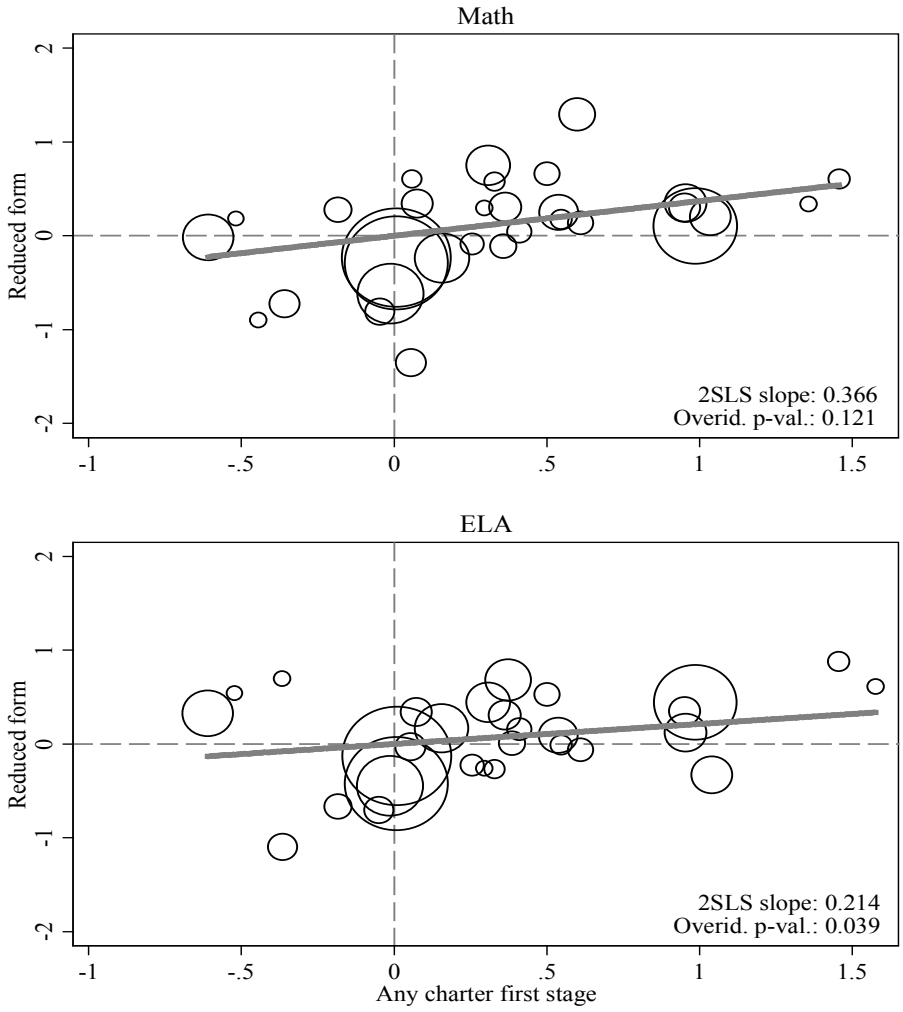


Figure B2b: RSD charter-to-charter grandfathering DD



Notes: Figure B2a plots average LEAP/iLEAP math and ELA scores of students in the RSD legacy charter middle school matched sample. Figure B2b plots achievement growth relative to the baseline grade. Estimates in both figures control for matching cell fixed effects. Scores are standardized to have mean zero and standard deviation one within each year and grade in the set of direct-run schools in New Orleans RSD.

Figure B3: Visual IV estimates of RSD charter attendance effects



Notes: This figure plots reduced form and first stage estimates from column 5 of Table 5. The instruments are interactions of grandfathering eligibility with baseline year, special education status, and SPS bin cells. Marker sizes are inversely proportional to first stage standard errors. Slopes of lines correspond to second-stage 2SLS estimates.

Table B1: Educational philosophy of New Orleans RSD study takeover networks

Takeover Network	Legacy Schools	Takeover Network Educational Philosophy	No Excuses
Crescent City	Paul B. Habans Elementary Murray Henderson Elementary	"We have the highest expectations of our students because we believe in the potential of each child. We believe that every student can learn and succeed in a high-performing academic environment. Having high expectations for each student means understanding the absolute standard a child must reach and building an engaging academic program that motivates students to persevere in the face of adversity. High standards push students to improve the quality of their work, work hard to meet a new challenge, and reach beyond what they had thought possible. [Cite: Samuel Casey Carter, ***No Excuses: Lessons from 21 High-Performing, High-Poverty Schools*** , *The Heritage Foundation* (2000); U.S. Department of Education, Successful Charter Schools (2004)] " "... Students will be explicitly taught everything from walking in lines, participating in class, eating lunch, entering and exiting the building, and greeting teachers and each other. We believe this explicit instruction will set the standard for excellence in our building, and allow **no excuses** from students for not following school rules and procedures. The school principal will lead most of these sessions, supported by school staff, so that all staff develop the same language and tone for maintaining student culture." Source: Crescent City Schools Paul B. Habans Charter School Application 2012, p. 30.	Yes
FirstLine	John Dibert Elementary	"These *FirstLine Schools Educational Principles* are drawn from the practices of highly effective open admissions urban schools serving low-income student populations in the United States and United Kingdom. Three sources of evidence support the common thread of these principles as key levers in highly effective urban schools: the **Urban Excellence Framework** developed by New Leaders for New Schools, the **aligned instructional approach** used initially by the Brazosport Texas schools and now widely copied across the country [Cite: ***Closing the Achievement Gap: No Excuses*** . Pat Davenport and Gerald Anderson. American Productivity and Quality Center. Education Initiative, 2002.], and the **effective schools research** of Ron Edmonds, Larry Lezotte, and others." Source: John Dibert Community School Charter Application Binder, submitted August 23, 2009 by FirstLine Schools, p. 16.	Yes
Friends of King	Joseph A. Craig	"FOKS employs the principle of '**no excuses**' at schools. All students are led to believe that they are capable of 'searing to great heights' no matter how tough it gets. Students are aware that failure is not an option.." Source: Type 5 Charter Experience Operator Application Submitted by the Friends of King School District, 2013, p. 10.	Yes
New Beginnings	Gentilly Terrace Elementary	"Gentilly Terrace is an institution committed to educating and preparing the whole child to succeed academically and socially. Our belief is that all children have a natural ability to learn and achieve. We are mindful of children's natural curiosity and sincere desire to learn, and that intelligence is dynamic and multidimensional. In educating the whole child, several different areas need to be addressed; these include the cognitive, physical, artistic, and social/emotional aspects of learning... Hank Levin and James Meza, Jr. modeled this philosophy through the **Accelerated Schools Project (ASP)**, which started at two centers and grew to mode than 700 schools in 35 states." Source: New Beginnings Schools Foundation, Gentilly Terrace Charter School Application, p. 10.	
ReNEW	Laurel Elementary Live Oak Elementary Sarah Towles Reed Elementary H.C. Schaumburg Elementary Abramson Science and Technology	"ReNEW's model is heavily influenced by the "**No Excuses**" school model, a model that has proven to be extremely effective in raising student achievement level in at-risk student populations. Many of our nation's highest performing charter groups - including KIPP, Achievement First, and Uncommon Schools - implement some form of his model." Source: ReNEW School's CMO Charter Application for two Type-5 Takeover Charters, Executive Summary p. 3.	Yes
Spirit of Excellence	Harney Elementary	"With regard to our academic philosophy, we envision Harney as an environment that expects, supports, promotes, encourages and reinforces subject mastery and academic achievement for all students. From this educational platform, the students of the Spirit of Excellence Academy will be positioned, not only for the rigors of secondary education, but will also have a solid foundation of academic expertise, social and cultural experiences, community support, and critical thinking and decision-making skills to support long-term academic success." Source: Edgar P. Harney Spirit of Excellence Academy website, http://www.soeanola.com, last accessed October 21, 2014. "The Academy will utilize the Louisiana Comprehensive Curriculum supported by the **TargetTeach** curriculum designed by Fenwick English, PhD. to better ensure content alignment, diagnostic assessment, student-centered data and subject mastery. Our partner school, The Edgar P. Harney Spirit of Excellence Academy located in Orleans Parish, has achieved tremendous success utilizing this curriculum. Evans Newton, Inc. (TargetTeach) customizes its program components to meet the state standards through a systematic review process. The company retrieves samples of the schools text books, work books, instructional tools, etc. and aligns the materials to the grade level expectations (GLE's) relative to curriculum alignment." Source: Experienced Operator Application, submitted by Spirit of Excellence, May 15, 2013, Executive Summary p.1.	

Table B2: RSD and Boston grandfathering cohorts

Closure Spring Year	Legacy school	Takeover charter network	Grandfathering-eligible students				Comparison students
			All	With baseline covariates	Direct-run/BPS at baseline	Unique analysis sample	
			A. RSD				
2010	John Dibert	FirstLine	140	92	86	78	204
	Laurel	ReNEW	176	102	96	76	873
	Live Oak	ReNEW	152	76	72	65	673
	Harney	Spirit of Excellence	121	63	56	55	425
	Gentilly Terrace	New Beginnings	156	111	107	106	543
2011	Sarah Towles Reed	ReNEW	215	143	137	81	267
2012	Joseph A. Craig	Friends of King	216	154	142	86	112
2013	Paul B. Habans	Crescent City	232	180	168	87	326
	Murray Henderson	Crescent City	135	85	66	53	168
	H.C. Shaumburg	ReNEW	111	81	71	55	274
	Abramson	ReNEW	25	24	23	21	45
	Pooled RSD:		1,657	1,105	1,019	763	2,410
			B. Boston				
2011	Gavin	UP	334	307	290	290	913
2010	Dearborn		152	126	116	116	379
	Harbor		206	204	200	200	716
	Orchard Gardens		182	166	166	166	1,554

Notes: This table describes the sample of grandfathering-eligible students and their ineligible matches for the RSD study takeovers, UP, and the Boston non-charter turnarounds. Legacy school students are matched to comparison students by race, sex, baseline grade and year, special education status, subsidized lunch eligibility, and either baseline school SPS scores in five-point bins (RSD), baseline school MCAS score deciles (Orchard Gardens), or baseline school (UP, Harbor, and Dearborn).

Table B3: Grandfathering attrition

	Sample means				Balance coefficients
	RSD/Boston		Analysis sample		
	RSD/Boston students	Charter-bound students	Takeover charter students	Grandfathering-eligible students	Analysis sample
	(1)	(2)	(3)	(4)	(5)
			A. RSD		
Has legacy grade outcomes	0.749	0.856	0.958	0.936	0.946***
					(0.227)
N	14,575	11,381	1,040	763	2,740
Has first exposure year outcomes	0.671	0.774	0.828	0.710	0.760*
					(0.427)
N	14,575	11,381	1,040	763	2,740
Has second exposure year outcomes	0.633	0.733	0.814	0.738	0.728
					(0.445)
N	9,390	7,534	775	443	1,910
Has third exposure year outcomes	0.605	0.709	0.755	0.669	0.680
					(0.467)
N	5,862	4,679	534	290	1,215
Has fourth exposure year outcomes	0.477	0.569	0.599	0.488	0.551
					(0.498)
N	2,545	2,090	252	162	626
			B. UP		
Has legacy grade outcomes	0.910	0.974	0.938	0.893	0.965
					(0.000)
N	8,506	1,563	225	290	913
Has first exposure year outcomes	0.884	0.939	0.933	0.855	0.950
					(0.000)
N	8,506	1,563	225	290	913
Has second exposure year outcomes	0.868	0.915	0.877	0.817	0.935
					(0.000)
N	7,993	1,448	130	164	462
			C. BPS turnaround		
Has legacy grade outcomes	0.908	0.971	0.973	0.969	0.010
					(0.009)
N	4,995	792	400	482	3,075
Has first exposure year outcomes	0.888	0.949	0.958	0.929	-0.002
					(0.013)
N	4,995	792	400	482	3,075
Has second exposure year outcomes	0.884	0.926	0.932	0.925	0.008
					(0.018)
N	2,756	474	220	267	1,622

Notes: This table reports sample means and coefficients from regressions of the variable in each row on a grandfathering eligibility dummy indicating enrollment in an takeover legacy school in the fall of the academic year prior to takeover, controlling for matching strata. Regressions in column 6 also control for pre-baseline MCAS scores. The sample in columns 3-6 is restricted to students enrolled in an RSD direct-run school (panel A) or BPS school (panel B) at baseline. Column 1 reports means for a sample of RSD/Boston students in the same baseline years as the analysis sample, while column 2 is restricted to those students that enroll in an RSD/Boston charter school in grades following the baseline. Column 3 reports means for students that enroll in a takeover school in potential takeover grades, while column 4 describes students enrolled in a legacy school. Robust standard errors are reported in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%

Table B4: Grandfathering IV estimates of RSD takeover attendance effects (science and social science)

		Comparison group mean		2SLS estimates	
			OLS	First stage	Attendance effect
		(1)	(2)	(3)	(4)
All grades	Science	-0.125	0.081***	1.070***	0.142***
	(N: 5,613)		(0.022)	(0.052)	(0.046)
	Social science	-0.122	0.053**	1.072***	0.115**
	(N: 5,602)		(0.023)	(0.052)	(0.048)
			A. By grade		
5th & 6th grades	Science	-0.136	0.082*	0.742***	0.160*
	(N: 2,574)		(0.044)	(0.042)	(0.085)
	Social science	-0.135	0.022	0.744***	0.049
	(N: 2,570)		(0.044)	(0.042)	(0.088)
7th & 8th grades	Science	-0.116	0.085***	1.347***	0.141***
	(N: 3,039)		(0.022)	(0.071)	(0.040)
	Social science	-0.111	0.061***	1.349***	0.153***
	(N: 3,032)		(0.022)	(0.071)	(0.042)
			B. By potential exposure		
First exposure year	Science	-0.159	0.120**	0.659***	0.126
(5th-8th grades)	(N: 2,549)		(0.052)	(0.023)	(0.081)
	Social science	-0.174	0.132**	0.661***	0.220***
	(N: 2,545)		(0.054)	(0.023)	(0.085)
Second exposure year	Science	-0.143	0.093***	1.146***	0.158**
(6th-8th grades)	(N: 1,662)		(0.035)	(0.061)	(0.066)
	Social science	-0.107	0.046	1.148***	0.123*
	(N: 1,656)		(0.035)	(0.061)	(0.064)
Third & fourth exposure year	Science	-0.045	0.071***	1.693***	0.132***
(7th & 8th grades)	(N: 1,402)		(0.023)	(0.132)	(0.046)
	Social science	-0.048	0.044*	1.697***	0.034
	(N: 1,401)		(0.025)	(0.132)	(0.050)

Notes: This table reports OLS and 2SLS estimates of the effects of RSD takeover charter enrollment on 5th-8th grade LEAP/iLEAP science and social science test scores using the grandfathering eligibility instrument. The sample in columns 2-4 includes RSD direct-run school students matched to a pre-takeover year legacy school student. The endogenous regressor counts the number of years enrolled in a takeover charter prior to testing. All models control for matching strata, limited English proficiency, baseline test scores, and year/grade effects. Robust standard errors, clustered by student, are reported in parentheses. Means in column 1 are outcome grade scores for grandfathering-ineligible matched students. *significant at 10%; **significant at 5%; ***significant at 1%

Table B5: RSD takeover effects by subgroup

	Math		ELA	
	Comparison group mean	Attendance effect	Comparison group mean	Attendance effect
	(1)	(2)	(3)	(4)
Female	-0.110	0.225***	0.031	0.188***
(N: 2,737)		(0.049)		(0.047)
Male	-0.069	0.200***	-0.204	0.087
(N: 2,888)		(0.060)		(0.065)
High baseline score	0.424	0.212***	0.442	0.098*
(N: 2,116)		(0.047)		(0.052)
Mid baseline score	-0.223	0.168***	-0.179	0.208***
(N: 2,068)		(0.065)		(0.066)
Low baseline score	-0.657	0.282**	-0.763	0.150
(N: 1,441)		(0.111)		(0.104)

Notes: This table reports 2SLS subgroup estimates of the effects of RSD takeover charter enrollment on 5th-8th grade LEAP/iLEAP math and ELA test scores using the grandfathering eligibility instrument. The sample in columns 2 and 4 includes RSD direct-run school students matched to a pre-takeover year legacy school student. The endogenous regressor counts the number of years enrolled at a takeover charter prior to testing. All models control for matching strata, limited English proficiency, baseline test scores, and year/grade effects. Robust standard errors, clustered by student, are reported in parentheses. Means in columns 1 and 3 are outcome grade scores for grandfathering-ineligible matched students. Baseline score terciles are based on combined math and ELA test scores.

*significant at 10%; **significant at 5%; ***significant at 1%

Table B6: Alternative grandfathering IV estimates of RSD charter attendance effects

	Leave-out predicted other RSD charter enrollment interactions			Charter distance interactions			Baseline and charter distance interactions		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					A. Math (N: 5,625)				
Takeover charter	0.201***	0.539***		0.226***	0.429		0.223***	0.346***	
	(0.039)	(0.124)		(0.039)	(0.718)		(0.038)	(0.077)	
Other RSD charter		0.727**			0.487			0.312*	
		(0.284)			(1.726)			(0.169)	
Any RSD charter			0.401***			0.388***			0.360***
			(0.067)			(0.068)			(0.060)
Instruments	2	2	2	3	3	3	25	25	25
First stage *F*	282.6	8.5	194.5	139.7	1.1	77.5	58.1	16.9	39.0
					B. ELA (N: 5,621)				
Takeover charter	0.136***	0.362***		0.154***	0.286		0.154***	0.132*	
	(0.040)	(0.119)		(0.040)	(0.617)		(0.039)	(0.073)	
Other RSD charter		0.493*			0.318			-0.057	
		(0.278)			(1.495)			(0.157)	
Any RSD charter			0.268***			0.263***			0.212***
			(0.067)			(0.070)			(0.061)
Instruments	2	2	2	3	3	3	25	25	25
First stage *F*	282.3	8.5	195.8	139.7	1.1	78.9	58.6	16.9	39.4

Notes: This table reports 2SLS estimates of the effects of study takeover and other RSD charter enrollment on 5th-8th grade LEAP/iLEAP math and ELA test scores. The sample, controls, and endogenous regressors are as in Table 5. The instruments for columns 1-3 is grandfathering eligibility and its interaction with leave-out predicted other charter enrollment based on baseline year, grade, special education status, and SPS bin cells. Columns 4-6 use interactions with a quadratic in distance from a student's baseline school to the closest RSD charter school in operation in the fall following the baseline year. Columns 7-9 add these to the set of interactions used in Table 5. Robust standard errors, clustered by student, are reported in parentheses.
*significant at 10%; **significant at 5%; ***significant at 1%

Table B7 Grandfathering IV estimates of UP attendance effects with lagged achievement matching

		Comparison group mean	OLS	2SLS estimates: First stage	2SLS estimates: Attendance effect
		(1)	(2)	(3)	(4)
			A. All grades		
7th-8th grades	Math	-0.320	0.410***	1.062***	0.362***
	(N: 924)		(0.035)	(0.047)	(0.040)
	ELA	-0.269	0.269***	1.061***	0.365***
	(N: 920)		(0.043)	(0.047)	(0.048)
			B. By potential exposure		
First exposure year	Math	-0.290	0.393***	0.854***	0.378***
(7th & 8th grades)	(N: 613)		(0.055)	(0.029)	(0.049)
	ELA	-0.247	0.428***	0.847***	0.456***
	(N: 611)		(0.066)	(0.030)	(0.062)
Second exposure year	Math	-0.379	0.416***	1.501***	0.353***
(8th grade)	(N: 311)		(0.046)	(0.108)	(0.048)
	ELA	-0.313	0.197***	1.516***	0.236***
	(N: 309)		(0.060)	(0.110)	(0.061)

Notes: This table reports OLS and 2SLS estimates of the effects of UP enrollment on 7th and 8th grade MCAS math and ELA test scores using the grandfathering eligibility instrument. The sample in columns 2-4 includes BPS students matched to a 2010-11 6th or 7th grade Gavin Middle School student using lagged combined math and ELA MCAS score terciles to match in addition to race, sex, special education status, subsidized lunch eligibility, and 5th grade school and year). The endogenous regressor counts the number of years enrolled at UP prior to testing. All models control for matching strata, limited English proficiency, baseline test scores, and year/grade effects. Robust standard errors, clustered by student, are reported in parentheses. Means in column 1 are outcome grade scores for grandfathering-ineligible matched students.

*significant at 10%; **significant at 5%; ***significant at 1%

Table B8: UP lottery descriptive statistics, balance, and attrition

	Sample means					Balance coefficients	
	Boston students	Grandfathering-eligible students	Lottery applicants		Lottery compliers	Immediate offer	Waitlist offer
			6th grade	7th grade			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				A. Balance			
Hispanic	0.374	0.241	0.327	0.294	0.326	-0.023	0.035
						(0.033)	(0.037)
Black	0.375	0.469	0.483	0.373	0.510	0.004	-0.026
						(0.036)	(0.040)
White	0.124	0.152	0.090	0.196	0.097	0.014	-0.005
						(0.022)	(0.023)
Asian	0.073	0.100	0.055	0.098	0.043	0.025	-0.012
						(0.019)	(0.019)
Female	0.487	0.483	0.504	0.471	0.553	0.003	-0.017
						(0.036)	(0.040)
Special education	0.222	0.317	0.231	0.275	0.216	0.032	-0.001
						(0.031)	(0.034)
Free/reduced price lunch	0.794	0.928	0.802	0.843	0.815	0.019	-0.024
						(0.029)	(0.032)
Limited English proficient	0.280	0.307	0.248	0.275	0.269	0.023	-0.035
						(0.032)	(0.034)
N	6,744	290	911	51	434	962	962
Baseline math test score	0.003	-0.253	-0.054	-0.081	-0.069	0.003	-0.064
						(0.066)	(0.073)
N	6,501	258	897	48	426	945	945
Baseline ELA test score	0.006	-0.235	-0.030	-0.169	-0.081	-0.060	0.018
						(0.066)	(0.074)
N	6,387	254	890	47	422	937	937
				B. Attrition			
Has first exposure year outcomes	0.917	0.855	0.924	0.843	0.964	-0.016	0.033
						(0.020)	(0.021)
N	6,744	290	911	51	434	962	962
Has second exposure year outcomes	0.878	0.817	0.872	0.784	0.883	-0.034	0.014
						(0.025)	(0.028)
N	6,744	164	911	51	434	962	962
Has third exposure year outcomes	0.826		0.814		0.816	-0.047	-0.038
						(0.039)	(0.044)
N	4,294		617		277	617	617

Notes: This table reports sample means and coefficients from regressions of the variable in each row on either an immediate or waitlist offer dummy. The immediate offer dummy indicates that a lottery applicant was offered a seat in the March lottery, while the waitlist offer dummy indicates that an applicant was eligible for the offer of a seat off the waitlist from March to the end of September. All regressions include lottery risk set dummies. The sample in columns 2-7 is restricted to students enrolled in a BPS school at baseline. Column 1 reports means for a sample of Boston students in the same baseline grades and years as the analysis sample, and column 2 repeats column 4 from Table 6. Columns 3 and 4 reports means for students in the 6th and 7th grade lottery samples. Column 5 reports means and counts of lottery "ever offer" compliers, estimated by the method outlined in Abadie (2003). Robust standard errors are reported in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%

Table B9: UP lottery records

	2011		2012	
	6th grade	7th grade	6th grade	Total
	(1)	(2)	(3)	(4)
Total number of records	791	170	457	1,418
Excluding late applicants	698	81	361	1,140
Excluding applicants from outside of BPS	666	79	323	1,068
Excluding siblings of UP students	652	61	302	1,015
Excluding records not matched to SIMS	621	53	298	972
In a BPS school at baseline	619	51	292	962

Notes: This table summarizes the sample restrictions imposed for the analysis of UP's lottery applicants.

Table B10: School choice in the UP analysis samples

	All students		Compliers	
	Z=0	Z=1	Z=0	Z=1
	(1)	(2)	(3)	(4)
		A. Grandfathering		
Enrolled in UP	0.012	0.794	--	1.000
…in other Boston charter	0.063	0.009	0.070	--
…in BPS	0.837	0.137	0.856	--
…in other Massachusetts	0.087	0.060	0.075	--
N	804	233		
		B. Lottery		
Enrolled in UP	0.040	0.514	--	1.000
…in other Boston charter	0.179	0.157	0.057	--
…in BPS	0.748	0.307	0.937	--
…in other Massachusetts	0.033	0.022	0.006	--
N	425	453		

Notes: This table describes school enrollment in the first exposure year for students in the UP grandfathering and lottery analysis samples. Columns 1-2 in panel A characterize enrollment for grandfathering-eligible (Z=1) and grandfathering-ineligible (Z=0) students, while columns 3-4 show the same for grandfathering compliers. Columns 1-2 in panel B characterize enrollment for "ever offered" (Z=1) and not offered (Z=0) students, while columns 3-4 show the same for lottery offer compliers. Ever offered lottery applicants are those who received either an immediate or a waitlist offer. Complier means in panels A and B are estimated by the method outlined in Abadie (2003), using a probit specification for E[Z|X] and the same controls as were used to construct the estimates in Tables 7 and 8.

Table B11: BPS turnaround descriptive statistics and grandfathering balance

	Dearborn/Harbor					Orchard Gardens				
	Sample means		Balance coefficients			Sample means		Balance coefficients		
	Analysis sample		Analysis sample		First exposure year sample	Analysis sample		Analysis sample		First exposure year sample
	Turnaround students	Grandfathering-eligible students	No score controls	Lagged score controls	Lagged score controls	Turnaround students	Grandfathering-eligible students	No score controls	Lagged score controls	Lagged score controls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hispanic	0.189	0.212	--	--	--	0.618	0.608	--	--	--
Black	0.700	0.674	--	--	--	0.326	0.337	--	--	--
White	0.049	0.051	--	--	--	0.007	0.012	--	--	--
Asian	0.008	0.013	--	--	--	0.007	0.006	--	--	--
Female	0.514	0.503	--	--	--	0.500	0.530	--	--	--
Special education	0.284	0.272	--	--	--	0.271	0.271	--	--	--
Free/reduced price lunch	0.872	0.858	--	--	--	0.826	0.825	--	--	--
Limited English proficient	0.210	0.234	0.044	-0.016	-0.012	0.389	0.373	0.088**	0.006	-0.003
			(0.027)	(0.026)	(0.027)			(0.038)	(0.037)	(0.038)
N	243	316	1,355	1,239	1,177	144	166	1,720	1,538	1,448
Baseline math score	-0.374	-0.326	-0.165***	-0.007	-0.007	-0.864	-0.877	-0.316***	-0.023	-0.025
			(0.060)	(0.042)	(0.044)			(0.071)	(0.054)	(0.055)
N	232	307	1,325	1,223	1,165	137	158	1,661	1,510	1,433
Baseline math gain	0.032	0.057	0.052	0.052	0.058	-0.029	-0.033	0.100	0.097	0.097
			(0.047)	(0.048)	(0.050)			(0.062)	(0.061)	(0.061)
N	216	284	1,251	1,108	1,058	124	142	1,541	1,426	1,356
Baseline ELA score	-0.219	-0.224	-0.109*	0.012	0.023	-0.790	-0.831	-0.342***	-0.042	-0.054
			(0.064)	(0.045)	(0.047)			(0.070)	(0.051)	(0.052)
N	223	295	1,312	1,226	1,167	134	155	1,636	1,517	1,436
Baseline ELA gain	0.042	0.047	-0.001	0.036	0.047	0.017	0.011	0.058	0.052	0.036
			(0.047)	(0.046)	(0.048)			(0.059)	(0.059)	(0.059)
N	203	268	1,228	1,110	1,060	123	141	1,519	1,433	1,360

Notes: This table reports sample means and coefficients from regressions of the variable in each row on a grandfathering eligibility dummy indicating enrollment in Dearborn/Harbor or Orchard Gardens in 6th or 7th grade in the fall of 2009. Baseline test score gains are relative to the previous pre-baseline grade. All regressions include matching cell fixed effects (cells are defined as in the grandfathering analysis of UP for Dearborn/Harbor and as in the analysis of RSD for Orchard Gardens, with average MCAS deciles used in place of SPS bins). Regressions in columns 4, 5, 9, and 10 also control for lagged MCAS scores (pre-baseline for baseline demographics and test socres, pre-pre-baseline for baseline score gains). Regressions in columns 4, 5, 9, and 10 also control for lagged MCAS scores. The sample is restricted to students enrolled at a BPS school at baseline. Columns 1 and 6 report means for students in the analysis sample who enroll at the BPS turnaround in grades 7 and 8, while columns 2 and 7 describes students enrolled at the legacy school in the fall of 2009. Robust standard errors are reported in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%