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I. TECHNICAL APPENDIX

The goal of *Multiple Choice: Charter School Performance in 16 States* was to provide, for the first time ever, a comprehensive look at achievement in charter schools compared to their competitor traditional public schools (TPS) as well as insight into different state policies affecting charter schools. A four-step process was required to obtain a dataset that could meet these needs. This process, described in detail below, addressed the twin challenges of using data from 16 different education departments and identifying matches between charter and TPS students.

Step 1: Clean Data

When data was received from a state, a customized cleaning procedure was required to transform the information into variables that would be uniform across states. This procedure necessitated simplifying special education, English proficiency and lunch program statuses into binary variables with students designated as either participating in the program or not. Race/ethnicity categories were condensed into five designations – Asian/Pacific Islander, Black, Hispanic, Native American and white. Variables identifying both charter students and students attending school at juvenile detention centers were also added to the dataset. In addition to standardizing variables, the cleaning procedure also eliminated duplicate student records within each year.

Step 2: Identify Potential Match Pool

After a state's data was cleaned, the next step was to generate the list of TPS students who were potential matches for a given charter school. To do this, we isolated charter students in each year t , grouped them by the charter school they attended in that year and generated a list of traditional public schools they attended in year $t-1$, called the feeder school list. All students who attended a feeder school in year $t-1$ were then identified as the potential match pool for the charter school's students in year t .

In the third step of the process, the feeder and similar schools list was used to identify the pool of students who attended those schools in year $t-1$. This pool, then, comprised the potential matches, since matches were based on the grade level and test score from year $t-1$ as well as year-independent demographic information.

Step 3: Match Charter and TPS students

To match each charter school student, a potential match record had to meet several criteria:

- The student had to be demographically identical to the charter student in terms of:
 - Gender¹
 - Race/ethnicity
 - Special education designation
 - English learner status
 - Lunch status
 - Grade level for all years
- The student's test score in year $t-1$ test score had to be no more than one-tenth of a standard deviation higher or lower than the charter student's $t-1$ test score.
- Finally, the student had to have a test score record from a traditional public school – not a juvenile detention center or a charter school – for every year.²

When all matches for a charter student were identified, an average test score was calculated for each of the available years. If a student attended a charter school for more than one year, we attempted to create a matched comparison group that was consistent across as many years as possible. When the group could not remain intact, we calculated the succeeding test score averages for the remaining students in the group, if any.

Step 4: Compile dataset

The final phase of dataset creation compiled all results by state. Then test scores were standardized by year and grade level to obtain a z-score.³ The means and standard deviations used in standardizing scores were either calculated from the full state dataset, when available, or gathered from the state's technical report about the test for that year. When scores are thus standardized into z-scores, every student is placed relative to his peers. A z-score of zero, for example, denotes a student at the 50th percentile, while a z-score one standard deviation above that equates to the 84th percentile.

After scores were standardized, a one-year growth score was calculated for each time period for each record. In the first time period, the growth score was equal to the z-score in year $t-1$ subtracted from the z-score in year t . It is commonly assumed that students will generally maintain their relative place from year to year, which would equate to a growth score of zero. Therefore, by using standardized scores to create growth scores, we were able to compare growth for different students across grade levels, across years and across states.

¹ Gender was not available in the Florida data.

² In two states – California and North Carolina – math tests are administered by subject matter rather than grade level in the upper grades. Further, in North Carolina, one English test can be taken in any grade level from 8th grade to 11th grade. For these cases, a criterion that scores be from the same test in the same year was added.

³ Where applicable, test scores were standardized by subject matter instead of grade level.

Analytic Models

For our analysis, we relied on ordinary least squares (OLS) regression. Math and reading were analyzed separately. The dependent variable was the standardized growth score in either reading or math. The independent variable of interest in the basic model was a charter school indicator. The basic models also included standardized starting score, year and observed time period variables. In addition, dummies were included as controls for:

- Race/ethnicity - Asian/Pacific Islander, Black, Hispanic and Native American
- Special education
- English proficiency
- Free/reduced-priced lunch
- Repeating a grade
- Grade levels
- Scores affected by Hurricane Katrina in August 2005
- States

We could not control for gender in our models because it was not available for all states.

Variations on the basic model were run to determine whether charter schools or traditional public schools were more effective with various subgroups of students. To do this, variables were created to indicate charter students within each student subgroup. This was done for race/ethnicity variables as well as special education, English proficiency, lunch status and grade-repeater indicators. A similar model was run for students based on their starting score decile.

Two additional variations on the basic model were run. Both excluded the general charter school indicator in favor of looking at different aspects of charter schooling. The first included a charter indicator for each of four different types of charter schools: elementary, middle, secondary and multilevel schools. The second model included indicators for each year of attendance at a charter school.

In a different type of enhancement to the basic model, we excluded the general charter school indicator and instead included a charter indicator for each state. This breakout allowed us to see the variation in charter school quality across states.

To drill down even further, we ran a third model. This version excluded both state and charter-state effects. It included fixed effects for each charter school as well as fixed effects for each charter school market. The charter school market was defined as all of the charter's students and all of their matched comparison records. In other words, each charter belonged to a different charter school market.

II. TABLES OF RESULTS

Overall Effect

Dependent variable: z-score growth for one year	READ	MATH
Charter student	-0.006 (0.001)**	-0.025 (0.001)**
Starting score	-0.261 (0.001)**	-0.257 (0.001)**
Black	-0.134 (0.001)**	-0.127 (0.001)**
Hispanic	-0.042 (0.001)**	-0.037 (0.001)**
Asian or Pacific Islander	0.092 (0.002)**	0.141 (0.002)**
Native American	-0.122 (0.006)**	-0.117 (0.007)**
Is Special Ed	-0.245 (0.002)**	-0.197 (0.002)**
Is English Learner	-0.149 (0.002)**	-0.073 (0.002)**
Receives Free or Reduced-priced Lunch	-0.084 (0.001)**	-0.075 (0.001)**
Repeated grade	0.087 (0.003)**	0.074 (0.003)**
Fall of starting score test year	0.001 (0.000)**	0.000 (0.000)
Time Period	0.030 (0.001)**	0.025 (0.001)**
Affected by Hurricane Katrina in August 2005	-0.111 (0.006)**	-0.138 (0.006)**
AR	-0.030 (0.005)**	0.005 (0.006)
AZ	-0.009 (0.003)**	0.022 (0.004)**
CA	-0.042 (0.003)**	-0.026 (0.004)**
CO	-0.090 (0.005)**	-0.029 (0.005)**
DC	0.101 (0.006)**	0.141 (0.006)**
FL	-0.044 (0.003)**	0.012 (0.004)**
GA	0.066 (0.003)**	0.012 (0.004)**
IL	-0.018 (0.004)**	0.007 (0.005)

Dependent variable: z-score growth for one year	READ	MATH
LA		0.059
		(0.005)**
MN	-0.070	-0.078
	(0.004)**	(0.005)**
NC	-0.064	-0.052
	(0.003)**	(0.004)**
MO	-0.124	-0.147
	(0.005)**	(0.006)**
NM	-0.032	
	(0.005)**	
OH	-0.159	-0.112
	(0.003)**	(0.004)**
TX	-0.100	-0.042
	(0.003)**	(0.004)**
grade_01	0.282	0.652
	(0.030)**	(0.041)**
grade_02	-0.227	0.034
	(0.005)**	(0.005)**
grade_03	0.043	0.029
	(0.002)**	(0.003)**
grade_04	-0.019	-0.005
	(0.002)**	(0.002)**
grade_06	0.009	0.036
	(0.001)**	(0.001)**
grade_07	0.029	0.033
	(0.001)**	(0.001)**
grade_08	0.008	0.063
	(0.001)**	(0.001)**
grade_09	0.012	-0.049
	(0.002)**	(0.002)**
grade_10	-0.099	-0.201
	(0.002)**	(0.002)**
grade_11	0.008	-0.120
	(0.003)**	(0.003)**
grade_12	0.416	0.656
	(0.008)**	(0.008)**
Constant	-2.099	0.480
	(0.675)**	(0.662)
Observations	1730236	1733758
Adjusted R-squared	0.16	0.17
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

School Characteristics

Dependent variable: z-score growth for one year	READ	MATH
Is Charter Elementary School	0.010 (0.001)**	-0.001 (0.001)
Is Charter Middle School	0.018 (0.001)**	0.022 (0.001)**
Is Charter High School	-0.021 (0.002)**	-0.053 (0.002)**
Is Charter Multilevel School	-0.036 (0.001)**	-0.075 (0.001)**
Starting score	-0.262 (0.001)**	-0.257 (0.001)**
Black	-0.135 (0.001)**	-0.13 (0.001)**
Hispanic	-0.044 (0.001)**	-0.041 (0.001)**
Asian or Pacific Islander	0.090 (0.002)**	0.138 (0.003)**
Native American	-0.124 (0.006)**	-0.12 (0.007)**
Is Special Ed	-0.247 (0.002)**	-0.198 (0.002)**
Is English Learner	-0.151 (0.002)**	-0.075 (0.002)**
Receives Free or Reduced Lunch	-0.085 (0.001)**	-0.077 (0.001)**
Repeated grade	0.087 (0.003)**	0.073 (0.003)**
grade_01	0.284 (0.031)**	0.662 (0.041)**
grade_02	-0.222 (0.005)**	0.042 (0.005)**
grade_03	0.044 (0.002)**	0.033 (0.003)**
grade_04	-0.020 (0.002)**	-0.005 (0.002)**
grade_06	0.009 (0.001)**	0.035 (0.001)**
grade_07	0.030 (0.001)**	0.034 (0.001)**
grade_08	0.010 (0.001)**	0.065 (0.002)**
grade_09	0.025 (0.002)**	-0.024 (0.002)**
grade_10	-0.084 (0.002)**	-0.176 (0.002)**
grade_11	0.023 (0.003)**	-0.098 (0.003)**

Dependent variable: z-score growth for one year	READ	MATH
grade_12	0.431	0.679
	(0.008)**	(0.008)**
Fall of starting score test year	0.001	0
	(0.000)**	0
Time Period	0.029	0.025
	(0.001)**	(0.001)**
Affected by Hurricane Katrina in August 2005	-0.114	-0.14
	(0.006)**	(0.006)**
AR	-0.038	0
	(0.006)**	-0.007
AZ	-0.011	0.026
	(0.003)**	(0.004)**
CA	-0.046	-0.026
	(0.003)**	(0.004)**
CO	-0.096	-0.032
	(0.005)**	(0.005)**
DC	0.083	0.125
	(0.006)**	(0.007)**
FL	-0.052	0.005
	(0.003)**	-0.004
GA	0.056	0
	(0.003)**	-0.004
IL	-0.013	0.024
	(0.004)**	(0.005)**
LA		0.064
		(0.005)**
MN	-0.075	-0.08
	(0.004)**	(0.005)**
NC	-0.069	-0.053
	(0.003)**	(0.004)**
MO	-0.111	-0.122
	(0.006)**	(0.006)**
NM	-0.036	
	(0.005)**	
OH	-0.162	-0.108
	(0.003)**	(0.004)**
TX	-0.103	-0.041
	(0.003)**	(0.004)**
Constant	-2.671	0.548
	(0.684)**	-0.671
Observations	1700246	1704094
Adjusted R-squared	0.16	0.17
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

Student Characteristics

Dependent variable: z-score growth for one year	READ	MATH
Starting score	-0.261 (0.001)**	-0.257 (0.001)**
Is Special Ed	-0.248 (0.002)**	-0.203 (0.002)**
Sped Charter Student	0.006 (0.004)	0.012 (0.004)**
Black	-0.139 (0.001)**	-0.149 (0.001)**
Black Charter Student	-0.006 (0.002)**	-0.010 (0.002)**
Hispanic	-0.043 (0.001)**	-0.052 (0.001)**
Hispanic Charter Student	-0.015 (0.002)**	-0.022 (0.002)**
Asian or Pacific Islander	0.091 (0.002)**	0.134 (0.003)**
Asian/PI Charter Student	-0.016 (0.004)**	-0.040 (0.005)**
Native American	-0.108 (0.008)**	-0.103 (0.008)**
Native American Charter Student	-0.046 (0.012)**	-0.082 (0.013)**
White Charter Student	-0.017 (0.001)**	-0.054 (0.001)**
Receives Free or Reduced Lunch	-0.089 (0.001)**	-0.082 (0.001)**
Charter Student on Free/Reduced	0.010 (0.002)**	0.014 (0.002)**
Is English Learner	-0.172 (0.002)**	-0.089 (0.002)**
ELL Charter Student	0.045 (0.004)**	0.032 (0.004)**
Repeated grade	0.090 (0.004)**	0.095 (0.003)**
Repeated grade charter student	-0.005 (0.007)	-0.042 (0.006)**
grade_01	0.282 (0.030)**	0.652 (0.041)**
grade_02	-0.227 (0.005)**	0.034 (0.005)**
grade_03	0.043 (0.002)**	0.029 (0.003)**
grade_04	-0.019 (0.002)**	-0.005 (0.002)**
grade_06	0.009 (0.001)**	0.036 (0.001)**

Dependent variable: z-score growth for one year	READ	MATH
grade_07	0.029 (0.001)**	0.033 (0.001)**
grade_08	0.008 (0.001)**	0.063 (0.001)**
grade_09	0.012 (0.002)**	-0.049 (0.002)**
grade_10	-0.099 (0.002)**	-0.200 (0.002)**
grade_11	0.008 (0.003)**	-0.120 (0.003)**
grade_12	0.416 (0.008)**	0.656 (0.008)**
Fall of starting score test year	0.001 (0.000)**	0.000 (0.000)
Time Period	0.030 (0.001)**	0.025 (0.001)**
Affected by Hurricane Katrina in August 2005	-0.111 (0.006)**	-0.138 (0.006)**
AR	-0.030 (0.005)**	0.005 (0.006)
AZ	-0.009 (0.003)**	0.022 (0.004)**
CA	-0.042 (0.003)**	-0.026 (0.004)**
CO	-0.090 (0.005)**	-0.029 (0.005)**
DC	0.101 (0.006)**	0.141 (0.006)**
FL	-0.044 (0.003)**	0.011 (0.004)**
GA	0.066 (0.003)**	0.011 (0.004)**
IL	-0.018 (0.004)**	0.007 (0.005)
LA		0.059 (0.005)**
MN	-0.070 (0.004)**	-0.077 (0.005)**
NC	-0.064 (0.003)**	-0.052 (0.004)**
MO	-0.124 (0.005)**	-0.147 (0.006)**
NM	-0.032 (0.005)**	
OH	-0.159 (0.003)**	-0.113 (0.004)**

Dependent variable: z-score growth for one year	READ	MATH
TX	-0.100	-0.042
	(0.003)**	(0.004)**
Constant	-2.058	0.604
	(0.675)**	(0.662)
Observations	1730236	1733758
Adjusted R-squared	0.16	0.17
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

Starting Decile

Dependent variable: z-score growth for one year	READ	MATH
Charter Student & in State Decile 1 in t-1 yr	0.404 (0.003)**	0.408 (0.003)**
Charter Student & in State Decile 2 in t-1 yr	0.175 (0.003)**	0.194 (0.002)**
Charter Student & in State Decile 3 in t-1 yr	0.088 (0.003)**	0.094 (0.002)**
Charter Student & in State Decile 4 in t-1 yr	0.038 (0.003)**	0.027 (0.002)**
Charter Student & in State Decile 5 in t-1 yr	-0.007 (0.002)**	-0.022 (0.002)**
Charter Student & in State Decile 6 in t-1 yr	-0.043 (0.002)**	-0.057 (0.002)**
Charter Student & in State Decile 7 in t-1 yr	-0.085 (0.002)**	-0.090 (0.002)**
Charter Student & in State Decile 8 in t-1 yr	-0.113 (0.002)**	-0.125 (0.002)**
Charter Student & in State Decile 9 in t-1 yr	-0.153 (0.002)**	-0.158 (0.002)**
Charter Student & in State Decile 10 in t-1 yr	-0.278 (0.003)**	-0.273 (0.003)**
TPS Student & in State Decile 1 in t-1 yr	0.408 (0.003)**	0.434 (0.002)**
TPS Student & in State Decile 2 in t-1 yr	0.184 (0.002)**	0.226 (0.002)**
TPS Student & in State Decile 3 in t-1 yr	0.104 (0.002)**	0.124 (0.002)**
TPS Student & in State Decile 4 in t-1 yr	0.047 (0.002)**	0.048 (0.002)**
TPS Student & in State Decile 6 in t-1 yr	-0.037 (0.002)**	-0.037 (0.002)**
TPS Student & in State Decile 7 in t-1 yr	-0.074 (0.002)**	-0.071 (0.002)**
TPS Student & in State Decile 8 in t-1 yr	-0.106 (0.002)**	-0.103 (0.002)**
TPS Student & in State Decile 9 in t-1 yr	-0.150 (0.002)**	-0.131 (0.002)**
TPS Student & in State Decile 10 in t-1 yr	-0.275 (0.002)**	-0.240 (0.002)**
Black	-0.091 (0.001)**	-0.087 (0.001)**
Hispanic	-0.019 (0.001)**	-0.020 (0.001)**
Asian or Pacific Islander	0.073 (0.002)**	0.099 (0.003)**
Native American	-0.077 (0.006)**	-0.082 (0.007)**

Dependent variable: z-score growth for one year	READ	MATH
Is Special Ed	-0.186 (0.002)**	-0.045 (0.002)**
Is English Learner	-0.101 (0.002)**	-0.150 (0.002)**
Receives Free or Reduced Lunch	-0.057 (0.001)**	-0.052 (0.001)**
Repeated grade	0.139 (0.004)**	0.117 (0.003)**
grade_01	0.254 (0.031)**	0.618 (0.041)**
grade_02	-0.226 (0.005)**	0.023 (0.005)**
grade_03	0.046 (0.002)**	0.024 (0.003)**
grade_04	-0.027 (0.002)**	-0.010 (0.002)**
grade_06	0.007 (0.001)**	0.034 (0.001)**
grade_07	0.028 (0.001)**	0.031 (0.001)**
grade_08	0.005 (0.001)**	0.061 (0.002)**
grade_09	0.015 (0.002)**	-0.052 (0.002)**
grade_10	-0.094 (0.002)**	-0.191 (0.002)**
grade_11	0.034 (0.003)**	-0.078 (0.003)**
grade_12	0.411 (0.009)**	0.675 (0.009)**
Fall of starting score test year	0.001 (0.000)**	0.000 (0.000)
Time Period	0.023 (0.001)**	0.021 (0.001)**
Affected by Hurricane Katrina in August 2005	-0.094 (0.006)**	-0.118 (0.006)**
AR	-0.021 (0.006)**	0.005 (0.007)
AZ	-0.010 (0.003)**	0.018 (0.004)**
CA	-0.046 (0.003)**	-0.030 (0.004)**
CO	-0.055 (0.005)**	-0.011 (0.005)*
DC	0.092 (0.006)**	0.126 (0.006)**

Dependent variable: z-score growth for one year	READ	MATH
FL	-0.027	0.023
	(0.003)**	(0.004)**
GA	0.079	0.004
	(0.003)**	(0.004)
IL	-0.009	0.005
	(0.004)*	(0.005)
LA		0.047
		(0.005)**
MN	-0.037	-0.051
	(0.004)**	(0.005)**
NC	-0.050	-0.048
	(0.003)**	(0.004)**
MO	-0.088	-0.125
	(0.005)**	(0.006)**
NM	-0.028	
	(0.005)**	
OH	-0.124	-0.095
	(0.004)**	(0.004)**
TX	-0.085	-0.039
	(0.003)**	(0.004)**
Constant	-2.305	-0.797
	(0.700)**	(0.684)
Observations	1731134	1734862
Adjusted R-squared	0.09	0.11
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

Effect Over Time

Dependent variable: z-score growth for one year	READ	MATH
First Year in Charter	-0.055 (0.001)**	-0.088 (0.001)**
Second Year in Charter	0.006 (0.002)**	-0.002 (0.002)
Third Year in Charter	0.024 (0.004)**	0.028 (0.004)**
Four or More Years in Charter	-0.031 (0.008)**	0.018 (0.008)*
Starting score	-0.275 (0.001)**	-0.269 (0.001)**
Black	-0.128 (0.002)**	-0.124 (0.002)**
Hispanic	-0.032 (0.002)**	-0.035 (0.002)**
Asian or Pacific Islander	0.121 (0.004)**	0.163 (0.004)**
Native American	-0.117 (0.009)**	-0.107 (0.010)**
Is Special Ed	-0.252 (0.003)**	-0.206 (0.003)**
Is English Learner	-0.152 (0.003)**	-0.075 (0.003)**
Receives Free or Reduced Lunch	-0.080 (0.001)**	-0.07 (0.001)**
Repeated grade	0.071 (0.004)**	0.051 (0.004)**
grade_01	0.328 (0.054)**	0.683 (0.076)**
grade_02	-0.253 (0.009)**	0.004 -0.01
grade_03	0.060 (0.005)**	0.052 (0.006)**
grade_04	-0.043 (0.003)**	-0.024 (0.003)**
grade_06	0.016 (0.002)**	0.052 (0.002)**
grade_07	0.032 (0.002)**	0.038 (0.002)**
grade_08	0.000 (0.002)	0.049 (0.002)**
grade_09	0.037 (0.002)**	-0.005 (0.002)*
grade_10	-0.103 (0.003)**	-0.161 (0.003)**
grade_11	0.048 (0.004)**	0 -0.004

Dependent variable: z-score growth for one year	READ	MATH
grade_12	0.400	0.697
	(0.010)**	(0.011)**
Fall of starting score test year	0.004	0.004
	(0.000)**	(0.000)**
Time Period	0.029	0.013
	(0.001)**	(0.001)**
Affected by Hurricane Katrina in August 2005	-0.181	-0.236
	(0.009)**	(0.009)**
AR	-0.038	0.011
	(0.007)**	-0.008
AZ	-0.019	0.014
	(0.005)**	(0.006)*
CA	-0.076	-0.053
	(0.004)**	(0.005)**
CO	-0.106	-0.02
	(0.007)**	(0.008)*
DC	0.090	0.161
	(0.009)**	(0.009)**
FL	-0.043	0.025
	(0.004)**	(0.005)**
LA		0.084
		(0.007)**
IL	-0.052	-0.019
	(0.006)**	(0.007)**
MN	-0.086	-0.087
	(0.007)**	(0.008)**
NC	-0.061	-0.053
	(0.005)**	(0.006)**
MO	-0.207	-0.222
	(0.010)**	(0.011)**
NM	-0.044	
	(0.007)**	
OH	-0.179	-0.138
	(0.006)**	(0.006)**
GA	0.050	0.011
	(0.005)**	-0.006
TX	-0.123	-0.063
	(0.004)**	(0.005)**
Constant	-8.314	-8.753
	(0.950)**	(0.912)**
Observations	814722	829018
Adjusted R-squared	0.17	0.19
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

Effect by State

Dependent variable: z-score growth for one year	READ	MATH
Charter in AR	0.019 (0.009)*	0.048 (0.010)**
Charter in AZ	-0.010 (0.003)**	-0.043 (0.003)**
Charter in CA	0.015 (0.001)**	-0.031 (0.002)**
Charter in CO	0.022 (0.008)**	0.068 (0.008)**
Charter in DC	-0.007 (0.010)	0.005 (0.009)
Charter in FL	-0.021 (0.001)**	-0.027 (0.001)**
Charter in GA	0.006 (0.004)	-0.011 (0.003)**
Charter in IL	0.003 (0.006)	0.024 (0.005)**
Charter in LA	0.058 (0.004)**	0.058 (0.004)**
Charter in MN	-0.021 (0.007)**	-0.029 (0.007)**
Charter in MO	0.030 (0.009)**	0.032 (0.009)**
Charter in NC	0.007 (0.003)*	-0.027 (0.003)**
Charter in NM	-0.024 (0.008)**	-0.047 (0.007)**
Charter in OH	-0.005 (0.004)	-0.058 (0.004)**
Charter in TX	-0.053 (0.003)**	-0.045 (0.002)**
Starting score	-0.261 (0.001)**	-0.257 (0.001)**
Black	-0.133 (0.001)**	-0.127 (0.001)**
Hispanic	-0.042 (0.001)**	-0.037 (0.001)**
Asian or Pacific Islander	0.092 (0.002)**	0.141 (0.002)**
Native American	-0.122 (0.006)**	-0.117 (0.007)**
Is Special Ed	-0.245 (0.002)**	-0.197 (0.002)**
Is English Learner	-0.150 (0.002)**	-0.073 (0.002)**
Receives Free or Reduced Lunch	-0.084 (0.001)**	-0.075 (0.001)**

Dependent variable: z-score growth for one year	READ	MATH
Repeated grade	0.087	0.074
	(0.003)**	(0.003)**
grade_01	0.282	0.652
	(0.030)**	(0.041)**
grade_02	-0.227	0.034
	(0.005)**	(0.005)**
grade_03	0.043	0.029
	(0.002)**	(0.003)**
grade_04	-0.019	-0.005
	(0.002)**	(0.002)**
grade_06	0.009	0.036
	(0.001)**	(0.001)**
grade_07	0.028	0.033
	(0.001)**	(0.001)**
grade_08	0.008	0.063
	(0.001)**	(0.001)**
grade_09	0.011	-0.049
	(0.002)**	(0.002)**
grade_10	-0.099	-0.201
	(0.002)**	(0.002)**
grade_11	0.008	-0.120
	(0.003)**	(0.003)**
grade_12	0.415	0.656
	(0.008)**	(0.008)**
Fall of starting score test year	0.001	0.000
	(0.000)**	(0.000)
Time Period	0.030	0.025
	(0.001)**	(0.001)**
Affected by Hurricane Katrina in August 2005	-0.111	-0.138
	(0.006)**	(0.006)**
AR	-0.011	-0.043
	(0.005)**	(0.006)**
AZ	0.025	0.020
	(0.003)**	(0.004)**
CA	-0.020	-0.035
	(0.003)**	(0.004)**
CO	-0.072	-0.087
	(0.005)**	(0.006)**
DC	0.134	0.115
	(0.005)**	(0.006)**
FL	-0.005	0.002
	(0.003)	(0.004)
GA	0.092	-0.007
	(0.004)**	(0.005)

Dependent variable: z-score growth for one year	READ	MATH
IL	0.009	-0.028
	(0.004)*	(0.005)**
LA		0.007
		(0.005)
MN	-0.030	-0.087
	(0.005)**	(0.006)**
NC	-0.038	-0.062
	(0.003)**	(0.005)**
MO	-0.111	-0.187
	(0.006)**	(0.007)**
NM	0.009	
	(0.005)	
OH	-0.128	-0.107
	(0.004)**	(0.005)**
TX	-0.044	-0.043
	(0.003)**	(0.004)**
Constant	-2.097	0.491
	(0.676)**	(0.662)
Observations	1725062	1733758
Adjusted R-squared	0.16	0.17
Robust standard errors in parentheses		
* significant at 5% level; ** significant at 1% level		

Charter School Policy – Reading

Dependent variable: z-score growth for one year	READ						
	Charter student	-0.006 (0.001)**	-0.006 (0.001)**	-0.006 (0.001)**	-0.006 (0.001)**	-0.006 (0.001)**	-0.006 (0.001)**
Cap	0.040 (0.002)**			-0.029 (0.001)**			
90 percent of cap		0.008 (0.002)**			-0.048 (0.001)**		
Multiple authorizers			0.009 (0.005)			-0.077 (0.001)**	
Appeals							0.007 (0.001)**
AR	-0.037 (0.005)**	-0.027 (0.005)**	-0.028 (0.006)**				
AZ	0.023 (0.004)**	-0.006 (0.003)	-0.015 (0.005)**				
CA	-0.052 (0.003)**	-0.039 (0.003)**	-0.048 (0.005)**				
CO	-0.057 (0.005)**	-0.087 (0.005)**	-0.096 (0.006)**				
DC	0.091 (0.006)**	0.105 (0.006)**	0.095 (0.007)**				
FL	-0.013 (0.003)**	-0.041 (0.003)**	-0.050 (0.004)**				
GA	0.100 (0.004)**	0.069 (0.003)**	0.068 (0.004)**				
IL	-0.027 (0.004)**	-0.022 (0.004)**	-0.016 (0.004)**				
LA							
MN	-0.038 (0.005)**	-0.066 (0.004)**	-0.076 (0.006)**				
NC	-0.068 (0.003)**	-0.069 (0.003)**	-0.070 (0.005)**				
MO	-0.094 (0.006)**	-0.121 (0.005)**	-0.131 (0.006)**				
NM	-0.039 (0.005)**	-0.029 (0.005)**	-0.035 (0.005)**				
OH	-0.167 (0.003)**	-0.162 (0.004)**	-0.166 (0.005)**				
TX	-0.103 (0.003)**	-0.100 (0.003)**	-0.106 (0.005)**				
Starting score	-0.261 (0.001)**	-0.261 (0.001)**	-0.261 (0.001)**	-0.257 (0.001)**	-0.258 (0.001)**	-0.257 (0.001)**	-0.257 (0.001)**

Dependent variable: z-score growth for one year	READ						
	Black	-0.134	-0.133	-0.133	-0.127	-0.126	-0.139
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Hispanic	-0.041	-0.042	-0.042	-0.045	-0.050	-0.044	-0.047
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Asian or Pacific Islander	0.092	0.092	0.092	0.095	0.086	0.090	0.090
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
Native American	-0.122	-0.122	-0.122	-0.110	-0.107	-0.100	-0.105
	(0.006)**	(0.006)**	(0.006)**	(0.006)**	(0.006)**	(0.006)**	(0.006)**
Is Special Ed	-0.245	-0.245	-0.245	-0.238	-0.237	-0.235	-0.235
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
Is English Learner	-0.150	-0.150	-0.150	-0.135	-0.141	-0.134	-0.138
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
Receives Free or Reduced Lunch	-0.084	-0.084	-0.084	-0.087	-0.087	-0.090	-0.087
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Repeated grade	0.088	0.087	0.087	0.079	0.080	0.083	0.081
	(0.003)**	(0.003)**	(0.003)**	(0.003)**	(0.003)**	(0.003)**	(0.003)**
grade_01	0.282	0.282	0.282	0.389	0.396	0.341	0.409
	(0.030)**	(0.030)**	(0.030)**	(0.030)**	(0.030)**	(0.030)**	(0.030)**
grade_02	-0.227	-0.227	-0.227	-0.135	-0.126	-0.181	-0.112
	(0.005)**	(0.005)**	(0.005)**	(0.004)**	(0.004)**	(0.005)**	(0.004)**
grade_03	0.043	0.043	0.043	0.072	0.061	0.059	0.068
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
grade_04	-0.020	-0.019	-0.019	-0.019	-0.017	-0.018	-0.018
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
grade_06	0.009	0.009	0.009	0.010	0.010	0.010	0.010
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
grade_07	0.028	0.028	0.028	0.030	0.027	0.029	0.028
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
grade_08	0.008	0.008	0.008	0.010	0.007	0.008	0.008
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
grade_09	0.011	0.011	0.011	0.009	0.005	0.010	0.003
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)
grade_10	-0.099	-0.099	-0.099	-0.105	-0.114	-0.100	-0.110
	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**	(0.002)**
grade_11	0.008	0.008	0.008	0.004	-0.006	0.006	-0.003
	(0.003)**	(0.003)**	(0.003)**	(0.002)	(0.002)*	(0.002)**	(0.002)
grade_12	0.417	0.416	0.415	0.401	0.405	0.423	0.410
	(0.008)**	(0.008)**	(0.008)**	(0.008)**	(0.008)**	(0.008)**	(0.008)**
Fall of starting score test year	0.004	0.001	0.001	0.003	0.004	0.004	0.003
	(0.000)**	(0.000)	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Time Period	0.029	0.030	0.030	0.028	0.033	0.030	0.032
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.000)**	(0.000)**	(0.000)**

Dependent variable: z-score growth for one year	READ						
	Affected by Hurricane Katrina in August 2005	-0.117	-0.108	-0.117	-0.054	-0.079	-0.051
	(0.006)**	(0.006)**	(0.007)**	(0.005)**	(0.005)**	(0.005)**	(0.005)**
Constant	-8.399	-1.007	-1.742	-5.227	-7.505	-8.385	-5.118
	(0.816)**	(0.704)	(0.695)*	(0.532)**	(0.531)**	(0.534)**	(0.532)**
Observations	1725062	1725062	1725062	1725062	1725062	1725062	1725062
Adjusted R-squared	0.16	0.16	0.16	0.15	0.15	0.15	0.15
Robust standard errors in parentheses							
* significant at 5% level; ** significant at 1% level							

Charter School Policy – Math

Dependent variable: z-score growth for one year	MATH						
	Charter student	-0.025 (0.001)**	-0.025 (0.001)**	-0.025 (0.001)**	-0.025 (0.001)**	-0.025 (0.001)**	-0.025 (0.001)**
Cap	0.020 (0.002)**			-0.032 (0.001)**			
90 percent of cap		-0.009 (0.002)**			-0.047 (0.001)**		
Multiple authorizers			-0.001 (0.005)			-0.035 (0.001)**	
Appeals							0.011 (0.001)**
AR	0.005 (0.006)	0.005 (0.006)	0.004 (0.007)				
AZ	0.042 (0.005)**	0.022 (0.004)**	0.022 (0.004)**				
CA	-0.027 (0.004)**	-0.027 (0.004)**	-0.026 (0.004)**				
CO	-0.008 (0.006)	-0.029 (0.005)**	-0.029 (0.006)**				
DC	0.140 (0.006)**	0.140 (0.006)**	0.141 (0.006)**				
FL	0.032 (0.005)**	0.013 (0.004)**	0.012 (0.004)**				
GA	0.032 (0.005)**	0.012 (0.004)**	0.011 (0.005)*				
IL	0.007 (0.005)	0.014 (0.005)**	0.006 (0.006)				
LA	0.063 (0.005)**	0.063 (0.005)**	0.059 (0.005)**				
MN	-0.058 (0.006)**	-0.078 (0.005)**	-0.077 (0.005)**				
NC	-0.050 (0.004)**	-0.042 (0.005)**	-0.051 (0.004)**				
MO	-0.128 (0.007)**	-0.147 (0.006)**	-0.146 (0.006)**				
NM							
OH	-0.113 (0.004)**	-0.106 (0.005)**	-0.112 (0.005)**				
TX	-0.040 (0.004)**	-0.039 (0.004)**	-0.041 (0.004)**				
Starting score	-0.257 (0.001)**	-0.257 (0.001)**	-0.257 (0.001)**	-0.251 (0.001)**	-0.252 (0.001)**	-0.251 (0.001)**	-0.251 (0.001)**
Black	-0.127 (0.001)**	-0.127 (0.001)**	-0.127 (0.001)**	-0.121 (0.001)**	-0.120 (0.001)**	-0.128 (0.001)**	-0.123 (0.001)**

Dependent variable: z-score growth for one year	MATH						
	Hispanic	-0.037 (0.001)**	-0.037 (0.001)**	-0.037 (0.001)**	-0.033 (0.001)**	-0.039 (0.001)**	-0.034 (0.001)**
Asian or Pacific Islander	0.141 (0.002)**	0.141 (0.002)**	0.141 (0.002)**	0.142 (0.002)**	0.132 (0.002)**	0.137 (0.002)**	0.136 (0.002)**
Native American	-0.117 (0.007)**	-0.117 (0.007)**	-0.117 (0.007)**	-0.107 (0.007)**	-0.105 (0.007)**	-0.100 (0.007)**	-0.102 (0.007)**
Is Special Ed	-0.197 (0.002)**	-0.197 (0.002)**	-0.197 (0.002)**	-0.191 (0.002)**	-0.188 (0.002)**	-0.187 (0.002)**	-0.186 (0.002)**
Is English Learner	-0.073 (0.002)**	-0.073 (0.002)**	-0.073 (0.002)**	-0.066 (0.002)**	-0.071 (0.002)**	-0.067 (0.002)**	-0.069 (0.002)**
Receives Free or Reduced Lunch	-0.075 (0.001)**	-0.075 (0.001)**	-0.075 (0.001)**	-0.076 (0.001)**	-0.075 (0.001)**	-0.077 (0.001)**	-0.075 (0.001)**
Repeated grade	0.074 (0.003)**	0.074 (0.003)**	0.074 (0.003)**	0.077 (0.003)**	0.078 (0.003)**	0.078 (0.003)**	0.080 (0.003)**
grade_01	0.652 (0.041)**	0.652 (0.041)**	0.652 (0.041)**	0.662 (0.041)**	0.673 (0.041)**	0.654 (0.041)**	0.687 (0.041)**
grade_02	0.034 (0.005)**	0.034 (0.005)**	0.034 (0.005)**	0.042 (0.005)**	0.054 (0.005)**	0.033 (0.005)**	0.069 (0.005)**
grade_03	0.029 (0.003)**	0.029 (0.003)**	0.029 (0.003)**	0.036 (0.002)**	0.025 (0.003)**	0.028 (0.003)**	0.030 (0.002)**
grade_04	-0.005 (0.002)**	-0.005 (0.002)**	-0.005 (0.002)**	-0.004 (0.002)**	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)
grade_06	0.036 (0.001)**	0.036 (0.001)**	0.036 (0.001)**	0.038 (0.001)**	0.038 (0.001)**	0.038 (0.001)**	0.038 (0.001)**
grade_07	0.033 (0.001)**	0.033 (0.001)**	0.033 (0.001)**	0.036 (0.001)**	0.033 (0.001)**	0.034 (0.001)**	0.034 (0.001)**
grade_08	0.063 (0.001)**	0.063 (0.001)**	0.063 (0.001)**	0.064 (0.001)**	0.061 (0.001)**	0.062 (0.001)**	0.062 (0.001)**
grade_09	-0.049 (0.002)**	-0.049 (0.002)**	-0.049 (0.002)**	-0.046 (0.002)**	-0.050 (0.002)**	-0.048 (0.002)**	-0.053 (0.002)**
grade_10	-0.201 (0.002)**	-0.201 (0.002)**	-0.201 (0.002)**	-0.201 (0.002)**	-0.206 (0.002)**	-0.201 (0.002)**	-0.207 (0.002)**
grade_11	-0.120 (0.003)**	-0.120 (0.003)**	-0.120 (0.003)**	-0.120 (0.003)**	-0.127 (0.003)**	-0.124 (0.003)**	-0.128 (0.003)**
grade_12	0.655 (0.008)**	0.656 (0.008)**	0.656 (0.008)**	0.655 (0.008)**	0.660 (0.008)**	0.660 (0.008)**	0.658 (0.008)**
Fall of starting score test year	0.001 (0.000)**	0.000 (0.000)	0.000 (0.000)	-0.005 (0.000)**	-0.003 (0.000)**	-0.004 (0.000)**	-0.005 (0.000)**
Time Period	0.025 (0.001)**	0.025 (0.001)**	0.025 (0.001)**	0.027 (0.001)**	0.032 (0.000)**	0.030 (0.000)**	0.031 (0.001)**
Affected by Hurricane Katrina in August 2005	-0.141 (0.006)**	-0.141 (0.006)**	-0.137 (0.007)**	-0.053 (0.005)**	-0.078 (0.005)**	-0.060 (0.005)**	-0.072 (0.005)**

Dependent variable: z-score growth for one year	MATH						
	Constant	-2.708	-0.634	0.439	9.385	6.682	7.742
	(0.790)**	(0.694)	(0.677)	(0.529)**	(0.531)**	(0.529)**	(0.529)**
Observations	1733758	1733758	1733758	1733758	1733758	1733758	1733758
Adjusted R-squared	0.17	0.17	0.17	0.16	0.16	0.16	0.16
Robust standard errors in parentheses							

III. SUMMARY OF STATE DATA INCLUDED IN ANALYSIS

State	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	No. of Years/State
AR				X	X	X	X	X	5
AZ					X	X	X	X	4
CA						X	X	X	3
CO				X	X	X	X	X	5
DC						X	X	X	3
FL	X	X	X	X	X	X	X	X	8
GA				X	X	X	X	X	5
IL					X	X	X	X	4
LA	X	X	X	X	X	X	X	X	8
MA					X	X	X		3
MN					X	X	X	X	4
MO						X	X	X	3
NC			X	X	X	X	X		5
NM					X	X	X	X	4
OH					X	X	X	X	4
TX			X	X	X	X	X		5
No. of States/Year	2	2	4	7	13	16	16	13	