

## Analyzing the Demand for Charter Schools

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### **Abstract**

Charter schools have become a permanent feature in America's public education landscape, accounting for 1 of every 14 public schools. They have been studied– and consequently vilified or glorified– from the perspective of parental satisfaction, financial responsibility, disciplinary and academic outcomes, and a swath of other performance metrics. However, charter school authorization has not been previously studied through the lens of institutional economics, which analyzes such developments in light of their institutional and organizational environment. My paper looks at the demand for charters at a district level, to answer the question of whether these localities share a similar institutional and organizational environment. To measure this, I identify a wide range of variables to measure the influence of informal institutions and surrounding organizations, then measure their impact upon whether or not the school district has charter schools and students attending them. Many of my findings back earlier research, supporting the view that charters are more likely to be chosen in urban, impoverished, and racially diverse school districts. However, this project also reveals that certain informal institutional constraints, such as religion or perceptions about women in the workplace, do not play a significant role. Finally, I show that the role of two organizational influences, that of the local traditional public schools and teachers' unions, have respectively positive and negative significant impacts on the authorization of charters. These findings enhance our understanding regarding which environments are welcoming to school choice in the form of charters and can help provide a framework for successful school choice policy down the road.

## **Introduction**

Charter schools have received a lot of attention since the first one opened its doors in Minnesota during the fall of 1992. Indeed, with Alabama becoming the 43th state to authorize charter schools, families across the nation have deliberately decided that charter schools are here to stay. Such a widespread—and still controversial—movement has been well-researched by many different evaluations, ranging from student performance (Hoxby, Murarka, and Kang 2009; Bifulco and Ladd 2006), to parental satisfaction (Wohlstetter, Nayfack, and Mora-Flores 2008), diversity (Weiher and Tedin 2001), success in teaching civic virtues (Wolf 2007), economic impacts (Hoxby 2007), and countless more. Departing from an outcomes-based approach, this paper is interested in analyzing these shifts from the demand-side, to determine if these chartering districts share a similar institutional and organizational environment. This distinct approach is primarily informed by the perspective of institutional economics, which emphasizes the role of both informal and formal institutions in shaping individual decision-making (North 1991 and Coase 1998). While previously applied to economic development, the question that I answer is whether the influences of local organizations and informal institutions will shape whether or not a district will embrace charter schools as a choice of educational organization. I first control with socioeconomic data, gleaned from past research, and add proxies for the influence of certain interested organizations and informal institutions at the school district level to get a clearer picture of the types of communities that are chartering schools and sending their children to them.

As control variables, I selected measurements of the district's percentage of dropouts from local traditional public schools, the percentage of families in poverty, the

percentage of nonwhite households, and the district's categorized locale, which are both proxies of satisfaction with current schooling options (most parents who cannot afford private schools would look for alternatives to sending their child to a failing or overcrowded school). The proxies chosen for the organizational influence, the local traditional public schools and teachers unions are measured by local dropout rates and the percentage of the district employed in education, health care, and social work. Finally, the best informal institutional variable to measure the impact of culture and social norms at a school district level is religion, so I collected the closest available measure for strength of religion, proportion of religious adherence by county, and matched it with each district.

My hope is that the results will add clarity to our perception of the kinds of families that are taking action in their community to have this option for school choice available to their children. This would suggest that they the traditional public school system and/or their local private schools are no longer living up to their organizational purpose, incentivizing these agents of change to create another choice.

### **Literature Review**

There exists a plethora of studies covering charter schools, not to mention the entire school choice movement at large. The origin of charters, school choice, is the effort to return back to parents their agency in choosing the characteristics of the school that their child attends; policy mechanisms include vouchers and tax credit scholarships, which allow the dollars to follow the student, and charter schools, which provide another publically-funded choice for local families that they can customize to best fit the district's needs. There are a few notable field experts in this prominent national conversation. Caroline M. Hoxby, beginning with her paper "Does Competition Among

Public Schools Benefit Students and Taxpayers?” (1994), has done extensive research on the school districts of metropolitan areas, primarily New York and Chicago. Though measuring different outcomes each time, her findings show that programs for school choice, through increasing competition amongst traditional public schools, result in modest improvements in educational outcomes and financial benefits for certain groups of students, while having little impact on other groups of students. A more recent paper, “The Impact of Charter Schools on Educational Achievement” (Hoxby and Rockoff, 2004), reports:

I show that, compared to their lotteried-out fellow applicants, students who apply to and attend charter schools starting in the elementary grades score about six national percentile rank points higher in both math and reading.

Other experts, such as Angrist, Pathak, and Walters (2013), build their studies upon this existing evidence suggesting that charter schools can dramatically increase performance for minority students in high-poverty areas. After accounting for student demographics and differences within the schools, Angrist et al. found that urban charter schools that implement the “No Excuses” philosophy\* generate Math and English Language Arts gains of 0.21 and 0.15 standard deviations larger than the effects of regular charter schools. Their school-level variable findings are consistent with research in New York reported by Dobbie and Fryer (2011), that points to high expectations, frequent teacher feedback, high-dosage tutoring, increased instruction time, and data-driven instruction as the five key components to charter school effectiveness. They conclude from their Massachusetts sample that urban charter schools using the “No Excuses” approach

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\* “No Excuses” is a charter school model that involves high disciplinary standards, increased face-to-face time in the classroom, and (usually) uniforms.

generate positive results, especially for minority students from high-poverty backgrounds, while “non-No Excuses” schools in urban or rural settings do not generate any measurably positive results. Citing these studies is just to lend insight to the fact that the charter school debate is multifaceted and involves many factors.

There have been multiple instances of econometric research on the characteristics of districts in which charters locate that have informed my selection of socioeconomic controls. Glomm, Harris, and Lo (2005) have found from their sample in Michigan that more charters are located in districts with diverse populations, in terms of racial diversity and adult educational attainment. They also found that they locate in districts with low public school achievement. In studying household choices amongst schools, Ferreyra and Kosenok (2013) found in their panel data for Washington, D.C. that African American and Hispanic households have higher preference for charters than whites, as well as poorer households being likelier to send their children to charter schools in their district. Thus, my estimation equation involves controls for racial diversity, educational attainment, quality of the local public schools, and family poverty.

My paper extends the study of school choice in the form of charter schools by turning to the demand-side, evaluating how the informal institutions and organizations govern a district’s approach to providing their children with an education that best fits their needs. The lens of institutional economics was useful in describing this particular change in the “rules of the game,” and I draw my definitions from North’s (1991 and 1993) work on the subject of institutions. To begin, he distinguishes between formal institutions, which is the rule of law, informal institutions, which correspond to social norms and religious rules, and organizations, which may be the city council, trade unions, or educational bodies like schools. These organizations have been fashioned

purposefully, and when they do not fulfill their mission, we find “the most fundamental long run source of change is learning by individuals and entrepreneurs of organizations” (1993, V). Finally, North (1995) notes that,

The constraints imposed by the institutional framework (together with the other constraints) define the opportunity set and therefore the kind of organizations that will come into existence (3).

When applied to the topic of charter schools, the wave of states’ charter authorizations, a shift in formal institutions, display an underlying current of individuals of organizations who sought to change it based upon their view that the current educational organization, traditional public schools, was not serving the purpose for which it was intended—the complete education of its students.

While a review of the current school choice literature helped to identify the specific variables that would be useful to measure, the framework of my research question was inspired by the findings of New Institutional Economics. Although Williamson (2000) is clear “that we are still very ignorant about institutions... Chief among the causes of ignorance is that institutions are very complex,” I saw merit in refining this analysis at the local level of school districts (595). Though still very imperfect, this simpler approach eliminates many of the complications intertwined within past applications, notably to third world development in identifying how a successful institutional framework can fit with the informal institutional features of a community (North 1995). Ronald Coase (1998) describes New Institutional Economics as “a complicated set of interrelationships” between “the influence of the laws, of the social system, and of the culture, as well as the effects of technological changes such as the digital revolution with its dramatic fall in information costs” (73). Here he identified

what may be the impetus of this innovation, namely, the fact that more families are able to compare the performance of their schools with a larger network. My paper extends the study of institutional economics by analyzing the potential for an organizational change, unleashed by a change in formal institutions. I ask: What is the informal institutional and organizational environment in school districts that are welcoming to charter schools?

### **Data & Estimation Approach**

Knowing that educational choices are truly a family affair, I gathered “grass-roots” data on households in every school district across the nation. The goal of the particular variable selection was to control for the already known socioeconomic factors that influence the likelihood that a district has a charter, in addition to proxies for both the informal institutions and interested organizations. The socioeconomic characteristics that I include are family poverty, diversity, district locale, educational attainment, and the proportion of females in the workforce. The proxies for the relevant organizations, being the quality of local public schools and prevalence of teachers’ unions, are measured by the rate of dropouts from local public schools and the proportion of the population employed in education, healthcare, or social work—which is unfortunately the closest measure I was able to find. The informal institutional proxy, for cultural and social norms, was the religious adherence rates in the county in which the district was located. The benchmark estimation equation is as follows:

$$\begin{aligned} Charter\_Students_i = & \beta_0 + \beta_1 local\_dropouts_i + \beta_2 fam\_diversity_i + \beta_3 fam\_poverty_i + \\ & \beta_4 locale_i + \beta_5 females\_employed_i + \beta_6 educ\_attain_i + \beta_7 educ\_employed_i + \\ & \beta_8 church\_adhere_i + \varepsilon_i \end{aligned}$$

The dependent variable, which captures how welcoming a school district is to charter schools, measures the number of students enrolled in charter schools (both estimates for the years 2010-15). The remaining eight states without charter authorization laws (as of 2015), that is, Alabama, Kentucky, Montana, Nebraska, North Dakota, South Dakota, Vermont, and West Virginia, were removed because even if the families of the school district are interested in chartering a school, the overarching state law does not allow them the freedom of this decision. This was done because no matter the informal institutional and organizational environment, the community was automatically restricted from chartering a new school for their children.

To measure poverty, I used the “Poverty Status in the Past 12 Months of Families” from the Census data in 5-year estimates in 2014. This metric captures the percentage of families in a school district whose income in the past 12 months was below the poverty level. In order to measure racial diversity, I used the same set of 5-year estimates, but the “Selected Economic Characteristics” data from the Census. This specific variable measures the percentage of non-white householders within each school district. The rate of dropouts from local traditional public schools and the 12-level coded locale of the district were taken from the Local Education Agency (School District) Universe Survey Dropout and Completion Data (2009-10) from the NCES. The locale of districts is coded in a range from 11 (City-Large) to 43 (Rural-Remote). Educational attainment, measured as the percentage of the population with bachelor’s degrees or higher, was again from the Census, as presented in the “Educational Attainment” dataset. The percentage of the population employed in educational services, health care, or social services, as well as the percentage of females participating in the work force, was gleaned using the “Selected Economic Characteristics” dataset as well. Unfortunately,



there was no available measure for weekly church attendance per school district, which would have provided a strong indicator as to the influence of religion as an informal institution within a school district. However, the U.S. Religious Census in 2010 did report measurements by county, so I utilized the rate of church adherence per 1,000 people in each county and then matched the county with the school districts. Finally, I cleaned the data by dropping all observations in each of the variables that had no recorded data. This refined the set of districts from just under 13,000 to around 9,000.

The results are as follows in Table 1:

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min.	Max.
Charters	9076	.25	3.68	0	264
Charter Students	9076	94.30	1781.34	0	136185
Percent of Families in Poverty	9076	10.45	6.67	0	57.1
Percent of Non-white Householders	9076	11.30	14.96	0	100
Percent of Females in the Labor Force	9076	56.67	7.81	0	100
Percent of population with BA or higher	9076	22.71	13.04	0	87.1
Percent of population employed in education, health services, or social work	9076	23.34	5.67	0	75

Percent of Church Adherents by County	9076	502.00	172.59	0	1234.53 <sup>†</sup>
Locale of the district	9076	33.49	9.92	11	43
Rate of dropouts from local public schools	9076	-1.64	4.55	-9	82.3

Next, as many of the variables presumably have an influence on one another, I ran the correlation. The strongest correlations were with family poverty in a district, but as this was just a control variable and not one of interest, there are no concerns. Full results are in [Table 2](#) below:

**Table 2:** Correlation between Independent Variables

	Families in Poverty	Non-white Householders	Females in the Labor Force	Population with BA or higher	Population employed in education, etc.	Church Adherents	Locale	Dropouts
Families in Poverty	1							
Non-white Householders	0.4797	1						
Females in the Labor Force	-0.4162	-0.0592	1					
Population with BA or higher	-0.4888	-0.0062	0.3256	1				
Population employed in education, etc.	0.0011	0.0770	0.0715	0.2408	1			
Church Adherents	0.0768	0.0030	-0.0652	-0.0976	0.0101	1		
Locale	0.0417	-0.2948	-0.2884	-0.4462	-0.1354	0.1075	1	
Dropouts	0.2290	0.2625	-0.0354	-0.0959	-0.0073	-0.0493	-0.1409	1

<sup>†</sup> “There are 31 counties or equivalents for which the number of reported adherents exceeds the total population in 2010. Reasons for the discrepancy will differ from county to county, but the most plausible would include U.S. Census undercount, church membership overcount, and county of residence differing from county of congregational membership” (U.S. Religion Census: Religious Congregations and Membership Study, 2010).

Again, these variables were collected to reasonably account for all groups of a community that might be interested in whether or not a charter school is chartered in their school district. My regression analysis confirmed some well-known results concerning the success of charters in urban, impoverished districts with high drop-out rates but sheds light on other interested parties by demonstrating their correlation with charter school openness, across majority of school districts within the United States.

### **Methods & Results**

Each of the regressions was run to estimate two similar dependent variables, the number of charter schools and the number of students attending charter schools within a district, as a robustness check. The first analysis that I ran was a tobit regression, which accounts for the 8,567 districts out of the total 9,074 districts without a charter school, thus balancing the severely censored data around zero. The results of the tobit estimation regressions in [Table 3](#) are reported for all states who have authorized charter schools, and therefore the school districts are able to authorize a charter school should they so desire. As the dependent variable is count data, meaning that it is a non-negative integer with a small range of values, I ran a negative binomial regression since the variance is larger than its mean. Finally, I ran probit regressions for both dependent variables in order to simplify the relationship between the independent variables and whether or not the school district has a charter school as a binary measure. To reiterate, my purpose in these regressions is to determine the informal institutional and organizational environment within school districts that are open to charter schools.

**Table 3: Estimations of Openness to Charters by School District Variables**

	Tobit		Negative Binomial		Probit (marginal effects)	
	Charter Students	Charter Schools	Charter Students	Charter Schools	Charter Students	Charter Schools
Locale of the district	-252.57*** (77.89)	-0.54*** (0.14)	-0.11*** (.01)	-0.10*** (.01)	-0.003*** (0.00)	-0.003*** (0.0002)
Rate of dropouts from local public schools	120.67** (51.21)	0.27*** (0.10)	0.11*** (.03)	0.05*** (.02)	0.001*** (0.00)	0.001*** (0.0004)
Percent of non-white householders	38.32** (17.10)	0.08** (0.03)	0.03*** (0.01)	0.02*** (0.01)	0.0003** (0.00)	0.0003** (0.00)
Percent of families in poverty	137.15*** (55.88)	0.26*** (0.10)	0.05** (0.03)	0.04** (0.02)	0.001*** (0.00)	0.001*** (0.00)
Percent of females in the labor force	9.56 (29.14)	0.02 (0.06)	-0.01 (0.01)	0.00 (0.01)	0.0001 (0.00)	0.0009 (0.00)
Percent of population with BA or higher	63.99*** (24.81)	0.12*** (0.05)	0.07*** (0.02)	0.02*** (0.01)	0.001*** (0.00)	0.0006*** (0.00)
Percent of population employed in education, health services, or social work	-316.48*** (104.94)	-0.64*** (0.20)	-0.12*** (0.00)	-0.11*** (0.02)	-0.003*** (0.00)	-0.003*** (0.00)
Percent of church adherents by county	-1.64* (0.00)	-0.004* (0.00)	-0.0005 (0.00)	-0.0003 (0.00)	-0.00002* (0.00)	-0.0002* (0.00)
Constant	-2184.81	-3.68	7.48	2.38		
Observations	9076	9076	9076	9076		
R-squared	0.0299	0.0560	0.0182	0.0979		

Robust standard errors in parentheses

\*\*\* 1% significance, \*\* 5% significance, \* 10% significance

As is evident across each of the estimation equations, not a single coefficient sign is changed, which reveals that I can be reasonably confident that the direction of the impact that each independent variable has upon the dependent variable is consistent and robust. Thus, the assumptions of the control variables from past research on charter school productivity are confirmed, since school districts that are more open to charter schools tend to be more urban, with high dropout rates from local traditional public high schools, and with high poverty. However, high levels of diversity, high educational attainment, a low proportion employed in education, healthcare or social work, and lower church adherence also display significant impacts on the district's openness to charters.

When it comes to interpreting the tobit regression specifically, the most striking feature is that the poverty measure generates such a positive, statistically significant (at the 1% level) coefficient. This is interpreted to mean that a 1 percentage point increase in family poverty within a school district means that the number of students in charter schools increases by 137. Unsurprisingly, there is also a very strong relationship between the drop-out rate at the local traditional public schools and the number of charter schools within a district. For instance, when comparing a district with a 11% drop-out rate increased from a district with a 10% drop-out rate, the number of students attending charter schools would be greater by about 120 students. The same direction of impact holds true for a 1% increase in nonwhite householders (increasing in the number of students in charters by 38) and the percent of the population with a BA or higher (64 more students). There are a few reasons that might explain why communities that are diverse and educated are in favor of charter schools. I would postulate that this is because local traditional schools are excessively "one-size-fits-all" in their approach

when it comes to providing satisfactory educational outcomes to diverse communities. Furthermore, diverse and educated communities would be allured by the promise of better outcomes and unique educational opportunities, as many models of charters include distinctive features such as bilingual or STEM training.

Next, I see that the percentage of females in the labor force has no statistically significant impact on whether or not the district has a propensity for charters. One possible explanation for this is that my variable was not specific enough to capture the effect of working mothers, or that both stay-at-home mothers and working mothers have extremely varied responses to charter schools. Turning an eye toward the “cultural” variables negatively impacting the warmth of a district towards charters, the percentage of the population employed in education, healthcare and social services and the church adherence per 1,000 people impact the number of students in charter schools within the school district negatively. Though very strong and significant, the beta for the percentage of the population employed in education, healthcare, and social services represents a complex web of reasons. Numerically, this means that for every 1 percentage point increase in education/healthcare/social services employees, about 316 less students would be in charter schools within that school district. This merits the need to explain this relationship across all three sectors. My hypothesis would be that this is capturing the negative sentiment of teachers’ unions, as they are strongest where their number of employees is the highest, and also a caution towards charters on the part of healthcare and social work personnel. Lastly, the beta for church adherents is negative and significant at the 10% level, although very small. This could be because those who display strong preferences for religion are more apt to find educational alternatives in the private school sectors; in other words, their demand for private,

religious schools would be inelastic even regardless of the high cost and failing public school alternatives.

### **Conclusion**

In conclusion, this paper was aimed at extending the scope of the school choice debate to the school district demand, in order to analyze the incentives and constraints from informal institutions and organizations which are authorizing charter schools. My hope is to illustrate a clearer picture of the families that are building charters and sending their children to them. My research shows that charter schools are the chosen educational organization for districts that generally are home to high diversity, high drop-out rates in the local traditional public schools, high poverty rates, and high educational achievement. Charters are more unlikely to be found in districts with large amounts of the population employed in the education, healthcare, and social work sector or, to a much lesser extent, in districts with a larger proportion of church adherence. This causes us to examine our assumptions about the kind of families who send their children to these schools—it follows that minorities, the educated, and the impoverished alike are attracted by charters. This study provides a small signal to policymakers that these groups of people are interested and invested in this form of school choice. When it comes to implementing policy, we would do well to heed an old philosopher's advice about staying near to the mean—neither hailing charter schools as the savior for all educational woes but also acknowledging that they definitely provide benefits to the school districts who make the deliberate decision to authorize them and send their children to them.

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