



Charter school entry and school choice: The case of Washington, D.C. ☆

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ABSTRACT

This paper develops and estimates an equilibrium model of charter school entry and school choice. In the model, households choose among public, private, and charter schools, and a regulator authorizes charter entry and mandates charter exit. The model is estimated for Washington, D.C. According to the estimates, charters generate net social gains by providing additional school options, and they benefit non-white, low-income, and middle-school students the most. Further, policies that raise the supply of prospective charter entrants in combination with high authorization standards enhance social welfare.

1. Introduction

The dismal academic performance of public schools in urban school districts has been a growing concern in recent decades. Charter schools provide families with additional school choices, and are seen by many as a possible solution. Unlike traditional public schools, charter schools are run independently of school districts by private individuals and associations. They receive public funding in the form of a per-student stipend and do not have residence requirements; if oversubscribed, they determine admission by lottery. Charters are free from many regulations that apply to traditional public schools, but are subject to the same accountability requirements, and are regulated by state laws. The first law passed in Minnesota in 1991 and has been followed by laws in 44 states and the District of Columbia, all of which differ widely in their permissiveness towards charters. Currently, the nation's 6700 charters serve about 2.9 million students, or 5.1 % of the primary and secondary market. While seemingly small, this market share conceals large variation across states and districts.

A prospective charter entrant presents a proposal to the chartering entity. The proposal, akin to a business proposal, specifies the school's

mission, curricular focus (such as arts or language), grades served, teaching methods, anticipated enrollment, intended facilities, and financial plan. The decision to open a charter is similar to that of opening a firm in that both seek to exploit a perceived opportunity. For example, in a residence-based system, a low-income neighborhood with low-achieving public schools creates an opportunity for a charter entrant to serve households unsatisfied with the local public schools. Other example opportunities are middle-class families reasonably well served by local public schools but interested in different academic programs, or families attending private schools but willing to try charter schools to avoid tuition.

In this paper we investigate charter entry and household school choice for Washington, D.C. We document charter entry by geographic area, curricular focus and grade span to gain insight into the opportunities exploited by charters. We then explore how households sort among public, private and charter schools, and how the entry, exit or relocation of a school affects others. We also study the critical role of the chartering entity (henceforth, the regulator) in this market, quantify welfare gains from charters, and investigate how the educational landscape responds to regulatory changes.

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Addressing these research questions is challenging. For example, when a student enrolls in a new charter school, she affects the peer characteristics of both his new and former school. In other words, charter entry triggers equilibrium effects as students re-sort among schools. Although the entrant can specify some aspects of the school, like thematic focus and educational philosophy, the student body composition is largely beyond its control. The uncertainty about demand for charters poses an additional research challenge. The uncertainty is more severe for new entrants, whose ability to run the new enterprise may not be known. Further, the entry, exit or relocation of one school affects others and leads to student re-sorting.

Thus, we develop and estimate an equilibrium model of household school choice, charter school entry and school interaction in a large urban school district. In the model, a charter entry point is a combination of location (neighborhood), grade span and focus. For some entry points, prospective entrants submit entry applications to the regulator. Charter funding is connected to enrollment, and prospective entrants must be financially viable. Hence, the regulator forecasts an applicant's enrollment and peer characteristics based on its entry point, and approves applicants expected to be financially viable.

We estimate the model using a unique and detailed data set from Washington D.C. from 2003 to 2007. The main data set contains information for all public, private and charter schools in the city including enrollment by grade, school demographics, focus and proficiency rates in standardized tests. We supplement these data with neighborhood-level information on charter school attendance and travel distance to charter and public schools. Lacking student-level data, we further augment the school-level data with the block-group level empirical distribution of child age, race, poverty status and family income, and draw from this distribution in order to calculate the model's predictions. Since market shares for public, private and charter schools vary widely across grades, we define a market as a grade-year combination. We estimate the model in three stages corresponding to student demand, school supply and school proficiency rates.

We model schools as differentiated products and estimate the demand side of the model using an approach similar to [Berry et al. \(1995\)](#), henceforth BLP. We allow for a school-grade-year quality component (such as teacher quality) observable to households but not to the researcher. The ensuing correlation between school peer characteristics and the unobserved quality component is similar to the correlation between price and unobserved quality in BLP. Unlike price, which is determined by the firm under consideration, peer characteristics are determined by aggregate household choices and are similar to [Bayer and Timmins's \(2007\)](#) local spillovers. Following [Nevo \(2000, 2001\)](#), we exploit the panel structure of our data and include school, grade and year fixed effects to capture some variation in the unobserved quality component. The school fixed effects are our estimates of school quality; they capture unmeasured factors in household choices such as school climate and culture, length of school day and year, and facility characteristics. When estimating parameters of the proficiency rate function we estimate a separate set of school fixed effects that capture the ability of schools to raise passing rates in standardized math tests; these constitute our measure of school productivity.

To study the behavior of charters facing the same institutional structure, we focus on a single, large urban district. We chose Washington, D.C. because it has a permissive, well-established 1996 charter law under which the charter school sector has grown to 45 % of total public school enrollment as of 2015–2016.¹ It has a single public school district, the District of Columbia Public Schools (DCPS), which facilitates research design and data collection. Finally, it is relatively large with substantial variation in household demographics, which provides scope for charter entry.

¹ As of 2015–2016, 17 districts had more than a 30 % charter share. The five largest shares were in New Orleans (92 %), Detroit (53 %), Flint (53 %), D.C. (45 %), and Gary (43 %). Source: <http://www.publiccharters.org>.

The majority of charter entrants in D.C. have located in the dis-advantaged areas of the city, namely the Northeast and Southeast, which are home to most of the poor, non-white students, and to the lowest-proficiency public schools. Most charter entrants offer elementary and middle school grades and a specialized curriculum. Poor, non-white students have access to fewer school options than their more advantaged counterparts at all grade levels, but particularly at middle and high school.

Our estimates show that poor, non-white students have the strongest preference for charters. They also show that many students have a preference for specialized curricula, of which public and private schools offer little. Based on our estimates, in the Northeast and Southeast charters have, on average, higher school quality than public schools, particularly for middle and high school, and higher school productivity, particularly in elementary and middle schools. Such quality and productivity differences are largest in the most disadvantaged area, namely the Southeast.

The ensuing combination of household preferences, characteristics, and choice sets, along with the geographic distribution of school options, quality, and productivity is closely associated with the observed charter entry patterns. These patterns are also associated to charter fixed costs, which are highest in the most affluent parts of the city (due to high real estate costs) and in the most disadvantaged (due to facilities' condition and to high security and insurance costs). Further, fixed costs are higher for high school than for lower grades.

From a social standpoint, the existence of charter schools yields net benefits based on our estimates. Welfare gains from charters are highest for middle-school students, for whom charters contribute the most in quantity and quality of options, and for poor, black students in all grades.

Given these benefits, in our counterfactuals we investigate alternative avenues for charter expansion in D.C., namely, a funding increase, a relaxation of approval (authorization) standards, and policies aimed at raising the supply of prospective entrants. Our results indicate that raising the supply of prospective entrants while maintaining strict approval standards is welfare-enhancing. Policies that facilitate the application process by aiding entrants in obtaining building facilities, developing business and instructional plans, learning from other charters and navigating bureaucratic processes can raise the supply of prospective entrants.

Throughout we make several contributions. First, we develop and estimate a rich yet tractable model of charter entry. While most charter school literature studies achievement effects,² relatively little research has focused on entry. In a reduced form fashion, [Glomm et al. \(2005\)](#), [Rincke \(2007\)](#), [Bifulco and Buerger \(2015\)](#) and [Imberman \(2011\)](#) study charter entry while [Henig and MacDonald \(2002\)](#) study early charter location in Washington, D.C. [Cardon \(2003\)](#) models entrant quality choice when facing an existing public school. Closest to our approach is [Mehta's \(2017\)](#) structural study of charter entry in North Carolina. We differ from Mehta in several ways: we model student heterogeneity in race, income and poverty status; we endogenize student body composition in these characteristics; and we include private schools in the student choice set. In our model, as in reality, all charters in the economy are available to households regardless of their residential location, and this means that each public school competes against potentially many charters, and vice versa. Finally, we model charter heterogeneity in curricular focus, grade coverage and costs.³

² For a comprehensive review of the charter achievement literature, see [Bifulco and Bulkeley \(2015\)](#) and [Betts and Tang \(2011\)](#).

³ Other related work includes [Walters \(2017\)](#), [Neilson \(2013\)](#), and [Singleton \(2017\)](#). Using data on charter school lotteries and individual-level school choice and achievement, Walters estimates preference and achievement parameters. [Neilson \(2013\)](#) uses Chilean student-level data to estimate achievement and BLP-style preference parameters. Neither Walters nor Neilson model school entry or endogenous peer characteristics. [Singleton \(2017\)](#) studies financial incentives for charter schools, an issue we study as well as highlighted by our counterfactuals. He models charter entry and exit, yet does not model horizontal or vertical differentiation among charters, endogenous peer effects, or private schools.

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