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The political economy of school choice: Support for charter schools across states and school districts

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Abstract

Public charter schools are one of the fastest growing education reforms in the US, currently serving more than a million students. Though the movement for greater school choice is widespread, its implementation has been uneven. State laws differ greatly in the degree of latitude granted charter schools, and—holding constant state support—states and localities vary widely in the availability of and enrollment in these schools. In this paper, we use a panel of demographic, financial, and school performance data to examine the support for charters at the state and local levels. Results suggest that growing population heterogeneity and income inequality—in addition to persistently low student outcomes—are associated with greater support for charter schools. Teachers unions have been particularly effective in slowing or preventing liberal state charter legislation; however, conditional on law passage and strength, local participation in charter schools rises with the share of unionized teachers.

Keywords: Charter schools; School choice; Teacher unions

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1. Introduction

Among education reforms currently underway in the United States, "market-based" reforms encouraging competition outside of traditional public schools are some of the most contentious. Reflecting both the short-run demands of families for immediate alternatives and the long-run hopes among a number of policymakers that the injection of competitive forces into public education will yield sustained improvement in student outcomes, market-based reforms have been closely watched and hotly contested.

Market-oriented reforms—in particular, public charter schools—are also among the fastest growing education reforms at the state and local levels. Though state accountability measures involving sanctions or rewards tied to student performance emerged well before charter laws, the growth in charter school authorizations has been much more rapid.[1] Since the first law authorizing charter schools was passed in Minnesota in 1991, 39 other states, the District of Columbia, and Puerto Rico have all adopted legislation supporting public charters. As of 2003–2004, more than 3000 charter schools were in operation, serving over 825,000 students.[2]

While the movement for greater school choice has been widespread, its implementation has been uneven. In the case of charter schools, state governments must first provide the legal foundation upon which charter schools can form and operate. The implementation of these laws, in turn, takes place at the local level, through parental demand, willing and able suppliers of charter schools and sufficient cooperation on the part of state and local officials who authorize proposed schools. State laws differ greatly in the degree of latitude granted charter schools, and—holding constant the level of state support—states and localities vary widely in the level of actual participation in these schools.

What explains these differences in support for and participation in charter schools across states and districts? Voters, elected officials and families who endorse charter schools may have a range of underlying motivations for their support: dissatisfaction with the performance of traditional public schools, desire for greater parental involvement or control, frustration with stringent state regulations or inefficient local bureaucracies, diverging preferences for education driven by a rise in local population heterogeneity, or other unmet demands for sorting across schools or districts. On the supply side, state-level advocacy groups who lobby for charter legislation or provide technical assistance to upstart charter schools may also explain differences in charter school growth across states and localities.

Using demographic, financial, political, and school performance data covering the 1990–2004 period, we examine the various forces associated with the level of support for charter schools. We take a dual approach to our analysis, examining the support for charter schools at both the state and local levels. First, we consider the political economy of charter school authorizations at the state level—why do some states support strong charter school legislation while others do not? What forces are instrumental to the passage of state laws enabling charter schools, and what forces work against such passage? Second, conditional on law passage and law strength, we look at the local conditions that yield support for—and subsequent enrollment in—charter schools.

[1] Of course, the sweeping federal No Child Left Behind Act of 2001 effectively superseded most existing state accountability measures. Stoddard and Kuhn [24] document the growth in state accountability reforms and charter laws prior to this act.

[2] Authors' calculations, using the 2003–2004 Common Core of Data School Universe, with Allen and Cooper [1]. The Center for Education Reform calculates that in the 2004–2005 school year, about a million students were served in about 3600 charter schools.

Which districts within a state are likely to see the most growth in charter school enrollment, and why? Why do charter schools emerge in some districts but not in others? Of course, these two approaches will not be mutually exclusive—the forces that produce support for charter schools within localities will frequently, but not always, be the same forces that yield favor for charter legislation at the state level.

While an improved understanding of the forces driving the growth in charter schools is interesting in its own right, this investigation may also help to shed light on recent conflicting evidence over the effectiveness of charter schools in raising student performance.[3] It may be that this form of school choice has very different effects in areas where parents support charter schools on the basis of public school performance than in areas where households simply desire more diverse sorting options.

2. Evidence on the politics, economics, and effectiveness of charter schools

Broadly defined, charter schools are independently managed public schools that operate under a contract (or "charter") with an authorizing body such as a local school district, state education agency, or university. They are entitled to public funds, yet are free (to varying degrees) from many traditional district policies and state laws, including policies on collective bargaining, curricula, and resource allocation. Like private schools, charters can draw students from throughout a school district or state, but unlike private schools they are unable to charge tuition, to set restrictive admissions criteria, and must adhere to state accountability standards.

The supply of charter schools begins at the state level, where legislators authorize the creation of charter schools and define the parameters for their continued operation. Such legislation is anything but uniform.[4] The Center for Education Reform (CER)—an advocacy organization for charter schools—ranks state charter laws based on the "strength," or permissiveness, of the laws' provisions.[5] Table 1 overviews the ten criteria used by the CER in the calculation of these measures (each criterion is scored on a 1–5 scale, with a total possible score of 50 for the laws most favorable to charter schools). These criteria include, for example, whether or not the state grants charter schools an exemption from collective bargaining, the number of chartering authorities (beyond local school boards), the number of new charter schools permitted, and whether charters are granted waivers from certain state and local laws. Figure 1 illustrates variation in the strength of charter law legislation across the states, based on the 2004 CER scorecard.[6] Appendix Table A.2 provides detailed CER scores for each state's charter provisions in 2003–2004.

As Fig. 1 shows, states such as Arizona, Michigan and Minnesota have enacted relatively "strong" legislation—that is, legislation that provides considerable latitude to charter schools. Other states, such as Kansas, Tennessee and Virginia, have adopted much more restrictive chartering provisions. Ten states continue to provide no legal authorization for charter schools at

[3] See Bettinger [3], Bifulco and Ladd [4] and Hoxby and Rockoff [19] for contrasting examples.

[4] See Geske, Davis, and Hingle [12] for a description of differences in early state charter legislation.

[5] http://edreform.com [Access date: January 26, 2006]. The Education Commission of the States also provides detailed descriptions of charter school policies in each state.
(http://www.ecs.org/ecsmain.asp?page=/html/educationIssues/ECSStateNotes.asp [Access date: July 2, 2006]).

[6] Center for Education Reform [7]. These scores have been used in a number of recent analyses. While an advocacy organization may have an incentive to understate the strength of these laws, it is unlikely that the degree of understatement varies systematically across states.

Table 1
Center for Education Reform criteria for a "strong" state charter law

(1)	Number of schools—states with stronger charter laws place fewer restrictions on the number of charter schools in operation.
(2)	Multiple chartering authorities—states with stronger charter laws allow entities other than local school boards to authorize new charters, or provide appeals processes to schools whose charter application has been denied.
(3)	Types of applicants—states with stronger charter laws place fewer restrictions on the types of groups or individuals that can form charter schools.
(4)	New starts vs. conversions—states with stronger charter laws allow for the formation of new schools, not simply conversions of existing public schools.
(5)	Evidence of local support—states with stronger charter laws do not require upstart schools to demonstrate a threshold level of local support for the school.
(6)	Waiver from laws and regulations—states with stronger charter laws automatically waive most state and local education laws for charter schools.
(7)	Legal autonomy—states with stronger charter laws permit charter schools to operate as independent legal entities, rather than operating under district jurisdiction (includes autonomy from enrollment restrictions).
(8)	Full funding—states with stronger charter laws provide the same level of per-pupil funding to charter schools that the student would have received in a regular public school.
(9)	Fiscal autonomy—states with stronger charter laws give charter schools full authority over their own budgets.
(10)	Exemption from collective bargaining—states with stronger charter laws provide charter schools with complete control over their personnel decisions.

Source: Center for Education Reform [7].

all; in fact, the state of Washington has soundly rejected charter school proposals in repeated statewide referenda attempts, most recently in 2004.[7]

A few authors have sought to explain this variation across states in charter school legislation in terms of differences in state politics and demographics.[8] Hassel [16] and Wong and Shen [28] find that Republican control, population and urbanization are associated with the passage of strong laws. Hassel [16] found little evidence that state National Assessment of Educational Progress (NAEP) scores or that teachers unions are associated with law strength.

State governments, however, provide only the groundwork upon which charter schools are formed and operated. The actual implementation of these laws takes place at the local level. As such, even when conditioning on the permissiveness granted charter schools by the state, there is likely to be considerable variation across states and districts in the actual number of charter schools created and enrollment in those schools (this is also visible in Fig. 1, which displays the location of most charter schools in 2003–2004).[9] As an illustration, Arizona and Minnesota were early leaders in the charter school movement, both passing legislation highly favorable to charter schools. By 2003–2004, over 8 percent of Arizona enrollment was in charter schools, while fewer than 2 percent of Minnesota students enrolled in charters.

In one of the few papers to date on the growth of charter schools *within* states, Glomm, Harris and Lo [13] examine differences in the number of charter schools across school districts in Michi-

[7] Corcoran and Stoddard [10] conduct a more detailed analysis of these referenda.

[8] Our state-level analysis of laws in section five is similar in spirit to Wong and Shen [28] (though our empirical model differs somewhat), and is presented here to compliment our school district-level analysis. Unlike these authors, we also examine state level participation in charters.

[9] Only those charter schools with geographic coordinates in the 2003–2004 Common Core of Data—the vast majority of these schools—are illustrated in Fig. 1 (refer to the data appendix for more on this).

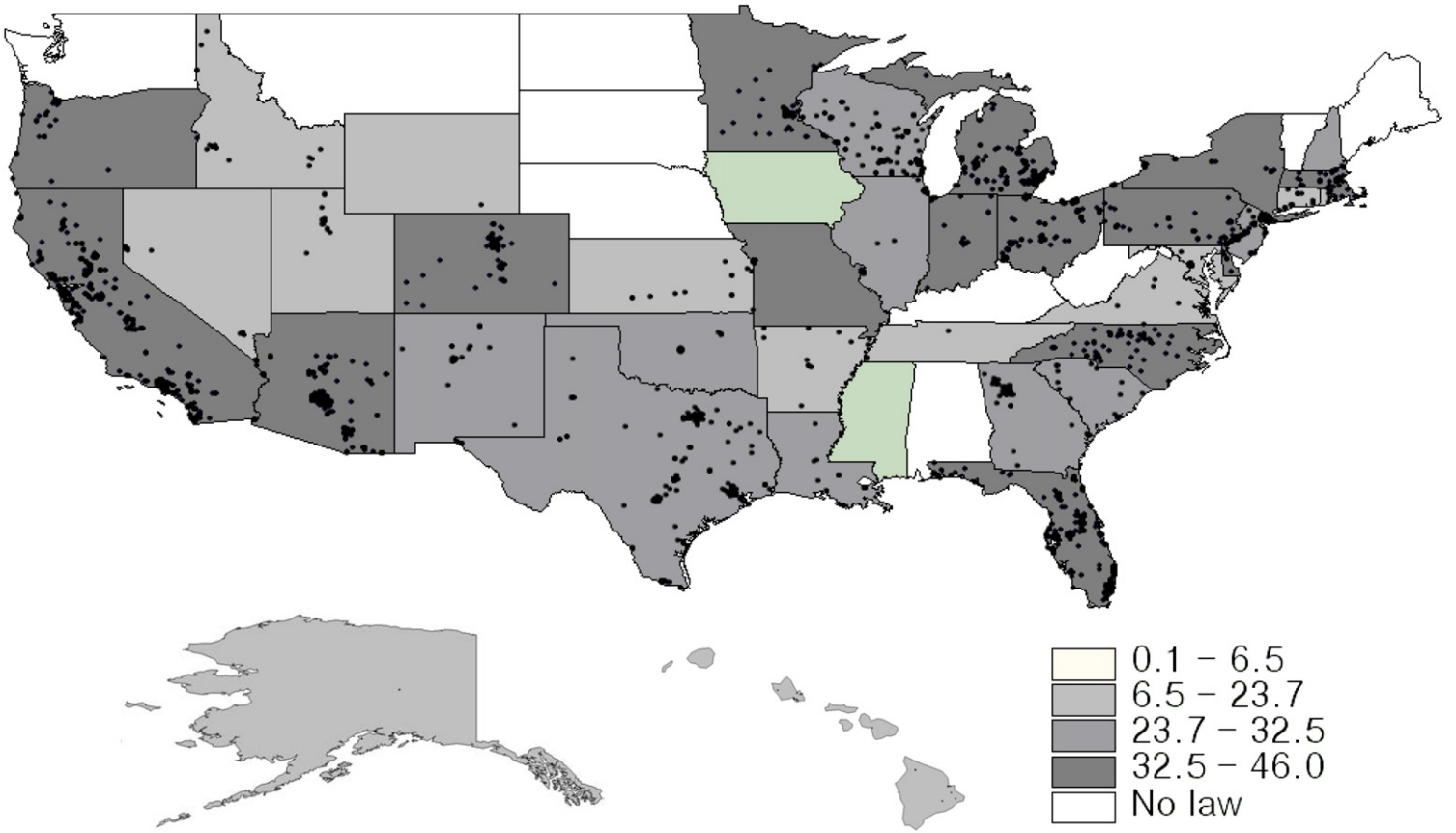

Fig. 1. Strength of charter laws in 2004, and school locations 2003–2004 (*Source*: Common Core of Data schools universe 2003–2004 and Center for Education Reform [7]).

gan. They find that—controlling for district enrollment—districts with greater heterogeneity in race and education, with more private schools, and with greater public spending on special education have more charter schools.[10] The results on achievement are mixed, with some evidence that districts with higher 4th grade math scores tend to have fewer charter schools.

There are a number of possible explanations for the steady, but uneven, growth of public charter schools during the 1990s. One explanation is poor public school performance. The hope among many charter school advocates is that students attending these schools—and perhaps students remaining in traditional schools—will benefit from the operation of charters through the infusion of additional school competition or through the innovative practices of charter schools.

Another explanation is that heterogeneity in local school populations may fuel demand for greater school choice, independent of school performance. Corcoran and Evans [9] show that school districts on the whole became much more heterogeneous during this period of growth in charter schools, and find that increases in racial heterogeneity were associated with increased private school enrollment and reduced per-pupil spending on public education.

To the extent that local school districts have become more diverse along race, ethnic, income, or other dimensions correlated with educational preferences, support for charter schools may have emerged as a means for families to sort across schools. An increased demand for sorting avenues may arise for several reasons. First, dissimilar households may demand different curricular approaches (e.g. bilingual, arts, or vocational curricula, programs for gifted or at-risk students). Many charter school founders explicitly state the goal of satisfying diverse preferences and attracting a target student population as central to their mission.[11] Second, changes in the demographic composition of local districts may increase the desire for sorting on the basis of peers. For example, Hanushek et al. [14], Booker, Zimmer and Buddin [6], and Bifulco and Ladd [5] all find that white students in charter schools on average transferred from schools that had a higher proportion of non-white students than the receiving charter school.[12] In practice, it is difficult to distinguish empirically between the influences of curricular tastes and peers. For example, a district with a number of Hispanic students may contain a charter school that focuses on Spanish instruction. Even with explicit knowledge of the founding mission of the school, it would be difficult to determine whether enrollment in this school can be attributed to demand for a unique curriculum or a desire to sort based on demographics.[13]

The extent to which local forces—whether dissatisfaction with existing school performance or diverging preferences and demographics—are likely to be manifest in support for charter schools depends on a number of other factors, including the presence of existing educational alternatives (such as private schools or neighboring public school districts), the state system of school finance, and the political power of opponents to charter schools (the most prominent example being teachers unions).[14] Existing educational alternatives may be important in that demand for

[10] See also Renzulli [22] and Henig and McDonald [17].

[11] Geske, Davis, and Hingle [12] provide some specific examples. Weiher and Tedin [27] provide evidence from parental surveys that stated educational priorities differ across demographic groups.

[12] For additional evidence on the impact of school choice programs on student sorting, see Teske and Scheider [26], Ladd and Fiske [20], Weiher and Tedin [27], and Cullen, Jacob and Levitt [11].

[13] Bifulco and Ladd [5] condition on programmatic or locational attributes and continue to find a significant effect of peer demographics for white families.

[14] The American Federation of Teachers has not explicitly come out in opposition to charter schools, though they often cast a skeptical eye, as this recent quote suggests: "In general, these schools are a diversion from reforms' and policymakers' efforts to improve education in America … the AFT concludes that policymakers should not expand charter school activities until more convincing evidence of their effectiveness and viability is presented" [2].

public charters within a district or region during a period of growing taste heterogeneity or public dissatisfaction with schools is likely to be higher when other sorting options are limited. State school finance policies and teacher unionization may influence the demand for charters to the extent they limit education programs or curricula, or impose rigid constraints on traditional public schools.

3. Empirical framework

Our empirical analysis weighs the relative importance of various demand, supply and institutional forces on the support for charter schools at the state and local level. In particular, we test two competing (but not necessarily mutually exclusive) hypotheses:

(1) the support for charter schools is driven by poor public school performance, and
(2) this support is fueled by within-district population demographics and heterogeneity.

In general, we estimate reduced form models like the following (where i represents a state or local school district):

$$\textit{Charter support}_i = \delta_1 + \delta_2 \textit{Achievement}_i + \delta_3 \textit{Demographics}_i + \delta_4 \textit{Choice}_i + \delta_5 X_i + \xi_i. \tag{1}$$

At the state level, *Charter support* is measured as the successful passage of legislation authorizing charter schools by 1999 (a binary variable), the year such a law—if any—was passed (through 2004), or a measure of law strength in 2004. We use 1999 as a break point to compare the characteristics of relatively "early adopters" (the 37 states, including DC, who had passed charter laws by 1999) and relatively "late" or non-adopters. (Only four additional states passed charter laws between 1999 and 2004). In the district analysis, we also measure *support* by whether or not the district has at least one operating charter school, testing whether districts with no charter schools differ systematically from those with at least one charter school. Finally, at both the state and district levels, we measure the level of support for charter schools using the fraction of students in the jurisdiction enrolled in charter schools during the 2003–2004 school year.

Achievement is measured as either the statewide mean SAT score or as the mean high school dropout rate (statewide, or at the district level), with an adjustment discussed below. *Demographics* is a vector of population demographic characteristics and heterogeneity measures likely correlated with preferences for education, including the share of the population black or Hispanic, the fraction of adults who are college educated, measures of household income and poverty, and a Gini coefficient of household income. *Choice* is a vector of variables that describe existing opportunities for school choice and sorting, including the fraction of state or district students enrolled in private schools and a Herfindahl index measuring the level of competition between local public school districts. Other included covariates (X) include the fraction of teachers unionized (in all specifications) and the year a charter law was passed and its strength index (in the state-level participation regressions only).

District regressions also include indicators for the level of district urbanization (the "modal school locale" of each district), the level of the district (elementary, secondary, or unified) and

state or MSA fixed effects.[15] These fixed effects capture factors common to districts within a state or metropolitan area, including differences in state charter law strength and finance rules, the extent of inter-district competition, and tastes for schooling or school choice. For example, the growth of charter schools may be related to "supply side" influences, such as state or local advocacy groups who provide technical assistance, charismatic leadership, and financial support or opposition to charter schools. Most of these groups (e.g. New York Charter School Association, Colorado League of Charter Schools) operate at the state level, making state fixed effects essential.

3.1. Level of analysis

As noted, we conduct our analysis at both the state and district levels. However, households are generally able to choose school districts in which to locate, and the presence of charter schools may affect both school outcomes and the demographic of an area. Measuring state or district characteristics contemporaneously with charter school participation or laws may conflate the degree to which these variables are causes or consequences of charter schools. To mitigate this potential source of endogeneity, we measure all characteristics in 1989–1990, several years before the first charter laws take effect.

Examining participation (rather than law passage alone) at the state level provides us a further check on the sensitivity of our district results to endogeneity and to allow for the possibility that students may cross district lines to attend charter schools.[16] We have additionally conducted analysis using MSAs as the unit of observation. The advantage to such an approach is the avoidance of inter-jurisdictional sorting issues, and the ability to consider holistic measures of public school choice for each MSA. The downside, however, is the loss of variation in most of the key determinants of charter school growth: there is considerably more variation in race, income, and school performance (for example) between school districts than between metropolitan areas. For this reason, our MSA-level regressions yielded very few statistically significant relationships, though the signs on our estimated coefficients were generally similar.[17]

3.2. "Expectations" and school performance

It is not clear whether parents are most concerned with the absolute level of student performance in their state and school district or student performance relative to what they might expect given school and household inputs. If parents or policymakers look to SAT scores as a measure of school quality, the expectations they place on these scores is likely to vary with the fraction of students in the state who actually take the SAT, and (say) parental income. Likewise if high school dropout rates are viewed as an indicator of school productivity, expectations are likely to vary with local demographics (such as poverty) and the level of investment in K-12 education (expenditures). Whether or not parents and policymakers are ultimately "satisfied" with public education may hinge on how well schools are performing relative to expectations.

[15] Modal school locales are derived from the CCD School Universe 2003–2004. We omit the enrollment Herfindahl index from our regression specifications with MSA fixed effects, as the MSA fixed effect should account for the degree of public school district competition facing school districts in each MSA.

[16] Our look at state-wide participation in charter schools further differentiates this paper from the existing literature on between-state differences in the support for charter schools.

[17] Results are available upon request.

Thus, to facilitate the interpretation of the effect of student achievement, we first compute predicted student achievement measures (either state mean SAT scores or high school dropout rates) from an education production function estimated using ordinary least squares:

$$Achievement_i = \beta_0 + \beta_1 Household\ inputs_i + \beta_2 School\ inputs_i + \omega_i \tag{2}$$

where *Household inputs* include the black and Hispanic population share, the fraction of adults who are college educated, and median household income. *School inputs* include per-pupil expenditure (individual district or the statewide average depending on the level of analysis).

The residuals from this regression, $\hat{\omega}_i$, can be interpreted as the performance of a state or school district relative to that that might be expected given its demographic composition and school expenditure. When SAT scores are used as *Achievement*, we also include the percentage of seniors who take the SAT test (and its square) as covariates. States with large positive residuals in this SAT regression are thus high performers given our limited set of student characteristics and school resources. Areas with higher dropout rates than predicted would be under-performing, given these observable inputs.[18]

Our residuals from estimating Eq. (2) are then used in our baseline regressions (1) as an "adjusted" achievement measure:

$$Charter\ support_i = \gamma_1 + \gamma_2 Demographics_i + \gamma_3 \hat{\omega}_i + \gamma_4 Choice_i + \gamma_5 X_i + \nu_i. \tag{3}$$

The use of achievement residuals in the baseline regression implies the interpretation that it is the deviation from expected student performance that influences the support for charter schools. This approach is clearly related to a specification that includes the usual covariates along with achievement, household and school inputs, the percentage taking the SAT and its square all directly. However, we believe that the "performance relative to expectations" formulation is easier to interpret. We have also conducted the analysis using alternative specifications that include the level of achievement directly, with qualitatively similar results.

4. Data and descriptive analysis

An analysis of charter school support at the state and district level requires data on charter school legislation and participation as well as information about household demographics, public school finances and performance, school district competition, and other forces that might influence charter support. The measures of the strength (permissiveness) of state charter school legislation—the annual CER rankings—and their years of passage were described in section two (and are provided in Appendix Table A.2). The remaining data come from a wide range of sources, briefly discussed below.[19]

4.1. Charter schools: counts, enrollment, and district assignment

To compile a national list of charter schools for 2003–2004, we consulted the NCES Common Core of Data (CCD) School Universe file which identifies most of the charter schools in operation during that year. We refined our list by matching to the CER directory of charter schools (Allen and Cooper [1]), allowing us to identify charter schools in the CCD that had been improperly identified (this matching process is described in the data appendix). Altogether, our master list of

[18] Results for the state and district achievement regressions are not shown here, but are available upon request.

[19] A more detailed description of the data assembled for this paper is available in the data appendix.

charter schools in 2003–2004 includes 3066 schools. State charter school and enrollment totals were computed from this master list of schools.

We next computed the total number of (and total enrollment in) charter schools in each *school district* by attaching each charter school to a public school district. A large number of charter schools are not chartered by a traditional public school district, and thus are not linked to any particular district in the CCD. We therefore used the spatial coordinates of each charter school from the CCD along with Census 2000 boundary files for unified, elementary and secondary school districts to assign charter schools to districts. In all, 1014 school districts (of the approximately 14,000 districts in the US) were found to contain at least one charter school. The total number of charter schools in 2003–2004, and enrollment in these schools by state are summarized in Table 2. This table also includes the count of unique districts in each state containing charter schools, and the fraction of total state enrollment in charter schools.

4.2. Demographic, financial, and school competition data for states and school districts

Population and housing characteristics for states and school districts are largely taken from the 1990 Census, which predates the first state charter law by one year. Financial data and information on membership in teachers' organizations come from the 1992 and 1987 Census of Governments, respectively (1987 is the last year in which unionization data is available at the district level); 1989–1990 per-pupil expenditures by state are obtained from the Digest of Education Statistics. Our district-level data builds on a panel of matched demographic and financial data originally compiled by Corcoran and Evans [9].[20] Included in this panel are measures of within-district income inequality (the Gini coefficient) for each school district.[21]

Using data from the 1989–1990 CCD for local education agencies, we compute for each district a measure of local public school district competition. The competition measure is a Herfindahl index of public enrollment concentration, calculated for district i as:

$$enrlherf_i = \sum_{j=1}^{J} s_{ij}^2 \tag{4}$$

where s_{ij} is the share of total public enrollment within a 10-mile radius of district i contained in district j (where j is a district that is located 10 miles or less from district i, and J is the total number of districts located within this radius). The closer this index is to one, the more concentrated is enrollment and thus the less "competitive" is the area around district i. At the state level, we calculate an "average" competition measure as a weighted average of these Herfindahl indices for all districts in the state, using district enrollment as weights.

4.3. Student achievement measures

We measure student achievement at the state and district levels in two ways. The first—at the state level only—is the average SAT score for each state for the 1989–1990 school years

[20] Earlier versions were compiled by Murray, Evans, and Schwab [21] and Harris, Evans, and Schwab [15].

[21] Corcoran and Evans [9] calculated within-school district Gini coefficients of income inequality for every district in the United States from grouped income data by assuming a flexible form distribution for income (the four-parameter Dagum distribution) and using a maximum likelihood procedure to estimate the parameters of this distribution for every district.

Table 2
Charter schools, charter enrollment, and districts containing charter schools, by state, 2003–2004

	Count of charter schools	Total enrollment in charter schools	Count of districts containing at least one charter school	Percent of enrollment in charter schools	Percent of districts with at least one charter
AK	19	3476	10	2.60	18.9
AR	13	2719	12	0.60	3.9
AZ	507	82,091	95	8.01	43.6
CA	467	181,184	196	2.88	20.0
CO	96	31,529	43	4.17	24.4
CT	13	2427	10	0.42	6.0
DC	37	12,958	1	16.64	100.0
DE	13	6241	8	5.30	50.0
FL	258	67,574	39	2.61	58.2
GA	53	29,178	15	1.91	8.3
HI	26	4502	1	2.45	100.0
ID	17	4811	12	1.91	10.7
IL	28	11,750	6	0.56	0.7
IN	17	2908	10	0.29	3.4
KS	19	1493	15	0.32	5.0
LA	16	4585	8	0.63	12.1
MA	51	17,971	28	1.83	9.4
MD	1	196	1	0.02	4.2
MI	222	73,829	100	4.23	18.1
MN	105	14,256	32	1.69	9.3
MO	26	10,304	2	1.12	0.4
MS	1	338	1	0.07	0.7
NC	93	21,955	36	1.60	30.8
NJ	51	12,806	22	0.93	3.9
NM	34	6225	13	1.87	14.6
NV	15	3917	3	1.02	17.6
NY	50	14,572	12	0.51	1.7
OH	165	46,130	43	2.51	7.0
OK	12	3491	2	0.56	0.4
OR	38	3376	25	0.62	12.6
PA	102	41,114	30	2.26	6.0
RI	10	1728	6	1.09	16.7
SC	19	3239	11	0.46	12.9
TN	4	324	2	0.04	1.5
TX	301	73,107	80	1.69	7.7
UT	19	3253	10	0.66	25.0
VA	7	786	7	0.07	5.2
WI	140	22,902	66	2.60	15.5
WY	1	132	1	0.15	2.1
Total (39)	3066	825,377	1014	1.71	7.2

Notes. Charter schools were mapped to public school districts according to the spatial coordinates of their school's location, using 2003–2004 CCD school coordinates and Census 2000 school district boundary files (see the data appendix for more information).
Source: Authors' calculations, using data from the 2003–2004 Common Core of Data Public Elementary–Secondary School Universe, and Allen and Cooper [1].

from the Digest of Education Statistics. The second is a state or district high school dropout rate. Because district-reported dropout rates are not reported consistently in the CCD in the early 1990s, we use as a proxy the fraction of individuals aged 16–19 residing in the state or district who were not high school graduates and were not attending school from the 1990 decennial Census. These two achievement measures—SAT scores and dropout rates—have the benefit of capturing performance at two different ends of the ability distribution and of being consistently measured across all states and districts.[22] A disadvantage, however, is that these two achievement measures are much more closely aligned to secondary school performance than primary school performance. (Only about 25 percent of charter school students were enrolled in a secondary grade in 2003–2004.) While this is an obvious limitation, high school graduation rates and mean SAT scores are very public indicators of "ultimate" educational outcomes and may be of broad interest to the parents and policymakers making decisions regarding charter schools.

4.4. Descriptive analysis

Means and standard deviations for the variables described above are presented for states in Table 3 and for districts in Table 4. All summary statistics in these tables are computed for 1990, except where noted, describing states and districts one year prior to the passage of the first charter law.

On average, states that had passed charter laws by 1999—and districts that contained at least one charter school by 2003–2004—had a significantly higher black and Hispanic population shares and higher fractions of adults with college degrees. States and districts with charter schools also had higher median incomes, greater poverty, and higher income inequality. The mean SAT score in states passing charter laws was nearly 39 points below that of states that did not, although many of the states without charter laws are in the Midwest, where writing the SAT is less prevalent. The mean high school dropout rate in 1990 was 12.5 percent higher in states that adopted charter laws as compared to non-charter states, and 23.7 percent higher in districts who later saw the emergence of charter schools versus those that did not. Despite being more urban (where one would expect greater competition), districts with charter schools had significantly *greater* enrollment concentration, on average (that is, *less* competition from other public school districts within a 10 mile radius) than non-charter districts.

Observed differences in the mean characteristics of states and school districts where charter schools have opened are only suggestive of the possible driving forces behind their growth. Differences in, say, dropout rates or income inequality between charter and non-charter districts may be due simply to the tendency for charter schools to locate in urban areas. Indeed, of the 3066 charter schools in 2003–2004, 36 percent were located in large cities (of at least 250,000 population), 18 percent were in mid-sized cities (50,000 to 250,000) and 25 percent were in the urban fringe of a large or mid-sized city.[23] (A perhaps surprisingly large 21 percent of charter schools were located outside of urban areas

[22] This is contrast to the National Assessment of Educational Progress, which is not representative of districts. Additionally, only 34 states have 4th grade reading scores in 1992.

[23] Authors' calculations, using the locale code in the CCD Schools Universe 2003–2004. By contrast, only 12 percent of traditional (non-charter) schools were located in large cities, 12 percent in mid-sized cities, 32 percent in the urban fringe, and 43 percent in towns and rural areas.

Table 3
Mean characteristics of states in 1990, all states and by charter law status

	No charter law by 1999	Charter law in 1999
Fraction black	0.067	0.121
	(0.089)	(0.129)
Fraction Hispanic	0.013	0.067
	(0.011)	(0.082)
Fraction of adults with college+	0.426	0.464
	(0.073)	(0.062)
Gini coefficient of household income, 1989	0.421	0.432
	(0.023)	(0.023)
Median household income (in thousands), 1989	26.407	30.167
	(4.842)	(5.450)
State average SAT score, 1989–1990	973.929	934.730
	(72.489)	(59.183)
Percent taking SAT, 1989–1990	26.429	36.514
	(23.399)	(24.053)
High School dropout rate (fraction of the civilian population age 16–19 not in school, not HS graduate)	0.096	0.108
	(0.027)	(0.023)
Expenditures per student (in thousands)	5.210	5.733
	(1.000)	(1.656)
Fraction of instructional employees organized, 1987	0.467	0.428
	(0.178)	(0.203)
Fraction K-12 students enrolled in private school	0.075	0.094
	(0.024)	(0.042)
Weighted average enrollment Herfindahl index, 10 mile radius (based on 1989–1990 enrollment patterns)	0.321	0.377
	(0.205)	(0.327)
Charter law strength in 2003–2004 (CER, from appendix Table A.1)	–	28.87
		(11.07)
Enrollment in charter schools in 2003–2004 (thousands)	–	20.131
		(34.109)
Fraction students enrolled in charter schools, 2003–2004	–	0.019
		(0.029)
N	14	37

Notes. Standard deviations in parentheses. The following 14 states did *not* have charter laws as of 1999: Alabama, Iowa, Indiana, Kentucky, Maryland, Maine, Montana, North Dakota, Nebraska, South Dakota, Tennessee, Vermont, Washington, and West Virginia. Four of these—Iowa, Indiana, Maryland, and Tennessee—had passed laws by 2003–2004. While 37 states had charter laws in 1999, only 32 of these had open schools as of 1999–2000 (Arkansas, New Hampshire, Oklahoma, Virginia, and Wyoming had none). In 2003–2004, two of the 41 states with charter laws had no schools or charter enrollment (Iowa and New Hampshire). Hawaii (a charter state) is missing from the "instructional employees organized" mean.

Sources: 1990 Census, 1995 and 1991 Digest of Education Statistics (expenditures and SAT scores), 1987 Census of Governments (for fraction of instructional employees organized), 1989–1990 and 2003–2004 Common Core of Data (for enrollment Herfindahl index and charter school enrollment), and author's calculations. Average enrollment Herfindahl index is calculated as the weighted average of district enrollment Herfindahl indices (using a 10-mile radius to define local market areas), where weights are K-12 student enrollment. Expenditure per student is "current expenditures per pupil in average daily attendance." See Data Appendix for more information.

Table 4
Mean characteristics of school districts in 1990, all districts and by presence of charter schools in 2003–2004

	No charter in district in 2003–2004	At least one charter in district in 2003–2004
Fraction black	0.040	0.094
	(0.104)	(0.151)
Fraction Hispanic	0.044	0.099
	(0.116)	(0.149)
Fraction of adults with college +	0.160	0.202
	(0.119)	(0.112)
Gini coefficient of family income, 1989	0.349	0.372
	(0.087)	(0.050)
Median household income (in thousands), 1989	28.186	29.526
	(11.748)	(9.000)
Fraction of population below poverty, 1989	0.137	0.141
	(0.098)	(0.093)
District per-pupil expenditure as a fraction of the state average per-pupil expenditure	1.003	0.958
	(0.329)	(0.221)
High school dropout rate (fraction of the civilian population age 16–19 not in school, not HS graduate)	0.093	0.115
	(0.087)	(0.065)
Fraction of district instructional employees organized, 1987	0.385	0.412
	(0.386)	(0.372)
Fraction K-12 students enrolled in private school	0.072	0.092
	(0.087)	(0.064)
Enrollment Herfindahl index, 10 mile radius (based on 1989–1990 enrollment patterns)	0.276	0.363
	(0.295)	(0.351)
Enrollment in charter schools in 2003–2004	–	827.117
		(2203.247)
Fraction students enrolled in charter schools, 2003–2004	–	0.097
		(0.301)
N	13,033	973

Standard deviations in parentheses.
Sources: 1990 Census, 1992 Census of Governments (per-pupil expenditures), 1987 Census of Governments (instructional employees organized), 1989–1990 and 2003–2004 Common Core of Data (for enrollment Herfindahl index and charter school enrollment, respectively), Corcoran and Evans [9] for district Gini coefficients, and author's calculations. Districts are defined based on their 2000–2001 boundaries (that is, if districts consolidated between 1989–1990 and 2000–2001, they are combined and treated as one district for purposes of this analysis). Refer to the data appendix for more information.

in large and small towns and rural areas). As urbanized areas tend to differ systematically from non-urbanized area along various dimensions of interest (such as racial diversity, poverty, and student outcomes) such differences may simply reflect the role of market size.

However, the composition of students who attend charter schools does differ somewhat from that of students who attend traditional schools, even when restricting the comparison to districts with charter schools. Table 5 shows that, on average, charter students are much more likely to be black than traditional students in these districts, and about equally likely to be Hispanic,

Table 5
Characteristics of students in charter schools and traditional public schools in districts with at least one charter school, 2003–2004

	Charter school students, 2003–2004	Traditional public school students, 2003–2004
Fraction black	.32	.17
Fraction Hispanic	.22	.19
Fraction American Indian	.02	.01
Fraction Asian	.03	.04
Fraction Receiving Free/Reduced Price Lunch	.37	.37
In a school with < 5 percent nonwhite	.03	.14
In a school with 5–20 percent nonwhite	.18	.24
In a school with 21–80 percent nonwhite	.39	.41
In a school with 81–95 percent nonwhite	.11	.09
In a school with > 95 percent nonwhite	.29	.11
In a school with < 5 percent free lunch	.16	.06
In a school with 5–20 percent free lunch	.12	.19
In a school with 21–80 percent free lunch	.40	.54
In a school with 81–95 percent free lunch	.12	.08
In a school with > 95 percent free lunch	.05	.02
Average racial segregation of schools*	.18	.15
	(.56)	(.11)
Average free lunch segregation of schools*	.11	.18
	(.52)	(.10)
Number of students in schools reporting racial breakdown	816,473	46,460,916
Number of students in schools reporting free lunch participation	704,932	42,421,516

* District level segregation index averaged across schools. Compares average exposure of white (free lunch) students to non-white (non-free lunch) students in schools with percent nonwhite (non-free lunch) in district. Higher values represent more segregation.
Sources: Common Core of Data, 2003–2004. Refer to the data appendix for more information on identification of charter schools and matching of charter schools to districts.

American Indian, Asian, or free- or reduced-price lunch eligible[24] (an indicator of household poverty).[25]

Charter school students also tend to be in more racially segregated schools compared to traditional school students in districts with charters; 29 percent of charter school students, for example, were in schools where 95 percent of the school was nonwhite, versus 11 percent of traditional school students. Allowing for the possibility that charter schools are disproportionately located in school districts that are themselves racially isolated, we computed segregation indices for both charter and non-charter schools. In calculating these indices, we compared the average "exposure rate" for students in charter and non-charter schools in the same districts (exposure of

[24] It is not clear if the counts of free- and reduced-price lunch eligible students are reported accurately for charter schools in the CCD. A disproportionately large number of these schools reported few or no eligible students, compared with similar traditional schools.

[25] Roy and Mishel [23], using an even more precise comparison group (Hoxby's [18] matched pairs of geographically proximate charter and non-charter schools) find that the composition of charter schools is notably different from traditional schools that draw from the same neighborhood.

the average white student to nonwhite peers, for example), to the maximum possible exposure of one group to another if all schools in the district had the same composition.[26] In effect, the segregation index measures the proportion of movers needed to create schools with an identical demographic composition, and thus ranges from zero to one, with one representing complete segregation. Table 5 suggests that charter schools are somewhat more racially segregated than traditional schools in their same districts. This observation is consistent with the recent work of Booker, Zimmer and Buddin [6], Bifulco and Ladd [5], and Weiher and Tedin [27] who find that students in California, North Carolina, and Texas who transferred to charter schools tended to move to schools with a racial composition more similar to their own. This suggests that there may be a common demand for charter schools that results in greater segregation by race, such as a taste for peers or a taste for curricula that varies by race.

5. Results

5.1. Support for charter schools across states

Our analysis at the state level asks three primary questions: (1) what state characteristics are associated with the adoption of charter laws and the *timing* of charter law adoption (i.e. do early adopters differ systematically from late or non-adopters)? (2) What characteristics are associated with the *strength* of charter laws (as measured using the CER index for 2003–2004)? (3) What characteristics are associated with the overall fraction of students in a state who choose to enroll in charter schools? Table 6 presents results from the analysis of these questions.

Table 6 includes four pairs of regression results. Each pair represents one estimated model, with separate results for each of our two measures of achievement discussed in section four (SAT scores and dropout rates). The first two columns are the results of a linear probability model for the likelihood of a state passing a law authorizing charter schools by 1999.[27] For those 40 states that passed a charter law by the 2003–2004 school year,[28] columns 3 and 4 present results from an OLS regression for the year the law was passed (the dependent variable here ranges from 1991 (Minnesota) to 2003 (Maryland)). Columns 5 and 6 are the results of a Tobit regression where the dependent variable is the CER index of law strength (non-adopters have a law strength equal to zero). Finally, the last two columns are the results of a Tobit model for the fraction of public school students in the state enrolled in charter schools (again, the Tobit specification accounts for states truncated at zero).

Table 6 suggests that demographics, teachers' union participation, and student performance are all important determinants of state charter legislation and participation. Controlling for student performance, states with greater Hispanic populations tended to pass laws supporting charter schools earlier and were likely to pass more permissive legislation. These states also saw a greater proportion of students enrolled in charter schools in 2003–2004, though the estimates of this effect are less precise. Interestingly, the fraction of a state population that is black has no statistically significant relationship with the passage, timing, or strength of charter laws, but does have a strong relationship with *participation*: a one standard deviation increase in the fraction

[26] Segregation indices such as the gap-based index used here, have been employed by Clotfelter [8] and others. Further details on its computation are provided in the data appendix.

[27] Due to the very limited number of observations, probit and logit models were inconclusive.

[28] Hawaii is excluded because of missing teacher unionization information.

Table 6
Effect of state characteristics on legal status of charters and participation in charters

	Charter law in 1999	Charter law in 1999	Year passed	Year passed	2003 law strength	2003 law strength	% in Charter in 2003–2004	% in Charter in 2003–2004
Fraction black	−0.528	−0.745	−1.840	0.378	16.855	21.263	0.164	0.188
	(0.869)	(0.917)	(5.570)	(5.941)	(33.509)	(37.36)	(0.043)**	(0.042)**
Fraction Hispanic	0.653	−0.039	−17.474	−11.680	93.122	84.482	0.040	0.068
	(0.952)	(1.023)	(7.312)*	(7.032)	(44.489)*	(49.301)†	(0.058)	(0.055)
Fraction of adults with college+	3.349	2.672	−20.417	−17.223	89.603	68.246	0.184	0.186
	(1.372)*	(1.435)†	(11.037)†	(10.429)	(55.707)	(58.904)*	(0.071)*	(0.066)**
Gini coefficient of household income	4.494	8.719	39.408	7.885	−124.500	−62.048	−0.121	−0.306
	(5.309)	(5.453)	(41.504)	(43.845)	(195.814)	(221.367)	(0.266)	(0.264)
Median household income (in thousands)	−0.003	0.017	0.168	0.056	−0.250	0.230	−0.001	−0.002
	(0.174)	(0.016)	(0.129)	(0.120)	(0.680)	(0.722)	(0.001)	(0.001)*
SAT (residual)	−0.010		0.065		−0.396		−0.0001	
	(0.003)**		(0.026)*		(0.141)**		(0.0002)	
Dropout rate (residual)		−0.882		8.933		144.357		0.374
		(3.489)		(30.646)		(152.229)		(0.171)*
Fraction of instructional employees organized	−1.027	−1.091	2.780	2.980	−18.785	−19.406	0.025	0.027
	(0.381)**	(0.423)*	(4.077)	(4.310)	(16.107)	(17.199)	(0.020)	(0.019)
Fraction K-12 enrolled in private school	8.322	5.396	−33.063	−14.501	348.892	248.833	0.042	0.059
	(2.575)**	(3.080)†	(23.392)	(26.934)	(121.23)**	(121.05)*	(0.156)	(0.136)
Average enrollment	0.212	0.384	3.458	2.153	−0.568	0.859	−0.002	−0.009
Herfindahl index	(0.337)	(0.382)	(2.820)	(2.837)	(11.833)	(13.226)	(0.015)	(0.014)
Years law in place (zero if no law)							0.002	0.002
							(0.001)	(0.001)**
Strength of law in 2003 (zero if no law)							0.001	0.0009
							(0.0002)**	(0.0002)**
Observations	50	50	40	40	50	50	50	50
R-squared (pseudo)	0.477	0.359	0.367	0.228	0.081	0.063		

† Significant at 10%.
* Significant at 5%.
** Significant at 1%.

Notes. Robust standard errors in parentheses. "Year Passed" ranges from 1991 (Minnesota) to 2003 (Maryland); note that we extend our definition of charter states in this regression to include the four states that passed charter laws between 1999 and 2003. See notes to Table 3 for data sources, and appendix Table A.2 for estimates of "predicted" SAT scores and dropout rates. Hawaii is excluded from all regressions in this table (due to missing unionization data). See the data appendix for more information.

black is associated with roughly a 2 percentage point higher charter enrollment rate. One potential explanation for this is that black voters are traditionally not swing voters (being more heavily concentrated in the Democratic party), and therefore may be less likely to be the median voter whose preferences are decisive. As a result, while black families may support charter schools once established, their preferences may not be reflected in the voting equilibrium.

Strong charter laws also appeared earlier in states where the fraction of adults with at least a college education was high. This finding—and the related finding that participation in charter schools is higher in states with more educated populations—may indicate a greater willingness on the part of these populations to experiment with new ideas or it may be a "supply side" phenomenon if higher educational attainment leads to a greater pool of charter suppliers.

We find that a state's mean SAT score—or more precisely, the residual SAT score controlling for state characteristics—has a fairly consistent relationship with charter law passage and strength. States with higher-than-predicted SAT scores were less likely to pass charter school legislation, tended to adopt such legislation later if at all, and passed weaker laws. There appears to be little relationship between state SAT performance and actual *participation* in charter schools (the relationship is negative, but imprecisely estimated). Our proxy for the state dropout rate has no clear relationship to the passage or strength of charter legislation, but does, interestingly, have a quite strong (and statistically significant) relationship with charter school participation. States with higher than predicted dropout rates had significantly higher enrollment in charters—a two percentage point increase in the dropout rate residual (one standard deviation) is associated with a roughly one percentage point higher rate of charter school participation. It may be that SAT scores as a very public measure of school performance lead to agitation for charter laws, but that charters themselves are more likely to target students at risk of dropping out, and therefore participation is more closely associated with dropout rates.

Finally, membership in teachers unions appears to be a particularly strong indicator of the legal status of charter schools. States where a greater fraction of teachers were covered by a union contract in 1987 were much *less likely* to pass a charter law in the 1990s, were more likely to pass a law later (if at all), and more likely to pass a weaker law. A one standard deviation increase in the fraction of teachers who are unionized is associated with a twenty percentage point reduction in the likelihood that a law will pass. Interestingly, conditional on the successful passage of a charter law—and controlling for law strength—the fraction of students *enrolled* in charter schools appears to *increase* with the fraction of teachers unionized, though this effect is much less precise ($p = 0.3$ and 0.2 in the two specifications). One explanation for these seemingly contradictory results is the following: strong unions may be more successful than weaker ones in opposing liberal charter legislation, but conditional on law passage, parents may be more likely to support charter schools in heavily unionized states, perhaps in a desire for more local control, less bureaucracy, or curricular and personnel policies that are less influenced by the union.

We find little evidence that the average level of public school competition in a state (as measured by average district Herfindahl indices) is related to charter school legislation and participation at the state level, nor do we find a relationship between income (or income inequality) and the support for charter schools. We find that the fraction of students enrolled in private schools is positively related to law passage and its strength. This may be due to private school parents advocating public charter schools as a substitute for private schools, or it may be related to systemic dissatisfaction with public schools and a generally higher demand for alternatives. (As we are measuring private school enrollment prior to the passage of charter laws, this coefficient is not conflated by the effect of charters on private school enrollment.)

These results are also robust to a variety of other alternative specifications. In general—and in contrast to earlier studies (e.g. Hassell [16] and Wong and Shen [28])—we have not reported results including measures of political party affiliation of the governor or legislature in our regressions. We consider these political measures (in a representative government) to be generally reflective of the underlying preferences and demographics of the electorate, and therefore incidental to our analysis. However, models in which we included the fraction of the 1989–1999 period in which Republicans occupied the state governorship indicate that this variable never has a statistically significant effect above and beyond our existing list of covariates. Coefficient estimates for other variables are similar to those reported here.

Alternative regressions examined changes in state demographic characteristics over time and found that states with growing Hispanic and college educated populations also were more likely to pass early charter laws.[29] We also found that states with growing income inequality during the 1980s were more likely to pass laws and to pass stronger charter laws in the 1990s. Results were similar using alternative measures of public school choice, including Herfindahl indices with other radii or the number of districts per student. Finally, we used state average eighth grade math test scores on the 1990 NAEP as an alternative achievement measure, though these were only available for 37 states.[30] Lower NAEP scores were associated with a higher probability that a charter law passed, stronger laws, and a higher fraction of students enrolled in charter schools. However, none of the coefficient estimates were significant at conventional levels, with p values ranging from 0.14 to 0.17.[31]

5.2. *Support for charter schools across school districts*

The results presented in Table 6 are suggestive of the forces at the state level that produce support for charter school legislation and participation. However, most decisions about charter school attendance are made at the local level, based on local preferences and attributes of the local market for education, which can vary widely within a state. The second part of our analysis is therefore based on district-level data.[32]

Table 7 provides estimates from two pairs of models. The first and third columns are the estimated marginal effects from a probit model of the likelihood of a district having at least one charter school in 2003–2004, as a test of whether districts with no charters differ systematically along various dimensions from those with at least some charter schools. The second and fourth columns are the results of a Tobit model for the fraction of public school students enrolled in charter schools in that year (the Tobit model accounts for the large number of districts clustered at zero). In order to control for differences in state charter laws (and other unobserved differences in state preferences, demographics, educational markets, and support or advocacy groups operating at the state level), we include state fixed effects in the first two columns; we replace these with

[29] See Stoddard and Corcoran [25] for these results.

[30] Fourth grade scores are available for 1992, after the passage of charter laws.

[31] Results available from the authors upon request.

[32] Unfortunately, consistent district-level test scores are not available for all states in the 1990s, so we are unable to include such measures in our current analysis. Glomm, Harris, and Lo [13] consider 4th grade MAEP math scores in their study of charter school growth across Michigan districts.

Table 7
Effect of district characteristics on the presence of and enrollment in charter schools

	Have at least one Charter in 2003–2004	% in Charter in 2003–2004	Have at least one Charter in 2003–2004	% in Charter in 2003–2004
Fraction black	0.123	0.596	0.249	0.651
	(0.015)**	(0.075)**	(0.034)**	(0.103)**
Fraction Hispanic	0.001	−0.056	−0.029	−0.178
	(0.013)	(0.068)	(0.038)	(0.126)
Fraction of adults with college+	0.165	0.678	0.294	0.610
	(0.021)**	(0.104)**	(0.045)**	(0.146)**
Gini coefficient of family income, 1989	0.031	0.098	0.082	0.189
	(0.024)	(0.149)	(0.058)	(0.217)
Median household income (in thousands), 1989	−0.000	−0.000	−0.000	−0.000
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Fraction of population below poverty, 1989	−0.024	0.083	0.039	0.410
	(0.041)	(0.142)	(0.096)	(0.210)†
District PPE/State PPE	−0.034	−0.035	−0.070	−0.007
	(0.008)**	(0.035)	(0.018)**	(0.048)
HS Dropout rate (residual)	0.055	0.203	0.084	0.207
	(0.018)**	(0.109)†	(0.052)†	(0.178)
Fraction of district instructional employees organized (1987)	0.006	0.048	0.012	0.066
	(0.003)†	(0.020)*	(0.009)	(0.030)*
Fraction K-12 in private school	0.063	0.281	0.100	0.252
	(0.018)**	(0.112)*	(0.041)*	(0.162)
Enrollment Herfindahl index, 10 mile radius	0.004	0.001		
	(0.007)	(0.038)		
Dummies for modal school locale	Yes	Yes	Yes	Yes
Dummies for school district level	Yes	Yes	Yes	Yes
Regional fixed effect	state	state	MSA	MSA
Observations	10,440	13,258	4923	6157
R-squared (pseudo)	0.320	0.380	0.350	0.396

† Significant at 10%.
* Significant at 5%.
** Significant at 1%.

Notes. Robust standard errors in parentheses. Columns 1 and 3 report the marginal effects (computed at the mean of each regressor) from a probit model; columns two and four report the marginal effects from a Tobit model. Seven dummy variables are included in each specification that indicated the modal school locale for each district (large city/central city of an MSA, mid-size city, urban fringe of a large city, urban fringe of a mid-size city, large town, small town, rural and outside MSA, rural and inside MSA). Dummy variables are included that indicate the type of school district (elementary, secondary or unified). See notes to Table 5 for data sources, and the data appendix for more information.

In column 1, all districts in states with no charter laws (AL, KY, ME, MT, ND, NE, SD, VT, WA, and WV), states with charter laws but no schools (IA, NH) and states with only one district or states with charters in every district (DC) are dropped from the regression when state fixed effects are included. In column 3, districts in 145 MSAs where no districts contained charter schools are dropped (districts in 182 MSAs remain).

MSA fixed effects in the latter two columns.[33] Also included in these models are dummy variables for the modal school locale in each district (a control for urbanicity), and dummy variables indicating the type of school district (elementary, secondary, or unified).

Consistent with our state-level results on participation, the fraction of a school district's population that is black is strongly and positively related to charter school presence and enrollment, while the fraction Hispanic bears little relationship with charter school participation at the district level. A ten percentage point increase in the fraction black (one standard deviation) increases participation in charters by about six percentage points. Given that the average fraction enrolled in charter schools in districts with a charter school is only about 10 percent, this is a considerably large effect. As at the state level, the fraction of adults that are college-educated is positively related to the presence of a charter school and the fraction of students enrolled in charters, and the magnitude of the effect is similar to the effect of the fraction black. Again as in the state-level estimates, districts that already had high fractions of students enrolled in private schools (controlling for urbanicity) had a greater likelihood of having a charter school open in their district by 2003–2004, and saw a higher fraction of public school students enrolled in these schools in that year. This latter result may be indicative of receptiveness on the part of these districts toward alternatives to public schools, or of a long-run response to systemic problems in these school districts; it certainly suggests that existing private schools did not serve as a hindrance to the later start-up of public charters.[34] Our measure of existing *public* school choice—the public enrollment Herfindahl index—appears to have no statistically significant relationship with charter school support at the district level, though the point estimates continue to be positive in sign. Estimated coefficients for the district locale and level dummy variables are not reported, but in general, secondary and unified districts were more likely to have a charter school in 2003–2004 than elementary districts, and districts whose modal school locale was a large or mid-sized central city, or large town were more likely to have a charter school than districts whose modal locale was the urban fringe of a city or rural area.

We also find, consistent with the state-level results, that higher-than-predicted rates of high school dropouts are positively related to the presence of—and enrollment in—charter schools. A one standard deviation increase in the dropout rate is associated with about a two percentage point increase in the fraction of student enrolled in charters. In addition, within-district income inequality tends to be associated with higher rates of charter schooling in 2003–2004 (though this result is not quite statistically significant at conventional levels). Districts whose spending was below their state average were more likely to have charter schools open in their district, though relative expenditure is not related to student enrollment in these schools.

Interestingly (and consistent with the state-level results), even when controlling for district demographics, dropout rates, district locale and state law strength (via state fixed effects), the extent of teachers' unionization is positively and statistically significantly related to the emergence of charter schools. Districts with a greater union presence were more likely to have a charter school and to have a greater fraction of public school students enrolled in charter schools in 2003–2004.

[33] MSAs are defined based upon their 1999 Census definitions. Our model in column (1) with state fixed effects clearly requires some within-state variation in charter school presence; thus, we lose a number of districts in states with no charter laws (10 states), in states with charter laws but no schools (2 states) and in states where all districts have charters (DC). Likewise, our model in column (3) requires within-MSA variation in charter school presence (this explains the smaller sample size in that column).

[34] In future work, we will combine data on private schools and enrollment (from the Private School Survey) with our charters-by-district dataset to estimate the effect of charter school growth on private school enrollment.

A one standard deviation increase in the fraction of teachers unionized is associated with about a 2 percentage point increase in the fraction of students enrolled in charters.

Again, we experimented with a number of alternative specifications. We examined changes in demographic characteristics between 1980 and 1990, and found that districts with a rising fraction of black or college educated individuals saw greater participation in charter schools.[35] As at the state level, we also found that while cross-sectional differences in income inequality across districts had a weak relationship with enrollment, districts where income inequality was *rising* saw higher (and statistically significant) participation in charter schools. We also ran specifications that used CCD measures of enrollment demographics (percent black and Hispanic, percent receiving free or reduced price lunches, overall district racial segregation, percent students in special education). Many of the coefficient estimates revealed a similar pattern of district heterogeneity associated with greater charter school enrollment. However, many districts in the CCD had missing or problematic data for one or more of these variables, so we choose to report estimates using Census measures instead. As in the state analysis, we also used alternative measures of public school competition (e.g., number of districts per student), with similar results. We also analyzed the effect of open enrollment policies, using a sample of districts in the 1993 Schools and Staffing Survey that report whether or not the district allows choice of schools within the district or has a magnet school. (Given the fact that this policy variable is only observed after charter schools began, we did not report these results). We found these measures of choice to be positively related to charter school enrollment. As with the positive correlation between private school enrollments (prior to charter passage) and charter school enrollments, this correlation may reflect underlying preferences for greater school choice or an existing, systemic dissatisfaction with the public schools.

6. Conclusions

School choice plans increased dramatically over the 1990s, expanding at a more rapid pace than many other types of school reforms. While there is a large and growing body of research studying the effects of school choice, there is less known about the driving forces behind the school choice movement. Understanding under what conditions states pass laws favorable to charters and under what conditions charter school participation is likely to be high will help to identify locations where school choice plans are likely to present a meaningful alternative to traditional public schools and where they are likely to remain small. It may also be the case that achievement in charter schools and the effect of charters on achievement in traditional public schools may depend in part on the motivations of parents who choose these schools. A better understanding of these influences may help to shed light on the current state of research on the effectiveness of charter schools.

Our results indicate that there are several sources for the expanding charter school movement. One sizable contributor is the change in population demographics, both within states and within districts. States and districts with a high fraction of blacks or college educated adults had a substantially larger fraction of students in charter schools than more homogeneous districts. These effects explain a large portion of the changes in charter school enrollment. Second, we found some evidence that systemically low student achievement also fuels the growth of charters. States with poor performance on the SAT were more likely to pass charter laws and to

[35] See Stoddard and Corcoran [25] for these results.

pass stronger laws. States and districts with higher dropout rates also had significantly higher participation in charter schools. Finally, we found that a highly unionized teaching force tends to reduce the likelihood that a charter law passes at the state level, but conditional on passing (and law strength), states and districts with a highly unionized teaching force are more likely to have charter schools emerge within their boundaries and experience a larger fraction of students enrolling in charter schools.

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Appendix A. Data appendix

A.1. Charter school and enrollment data

A.1.1. School and enrollment counts by state

In this paper, we begin with the list of non-Puerto Rico public schools in the Common Core of Data (CCD) School Universe for the 2003–2004 school year. In that year, 2977 operating schools were identified as charter schools (CHARTR03 = 1). We cross-checked these with the list of charter schools in the Center for Education Reform's (CER) annual Directory of Charter Schools (Allen and Cooper [1]). There were 274 of these schools that were not successfully matched to their counterpart in the CER directory, but we included these in our list of charter schools. In addition, 89 operating schools in the CCD that were *not* flagged as charters (CHARTR03 $\neq$ 1) were in fact determined to be charter schools, based upon their inclusion in the CER directory. Together, our master list of charter schools in 2003–2004 includes 3066 non-Puerto Rico charter schools.[36]

In the 2003–2004 CCD, graded enrollments are missing for 20 of the schools and equal to zero for 41 schools. In all, there are 3005 schools with nonzero and nonmissing enrollment. Total enrollment in charter schools by state was provided in Table 2 of the text, along with the percent of total state enrollment in charter schools.

A.1.2. School and enrollment counts by school district

The count of (and total enrollment in) charter schools by *school district* was calculated by first attaching each charter school to a public school district. This exercise was not entirely straightforward. For schools that have been chartered by a public school district, the CCD provides a unique identifier of that district (LEAID, the first seven digits of the NCES school identifier NCESSCH). In many cases, however, the charter school or chartering body has no formal affiliation with a local school district, and is assigned its *own* district ID. This makes it difficult to

[36] There were 161 additional schools that were listed in the CER but not successfully matched to the 2003–2004 CCD. Because no CCD data appeared to be available for these schools, we ignored them in our analysis. Many of these schools appear to be duplicate listings of other charter schools, or schools that had not yet begun operation. In the end, inclusion in the CCD was a necessary condition for inclusion in our dataset.

attach the school to the district in which it is geographically located. In addition, it is possible that some public school districts charter schools that lie outside their own geographic boundaries.

We therefore used the longitude and latitude coordinates of each charter school from the CCD along with Census 2000 boundary files for unified, elementary and secondary school districts to assign charter schools to districts.[37] A total of 2797 schools were matched to specific unified, elementary, and secondary districts based on their spatial coordinates. For various reasons—such as missing coordinate data in the CCD—the remaining schools had to be matched to school districts by other methods, including using the county name in areas with county based districts or using the geographically closest district, of the appropriate level, based on the schools' location zipcode (LZIP03).[38]

In some states (OK, NM, and NV for example) where charter schools must obtain their charter from local school districts, the CCD designated LEAID and GIS-mapped districts are always identical. In many other cases (PA, OH and NY) these IDs are never the same. In other cases (e.g. CA), the results are mixed. Overall, about 40 percent of the schools were matched to the same district listed in the CCD as their LEAID.

A.2. Sources for other data

Table A.1 lists the sources for all other variables used in the analysis.

A.3. Missing school districts

Charter school and enrollment counts were then matched to the school district panel described in the previous section by district ID. In California, forty districts did not participate in the original 1990 School District Data Book project; we thus do not have Census data for these districts.

A.4. Segregation indices

In Table 5 we computed segregation indices for charter schools and for non-charter schools in districts that contain charter schools. These segregation indices are traditional "gap-based" indices based on those used by Clotfelter [8] and others. The segregation index for some group x in school district j (say, white students or free lunch students) is found by first calculating the average exposure of this group to some other group y (e.g. nonwhite students or non-free lunch students) across schools (i):

$$EXY_j = \frac{\sum_i x_{ij}(Py_{ij})}{x_j}. \tag{5}$$

This average exposure rate of group x to y (for school district j) is simply the weighted average of the group y enrollment share across schools, where the weights are the number of students in group x. We compute this average exposure rate *separately* for students in charter and in non-charter schools. Then, for each school type, we subtract this average exposure rate from the

[37] Census school district boundary files can be found here: http://www.census.gov/geo/www/cob/bdy_files.html [Access date: January 10, 2006].

[38] The NCES district locator can be found at: http://nces.ed.gov/ccd/districtsearch/ [access date: January 10, 2006]. For those schools that were matched by this method, we also kept record of the number of miles between the school's location zipcode (LZIP03) and the geographically closest school district.

Table A.1

Variables	Source
District level	
Fraction black, Fraction Hispanic, Fraction adults age 25+ with at least a college degree, Fraction of the population age 5–17 in poverty, Fraction of the civilian population age 16–19 who are not attending school and are not high school graduates, Fraction of students kindergarten to 12th grade attending private school, Median household income, Per-pupil school expenditures, Gini coefficients of family income inequality	Corcoran and Evans [9] Based on data from *1990 Census School District Special Tabulation* (also known as the School District Data Book), and the *1992 Census of Governments: School Districts*
Fraction of full- and part-time instructional employees who are "organized" or "members of an employee organization	Employment files of the *1987 Census of Governments: School Districts*
1989 Herfindahl index of school district competition, based on districts within a 10 mile radius	Calculated by authors based on 1989–1990 Common Core of Data LEA Universe
1989 Herfindahl index of school district competition in an MSA	Calculated by authors. Based on 1999 Census MSA definitions. Includes only districts in counties included in an MSA
State level	
Fraction black, Fraction Hispanic, Fraction adults age 25+ with at least a college degree, Fraction students kindergarten through 12th grade attending private school, Median household income (1989), Fraction of civilians age 16–19 who are not attending school and not high school graduates (1990)	Longform of the 1990 Censuses of Population and Housing (Census CD 1990)
Gini coefficients of state household income inequality for 1989	Census Bureau Housing and Household Economic Statistics Division. http://www.census.gov/income/ftp/decennial/historical/state/s4.prn [Access date: February 2, 2006]
Per-pupil Current Expenditures (1989–1990) Mean SAT scores (1989–1990), Fraction of high school seniors writing the SAT (1989–1990)	Digest of Education Statistics, 1995 Digest of Education Statistics, 1991
Fraction of full- and part-time instructional employees who are "organized" or "members of an employee organization	Aggregate of district measures. Based on employment files of the *1987 Census of Governments: School Districts*
1989 Herfindahl index of school district competition, based on districts within a 10 mile radius	Authors' calculation. Weighted average of the Herfindahl indices over all districts in the state, where the weights are total enrollment in each district

district-wide proportion of students in group *y;* this difference as a fraction of the districtwide proportion of students in group *y* comprises the segregation index:

$$S_j = \frac{Py_j - EXY_j}{Py_j}. \tag{6}$$

The district-wide proportion in group *y* represents the maximum possible exposure to group y students if all schools in the district had the same composition, so the segregation index measures the proportion of movers needed to create schools with an identical demographic composition. This index lies between zero and one, with zero representing districts with perfectly balanced schools and one represented perfectly segregated schools.

Table A.2
Center for education reform rankings of state charter legislation, 2004 ("strongest" to "weakest")

State	Year Charter law passed	CER overall law strength (2004)	2004 CER individual criteria scores (each on a 1–5 scale)									
			Number of schools	Multiple chartering authorities	Types of applicants	New starts vs. conversions	Evidence of local support	Waiver from laws and regulations	Legal autonomy	Full funding	Fiscal autonomy	Exempt from collective bargaining
Arizona	1994	46.00	4.50	4.00	5.00	4.75	5.00	4.50	5.00	3.50	5.00	4.80
Minnesota	1991	45.25	5.00	4.50	5.00	4.75	3.50	5.00	4.50	3.50	5.00	4.50
D.C.	1996	44.75	4.50	4.00	5.00	4.75	3.00	5.00	4.50	4.50	4.50	5.00
Delaware	1995	44.50	5.00	4.00	5.00	4.50	3.50	3.50	4.00	5.00	5.00	5.00
Michigan	1993	44.45	4.50	4.50	5.00	4.75	5.00	2.70	5.00	5.00	5.00	3.00
Massachusetts	1993	40.30	3.30	3.50	4.30	4.50	4.00	3.00	4.70	5.00	5.00	3.00
Florida	1996	39.25	4.00	1.75	5.00	4.50	3.00	3.00	3.50	5.00	5.00	4.50
Indiana	2001	39.25	4.00	4.50	4.00	4.75	3.00	5.00	3.00	3.00	5.00	3.00
Colorado	1993	39.00	4.50	3.00	5.00	4.50	3.00	3.25	2.75	4.00	4.50	4.50
New York	1998	38.30	2.30	4.00	4.00	4.50	4.00	5.00	5.00	2.50	4.00	3.00
Ohio	1997	37.50	3.00	4.50	5.00	4.50	5.00	3.00	3.00	3.50	3.00	3.00
North Carolina	1996	37.25	3.00	3.00	5.00	4.75	3.00	4.00	3.00	4.50	4.00	3.00
Pennsylvania	1997	36.75	5.00	1.75	5.00	4.50	3.50	3.00	3.00	3.00	3.50	4.50
Missouri	1998	36.00	2.00	3.50	4.00	3.00	4.00	4.00	3.50	4.00	4.00	4.00
California	1992	35.75	5.00	4.00	5.00	4.75	3.00	2.00	2.00	3.00	3.00	4.00
Oregon	1999	34.75	5.00	1.50	5.00	3.50	5.00	2.50	3.00	2.50	2.50	4.25
New Jersey	1996	32.50	5.00	3.00	4.00	4.50	3.00	1.00	2.00	2.00	5.00	3.00
Wisconsin	1993	32.05	5.00	3.50	5.00	4.75	2.50	2.50	2.50	2.00	1.80	2.50
Texas	1995	30.75	3.00	3.25	4.25	4.75	3.50	0.00	2.00	3.00	3.00	4.00
New Mexico	1993	30.00	3.50	1.75	5.00	4.50	3.00	2.00	2.75	3.00	2.00	2.50
Oklahoma	1999	29.00	2.00	1.00	4.00	4.50	5.00	2.50	1.00	2.00	3.00	4.00
South Carolina	1996	28.75	5.00	1.75	4.00	4.50	2.00	2.50	2.00	2.00	2.00	3.00
New Hampshire	1995	28.00	5.00	4.00	3.00	2.00	3.00	4.00	2.00	0.00	0.00	5.00
Illinois	1996	27.00	1.75	1.75	4.00	4.50	1.00	3.00	2.00	3.00	3.50	2.50
Louisiana	1995	26.25	2.00	1.75	3.50	4.50	2.00	2.50	1.00	3.00	4.50	1.50
Georgia	1993	25.00	5.00	1.50	5.00	4.50	2.50	0.00	1.00	2.00	2.00	1.50
Idaho	1998	23.70	2.60	1.30	5.00	4.50	1.00	4.30	0.00	3.00	1.00	1.00
Connecticut	1996	23.00	1.50	2.50	1.50	4.50	1.00	2.50	0.5.	3.50	3.00	2.50
Nevada	1997	23.00	2.00	1.00	2.00	4.50	5.00	2.50	1.50	3.50	1.00	0.00
Utah	1998	23.00	1.50	3.00	4.00	4.50	2.50	0.60	1.60	0.30	1.00	4.00

Table A.2 (*continued*)

State	Year Charter law passed	CER overall law strength (2004)	2004 CER individual criteria scores (each on a 1–5 scale)									
			Number of schools	Multiple chartering authorities	Types of applicants	New starts vs. conversions	Evidence of local support	Waiver from laws and regulations	Legal autonomy	Full funding	Fiscal autonomy	Exempt from collective bargaining
Wyoming	1995	21.75	5.00	1.75	5.00	4.50	2.50	0.50	0.00	1.50	1.00	0.00
Tennessee	2002	20.75	2.00	1.75	4.00	4.00	2.00	0.00	0.00	3.00	1.00	3.00
Hawaii	1994	20.00	2.00	1.00	3.00	4.50	2.00	4.50	0.50	1.50	1.00	0.00
Alaska	1995	18.80	2.30	1.00	5.00	5.00	1.00	0.00	0.00	3.50	1.00	0.00
Arkansas	1995	17.00	2.00	2.50	2.00	4.50	2.50	0.00	2.00	1.50	0.00	0.00
Rhode Island	1995	15.00	1.00	1.00	2.50	4.50	0.00	0.50	0.50	3.50	1.50	0.00
Maryland	2003	14.50	1.00	1.50	4.00	4.00	1.00	0.00	0.00	2.00	1.00	0.00
Virginia	1998	13.10	1.60	1.00	2.00	4.50	2.50	0.50	0.50	0.50	0.00	0.00
Kansas	1994	13.00	1.00	1.00	4.50	4.50	1.00	0.50	0.00	0.50	0.00	0.00
Iowa	2002	6.50	1.00	1.00	0.00	0.00	1.50	3.00	0.00	0.00	0.00	0.00
Mississippi	1997	2.30	0.00	1.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00
AVERAGE		28.87										

Notes. States with no charter law in 2004 include Alabama, Kentucky, Maine, Montana, Nebraska, North Dakota, South Dakota, Vermont, Washington and West Virginia. In 2003–2004, two of the 41 states with charter laws had no schools or charter enrollment (Iowa and New Hampshire).
Source: Center for Education Reform [7].

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