1. The Supply of Charter Schools

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Over the past decade, the numbers of charter schools and charter school students have grown rapidly in the U.S. In the 2005–06 school year, 3,625 charter schools were in operation. Yet, just thirteen years earlier, in the 1992–93 school year, just a single charter school operated. In 2003–04, which is the most recent school year for which we have reliable enrollment statistics, charter schools served 789,025 students, up from the mere handful with which the lone school had started eleven years earlier. In spite of all this growth, however, charter schools served only 1.6 percent of American public school students in the 2003–04 school year.

Thus, when someone asks whether charter schools are important, a reasonable person looking at the statistics might not know what to say. In fact, the answer depends on whether the supply of charter schools is *elastic*. That is, will the supply of places in charter schools expand so long as there is demand for them? Or, is the supply of places that currently exists just about all we will ever see? Some commentators have speculated that we will simply run out of suitable buildings for charter schools

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or, more importantly, run out of people who are interested in teaching in them. Such speculations embody the idea that charter schools are not an elastic part of normal American schooling, but peculiar institutions that exist as experiments only.

If the supply of places is elastic, then charter schools may well be an important part of the future of American education—a relevant schooling option for many families and a force with which regular public schools will have to reckon. If the supply is inelastic, then charter schools may end up being just another special case that warrants explanatory footnotes. Today, we tend to treat homeschooling and alternative schools for dropout-prone youth as special cases.

This study investigates whether the supply of charter schools is elastic and what factors promote greater supply. It turns out that differences in states' charter school laws are the primary reason why the supply of places for students in charter schools differs across areas of the U.S. If a state's law simultaneously allows charter schools and creates an environment that is hostile to them, few places for students are created in charter schools. In contrast, the supply of charter school places is much greater in states whose laws create an even playing field between charter schools and regular public schools. The evidence presented in this study suggests that the key elements of an even playing field are funding that is commensurate with that of the local regular public schools, fiscal autonomy, and operational autonomy at start-up. The evidence also indicates that teachers' unions create an environment that is hostile to charter schools. At one level, these findings should hardly come as a surprise. At another level, proponents of charter schools have often been forced into political compromises wherein they see a law enacted that provides charter schools with highly unequal funding and little autonomy. The results presented in this study suggest that they may be "giving up the baby with the bath water."

Any study of supply must account properly for the factors that influence *demand*. This is because the number of charter school places we observe is the result of the interaction between supply and demand. Thus, as a bonus of sorts, this study presents evidence on the factors that raise demand for charter schools. Simple economics would lead us to expect that there will be more demand for charter schools in areas where there are families who do not otherwise get to exercise choice, either because one or only a few public school districts monopolize the local "market" or because they are too disadvantaged to exercise choice. The latter case might exist, for example, where there is ample choice among public school districts only for families who are able to buy a house in the suburbs.

What One Needs to Know about
Charter School Growth

Minnesota was the first state to pass a charter school law, in 1991, and by the 1992–93 school year, its one charter school was the pioneer for the nation. Thereafter, other states enacted charter school laws: California in 1992; Colorado, Georgia, Massachusetts, Michigan, New Mexico, and Wisconsin in 1993; and so on. The entire range of legal enactment dates is shown in Table 1.1. Within two years of enactment, the typical state began seeing some charter schools open their doors to students and thereafter saw relatively steady growth. We can see by examining Figure 1.1, which shows that, once begun, the growth in the number of charter schools in the U.S. proceeded at a very steady rate. Indeed, the line is nearly straight from 1997 to 2005, indicating a stable rate of growth.

Nevertheless, the growth in charter schools was by no means the same in every state that enacted a law. Mississippi's law was passed in 1997, yet the state still had only a single charter school

Table 1.1   Number of Charter Schools in Operation by School Year

State	Year of Charter Law	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	Percent of All Schools
Alabama																0.0%
Alaska	1995	0	0	0	1	1	8	11	12	13	13	14	17	20	24	4.5%
Arizona	1994	0	1	2	36	85	125	167	225	292	353	407	429	442	449	21.4%
Arkansas	1995	0	0	0	0	0	0	0	0	0	3	6	11	16	17	1.5%
California	1992	0	22	47	68	89	102	127	193	250	308	366	432	511	592	6.3%
Colorado	1993	0	3	12	21	29	50	58	65	76	85	91	97	105	116	6.7%
Connecticut	1996	0	0	0	0	0	8	9	11	11	11	12	12	15	15	1.2%
Delaware	1995	0	0	0	0	2	3	5	5	9	11	13	15	15	15	7.2%
D.C.	1996	0	0	0	0	1	2	13	24	30	34	37	39	49	65	31.3%
Florida	1996	0	0	0	0	4	27	56	88	121	162	191	219	272	326	9.0%
Georgia	1993	0	0	0	2	3	4	8	10	15	20	28	33	37	49	2.0%
Hawaii	1994	0	0	0	1	2	2	2	2	9	22	25	26	27	27	9.5%
Idaho	1998	0	0	0	0	0	0	1	4	4	5	11	14	17	23	3.3%
Illinois	1996	0	0	0	0	0	5	13	17	18	22	25	29	33	41	0.9%
Indiana	2001	0	0	0	0	0	0	0	0	0	0	11	15	22	29	1.4%
Iowa	2002	0	0	0	0	0	0	0	0	0	0	0	0	3	7	0.5%
Kansas	1994	0	0	0	0	0	0	6	6	7	16	17	19	28	33	2.3%
Kentucky																0.0%
Louisiana	1995	0	0	0	0	2	5	8	10	13	15	16	16	17	21	1.3%
Maine																0.0%
Maryland	2003	0	0	0	0	0	0	0	0	0	0	0	0	1	15	1.1%
Massachusetts	1993	0	0	0	14	20	21	30	36	38	40	45	48	54	57	2.9%
Michigan	1993	0	0	4	41	73	99	132	168	180	189	195	206	226	233	5.6%
Minnesota	1991	1	5	10	13	15	20	31	46	57	67	76	86	103	126	4.8%
Mississippi	1997	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.1%

State	Opened															%
Missouri	1998	0	0	0	0	0	0	0	14	19	20	25	26	26	26	1.1%
Montana		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Nebraska		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Nevada	1997	0	0	0	0	1	1	1	5	6	8	11	14	20	20	3.5%
New Hampshire	1995	0	0	0	1	0	0	0	0	0	0	0	0	2	6	1.6%
New Jersey	1996	0	0	0	0	0	12	26	35	39	43	45	47	49	52	1.3%
New Mexico	1993	0	1	1	1	1	1	1	2	10	21	27	34	42	51	5.8%
New York	1998	0	0	0	0	0	0	0	2	14	27	34	46	58	79	2.1%
North Carolina	1996	0	0	0	0	0	26	47	62	77	85	91	93	97	100	4.4%
North Dakota		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Ohio	1997	0	0	0	0	0	0	14	39	60	90	130	162	240	277	6.5%
Oklahoma	1999	0	0	0	0	0	0	0	1	6	10	10	13	13	13	0.7%
Oregon	1999	0	0	0	0	0	0	0	1	7	13	20	36	50	62	4.7%
Pennsylvania	1997	0	0	0	0	0	7	26	44	62	72	85	95	104	115	3.5%
Rhode Island	1995	0	0	0	0	1	1	2	2	3	6	9	10	11	11	3.2%
South Carolina	1996	0	0	0	0	0	0	1	5	6	7	10	15	20	26	2.2%
South Dakota		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Tennessee	2002	0	0	0	0	0	0	0	0	0	0	0	4	7	12	0.7%
Texas	1995	0	0	0	0	15	20	101	156	176	208	224	233	251	259	3.1%
Utah	1998	0	0	0	0	0	0	3	5	7	7	10	17	28	39	4.3%
Vermont		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Virginia	1998	0	0	0	0	0	0	0	0	0	3	5	5	5	5	0.2%
Washington																0.0%
West Virginia																0.0%
Wisconsin	1993	0	0	0	1	8	17	28	45	74	92	112	129	162	188	8.2%
Wyoming	1995	0	0	0	0	0	0	0	0	0	0	1	1	2	3	0.8%
Nation		1	31	78	207	355	566	928	1341	1710	2089	2436	2744	3201	3625	

Notes: This table is based on Center for Education Reform (2005). It shows the number of charter schools that are still in operation, by the year in which they open, cumulatively.
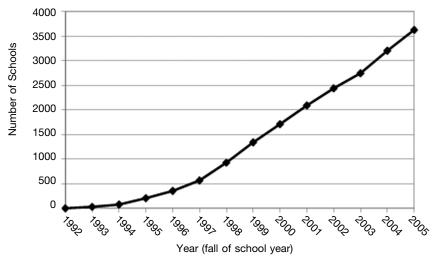
Fig. 1.1   Number of Charter Schools in the United States

operating eight years later. At the other end of the spectrum, Arizona enacted a law in 1994 and had 407 schools operating eight years later. These and the numbers for all other states are shown in Table 1.1. As of the 2005–06 school year, the states with the largest share of their public schools set up as charter schools were Arizona (21.4 percent), Hawaii (9.5 percent), Florida (9.0 percent), and Wisconsin (8.2 percent). The District of Columbia is something of a special case because it contains a city with no suburbs or rural areas: 31.3 percent of its schools are charter schools.

As shown in Figure 1.2, national charter school enrollment also grew at a very steady pace from 1997 onwards. The line shown on the figure is nearly straight, indicating stable growth. (The 1997–98 school year is the first for which we have reasonably reliable charter school enrollment data. Before that time, states were inconsistent about classifying schools as charter schools.) The growth in enrollment was by no means similar in
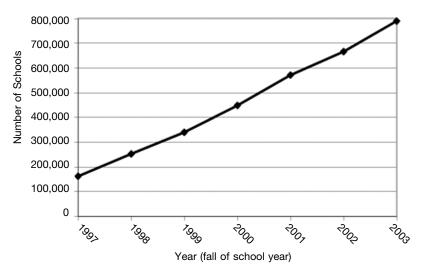
Fig. 1.2   Charter School Students in the United States

each state, however. Table 1.2 shows that Kansas, for instance, passed a charter school law in 1994 and yet had only 0.3 percent of its students enrolled in charter schools in the 2003–04 school year. Arizona also passed its law in 1994 but had 8.0 percent of its students in charter schools by 2003–04. In the District of Columbia, 16.6 percent of students attend charter schools. All states' enrollment histories are shown in Table 1.2.

The steady national growth rates in the number of charter schools and charter school students disguise very substantial variation in growth rates among states. It could be differences in *demand* that explains all this variation. Perhaps people in Mississippi and Kansas simply do not want to attend charter schools, regardless of how available they are. Perhaps people in Arizona, Hawaii, Florida, Wisconsin, and the District of Columbia are simply very eager to attend charter schools and will overcome obstacles to do so. Differences in the environment for *supply* could also, however, explain the variation in growth rates. The

Table 1.2   Charter School Enrollment, by School Year

	Year of Law	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	Percent of All Students
Alabama									0.0%
Alaska	1995	1,097	2,126	2,300	2,594	2,327	2,577	3,476	2.6%
Arizona	1994	25,128	32,209	31,176	45,596	61,571	56,632	81,723	8.0%
Arkansas	1995				708	1,083		2,719	0.6%
California	1992	55,764	73,905	104,730	115,582	132,807	156,696	166,204	2.6%
Colorado	1993	10,888	13,911	17,822	20,155	24,658	28,785	31,529	4.2%
Connecticut	1996	1,084	1,875	2,148	2,429	2,594	2,198	2,222	0.4%
Delaware	1995	365	992		2,716	4,230	5,060	6,241	5.3%
D.C.	1996	235	3,364	6,432		6,943	8,644	12,958	16.6%
Florida	1996	3,123	10,561	17,251	26,893	40,468	51,698	67,466	2.6%
Georgia	1993	14,522	18,611	11,005	20,066	24,656	25,732	26,752	1.8%
Hawaii	1994	832	841	790	1,343	3,071	3,354	4,502	2.5%
Idaho	1998		57	915	1,083	1,478	3,056	4,811	1.9%
Illinois	1996	2,117	3,379	6,152	7,552	8,661	7,464	11,740	0.6%
Indiana	2001						1,271	2,906	0.3%
Iowa									0.0%
Kansas	1994	70	1,545			1,465	1,944	1,389	0.3%
Kentucky									0.0%
Louisiana	1995	463	1,589	2,449	3,212	3,923	4,730	4,585	0.6%
Maine									0.0%
Maryland	2003							196	0.0%
Massachusetts	1993	6,360	9,673	12,518	13,712	14,446	15,912	17,971	1.8%
Michigan	1993	18,273	25,294	46,078	54,751	64,598	68,072	72,096	4.1%
Minnesota	1991	2,892	4,670	7,794	9,395	10,206	12,144	14,210	1.7%
Mississippi	1997		340	347	367	351	335	338	0.1%

State	Year								
Missouri	1998			4,303	7,061	7,694	9,743	10,304	1.1%
Montana									0.0%
Nebraska									0.0%
Nevada	1997			898	1,255	1,945	2,788	3,917	1.0%
New Hampshire									1.9%
New Jersey	1996	1,424	4,001		10,179	11,706	12,526	12,804	0.9%
New Mexico	1993	4,563	4,601		1,335	2,697	4,404	6,225	0.5%
New York	1998						10,396	14,572	0.0%
North Carolina	1996	4,488	9,513	12,691	15,523	18,235	20,420	21,955	1.6%
North Dakota									0.0%
Ohio	1997		2,509	9,809	14,745	22,569	33,828	45,838	2.5%
Oklahoma	1999				1,208	2,133	2,712	3,491	0.6%
Oregon	1999			109	559	999	1,959	2,487	0.5%
Pennsylvania	1997	974	5,474	11,413	18,981	28,453	32,860	41,114	2.3%
Rhode Island	1995	190	397	446	557	843	705	1,024	0.7%
South Carolina	1996	156	364	327	484	459	1,132	3,153	0.0%
South Dakota									0.0%
Tennessee	2002							324	0.0%
Texas	1995	5,533	18,590	25,687	37,978	47,050	53,984	60,833	1.4%
Utah	1998			390	537	656	1,552	3,239	0.7%
Vermont									0.0%
Virginia	1998				55	813	464	476	0.0%
Washington									0.0%
West Virginia									0.0%
Wisconsin	1993	1,589	2,060	3,561	9,511	15,241	18,998	21,113	2.4%
Wyoming	1995						102	132	0.2%

Notes: Enrollment data for charter schools is systematically understated and not always available for a state that has operating schools. This is due to states' not reporting schools' charter status in a systematic way. The problem particularly affects early years such as 1997–98 and 1998–99. Missing data does not necessarily mean that enrollment was zero, especially if Table 1 indicates that the state had operational charter schools. The sources are author's calculations based on U.S. Department of Education (1999, 2000) and on the Common Core of Data, 1998–99 through 2003–04 school years.

environment for charter schools in each state is determined by the details of its law.

A Brief Survey of States' Legal Environments

The environment that each state creates for its charter schools is a function of the law that governs their start-up, operation, and continuance. Most analysts of charter school laws look at a variety of indicators but have one simple question in mind: is the state putting the charter schools on an even playing field or is it crippling their ability to thrive, no matter how good an education they provide? Several sub-questions are crucial. Do charter schools have sufficient funding? Is their funding at all commensurate with that of regular local public schools? The answers to these questions matter because, regardless of how efficient and economical they are, charter schools must hire teachers in competition with regular public schools, they must lease or buy space in a competitive real estate market, and they must pay utility bills and the like. It may be particularly hard for a charter school to succeed if teachers must take a substantial pay cut to work in it. In addition, charter schools face the same safety, health, facilities, and accountability standards that other public schools face, so it is hard for them to provide, say, the same square feet per student if they have only a small fraction of the budget to spend on a physical plant.

Another important sub-question is whether a charter school is fiscally autonomous. It is easiest to understand the importance of fiscal autonomy by considering the concrete example of a charter school that is succeeding in attracting great numbers of applicants who are drawn from the local public school district. If the charter school is fiscally autonomous, it may be able to continue growing so long as it can expand its operation on whatever its set per-pupil revenue is. If the school is not autonomous, how-

ever, its budget is held by its local district and it must negotiate for the budget's release. A charter school that is "too" successful may find itself in a tense conference with officials from the local district, who may decide that they need to reduce the charter school's per-pupil revenue. The officials may even tell the school that its success is evidence that it is getting too much revenue per pupil. Clearly, a lack of fiscal autonomy can set off a negative spiral in which success is punished by financial deprivation. In such circumstances, charter schools may hesitate to expand for fear of attracting attention and triggering financial austerity.

Operational autonomy is important as well. While all charter schools are held accountable for their achievement and certain outcomes, through their states' accountability systems and the federal No Child Left Behind act, not all charter schools have equal ability to set their own curriculum, salaries, benefit schedule, disciplinary standard, and other matters of management. The first time that operational autonomy is an issue is at the school's start-up. If it lacks autonomy then, it may be forced to accept operational methods that undermine its ability to succeed. For instance, in some states, a charter school needs to prove that it has local support for its start-up (not merely prove that it can attract students and satisfy state standards). The approval of the local district is often crucial, in practice, in demonstrating local support. Yet, the local district may condition its approval on the charter school's not growing beyond a certain size, accepting space in an unsuitable building, being strictly oriented toward at-risk or dropout-prone students, participating in most or all of the local district's purchasing and salary contracts, and so on. Once the charter school has started up, continuing operational autonomy may be an issue.

Although a variety of authors and organizations have surveyed states' charter school laws, the analyses that are the most detailed and consistent over time have been carried out by experts con-

vened by the Center for Education Reform (2003, 2004) and the
Fordham Foundation (Palmer and Gau, 2003). This study em-
ploys the Center for Education Reform's ratings simply because
they cover the most states. They are also easily interpretable and
widely known. It is important for a study of this type *not* to con-
struct its own ratings. It is desirable to have an arms-length re-
lationship between the researchers who rate laws that serve as
potential explanatory factors and the researcher who evaluates
the effects of laws on the supply of charter schools.

For the analysis that follows, which focuses on the most re-
cent enrollment data available (for the 2003–04 school year), the
2003 ratings are the most appropriate ones. Consequently, Table
1.3 shows the Center for Education Reform's 2003 ratings of
states' charter school laws. A score of five on an aspect of the law
means that the state puts the charter schools on an even playing
field on this particular dimension. A score of zero means that the
state puts the charter schools at a great disadvantage, relative to
the regular public schools, on this particular dimension. All as-
pects of the law listed in the table are defined with some precision
in the notes below the table. The definitions are from the Center
for Education Reform. The variables that correspond most closely
to the issues of funding and autonomy already discussed are listed
toward the left-hand side of the table.

Consider fiscal autonomy. Arizona, Delaware, Florida, Indi-
ana, Massachusetts, Michigan, Minnesota, and New Jersey all re-
ceive scores of five, indicating that their charter schools' budgets
cannot be held hostage by their local districts. In Arkansas, Iowa,
Kansas, Maryland, Mississippi, New Hampshire, and Virginia, the
law gets a rating of zero because a local district can hold up a
charter school's budget with relative ease.

Consider whether charter schools are guaranteed full or rel-
atively full per pupil funding. The District of Columbia, Florida,
Massachusetts, Michigan, and North Carolina all get scores of

four and a half or above. Their charter schools can afford salaries and supplies similar to those of regular public schools—though some caution is necessary here because charter schools are often left out of state mechanisms that subsidize the purchase or lease of buildings and other capital. Iowa, Kansas, Mississippi, New Hampshire, Utah, and Virginia all get scores *below* one, which suggests that their charter schools are severely revenue-deprived compared to the regular public schools with which they compete.

Readers can examine the remaining columns of the table for themselves. It is important to note that the ratings of various aspects of a state's law tends to be correlated with one another. In other words, states that give charter schools fiscal autonomy also tend to give them fuller funding, more operational autonomy, exemptions from local collective bargaining agreements, more ability to expand, and so on. This correlation poses something of a problem: it will prove hard to tell whether it is really fiscal autonomy or, say, exemptions from local collective bargaining agreements that matter if the two aspects of the law tend to be both favorable or both unfavorable. In fact, in the analysis that follows, it is not possible to assign separate credit to each of the ten aspects of the laws recorded by the Center for Education Reform. Instead, the analysis focuses on just the first four aspects listed—this is the maximum that can be used while maintaining reasonably straightforward interpretation.

Some Pointers on the Analysis that Follows

The data used in the analysis below include the Center for Education Reform's ratings, shown in Table 1.3; the number of charter schools and charter school students in 2003–04, summarized in Tables 1.1 and 1.2 derived from the Common Core of Data (U.S. Department of Education, 1999 through 2005), two U.S. Department of Education Reports (1999, 2000), and Center for

Table 1.3 Environment for Charter Schools, by State

State	Fiscal Autonomy	Autonomy at Start-Up	Continuing Legal/ Operational Autonomy	Guaranteed Full Per-Pupil Funding	Number of Schools Allowed	New Starts Allowed	Multiple Chartering Authorities	Variety of Applicants	Automatic Waiver from State Rules	Exempt from Local Collective Bargain
Alaska	1	1	0	3.5	2.3	5	1	5	0	0
Arizona	5	5	5	3.5	4.5	4.75	4	5	4.5	4.75
Arkansas	0	2.5	2	1.5	2	4.5	2.5	2	0	0
California	3	3	2	3	5	4.75	4	5	2	4
Colorado	4.5	3	2.75	4	4.5	4.5	3	5	3.25	4.5
Connecticut	3	1	0.5	3.5	1.5	4.5	2.5	1.5	2.5	2.5
Delaware	5	3.5	4	5	5	4.5	4	5	3.5	5
D.C.	4.5	3	4.5	4.5	4.5	4.75	4	5	5	5
Florida	5	3	3.5	5	4	4.5	1.75	5	3	4.5
Georgia	2	2.5	1	2	5	4.5	1.5	5	0	1.5
Hawaii	1	2	0.5	1.5	2	4.5	1	3	4.5	0
Idaho	1	1	0	3	2.6	4.5	1.3	5	4.3	1
Illinois	3.5	1	2	3	1.75	4.5	1.75	4	3	2.5
Indiana	5	3	3	3	4	4.75	4.5	4	5	3
Iowa	0	1.5	0	0	1	0	1	0	3	0
Kansas	0	1	0	0.5	1	4.5	1	0	0.5	0
Louisiana	4.5	2	1	3	2	4.5	1.75	3.5	2.5	1.5
Maryland	0	1	0	2	1	4	1.5	2	0	0
Massachusetts	5	4	4.7	5	3.3	4.5	3.5	4.3	3	3
Michigan	5	5	5	5	4.5	4.75	4.5	5	2.7	3
Minnesota	5	3.5	4.5	3.5	5	4.75	4.5	5	5	4.5
Mississippi	0	0	0	0	0	0	1	0	1.3	0
Missouri	4	4	3.5	4	2	3	3.5	4	4	4
Nevada	1	5	1.5	3.5	2	4.5	1	2	2.5	0
New Hampshire	0	3	2	0	5	2	4	3	4	5
New Jersey	5	3	2	2	5	4.5	3	4	1	3
New Mexico	2	3	2.75	3	3.5	4.5	1.75	5	2	2.5
New York	4	4	5	2.5	2.3	4.5	4	4	5	3

North Carolina	4	3	4.5	3	4.75	3	5	4	3
Ohio	3	5	3.5	3	4.5	4.5	5	3	3
Oklahoma	3	5	2	1	4.5	1	4	2.5	4
Oregon	2.5	5	2.5	3	3.5	1.5	5	2.5	4.25
Pennsylvania	3.5	3.5	3	3	4.5	1.75	5	3	4.5
Rhode Island	1.5	0	3.5	0.5	4.5	1	2.54	0.5	0
South Carolina	2	2	2	2	4.5	1.75	4	2.5	3
Tennessee	1	2	3	0	4	1.75	4	0	3
Texas	3	3.5	3	2	4.75	3.25	4.25	0	4
Utah	1	2.5	0.3	1.6	4.5	3	4	0.6	4
Virginia	0	2.5	0.5	0.5	4.5	1	4.5	0.5	0
Wisconsin	1.8	2.5	2	2.5	4.75	3.5	5	2.5	2.5
Wyoming	1	2.5	1.5	0	4.5	1.75	5	0.5	0

Notes: The table is borrowed from Center for Education Review (2003). It shows states' support for autonomous charter schools, as indicated by their laws, which were rated as of December 2002 by the Center for Education Reform. States not shown had no charter school law on their books in December 2002.

Fiscal Autonomy: States that give charter schools full control over their own budgets, without the district holding the funds, encourage more activity than states that do not.

Autonomy at start-up (formal evidence of local support): States that permit charter schools to be formed without having to prove specified levels of local support encourage more activity than states that require such demonstrations of support.

Continuing legal/operational autonomy: States in which charter schools are independent legal entities that can own property, sue and be sued, incur debt, control budget and personnel, and contract for services encourage more activity than states in which charter schools remain under district jurisdiction. In addition, legal autonomy refers to the ability of charter schools to control enrollment numbers, with no special conditions imposed by the charter law or the local district on its policies.

Guaranteed full funding: States where 100% of per-pupil funding automatically follows student enrolled in charter schools encourage more activity than states where the amount of funding is automatically set below 100%, or must be negotiated with the district.

Number of Schools: States that permit an unlimited or substantial number of autonomous charter schools encourage more activity than states that either limit the number of autonomous schools, or allow an unlimited number of charter schools with restrictions on their autonomy, demographics, etc.

New starts: States that permit new schools to start up encourage more activity than those that permit only public school conversions.

Multiple chartering authorities: States that permit a number of entities in addition to or instead of local school boards to authorize charter schools encourage more activity than those that vest authorizing power in a single entity, particularly if that entity is the local school board, or provide an appeals process.

Variety of applicants: States that permit a variety of individuals and groups both inside and outside the existing public school system to start charter schools encourage more activity than states that limit eligible applicants to public schools or public school personnel.

Automatic waiver from laws and regulations: States that provide automatic blanket waivers from most or all state and district education laws, regulations, and policies encourage more activity than states that provide no waivers or require charter schools to negotiate waivers on an issue-by-issue basis with charter-granting authorities. (In no case, however, are civil rights laws or health/safety codes waived for charter schools.)

Exemption from collective bargaining agreements / district work rules: States that give charter schools complete control over personnel decisions encourage more activity than states where charter school teachers must remain subject to the terms of district collective bargaining agreements or work rules.

Education Reform reports (2003, 2004, 2005). In addition, the data include characteristics of each county in the U.S., derived from U.S. Department of Education (2003). The characteristics selected are those that are likely to affect the demand for charter schools, and they are further described in the Data Appendix.

In the analysis that follows, a regression is used to show how supply and demand factors explain the variation among counties in the number of their students who are enrolled in charter schools. Regression is a statistical technique that separates the variation in an outcome—in this case, the number of students in charter schools—into parts associated with the variation in multiple explanatory factors. Another regression is used to show how the same factors explain the variation among counties in the number of charter schools operating.

The analysis is conducted at the county level because, within a state, counties differ greatly in their characteristics, especially the conditions likely to affect demand for charter schools. For instance, only one county might offer families a lot of school choice within the regular public sector. Another county might offer them none. Readers who are interested in statistical details may wish to know that the standard errors are robust and clustered at the level of the state, owing to the fact that charter school laws vary only at that level.

Explaining the Number of Students Enrolled in Charter Schools

Table 1.4 shows the main results of this study. The factors that affect the number of charter school students in a county are divided into those that mainly affect the supply of charter schools, those that mainly affect the demand for charter schools, and those that affect both supply and demand. The division into these groups is only approximate. Aspects of the state's charter school

Table 1.4   Determinants of the Number of Charter School Students
Dependent Variable: ln(Number of Charter School Students in a County)

	Main Results	Including Teachers' Unionization
Factors that Mainly Affect Charter School Supply		
ln(Charter School Revenue Per Pupil, in thousands)	**0.42**	**0.38**
Years Since Charter Law Passed	**0.58**	**0.75**
Fiscal Autonomy (1–5 scale)	**0.81**	**1.80**
Autonomy at Start-Up (1–5 Scale)	0.41	−0.10
Legal/Operational Autonomy (1–5 scale)	**−1.30**	**−1.39**
Guaranteed Full Per-Pupil Funding (1–5 scale)	**0.22**	0.02
Share of Teachers Who Are Union Members (0–1 scale)		**−1.13**
Factors that Mainly Affect the Demand for Charter Schools		
ln(black students in county)	**0.40**	**0.53**
ln(Hispanic and other race students in county)	**−0.25**	**−0.26**
ln(White students in county)	**0.57**	**0.58**
ln(Asian students in county)	**−0.19**	**−0.14**
ln(households with income less than $30,000)	0.44	0.39
ln(magnet school students in county)	−0.04	−0.07
Index of Choice among Public School Districts (0–1 scale)	**−1.08**	**−1.44**
ln(special education students in county)	0.39	0.43
ln(English language learners in county)	**0.09**	**0.06**
Factors that Affect Both Supply and Demand		
large city	−0.01	−0.01
mid-sized city	−0.01	**−0.05**
urban fringe of a large city	**−0.30**	**−0.33**
urban fringe of a mid-sized city	**−0.32**	**−0.34**
large town	**−0.12**	**−0.14**
small town	**−0.09**	**−0.10**
rural but inside metropolitan statistical area	**−0.06**	**−0.11**
rural and outside metropolitan statistical area	0.08	0.05
constant	**−11.63**	**−13.70**

Notes: The table shows estimates from linear regressions. Because the dependent variable is in natural log units, one may interpret the coefficient as the *percentage change effect* of the explanatory variable. If the explanatory variable is also in natural log units, then one may interpret the coefficient as the percentage change effect of a percentage change effect in the explanatory variable. For instance, the first coefficient shown indicates that if there a 100 percent change in the per-pupil revenue of charter schools, the number of charter school students would rise by 0.42 or 42 percent. To take another example, with each year after the passage of a charter school law, enrollment grows by 0.58 or 58 percent. (Remember that charter school enrollment usually starts from a *tiny* base.) A coefficient that is shown in bold typeface is statistically significantly different from zero at the 0.15 level. The standard errors were computed to be robust with clustering at the level of the state. The variables that are measured on a scale of 1 to 5 are such that a higher value corresponds to more of the property in question—for instance, more fiscal autonomy. See Table 1.3 and data appendix for details on variables.

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law are listed under supply factors because they influence how
feasible and attractive it is to run a charter school, given the po-
tential population of students. Socio-demographic variables that
describe local students are listed under demand factors because
they describe the potential demanders of charter schools. If, for
instance, English language learners demand charter schools more
or less than other students, the socio-demographic variables will
allow us to account for it. Finally, the series of indicator variables
for different levels of urbanicity are supply factors because it is
harder to run a charter school in an area with dispersed popula-
tion than one with a dense population. This is simply because,
unlike a regular public school that serves a compact geographic
"attendance area," a charter school must typically gather its stu-
dents from across a few attendance areas. The more rural the
charter school, the more mired it will be in transportation diffi-
culties. The indicators for urbanicity are also related to supply
because the cultural background, employment, and education of
parents who live in cities may make them more or less interested
in demanding charter schools.

The first thing to note about Table 1.4 is that most of the
factors listed have a statistically significant effect on the number
of students enrolled in charter schools. (Coefficients shown in
bold are statistically significantly different from zero at the 15
percent level, and the vast majority of these are statistically sig-
nificant at the 5 percent level.) This tells us immediately that the
supply of charter schools *is* elastic. If they were not elastically
supplied, there would be little variation in the number of students
in charter schools generated by variables in either supply or de-
mand factors and, as a result, the factors would tend not to have
a statistically significant effect.

Second, the supply factors have sizable effects on charter
school enrollment. Because the dependent variable is in natural
log units, one may interpret the coefficient as the percentage

change effect of the explanatory variable. If the explanatory variable is also in natural log units, then one may interpret the coefficient as the percentage change effect of a percentage change effect in the explanatory variable. Remember that charter school enrollment usually starts from a tiny base so that large percentage changes may correspond to a smaller number of students than one might suppose at a glance. The first coefficient shown indicates that if there is a 100 percent change in the per-pupil revenue of charter schools, the number of charter school students would rise by 0.42 or 42 percent. The second coefficient shows that with each year after the passage of a charter school law, charter school enrollment grows by an average of 0.58 or 58 percent. Each point on the fiscal autonomy scale raises the number of charter school students by 81 percent; a point of initial operating autonomy has an insignificant effect (but a positive coefficient); and a point on the guaranteed full funding scale raises the number of charter school students by 22 percent. Greater continuing operating autonomy has, however, a *negative* effect on charter school enrollment. This result will be left as somewhat puzzling for now, but it will be explained below.

The right-hand column of Table 1.4 shows what happens to the coefficients on the supply factors if we introduce a measure of teacher unionism—specifically, the share of teachers in the county who are union members. This variable has a large negative effect: if the share unionized rises by 0.10 (10 percent), then charter school enrollment drops by 11.3 percent. Also, the inclusion of the unionization variable makes the effect of full funding drop to zero. The way to interpret this evidence is that a powerful union presence creates an environment in which charter schools do not get funding that is commensurate with that of regular public schools. Thus, unions may have a direct effect on the supply of charter schools—perhaps by creating a hostile climate—

but they also have an indirect effect through their influence on the law that gets enacted.

The bottom part of the table shows us the effect of demand factors. For convenience, focus on the column without the unionization variable. The most interesting coefficient is effect of choice among public school districts. If the choice index rises by 0.25, which corresponds to a shift from two to four districts in the county, then charter school enrollment falls by 27 percent (108×0.25). Magnet school enrollment has a small and negative coefficient that is statistically insignificant. This evidence suggests that magnet schools are not an alternative form of choice that parents consider to be equivalent to charter schools, probably because magnet schools have very little autonomy from their parent districts (relative either to another district or a charter school). Put another way, families appear to have a demand simply for exercising meaningful choice over schools—that is, choice over schools that are sufficiently autonomous to differ. When families can exercise choice easily within the regular public school sector, they are less inclined to charter schools.

Black and white students are about equally likely to demand charter schools, but Asian students are less likely to demand them. The coefficients on Hispanic and English language learners may be interpreted together because the vast majority of English language learners are native Spanish speakers. Interpreted together, they suggest that Hispanics whose first language is not English are more likely to demand charter schools, but that Hispanics who are native English speakers are less likely to demand charter schools. In other words, students who classified themselves as Hispanics vary a lot, from recent immigrants to people whose ancestors immigrated generations ago. It is recent immigrants among the Hispanics who demand charter schools more. There is a large and positive but statistically insignificant coefficient for students whose families have less than $30,000 in in-

come. While we cannot conclude that poor students are more likely to demand charter schools, they do not appear less likely to do so either. (In fact, the coefficient is just on the border of being significant so we can rule out poor students demanding charter schools substantially less than others.) On the whole, the socio-demographic coefficients suggest that disadvantaged students are more likely to demand charter schools. This is not surprising, both because it accords with other evidence on who attends charter schools and because it is sensible. Advantaged families usually have numerous school choices in the regular public and private school sectors, so they are less likely to rely on charter schools in order to exercise choice.

Finally, the coefficients on the indicators for urbanicity suggest that we are most likely to find charter schools in densely populated central cities of urban areas or in rural areas. We are least likely to find them in the suburbs of major cities. This makes sense. A large district often monopolizes the central city of a metropolitan area, giving central city students little choice. Also, it should be more feasible to run a charter school in a central city area (apart from problems associated with buildings). Rural families also tend to lack school choice, especially if they live in a vast consolidated district. While running a charter school in a rural area may create transportation difficulties, some rural charter schools are small enough to serve a "pocket" of families who do not want their children to travel to a district consolidated school. Also rural charter schools have been pioneers in making use of the Internet to overcome transportation difficulties.

Which Charter Schools Are Most Elastic?

The Appendix Table presents results that show how the supply and demand factors affect charter school enrollment among various subgroups of students. From its results, we can take away a

few key findings. First, charter school places in the elementary and middle school grades appear to be more elastic than those in the high school grades. That is, if a state changes its law so it provides more of an even playing field for charter schools, it can expect enrollment to increase more in the elementary and middle than in the high school grades. Second, commensurate per-pupil funding is important for increasing the supply of places in charter schools that will attract enrollment by white students (more important than it is for black or Hispanic students). This may be because white students have regular public school options that are relatively attractive so their families are unwilling to see their child in a school that appears to be pinched for pennies. Black and Hispanic students may see their regular public school options as less attractive, even if they have many resources in theory. This might be the case because black and Hispanic students disproportionately attend run-down or chaotic schools located in districts with high per-pupil spending. Third, fiscal autonomy is important for increasing the supply of places in charter schools that will attract enrollment by black or Hispanic students (more important than it is for white students). One suspects that this is because black and Hispanic students are more likely to reside in politicized regular public school districts where tension over a charter school's being "too" successful might actually end in its budget being held up. Finally, higher per-pupil funding and commensurate per-pupil funding are important for ensuring that there is a supply of charter schools to students who are eligible for free or reduced-price lunch (that is, within 185 percent of the federal poverty line). Perhaps because poor children can bring few resources to school from theirs homes, it is harder to run a charter school on a shoestring if the students being served are poor. Their families are less able to compensate for materials that the school lacks.

Explaining the Number of Charter Schools

Table 1.5 shows results from a regression that attempts to explain the number of charter schools, as opposed to students. Because, for a given number of students, the number of schools will rise if the schools are smaller, this analysis differs from that above mainly in its emphasis on school size.

On the whole, the supply and demand factors that explain charter school enrollment also explain the number of charter schools, in much the same way. There is, however, one exception that is worth noting. Recall that operating autonomy appeared to *decrease* and full funding appeared to increase the supply of charter school places. The evidence in Table 1.5 suggests, in contrast, that operating autonomy increases and full funding decreases the supply of charter *schools*. We can reconcile the results if operating autonomy combined with much-less-than-commensurate funding produces numerous but small charter schools. This is only one possible reconciliation of the results. Others are possible as well.

Summing Up

We have seen that charter schools are elastically supplied. The evidence suggests that greater demand among families is met with a greater number of places. We have also seen that supply is greater in states that have created an environment where charter schools operate on a more even playing field to that of regular public schools. Fiscal autonomy, autonomy at start-up, and commensurate per-pupil funding appear to be the key factors that make a playing field more even, but we should be mindful of the fact that other aspects of state laws may matter a great deal too: we cannot sort out the independent role of some aspects of laws because they are so correlated with the key aspects. If states enact laws that allow charter schools to compete on an equal footing,

Table 1.5 Determinants of the Number of Charter Schools
Dependent Variable: ln(Number of Charter Schools in a County)

Factors that Mainly Affect Charter School Supply	
ln(Charter School Revenue Per Pupil, in thousands)	**0.27**
Years Since Charter Law Passed	**0.28**
Fiscal Autonomy (1–5 scale)	**1.35**
No Need to Prove Local Support (1–5 Scale)	−0.20
Legal/Operational Autonomy (1–5 scale)	**0.78**
Guaranteed Full Per-Pupil Funding (1–5 scale)	−**0.30**
Factors that Mainly Affect the Demand for Charter Schools	
ln(black students in county)	**0.34**
ln(Hispanic students in county)	−**0.17**
ln(White students in county)	**0.37**
ln(Asian students in county)	−**0.18**
ln(households with income less than $30,000)	**0.83**
ln(magnet school students in county)	−**0.06**
Index of Choice among Public School Districts (0–1 scale)	−**0.42**
ln(special education students in county)	0.11
ln(English language learners in county)	**0.11**
Factors that Affect Both Supply and Demand	
large city	−0.01
mid-sized city	−**0.07**
urban fringe of a large city	−**0.29**
urban fringe of a mid-sized city	−**0.28**
large town	−**0.11**
small town	−**0.09**
rural but inside metropolitan statistical area	−**0.24**
rural and outside metropolitan statistical area	−**0.12**
constant	−**11.65**

Notes: The table shows estimates from a linear regression. Because the dependent variable is in natural log units, one may interpret the coefficient as the *percentage change effect* of the explanatory variable. If the explanatory variable is also in natural log units, then one may interpret the coefficient as the percentage change effect of a percentage change effect in the explanatory variable. For instance, the first coefficient shown indicates that if there a 100 percent change in the per-pupil revenue of charter schools, the number of charter schools would rise 0.27 or 27 percent. To take another example, with the average year after the passage of a charter school law, the number of charter schools grows by 0.28 or 28 percent. (Remember that the number of charter schools usually starts from a *tiny* base.) A coefficient that is shown in bold typeface is statistically significantly different from zero at the 0.15 level. The standard errors were computed to be robust with clustering at the level of the state. The variables that are measured on a scale of 1 to 5 are such that a higher value corresponds to more of the property in questionûfor instance, more fiscal autonomy. See Table 1.3 and data appendix for details on variables.

we should expect that they will expand to meet demand. Of course, the "if" is a big "if": we have seen that the local prevalence of teachers' unions reduces charter school supply, in part by generating laws with less commensurate funding. The bottom line is that the details of a charter school law matter. If all laws were like those of the states with the lowest rated laws, charter schools would remain just a marginal phenomenon. If all states' laws were like those rated highest, charter schools might—in another decade or so—be a pervasive and important force in U.S. public education.

Finally, a variety of results suggest that the families who most demand charter schools are those who have little meaningful choice within the regular public school system. In this sense, a law that puts charter schools on an even playing field with regular public schools also puts an important population of *families* on an even playing field with others.

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Appendix

Data on Enrollment and the Number of Schools

The enrollment and number of schools data used in the regression analysis come from the 2003–04 version of the *Common Core of Data* (U.S. Department of Education, 2005). The original data are at the level of the individual school, and they are aggregated up to the level of the county. The *Common Core* indicates whether a school is a regular public, charter, or magnet school; its enrollment by grade; and its enrollment by racial subgroup and other subgroup (English learner, free-lunch participant, reduced-price lunch participant, special education participant). The *Com-*

mon Core does not, however, contain accurate information on enrollment in or the number of charter schools in school years up through 1999–2000. Thus, for the purposes of constructing Tables 1.1 and 1.2, the dataset was supplemented with information from U.S. Department of Education Reports (1999, 2000) and Center for Education Reform reports (2003, 2004, 2005). The published reports are based on at least as much, and more, data than are in the *Common Core*. Thus, when a report and the aggregated *Common Core* generated different statistics, the statistics from the report was kept. Upon occasion, statistics from two reports were in conflict. Because undercounting, not overcounting, plagues statistics on charter schools, the maximum enrollment or number of schools was reported where sources were conflict. Such conflicts, however, were minor in magnitude. The data are aggregated to the county level.

Data on State Charter School Laws

The data on state charter school laws are from Center for Education Reform (2003).

Data on Per-Pupil Revenue in Charter Schools

The enrollment data used for the denominator of this variable are from the 2002–03 version of the *Common Core of Data* (U.S. Department of Education, 2004). The revenue data used for the numerator are from the 2003–03 version of the *Public Elementary-Secondary Education Finance Data* (U.S. Department of Commerce, 2005). Charter school revenue and expenditure can be computed as follows. For single charter schools that are treated by their states as separate districts, a full set of revenue and expenditure figures are reported at the school level in the *Public Elementary-Secondary Education Finance Data*. For the rare charter schools that are part of a group and are treated by their states as

Appendix Table   Determinants of the Number of Various Types of Charter School Students

	Dependent Variable: Natural Log of the Number of Charter School Students in a County who are . . .						
	in Grades K–5	in Grades 6–8	in Grades 9–12	white	black	Hispanic	eligible for free or reduced-price lunch
Factors that Mainly Affect Charter School Supply							
ln(Charter School Revenue Per Pupil, in thousands)	**0.75**	**0.55**	**0.59**	**0.39**	**0.41**	**0.70**	**1.06**
Years Since Charter Law Passed	**0.82**	**0.97**	**0.54**	**0.92**	0.21	**0.44**	0.43
Fiscal Autonomy (1–5 scale)	**0.78**	0.34	**4.25**	–0.49	**2.82**	**1.08**	–0.97
Autonomy at Start-Up (1–5 Scale)	**0.60**	**0.99**	**–1.30**	**0.77**	–0.24	0.01	**1.06**
Legal/Operational Autonomy (1–5 scale)	**–1.83**	**–1.77**	**–1.64**	**–1.05**	**–1.95**	**–1.22**	–1.09
Guaranteed Full Per-Pupil Funding (1–5 scale)	**0.82**	**1.06**	**–1.13**	**0.78**	0.08	0.26	**1.09**
Factors that Mainly Affect the Demand for Charter Schools							
ln(black students in county)	**0.43**	**0.64**	**0.70**	**0.28**	**1.23**	**0.26**	0.42
ln(Hispanic students in county)	**–0.26**	0.11	**0.39**	–0.16	–0.12	**0.87**	0.10
ln(White students in county)	0.32	**0.75**	**0.94**	**0.68**	–0.07	–0.20	**–0.87**
ln(Asian students in county)	**–0.28**	–0.27	–0.23	–0.12	–0.31	–0.27	–0.49

ln(households with income less than $30,000)	0.19	0.38	−0.22	−0.26	0.57	−0.25	0.59
ln(magnet school students in county)	−0.06	**−0.07**	**−0.06**	0.00	−0.03	−0.01	0.03
Index of Choice among Public Schl Districts (0–1 scale)	**−1.24**	**−1.26**	−0.86	**−1.13**	**−1.06**	−0.50	**−0.45**
ln(special education students in county)	**0.92**	−0.49	0.05	0.62	0.20	**0.69**	**0.89**
ln(English language learners in county)	**0.10**	0.03	−0.07	−0.01	0.09	0.01	0.35
Factors that Affect Both Supply and Demand						
large city	**−0.02**	**−0.02**	**−0.03**	−0.01	**−0.07**	0.00	**0.06**
mid-sized city	**−0.05**	−0.08	0.06	**−0.03**	−0.05	0.03	**0.10**
urban fringe of a large city	−0.07	0.24	**−0.55**	−0.08	−0.25	**−0.28**	**−0.54**
urban fringe of a mid-sized city	−0.04	0.28	**−0.63**	−0.04	−0.32	**−0.33**	**−0.56**
large town	**−0.08**	**−0.09**	−0.05	**−0.06**	**−0.18**	**0.04**	0.12
small town	−0.12	−0.06	−0.08	−0.04	−0.12	0.02	0.09
rural but inside metropolitan statistical area	**0.17**	**0.39**	−0.07	0.23	0.00	**−0.12**	0.05
rural and outside metropolitan statistical area	0.03	−0.07	**0.23**	**0.17**	0.11	0.13	**0.55**
constant	**−17.54**	**−21.53**	**−13.13**	**−14.63**	**−12.72**	**−9.34**	**−10.38**

Notes: The table shows estimates from linear regressions. Because the dependent variables are in natural log units, one may interpret the coefficient as the *percentage change effect* of the explanatory variable. If the explanatory variable is also in natural log units, then one may interpret the coefficient as the percentage change effect of a percentage change effect in the explanatory variable. A coefficient that is shown in bold typeface is statistically significantly different from zero at the 0.20 level. The standard errors were computed to be robust with clustering at the level of the state. The variables that are measured on a scale of 1 to 5 are such that a higher value corresponds to more of the property in question—for instance, *more* fiscal autonomy. See Table 1.3 and data appendix for details on variables.

a district, a full set of revenue and expenditure figures are reported at group (of charter schools) level in the *Public Elementary-Secondary Education Finance Data*. For charter schools that are dependent on a regular public school district and receive revenue only from it, the *Public Elementary-Secondary Education Finance Data* report the funds transferred from the overseeing district and received by the charter school. Thus, in order to compute charter schools' revenue, each charter school is first classified (independent, dependent; single, part of a group) and then the correct revenue and expenditure measures are associated with each school. The data are aggregated to the county level.

Other Data

The index of choice among public school districts is a standard index of deconcentration. To compute it, each school district's share of enrollment in the county is calculated. Each enrollment share is squared, and the sum of the squared shares is calculated. The sum is subtracted from 1. Enrollment data from the *Common Core* (as described above) is used.

The share of households with incomes less than $30,000 in 1999 is taken from the *School District Demographics* data, which are at the district level, and aggregated to the county level.

The share of teachers who are union members is taken from the 1987 *Census of Governments* (U.S. Department of Commerce, 1990), the most recent census of teachers unionization. The data are collected at the district level; they are aggregated to the county level for the purpose of this paper.