November 2004

Education Policy Analysis Archives 12/66

Arizona State University

University of South Florida

EDUCATION POLICY ANALYSIS ARCHIVES

A peer-reviewed scholarly journal
Editor: Gene V Glass
College of Education
Arizona State University

Volume 12 Number 66 **November 30, 2004** **ISSN 1068-2341**

The Effect of Charter School Legislation on Market Share

Simona Kúscová
Stony Brook University

Jack Buckley
Boston College

Citation: Kúscová, S. & Buckley, J. (2004, November 30). The effect of charter school legislation on market share. *Education Policy Analysis Archives, 12*(66). Retrieved [date] from http://epaa.asu.edu/epaa/v12n66/.

Abstract
Many proponents of school choice use the claim of the market's capability to enhance efficiency and improve performance to call for its expansion. But no markets are perfectly competitive, and the local market for public goods is filled with institutional arrangements that make it differ from the neoclassical ideal. In this paper, we look at a particular institution—the provisions of charter school legislation—and assess how it affects the ability of charter schools to gain market share. Using data from the 36 states that had passed charter legislation by 2000, and controlling for a variety of other factors, we estimate a model of the effects of various provisions in the charter laws on charter school market share. We find that two such provisions, one concerning the sponsorship of charters and another their funding sources, appear to have a strong effect on the market share of charter schools.

Institutions and the Market for Education

One salient debate in U.S. education policy centers on whether the introduction of market-like mechanisms will improve the performance and accountability of public schools (e.g., Chubb and Moe, 1990; Teske , Schneider et al., 2000). Charter schools are empirically the most important part of this pro-market, pro-competition agenda that structures many debates about how to reshape the way in which education is delivered.

Appearing first in the early 1990s and growing virtually exponentially in market share, charter schools now play a prominent role in the nation's public education system: As of May 2003, there were almost 2,700 charter schools operating in 41 states (and the District of Columbia) educating over 684,000 students (Center for Educational Reform 2003a). As is well known, charter schools are publicly funded schools of choice that typically have fewer restrictions and regulations governing their behavior. In return for this greater freedom, charter schools are supposed to be held more accountable for their performance.[1] Given their potential promise, charter schools have sparked serious scholarly debate. The mainstream of research in charter school reform focuses primarily on assessing the effectiveness of charter schools and on their propensity to innovate and experiment (e.g., Cheung et al., 1998; Henig et al., 1999; Wong et al., 2000; Gill et al., 2001).

Given their prominence in the debates over markets and education, it is not surprising that charter schools have been the center of another literature, one that focuses on the effect of charter school competition on the traditional public schools (Rofes, 1998; Maranto et al., 1999; Finn et al., 2000; Teske et al., 2001). Here, the argument of charter school supporters is that the introduction of charter schools introduces competition to public education that will lead to an improvement and innovation in the whole sector of public education (Kolderie, 1995; Mintrom and Vergari, 1997; Hassel, 1999; Wong et al., 2000). It is this area, the broader market for education in which charter schools play a part, that is the focus of this paper. Specifically, we investigate empirically the effects of variation of a particular set of institutions—charter laws—on the market share of charter schools in the states.

The crux of the market argument for school choice, as espoused by supporters of charter initiatives (and school choice more broadly), is that once traditional public schools lose their monopoly control over enrollments they cannot lag behind charter schools (or any superior school) in the quality of the services they offer to parents as consumers. If they do, the market will punish them: they will lose their students to "better" schools and some of them may even be forced to close their doors.[2]

One of the cornerstones of market theory is the assumption that there are no barriers to entry that prevent the new, innovative schools of choice, such as the charters, from increasing their share of the market. In any real market however, as Porter (1980) points out, there are a variety of factors that might serve as barriers to entry, including the deliberate tactics of competitors, switching costs, customer loyalty, economies of scale, and government policy. Even economist Milton Friedman (1962) believes that due to market imperfections such as monopolies and neighborhood effects, government is essential in setting and enforcing the rules of the game. However, as he asserts in the example of

---

[1] For a discussion of the myriad types of choice reforms, see, e.g., Schneider, Teske and Marschall (2000), or Mintrom (2000).

[2] For the genesis of this market-based argument applied to education, see the work of Milton Friedman (1955; 1962).

medical licensure, the consequence of such a barrier to entry may be a reduction in both the quantity and quality of the service provided.

Although economic theories examining the relationship between supply and demand sides of regulation have been extant for over thirty years (Stigler, 1971; Posner, 1974; Peltzman, 1976; Hammond and Knott, 1988, to name but a few), the issue of legal barriers to entry in schooling is an area that is not rich in quantitative analysis. Here we are particularly interested in government policy—in the form of charter school legislation—as the crucial institution that shapes the market for education.[3] The only research that we are aware of on this subject is a working paper by Witte et al. (2003).[4]

In the real institutional environment of educational choice it is manifestly not the case that neoclassical perfect competition exists (Henig, 1994). For example, in their investigation of legal barriers to entry in California and Michigan, Wong and his colleagues (2000) find evidence that there is "a significant positive relationship between a supportive legal environment and charter school density." Similarly, Teske et al. (2001) note that differences in charter laws in the states they study lead to different perceptions of charter schools by school district officials and different attitudes toward adopting the innovations of the new schools. The common thread in this research is that the nature of the market is mediated by legal and political factors.

In this paper, we look at the particulars of charter school legislation and assess how they affect the ability of charter schools to gain market share. Since the Framers of the Constitution did not include education among the purposes of the federal government, state and local governments have traditionally regulated education in the U.S. As a result, there is little uniformity in how states limit competition in education (Hassel, 1999). Some state governments use legal institutions to limit charter school competition completely—Maine and Montana, for example, have not adopted any charter school law. Most states have passed some form charter school legislation that includes some barriers to the creation of charter schools or other restrictions on the chartering authority.

In order to ensure that our estimates of the effect of various charter law provisions are valid, in our empirical analysis below we also control for additional variables that the literature suggests should have an effect on the market share of charter schools.

The Importance of Charter Laws

Charter laws, as institutions shaping policy outcomes, have several important dimensions that might matter to their market share:

Multiple Sponsors

The first of these is the number of sponsoring authorities allowed to grant charters. Proponents of charter schools argue that one of the most important differences among charter laws is whether a school board is the single chartering authority or if there are other bodies that are empowered to grant charters (Hassell 1999; Kolderie 2000). A single body,

[3] Note here that we are not advancing the normative argument that a broad market for education is inherently desirable (or even that charter schools are necessarily beneficial).
[4] In contrast to our approach, Witte et al. choose to model the absolute number of charter schools in various states as opposed to their market share.

they argue, inhibits the development of numerous independent charter schools. The researchers in the Center for Education Reform (CER) make this assertion and further report that 57% of charter schools operating in the 2000/2001 academic year were approved by entities other than a local school board. States with multiple sponsors have on average nearly eight times more charter schools than states with a single sponsoring authority (CER 2003b).[5]

The importance of multiple sponsors is also emphasized in the empirical literature on charter schools. Witte and his colleagues (2003) report that authorization arrangements are a significant factor affecting the number of operating charter schools. In their study of charter schools in four cities, Teske et al. (2001) note that school and union officials in Massachusetts credit the dual nature of that state's chartering provisions with facilitating the expansion of charters. Similarly, in discussing the case of the struggle of "Margarita Ortiz" to gain approval for a charter school in Oakland, Fuller (2000) notes:

> But the Oakland school board refused to grant a charter for a new middle school; it said no to Ortiz and her comrades. The board was caught up in its own bureaucratic aloofness and penned in by the teacher union that feared the emerging threat posed by the new charters. Ortiz then figured out that Sacramento's charter law provided more than one way to secede from the education establishment. So she went to the priest, the city's fledgling Latino leadership, and well-heeled conservatives who backed school choice. Together they moved the county education office to approve their license for liberation. (2000:2).

Consequently, we hypothesize that, *ceteris paribus*, states with more charting authorities reduce the average difficulty of an applicant getting chartered and thus increase the market share of the charter sector.

Caps on Total Number

Another provision in the charter law that can have an obvious effect on the absolute number and density of charter schools is the limit on the total number of charters that can be granted. This is a common provision: only 12 out of the 36 charter laws we study[6] do not place a cap on the number of charter schools in the state/district, or on their number allowed per year. Note that we do not include a measure of caps in our statistical model, for reasons discussed below.

Allowable Applicants

A third provision of charter laws that is possibly important for charter school market penetration is the presence or absence of limits on exactly who can charter a school—for

---

[5] Even though this assertion may be true looking at the raw data, it is somewhat misleading to compare the number of charter schools in bigger states to their amount in smaller states. Our alternative below is to substitute charter school market share or density, constructed by dividing the number of charter schools in a state by the number of all schools (public and private) in the same state, for this simple count of charter schools.

[6] With regard to the availability of the data, we examine the market for schooling in the year 2000.

example, are for-profit EMO's (educational maintenance organizations) allowed, or only non-profit groups, or only groups affiliated with the traditional public schools? One reasonable conjecture is that states that permit a larger number of individuals and groups both outside and inside the structure of public schools to apply for a charter will have higher charter school market share than states that allow only public schools and their personnel to start charter schools.

Conversions

Charter schools can be either newly created or existing public or private schools can be converted into charter schools. In 2000 all states with charter laws allowed for the conversion of public schools to charter status, but only 10 allowed private school conversions.[7] It is reasonable that states that allow for both types of conversions will have, on average, more charter schools than states that prohibit private schools conversions.

Funding Provisions

Finally, the treatment of the funding of charter schools varies from state to state as well. In some states (e.g., Michigan and Minnesota) funding follows students on a per-pupil basis and charter schools receive their funds directly from the state (Hassel 1999). Alternatively, some states have more complex formulae for funding in which most funding follows students (e.g. Hawaii and Colorado). In still others (e.g., Georgia and Kansas) charter schools are part of the local school district and are funded like their fellow traditional public schools.

This last scenario creates the environment most challenging for charter schools because it is based on the expectation that local school boards will support their direct market competitors, clearly a potential conflict of interest (Mintrom and Vergari, 1997). As Hassel (1999: 83) reports, local school officials are often hostile to the charter schools in their district and may hinder the implementation of otherwise charter-friendly law. We expect that because local school boards may perceive charter schools as undesirable competitors to other schools in the district that they will take advantage of their monopoly-like power over the charter schools funds, with adverse consequences for charter market share. Conversely, we expect states that provide charter schools with full funding per each enrolled child will have a higher market share of charters.

We now turn to an empirical test of the effects of these provisions of charter law on the market share of charter schools.

Data and Hypotheses

To determine the effects of variation in charter laws on charter market share, we gather data from various sources. Our dependent variable is constructed using data on regular public schools, alternative public schools, charter schools and private schools

[7] In addition, Mississippi severely limits new start-ups. Mississippi's charter law not only prevents private school conversions but it prohibits newly created charter schools as well. Thus, only public schools can convert to charter status.

collected by the National Center for Education Statistics (NCES).[8] We simply divide the number of charter schools by the total number of schools in the state to derive the market share.

For our key independent variables, measures of charter law provisions, we use the Center for Education Reform's annual rankings of charter laws according to their "strength."[9] In 2000, the CER asked a panel of charter school experts[10] to rank each state's charter laws on several dimensions.

The panel created a scale ranging from 0 to 5 where the higher scores correspond to the environment that strongly supports the expansion of charter schools. Thus, if the state's provisions under a particular criterion were evaluated as 0 it indicates that in this state the development of charter schools is strongly restricted while the score of 5 suggests that charter schools have a high chance to flourish in a given state.[11]

We use the CER's ranking of 36 charter school laws in existence as of April 2000 to construct several of our independent variables all of which range from 0 to 5, where the higher number corresponds to the law that is supportive of charter school creation:

- *Sponsors* represents the ease of the process of granting charters. States that limit authorization to local school boards receive the lowest ranking. There are more points for having some entity other than local school board as a sole sponsor and for providing an appeals process. An advisory appeals process receives a lower score than a binding appeals process but the burdensomeness of the process is taken into account as well. States with multiple chartering authorities get the highest scores in

[8] We obtained the number of charter schools from nces.ed.gov/pubs2002/overview/table9.asp; the data for private schools are available at nces.ed.gov/pubs2002/digest2001/tables/dt063.asp; alternative and regular public schools figures are reported at nces.ed.gov/pubs2002/overview/table1.asp. We change the number of charter schools in Kansas because the NCES reports only one charter school for that state for 2000/2001 academic year. We know from other sources, such as the CER, that at that time at least four charter schools were operating in Kansas.

[9] Rankings are available for 1997 to the present from the CER's website at www.edreform.org.

[10] These charter school experts were: Jeanne Allen, President, The Center for Education Reform and Bruno Manno, Senior Fellow with the Annie E. Casey Foundation and Adjunct Fellow with the Hudson Institute. These specialists were building upon the expertise of Linda Brown, Director, Pioneer Institute Charter School Resource Center; Chester Finn, President of the Thomas B. Fordham Foundation and John M. Olin Fellow at the Hudson Institute who assisted with 1997 and 1998 ranking (CER 1998). The panel was asked to evaluate is not the original law but its amended (current) version along with the state board regulations, department of education policy, legal rulings and "the realities of actual implementation" (CER 2003a).

[11] Because not all analysts accept the CER scorecard as an unbiased measure of the strength of charter legislation (Witte et al. 2003), we correlated the CER 1997 numbers with those of Mintrom and Vergari (1997) and found a correlation between these two score exceeding .8. Witte et al. (2003) report similar results (.82 correlation) for their newly created charter school law index—which they cite as proof of their alternative measure's validity despite their warnings about the bias of the CER. In addition, our views regarding validity of the CER scorecard are supported by Henig et al. (2002: 13).

this category. As noted above, our hypothesis is that, *ceteris paribus*, states with more chartering authorities reduce the difficulty, on average, of an applicant in getting chartered—thus increasing the charter school market share.

- *Applicants* measures the variety of allowable charter schools applicants. The higher score is associated with a more diverse potential applicant pool. Thus, states that limit eligible applicants to public schools and public school personnel, received lower score than states that allow, for example, museums and other cultural institutions, or for-profit concerns, to start charter schools. Our hypothesis here is that fewer restrictions on who can start a charter should predict more charter school market share, all else equal.
- *Conversions* evaluates the process of starting charter schools with regard to whether new schools, conversions of the existing public schools and conversions of the existing private schools are allowed. The more venues there are in a state for the creation of charter schools, the higher is the score assigned to the law provision by the panel of experts. Here we predict that states that allow new start ups, public school conversions, and private school conversions encourage charter school activity more than do states that limit this set of options.
- *Funding* is a measure of the fiscal autonomy of the charter schools from their local school boards or other district controls. Our hypothesis here, as noted above, is that states that allow their charter schools more autonomy will be more attractive to entrepreneurs and thus should see a higher charter market share.

We also include several additional variables in our model as controls:

- *Alternatives* measures the market share of alternative public schools and private schools. To construct this variable, we divided the sum of private and alternative schools in a state by the total number of schools in that state. In accordance with the market model, our hypothesis is that, on average, the larger is the share of private and alternative public schools in the state, the lower is the share of charter schools.[12]
- *Professional Legislature* is a control variable that reflects the degree to which the state legislature is "professionalized" as evidenced by sessions, staff, and salaries (Mooney, 1994). More professionalized legislatures are hypothesized to be less dependent on interest groups for information and less vulnerable to the demands of powerful interests (Barrileaux and Miller, 1998; Maestas, 2000). Our hypothesis is that more professional state legislatures predict, on average, a larger charter school market share due to the lower influence of teachers' unions which are generally believed to be the most powerful education special interest (Moe, 2001; Henig et al., 1999). We follow Hamm and Moncrief (2003) and code legislatures as "professional" (coded 2), "hybrid (1), or "citizen" (0).

[12] We thus are considering the market share of all alternatives to traditional public schools as a fixed quantity to be apportioned to the various types of alternatives—in other words, a zero-sum system in which private schools, charter schools, and others are all competing for the same "shoppers." An alternative is that a larger private school market suggests a weaker "public school ideology" (Moe 2001) and thus predicts an increase in market share. We suspect, following the "marginal consumer" literature (e.g. Schneider, Teske, and Marschall 2000; 1997) that the former case is more likely.

- *Interest Group (IG) Diversity* is a measure of the degree of pluralism at the state level. Here we follow the premise that the power of even the strongest interest groups is diminished in a pluralistic system where diverse interests compete to exert their influence over public policy (Gray and Lowery, 1996). As noted above, we assume that teachers' unions are the most powerful interest group across the nation, but that they may be opposed by a variety of conservative or anti-labor interests. We use Gray and Lowery's Herfindahl index as a general measure of interest group diversity (smaller values indicate greater diversity). In general, we believe that states with the most pluralist systems (e.g. Arizona, Idaho) have a more charter-friendly environment than less pluralistic states (e.g. Massachusetts).
- *Political Culture* is another factor which varies across states and for which we control. We follow the work of Elazar (1972; 1984) who groups states in into three broad categories—traditionalist, moralistic, and individualistic—based primarily on the dominant religious factions in each state. Whereas the traditionalist states are believed to oppose innovations, and moralistic cultures should support positive actions of government (including economic regulation), "[t]he individualistic political culture emphasizes the conception of the democratic order as marketplace" (1984: 115). Because charter schools are both an innovation and a form of educational deregulation we do not expect states with prevailing traditionalist or moralistic cultures to have too much demand for charter schools. We believe, instead, that in states where individualistic culture is dominant citizens should be supportive of charter schools because they appeal to the ideas of *laissez faire* that typify this culture. We employ Elazar's operational definition of political cultures (see also Gray, 1999) to construct a dummy variable that takes on value one if the state culture is predominantly individualistic, zero otherwise.
- *Population Growth,* especially of the under 15 years of age demographic, is another possibly confounding variable for which we control. States that experience such growth (e.g., Nevada, Arizona, Florida) may face difficulties with providing schools for their growing number of students (Gray, 1999; Henig et al., 2002; Teske et al., 2000). In those states, charter schools may be a welcome means of relieving pressure on the traditional public system. In contrast, states that have been experiencing a decrease in their juvenile population (e.g., North Dakota, West Virginia, Montana, Wyoming) often must consolidate their existing schools, especially in rural areas with sparse population (Gray, 1999).[13] Thus we include a measure of the change in the population under 15 years of age in the period 1980-2000 in our model.[14] We expect that states with the highest increase in their population experience the highest charter school growth.
- *Metropolitan Population*: Another demographic factor that may affect the market share for charter schools is the density of population. Not only are heavily populated urban areas suitable for producing a pool of potential charter school operators but also—as Hassel (1999) points out—states with high levels of urbanization have a higher propensity to innovate than their less urbanized counterparts (see also Walker, 1969).

[13] Note that neither West Virginia nor North Dakota nor Montana have adopted any charter school law as of publication.

[14] We obtained the data from the Census 2000 Special reports at http://www.census.gov/prod/2002pubs/censr-4.pdf

Furthermore, urban schools are "often the most visible examples of the shortcomings of current arrangements" (Hassel, 1999). Therefore, we expect that the larger the proportion of metropolitan population in a given state, the bigger the charter school share of the market.[15]

- *Finance* measures state level per pupil expenditures.[16] We expect that the more money the state spends per child enrolled in the traditional public school the less willing are chartering authorities, particularly school boards, to introduce competition by granting a charter. Conversely, as the fiscal health of a state's school system decreases, charters are more likely to seem a viable alternative.
- *Time* represents years that passed since the law was adopted. This variable ranges from 0 for Oklahoma and Oregon to 8 for Minnesota. Our hypothesis here is simply that the marginal effect of time is to increase, on average, the market share of charter schools. In effect, this covariate is included to account for any unmodeled factors that are correlated with how long the charter law has been in place.

Statistical Model

We believe that the limited nature of our dependent variable requires a statistical model that departs somewhat from the normal methods applied in studies of this type. There is a growing literature on specialized models for percentages or proportions as dependent variables, which are particularly relevant when many observed proportions are very small or very large (and the former is clearly the case, as the market share of charter schools in many states is virtually zero). Of particular note is Paolino's (2001) maximum likelihood model that assumes the variable is distributed beta, and improves over earlier beta models by specifying separate equations for both a mean and dispersion effect.
Here we adopt Paolino's approach and, using software provided by Buckley (2003, 2002), we estimate a maximum-likelihood beta regression model.[17] Our model is:

$$\text{Market Share}_i \sim \text{Beta}(a_i, b_i) \qquad (1)$$

where

$$a_i = \frac{\left(E(\text{Market Share}_i)\right)^2 \left(1 - E(\text{Market Share}_i)\right)}{\text{Var}(\text{Market Share}_i)} - E(\text{Market Share}_i) \qquad (2)$$

[15] We used the *Almanac of the 50 States* to construct this variable.
[16] The source of the data is the U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "National Public Education Financial Survey," 1999-2000; and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1999-2000 (nces.ed.gov/quictables/Detail.asp?Key=778)
[17] Note, as discussed above, the issue of caps on the number of charter schools suggests that a censored beta model may be more appropriate. While this is a possibility for further research, in our data only one observation (Utah) has a charter market share equal to its cap. As the econometric literature on censored normal regression illustrates (e.g., Greene 1980), the bias induced by not modeling the censoring is quite small when few observations are censored.

and

$$b_i = \frac{E(\text{Market Share}_i)\left(1 - E(\text{Market Share}_i)\right)^2}{\text{Var}(\text{Market Share}_i)} - \left(1 - E(\text{Market Share}_i)\right). \quad (3)$$

This specification allows us to express both the variance and the expected value (or mean) of the dependent variable using functions that allow for the modeling of linear combinations of covariates. In our case, the mean is given by:

$$E(\text{Market Share}_i) = \frac{\exp(\mathbf{X\beta})}{1 + \exp(\mathbf{X\beta})} \quad (4)$$

where the matrix of covariates, $\mathbf{X}$, includes all of the variables described above (plus a constant) and the vector of coefficients, $\boldsymbol{\beta}$, is the target of estimation. No interactions or other nonlinear combinations are included.

The variance of market share, in turn, is given by:

$$\text{Var}(\text{Market Share}_i) = \frac{E(\text{Market Share}_i)\left(1 - E(\text{Market Share}_i)\right)}{\phi_i + 1} \quad (5)$$

where ϕ_i, the dispersion, is defined in terms of a different linear combination of covariates:

$$\phi_i = \exp(\mathbf{Z\Phi}). \quad (6)$$

Here, we include only a constant and are interested in estimating the vector $\boldsymbol{\Phi}$.

Results

The results of the estimation of our model are presented in Table 1, which gives the estimated $\boldsymbol{\beta}$ and $\boldsymbol{\Phi}$ coefficients and their standard errors.[18] As the table shows, our results support two of our hypotheses about the importance of the provisions of charter laws. We find that both an increase in the flexibility regarding who may sponsor charter schools (*Sponsors*) and more favorable provisions regarding how the charter schools may be funded (*Funding*) are statistically significant predictors of an increase in charter school market share ($p < .05$, two-tailed). Note, however, that in the case of the other two dimensions of charter laws—conversions and financial provisions—we are not able to reject the null hypotheses that these two provisions do not influence charter school market share.

[18] Also note that, following Paolino (2001), we report as a measure of model fit what he terms the "mean squared error of the estimate", which is actually the mean of $[\text{E(Market Share}_i) - \text{Market Share}_i]^2$, i.e. the mean of the sum of squared errors. This value is quite small because it is in the original scale of measurement of the dependent variable, which is a proportion bounded between 0 and 1.

Table 1
Some Provisions of Charter School Legislation Have a Significant Effect of Market Share

	Coefficient (Standard Error)
Mean Model	
Sponsors	0.399 (0.146)**
Applicants	0.146 (0.139)
Conversions	-0.353 (0.258)
Funding	0.284 (0.120)**
Alternatives	-2.906 (1.664)*
Professional Legislature	0.105 (0.351)
IG Diversity	-33.265 (14.841)**
Political Culture	0.455 (0.362)
Population Growth	1.261 (0.586) **
Metropolitan Population	-0.004 (0.015)
Finance	0.0001 (0.0002)
Time	0.123 (0.071)*
Constant	-1.581 (2.077)
Dispersion Model	
Constant	5.138 (0.254)**

** $p < .05$, * $p < .10$, two-tailed. Results are from a beta regression of charter school market share. The number of observations is 36. Paolino's MSE = 0.00009.

As the table further shows, we also find support for our hypotheses that charter schools flourish in areas with a lower share of other alternatives to traditional public schools and in areas that are in need of services for their growing school age population: the coefficients for the relevant variables (*Alternatives* and *Population Growth*) are in the predicted directions and statistically significant at at least the .10 level, two-tailed, which believe is reasonable given our small sample size and number of covariates. We also find support for our hypothesis regarding the effect of interest group diversity (*IG Diversity*) on the market share of charter schools. Finally, our measure of unmodeled duration dependence (*Time*) is also statistically significant.

Since the beta regression model is nonlinear, it is difficult to determine the substantive significance or effect sizes of the various covariates by simply examining the coefficient estimates in Table 1. Accordingly, in Table 2, we present the predicted changes in market share yielded by varying each of the statistically significant covariates in the model from its observed minimum to its observed maximum value, holding all other variables

constant at their mean or modal values, as appropriate. This allows us to better illustrate the effect of each of the covariates on market share.

Table 2
Predicted Effects of the Statistically Significant Covariates on Charter School Market Share

Variable	Prediction for the minimum value	Prediction for the maximum value	Difference
Sponsors	0.4%	2.8%	2.4%
Funding	0.4%	1.8%	1.4%
Alternatives	1.5%	0.7%	-0.8%
Population Growth	0.6%	5.0%	4.4%
IG Diversity	2.0%	0.5%	-1.5%
Time	0.6%	1.7%	1.1%

The first two rows of Table 2 present the effects of sponsorship and funding provisions of charter laws. Holding all else equal, as the table shows, changing a state's CER rating from the lowest to the highest category on these measures predicts, on average, an increase of 2.4% in market share for sponsors and 1.4% for funding. Considering that the sample average market share of charter schools is about 2%, these are clearly substantively significant effects.

Indeed, as the remaining rows of Table 2 illustrate, the marginal effects of the other significant control variables on predicted charter market share—alternative, non-charter competitors (-0.8%), interest group diversity (-1.5%), and simply time itself (1.1%)—are all similar in size to these two areas of charter legislation. Only the effect of population growth, 4.4%, is significantly larger than the sponsors and funding provisions effects.

Discussion

"Institutions matter" is a familiar refrain in political science and policy studies, and it comes as no surprise that they matter in the case of school choice policy. The institutional environment that states create for their school choice initiatives (or, more accurately, the environment created by political conflict and compromise) can have a profound effect on the performance of policies and programs, including market-based reforms. In our examination of the effect of charter school legislation on market share, we find that two particular sets of provisions regarding who can sponsor charters and how charter schools are funded have a substantial effect on their share of a market for education. This finding supports earlier qualitative research and anecdotal evidence suggesting that multiple

sponsoring authorities enable charter school founders to avoid procedural or political obstacles occasionally erected by one authority, and that funding provisions are an essential component of any market-based education reform.

A second finding that should be of interest to all sides in the school choice debate is the importance of population growth as an engine driving the proliferation of schools of choice. This is not unexpected; for example, in interviews with school administrators and teacher union officials in Massachusetts and New Jersey, Teske et al. (2001) note that even skeptics of charter schools recognize their potential usefulness in reducing overcrowding and improving student-teacher ratios in the traditional public schools. As we note above, we estimate the size of this population effect to be even greater than that of the charter law provisions. Nevertheless, the sponsorship and funding provisions are still, empirically, quite significant.

Those applying the market model to even private goods must take into account the actual institutional arrangements, historical circumstances, and other factors that may make the market less than fully competitive. This point is even more germane in the case of public goods. Since at least 1990, with the publication of Chubb and Moe's seminal study of school choice, advocates of market-like approaches to school reform have been forced to pay at least superficial attention to how markets for schools might actually function. Our work shows that the concern for how public policies affect access to the local market for schools matters substantially. Consistent with economic theory that emphasizes the importance of barriers to entry, our findings suggest that actors who either support or oppose the successful spread of charter schools as an educational alternative have, in the sponsorship and funding provisions of charter legislation, a potentially powerful lever for affecting the market share of the charters. In turn, both proponents and opponents of charter schools are justified in focusing on these seemingly minor provisions of charter laws.

Acknowledgment
Thanks to Mark Schneider and Paul Teske for their helpful comments on earlier revisions.

References

Barrilleaux, Charles J., and Mark E. Miller. 1988. "The Political Economy of State Medicaid Policy." *American Political Science Review* 82(4): 1089-1107.

Buckley, Jack. 2003. "Estimation of Models with Beta-Distributed Dependent Variables: A Replication and Extensions of Paolino (2001)". *Political Analysis* 11(2): 204-205.

Buckley, Jack. 2002. *MLBETA: A STATA Ado File for the Maximum-Likelihood Estimation of Models with Beta-Distributed Dependent Variables.* Available at www2.bc.edu/~bucklesj.

Center for Education Reform. 1998. "Ranking Of Charter Legislation Released; California Jumps into the Top Ten, Mississippi Still Weakest in Nation, Four New States Join the Charter Ranks." Washington, D.C. Posted December 2, 1998. Accessed July 25, 2003.

Center for Education Reform. 2003a. "CER Releases 8th National Charter School Directory. Some 2,700 Schools Serve Nearly 685,000 Students Nationally." http://www.edreform.com/press/2003/csdirectory.htm. Washington, D.C. Posted January 21, 2003. Accessed July 25, 2003.

Center for Education Reform. 2003b. "Testimony Before the Maryland Senate Education,

Health and Environmental Affairs Committee." Washington, D.C. Posted February 6, 2003. Accessed July 25, 2003.

Cheung, Stella, Mary Ellen Murphy, and Joe Nathan. 1998. "Making a Difference? Charter Schools, Evaluation and Student Performance." Minneapolis, MN: Center for School Change.

Chubb, John, and Terry Moe. 1990. "Politics, Markets, and America's Schools." Washington, D.C.: Brookings Institution Press.

Elazar, Daniel. 1972. *American Federalism: A View from the States.* New York: Crowell.

Elazar, Daniel. 1984. *American Federalism: A View from the States.* 3rd ed. New York: Harper & Row Publishers.

Finn, Chester E., Jr., Gregg Vanourek, and Bruno V. Manno. 2000. *Charter Schools in Action: Renewing Public Education.* Princeton, N.J.: Princeton University Press.

Friedman, Milton. 1955. The Role of Government in Education. "Economics and Public Interest." R. A. Solo. New Brunswick, N.J., Rutgers University Press.

Friedman, Milton. 1962. "Capitalism and Freedom." Chicago: University of Chicago Press.

Fuller, Bruce. 2000. "Introduction: Growing Charter Schools, Decentering the State." In Bruce Fuller (ed.). *Inside Charter Schools: The Paradox of Radical Decentralization.* Cambridge, Mass.: Harvard University Press.

Gill, Brian P., P. Michael Timpane, Karen Ross, and Dominic J. Brewer. 2001. "Rhetoric Versus Reality: What We Know and What We Need to Know About Vouchers and Charter Schools." Santa Monica, CA: Rand Corporation.

Gray, Virginia. 1999. "The Socioeconomic and Political Context of States." In Virginia Gray, Russell L. Hanson, and Herbert Jacob (ed.) *Politics in the American States: A Comparative Analysis,* 7th Edition. Washington, D.C.: CQ Press.

Gray, Virginia, and David Lowery. 1996. "The Population Ecology of Interest Representation: Lobbying Communities on the American States." Ann Arbor, MI: University of Michigan Press.

Greene, William. 1980. "On the Asymptotic Bias of the Ordinary Least Squares Estimator of the Tobit Model." *Econometrica* 48: 505-514.

Hamm, Keith E. and Gary Moncrief. 2003. "Legislative Politics in the States," in Politics in the American States, Eight Edition, Virginia Gray and R. Hanson eds. Washington, D.C.: CQ Press.

Hammond, Thomas, and Jack Knott. 1988. "The Deregulatory Snowball: Explaining Deregulation in the Financial Industry." *Journal of Politics,* 50: 3-30.

Hassel, Bryan M. 1999. *The Charter School Challenge: Avoiding the Pitfalls, Fulfilling the Promise.* Washington, D.C.: Brookings Institution Press.

Henig, Jeffrey. 1994. *Rethinking School Choice: Limits of the Market Metaphor.* Princeton; Princeton University Press.

Henig, Jeffrey R., Michele Moser, Thomas T. Holyoke, Heath Brown, and Natalie Lacireno-Paquet. 2002. "The Political Dynamics of State Charter School Policies." Paper prepared for presentation at the Annual Meeting of the American Political Science Association, Boston, Massachusetts, 2002.

Henig, Jeffrey R., Michele Moser, Thomas T. Holyoke, and Natalie Lacireno-Paquet. 1999. Making a Choice, Making a Difference? An Evaluation of Charter Schools in the District of Columbia. Washington, D.C.: The Center for Washington Area Studies, George Washington University.

Hill, Paul, Lawrence C. Pierce, and James W. Guthrie. 1997. *Reinventing Public Education.* Chicago: University of Chicago Press.

Kolderie, Ted. 2000. "The Charter Idea: Update and Prospects." Center for Policy Studies, St. Paul, MN.

Maestas, Cherie. 2000. "Professional Legislatures and Ambitious Politicians: Policy Responsiveness of State Institutions." *Legislative Studies Quarterly* XXV: 663-690.

Maranto, Robert Antony, Scott Milliman, Frederick Hess, and April Gresham. (1999). "Arizona Charter Schools and District Schools." In Maranto, Milliman, Hess and Gresham, eds. *The Frontiers of Public Education: Lessons From Arizona Charter Schools.* Boulder, Colorado: Westview.

Mintrom, Michael. 2000. *Policy Entrepreneurs and School Choice.* Washington, D.C.: Georgtown University Press.

Mintrom, Michael, and Sandra Vergari. 1997. "Charter Schools as a State Policy Innovation: Assessing Recent Developments." *State and Local Government Review* 29(1): 43-49.

Moe, Terry M. 2001. *Schools, Vouchers, and the American Public.* Washington, D.C.: Brookings Institution.

Mooney, Christopher Z. 1994. "Measuring U.S. State Legislative Professionalism: An Evaluation of Five Indices." *State and Local Government Review* 26: 70-78.

Paolino, Philip. 2001. "Maximum Likelihood Estimation of Models with Beta Distributed Dependent Variables." *Political Analysis* 9(4): 325-346.

Peltzman, Samuel. 1976. "Toward a More General Theory of Regulation." *Journal of Law and Economics* 19: 211-240.

Peltzman, Samuel. 1989. "The Economic Theory of Regulation after a Decade of Deregulation." Brookings Papers: Microeconomics.

Porter, Michael. 1980. *Competitive Strategy.* New York, NY: Free Press.

Posner, Richard A. 1974. Theories of Economic Regulation. *Bell Journal of Economics and Management Science* 5: 335-58.

Rofes, Eric .1998. "How Are School Districts Responding to Charter Laws and Charter Schools?" Berkeley, Calif.: Policy Analysis for California Education (PACE).

Schneider, Mark, Paul Teske, Christine Roch, and Melissa Marschall. 1997. "Networks to Nowhere: Segregation and Stratification in Networks of Information about Schools." *American Journal of Political Science* 41:1201-1223.

Schneider, Mark, Paul Teske, and Melissa Marschall. 2000. *Choosing Schools: Consumer Choice and the Quality of American Schools.* Princeton, NJ: Princeton University Press.

Stigler, George.1971. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science* 2: 3-21.

Teske, Paul, Mark Schneider, Jack Buckley, and Sara Clark. 2001. "Does Charter School Competition Improve Traditional Public Schools?" In Paul E. Peterson and David Campbell (eds.) *Charters, Vouchers and Public Education.* Washington, D.C.: Brookings Institution Press.

Walker, Jack L. 1969. The Diffusion of Innovation among the American States. *The American Political Science Review* 63: 880-899.

Witte, John F., Arnold F. Shober, and Paul Manna. 2003. "Analyzing State Charter Laws and Their Influence on the Formation of Charter Schools in the United States." Paper presented at the Annual Meeting of the American Political Science Association, August 28-31, Philadelphia.

Wong, Kenneth, Francis Shen, and Gabrielle Novacek. 2000. "Institutional Effects of Charter Schools: Competition, Innovation, and Segregation." Presented at the 2000 Annual Meeting of the American Political Science Association, August 31-September 4, Washington, D.C.

About the Authors

Simona Kúscová
Department of Political Science
Stony Brook University
Stony Brook, NY 11794

Simona Kúscová is a Ph.D. candidate in Political Science at the State University of New York, Stony Brook. Her research interests are in the fields of education, and legal systems.

Jack Buckley
Department of Educational Research,
Measurement, and Evaluation
Boston College
Lynch School of Education
Chestnut Hill, MA 02467
bucklesj@bc.edu

Jack Buckley is Assistant Professor of Educational Research, Measurement, and Evaluation at Boston College's Lynch School of Education. He researches and teaches applied statistics and educational policy. His training is in political science and public policy, and he has researched several aspects of school choice and education privatization.

Education Policy Analysis Archives http://**epaa.asu.edu**

Editor: Gene V Glass, Arizona State University

Production Assistant: Chris Murrell, Arizona State University

General questions about appropriateness of topics or particular articles may be addressed to the Editor, Gene V Glass, glass@asu.edu or reach him at College of Education, Arizona State University, Tempe, AZ 85287-2411. The Commentary Editor is Casey D. Cobb: casey.cobb@uconn.edu.