

Beyond Achievement: Enrollment Consequences of Charter Schools in Michigan

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Abstract

One of the biggest public school reform movements in the past decade has been the passage of charter school laws. Forty states and Washington, D.C. have approved legislation that allows charter schools to operate within their jurisdictional boundaries. The academic research thus far has focused on where charter schools have located and the achievement consequences of the schools. This paper addresses a direct effect of charter schools by examining their enrollment consequences. We find that in Michigan approximately 20 percent of the students who enroll in charter schools were previously enrolled in private schools and approximately 80 percent move from the traditional public schools.

JEL classification code: I2

I. Introduction

One of the most important reform movements in the K-12 public school system over the past decade has been states' passage of charter school laws and the subsequent establishment of charter schools. Forty states and Washington, D.C. have approved legislation that allows charter schools to operate within their jurisdictional boundaries. Since the first charter law passed in 1991, individuals and institutions have responded by opening over 3,500 charter schools and enrolling nearly 1 million students nationwide.

The academic research relating to charter schools has primarily addressed two major questions. One avenue of research has examined the political economy issues surrounding the passage of charter school laws (Stoddard and Corcoran, 2005) and the subsequent location or supply of charter schools (Glomm, Harris, and Lo, 2005). The second and larger strand of research has focused on the achievement effects of charter schools both on the charter-enrolled students and on students in the traditional public schools (Bettinger, 2004; Buddin and Zimmer, 2005; Bifulco and Ladd, 2005; Sass, 2005; Booker et al., 2004; Hanushek, Kain, and Rivkin, 2002; Hoxby and Rockoff, 2004; Zimmer et al, 2003; Solmon, et al., 2001).

Like all school reform efforts, charter school legislation presumably is intended to improve performance in the public school system. Scholars and the public view charter laws as ones that were passed to free schools from the bureaucratic burdens of traditional public schools, to stave off more radical school voucher proposals, to provide choice to particular segments of the population who might otherwise leave the system or be poorly served by the system, or to introduce competition between schools.

While the aim of charters may be to increase support for the public schools, few scholars have directly addressed the consequences of charters beyond looking at the achievement effects. We propose to do so by looking at enrollment patterns. In particular, we look at a single state, Michigan, over a five-year period involving rapid growth of charter schools and look in some detail at enrollment in charter schools vis-à-vis other school types. As part of this analysis, we examine the effect charter schools have on private school enrollment. Whether charter schools can attract students from private schools is an important question because if they can, the public burden of educating students may increase as these schools will bring in students who previously exerted little demand on public resources. We hypothesize that individuals choose charter schools if they anticipate greater satisfaction from this school type than from others, regardless of whether they are traditional public or private schools. Empirically, we find that almost one fifth of the enrollment in the Michigan charter schools comes from the private sector while over four fifths comes from traditional public schools.

II. Reform Implications

Since the 1970s there have been many school reform efforts that have directly or indirectly affected enrollment in the public education system. One reform that has received a great deal of scholarly attention, as well as attention by state courts and legislatures, has been the shift in financing of schools from local property tax bases to more centralized state sources of funding. The literature is lengthy and somewhat inconclusive regarding the long-term effects of the shift in financing methods on the voter-taxpayers' support for public schools. Several scholars have argued that the decline

in financial support for California public schools and the increase in private school enrollment are attributable to the *Serrano v. Priest* court case that overturned the local property tax as the base for financing public schools (Sonstelie, 1979; 1995; Downes and Shoeman, 1998). Fischel (1992) argues that any shift in financing away from localities weakens the link between school quality and property values and, therefore, results in less support for the publicly provided good.

Nechyba (2003) has raised conceptual questions about the net effect of centralized financing. While caps on spending in high income districts presumably weaken the public's support for schools in those districts and lead to increases in private enrollment, low income districts may gain from the change and increase public school enrollment. Furthermore, because centralized financing weakens the relationship between housing quality and school quality, persons may sort into areas where they previously would have chosen not to live and create additional pressure for higher quality public schools.

While scholars have given significant attention both conceptually and empirically to the intended and unintended consequences of centralization of funding (Fischel 1989; 1992; Theobald and Picus, 1991; Murray, Evans, and Schwab, 1998; Downes and Shoeman, 1998; Moser and Rubenstein, 2002; Zimmer and Jones, 2005), they have given less attention to whether the major structural reform of the nineties, the advent of charter schools, increases or decreases various forms of support for public schools. As we will describe below, the establishment of charter schools should influence taxpayer demand for the public schools and influence support for private sector schooling.

To understand how charter schools might affect the taxpayers' support for the public schools, it is useful to describe some of the institutional features of charter laws.

Charter schools are publicly financed schools that operate outside the regulations of the traditional public schools. The extent to which the regulations are loosened varies by state and according to the type of charter law that has been passed.¹ Charter schools cannot charge tuition and are funded on a per-pupil formula that varies across states from as low as 50 percent of the traditional funding base to about 80 percent (Finn, Manno, and Vanourek, 2000). Also of importance, charter schools rarely receive public funding for capital expenses. Rather, the chartering organization typically assumes responsibility for locating and financing capital structures and for their maintenance over time.

In a study examining where charter schools have located, Glomm, Harris and Lo (2005) found that greater district heterogeneity in race and adult education was associated with greater numbers of charter schools. Furthermore, districts in which more private schools were located and districts that had greater amounts of spending on special education also had more charter schools. Others (Booker, Zimmer, and Buddin, 2005) note that charter schools tend to locate disproportionately in poor performing districts. Studies such as this imply that charter schools arose as a means of satisfying demands that were not being met by the traditional public schools for at least some segment of the population.² Stoddard and Corcoran (2005) looked across states and across schools districts and found that weak student performance (on SATs) and demographic heterogeneity were related to greater support for and enrollment in charter schools.

The studies examining the location of charter schools suggest the advent of new school types should increase taxpayers' demand for public schools. To illustrate more

¹ See Stoddard and Corcoran (2005) for a full description of the types of charter laws across the states as well as an analysis of the determinants of the type of law passed.

² See Stoddard and Corcoran (2005) for a detailed analysis of the political economy of the passage of charter school laws.

precisely the effects of charter schools on demand for public schooling, consider the following simple description typically used to illustrate the household choice between public and private school types. Suppose each household h has one child and that child can attend private school, P, or a traditional public school, T.³ Each household chooses its school type i from these options in its residential district.⁴ The household utility from any school type depends on its tastes and preferences for the school type relative to a composite package of consumption goods, X_h . Household utility can be expressed as

$$(1) \quad U_{hi} = U(P, T, X_h, \varepsilon_{hi})$$

where ε_{hi} is a scalar composite of all relevant but unmeasured factors influencing utility. The inclusion of this disturbance term will capture both unmeasured school-specific characteristics and the perception of these characteristics by the household. For the household, the budget constraint is

$$(2) \quad I_h = tP + \tau_h B_h + X_h$$

where t is the private school tuition, τ is the household's tax price for the publicly provided schooling, and B is the household's tax base. From the household's perspective, the tax rate for public schooling is independent of its decision to enroll in either the public school or private school options. It can, of course, completely avoid expenditures on private schools with a decision to enroll in public schools but it will still pay the public school bill under the private school option. Households choose the school alternative i only if the utility it derives from that school type is greater than any of the

³ Households can also choose home schools but we do not consider them in this paper because of lack of data. Often these models separate private religious and private secular schools. See Houston and Toma (2003), Lankford, Hamilton, Lee, and Wyckoff (1995), Landford, Hamilton, and Wyckoff (1992), and Long and Toma (1988).

⁴ While the public school must be within the district of residence, the private school can be located outside the public district boundaries. We shall address this in the empirical section.

other k alternatives, or $U_{hi} > U_{hk}$. To attend private school, households must receive marginal utility that exceeds that of the public schools by at least the amount of the private tuition.

Now suppose we introduce another school type so that the household chooses between private schools, traditional public schools, and the new charter schools.⁵ The utility function is now given by:

$$(3) \quad U_{hi} = U(P, T, C, X_{hi}, \varepsilon_{hi})$$

where C represents charter schools. Of great significance, the household's budget constraint remains unchanged. Because the tax price to the household is the same for charter and traditional public schools, the household will choose between the public types independently of the tax price.

If the charter schools, previously unavailable in the public sector, provide a product that better matches the tastes of the household, utility from the charter school increases relative to that of the traditional public school and the household will enroll its child in the new charter option, *ceteris paribus*. Furthermore, households that previously chose the private sector may receive sufficient added utility from the charter schools to switch enrollment from the private sector to the public one.

As we aggregate from the household to the community, there will be long run implications for the education sector that go beyond enrollment. Recall that financing the operations of charter schools occurs at a percentage of the cost of traditional schools and that expenditures for capital are typically excluded. So while students in charter schools conceptually lower the cost of providing public schooling, the alternatives offered by

⁵ Charter schools, like private ones, may be chosen outside the boundaries of the residential public school district.

charter schools presumably increase demand for schooling provided in the public sector. The relative magnitude of these changes will determine the ultimate effect on the budgetary outlays for public schooling and the household's tax price for the public schools.⁶

While there are competing effects on the long run budgetary consequences of charter schools, the enrollment effects discussed above can occur in the short run. If charter schools offer a schooling alternative that taxpayers view as sufficiently superior to their status quo choice, they will switch to the charters. Significantly, enrollment in the charter schools comes from either the traditional public schools or the private sector.⁷ Because the choice to attend charter schools is made at the household level, enrollment behavior serves as a revealed preference for charter schools vis-à-vis other school types.

III. Charter Schools in Michigan: Data

The remainder of this paper focuses on the state of Michigan. This is a particularly interesting state in terms of charter schools because it was one of the first states to pass legislation allowing charter schools (1993) and its charter laws are among the strongest of the states. According to the Center for Education Reform, Michigan scores approximately 45 on a 50 point scale of strength of charter laws. Arizona and the District of Columbia had equally strong laws under this ranking. Although school districts technically can begin charter schools, the voting rules for approval by districts

⁶ This paper will not examine the financial consequences of charter schools. Rather, we focus on enrollment effects for a single state. Across states, the consequences may vary depending on the particulars of the funding formulae for the charter schools.

⁷ Although not allowed in this model, empirically charters can also generate enrollment from new growth in their jurisdiction.

are sufficiently binding that few districts have done so.⁸ The rules allow, however, universities and other organizations, both for-profit and nonprofit, to seek charter approval. For the school year 2005-06, approximately 85,000 students attend 220 charter schools in Michigan. Our analysis examines the effect charter schools have on public support in the years from 1994-95 through 1998-99, which is a period of strong charter school growth as shown in Table 1.

Table 1 About Here

Charter schools in Michigan, like in other states, do not charge tuition but rather receive funding based on per pupil enrollment. They are required to hire certified teachers, must administer the Michigan accountability tests (MEAP), and abide by the health and safety codes of other public schools. If the school oversubscribes, the schools grant entrance through random selection. Unlike the traditional public schools, however, charter schools in Michigan can renew their charters only with adequate student academic performance.

To examine the effects of charter schools in Michigan, we look at the universe of school districts and charter schools⁹ over the five academic years 1994-95 to 1998-99.¹⁰ Data came from a variety of sources. Michigan School Report (MSR) is one of our main sources from which school district identification codes, enrollments and district race/ethnicity percentages for the academic years 1994-95 to 1998-99 were retained.

⁸ For the district to establish a charter school, there must be majority approval by the school board in Michigan.

⁹ In Michigan, charter schools are treated as their own school districts.

¹⁰ We chose these years because 1995 is the first year of significant enrollment in charter schools in Michigan. Beginning in 2000, other factors such as No Child Left Behind complicate the issues discussed here.

From the enrollment data, we calculate the annual percentage growth of public school enrollment for each county and use this variable to control for student growth that may affect the types of schooling options within each county.

We also collected the breakdown of local, state, and federal revenue from Michigan's 1014 report.¹¹ From this report, we constructed a variable measuring the proportion of state funding for each district and charter school across the state over time. This variable acts as a control for the impact that centralized funding may have on school choice from Michigan's Proposal A in 1994.¹²

Local economic conditions that affect unemployment rates and income levels directly affect decision making. County unemployment rates for each year are used to control regional variations in economic factors. These rates are merged at the county level by year and are accessible from the Michigan Department of Career Development website.¹³ Information on population income comes from the Internal Revenue Service's data series, "County Income Data."¹⁴ From these data, we retain the reported county gross income and divide it by the number of reported county returns.¹⁵ This produces an estimate of the average tax filer's gross income for each county for each year. These data are then merged with the other data by county and year to control for preferences for different types of schools to the extent schooling preferences are correlated with income.

Finally, we collected private school enrollment from the National Center for Education Statistic's Private School Universe Survey.¹⁶ This survey is administered in

¹¹ <http://www.state.mi.us/mde/reports/B1014/index.html>

¹² We have also restricted our data to post Proposal A years.

¹³ http://www.michlmi.org/web_nav/Unemployed/frame.htm

¹⁴ <http://ftp.fedworld.gov/pub/irs-soi/prodserv.pdf>

¹⁵ When dollar values are used in the regression they are based on real 1994 dollars.

¹⁶ <http://nces.ed.gov/surveys/pss/>

even years and thus enrollment in odd years is unobserved. To increase the usefulness of these data, we impute the missing observations with averages of the previous and successive even years. This approach assumes private school enrollment trends linearly between years, which may not be the case; however, it is not an unreasonable method to preserve the degrees of freedom. Table 2 shows the mean and standard deviation for the variables across the five school years.

Table 2 About Here

IV. Empirical Model

The remainder of this paper examines the enrollment consequences of the introduction of charter schools in Michigan. While others have looked at the consequences of charter schools on achievement scores of students, the enrollment effects are a direct measure of whether charter schools enhance competition among schools and whether the competition is among public and/or private schools.

The requirement of mandatory schooling creates an enrollment identity that partitions the school aged population between public or private educational institutions. This identity is disrupted with the introduction of a third education alternative, charter schools, that may siphon a portion of the population away from the two alternatives. Exploiting the effect of the exogenous introduction of charter schools on this enrollment relationship allows a direct means of estimating charter schools' impact on public and private school enrollments. Because there may be unobservable differences between parental and student characteristics, we use a district/charter school fixed effect approach

that controls for time invariant unobservable characteristics. Formally, the model is estimated by:

$$(4) \text{ PRIVATE}_{dt} = \alpha_0 + \alpha_1 \text{CHARTER}_{dt} + \alpha_2 Zc_t + \alpha_3 X_{dt} + \alpha_4 \text{YEAR} + \mu_{dt} + \varepsilon_{it}$$

where c and d represent county c, and district or charter school d in year t in the model.

Charter schools are identified in the data as their own districts.¹⁷ PRIVATE is the percent of a county's total enrollment in private schools for all districts; CHARTER is the percent of the county's enrollment in charter schools for each county district; Z is a vector of county level variables that are expected to influence enrollment and can be measured annually; X is a vector of district level variables that are expected to influence enrollment and that can be measured annually; μ represents district/charter school fixed effects; and ε is the error term. Independent variables included in the Z vector are annual enrollment growth rates, GROWTH, by county; unemployment rate, UNEMPLOYMENT; and average real income, INCOME. Independent variables included in the X vector are percent of the population that is black, BLACK; percent that is Hispanic, HISPANIC; and percent Native American, NATIVE AMERICAN (percent white is the omitted category); and percent of total school revenues derived from the state, STATE REVENUE. We also include a year time trend variable, YEAR.

For the enrollment variables, we used county level data rather than district data because charter schools do not restrict enrollment to the designated district of residence.¹⁸ Similarly, the distance from a student's residence to the private school influences private school enrollment but is not restricted to the public school district boundaries. In

¹⁷ In Michigan, charter schools are considered their own district. Thus, the district fixed effects controls for time invariant characteristics across districts and charter schools simultaneously.

¹⁸ MSA would perhaps be preferable but we do not have these data at this point in time. Note that we also estimated the model using district level data and found quite similar results to those presented in this paper.

Michigan, counties contain multiple school districts and it is reasonable to assume students could travel across these districts to choose either charter or private schools. For other variables, including racial characteristics and the proportion of revenue received from the state, we used district data because variances across the districts within the counties should lead to greater precision in our estimates.

The data set for purposes of analysis is restricted to the set of observations (2,390) for which we have a full sample. Table 3 presents the enrollment results from estimating the above equation. An increase in the proportion of public school students who are in charter schools is significantly and negatively related to the proportion of total enrollment in private schools.¹⁹ More specifically, the coefficient on PRIVATE indicates that approximately 17 percent of charter school enrollment over this period is pulled from the private sector. Put in perspective, the significance of this estimate becomes quite large. Slightly more than 8 percent of the students in Michigan were enrolled in private schools over this period of time; with 17 percent of charter enrollment derived from this 8 percent, the effects on the private sector could be quite large.

Table 3 About Here.

To provide a slightly different perspective on this, we re-estimated the above model but substituted numbers of students enrolled in the private and charter schools for the percent of students enrolled. Table 4 reports the results. The estimated coefficient on the charter enrollment variables suggests that private schools will lose one student for

¹⁹ Plank and Sykes (1999) looked at aggregate numbers in the first year of charter schools in Michigan and found that private school enrollment decreased as charter school enrollment increased.

every three students gained in the charter schools. Taken together, the estimates in Tables 3 and 4 indicate that not only are charter schools having a statistically significant effect on private schools but an effect that is economically meaningful.

Table 4 About Here

Other economic factors also affect the private schools as indicated by the above regressions. The annual enrollment growth rate is positive, as expected, in both regressions and is statistically significant in the first regression. Also of interest, YEAR, is significant and negative in both regressions, suggesting that private school enrollment has diminished over time, *ceteris paribus*. Of the racial variables, only proportion black is significant and has a negative effect.

The above regression results indicate that charter schools are competitors to private schools, but how do charter schools impact traditional public schools? Although the results in Table 2 can give us part of the answer, we can also directly estimate the magnitude of the effect similar to that in Table 3. In particular, we change the dependent variable of the regression model from private school enrollment to traditional public school enrollment and re-estimate the parameters.²⁰ The parameter estimate on charter school enrollment indicates the magnitude of the substitutability between charter schools and traditional public schools. Table 5 presents the results. The Charter enrollment coefficient shows that the traditional public schools lose one student for every three

²⁰ We also estimated percentage of enrollment to verify our results and confirmed that approximately 83 percent of charter enrollment comes from the traditional public schools.

students added to charter schools. In absolute numbers, the charter schools draw enrollment from public schools at nearly the same rate as they do from private schools.²¹

The signs on the remaining estimates are intuitively appealing and attest to the accuracy of the model. Again, annual enrollment growth rate positively and significantly affects numbers of students in traditional public schools as do both the percent of black students and percent of Hispanic students.

Table 5 About Here

V. Conclusions

The history of charter schools is still very young in the U.S. There has been a surprising amount of work on the consequences of charter schools in terms of student achievement on standardized tests. The consequences have varied by state and study but there is not agreement at this point regarding the achievement consequences of charter schools.

This paper suggests that there are other dimensions or margins on which charter schools should be evaluated. Taxpayer preferences for the public schools are likely to be first demonstrated through enrollment decisions. Our results for Michigan suggest that charter schools are generating immediate competitive effects for both traditional public schools as well as for private schools. The finding that charter schools are attracting significant numbers of students from the private sector has long run consequences for the financing of public schools. While charter schools are financed at a fraction of the cost

²¹ The charter schools may be attracting other students from population growth or home schooling. These data do not allow us to determine alternative sources of attraction.

of traditional schools, the public sector expenditures for education will not necessarily decline if the public school student base expands with the development of charter schools. Using the “vote with your feet” criterion, charter schools appear to have increased support for the public school system in Michigan. In future work, we plan to extend the work across states. Much remains to be done.

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Table 1
Charter Schools in Michigan

School Year	Number of Charter Schools
1994-95	8
1995-96	43
1996-97	79
1997-98	108
1998-99	138

Table 2: Descriptive Means From 1994-95 Through 1998-99 School Years

Variables	Observations	Mean	Standard Deviation
Percent Countywide Private Enrollment	3186	8.84	4.622
Percent Countywide Charter Enrollment	3186	0.21	0.745
Percent Countywide Traditional Public Enrollment	3186	90.95	4.807
Average Countywide Yearly Student Growth Rate	2456	.650	1.867
Unemployment Rate	3201	4.60	1.942
Real Gross Income Per Tax Filer (\$000)	3201	39.99	9.211
Proportion District-Wide Black Enrollment	3127	8.81	22.454
Proportion District-Wide White Enrollment	3127	85.75	23.653
Proportion District-Wide Hispanic Enrollment	3127	2.72	5.579
Proportion District-Wide American Indian Enrollment	3127	1.84	6.588
Proportion State Revenue	3140	79.04	16.036

Table 3: Effects of Charters on Percent Private Enrollment

Independent Variables	Coefficients	t-statistics
Charter	-0.17*	-2.46
Income	0.01	0.57
Black	-0.02*	-2.01
Hispanic	0.01	1.04
Native American	-0.01	-0.51
State Revenue	0.00	1.17
Growth	0.05*	5.19
Unemployment	-0.01	-0.43
Time	-0.16*	-14.16
Constant	8.92*	11.87
N	2390	
Prob>F	0.000	

* indicates significant at the .01 level.

** indicates significant at the .05 level.

Table 4: Effects of Charters on Numbers of Private Students

Independent Variables	Coefficients	t-statistics
Charter	-0.31*	-13.49
Income	2.93	-0.19
Black	-45.16*	-4.21
Hispanic	2.23	0.26
Native American	11.49	0.61
State Revenue	0.22	0.06
Growth	5.02	0.53
Unemployment	-5.27	-0.18
Time	-105.79*	-9.01
Constant	9386.61*	11.94
N	2390	
Prob>F	0.000	

* indicates significant at the .01 level

Table 5: Effects of Charters on Numbers of Public Students

Independent Variables	Coefficients	t-statistics
Charter	-0.30*	-3.49
Income	-1.52	-0.03
Black	216.47*	5.35
Hispanic	86.93	2.74
Native American	-68.86	-0.97
State Revenue	1.72	0.12
Growth	99.13*	2.76
Unemployment	10.93	0.10
Time	821.44*	18.57
Constant	56625.45*	-19.12
N	2390	
Prob>F	0.000	

* indicates significant at the .01 level.