

STATE POLICY DETERMINANTS OF CHARTER SCHOOL MARKET SHARE

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ABSTRACT OF THE DISSERTATION

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This study investigates the determinants of charter school enrollment using a comprehensive model of supply and demand. Research on the determinants of charter school enrollment has tended to focus solely on state policies believed to limit or support charter school growth; ignoring other determinants risks misidentifying the contributions of these policies due to omitted variables bias. In addition, prior research has tended to view charter school expansion as entirely at the expense of traditional public school enrollment—and thereby “taking funding away” from traditional public schools, when charter schools may retain some children in the public system who otherwise would attend private schools.

Key words: charter schools, charter school enrollment, comprehensive model of supply and demand, determinants of charter school enrollment, state policies, and traditional public school enrollment

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Chapter 1: Introduction

Public education reform in the United States focuses increasingly on efforts to provide school choice within the public education market. Answering questions concerning how school choice is provided and the impact of different approaches on traditional public schools (TPSs) requires developing a better understanding of the public education market including the relationship between charter and traditional public schools within the market. Central to answering these questions is how state charter school laws influence charter school formation, the share of the public education market, and overall enrollment in public education. This requires investigating the differences in state charter school laws that are found in different policy structures and their influence on charter school formation and market share.

Background

Theoretically, charter schools are designed to offer greater choice than other intra-district or inter-district choice models (Levin, 2009; Levin & Belfield, 2003). However, different states create different laws and regulations for charter schools. Charter schools are public schools that operate without many of the same laws and regulations as TPSs but must meet the goals and requirements of their charters (Levin, 2009; Levin & Belfield, 2003). Manno (2001) outlines four principles underlying the charter school movement:

1. A public school is any school that is open to the public, paid for by the public, and accountable to the public. The government need not run it.
2. Public schools should be different in myriad ways, and all families should be able to choose among them.
3. What matters most are not the resources a school commands or the rules it obeys, but the results it produces.
4. Each school is a small, self-governing community in which parents, teachers, and the community have valued roles (p. 55).

Charter schools are a public school choice model that seeks to expand choice beyond that offered by movement from one neighborhood or district to another. Tiebout (1956) argued that such choices are not necessary as the ability of local public goods to meet variations in parental preferences could be met to a substantial extent by the willingness of some families to choose specific geographic locations (e.g., catchment areas) based on the combination of services and taxes offered. Choice of residence is linked to the choice of education bundle (i.e., district or school). However, Tiebout's (1956) model has faced serious criticisms because of what are considered as his unrealistic assumptions that do not fully account for elements of market failure such as asymmetric information, externalities, imperfect housing markets, irrational consumers, inequalities in the capabilities of families to vote with their feet, and barriers to families exiting their district or entering a new one in search of an educational offering that better meets their preferences (Brunner & Imazecki, 2008; Conley & Wooders, 1997; Coons & Sugarman, 1971, 1978; Fischel, 1998, 2001, 2002, 2005; Kelleher & Lowery, 2002; Marsh & Kay, 2006; McDonald, 2010; Saiger, 2009; Westhoff, 1977; Whiteman, 1983).

Charter schools provide the opportunity for parents to choose their children's schools without having to obtain residency in a targeted catchment or geographic area. Thus, charter schools offer a model of nonresidential-based choice in which consumers "vote with their seat" by changing schools, rather than their feet, as is attributed to Tiebout, and "who choose a new school without moving their place of residence" (Buckley & Schneider, 2006, p. 102). Voting with your seat transforms the public school choice model by supplementing traditional inter-district residency-based competition

with nonresidential-based competition among different charter schools and TPSs independent of geographic location.

Although charter schools claim to be open to everyone, in practice, access typically has been more limited. Enrollment is often based on seating capacity and lotteries are used when the number of applicants exceeds available spots. Access also tends to be unequal. For example, asymmetric information, lack of mobility, and transportation costs limit freedom of choice, especially for low-income people (Belfield & Levin, 2005; Buckley & Schneider, 2006; Chubb & Moe, 1990; Coffin, 2019a, 2019b; Levin, 2009; Levin & Belfield, 2005).

Charter schools have grown substantially since Minnesota passed the first charter school law in 1991, but still, enroll a relatively small percentage of the nation's students. In my study, the District of Columbia and 42 states had adopted charter school laws by the end of the 2014-2015 school year. In the 2014-2015 school year, 6,752 charter schools enrolled approximately 5.4% or 2.7 million of the 50.3 million total public school students nationwide (NCES, 2017a). By comparison, private schools enrolled approximately 5.4 million students that year (NCES, 2017b).

However, Alabama, Kentucky, and West Virginia have adopted charter school laws since the 2014-2015 school year (NCES, 2019). In the 2017-2018 school year, over 7,000 charter schools enrolled approximately 6.2% or 3.2 million of the approximately 51.0 million total public school students nationwide (NCES, 2019). By comparison, private schools enrolled approximately 5.8 million students that year (NCES, 2019).

Interstate Variation

Charter and traditional public schools operate in public education markets that are highly organized and governed by state regulations and laws. As a result, no two-state markets for public education are the same. Of particular interest to the present study, state charter laws differ substantially in ways that are hypothesized to affect charter school formation and market share. In my study, eight states do not permit charter school formation because these states have not adopted charter school laws. Among the 42 states and Washington, D.C. that have adopted charter school laws, the number of charter schools ranges from 1,177 in California to three in Mississippi (NCES, 2017a; NCES, 2017b; Ziebarth & Palmer, 2016). However, in the 2017-2018 school year, the number of charter schools ranges from 1,275 in California to three in Mississippi and one in Alabama (NCES, 2019). One of the likely reasons that charter school numbers and enrollment vary so much by state is that state policy structures vary in the extent to which they support or restrict charter school formation and market share.

Charter schools can be granted independence from many of the laws and regulations governing TPSs, but state charter laws differ considerably in the degree to which they grant that independence. This variation is likely to influence charter school formation and market share (Belfield & Levin, 2005; Buckley & Schneider, 2006; Chubb & Moe, 1990; Coffin, 2019a, 2019b; Jeynes, 2014; Levin, 2009; Levin & Belfield, 2005), which varies among the states.

Problem Statement

Charter school policies.

The broad hypothesis of this study is that differences in state charter school policy structures affect charter school market share. In addition, this study seeks to quantify the relative importance of specific policies jointly and individually as influences on charter market share. Charter school advocates, such as the Center for Education Reform (CER) and National Alliance for Public Charter Schools (NAPCS), argue that the strongest policy structures are those that place minimal or no limitations on charter school formation, numbers, enrollment, autonomy, operational flexibility, accountability, funding, or conversions of traditional public schools. A conversion involves changing a TPS into a charter school that uses the same facility but operates according to state charter laws rather than district laws and regulations. This is consistent with school choice advocates' market-based argument that strong charter school laws will enable charter schools not only to break the traditional public school districts' (TPSDs') monopoly over public school enrollment but also to gain market share.

As the NAPCS policy identification is based on one particular theoretical perspective, I will further investigate the relative importance of state policies as determinants of charter school market share based on the empirical research literature. My literature review suggests a somewhat different set of policies as having a strong effect on charter market share. This study will compare the predictive power of two sets of policies to see which has the strongest effect on the charter school market share. One set is based on a review of the broader literature and the other on the policies the NAPCS has specified as most important. In addition, I will conduct a post-hoc analysis to see

which, if any, of the policies making up either set may account individually for most of the explanatory power.

NAPCS-based assessment of state charter policies.

The NAPCS ranks state laws according to how strongly they conclude the law supports charter school formation and market share. Low scores on the NAPCS' scale indicate that the state policy is restrictive (i.e., weak support of market share) while high scores indicate that the state policy is supportive. The NAPCS weights each policy from 0-4 based on its strength in supporting charter school market share with zero being the weakest and four the strongest. Then, the NAPCS rates each policy from zero to four based on how well the policy conforms to its model charter school legislation, multiplies the rating times the weight, and adds the products to generate a score for each state. Based on the NAPCS' ratings indicating the policies having the greatest predictive strength, I will evaluate the following set of policies, which frequently topped the NAPCS' list of policies supporting charter school market share during the last several years:

- Authorizers independent of the state and district BOE
- Operational funding
- Capital funding
- Exclusion from collective bargaining requirements
- EMOs (Education Management Organizations)

An alternative evidence-based assessment of state charter policies.

My review of the literature suggests a somewhat different set of policies as having a strong effect on market share than those identified by the NAPCS' ratings. I identified the following policies as most likely to have the greatest predictive strength.

- Multiple charter authorizers, which may include the state or district board of education (BOE)

- Annual cap on charter school enrollment, numbers, or formation
- Statewide cap on charter school enrollment, numbers, or formation
- Geographic cap on charter school enrollment, numbers, or formation
- Charter schools are operationally and legally autonomous from the host TPSD
- District BOE has sole charter approval authority
- The state has sole charter approval authority
- District BOE has final charter approval authority
- The state has final charter approval authority

Supply and demand variables.

Charter school market share is determined by both supply and demand. However, prior research has estimated the effects of state policies without fully accounting for other influences on supply and demand potentially resulting in omitted variables bias. I include the supply and demand variables together with the NAPCS-based and literature review-based policies so they are not confounded with the policy variables. The additional supply and demand variables also increase statistical power. In recognition that there may be additional state-specific variables that influence charter supply, and demand for charter schools and public schools more generally, I also include state fixed effects in the models.

Supply variables.

On the supply-side, public policies and other factors affect the number of classroom seats available in charter schools. In addition, to quantifying the relative importance of specific policies jointly and individually as influences on the charter market share, I evaluate the following supply-side variables, some of which are state charter school policies as well.

- The percentage of all students enrolled in the state's public and private schools who are enrolled in private schools in the state as of 1990 (e.g., a measure of having choice as an option to the local TPS). 1990 is used because it preceeds the passage of the first charter school law and is prior to the charter market share being explained.

- The number of school districts (e.g., a measure of inter-district choice as an option) in the state
- The number of religious schools in 1990 as an indication of the market potential for flipping religious schools into charter schools in the state. 1990 is used because it precedes the passage of the first charter school law and is prior to the charter market share being explained.
- The state law grants operational funding and access to state and federal categorical funding similar to that of traditional public schools (policy)
- The state law grants capital funding and facilities similar to that of traditional public schools (policy)
- The state law permits the conversion of traditional public schools (policy)
- The state law permits for-profit-EMOs (i.e., Educational Management Organizations) (policy)
- The state law excludes charter schools from collective bargaining requirements (policy)
- Charter schools are operationally and legally autonomous schools with independent public charter school boards in the state (policy)
- The number of years since the charter law passed as an indication of the market potential for awareness of charter schools in the state
- The number of consecutive years in which the state has had charter schools as an indication of the market potential for awareness of charter schools in the state
- The percentage of public school students eligible for free-or-reduced-price-lunch (i.e., FRPL as a measure of student poverty or proxy for poverty) in the state
- The percentage of ELL (English Language Learners) public elementary and secondary school students in the state

Demand variables.

Demand-side influences are essentially parental choice. On the demand-side, what leads parents to choose charter schools over TPS is influenced by their preferences for the following:

- Academic and school quality, as defined and perceived by parents
- Student achievement such as measured by statewide mean SAT reading scores and high school graduation rates (only mean SAT reading scores are used because they are correlated with mean SAT math scores at 0.96).
- Parental demographic characteristics such as parental educational attainment and median household income, which are likely associated with parental preferences for education and schooling options
- Peer group demographic characteristics such as the percentage of students who are Black, Hispanic, (i.e., White and Asia/Pacific Islander are the

excluded category because their coefficients tended to be indistinguishable from each other), special-education or ELL eligible, which may foster differences in school choice and sorting

- Opportunities for choice as an option to the local TPS such as the percentage of students enrolled in private schools in the state in 1990, the number of school districts in the state, or the number of religious schools in the state in 1990.
- The percentage of public school students who reported being threatened or injured on school property at least once during the previous 12 months (e.g., crime victims)

Public school enrollment policy question.

To understand more fully which state policies are important determinants of charter school market share and the degree to which they support or restrict market share, the size of the public education market *per se* must be investigated. Charter schools can draw students from private schools as well as TPSs and can affect public and private school enrollment differently. I theorize that it is unlikely to assume that charter schools only draw students from TPSs, and to the extent that charter schools may increase total enrollment in public schools, this may cast a different light on the impacts of charter school expansion.

Research Questions

The focus of this study is to provide a better understanding of the predictive strength of different policies in determining the charter school share of the public education market and the influence of charter school share on overall enrollment in public education. Specifically, I will assess how well a research-based set of policy variables predicts market share as compared to the NAPCS-based set, which has not been analyzed in the peer-reviewed literature. In addition, I will assess the extent to which charter school market share increases the overall (TPS and charter) public school share of the education market. Based on the aforementioned classifications of predictive strength

for the NAPCS-based and literature review-based policies, and the hypothesis that charter schools in different states compete for market share in markets of varying sizes and draw students from public and private schools differently in those markets, I will address these research questions:

1. To what extent is the NAPCS-based set of policies predictive of charter school market share? (These variables will be discussed in the subsequent chapter.)
2. To what extent is the research-based set of policies predictive of charter school market share? (These variables will be discussed in the subsequent chapter.)
3. Are there individual policies that on their own are strong predictors of market share compared to the set of policies as a whole?
4. How well does the research-based set of policies predict market share as compared to the NAPCS-based set?
5. To what extent do charter school policies and supply and demand variables influence overall public school enrollment, and does charter school market share have the potential to increase the overall (TPS and charter) public school share of the education market?

Purpose statement

The purpose of this study is to provide a better understanding of the different policy structures and supply and demand variables, which are significant determinants of the charter school share of the public education market and overall enrollment in public education. Identifying the policies and variables that most likely have the greatest predictive strength of charter market share will inform policymakers who make highly consequential decisions on state charter policies and state school funding formulae. Policymakers equipped with a better understanding of the key influences of charter school formation and market share may take new approaches to legislation that determine the policies that govern the creation and operation of charter schools and the allocation of financial, material, and human resources among charter and traditional public schools. These decisions will shape not only charter school formation, enrollment, funding, and

autonomy but also the impact of that enrollment, funding, and autonomy on the host TPSD.

Contribution

The NAPCS' charter school policies have not been evaluated in the literature. My innovation is distilling the literature in a new way and then assessing the contribution of the NAPCS identified policies in the context of a more complete model based on the literature. The ultimate goal of this study is to determine how well the research-based set of policies and variables predicts charter school market share as compared to the NAPCS-based set and to identify the individual policies and variables that on their own are strong predictors of charter school share compared to the set of policies as a whole. Thus, I aim to determine whether the NAPCS-based set of policies provides a sound basis on which policymakers can develop charter school laws. In addition, I address the question of the impacts of charter school policies on the total public school market share inclusive of both traditional public schools and charters.

Chapter 2: Literature Review

Overview

This review begins with an introduction to school choice, its evolution in the United States, and the market theory that undergirds school choice, which is essential to understanding the arguments for charter school formation and growth. I discuss the theories' strengths and shortcomings.

Market theory is important because it centers on two different aspects of efficiency that charter schools seek to improve. One is the efficiency of producing achievement and attainment *per se* as a kind of generic service. This stems from competition that is theorized to lead to better performance. The second efficiency stems from the choice that allows product differentiation to meet different preferences within a district rather than having only one size fits all. In theory, the first efficiency is lower than it should be because the government fails to use resources as effectively as it could in achieving educational goals (Chubb & Moe, 1990; Friedman, 1955, 2002; Friedman & Friedman, 1990; Porter, 1998a, 1998b; Wolf, 1993). In theory, the second efficiency centers on the problem of producing one product in one system (Chubb & Moe, 1990; Friedman, 1955, 2002; Friedman & Friedman, 1990; Porter, 1998a, 1998b; Wolf, 1993). However, charter schools may provide a way for TPSDs to offer education guided by two different philosophies, which is difficult, if not impossible for TPSs.

Like perfect markets, perfect TPSs exist only in theory. To understand the role of charter schools it is essential to discern the choice charters represent between imperfect alternatives, and whether imperfect markets work better at providing public education than imperfect TPSs (Buddin, 2012; Chubb & Moe, 1990; Friedman, 1955, 2002;

Friedman & Friedman, 1990; Miron, 2017; Singleton, 2017; Wolf, 1993). Therefore, I discuss charter schools as an alternative choice mechanism to TPSs because charter schools stem from shortcomings of the Tiebout model of traditional catchment area or residency-based school attendance and competition among catchment area schools (Bewley, 1981; Wooders, 1989). Charter schools provide a new model of nonresidential-based choice.

Next, I highlight charters as an alternative choice mechanism, and the arguments for and against, and what is known about their impacts. I include a brief discussion of charter school market share and its growth over time. Understanding charter school market share and growth are essential to establishing the context and the purpose for the investigation of my research questions. Then, I discuss the success and failure of charter schools and what can be inferred about the likelihood of charter schools in meeting promises of achievement and attainment. I also review the different arguments and ways that charter school advocates and opponents address charter schools.

This is followed by a review of research on the broader determinants of charter school demand and supply. On the demand-side, parental choice is influenced by their preferences for school quality, academic quality, academic attributes, extracurricular activities, relative proximity, and student achievement. On the supply-side, public policies and other factors affect the number of places available in charter schools and the extent to which they can better meet the preferences of some parents than the local TPS. These other factors include school crime, racial composition, and percentages of free-and-reduced-price lunch (FRPL) eligible students, which serve as a proxy for poverty or low-income.

Evolution and Market Theories

Evolution of school choice.

The origination of the arguments, assuming an ideal market model, that support school choice using vouchers to correct for the presumed educational shortcomings inherent in the current TPSD system, is attributed to Friedman. In discussing the evolution of school choice, Levin and Belfield (2003) reflect on the movement to give parents the freedom to choose the school that met their educational preferences using vouchers. They argue that school choice via vouchers would generate market competition, making schools more efficient, force the closure of inefficient schools or schools that failed to meet market demands, and end the one-size-fits-all standardized schooling approach. "Under a market approach, schools will seek market niches through product differentiation. That is, they will compete by matching their appeal to particular educational preferences of parents rather than trying to produce a standardized educational product" (Levin & Belfield, 2003, p. 194).

Market theory.

Advocates of market-based theory purport that charter schools introduce competition for students that improve educational quality for all public schools and forces schools to meet better the demands of their customers (Chubb & Moe, 1990; Loveless & Field, 2009; Weil, 2009). Competition forces charter and TPSs to innovate and provide the best possible education or risk losing students and going out of business. The expectation is that this would result in improved educational quality district-wide. The market theory holds that charter schools are better designed to meet customer needs because they are incentivized to meet the educational outcomes specified in their charter.

Charter school success is measured by how well a charter school achieves its goals. If a charter school fails to meet its goals, the school could be closed or restructured, unlike a TPS, which – absent charter school competition – could maintain enrollment subject to the loss of students to private schools or other neighborhoods; or possibly be closed for poor performance in a few states. Charter schools are theorized to improve TPS performance as well. Betts (2009) explains that competition is purported to improve all schools' educational quality:

(...) in addition to improving outcomes for those students who choose to enroll, charter schools provide a competitive spur to traditional public schools. The essence of the argument is simple: traditional public schools do not want to lose students to charter schools, for fear of cutbacks or outright closure. Teachers, principals, and district administrators, therefore, react to increased competition for students by examining what parents are seeking in a school and then implementing reforms in the traditional public schools to emulate the most popular of the charter schools. (pp. 195-196)

In theory, in the presence of a substantial charter school market share, TPSs would differentiate their services as well to better meet the needs of specific students. I theorize also that, rather than competing via performance, many charter schools use marketing and advocacy to create and protect market share. Typically, TPSD's are unable to respond in kind because they lack sufficient financial resources. In addition, I theorize TPSD's may be unable to satisfy parental preferences for certain peer groups, which charter schools might provide via racial, ethnic, religious, or economic status cream-skimming or cropping.

Efficiency gains.

The market theory provides a conceptual linkage between two different types of efficiency gains. The first type stems from competition that leads to better performance. The second stems from the choice that allows product differentiation to meet different

preferences within a district rather than only having one size fits all. Understanding the theory behind efficiency gains may help to explain charter market share.

Product differentiation.

Hirschman's (1970) concept of product differentiation helps to explain how a school can succeed by offering a product that differentiates it from competitors and satisfies different consumer preferences. Hirschman (1970) argues that firms fail when the quality of their products and services fail to meet market demand. As applied to schools, Hirschman (1970) argues how consumers and firms behave when firms fail to meet consumer demand:

- (1) Some customers stop buying the firm's products or some members leave the organization: this is the exit option. As a result, revenues drop, membership declines, and management are impelled to search for ways and means to correct whatever faults have led to the exit.
- (2) The firm's customers or the organization's members express their dissatisfaction directly to management or to some other authority to which management is subordinate or through general protest addressed to anyone who cares to listen: this is the voice option. As a result, management once again engages in a search for the causes and possible cures of customers and members' dissatisfaction. (p. 4)

Hirschman's (1970) exit option demonstrates the power of choice while the voice option demonstrates the power information in influencing school product offerings (Levin & Belfield, 2003). Applying Hirschman's (1970) theory to schools may help to explain how market competition would make schools efficient and improve their educational product offerings (Levin & Belfield, 2003).

Like Hess (2004), Levin and Belfield (2003) argue schools must meet market demand to survive, giving schools "incentives to innovate over the long run to gain market advantages," which "arise primarily from choice and competition promoted by the marketplace" (p. 192). Choice fosters product differentiation in the school market by

forcing schools to “compete by matching their appeal to particular educational preferences of parents rather than trying to produce a standardized educational product” (Levin & Belfield, 2003, p. 194). In studying Michigan schools, Glomm, Harris, and Lo (2005) use product differentiation theory to explain their notion for the charter school location. Glomm et al. (2005) argue that charter schools located in TPSDs to provide educational offerings that meet parental preferences that are unmet by the existing TPSs or private schools. Glomm et al. (2005) concluded charter schools tend to locate in districts with large numbers of private schools that may indicate a high level of TPS failure to meet specific demands, which means high-unmet demands for higher quality public schools, or schools that are different.

Thus, charter schools are intended to solve the key problems associated with TPSs through market competition and choice. In theory, TPSs are monopolies that underperform and use resources ineffectively (Chubb & Moe, 1990; Friedman, 1955, 2002; Friedman & Friedman, 1990; Porter, 1998a, 1998b; Wolf, 1993). Although TPSs theoretically offer one-size-fits-all, which may be what the majority of voters want, parents cannot find the best match for their individual willingness to pay, values, and children’s needs (Chubb & Moe, 1990; Friedman, 1955, 2002; Friedman & Friedman, 1990; Porter, 1998a, 1998b; Wolf, 1993). Moreover, inter-district school choice (e.g., Tiebout model) is a limited solution offering only some families choice and limiting pressure for TPSs to innovate or improve quality (Bewley, 1981; Wooders, 1989).

Tiebout's model.

Theory.

Tiebout theorizes that public education differs from other public goods because it is provided in local bundles (i.e., school districts). Tiebout argued that public education benefits only those consumers living in the district meaning that education bundles can be consumed only within specific geographic locations (i.e., TPSDs). Consumers seek the bundle of education along with the housing and quality of life that best meets their preferences (Tiebout, 1956). In theory, through shopping among competing districts, consumers reveal their preferences for education bundles and how they value locally provided public education (Tiebout, 1956).

Tiebout argued that consumers reveal and aggregate their preferences with similarly minded people within a district by selecting similar bundles and choosing to reside in the district that provides the preferred bundle. In this way, Tiebout countered Samuelson's (1954) contention that no market-type mechanism existed to achieve the optimal provision of public goods such as education. Samuelson had reasoned that because education was non-rival and non-excludable from consumption, consumers would neither reveal nor aggregate their preferences for bundles of education (Tiebout, 1956).

Tiebout argues that choice and competition among TPSDs will spur efficiency in the public education market. Consumers are assumed to be mobile, have symmetric information about schools, encounter no externalities, and lack barriers to exiting their district or entering a new one in search of an educational offering that better meets their preferences (Tiebout, 1956). In theory, consumers can vote with their feet in selecting the

school within a district that best meets their preferences. In theory, choice and competition among districts result in an efficient level of public education among TPSs because schools that fail to meet consumer preferences will lose students along with their associated revenues and, barring corrective action, ultimately be closed.

Critique.

Tiebout's model is a limited solution affecting only some families' choice. Tiebout's model limits the pressure to change the problems that charter schools are intended to solve: (Bewley, 1981; Tiebout, 1956; Wooders, 1989)

- TPSs are monopolies that underperform and use resources ineffectively
- TPSs offer a one-size-fits-all model
- TPSs insufficiently innovate because of state and local regulations

However, TPSs provide public education, which is a public, not a private good. The majority of voters may prefer a one-size-fits-all model. Furthermore, TPSs may insufficiently innovate because the electorate and governmental officials have a low tolerance for risk and following traditional practices is safer.

School choice mechanisms such as charter schools conflict with Tiebout's model when used as inter-jurisdictional tools. Affluent families can afford to move to districts offering their desired education bundle; they can vote with their feet. The poor and those lacking residential mobility cannot afford to move; therefore, they cannot vote with their feet and move to a district that meets their preferences. Thus, "The poor who cannot move have no choice" (Coons & Sugarman, 1971, p. 4). Lacking the ability to exercise voting with their feet, the poor are limited to their catchment area school.

School choice policies stem from the limitations of the Tiebout model. The poor lack equitable access and equal educational opportunity for the educational quality

provided by affluent districts. Fischel (2005) argues that vouchers provide the urban poor greater freedom to choose schools offering better educational quality than their catchment area schools making vouchers more compelling in large urban poor districts because these districts lack sufficient levels of community-specific social capital. Inequities and the lack of equal educational opportunity, especially for the poor and those lacking mobility, necessitate alternative choice mechanisms such as vouchers and charter schools according to choice advocates. Fischel (2005) argued that the lack of high-quality schooling choices for the disadvantaged also necessitates alternative choice mechanisms.

Brunner and Imazeki (2008) found that winners and losers in “universal voucher systems depend on two effects: changes in peer group composition and changes in housing values” (pp. 253, 254). Brunner and Imazeki (2008) concluded: “that the direction and magnitude of each of these effects hinge critically on market structure, i.e., the amount of school choice that already exists” (p. 253). Thus, in high Tiebout choice areas, poor families tend to support vouchers more than affluent ones because vouchers provide access to higher quality schools that the affluent already enjoy (Brunner & Imazeki, 2008). However, “in low choice markets, the introduction of universal vouchers may lead to more racially and economically segregated schools as a disproportionate number of high-income, highly-educated and white families opt out of the public sector” (Brunner & Imazeki, 2008, p. 277). Accounting for findings like these, Coons and Sugarman (1971) suggest providing higher dollar value vouchers or limiting vouchers to the poor to improve educational equity and equal access to quality schools.

Alternative choice mechanism.

Charter school advocates claim that charter schools provide an alternative choice mechanism necessary to break up the TPS system, which restricts educational quality, innovation, and access. They assert that the TPS monopoly limits parents and students' freedom to choose the school providing their desired educational quality. Thus, TPSs lack incentives to improve educational quality without competition provided by school choice.

Charter school advocates argue alternative choice mechanisms are needed to provide incentives for TPSs to innovate, improve educational quality, better meet parents' preferences, and provide access to public schools independent of catchment areas and other monopolistic limitations. Increased charter school availability will force TPSs to compete based on educational quality. Uncompetitive schools will suffer the market consequences of losing customers (i.e., students), losing revenue (e.g., enrollment-based aid and tuition), and increasing costs (e.g., increased mix of more expensive and difficult to educate students) culminating in going out of business (e.g., school or district closures or consolidations). Theoretically, this competition will eliminate failing schools and leave only those schools that meet market demand.

Choice-based competition.

In promoting what he calls common sense school reform, Hess (2004) argues that choice-based competition among schools would generate accountability. Choice-based competition would make schools accountable to consumer demand because parents could select the school that meets their preferences and leave schools that fail to provide quality education. Parents are presumed to make schooling decisions that best meet the needs of their children, "Pure competition is largely agnostic about what constitutes a 'bad'

school, leaving consumers free to decide” (Hess, 2004, p. 33). Competition disciplines the school market. Competition prevents homogenized schools from trying “to be everything to everybody,” forces innovation, and provides “quality control” as long as funding follows students to their new schools (Hess, 2004, p. 70).

Levin and Belfield (2003) echo Hess’ (2004) arguments that choice-based competition among schools improves educational quality and promotes efficiency because “in instances in which choice and competition are present, either educational quality will rise when costs are constant or costs will fall for a given degree of quality” (pp. 190-191). Accordingly, choice-based competition empowers consumers with the freedom to choose the school that meets their preferences. Thus, schools are incentivized to offer more customized education bundles rather than similar ones and meet parental preferences for their children's education or risk losing enrollment and the revenues associated with the lost students.

Similarly, Lizotte (2013) argues that TPSs’ failure to meet parental educational preferences results in “educational inequities” (p. 294). These inequities stem from the lack of universal and equal opportunity choice. Lizotte (2013) concludes the solution “is employing market-based principles (e.g., charter schools) (...) to empower parents and students to select the school that best meets their preferences” (p. 294). Thus, choice-based competition promotes equal educational opportunity and equity by severing the link of “school attendance to catchment areas based on stratified housing and income groupings” (Lizotte, 2013, p. 294).

Coons and Sugarman (1978) argue that empowering families with more equal educational resources can lead to more equal educational opportunity, and place the

concept of providing more “public resources to the family to purchase its children’s education” in historical context (Coons & Sugarman, 1978, p. 18). Adam Smith included the empowerment concept in his “*Wealth of Nations* in 1776” while Thomas Paine may “have been the first American to have suggested it (in 1792 in *The Rights of Man*)” (Coons & Sugarman, 1978, p. 18). Smith further attacked the monopoly of public schools, colleges, and universities; and he recommended choice-based competition funded by a family stipend or a governmental subsidy to the school of choice (Coons, Clune, & Sugarman, 1970; Coons & Sugarman, 1978). Paine suggested choice-based competition funded “through what today might be called a negative income tax scaled progressively in favor of the poor, coupled with a parental duty to purchase adequate education” (Coons & Sugarman, 1978, p. 19).

Intra-district-based and inter-district-based choice models.

Levin (1987) theorizes that public choice in a competitive schooling market is more efficient and practical than privatization because it “will expand the production of privately valued educational outcomes while maintaining the public functions of schooling” (p. 628). This can be accomplished by reorganizing how education is funded and produced (Levin, 1987). Like other scholars, Levin (1987) argues that choice-based competition will force increased efficiency in the schooling market (Coons & Sugarman, 1978; Friedman, 1955, 2002; Hess, 2004; Levin & Belfield, 2003; Lizotte, 2013). In addition, Levin (1987) asserts that schooling choices should be limited to those that increase public outputs.

Levin (2009) discusses two types of models of school choice: (1) residence-based choice, and (2) intra-district-based or inter-district-based choice. The residential mobility

choice model is Tiebout's model in which consumers' choice of residence determines their school and district. Tiebout (1956) theorizes that public school districts compete for education consumers who shop among competing districts to choose the district that provides the bundle of public education that meets their preferences and budget. Education consumers select their bundle of public education by voting with their feet; a concept, which is attributed to Tiebout.

Contrary to Samuelson's (1954) argument, Tiebout (1956) argued that market theories applied to local public goods; particularly public education. However, Tiebout's model assumes education consumers have perfect mobility and information with which to purchase housing in the district that meets their educational preferences and budget. The limitations of Tiebout's model do not account for inequities in the housing market including racial and ethnic discrimination, zoning regulations, and the redlining of mortgages, insurance and financial services limit freedom of choice especially for racial, ethnic, and low-income people.

Education consumers have limited ability to shop among competing districts and select the school that provides the education bundle best meeting their preferences and budget because of asymmetric information, and transportation, transaction, and relocation costs. Consumers shopping among districts fail to generate perfect competition among districts because consumers are not perfectly mobile and cannot readily move to a district that better meets their needs should their district's bundle of public education become inconsistent with their preferences and budget. The limitations on education consumers' ability to vote with their feet have fueled interest in alternative school choices particularly charter schools.

Levin (2009) discusses nine forms of intra-district-based or inter-district-based choice models in which consumers are free to choose schools either within their district's jurisdiction or in another district. First, open enrollment enables parents to choose the school within the district that meets their preferences with the choice limited to open seating capacity. Similarly, magnet schools enable parents to choose a school that meets their preferences while magnet schools typically focus on specific academic areas. Third, schools-within-schools offer more individualized learning and teaching experiences. Fourth, Levin (2009) proposes inter-district choice in which consumers are free to choose schools in other districts depending on available seating capacity. Inter-district choice models that fail to provide transportation or subsidies for low-income people are inequitable and the lack of openings in affluent districts limits freedom of choice.

Fifth, Levin (2009) discusses homeschooling. Homeschooling enables parents to choose to educate their children at home rather than attend their catchment area school. However, low-income parents would be at a disadvantage to provide the same quality of homeschooling as affluent parents. Sixth, Levin (2009) discusses private schools. Schools that are not affordable or accessible for poor people create inequities. Vouchers or tuition tax credits often provide funds to pay some or all of private school tuition. Some voucher plans provide transportation or subsidies to help offset transportation costs. Seventh, tuition tax credits (TTCs) fund some or all of private school tuition (Levin, 2009; Levin & Belfield, 2003). TTCs help low-income families afford private schools and are deducted directly from the amount of taxes owed (Levin, 2009; Levin & Belfield, 2003)... Tuition tax deductions (TTDs) differ from TTCs because they provide a benefit only equal to the person's tax rate times the person's income less the deduction, resulting in a

benefit equal to the person's tax rate on the deduction amount. A simple example: with \$100 of income, a 30% tax rate, \$30 taxes owed, and a \$5 TTC or TTD; the benefits would differ as follows. (Levin, 2009; Levin & Belfield, 2003).

- TTC: Assuming that \$30 taxes is owed less a \$5 TTC equals a \$25 tax liability, which would benefit a person by five dollars.
- TTD: Assuming a \$100 income less a \$5 TTD equals a \$95 taxable income; however, \$95 in taxable income times a 30% tax rate equals a \$28.50 tax liability, which would benefit a person by \$1.50.
- In this example, the net benefits are \$3.50 more with the TTC.

However, asymmetric information, lack of mobility, lack of personal transportation options, transportation costs, and the inability to pay the full private school tuition or any amount not covered by TTCs or TTDs limit freedom of choice.

Additional inequities result when the TTC exceeds a poor person's tax liability; therefore, the poor person is unable to benefit from the full TTC while an affluent taxpayer would. TTCs create inequities by enabling parents to supplement the TTC with personal funds such as paying tuition and fees not fully covered by the TTC or to use personal funds when applying the TTC at more expensive private schools that a poor person could not afford even with a TTC. TTCs could be designed to limit or prevent inequities. This could be accomplished by limiting TTCs to poor people and allowing poor people to keep the full TTC even it exceeds their tax liability or scaling the TTC amount inversely with income such that poor and affluent TTC recipients would derive equal benefit from their TTCs.

Vouchers are the eighth public choice type that Levin (2009) discusses. Vouchers provide funds to pay some or all of the tuition at private schools that usually are neither affordable nor accessible to low-income families. Although some voucher plans provide transportation or subsidies to help offset transportation costs, asymmetric information,

lack of mobility, lack of personal transportation options, transportation costs, and the inability to pay the tuition and other costs not covered by vouchers limit the freedom of choice. Levin's (2009) ninth public choice type is charter schools. Theoretically, charter schools are designed to offer greater choice than other intra-district or inter-district choice models (Levin, 2009; Levin & Belfield, 2003).

Market failure.

Imperfections.

Every market has imperfections including the schooling market (Belfield & Levin, 2005; Levin & Belfield, 2003). They assert that these imperfections include:

- Market information is asymmetric or limited for suppliers and consumers
- Externalities (costs or benefits) exist
- Mobility is limited for certain suppliers and consumers
- Transportation, transaction, and relocation costs exist for suppliers and consumers
- Freedom to choose does not exist equally and equitably for all consumers
- Barriers to entry or exit exist for suppliers and consumers
- Imperfect housing market: housing market does not function equally and equitably for all suppliers and consumers
- All suppliers and consumers are not rational; suppliers and consumers can act irrationally or with prejudice
- No optimal or large number of suppliers and consumers exist in all markets; thereby, one or two significant suppliers or consumers can disproportionately affect education's market price

Market failure reduces the efficiency of schools in the market; raising the question

“whether greater choice and competition is [*sic*] introduced and improves [*sic*]

educational processes and outcomes, not whether the improvement is optimal” (Belfield

& Levin, 2005, p. 32; Levin & Belfield, 2003, p. 192). “As long as there is a certain

amount of choice and competition, it is believed that the outcomes will be better than

when there are no choices at all” (Belfield & Levin, 2005, p. 32; Levin & Belfield, 2003, p. 192).

Asymmetric information.

Asymmetric information results in inefficient markets. Efficient markets require parents to act rationally, which means parents must have access to and understand information on the quality of the education provided by schools so that they can make informed choices. However, information on school quality is often difficult to access, not readily available, or difficult to decipher. Parental schooling decisions using imprecise, incomplete, or incorrect information result in choices that are not rationale.

Lacking perfect, accurate, or complete information, parents may not select the school that is best for their children or even the best school available (Chubb & Moe, 1990; Jeynes, 2014; Loeb, Valant, & Kasman, 2011). Thus, market-based competition would not function as presumed because market forces would not force poor performing schools, whether TPS or charter, to close or make educational improvements (Loeb et al., 2011). In a real-world scenario, this market failure would obscure accurate school quality; therefore, parents would have difficulty deciding which school their children should attend and counteract selection processes intended for sorting out the better performing schools whether TPSs or charters (Loeb et al., 2011).

Barriers.

Education consumers face barriers in choosing and accessing desired schools. One major barrier is that not all education consumers do have the perfect mobility to vote with their feet among a large number of districts offering different kinds and qualities of education. Not all consumers are equally free to choose their residence location or school district with perfect information, and no transportation, transaction or relocation costs (Belfield & Levin, 2005; Chubb & Moe, 1990; Jeynes, 2014; Levin & Belfield, 2003;

Loeb et al., 2011). Poor people lack the same resources with which to compete and select schools.

Public transportation may be unavailable, too expensive, too distant or time-consuming, preventing on-time arrival, or inaccessible. Public transportation may be available near the student's home but not in proximity to their desired choice school. Private transportation may be unavailable or too expensive (e.g., car ownership, cab usage, or ride sharing). Cycling or walking to the choice school may be unsafe or too time-consuming. These transportation or transactions costs lead to imperfect or inefficient market-based outcomes.

Barriers to entry and exit.

Inefficient markets result from barriers that prevent parents or charter schools from entering or exiting schools or districts. Efficient markets require parents and charter schools to have the freedom to make rational choices and be able to act freely on those decisions. Barriers result in less than rational choices, which lead to inefficient competition and market failure.

Efficient markets also require districts to have the capacity to include new parents and charter schools, which requires a lack of barriers to entry and exit. “There exists an optimal community size (there is some theoretical point at which communities are maximally efficient) and communities that are not of optimal size will try to attract or deter residents to reach that optimal size” (Buckley & Schneider, 2006, p. 101). Moreover, “In general residential decisions involve many factors in addition to education—proximity to work, quality of housing, availability of public services—and, once they are made, the financial costs and personal adjustments entailed by moving are

quite high” (Chubb & Moe, 1990, p. 33). Residential mobility is imperfect and does not equate pure freedom to choose “even for those citizens affluent enough to move where they want when they want” (Chubb & Moe, 1990, p. 33). When parents and charter schools act rationally based on symmetric information combined with a lack of barriers to entry and exit efficient markets for public education can result.

Critique of imperfect government and markets.

Theoretically, the perfect market or government exists. However, the school choice argument centers on markets rather than a perfect model. Specifically, the argument is whether imperfect markets work better than imperfect government concerning the provision of education and schooling.

Imperfect government.

Privatization advocates have created an environment in which the national education system is viewed as failing, and, therefore, in need of restructuring (Henig, 1994). Introducing market forces to the schooling arena is the favored prescription. School choice is advocated to enable market forces to restructure the current traditional public school district (TPSD) monopoly and give parents the freedom to choose the school meeting their educational preferences. School choice, whether through vouchers, TTCs, magnet, or charter schools, would free students from having only the choice of attending their catchment area school regardless of its academic performance, funding, or teacher quality (Henig, 1994). In theory, school choice would shift control of schools from the government to the market, making schools more efficient and responsive to educational consumer needs (Henig, 1994).

Imperfect markets.

Although Henig (1994) acknowledges dissatisfaction with government and the theoretical appeal of school choice fuel the privatization movement, he criticizes the competition-based market model for school choice. He argues reformers have exaggerated claims that the nation's schools are failing and their failure to educate students properly leads to economic and social problems. Supporting his argument, Henig (1994) criticizes Chubb and Moe as major school choice advocates who try "to deny the link between school choice and the privatization movement" exposing the weakness in their argument (p. 7). Henig (1994) faults Friedman, whom he credits for developing the conceptual framework undergirding school choice using vouchers, for arguing that market failures were uncommon and governments act more from self-interest rather than in the public interest.

Henig (1994) concludes that market-based privatization advocates have deliberately misinterpreted and misconstrued problems with education to create a sense of crisis to support "their claim that only radical change will suffice" (p. 10). Henig (1994) argues this rationale for school choice evolved from a false sense of urgency to solve an exaggerated education crisis. School choice is made acceptable by transforming it from being perceived as a radical change to the logical result of "lessons learned" (Henig, 1994, p. 12).

The market model provides the necessary conceptual framework linking school choice models including vouchers, magnet schools, district-wide open enrollment, and charter schools with market models. The public is led to draw the conclusion that school choice would function as an ideal market model. School choice, based on an ideal market

model, therefore, would correct for the market failure and educational shortcomings inherent in the current TPSD monopoly. School choice is promoted not as a theoretical leap of faith or radical change but as an urgently needed way to solve the educational crisis using proven ideal free market principles.

To determine the factors with the greatest influence on school choice, Henig (1994) assesses the market model using “four alternative motivators of school choice: individuality and personal growth, communal values and cultural diversity, community-power, and contingent alliance” (p. 14). In analyzing school choice influences, Henig (1994) criticizes the market model.

Lacking any working examples of a truly market-based system of school choice, proponents have based their claim to empirical support on the implied analogy between certain existing practices and free-market models. They assert that existing practices that incorporate elements of choice (...) are like free markets, only a little less so. It is this analogy that sustains the interpretive leap: if it can be demonstrated that these practices succeed in promoting educational achievement without undermining equality, then stronger steps to displace governmental with market forces are surely worth trying. (p. 13)

(...) if parents are freed to act as rational education consumers—able to take their business elsewhere if unsatisfied with the product that their local schools provide—schools will be forced to increase the quality of education and the efficiency with which they deliver it, or else risk going out of business. (p. 57)

Citing the lack of “working examples of a truly market-based system of school choice,” Henig (1994) criticizes the market model for requiring a leap of faith that competition will result in equal educational opportunity, achievement, and equity (p. 13). Henig (1994) goes further in suggesting if pure market conditions truly exist such that consumers act rationally to choose schools with complete mobility, freedom to choose, and information and without barriers or costs, then parents would tend to choose schools based on quality.

However, Henig (1994) concludes that market-based competition does not induce public schools to provide quality education to meet parental preferences “or else risk going out of business” because parents are not free to act rationally in choosing schools with complete mobility and information and without barriers (Henig, 1994, p. 57). Therefore, the market model prevents parents from acting rationally in choosing schools. Thus, parents are unable to select schools based on quality that leads to inefficient competition, which results in inefficient markets for education.

Market share growth.

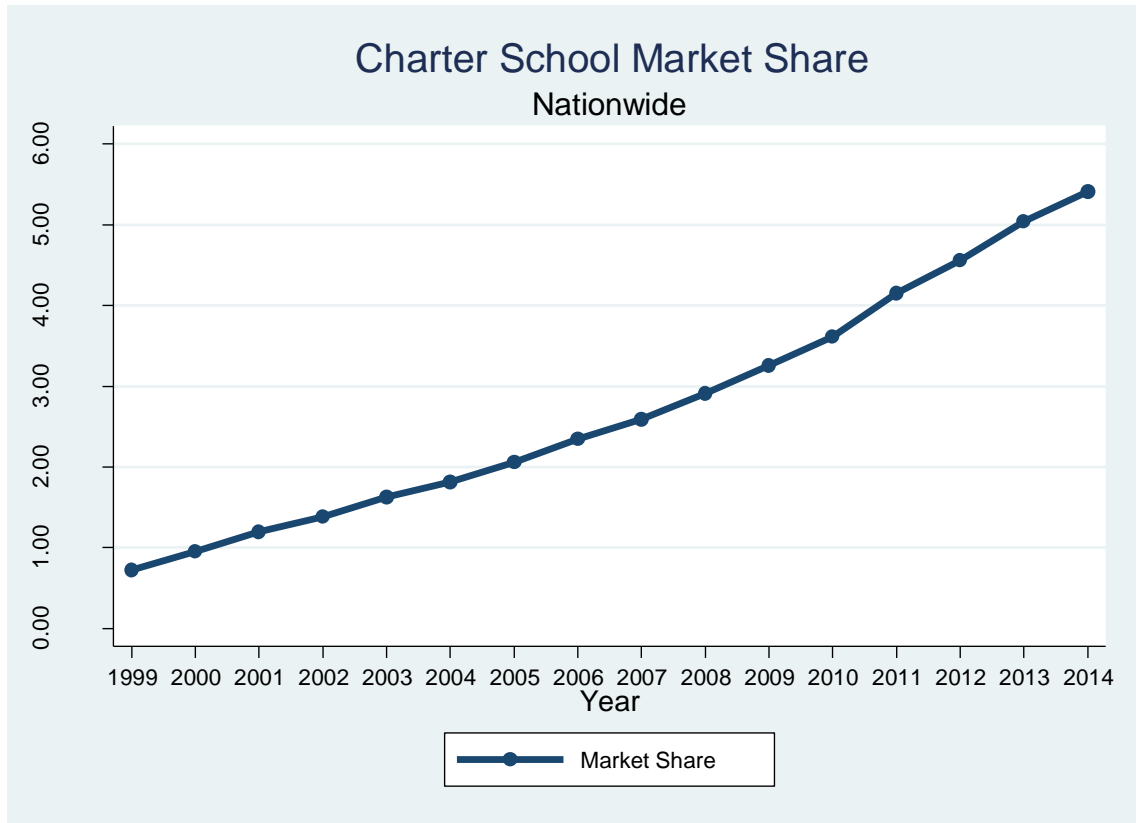
Charter school growth during 1999 to 2014 propelled charter schools to the forefront of the debate over the extent to which the traditional public education policy paradigm is shifting or should move toward a choice-based market competition model, and prompted questions concerning the implications for public education. Following the publication of *A Nation at Risk* and before charter schools began enrolling significant numbers of students; the paradigm discussions were largely centered on how to improve the nation’s traditional public education system. Charter schools changed the focus of these paradigm discussions.

Charter schools altered the paradigm by advancing choice-based market competition. Charter schools offered choice in a competitive market as a way to improve the quality of public education by increasing efficiency, forcing out poor performing schools, raising educational standards, and thereby improving school and student performance. In theory, therefore, educational quality would improve “when the public schools have to compete for students and students and their parents have the right to

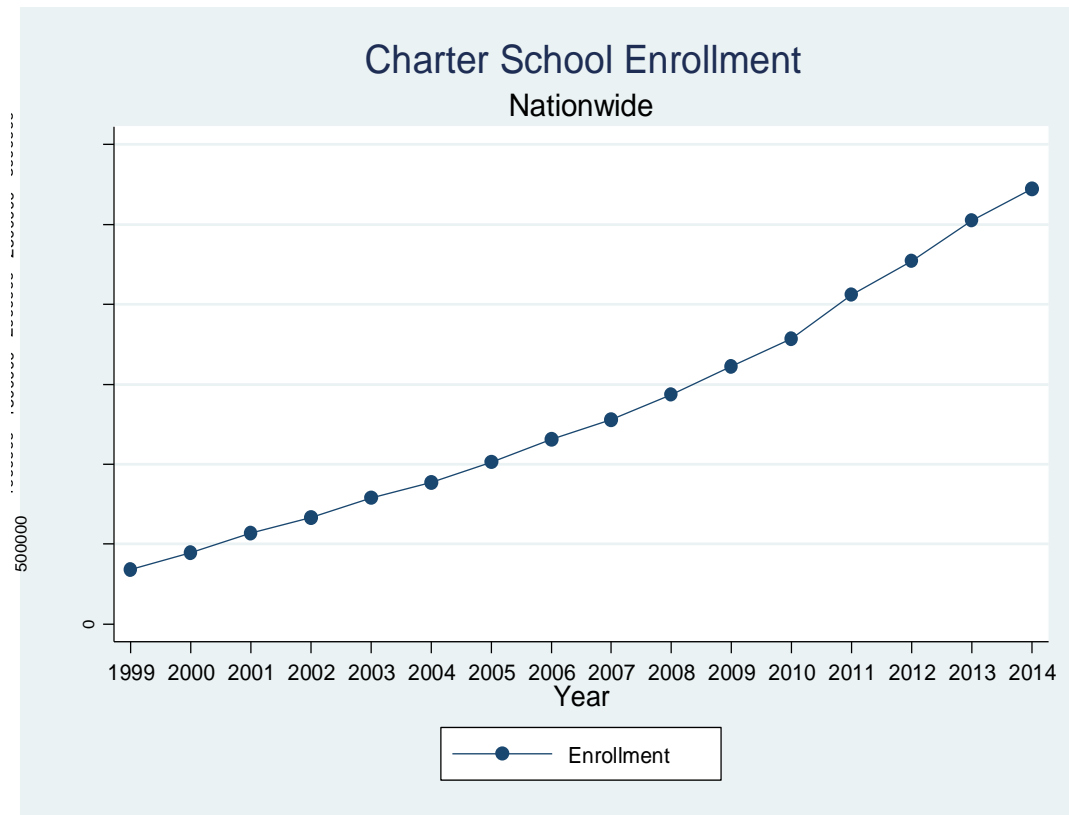
choose” (Weil, 2009, p. 215). Charter school growth needs to be understood within the context of this paradigm shift.

Central to answering questions concerning how charter school growth has affected the public education paradigm and market is better understanding the trends of its enrollment, share of the public education market, and overall enrollment in public education. Charter school enrollment grew at an annual average rate of 44% from 340,000 to 2,721,786 (Graph 2); while total public school enrollment grew at an annual average rate of only 0.49% from 46,689,000 to 50,312,581 (Graph 3) during 1999-2014. During this period, the charter school market share increased at an annual average rate of 40% from 0.73% to 5.41% (Graph 1). The growth rate in charter school enrollment and market share greatly exceeded that of total public school enrollment during 1999-2014. This raises questions concerning the key determinants of charter school market share growth, which establish the context for my study and undergird its need.

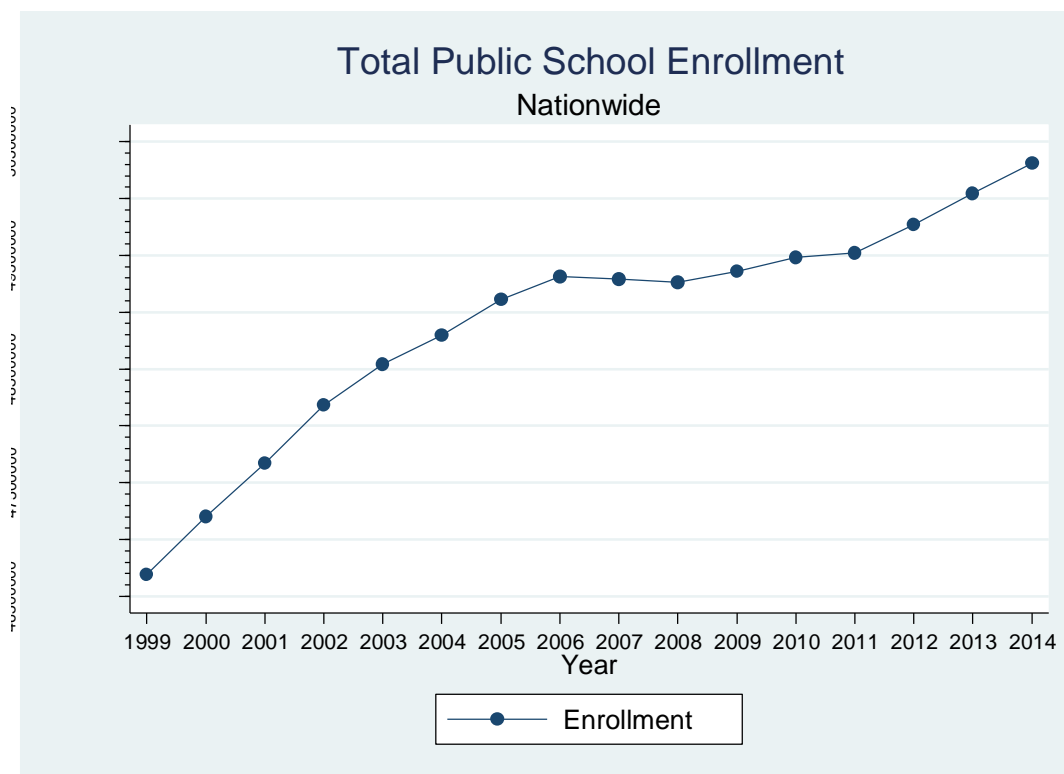
Graph 1



Graph 2



Graph 3



Promises.

The growth of charter schools has spurred debate about charter school performance and the effectiveness of charter schools in achieving desired outcomes. Charter schools are purported to usher choice and competition into the education market, which would improve public school quality, parental satisfaction, and student achievement (Wong, 2014).

Interestingly, while most studies or evaluations of charter schools find that parents and students are generally satisfied with their charter school, the growing body of evidence indicates that—on the whole—charter schools are not performing better on standardized tests than are traditional public schools. Although there are a few successful states, the overall results are mixed at best. (Miron, 2017, p. 228)

Although more permissible or expansive charter school laws, operational and curricular flexibility, and greater autonomy support charter school formation and growth while higher accountability limits formation and growth, increased permissibility and accountability are associated with lower student outcomes (Wong, 2014). The results are mixed with interstate and intrastate variations (CREDO, 2009; Watral, 2007; Wong, 2014; Wong & Shen, 2006).

Market reform advocates assert that the TPSDs' monopoly results in market failure stemming from the lack of a large number of suppliers and consumers enabling one or two significant suppliers or consumers to disproportionately affect education's market price (Diedrich, 2012). Market reform advocates claim competition and school choice will create the competition necessary to break the TPSDs' monopoly (Miron, 2017). Similarly, TPS advocates use theories of market failure to support their claim that school choice and competition will not improve the quality of education (Diedrich, 2012). However, "The academic performance of charter schools is generally seen to be mixed,

with relatively small differences between demographically similar students in charter and district schools” (Miron, 2017, p. 229).

Pro-market advocates argue that monopolistic catchment area-based attendance causes TPSDs to lack the incentive to improve the quality of education (Morley, 2006). Pro-market reform advocates argue market-based school choice will provide the competition necessary to incentivize TPSDs to provide higher quality education or lose students along with their associated revenues and go out of business (Diedrich, 2012). The same market-based competition applies to charter schools; “Yet closure rates are relatively low, and most charter schools that close do so because of financial mismanagement, rather than performance or market accountability” (Miron, 2017, p. 228).

Charter schools “straddle the division line between public and private and are one of the clearest manifestations of the ways in which market-oriented policy initiatives are blurring the boundaries between government and markets” (Henig, Holyoke, Lacireno-Paquet, & Moser, 2003, p. 39). In studying Washington, D.C. charter schools, Henig et al. (2003) found charter schools tried to influence policy when faced with market-based competition “to provide a substantial and relatively permanent advantage vis-à-vis their competitors,” and “use politics to more permanently alter the institutionalized parameters that define the policy regime within which they operate” (p. 45). Henig et al. (2003) concluded Washington, D.C. charter schools worked to change their market through political advocacy and lobbying. Similarly, Jabbar (2015), Kasman & Loeb (2013), and Lubienski (2005) (as cited in Rubin, J. S., Good, R. M., & Fine, M., 2019) reported that “studies have found that schools in competitive environments devote more resources to

marketing, working to attract more students by burnishing their image in the marketplace.”

TPS advocates claim that charter schools cream skim or crop students to enroll disproportionately more high-aptitude and White students while enrolling fewer students who are at-risk and, therefore, more expensive to educate including special education, ELL, minority, or free-and-reduced-price lunch eligible students (Buddin, 2012). Enrolling disproportionately more White students increases segregation and racial isolation and draws parallels to separate but equal adverse effects (Buddin, 2012). Charter school advocates deny these assertions (Consoletti-Zgainer & Kerwin, 2015; Ziebarth, 2015; Ziebarth & Palmer, 2016; Ziebarth, Palmer, O’Neill, & Lin 2014).

Exemptions from collective bargaining, unionization, and district regulations were associated with negative student outcomes while other studies found no relationship (Watrall, 2007; Wong, 2014). CREDO (2009) found states having enrollment caps or multiple authorizers had slightly lower student achievement compared to TPSs while Wong (2014) found no association.

Findings regarding the impact of charter schools on student achievement and comparisons to TPSs are mixed. Buddin (2012) found no significant effect of charter schools on TPS’ student achievement. Wong (2014) concluded that charter schools seemed to improve student achievement most in those states with lower overall student achievement levels. Betts & Tang (2014) found charter schools improved students’ math test scores over TPSs but reading scores were not significant. Gleason, Clark, Tuttle, and Dwyer’s (2010) study found no improvement in math and reading scores. CREDO (2013) conducted a study of charter schools nationwide and concluded that charter school

students performed favorably in reading and equally as well as TPS students in math. Pendergrass and Kern (2017) report math and reading test score improvements for African-American, FRPL-eligible, and ELL students, in reviewing the CREDO (2013) study. CREDO (2015) found improvements for urban charter schools compared to urban TPSs in its study of large urban districts. Dobbie and Fryer (2011) found a narrowing of the achievement gap among White and African-American students.

Charter schools' implied promise of improving student performance and school quality is based on the expected gains from an exchange of greater independence, autonomy, and flexibility for greater accountability. When Minnesota passed the first charter school law in 1991, charter schools held the promise of becoming, independently chartered public school laboratories in which new and improved educational practices would be experimentally developed and shared with all schools. These pedagogical and learning best practices would be developed in schools with more operational, managerial, and financial efficiency. However, the effect of charter schools on student achievement and school quality in comparison to TPSs has been mixed. Whether charter schools are more efficient and effective than TPSs in improving student performance and school quality remains an open question.

Politics.

Philanthropy.

A new form of education philanthropy is increasingly focused on efforts to “promote significant change in how America’s schools and school systems go about their work” (Hess & Henig, 2015, p. 2). The new educational philanthropies aim to achieve “more macro educational [*sic*] transformations, including market-based reforms” (Verger,

Fontdevila, & Zancajo, 2016). Diane Ravitch is one of the most outspoken critics of this changing role of traditional education philanthropy. Diane Ravitch criticizes how it has shifted funding to charter schools. Ravitch asserts that this new education philanthropy is a form of “muscular philanthropy” that promotes “advocacy, structural reform, and public-private partnership” to privatize education (Hess & Henig, 2015, p. 5). Ravitch concluded that pro-charter school philanthropists fund efforts to “undercut public education and impose a free market competition among schools” (Ravitch, 2014).

Pro-charter school philanthropic organizations and foundations have subsidized charter school formation and expansion and leveraged their resources to mobilize political and legislative support for charter schools especially at the state level. New York State is a prime example. In 2014, donations and support provided to New York Governor Andrew Cuomo from charter school supporters led Cuomo to block New York City Mayor De Blasio’s efforts to limit charter school expansion and the colocation of charter schools in TPSs (Hess & Henig, 2015).

Another form of foundation grant making is referred to as “venture philanthropy” (Hess & Henig, 2015, p. 29). Although conceptually similar to traditional venture capital, venture philanthropy earns a return on its investment by achieving its social goals of policy and structural reform. The Gates Foundation’s grants to “the Center for Education Reform ‘to advance high-quality charter policies’” exemplify this advocacy for policy reform (Hess & Henig, 2015, p. 21). The Broad Foundation’s grants to the Green Dot Public Schools, a major nationwide for-profit charter school EMO; exemplify how venture philanthropy works for structural reform (Hess & Henig, 2015). The major venture philanthropic foundations that contributed the most financially to promote

market-based competition in the K-12 arena and advance charter schools during 2000-2012 include: “The Eli and Edythe Broad Foundation, Michael & Susan Dell Foundation, Bill & Melinda Gates Foundation, Robertson Foundation, and Walton Family Foundation” (Hess & Henig, 2015, p. 34).

Over the past 15 years, these major venture philanthropic foundations diversified their charter school grant making to focus on funding major "charter management organizations (CMOs) (...) including Aspire Public Schools, KIPP, and Green Dot Public Schools" plus K12 Inc. and Edison Learning, Inc. (Hess & Henig, 2015, p. 40). These CMOs form and operate charter schools nationwide. The change in the proportions of total grant making by the major venture philanthropic foundations during 2000 to 2010 highlights the shifting emphasis to funding CMOs rather than just charter schools. In 2000, “individual charter schools received 71.5 percent of all charter school dollars, with CMOs receiving the remainder (...) By 2010, the forty-six largest charter school beneficiaries were CMOs, and these organizations represented 81.1 percent of all new foundation charter school grants” (Hess & Henig, 2015, pp. 40-41).

The major venture philanthropic foundations further diversified their funding efforts by developing philanthropic venture capital funds. The New Schools Venture Fund (NSVF) and Charter School Growth Fund (CSGF) bring “venture capital principles to education reform in efforts to maximize return on investment” (ROI) (Hess & Henig, 2015, p. 41). The NSVF and CSGF provide venture capital to CMOs to foster charter school growth and maximize their charter school-based ROI.

The success of the major pro-charter school philanthropic foundations in subsidizing charter school formation and market share growth while securing increasing

political and legislative support for charter schools has spurred the opposition of major critics including Diane Ravitch, Leonie Haimson, Mark Naison, and Michael Mazenko. These critics attack the major pro-charter school philanthropic foundations' form of education philanthropy because it supports school choice mechanisms primarily charter schools but also vouchers and tuition tax credits rather than traditional catchment area public schools (Hess & Henig, 2015).

Diane Ravitch, a former assistant Secretary of Education, attacks the major pro-charter school foundations because she believes their charter school funding will result in the privatization of education nationwide (Hess & Henig, 2015). "Leonie Haimson, the founder of Class Size Matters and Parents Across America," opposes the major pro-charter school foundations for their adverse impact on TPSs (Hess & Henig, 2015, p.131). In particular, she attacks the Walton Foundation for what she decries as the "'Walton-supported law' in New York that provides free space [colocation] for charter schools at the city's expense" (Hess & Henig, 2015, p.133). "Mark Naison, a Professor at Fordham University and co-founder of the Badass Teachers Association," attacks the Walton Foundation's funding of charter schools because of what he asserts as charters adverse impact on poor inner-city students and TPSs (Hess & Henig, 2015, p.133). He further attacks what he considered the Gates Foundation's attempt to influence governors' charter school policies by contributing \$200 million to the National Governors Association (Hess & Henig, 2015, p.138).

Michael Mazenko, a public school teacher, summarizes the criticism in declaring, "That the reform movement fundamentally misunderstands the issues of contemporary school systems" because their efforts are not based on the first-hand in-school experience

of school teachers, administrators, and leaders (Hess & Henig, 2015, p.135). Like the three other critics, Mazenko is not objecting primarily because charter supporters do not have first-hand education experience; they are objecting because they believe that charters are destroying public education and increasing segregation. Thus, he concludes that charter school-based reform will not address the problems associated with poor performing TPSs because their proposed solutions do not fit.

Unions.

In the political struggle over charter schools “the increased role of education philanthropists has tended to undermine the power of traditional education actors like unions” (Maranto & Rhinesmith, 2017, p. 460). Generally, teachers’ unions oppose market-based competition among charter and TPSs (Burch, 2010; Giles, 2006; Verger et al., 2016). Teachers’ unions assert that market-based school choice will undermine public education and culminate in the privatization of education (Burch, 2010; Giles, 2006; Verger et al., 2016). Teachers' unions "oppose market-based education reforms" involving "publicly subsidized school choice" especially state funding of charter schools arguing that it siphons scarce revenues from TPSs (Maranto & Rhinesmith, 2017, pp. 450, 454).

Maranto and Rhinesmith (2017) argue that nationwide, “teachers unions have opposed efforts to pass or expand charter laws” because teachers’ unions realize that “charter schools are overwhelmingly non-union and their employees typically lack tenure” (pp. 456, 459). On a more micro-level, several scholars assert that teachers’ unions view state charter laws that increasingly grant charter schools waivers from unionization and collective bargaining requirements as a direct threat to the survivability

of unions while charter schools oppose having their teachers join unions (Burch, 2010; Giles, 2006; Hartley & Flavin, 2011; Verger et al., 2016). Hartley and Flavin (2011) argue that teachers' unions view the waivers granted to charter schools as threatening the protections and other benefits that their contracts provide for teachers' jobs. They claim that these waivers result in lower compensation that gives charter schools a cost advantage in the market-based competition (Hartley & Flavin, 2011). Teachers' unions argue that this competitive advantage will culminate in closing many TPSs and are concerned that charters pose an existential threat to unions. "For unions, losing members means a reduction in financial resources and representational legitimacy, and this ultimately translates into a reduction in mobilization capacity and political influence" (Verger et al., 2016, p. 167). Indeed, "privatization reforms alter the resources available for TUs in education politics" (Verger et al., 2016, p. 167).

The National Education Association (NEA) and American Federation of Teachers (AFT) are among the nation's largest professional unions, have members nationwide, and leverage their large memberships to oppose charter schools (Maranto & Rhinesmith, 2017). To combat charter schools, teachers' unions focus on lobbying governors and state legislators to influence charter school legislation (Hartley & Flavin, 2011). In addition, teachers' unions make financial contributions and mobilize their members to work in the campaigns of pro-union candidates (Hartley & Flavin, 2011). Teachers' unions argue that lobbying and participating in political campaigns are more effective in opposing charter schools and privatization than are the size of union membership or proportion of union members in the workforce statewide (Hartley & Flavin, 2011).

Supply-side Influences

Caps.

Expansive charter school laws are those that foster market share while restrictive laws limit market share. Kane and Lauricella (2001) found that 70% of charter schools operated in “expansive law” states: Arizona, California, Colorado, Florida, Michigan, North Carolina, and Texas (p. 207). Arizona had the most expansive law because charters have no caps, almost no limit on whom can apply for a charter, three different authorizer types, receive full-state funding, are legally and financially autonomous, are exempt from state and district regulations, and exempt from collective bargaining (Kane & Lauricella, 2001, p. 207). Kane and Lauricella (2001) found that less than one percent of charter schools operated in 12 “restrictive law” states: Alaska, Arkansas, Georgia, Hawaii, Idaho, Kansas, Mississippi, Nevada, New Mexico, Rhode Island, Virginia, and Wyoming (p. 207). Mississippi had the most restrictive law because the state board of education is limited to granting only six charters annually, and only existing TPSs seeking conversion may apply (Kane & Lauricella, 2001, p. 207).

States with expansive charter school laws tend to have more charter applications and charter schools because these states’ laws generally provide more autonomy, less restrictive caps, multiple authorizers, facilities, funding and political support than states with restrictive charter school laws (Renzulli, 2005). Similarly, Kuscova & Buckley (2004) found states that cap charter school numbers or enrollment whether annually, statewide, or geographically restrict charter school formation and market share. “Fewer caps can allow greater options and increased accessibility for families,” which supports charter school market share” (Christie, Millard, Thomsen, & Wixom, 2014, p.3). Charter

advocates claim caps limit charter schools arbitrarily and “prevent competition from naturally determining the appropriate number of schools” while opponents assert that caps cause authorizers “to be more rigorous in closure and approval decisions” (Bell, 2011, p. 3). The most expansive state laws have no annual cap, limit on the total number of charter schools statewide, and geographic limitations (e.g., charters granted only within certain cities or metropolitan areas).

Authorizers.

Multiple.

Expansive laws typically permit independent and multiple authorizers to grant charters statewide while restrictive laws tend to restrict the granting of charters to districts’ BOEs (Baker & Miron, 2015; Bifulco & Bulkley, 2015; Kane & Lauricella, 2001; Nelson, Muir, & Drown 2000). Kuscova and Buckley (2004) argue that multiple charter authorizers in addition to the state or district BOE support charter market share while granting the district BOE sole charter approval restricts market share. Bifulco and Bulkley (2015) and Kane and Lauricella (2001) found that states having multiple charter authorizers that excluded the state and district BOE more favorably supported charter school market share than those that included the state or district BOE. Shober, Manna, & Witte (2006) conclude that “if there are multiple charter school authorizers, schools are likely to open” promoting charter school formation and market share (p. 579).

Independent.

Independent authorizers are those that are not linked to or controlled by the state or district BOE. States having only independent authorizers promote charter school formation (Nelson et al., 2000; Shober et al., 2006). Other researchers found that states

having independent authorizers with either the state or district BOE only having approval authority governing an appeal of a charter rejection also promote charter school formation but not as strongly as states that lack a similar state or district BOE appeal process (Bifulco & Bulkley, 2015; Kane & Lauricella, 2001; Kuscova & Buckley, 2004).

State and district BOE authorizers.

Funding.

Statewide authorizers, whether state departments of education or independent agencies are more consistent and provide higher quality in the charter review and approval process than local or regional authorizers (Christie et al. 2014). However, intra-state funding variations arise when a state's charter school law enables the authorizing entity to determine per-pupil funding, and different authorizer types establish different funding amounts (Epple, Romano, & Zimmer, 2015; Green and Mead, 2004). A major source of intra-state variation occurs in states, such as Alaska, Colorado, and Illinois, in which host district BOEs determine the funding requiring each charter school to negotiate its per-pupil funding. "However, such funding arrangements also give school districts flexibility in providing funding for the specific needs of charter schools including higher costs associated with particular programs or student populations" (Nelson et al., 2000, p. 31). Kuscova and Buckley (2004) conclude that district BOEs will use the aforementioned flexibility in providing funding to underfund charter schools:

We expect that because local school districts 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. (p. 5)

States that provide charter schools with operational funding equal to TPSs including equal access to revenue sources are more likely to have higher charter school market shares (Kuscova & Buckley, 2004).

Host TPSD's can grant charter schools access to some of their programs or services such as athletic facilities, transportation, and special education, which can be expensive. However, transportation costs can result in funding variations as some states and host TPSDs fund only a portion or no charter school transportation costs, or provide funding below the level of actual costs for transporting district students to charter schools (Nelson et al., 2000). States such as Louisiana, Colorado, Kansas, New Mexico, and Texas provide additional funding for charter schools in small TPSDs to address "diseconomies of scale" (Nelson et al., 2000, p. 46). Illinois and Minnesota provide additional funding for charter schools locating in TPSDs with large concentrations of poor students while Colorado, Florida, and Texas provide additional funding for charter schools locating in TPSDs with a high cost of living (Nelson et al., 2000).

Charter schools often are required to pay administrative fees to their host TPSD that can vary by authorizing district, and rarely receive funding for fixed assets such as school buildings (Nelson et al., 2000). TPSDs can charge fees for providing charter schools with programs and services including participation fees in some states. However, states such as Ohio "assign to authorizers a percentage of public revenue designated for charter schools to pay for their oversight" (Baker & Miron, 2015, p. 17).

Witte, Schlomer, and Shober (2007) argue that charter schools located in districts with large enrollments, relatively high per-pupil spending, and perceptions that host TPSDs fail to meet parents' educational preferences to maximize per-pupil transfer

payments and enrollment. Leveraging these factors enables charter schools to attract large numbers of students to meet enrollment goals, maximize revenues based on host TPSD high per-pupil spending to meet financial goals, and provide competitive schooling alternatives to host TPSDs that attract and retain targeted students especially those attending TPSs that fail to meet their educational needs (Witte et al., 2007).

Authorizing.

In rethinking the federal role in education, Croft, Dynarski, Hoxby, Loveless, Schneider, Whitehurst, and White (2010) argue that allowing district BOE's to authorize charter schools is a conflict of interest because charter and TPSs compete for students, faculty, and funding. Thus, district BOE's would be incentivized to reject or limit charter approvals. In studying Florida charter school enrollment, Singleton's (2017) findings supported the idea of district BOE opposition. Florida state law restricted district BOE charter approval authority that promoted charter school formation and market share because charters could be approved by a wide range of authorities. Croft et al. (2010) concluded that state departments of education, universities, non-profit organizations, and independent authorizing boards would be more objective in reviewing and approving charters, and recommend that district BOE's should be granted approval authority only if multiple authorizers are granted approval authority.

Autonomy.

Charter advocates claim operating, fiscal, and legal autonomy enable charter schools to innovate, operate efficiently, be accountable to parents and meet their charters' goals (Kane & Lauricella, 2001). Shober et al. (2006) found that the degree of flexibility and autonomy from district and state laws and regulations affected charter school

formation and market share. Shober et al. (2006) concluded that states with laws granting more flexibility and autonomy have more charter schools while states with laws requiring more accountability have fewer charter schools.

Expansive charter school laws are more permissive in providing greater legal, operational, and financial autonomy, which foster charter school market share and formation. Restrictive laws reflect the extent to which state laws limit these attributes. Expansive state laws grant legal, operational, and financial autonomy such as waivers from the district and state laws and regulations including collective bargaining. However, charter schools that receive funding directly from their host TPSD and are subject to district regulations are dependent on their host TPSD and lack autonomy (Kane & Lauricella, 2001). Charter schools that are authorized by the state or an agency independent of the district BOE and receive funding directly from the state tend to be granted more autonomy (Kane & Lauricella, 2001).

Funding.

Charter school advocates argue operational and facilities funding equivalent to that of host district TPSs is essential to improve charter school student achievement, formation, and growth while opponents argue that directing revenues to charter schools siphons scarce funding from TPSs, which undermines TPS student performance and forces many TPSs to close (Wong, 2014). TPS advocates argue that TPSs spend more per-pupil than charters because they have higher costs for special education, transportation, food services, and facilities, which they often permit charter schools to use without charge (Buddin, 2012; Wong, 2014). Charters often receive disproportionately more private donations and foundation funding while TPSs argue they are underfunded

(Buddin, 2012; Wong, 2014). TPS advocates claim that funding charter schools at the expense of TPSs causes underfunding, which leads to the loss of students and often closure more so than do the effects of choice and competition (Buddin, 2012).

Operational.

Charter schools receive per-pupil revenues from either the state or the host TPSD (Bifulco & Bulkley, 2015; Epple et al., 2015). Nelson et al. (2000) argue that it makes little difference whether the state or the district funds charter schools:

Most or all per-pupil funding flows with students from school districts to charter schools in almost all states. Whether charter schools are funded through state appropriations or payments directly from school districts makes little difference in regard to school district revenue transferred to charter schools. (Nelson et al. 2000, p. 2)

Charter school per-pupil funding is provided through one of the three different ways: (1) The host TPSD pays its average per-pupil amount for each pupil enrolled from the district, which sometimes includes additional funding for high-need high-cost-to-educate pupils. In some states, per-pupil funding is provided by the student's TPSD of residence even if it is outside the host TPSD creating additional variation in funding levels. (2) The state provides direct per-pupil funding. (3) The state and host TPSD share in funding the per-pupil amount given charter schools (Green & Mead, 2004). However, "When payments are made directly by the state, charter school students are typically not counted in district enrollment for purposes of state aid, so that charter schools are at least partially financed by reductions in state aid to districts" causing TPSDs to reduce charter school access to district programs and services (Bifulco & Bulkley, 2015, p. 425).

States that provide charter schools with greater direct operational and facilities funding have more charter applications and schools, which increases charter school

market share (Renzulli, 2005). The per-pupil payments New York State charter schools receive from the TPSD of each pupil attending the charter school serve as the primary source of funds (Bifulco & Buerger, 2012). Host TPSDs must "provide textbooks and software, transportation, health, and special education evaluation services," incentivizing charter schools to locate in TPSDs spending large amounts on these goods and services (Bifulco & Buerger, 2012, p. 3).

"Charter school funding varies with the financial characteristics of the school district in which it is physically located, or the school districts in which charter school students reside" (Nelson et al. 2000, p. 2). Moreover, some states ease charter schools' financial burden by requiring the host TPSD to provide free access to programs and services, which often include co-location, transportation, extracurricular activities, athletics, special education services, and playing field, auditorium, and gymnasium usage (Baker & Miron, 2015; Bifulco & Bulkley, 2015; Nelson et al. 2000). In addition, "the pass-through model for fiscally dependent charter schools" often includes host TPSDs providing programs and services that vary in amount and type by state (Baker & Miron, 2015, p. 15). Nelson et al. (2000) concluded that charter school funding varies according to the school's enrollment, grade range (e.g., elementary, middle, or high school); student demographics, host TPSD's per-pupil spending, and jurisdiction.

In their nationwide study, Croft et al. (2010) argue that the district BOEs granted charter approval authority tend to limit charter school transfer payments because they believe charter schools compete for the same human and financial resources. Croft et al. (2010) assert that Title 1 per-pupil funding is not equivalent among charter and TPSs and charter schools receive Title 1 funds often later than comparable TPSs.

Capital.

Croft et al. (2010) argue that charter schools not only receive less per-pupil operational revenues than TPSs and lack equitable access to state and federal categorical funding but also are underfunded relative to TPSs in terms of public funding overall and equitable access to capital funding and facilities. They argue that charter schools often require new facilities construction, purchase or lease while TPSs typically have legacy buildings that have been fully amortized leaving TPSs to pay only for operating costs. They argue that this lack of equitable access to capital funding and facilities limits charter school formation and market share. Thus, Croft et al. (2010) conclude that the federal government should provide charter schools with greater financial assistance to offset TPSs' relative advantage in capital funding and facilities.

Exclusion from collective bargaining.

Charter schools are often granted waivers from collective bargaining requirements in return for greater accountability. Charter school advocates assert that teachers will be given "greater individual autonomy" in the classroom, which will increase job satisfaction and teaching quality, once the waivers are implemented (Buss, 1999, p. 300). Competition among teachers to perform better can be induced by waiving collective bargaining requirements along with tenure; therefore, top performers can be rewarded while poor performers can be more easily identified and eliminated (Buss, 1999). Theoretically, this should make schools more efficient while improving the quality of education (Buss, 1999).

Buss (1999) found that TPS teachers tend to view these waivers as a threat to their "union's traditional role as the collective bargaining agent" (p. 300). Buss (1999) further

theorized that teachers view waivers as threatening not only their union but also their job security and tenure. Depending on the scope and growth of charter schools that are granted waivers, teachers fear waivers will restructure “the appropriate unit of bargaining, the scope of bargaining, and the security arrangements under which teachers’ unions have been assured that a high proportion of teachers would become union members and pay union dues” (Buss, 1999, p. 301). This leads teachers to oppose charter schools in general and charter laws that grant waivers from collective bargaining requirements in particular while unions are trying organize charter schools according to several scholars (Burch, 2010; Giles, 2006; Hartley & Flavin, 2011; Maranto & Rhinesmith, 2017; Verger et al., 2016).

EMOs.

“Charter school policy has proven to be a primary mechanism for privatizing public schools and public school functions” with school business, operational, and financial management serving as prime examples (Miron, 2017, p. 231). Minnesota passed the first charter school law in 1991 and as other states followed, charter school venture capitalists and philanthropic foundations quickly established private non-profit and for-profit education management organizations (EMOs) in all states having charter schools. Venture philanthropists and philanthropies viewed EMOs “as the best vehicle for organizing and promoting the expansion of [*sic*] charter schools” (Miron, 2017, p. 231).

Market-based reform advocates assert that non-profit and especially for-profit EMOs manage charter school finances more efficiently than district BOEs manage TPSDs (Morley, 2006). Charter advocates use the for-profit EMOs argument to support their claim that resources would be better employed by charter schools than TPSs in

providing education. Morley (2006) argues that for-profit EMOs can raise capital and manage debt and assets more efficiently. Morley (2006) concludes that EMOs provide better financial management, oversight, and accountability because EMOs run charter schools like businesses while parents, voters and BOE's have limited ability to manage TPSs efficiently and hold TPSs accountable.

Charter school advocates argue EMOs "bring what is deemed as successful charter models to scale" (Miron, 2017, p. 231). Miron (2017) found that by 2014-2015 approximately 40% of charter schools were operated by EMOs. In addition, Miron (2017) found that these schools had larger enrollments than other charters and enrolled approximately 45% of charter school students nationwide. Miron (2017) estimated that by 2015-2016, the EMO share would exceed 50%.

However, even though Miron found that KIPP (Knowledge Is Power Program) EMOs improved student performance, KIPP accomplished this outcome by having "an average of \$6,500 dollars more per-pupil in public and private revenues relative to local school districts" and employed "selective entry [cream skimming], and [*sic*] selective exit [cropping] (i.e., high attrition of lower performing students)" (Miron, 2017, p. 232). Also, like all EMO's, KIPP charges management fees.

Interestingly, several Ohio charter schools were unable to obtain sound financial statements from their EMO, White Hat Management (Miron, 2017). This lack of financial reporting transparency caused them to sue White Hat Management to divulge its sources and uses of funds; especially how it was spending the funds provided by public sources (i.e., revenues provided by host TPSDs and the state) (Miron, 2017).

Although some EMO-operated charter schools may be more efficiently run than comparable TPSs, the results are mixed (Miron, 2017; Morley, 2006). In addition, whether EMO-operated schools perform better or worse than non-EMO-operated schools is an open question (Miron, 2017). Despite EMOs dominant role in the charter school arena, the record of mixed results, transparency shortcomings, and financial resource advantages have led to calls for “safeguards and guidelines to protect” the public education aspect of charter schools (Miron, 2017, p. 232).

FRPL.

Singleton (2017) developed a model to evaluate his theory that charter school funding policies cause charter schools to favor enrolling low-cost to educate pupils such as those not eligible for FRPL, which serves as a proxy for poor students. Singleton (2017) concludes that charter schools “are typically funded by formulas that provide the same amount for all students regardless of advantage or need” (p. 2). Singleton (2017) further argues:

... charter schools choose a location in a school district based at least partly on expected revenues, which depend on enrollment and the per-pupil funding rate, and costs. As variable costs depend on the composition of students served, the flat formula potentially presents a strategic incentive to spatially “cream skim.” (p. 2)

Singleton (2017) found that a "flat funding formula leads charter schools to underserve disadvantaged student populations" such as pupils eligible for FRPL, special education, or ELL (p. 3). When Singleton (2017) adjusted the formula to match funding with per-pupil costs, he found "about an 8% increase in the share of subsidized lunch students and a 10% increase in the share of black students attending charter schools" (p. 3).

In their study of Washington, D.C. market-oriented and non-market-oriented charter schools, Lacireno-Paquet, Holyoke, Moser, & Henig (2002) found that market-

oriented charter schools underserve high need high cost-to-educate pupils such as those eligible for FRPL, special education, or ELL. Market-oriented charter schools are those operated by for-profit EMOs (Lacireno-Paquet et al. 2002). Lacireno-Paquet et al. (2002) suggest that “‘Rather than skimming the cream’ off the top of the potential student population, market-oriented charter schools may be ‘cropping off’ service to students whose language or special education needs make them more costly to educate” (p. 145).

Charter schools that engage in cream skimming and cropping tend to siphon away more of the high potential student population while leaving TPSs with disproportionately more at-risk pupils, which might favorably influence parents who seek a higher caliber peer group. In their study of Washington, D.C. charters, Lacireno-Paquet et al. (2002) found that not-for-profit charter schools served equal or higher proportions of high need high cost-to-educate pupils than TPSs while for-profit charter schools served the lowest proportions. Lacireno-Paquet et al. (2002) concluded that market-oriented charter schools are more likely to crop high need high cost-to-educate pupils in states that do not match per-pupil funding with per-pupil costs.

In studying Wisconsin charter schools, Witte et al. (2007) found that the percentage of FRPL-eligible students was highly correlated with districts opening charter schools; however, Wisconsin charter law does not permit districts that are composed of only charter schools. Witte et al. (2007) concluded that charter schools tend to locate in districts with high percentages of FRPL students because Wisconsin’s law requires that state aid follow the pupil to his/her non-resident choice school, is excluded from revenue limits, is augmented for pupils from poor households, and the resident district must pay for all special education services and programs. In addition, many FRPL students are

typically classified as special education. Frankenberg et al. (2011) found “charter schools nationally enrolled a higher percentage of low-income students than traditional public schools” (p. 47).

Robertson (2015) found charter schools run by for-profit Educational Management Organizations (EMOs) were more likely than non-profit EMOs to locate in demographically distinct districts. For-profit EMO-run charter schools tend to locate in more affluent neighborhoods with higher proportions of home ownership and enroll students who are less likely to be Title I eligible (Robertson, 2015). Robertson (2015) argues that for-profit EMO-run charter schools enrolling disproportionately fewer poor pupils than non-profit EMO-run charter schools may stem from their need to meet their charter’s for-profit goals.

Demand-side Influences: Parental Preferences

School quality.

Lubienski (2013) hypothesized that charter schools serve as vehicles for “creating markets in education by enabling families to choose, easing entry for new providers, and encouraging competition” (p. 499). Should their chosen school’s quality decline or their preferences change, families are free to choose another school that better meets their preferences. Borrowing a sports metaphor, competition creates a student free agency system that raises the quality of education provided by TPSs and charter schools competing for students and the resources that come with them.

Studying Wisconsin’s schools, Witte et al. (2007) developed a market-based model. Their model assumes that “schools are motivated by, and families attracted to, an expected utility derived from the unique mission of the school and the quality of its

education” (p. 418). Witte et al. (2007) recognize that this requires both developing a unique mission – product differentiation – and improving overall quality. Their argument suggests that the quality of education provided by TPSs fails to meet parental and student educational needs, and only a school system based on choice and market principles can correct the problem (Witte et al., 2007).

Witte et al. (2007) argue that in states in which districts receive financial benefits from charters, “districts begin charters, at least in part, to enhance revenues coming into the district from outside sources (whether state or federal). They do this by attracting non-attending students from private schools, homeschoolers, dropouts, or students from nearby school districts” (p. 418). This argument suggests that TPSD enrollment is not fixed, and charter schools need not produce a one-to-one enrollment loss, which raises the question of whether charters increase overall TPSD enrollment. Therefore, TPSD enrollment is unlikely to be the sum of charter and TPS enrollment if charters disappeared.

Like Witte et al. (2007), Lizotte (2013) concluded, based on his study of Seattle area schools, that school choice advocates argue TPSs fail to provide quality education and are unresponsive to student and parental needs, which necessitates the introduction of market model principles. Lizotte (2013) argued that market model advocates appeal to the public’s “sense of obligation to place” (...) “by reimagining the failures of public education at the scale of an entire urban region while glossing over the place-specific realities of embedded disadvantage and disinvestment in particular schools and neighborhoods” (p. 290). Thus, school choice is viewed as empowering parents and students with equal opportunity to obtain the education that meets their needs without

limiting school attendance to catchment areas based on stratified housing locations and income groups.

Academic quality.

Hanushek, Kain, Rivkin, & Branch (2007) found parents respond to quality as measured by test scores, curricula, and competitive rankings in deciding to have their children leave their catchment area TPS and attend a charter school. Hanushek et al. (2007) found few if any differences by race, ethnicity or income while evaluating charter school and TPS quality in their study of Texas charter schools. Although Hanushek et al. (2007) found some charter schools needed almost three years of operation to compare more favorably to that of corresponding TPSs, Hanushek et al. (2007) argued that teachers in charter schools operating less than four years are often relatively inexperienced compared to TPS teachers, which may explain some of the startup deficit. Hanushek et al. (2007) concluded, “The negative relationship between the probability of exiting and school quality indicates that charter school parents do place pressure on schools by withdrawing their children in response to poor quality” (pp. 845, 846).

Academic attributes.

Like Hanushek et al. (2007), Glazerman & Dotter (2017) investigated the influences of parental decision making in choosing schools and how this informs the understanding of the effect of competition on public school quality and enrollment. Glazerman & Dotter (2017) identified school choice preferences by studying 22,000 applications to a Washington, D.C. lottery for charter and TPSs. Glazerman & Dotter (2017) studied a wide range of school attributes, which they theorized influenced parental decision making including commuting distance (e.g., convenience, proximity), school

demographics (e.g., peer group race, ethnicity, income), and academic quality (e.g., accountability indicators, test scores, proficiency rates). Glazerman & Dotter (2017) argued that parents view “schools as bundles of attributes, valued as the sum of the attribute values, weighted by the intensity of preference for each attribute” (p. 594). Glazerman & Dotter (2017) suggest that parents select the bundle that best meets their preferences.

Glazerman & Dotter (2017) concluded that one size does not fit all because preferences are heterogeneous. More specifically, Glazerman & Dotter (2017) found parents were more likely to choose a school in close proximity, with access to public transit, with higher percentages of peers of similar racial or ethnic backgrounds, and higher proficiency rates, parental preferences for selecting a school varied depending on the student’s race, ethnicity, socio-economic status, and grade. Academic quality was a significant determinant of school choice; however, the rankings varied depending on the measure used whether accountability ratings, test scores, or proficiency rates.

Lower-income households' preferences differed from higher income households prompting Glazerman & Dotter (2017) to argue that costs and asymmetric information may disproportionately affect low-income households' selections. In addition, school choice may be influenced by those households that participate in the lottery and those who enroll in schools after the lottery deadline in the secondary assignment process. Glazerman & Dotter (2017) concluded that parents make tradeoffs within the bundle of attributes in selecting a school in a choice-based market.

Student achievement.

Charter school advocates assert that competition will force TPSs to improve their educational quality or risk going out of business and “peer effects will improve as parents exercise greater choice and students are better matched with their schools” (Teasley, 2009, p. 210). Teasley (2009) concludes that research findings concerning the impact of charter schools on student achievement and parental choice are inconclusive despite advocates’ claims that charter schools improve school quality and student outcomes.

Several researchers found mixed results in studies that used test scores to assess whether charter school competition improved academic achievement and outcomes in comparable or neighborhood TPSs (Gronberg, Jansen, & Taylor, 2012; Hanushek et al. 2007; Hastings & Weinstein, 2008; Imberman, 2011; Loeb et al. 2011; Sass, 2006; Toma & Zimmer, 2012; VanderHoff, 2008). Schwenkenberg and VanderHoff (2013) used New Jersey charter school “students’ test scores (cognitive skills), non-cognitive skills, and financial mismanagement” (p. 4) in studying charter school failure and if failure helps to explain whether charter school competition influences academic achievement and outcomes. Schwenkenberg and VanderHoff (2013) found that the higher the students’ test scores the less likely that charter schools would fail. Second, only to higher test scores, Schwenkenberg and VanderHoff (2013) found that higher spending on facilities and longer waiting lists reduces the likelihood of charter school failure, while administrative and direct classroom spending, enrollment size, and student demographics did not have significant effects.

Although Schwenkenberg and VanderHoff (2013) concluded that TPSs feel pressured by charter school competition, they did not link such competition to improving

test scores and academic outcomes. Higher test scores might indicate selection bias rather than competitive pressures. Higher spending on facilities and longer waiting lists may indicate the need to increase classroom capacity as charter schools add grades or campuses, or increase enrollment in existing grades. Charter school failure is shaped by many factors and does not seem to be a major determinant of academic outcomes.

Teasley (2009) argues that research findings are mixed because of the wide range of variables that influence student achievement making comparisons of charter and TPSs difficult. These variables include student and school demographics, school proximity, commuting distance, access to public transit or TPSD provided transportation, family background, students' academic abilities, student mobility, available classroom capacity, facility availability, and state-imposed caps on charter school enrollment, numbers, or geographic location (Teasley, 2009). Teasley (2009) concludes, “Thus, in the extant research, many of the findings can be generalized only to the impact of the intervention of regulatory flexibility rather than to the actual educational interventions that may produce different achievement outcomes” (Teasley, 2009, p. 210).

Extracurricular activities: sports and band.

According to one view, Hurricane Katrina enabled “disaster capitalists” to reconfigure New Orleans’ public schools and promote charter schools as “‘an experiment in choice’ in schools for parents and students” (Weil, 2009, p. 377). However, it can be argued that “parents never ‘chose’ this new system;” parents did not vote for changing New Orleans’ public education system as it was transformed by pro-charter forces (Weil, 2009, p. 377). New Orleans’ public schools are administered primarily by “three agencies: The Recovery School District, the Orleans Parish School Board, and state

school board” (Weil, 2009, p. 380). However, each agency administers the charter schools under its control differently, which it has been argued limits parental choice, creates inequities, and restricts equal educational access (Gumus-Dawes, Luce, & Orfield, 2013; Huff, 2015; Miron, Beabout, & Boselovic, 2015; Weil, 2009).

Differences in agency administration are claimed to have resulted in charter schools serving students with different demographic compositions and schools that are "racially and class-stratified" (Weil, 2009, p. 381). The Orleans Parish's charter schools are highly selective basing admission on "test scores and writing samples," give preference to affluent neighborhood residents, "are the only public schools in the city with any significant population of middle class white students," and have the highest test scores (Weil, 2009, p. 381). In contrast, the Recovery School District's charter schools are claimed to be “the schools of last resort” serving primarily "sub-prime" students (Weil, 2009, p. 381). These schools enroll disproportionately more of New Orleans' poor and minority public school students (Gumus-Dawes et al., 2013; Huff, 2015; Weil, 2009).

Various studies have examined what actually influences parental choice of charter schools in the context of different agencies administering the charter schools differently resulting in charter schools with different demographic compositions. Although public debates focus on academic achievement, multiple studies have found that parents are likely to value other aspects of schools in addition to academics including proximity, safety, the values schools communicate to students, and the type and quality of extracurricular activities. Multiple authors found preferences for schools that provided access to extracurricular activities, especially athletics and band, among parents in New Orleans (Cowen Institute, 2011, 2013; Harris & Larsen, 2015; Kamenetz, 2015). New

Orleans' parents preferred schools providing access to extracurricular activities and in relative proximity as much as schools with high academic quality (Harris & Larsen, 2015). Although high-income parents had higher preferences for academic quality, low-income parents tended to value proximity slightly more than academic quality, which may reflect their limited access to transportation (Harris & Larsen, 2015). Athletics especially football and band seemed to be highly valued in New Orleans (Cowen Institute, 2011, 2013; Harris & Larsen, 2015).

In reviewing a study of parental choice by the Education Research Alliance for New Orleans, Kamenetz (2015) found that parents generally do not select charter schools based on academic quality alone. Kamenetz (2015) found parents prefer schools offering extracurricular activities and in relatively close proximity and elementary and middle schools with longer academic days and after-school activities. Kamenetz (2015) echoed Harris and Larsen (2015) in concluding that parents preferred high schools offering football and band. Kamenetz (2015) concluded that New Orleans parents, particularly low-income parents, tend to choose schools that offer extracurricular activities, especially band and football, and are in close proximity over schools with higher academic quality ratings based on test scores that do not meet these qualifications. Like other studies, Kamenetz' revealed that New Orleans' parents shared similar preferences for factors other than just high test scores in choosing charter schools with slight differences among high and low-income families (Cowen Institute, 2011, 2013; Harris & Larsen, 2015; Kamenetz, 2015).

Proximity.

Logan and Burdick-Will (2016) studied parental preferences in choosing charter schools including location, distance, racial composition, poverty levels, and school achievement. Logan and Burdick-Will (2016) found that many African-American parents valued neighborhood proximity leading them to favor charter schools within their school district. Their choices were generally consistent despite having opportunities to select out-of-district charter schools with higher academic performance as measured by test scores, or schools located in lower poverty neighborhoods (Logan & Burdick-Will, 2016). Logan and Burdick-Will (2016) attributed these preferences to African-American parents' perceptions of charter schools as better options than district TPSs especially in high-poverty neighborhoods and their limited access to private transportation, public or district-provided transportation.

Lacireno-Paquet and Brantley (2008) found academic quality as measured by test scores, racial composition, poverty-status, and proximity influenced parents' selections of charter schools. Although parents voiced strong preferences for academic quality, White and African-American parents made different decisions based on racial composition and proximity: "White parents valued schools with a mostly White population and Black families exhibited preferences for schools with higher Black student populations" (Lacireno-Paquet & Brantley, 2008, p.17). Lacireno-Paquet and Brantley (2008) argued that parents might be using "race as a proxy for academic quality" (p.17).

Compared to White parents, Lacireno-Paquet and Brantley (2008) found that African-American parents tended to prefer proximate schools within a district. They hypothesized that this might reflect their limited access to private, public, or district

provided transportation, two working parents, and lack of after-school child-care (Lacireno-Paquet & Brantley, 2008). They also found that African-American parents preferred schools with low proportions of low-income students; however, these schools had to be accessible and within a reasonable distance for those parents to select them. Lacireno-Paquet and Brantley's (2008) findings were similar to other studies in concluding parents considered factors other than high test scores in choosing charter schools, and that there are differences among White and African-American parents in what those factors are (Cowen Institute, 2011, 2013; Harris & Larsen, 2015; Kamenetz, 2015; Logan & Burdick-Will, 2016).

EdNext and Gallup polls reflect the findings of several researchers that African-American parents tend to prefer charter schools within close proximity (Cheng, Henderson, Peterson, & West, 2018; Duncan, 2014; Harris & Larsen, 2015; Kamenetz, 2015; Litel, 2017; Logan & Burdick-Will, 2016; PDK International, 2015). Although distances were shorter in high versus low poverty areas, the differences were not significant (Cheng et al., 2018; Duncan, 2014; PDK International, 2015). In addition, charter schools located in close proximity to predominantly African-American neighborhoods had higher percentages of African-American enrollment (Cheng et al., 2018; Duncan, 2014; Litel, 2017; PDK International, 2015).

Crime.

The percentage of students who reported being the victim of a crime, or being threatened or injured with a weapon on school property at least once during the previous 12 months has been increasing since 2001 (National Center for Education Statistics, 2001, 2005, 2008, 2010, 2013, 2015). Several scholars have surveyed students rather than

school leaders to understand how students experience crime and violence on school grounds (Christensen, 2007; Cornell & Mayer, 2010; Hanson & Voight, 2014; Hoff, 2006; Kirk & Sampson, 2011; Ripski & Gregogy, 2009; Whitlock, 2006). However, Hamlin (2017) surveyed students rather than school officials to obtain what he believed would be a more unbiased indication of students' perceptions of their schools' safety.

In his study of Detroit public schools, Hamlin (2017) investigated the relationship of student safety perceptions within school and neighborhood crime. Hamlin (2017) found reported crime and violent crime in school were inversely related to student perceptions of safety while neighborhood vacancy or abandonment rates and major neighborhood reported crime had no significant relationship with student perceptions of safety. He concluded that measures of in-school crime were more important than neighborhood crime in understanding student perceptions of school safety.

In studying the school safety of Detroit charter and TPSs, Hamlin (2017) found that charter schools were perceived as a safer than TPSs. Neighborhood TPSs were considered less safe than neighborhood charter schools as well as out-of-neighborhood charter and TPSs when controlling for commuting distance (e.g., school proximity) (Hamlin, 2017). Neighborhood charter schools were perceived as safer than neighborhood TPSs when controlling for parental involvement (Hamlin, 2017). Although commuting distance and parental involvement lessen the higher perceived safety of charter schools relative to TPSs, these factors may be a function of pre-existing parental attributes, school characteristics, and charter schools advertising their safe environment, which foster increased parental involvement and charter school selection by parents who prioritize safety (Hamlin, 2017). Parents are influenced to choose charter over TPSs by

low levels of in-school crime and perceptions that schools are safe for students (Christensen, 2007; Cornell & Mayer, 2010; Hamlin, 2017; Hanson & Voight, 2014; Hoff, 2006; Kirk & Sampson, 2011; Ripski & Gregogy, 2009; Whitlock, 2006).

Race.

Frankenberg & Lee (2002) studied segregation in public schools. They found Black and Latino students were racially segregated as were Whites but in different schools. Frankenberg & Lee (2002) found that schools with disproportionate numbers of minority students were highly correlated with schools in high poverty neighborhoods.

After reviewing four U.S. Department of Education studies of charter school segregation, which concluded that charter schools were not overwhelmingly White and did not segregate, Casey, Glass, & Crockett (2000) studied charter schools in Arizona, Michigan, and California, which enrolled about 50% of charter school students nationwide. Casey et al. (2000) compared charter schools with proximate TPSs and found that charter schools were more White and segregated by race and ethnicity than proximate TPSs.

In his study of Washington, D.C. charter schools, Jacobs (2013) found that charter schools were more desegregated than TPSs; however, overall “students are heavily segregated along racial, economic, and linguistic profiles” (p.121). Jacobs (2013) studied Washington, D.C. charter schools because he determined that the District had implemented several measures to minimize segregation in its schools. In addition, the District mandated that all those eligible for free-and-reduced-price lunch (FRPL) receive free or reduced prices on all public transit to increase the freedom for poor families to select schools of choice. Jacobs (2013) concluded that students are segregated along

racial lines including White, Black, Asian, and Latino. Charter schools were segregated; however, slightly less than TPSs (Jacobs, 2013).

In their study of New Jersey charter schools, Gulosino and d'Entremont (2011) examined enrollments of neighborhood charter and TPSs. They found racial segregation. Gulosino and d'Entremont (2011) found disproportionate numbers of African-Americans attending charters than living in the surrounding area. Gulosino and d'Entremont (2011) conclude that charter schools may locate adjacent to densely populated African-Americans neighborhoods but in more racially diverse neighborhoods because these locations may be relatively more affluent than overwhelmingly Black neighborhoods. They seem to suggest that although these charter schools may provide a higher quality education than the students' catchment area TPSs, the possible adverse effects include racial segregation.

Frankenberg, Siegel-Hawley, & Wang (2011) studied charter and TPS segregation and the mix of enrollments. Although Frankenberg et al. (2011) found segregation growing in public schools nationwide, charter schools were more segregated than comparable TPSs while several charter schools had disproportionately more White students and others had disproportionately more minority students. Frankenberg et al. (2011) argue that asymmetric information and unequal access to public or TPSD provided transportation might influence school choice. Although charter schools are publicly funded, several receive private funds, which might enable private donors to influence the mix of enrollment (Frankenberg et al. 2011).

Summary of Evidence

Charter schools altered the traditional public education policy paradigm by advancing school choice in a competitive market as a way to improve the quality of public education and make its provision more efficient. Those favoring charters argue that market-based competition would thereby improve school and student performance. Empowering parents to choose their schools rather than being limited to catchment area schools would discipline the market by forcing schools that were not chosen to lose students along with their associated revenues.

Public education reform has increasingly focused on efforts to provide school choice through charter school expansion within the public education market during 1999-2014. However, charter school enrollment and market share growth raised questions concerning how school choice is provided; the impact on TPSs, school and student performance; and what charter schools' successes and failures indicate about the ability of charter schools to fulfill their promises and underlying market-based theoretical rationale. Central to answering these questions is developing a better understanding of how charter school policies influence the charter school share of the public education market and enrollment.

My study focuses on addressing the aforementioned questions. The central purpose of my study is to understand how charter school growth has affected the public education paradigm and market, and the impact of the charter school trends of enrollment, the share of the public education market, and enrollment in public education. Although charter school enrollment grew at an annual average rate of 44% while total public school enrollment grew at an annual average rate of only 0.49% during 1999-

2014, the charter market share was 5.41% (Graph 1) by 2014. Thus, TPSs enrolled 95% of public education students by 2014, which was an overwhelming majority.

Charter market share growth has spurred questions about the influence of charter school policy as well as charter school performance, impact on TPSs, and the effectiveness of charter schools in achieving desired outcomes, including improving educational quality, parental satisfaction, and student performance. Although the findings vary within and among states, states having more permissible charter school policies that grant operational and curricular flexibility, and greater autonomy, fostered charter school formation and growth and charter school expansion, but were associated with lower student outcomes (Wong, 2014).

States with laws granting exemptions from collective bargaining, unionization, and district regulations were found to have a wide range of student outcomes (CREDO 2009; Watral, 2007; Wong, 2014). Similarly, states having enrollment caps or multiple authorizers had slightly lower student achievement compared to TPSs while other studies found no association (Buddin, 2012; CREDO, 2009, 2013; Wong, 2014). Moreover, the results for all states were mixed with interstate and intrastate variations (CREDO, 2009, 2013; Watral, 2007; Wong, 2014; Wong & Shen, 2006).

Charter school and student academic performance vary widely among and within states while comparisons between demographically similar students in charter and TPSs were mostly insignificant (Diedrich, 2012; Miron, 2017). The impact of charter schools on student achievement and TPSs varies (Betts & Tang, 2014; CREDO, 2013, 2015; Dobbie & Fryer 2011; Gleason et al., 2010; Pendergrass & Kern 2017). Despite the lack of evidence showing charter schools compare consistently favorably in terms of school

and student performance to TPSs, charter school closure rates were relatively low, and most closures resulted from financial mismanagement rather than poor performance (Miron, 2017).

Numerous foundations support charter school market share growth while other organizations erect barriers. Pro-charter school philanthropic foundations have subsidized charter school formation and expansion while leveraging their resources to build political and legislative support for charter schools, especially at the state level (Hess & Henig, 2015). Foundations engaged in venture philanthropy, for which no significant counterpart exists for TPSs, have subsidized charter school market share growth (Hess & Henig, 2015). These venture philanthropists, including the Eli and Edythe Broad Foundation, Michael & Susan Dell Foundation, Bill & Melinda Gates Foundation, Robertson Foundation, and Walton Family Foundation, also fund CMOs, including Aspire Public Schools, KIPP, Green Dot Public Schools, K12 Inc., and Edison Learning, Inc., to operate charter schools (Hess & Henig, 2015). However, teachers' unions try to erect barriers to the passage or expansion of charter laws, especially those that they believe will minimize or waive unionization and collective bargaining requirements or threaten their job security (Burch, 2010; Giles, 2006; Hartley & Flavin, 2011; Maranto & Rhinesmith, 2017; Verger et al., 2016).

Parents tend to make decisions on choosing charter over TPSs based on demand-side influences including school quality, academic quality, academic attributes, and student achievement (Buddin, 2012; Miron, 2017; Singleton, 2017). Parents weigh school quality heavily in deciding whether to choose a charter over a TPS. Parents value the freedom to choose another school that better meets their preferences when they perceive

that the quality of its education exceeds their children's TPS. Parents become motivated to make this choice when they perceive that the quality of education provided by their TPS has declined or is failing to meet their children's educational needs (Buddin, 2012; Miron, 2017; Singleton, 2017). However, parents' perceptions of school quality are not well defined; and may derive from their views of academic quality, academic attributes, competition, and student achievement as well as a school's level of crime, racial composition, and percentage of poor students.

Academic quality seems to play a large role in influencing what parents perceive as school quality. Parents value academic quality in selecting a school. I theorize that a charter school believed to offer superior academic quality as measured by test scores, curricula, and competitive rankings greatly influences parents in deciding to have their children leave their catchment area TPS and attend a charter school.

Academic attributes seem to play a large role in influencing what parents perceive as school quality and include indications of academic quality. School attributes include commuting distance (e.g., convenience, proximity), school demographics (e.g., peer group race, ethnicity, income), and academic quality (e.g., accountability indicators, test scores, proficiency rates). Glazerman & Dotter (2017) concluded that parents were more likely to choose a school in close proximity, with access to public transit, with higher percentages of peers of similar racial or ethnic backgrounds, and higher proficiency rates. In addition, parental preferences for selecting a school varied depending on the student's race, ethnicity, socio-economic status, and grade. Academic quality was a significant determinant of school choice; however, the rankings varied depending on the measure used whether accountability ratings, test scores, or proficiency rates.

Like academic attributes, researchers found mixed results in their studies using test scores to determine the effect of charter school competition on educational outcomes, comparisons to TPSs, and parental choice (Gronberg et al., 2012; Hanushek et al., 2007; Hastings & Weinstein, 2008; Imberman, 2011; Loeb et al., 2011; Sass, 2006; Schwenkenberg & VanderHoff, 2013; Toma & Zimmer, 2012; VanderHoff, 2008). Similar to competition, research findings concerning the role of student achievement in parental decision-making were mixed. Teasley (2009) concluded that a wide range of variables influence student achievement, including student and school demographics, school proximity, commuting distance, access to public transit or TPSD provided transportation, family background, students' academic abilities, student mobility, available classroom capacity, facility availability, and state-imposed caps on charter school enrollment, numbers, or geographic location, which make comparisons of charter and TPSs difficult.

Thus, demand-side influences including school quality, academic quality, academic attributes, and student achievement affect parental decisions in choosing charter over TPSs. Parents tend to assess the overall bundle of education offered by schools and select the school with the bundle that best meets their preferences. However, one size does not fit all because parental preferences are heterogeneous.

I theorize that parents are influenced to choose charter over TPSs by school milieu, including a school's level of crime, racial composition, and percentage of poor students. The percentage of students who reported being the victim of a crime, or being threatened or injured with a weapon on school property at least one time during the previous 12 months has increased for many years (National Center for Education

Statistics, 2001, 2005, 2008, 2010, 2013, 2015). Schools with lower levels of reported crime and violent crime in school were perceived as safe, but neighborhood vacancy or abandonment rates, and major neighborhood reported crime had no significant relationship with safety perceptions while measures of in-school crime were more important than neighborhood crime in understanding safety perceptions (Christensen, 2007; Cornell & Mayer, 2010; Hamlin, 2017; Hanson & Voight, 2014; Hoff, 2006; Kirk & Sampson, 2011; Ripski & Gregogy, 2009; Whitlock, 2006).

Although neighborhood charter schools are perceived as safer than neighborhood TPSs, this perception may be affected by pre-existing parental attitudes and attributes, school characteristics, and charter schools advertising their safe environment, which foster increased parental involvement and charter school selection by parents who prioritize safety. Parents are influenced to choose charter over TPSs by low levels of in-school crime and perceptions that schools are safe for students (Christensen, 2007; Cornell & Mayer, 2010; Hamlin, 2017; Hanson & Voight, 2014; Hoff, 2006; Kirk & Sampson, 2011; Ripski & Gregogy, 2009; Whitlock, 2006).

Parents are influenced to choose charter over TPSs by schools' racial composition and percentage of low-income or poor students (e.g., FRPL-eligible) (Buddin, 2012; Miron, 2017; Singleton, 2017). Although high levels of racial segregation exist in charter and TPSs, the racial composition may combine with asymmetric information and unequal access to public or TPSD provided transportation in influencing school choice (Buddin, 2012; Miron, 2017; Singleton, 2017). In addition, pro-charter school philanthropic foundations subsidize charter school formation and expansion, which might enable these private donors to influence the mix of enrollment according to their racial preferences.

Charter schools typically receive the same per-pupil funding regardless of student type, which may cause charter schools to enroll disproportionately fewer high-cost to educate pupils such as those eligible for FRPL, which serves as a proxy for poor students, special education, or ELL (Buddin, 2012; Miron, 2017; Singleton, 2017). This flat-per-pupil formula funding could incentivize charter schools to cream skim the top potential students and crop or deselect students who are more costly to educate (e.g., FRPL-eligible) (Buddin, 2012; Miron, 2017; Singleton, 2017).

Combining philanthropic subsidies with flat-per-pupil funding could induce charter schools to enroll fewer poor students and racially segregate student populations, which may influence parents who seek schools with a White middle-class composition. Indeed, when Singleton (2017) adjusted the formulaic funding to match revenues with per-pupil costs, he found an 8% increase in FRPL-eligible students and a 10% increase in African-American students attending charter schools.

The role of demand and supply-side influences, as well as explanatory variables, raises questions concerning what drives charter market share. Central to answering these questions is developing a better understanding of the influence of state charter policies. However, different state laws have different policy structures that influence the charter school market share.

Thus, the core hypothesis of this study is that differences in state charter school policy structures affect charter market share differently. This undergirds the need for my study. The purpose of my study is to identify the key determinants of the charter school market share and quantify the relative importance of specific policies jointly and individually as influences on the charter market share.

My study will compare the predictive power of two sets of policies to see which has the strongest effect on the charter school market share. One set is based on the NAPCS' policies and the other on my literature review. This study will be groundbreaking because (unlike the CER's policies) the NAPCS' policies have not been evaluated in the peer-reviewed literature.

Chapter 3: Methodology

In this chapter, I describe the methodology used in this study. I begin with an overview followed by descriptions of the data, its sources, and coding. Next, I describe the statistical analyses conducted including the alternative models estimated and the statistical tests employed to evaluate these models. Finally, I consider the limitations of the methodology and their implications.

Data

This study uses data on charter school laws and public school enrollment from states and Washington, D.C. that had charter school laws between 1999 and 2014. I begin with 1999 because that marks the first year in which charter school data became consistently, reliably, and readily available. The data are gathered from publicly available sources for charter school market share, public school market share, state policies for charter schools, and other possible influences on charter school supply and demand.

Data for public school and charter school enrollment by state and year (1999 to 2014) were obtained from the Common Core of Data. Charter school market share is measured as the percentage of statewide public school students enrolled in charter schools. Public school market share is measured as the TPS plus charter school enrollment divided by the total statewide enrollment in public and private schools.

Data on supply and demand variables include both nonpolicy and policy variables. I used the Digest of Education Statistics to identify data on nonpolicy variables. I used the NAPCS' reports, which provided a ranking of state charter school laws and their major policies by state and year, to identify the NAPCS policy measures. I found data on policy variables in state charter school laws, documents, and other

published sources on charter policies. I identified measures of the other policy variables primarily in four sources based on my review of the literature (Chingos & West, 2015; Glazer, Massell, & Malone, 2019; Glazerman, & Dotter, 2017; Schneider, Teske, & Marschall, 2002).

The data were entered, checked and cleaned using EXCEL and STATA data utilities and validation procedures. All policy variables were coded as dichotomous variables with zero indicating the absence of the policy and one indicating that it was present in a state in a particular year. State fixed effects were included in models through dichotomous variables for each state and Washington, D.C. except for Washington State.

I present the output of my data analysis and statistical models including measures of adjusted R^2 , and the significance and effect sizes for the coefficients using Eta^2 as the measure of effect size, in the following tables for the charter school and public school market share models (i.e., CSMS, PSMS).

- Table 1: CSMS Model 1A: NAPCS-based policy variables without state fixed effects
- Table 2: CSMS Model 1B: NAPCS-based policy variables with state fixed effects
- Table 3: CSMS Model 2A: Literature review-based policy variables without state fixed effects
- Table 4: CSMS Model 2B: Literature review-based policy variables with state fixed effects
- Table 5: PSMS Model 1A: Public school enrollment-based variables without state fixed effects
- Table 6: PSMS Model 1B: Public school enrollment-based variables with state fixed effects

Each table of results is included in the findings discussion section for that respective model.

Table 7 lists and defines all of the substantive variables used in this study.

TABLE 7

List of substantial variables and their definitions

Where:

Variable_{it} is the policy, supply, or demand-based variable

i = state

t = time (year)

code (0,1) = 0 for absent; 1 for present

ChSchMktSh_{it} is the charter school market share in state_{it},

PubSchMktSh_{it} is the percentage of students enrolled in public schools in state_{it}
of all students enrolled in state_{it}'s public and private schools,

PRIV_SchMk_share_{it} is the percentage of students enrolled in private schools in
state_{it} in 1990 of all students enrolled in state_{it}'s public and private
schools (i.e., a measure of having choice as an option to the local TPS;
prior to the passage of state_{it}'s charter school law),

indau_{it} indicates charter authorizers with final approval authority and
independent of the state and district BOE operate in state_{it},

opfund_{it} indicates that state law grants operational funding and access to state and
federal categorical funding similar to that of traditional public schools in
state_{it},

capfund_{it} indicates that state law grants capital funding and facilities similar to
that of traditional public schools in state_{it},

emo_{it} indicates state law permits for-profit-EMOs (i.e., Educational Management
Organizations) in state_{it},

exclbrg_{it} indicates state law excludes charter schools from collective bargaining
requirements in state_{it},

frpl_{it} indicates the percentage of public school students eligible for free-or-
reduced-price-lunch (i.e., FRPL as a measure of student poverty) in
state_{it},

Black_{it} indicates the percentage of African-American public elementary
and secondary school students in state_{it},

Hispanic_{it} indicates the percentage of Hispanic public elementary and
secondary school students in state_{it},

- $crime_{it}$ indicates the percentage of public school students who reported being threatened or injured on school property at least one time during the previous 12 months (e.g., crime victims) in $state_{it}$,
- $SchDis_{it}$ indicates the number of school districts (e.g., a measure of inter-district choice as an option) in $state_{it}$,
- $RelSch_{it}$ indicates the number of religious schools in 1990 as an indication of the market potential for flipping religious schools into charter schools in $state_{it}$,
- $conv_{it}$ indicates state law permits the conversion of traditional public schools in $state_{it}$,
- $auto_{it}$ indicates charter schools are operationally and legally autonomous schools with independent public charter school boards in $state_{it}$,
- $YrsPass_{it}$ indicates the number of years since the charter law passed as an indication of the market potential for awareness of charter schools in $state_{it}$,
- $YrsCons_{it}$ indicates the number of consecutive years in which the state has had charter schools as an indication of the market potential for awareness of charter schools in $state_{it}$,
- ELL_{it} indicates the percentage of ELL (English Language Learners) public elementary and secondary school students in $state_{it}$
- $SATR_{it}$ indicates the statewide mean SAT reading score (e.g., a measure of student achievement) in $state_{it}$,
- $HSgrd_{it}$ indicates the statewide average high school graduation rate (e.g., a measure of student achievement) in $state_{it}$,
- $ParEd_{it}$ indicates the percentage of the population aged at least 25 years or older with a Bachelor's or higher degree in $state_{it}$,
- $PerPplEx_{it}$ indicates the statewide mean per-pupil spending in public schools in $state_{it}$,
- $MdHHin_{it}$ indicates the median household annual income in $state_{it}$,
- $SpEd_{it}$ indicates the percentage of special education public elementary and secondary school students in $state_{it}$,
- $mlpau_{it}$ indicates multiple charter authorizers with final approval authority, which may include the state or district BOE, operate in $state_{it}$,
- $disole_{it}$ indicates only the district BOE has sole charter approval authority in $state_{it}$,

capann_{it} indicates an annual cap is applied on charter schools or enrollment in state_{it} ,

capstw_{it} indicates a statewide cap is applied on charter schools or enrollment in state_{it} ,

capgeo_{it} indicates a geographic cap is applied on charter schools or enrollment in state_{it} ,

stsole_{it} indicates only the state has sole charter approval authority in state_{it} ,

difinal_{it} indicates only the district BOE has final charter approval authority in state_{it} ,

stfinal_{it} indicates only the state has final charter approval authority in state_{it} ,

$\text{st}(\text{state abbreviation})_{it}$ indicates the state fixed effect for state_{it} ,

$i = \text{state}$

$t = \text{time (year)}$

code (0,1) = 0 for absent; 1 for present

Analysis

I began testing my hypotheses by investigating the relative importance of the state policies identified as strong determinants of charter school market share based on my review of the literature and the NAPCS' reports. I distilled those policies that I identified as having the strongest influence into one policy set based on the literature review and one based on the NAPCS.

I identified the presence or absence of each policy by state and year from 1999 to 2014 and input the data into STATA data panels. I employed ordinary least squares (OLS) regression models to predict the charter school market share for each policy set and compared the performance of the two sets. I conducted post-hoc analyses to see if any of the policies making up either set account for most of the explanatory power on their own.

I hypothesize that charter market share is a function of state policies, other influences on supply, and demand variables. I estimate one set of models using the relevant state policy variables together with other variables that are indicators of supply and demand influences. As there are likely to be influences on charter school supply and demand for which I do not have measures, I also estimate each model including state fixed effects to control for otherwise unmeasured time-invariant effects on charter school market share.

First, I used OLS regressions to estimate two charter school market share models for the NAPCS-based policies combined with the supply and demand variables. The first model is estimated once without state fixed effects and then again with state fixed effects. The second model uses the policies I identified from the literature review combined with

the supply and demand variables, again once without state fixed effects and then with state fixed effects.

Second, I compared how well my literature review-based set of policies predicts market share as compared to the NAPCS-based set. I performed the assessments using statistical tests including comparisons of adjusted R^2 across models as well as the significance and effect sizes for the coefficients. I used Eta^2 as the measure of effect size.

Third, I estimated a public school enrollment model to determine the extent to which the charter school market share and policies influence overall public school enrollment, and whether charter school market share and policies have the potential to increase the overall public school share of the education market. I used OLS regressions to estimate the public school market share model (i.e., PSMS). Again, models are estimated with and without state fixed effects.

To foreshadow the findings presented in the next chapter, empirical analysis of all three models found that the versions including state fixed effects resulted in relatively more policy variables having statistically significant effects on market share and higher adjusted R^2 . This suggests that even after including other supply and demand measures, the models suffer from substantial omitted variables bias without fixed effects.

Statistical Tests

To compare the predictive power of the NAPCS-based and literature review-based sets of policy variables, I compared adjusted R^2 across models. I assessed the contributions of each individual variable based on the effect sizes for the coefficients (when statistically significant). I used adjusted R^2 because it adjusts for the number of variables in the model. Adjusted R^2 increases only if the incremental variable improves

the model more than would be expected by chance or random inclusion and decreases when that variable improves the model by less than would be expected by chance. Eta^2 , as a measure of effect size, is the proportion of the total variance that is attributed to an effect.

Limitations

My study is limited to the extent that I am unable to take into account certain factors that may affect charter school enrollment and market share as well as the influence of charter school share and policies on overall enrollment in public education because no measure or data exist for those factors. Although I may theorize how these factors might influence the results of my study and for which I will make caveats about what I can claim or draw conclusions, these factors are not included in the models. To the extent that these factors are time-invariant, I seek to control for their effects through the use of state fixed effects. These factors include the following.

- Intensity of parental preferences
- The degree to which parents are willing to make trade-offs among bundles of preferences
- The degree of parental prejudice (e.g., racial, ethnic, socio-economic status, or religious)
- The extent to which parents prefer a peer group of similar racial, ethnic, socio-economic status, or religious composition
- The degree to which parents face barriers in choosing and accessing desired schools
- The degree of parental experience with charter, private, religious, and TPSs
- Amount of parental information about charter, private, religious, and TPSs (e.g., asymmetric information)
- Academic quality (except as proxied by graduation rates and SAT scores)
- School quality with respect to attributes other than academics
- Politics (As this study seeks to identify the policy variables that explain charter school market growth, it does not include in its analyses the political variables (e.g., the extent of Democrat or Republican control of the governors' office or legislature) that may be viewed as determining policies or as the means by which voters express their policy preferences. Their inclusion in the types of models

estimated in this study would have obscured the effects of the policies that elected officials used as the means to influence charter school growth.)

- Regulatory implementation

Despite these limitations, the findings and conclusions of this study can add to the current body of knowledge to provide a better understanding of the predictive strength of different policies in determining the charter school share of the public education market and the influence of charter school share on overall enrollment in public education.

Chapter 4: Findings

Charter School Market Share Models

In this chapter, I present an overview of results of my empirical analysis of the CSMS models, followed by findings from each of the models estimated. I found that the research-based set of policies predicted market share better as compared to the NAPCS-based set. My models, which used the literature review-based set of policies with and without fixed effects, had more variables with significant effects on charter market share than the corresponding NAPCS-based set models. The literature review-based models' had higher adjusted R^2 .

My empirical analysis of the CSMS models found that the versions including state fixed effects resulted in relatively more variables having statistically significant effects on market share and higher adjusted R^2 . In addition, my model, which used the literature review-based set of policies, had twice as many policy variables with significant effects on charter market share than the NAPCS-based set. I included the supply and demand variables together with the NAPCS-based and literature review-based policies so that they were not confounded with the policy variables.

My post-hoc analysis found that parental educational attainment, FRPL, high school graduation rate, students who were crime victims, Black students, and ELL students accounted for a disproportionate amount of the explanatory power on their own. This is important because these are not policy variables. This suggests that the NAPCS may have overestimated the effects of its state policies in analyses that do not fully account for other influences on supply and demand.

This study focused on understanding the predictive strength of state policies combined with other supply influences and demand variables in determining the charter school share of the public education market and the influence of charter school share and policies on overall enrollment in public education. Three general steps were taken in the analyses, and each is reported below.

First, I estimated two charter school market share models (CSMS 1, CSMS 2). The first model used the NAPCS-based policies combined with the supply and demand variables without state fixed effects while its second version included state fixed effects. The second model used the literature review-based policies combined with the supply and demand variables without state fixed effects while its second version included state fixed effects. I included state fixed effects dummy variables to capture the effects of unmeasured, time invariant factors associated with each state. I was interested to learn the extent to which including state fixed effects would improve upon the predictive power of using only the NAPCS or literature review-based policies with supply and demand variables as has been typical in the literature.

Second, I compared the performance of the alternative models based on the literature review-based set of policies and the NAPCS-based set. To do this, I performed statistical tests including comparisons of adjusted R^2 across models as well as comparing the significance and effect sizes for the coefficients across models. I used η^2 as the measure of effect size.

Third, I estimated a public school enrollment model to determine the extent to which the charter school market share influences overall public school enrollment, and whether charter school market share has the potential to increase the overall public school

share of the education market. I estimated two multiple regressions for public school market share (PSMS 1A, PSMS 1B). The first model used charter school market share combined with the supply and demand variables without state fixed effects while the second version included state fixed effects. I compared the two versions using statistical tests including adjusted R^2 and based on the significance and effect sizes of the coefficients. I used Eta^2 is the measure of effect size.

CSMS Model 1A

The first charter school market share model (CSMS Model 1A) combines the NAPCS-based policies with the supply and demand variables without state fixed effects.

I estimated the following model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(b_0 + b_1\text{PRIV_SchMk_Share}_{it} + b_2\text{SATR}_{it} + b_3\text{HSgrd}_{it} + \\ b_4\text{ParEd}_{it} + b_5\text{SchDis}_{it} + b_6\text{RelSch}_{it} + b_7\text{PerPplEx}_{it} + b_8\text{MdHHin}_{it} + \\ b_9\text{frpl}_{it} + b_{10}\text{crime}_{it} + b_{11}\text{Black}_{it} + b_{12}\text{Hispanic}_{it} + b_{13}\text{SpEd}_{it} + \\ b_{14}\text{ELL}_{it} + b_{15}\text{YrsPass}_{it} + b_{16}\text{YrsCons}_{it} + b_{17}\text{indau}_{it} + b_{18}\text{auto}_{it} \\ + b_{19}\text{opfund}_{it} + b_{20}\text{capfund}_{it} + b_{21}\text{conv}_{it} + b_{22}\text{emo}_{it} + b_{23}\text{exclbrg}_{it} + \\ e_{it}) \end{aligned} \quad (\text{CSMS 1Aa})$$

My empirical analysis found 10 variables that had statistically significant effects on charter school market share: high school graduation rate, parental educational attainment, number of religious schools in 1990, FRPL, crime, independent authorizers, autonomy, capital funding, for-profit-EMOs, and exclusion from collective bargaining requirements. Private school market share, mean SAT reading score, number of school districts, mean per-pupil spending, median household annual income, Black students, Hispanic students, special education students, ELL students, number of years since the charter law passed, number of consecutive years in which the state has had charter schools, operational funding, and conversions were not found to have statistically significant effects. Taking these initial results into account resulted in the following more parsimonious NAPCS-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{RelSch}_{it} + b_4\text{frpl}_{it} + \\ b_5\text{crime}_{it} + b_6\text{indau}_{it} + b_7\text{auto}_{it} + b_8\text{capfund}_{it} + b_9\text{emo}_{it} + \\ b_{10}\text{exclbrg}_{it} + e_{it}) \end{aligned} \quad (\text{CSMS 1Aab})$$

In re-estimating the model, the number of consecutive years in which the state has had charter schools was found to have statistically significant effects. Taking these results into account resulted in the following NAPCS-based model.

$$\text{ChSchMktSh}_{it} = f(b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{RelSch}_{it} + b_4\text{frpl}_{it} + b_5\text{crime}_{it} + b_6\text{YrsCons}_{it} + b_7\text{indau}_{it} + b_8\text{auto}_{it} + b_9\text{capfund}_{it} + b_{10}\text{emo}_{it} + b_{11}\text{exclbrg}_{it} + e_{it}) \quad (\text{CSMS 1Aabc})$$

Finding relatively small coefficients for the variables that had statistically significant effects on charter market share, except for parental educational attainment of 0.0405 and capital funding of 0.0535, would seem to indicate that this CSMS model's variables by themselves are relatively weak determinants of market share. The Eta^2 measures for the variables that had statistically significant effects on charter market share, such as parental educational attainment of 0.3418, FRPL of 0.0900, independent authorizers of 0.0737, number of religious schools of 0.0488, for-profit-EMOs of 0.0478, and capital funding of 0.0649, also indicate that this CSMS model's policy variables by themselves are modest determinants of charter school market share (Table 1). Parental educational attainment accounted for a disproportionate amount of the explanatory power on its own. The adjusted R^2 explains 59.2% of the variance in charter school market share, and the model overall is statistically significant.

TABLE 1

Charter School Market Share Reduced Form Model 1A without State Fixed Effects

Variable	Coefficient	Effect Size
High school graduation rate	-0.0054 [*]	0.0313
Parental educational attainment	0.0405 [*]	0.3418
Number religious schools in the state	-0.0019 [*]	0.0488
Free and Reduced Price Lunch students	0.0118 [*]	0.0900
Students who are crime victims	0.0224 [*]	0.0449
Number consecutive years state has had charter schools	0.0162 [*]	0.0421
Independent charter authorizers	0.0212 [*]	0.0737
Autonomy	0.0187 [*]	0.0470
Capital funding	0.0535 [*]	0.0649
For-profit Educational Management Organizations	0.0095 [*]	0.0478
Exclusion from collective bargaining requirements	0.0132 [*]	0.0457

Note:

Adjusted $R^2 = 0.5918$; Sample Size = 660; * $p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

CSMS Model 1B

I estimated the model using the NAPCS-based policies combined with the supply and demand variables and state fixed effects with the following model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(& b_0 + b_1\text{SATR}_{it} + b_2\text{HSgrd}_{it} + b_3\text{ParEd}_{it} + b_4\text{SchDis}_{it} + \\ & b_5\text{PerPplEx}_{it} + b_6\text{MdHHin}_{it} + b_7\text{frpl}_{it} + b_8\text{crime}_{it} + b_9\text{Black}_{it} + \\ & b_{10}\text{Hispanic}_{it} + b_{11}\text{SpEd}_{it} + b_{12}\text{ELL}_{it} + b_{13}\text{YrsPass}_{it} + b_{14}\text{YrsCons}_{it} \\ & + b_{15}\text{indau}_{it} + b_{16}\text{auto}_{it} + b_{17}\text{opfund}_{it} + b_{18}\text{capfund}_{it} + b_{19}\text{conv}_{it} + \\ & b_{20}\text{emo}_{it} + b_{21}\text{exclbrg}_{it} + b_{22}\text{stAlaska}_{it} + b_{23}\text{stAriz}_{it} + b_{24}\text{stArk}_{it} + \\ & b_{25}\text{stCA}_{it} + b_{26}\text{stCol}_{it} + b_{27}\text{stCT}_{it} + b_{28}\text{stDel}_{it} + b_{29}\text{stDC}_{it} + b_{30}\text{stFL}_{it} \\ & + b_{31}\text{stGA}_{it} + b_{32}\text{stHI}_{it} + b_{33}\text{stIDit} + b_{34}\text{stIll}_{it} + b_{35}\text{stIN}_{it} + b_{36}\text{stIA}_{it} + \\ & b_{37}\text{stKS}_{it} + b_{38}\text{stLA}_{it} + b_{39}\text{stME}_{it} + b_{40}\text{stMD}_{it} + b_{41}\text{stMA}_{it} + \\ & b_{42}\text{stMI}_{it} + b_{43}\text{stMN}_{it} + b_{44}\text{stMS}_{it} + b_{45}\text{stMO}_{it} + b_{46}\text{stNV}_{it} + \\ & b_{47}\text{stNH}_{it} + b_{48}\text{stNJ}_{it} + b_{49}\text{stNM}_{it} + b_{50}\text{stNY}_{it} + b_{51}\text{stNC}_{it} + b_{52}\text{stOH}_{it} \\ & + b_{53}\text{stOK}_{it} + b_{54}\text{stOR}_{it} + b_{55}\text{stPA}_{it} + b_{56}\text{stRI}_{it} + b_{57}\text{stSC}_{it} + b_{58}\text{stTE}_{it} \\ & + b_{59}\text{stTX}_{it} + b_{60}\text{stUT}_{it} + b_{61}\text{stVA}_{it} + b_{62}\text{stWI}_{it} + b_{63}\text{stWY}_{it} + e_{it}) \\ & \text{(CSMS 1Ba)} \end{aligned}$$

My empirical analysis found 12 variables that had statistically significant effects on charter school market share: high school graduation rate, parental educational attainment, median household annual income, FRPL, crime, Black students, special education students, ELL students, number of consecutive years in which the state has had charter schools, independent authorizers, for-profit-EMOs, and exclusion from collective bargaining requirements. Mean SAT reading score, number of school districts, mean per-pupil spending, Hispanic students, number of years since the charter law passed, autonomy, operational funding, capital funding, and conversions were not found to have statistically significant effects. Taking these initial results into account suggested the following more parsimonious NAPCS-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(& b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{MdHHin}_{it} + b_4\text{frpl}_{it} + \\ & b_5\text{crime}_{it} + b_6\text{Black}_{it} + b_7\text{SpEd}_{it} + b_8\text{ELL}_{it} + b_9\text{YrsCons}_{it} + \\ & b_{10}\text{indau}_{it} + b_{11}\text{emo}_{it} + b_{12}\text{exclbrg}_{it} + b_{13}\text{stAlaska}_{it} + b_{14}\text{stAriz}_{it} + \\ & b_{15}\text{stArk}_{it} + b_{16}\text{stCA}_{it} + b_{17}\text{stCol}_{it} + b_{18}\text{stCT}_{it} + b_{19}\text{stDel}_{it} + b_{20}\text{stDC}_{it} \\ & + b_{21}\text{stFL}_{it} + b_{22}\text{stGA}_{it} + b_{23}\text{stHI}_{it} + b_{24}\text{stIDit} + b_{25}\text{stIll}_{it} + b_{26}\text{stIN}_{it} + \\ & b_{27}\text{stIA}_{it} + b_{28}\text{stKS}_{it} + b_{29}\text{stLA}_{it} + b_{30}\text{stME}_{it} + b_{31}\text{stMD}_{it} + b_{32}\text{stMA}_{it} \end{aligned}$$

$$\begin{aligned}
& + b_{33}\text{stMI}_{it} + b_{34}\text{stMN}_{it} + b_{35}\text{stMS}_{it} + b_{36}\text{stMO}_{it} + b_{37}\text{stNV}_{it} + \\
& b_{38}\text{stNH}_{it} + b_{39}\text{stNJ}_{it} + b_{40}\text{stNM}_{it} + b_{41}\text{stNY}_{it} + b_{42}\text{stNC}_{it} + b_{43}\text{stOH}_{it} \\
& + b_{44}\text{stOK}_{it} + b_{45}\text{stOR}_{it} + b_{46}\text{stPA}_{it} + b_{47}\text{stRI}_{it} + b_{48}\text{stSC}_{it} + b_{49}\text{stTE}_{it} \\
& + b_{50}\text{stTX}_{it} + b_{51}\text{stUT}_{it} + b_{52}\text{stVA}_{it} + b_{53}\text{stWI}_{it} + b_{54}\text{stWY}_{it} + e_{it}) \\
& \textbf{(CSMS 1Bab)}
\end{aligned}$$

In the more parsimonious model 13 variables had statistically significant effects on charter school market share: high school graduation rate, parental educational attainment, median household annual income, FRPL, crime, Black students, special education students, ELL students, number of consecutive years in which the state has had charter schools, independent authorizers, capital funding, for-profit-EMOs, and exclusion from collective bargaining requirements. In re-estimating the model, capital funding was found to have statistically significant effects. Taking these results into account resulted in the following NAPCS-based model.

$$\begin{aligned}
\text{ChSchMktSh}_{it} = f(b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{MdHHin}_{it} + b_4\text{frpl}_{it} + \\
b_5\text{crime}_{it} + b_6\text{Black}_{it} + b_7\text{SpEd}_{it} + b_8\text{ELL}_{it} + b_9\text{YrsCons}_{it} + \\
b_{10}\text{indau}_{it} + b_{11}\text{capfund}_{it} + b_{12}\text{emo}_{it} + b_{13}\text{exclbrg}_{it} + b_{14}\text{stAlaska}_{it} + \\
b_{15}\text{stAriz}_{it} + b_{16}\text{stArk}_{it} + b_{17}\text{stCA}_{it} + b_{18}\text{stCol}_{it} + b_{19}\text{stCT}_{it} + \\
b_{20}\text{stDel}_{it} + b_{21}\text{stDC}_{it} + b_{22}\text{stFL}_{it} + b_{23}\text{stGA}_{it} + b_{24}\text{stHI}_{it} + b_{25}\text{stID}_{it} + \\
b_{26}\text{stIll}_{it} + b_{27}\text{stIN}_{it} + b_{28}\text{stIA}_{it} + b_{29}\text{stKS}_{it} + b_{30}\text{stLA}_{it} + b_{31}\text{stME}_{it} + \\
b_{32}\text{stMD}_{it} + b_{33}\text{stMA}_{it} + b_{34}\text{stMI}_{it} + b_{35}\text{stMN}_{it} + b_{36}\text{stMS}_{it} + \\
b_{37}\text{stMO}_{it} + b_{38}\text{stNV}_{it} + b_{39}\text{stNH}_{it} + b_{40}\text{stNJ}_{it} + b_{41}\text{stNM}_{it} + \\
b_{42}\text{stNY}_{it} + b_{43}\text{stNC}_{it} + b_{44}\text{stOH}_{it} + b_{45}\text{stOK}_{it} + b_{46}\text{stOR}_{it} + b_{47}\text{stPA}_{it} \\
+ b_{48}\text{stRI}_{it} + b_{49}\text{stSC}_{it} + b_{50}\text{stTE}_{it} + b_{51}\text{stTX}_{it} + b_{52}\text{stUT}_{it} + b_{53}\text{stVA}_{it} \\
+ b_{54}\text{stWI}_{it} + b_{55}\text{stWY}_{it} + e_{it}) \\
\textbf{(CSMS 1Babc)}
\end{aligned}$$

Again, I found relatively small coefficients for the variables that had statistically significant effects on charter market share, except for parental educational attainment of 0.0632, FRPL of 0.0738, crime of -0.0458, and independent authorizers of -0.0356. The Eta^2 measures for the variables that had statistically significant effects on charter market share, such as high school graduation rate of 0.0642, parental educational attainment of 0.1546, FRPL of 0.1050, crime of 0.0789, and independent authorizers of 0.0852, seem

to indicate that this CSMS model's largest effects on charter market share were for nonpolicy variables (Table 2). Parental educational attainment, FRPL, crime, high school graduation rate, and independent authorizers accounted for a disproportionate amount of the explanatory power on their own.

The adjusted R^2 of 0.8379 for the final CSMS model 1Babc is much higher than the adjusted R^2 of a comparable model without state fixed effects. This suggests that unmeasured state-specific variables play a substantial role in determining charter school market share.

TABLE 2

Charter School Market Share Reduced Form Model 1B with State Fixed Effects

Variable	Coefficient	Effect Size
High school graduation rate	-0.0144 [*]	0.0642
Parental educational attainment	0.0632 [*]	0.1546
Median household income	5.69e-07 [*]	0.0149
Free and Reduced Price Lunch students	0.0738 [*]	0.1050
Students who are crime victims	-0.0458 [*]	0.0789
African-American students	-0.0010 [*]	0.0322
Special Education students	-0.0072 [*]	0.0399
ELL students	-0.0023 [*]	0.0322
Number consecutive years state has had charter schools	0.0171 [*]	0.0364
Independent charter authorizers	-0.0356 [*]	0.0852
Capital funding	0.0192 [*]	0.0318
For-profit Educational Management Organizations	0.0246 [*]	0.0526
Exclusion from collective bargaining requirements	0.0127 [*]	0.0415

Note:

Adjusted $R^2 = 0.8379$; Sample Size = 660; * $p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

CSMS Model 2A

The literature review-based policies were combined with the supply and demand variables without state fixed effects to estimate the following model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(b_0 + b_1\text{PRIV_SchMk_Share}_{it} + b_2\text{SATR}_{it} + b_3\text{HSgrd}_{it} + \\ b_4\text{ParEd}_{it} + b_5\text{SchDis}_{it} + b_6\text{RelSch}_{it} + b_7\text{PerPplEx}_{it} + b_8\text{MdHHin}_{it} + \\ b_9\text{frpl}_{it} + b_{10}\text{crime}_{it} + b_{11}\text{Black}_{it} + b_{12}\text{Hispanic}_{it} + b_{13}\text{SpEd}_{it} + \\ b_{14}\text{ELL}_{it} + b_{15}\text{YrsPass}_{it} + b_{16}\text{YrsCons}_{it} + b_{17}\text{mlpau}_{it} + b_{18}\text{disole}_{it} + \\ b_{19}\text{capann}_{it} + b_{20}\text{capstw}_{it} + b_{21}\text{capgeo}_{it} + b_{22}\text{auto}_{it} + b_{23}\text{opfund}_{it} + \\ b_{24}\text{capfund}_{it} + b_{25}\text{stsole}_{it} + b_{26}\text{difinal}_{it} + b_{27}\text{conv}_{it} + b_{28}\text{emo}_{it} + \\ b_{29}\text{exclbrg}_{it} + b_{30}\text{stfinal}_{it} + e_{it}) \end{aligned} \quad (\text{CSMS 2Aa})$$

My analysis found 14 variables that had statistically significant effects on charter school market share: parental educational attainment, number of religious schools, FRPL, Hispanic students, number of consecutive years in which the state has had charter schools, multiple authorizers, district BOE has sole approval authority, annual cap, geographic cap, autonomy, capital funding, state has sole approval authority, conversions, and exclusion from collective bargaining requirements. Private school market share, mean SAT reading score, high school graduation rate, number of school districts, mean per-pupil spending, median household annual income, crime, Black students, special education students, ELL students, number of years since the charter law passed, statewide cap, operational funding, district BOE has final approval authority, for-profit-EMOs, and state has final approval authority were not found to have statistically significant effects. Taking these initial results into account suggested the following more parsimonious literature review-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(b_0 + b_1\text{ParEd}_{it} + b_2\text{RelSch}_{it} + b_3\text{frpl}_{it} + b_4\text{Hispanic}_{it} + \\ b_5\text{YrsCons}_{it} + b_6\text{mlpau}_{it} + b_7\text{disole}_{it} + b_8\text{capann}_{it} + b_9\text{capgeo}_{it} + \\ b_{10}\text{auto}_{it} + b_{11}\text{capfund}_{it} + b_{12}\text{stsole}_{it} + b_{13}\text{conv}_{it} + b_{14}\text{exclbrg}_{it} + e_{it}) \end{aligned} \quad (\text{CSMS 2Aab})$$

Estimating a reduced model, I found 15 variables that had statistically significant effects on charter school market share: parental educational attainment, number of religious schools, FRPL, crime, Hispanic students, number of consecutive years in which the state has had charter schools, multiple authorizers, district BOE has sole approval authority, annual cap, geographic cap, autonomy, capital funding, state has sole approval authority, conversions, and exclusion from collective bargaining requirements. Taking these results into account resulted in the following literature review-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = & f(b_0 + b_1\text{ParEd}_{it} + b_2\text{RelSch}_{it} + b_3\text{frpl}_{it} + b_4\text{crime}_{it} + \\ & b_5\text{Hispanic}_{it} + b_6\text{YrsCons}_{it} + b_7\text{mlpau}_{it} + b_8\text{disole}_{it} + b_9\text{capann}_{it} + \\ & b_{10}\text{capgeo}_{it} + b_{11}\text{auto}_{it} + b_{12}\text{capfund}_{it} + b_{13}\text{stsole}_{it} + b_{14}\text{conv}_{it} + \\ & b_{15}\text{exclbrg}_{it} + e_{it}) \end{aligned} \quad (\text{CSMS 2Aabc})$$

As in the earlier models, the Eta^2 measures indicate that the largest effects on charter market share were for nonpolicy variables – parental educational attainment of 0.1749 and FRPL of 0.1303. The other substantive effects were for district BOE has sole approval authority of 0.0640, annual cap of 0.0667, geographic cap of 0.0893, and capital funding of 0.0578 (Table 3). Parental educational attainment, FRPL, district BOE has sole approval authority, capital funding, annual cap, and geographic cap accounted for a disproportionate amount of the explanatory power on their own. The adjusted R^2 of 0.6319 for the final CSMS model 2Aabc is higher than for the comparable NAPCS model.

TABLE 3

Charter School Market Share Reduced Form Model 2A without State Fixed Effects

Variable	Coefficient	Effect Size
Parental educational attainment	0.0440 [*]	0.1749
Number religious schools in the state	-5.51e-06 [*]	0.0077
Free and Reduced Price Lunch students	0.0312 [*]	0.1303
Students who are crime victims	-0.0258 [*]	0.0378
Hispanic students	-0.0178 [*]	0.0179
Number consecutive years state has had charter schools	0.0122 [*]	0.0356
Multiple charter authorizers	-0.0281 [*]	0.0547
District BOE has sole approval authority	-0.0310 [*]	0.0640
Annual cap	0.0690 [*]	0.0667
Geographic cap	-0.0469 [*]	0.0893
Autonomy	0.0149 [*]	0.0503
Capital funding	0.0558 [*]	0.0578
State has sole approval authority	0.0184 [*]	0.0468
Conversion	-0.0241 [*]	0.0471
Exclusion from collective bargaining requirements	0.0148 [*]	0.0471

Note:

Adjusted $R^2 = 0.6319$; Sample Size = 660; * $p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

CSMS Model 2B

To evaluate the effects of the literature review-based policies combined with the supply and demand variables with state fixed effects, I estimated the following model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f(& b_0 + b_1\text{SATR}_{it} + b_2\text{HSgrd}_{it} + b_3\text{ParEd}_{it} + b_4\text{SchDis}_{it} + \\ & b_5\text{PerPplEx}_{it} + b_6\text{MdHHin}_{it} + b_7\text{frpl}_{it} + b_8\text{crime}_{it} + b_9\text{Black}_{it} + \\ & b_{10}\text{Hispanic}_{it} + b_{11}\text{SpEd}_{it} + b_{12}\text{ELL}_{it} + b_{13}\text{YrsPass}_{it} + b_{14}\text{YrsCons}_{it} \\ & + b_{15}\text{mlpau}_{it} + b_{16}\text{disole}_{it} + b_{17}\text{capann}_{it} + b_{18}\text{capstw}_{it} + b_{19}\text{capgeo}_{it} + \\ & b_{20}\text{auto}_{it} + b_{21}\text{opfund}_{it} + b_{22}\text{capfund}_{it} + b_{23}\text{stsole}_{it} + b_{24}\text{difinal}_{it} + \\ & b_{25}\text{conv}_{it} + b_{26}\text{emo}_{it} + b_{27}\text{exclbrg}_{it} + b_{28}\text{stfinal}_{it} + b_{29}\text{stAlaska}_{it} + \\ & b_{30}\text{stAriz}_{it} + b_{31}\text{stArk}_{it} + b_{32}\text{stCA}_{it} + b_{33}\text{stCol}_{it} + b_{34}\text{stCT}_{it} + \\ & b_{35}\text{stDel}_{it} + b_{36}\text{stDC}_{it} + b_{37}\text{stFL}_{it} + b_{38}\text{stGA}_{it} + b_{39}\text{stHI}_{it} + b_{40}\text{stID}_{it} + \\ & b_{41}\text{stIll}_{it} + b_{42}\text{stIN}_{it} + b_{43}\text{stIA}_{it} + b_{44}\text{stKS}_{it} + b_{45}\text{stLA}_{it} + b_{46}\text{stME}_{it} + \\ & b_{47}\text{stMD}_{it} + b_{48}\text{stMA}_{it} + b_{49}\text{stMI}_{it} + b_{50}\text{stMN}_{it} + b_{51}\text{stMS}_{it} + \\ & b_{52}\text{stMO}_{it} + b_{53}\text{stNV}_{it} + b_{54}\text{stNH}_{it} + b_{55}\text{stNJ}_{it} + b_{56}\text{stNM}_{it} + \\ & b_{57}\text{stNY}_{it} + b_{58}\text{stNC}_{it} + b_{59}\text{stOH}_{it} + b_{60}\text{stOK}_{it} + b_{61}\text{stOR}_{it} + b_{62}\text{stPA}_{it} \\ & + b_{63}\text{stRI}_{it} + b_{64}\text{stSC}_{it} + b_{65}\text{stTE}_{it} + b_{66}\text{stTX}_{it} + b_{67}\text{stUT}_{it} + b_{68}\text{stVA}_{it} \\ & + b_{69}\text{stWI}_{it} + b_{70}\text{stWY}_{it} + e_{it}) \end{aligned} \quad (\text{CSMS 2Ba})$$

My analysis found 15 variables that had statistically significant effects on charter school market share: high school graduation rate, parental educational attainment, FRPL, crime, Black students, ELL students, multiple authorizers, annual cap, statewide cap, geographic cap, autonomy, state has sole approval authority, district BOE has final approval authority, exclusion from collective bargaining requirements, and state has final approval authority. Mean SAT reading score, number of school districts, mean per-pupil spending, median household annual income, Hispanic students, special education students, number of years since the charter law passed, number of consecutive years in which the state has had charter schools, district BOE has sole approval authority, operational funding, capital funding, conversions, and for-profit-EMOs were not found to have statistically significant effects. Taking these initial results into account resulted in the following more parsimonious literature review-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f & (b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{frpl}_{it} + b_4\text{crime}_{it} + \\ & b_5\text{Black}_{it} + b_6\text{ELL}_{it} + b_7\text{mlpau}_{it} + b_8\text{capann}_{it} + b_9\text{capstw}_{it} \\ & + b_{10}\text{capgeo}_{it} + b_{11}\text{auto}_{it} + b_{12}\text{stsole}_{it} + b_{13}\text{difinal}_{it} + b_{14}\text{exclbrg}_{it} + \\ & b_{15}\text{stfinal}_{it} + b_{16}\text{stAlaska}_{it} + b_{17}\text{stAriz}_{it} + b_{18}\text{stArk}_{it} + b_{19}\text{stCA}_{it} + \\ & b_{20}\text{stCol}_{it} + b_{21}\text{stCT}_{it} + b_{22}\text{stDel}_{it} + b_{23}\text{stDC}_{it} + b_{24}\text{stFL}_{it} + b_{25}\text{stGA}_{it} \\ & + b_{26}\text{stHI}_{it} + b_{27}\text{stIDit}_{it} + b_{28}\text{stIll}_{it} + b_{29}\text{stIN}_{it} + b_{30}\text{stIA}_{it} + b_{31}\text{stKS}_{it} + \\ & b_{32}\text{stLA}_{it} + b_{33}\text{stME}_{it} + b_{34}\text{stMD}_{it} + b_{35}\text{stMA}_{it} + b_{36}\text{stMI}_{it} + \\ & b_{37}\text{stMN}_{it} + b_{38}\text{stMS}_{it} + b_{39}\text{stMO}_{it} + b_{40}\text{stNV}_{it} + b_{41}\text{stNH}_{it} + \\ & b_{42}\text{stNJ}_{it} + b_{43}\text{stNM}_{it} + b_{44}\text{stNY}_{it} + b_{45}\text{stNC}_{it} + b_{46}\text{stOH}_{it} + b_{47}\text{stOK}_{it} \\ & + b_{48}\text{stOR}_{it} + b_{49}\text{stPA}_{it} + b_{50}\text{stRI}_{it} + b_{51}\text{stSC}_{it} + b_{52}\text{stTE}_{it} + b_{53}\text{stTX}_{it} \\ & + b_{54}\text{stUT}_{it} + b_{55}\text{stVA}_{it} + b_{56}\text{stWI}_{it} + b_{57}\text{stWY}_{it} + e_{it}) \quad (\text{CSMS 2Bab}) \end{aligned}$$

Reducing the model, I found 18 variables that had statistically significant effects on charter school market share: high school graduation rate, parental educational attainment, median household annual income, FRPL, crime, Black students, ELL students, multiple authorizers, annual cap, statewide cap, geographic cap, autonomy, capital funding, state has sole approval authority, district BOE has final approval authority, conversions, exclusion from collective bargaining requirements, and state has final approval authority. In re-estimating the model, median household annual income, capital funding, and conversions were found to have statistically significant effects.

Taking these results into account resulted in the following literature review-based model.

$$\begin{aligned} \text{ChSchMktSh}_{it} = f & (b_0 + b_1\text{HSgrd}_{it} + b_2\text{ParEd}_{it} + b_3\text{MdHHin}_{it} + b_4\text{frpl}_{it} + \\ & b_5\text{crime}_{it} + b_6\text{Black}_{it} + b_7\text{ELL}_{it} + b_8\text{mlpau}_{it} + b_9\text{capann}_{it} + \\ & b_{10}\text{capstw}_{it} + b_{11}\text{capgeo}_{it} + b_{12}\text{auto}_{it} + b_{13}\text{capfund}_{it} + b_{14}\text{stsole}_{it} + \\ & b_{15}\text{difinal}_{it} + b_{16}\text{conv}_{it} + b_{17}\text{exclbrg}_{it} + b_{18}\text{stfinal}_{it} + b_{19}\text{stAlaska}_{it} + \\ & b_{20}\text{stAriz}_{it} + b_{21}\text{stArk}_{it} + b_{22}\text{stCA}_{it} + b_{23}\text{stCol}_{it} + b_{24}\text{stCT}_{it} + \\ & b_{25}\text{stDel}_{it} + b_{26}\text{stDC}_{it} + b_{27}\text{stFL}_{it} + b_{28}\text{stGA}_{it} + b_{29}\text{stHI}_{it} + b_{30}\text{stIDit}_{it} + \\ & b_{31}\text{stIll}_{it} + b_{32}\text{stIN}_{it} + b_{33}\text{stIA}_{it} + b_{34}\text{stKS}_{it} + b_{35}\text{stLA}_{it} + b_{36}\text{stME}_{it} + \\ & b_{37}\text{stMD}_{it} + b_{38}\text{stMA}_{it} + b_{39}\text{stMI}_{it} + b_{40}\text{stMN}_{it} + b_{41}\text{stMS}_{it} + \\ & b_{42}\text{stMO}_{it} + b_{43}\text{stNV}_{it} + b_{44}\text{stNH}_{it} + b_{45}\text{stNJ}_{it} + b_{46}\text{stNM}_{it} + \\ & b_{47}\text{stNY}_{it} + b_{48}\text{stNC}_{it} + b_{49}\text{stOH}_{it} + b_{50}\text{stOK}_{it} + b_{51}\text{stOR}_{it} + b_{52}\text{stPA}_{it} \\ & + b_{53}\text{stRI}_{it} + b_{54}\text{stSC}_{it} + b_{55}\text{stTE}_{it} + b_{56}\text{stTX}_{it} + b_{57}\text{stUT}_{it} + b_{58}\text{stVA}_{it} \\ & + b_{59}\text{stWI}_{it} + b_{60}\text{stWY}_{it} + e_{it}) \quad (\text{CSMS 2Babc}) \end{aligned}$$

The largest coefficients were for parental educational attainment of 0.0865, FRPL of 0.0957, Black students of -0.0939, annual cap of -0.0740, autonomy of 0.0596, capital

funding of 0.0679, ELL students of -0.0626, and exclusion from collective bargaining requirements of 0.0842. The Eta^2 measures for the variables that had statistically significant effects on charter market share in order of magnitude were effect sizes for parental educational attainment of 0.1521, FRPL of 0.0669, high school graduation rate of 0.0659, crime of 0.0536, Black students of 0.0515, ELL students of 0.0509, conversions of 0.0481, and annual cap of 0.0447 (Table 4). Parental educational attainment, FRPL, high school graduation rate, crime, Black students, ELL students, conversions, and annual cap accounted for a disproportionate amount of the explanatory power on their own. The adjusted R^2 of 0.8537 for the final CSMS model 2Babc is higher than for the model without fixed effects and somewhat higher than for the comparable NAPCS model with fixed effects.

TABLE 4

Charter School Market Share Reduced Form Model 2B with State Fixed Effects

Variable	Coefficient	Effect Size
High school graduation rate	-0.0413 [*]	0.0659
Parental educational attainment	0.0865 [*]	0.1521
Median household income	0.0150 [*]	0.0157
Free and Reduced Price Lunch students	0.0957 [*]	0.0669
Students who are crime victims	-0.0415 [*]	0.0536
African-American students	-0.0939 [*]	0.0515
ELL students	-0.0626 [*]	0.0509
Multiple charter authorizers	-0.0360 [*]	0.0378
Annual cap	-0.0740 [*]	0.0447
Statewide cap	0.0130 [*]	0.0309
Geographic cap	-0.0170 [*]	0.0444
Autonomy	0.0596 [*]	0.0427
Capital funding	0.0679 [*]	0.0210
State has sole approval authority	0.0475 [*]	0.0422
District BOE has final approval authority	-0.0259 [*]	0.0408
Conversion	-0.0146 [*]	0.0481
Exclusion from collective bargaining requirements	0.0842 [*]	0.0244
State has final approval authority	0.0145 [*]	0.0304

Note:

Adjusted $R^2 = 0.8537$; Sample Size = 660; $*p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

Summary of Findings Regarding Charter School Market Share

I found that the research-based set of policies predicted market share better than the NAPCS-based set. Both versions of my model, which used the literature review-based set of policies, had higher adjusted R^2 as well as more policy variables that had significant effects on market share. Findings regarding nonpolicy variables were highly similar between the two models, as was the finding that including state fixed effects greatly increased the percentage of variance explained.

My post-hoc analysis found that parental educational attainment, FRPL, high school graduation rate, students who were crime victims, Black students, and ELL students accounted for a disproportionate amount of the explanatory power on their own. This is important because these are not policy variables. Parental educational attainment accounted for the largest proportion of the total variance across all four CSMS models. Parental educational attainment is directly related to charter school market share and may capture parents' preferences for schools that provide quality education for their children. I will further discuss the results in the discussion section and explore the policy implications in the conclusion section.

Public School Market Share Model

I estimated two versions of my public school enrollment model to determine the extent to which the charter school market share combined with supply and demand variables influence overall public school enrollment. The first version used charter market share combined with the supply and demand variables without state fixed effects while the second version included state fixed effects. I compared the two versions using adjusted R^2 for overall fit and Eta^2 as the measure of effect size.

PSMS Model without State Fixed Effects

To investigate the determinants of public school market share without state fixed effects, I began by estimating the following model.

$$\text{PubSchMktSh}_{it} = f(b_0 + b_1\text{ChSchMktSh}_{it} + b_2\text{SATR}_{it} + b_3\text{HSgrd}_{it} + b_4\text{ParEd}_{it} + b_5\text{SchDis}_{it} + b_6\text{RelSch}_{it} + b_7\text{PerPplEx}_{it} + b_8\text{MdHHin}_{it} + b_9\text{frpl}_{it} + b_{10}\text{crime}_{it} + b_{11}\text{Black}_{it} + b_{12}\text{Hispanic}_{it} + b_{13}\text{SpEd}_{it} + b_{14}\text{ELL}_{it} + e_{it}) \quad (\text{PSMS 1Aa})$$

My analysis found 10 variables that had statistically significant effects on public school market share: charter school market share, parental educational attainment, number of school districts in the state, number of religious schools in the state, mean per-pupil spending, FRPL students, African-American students, Hispanic students, special education students, and ELL students. Mean SAT reading score, high school graduation rate, median household annual income, and crime were not found to have statistically significant effects. Taking these results into account resulted in the following model.

$$\text{PubSchMktSh}_{it} = f(b_0 + b_1\text{ChSchMktSh}_{it} + b_2\text{ParEd}_{it} + b_3\text{SchDis}_{it} + b_4\text{RelSch}_{it} + b_5\text{PerPplEx}_{it} + b_6\text{frpl}_{it} + b_7\text{Black}_{it} + b_8\text{Hispanic}_{it} + b_9\text{SpEd}_{it} + b_{10}\text{ELL}_{it} + e_{it}) \quad (\text{PSMS 1Aab})$$

The Eta^2 measures for the variables that had statistically significant effects on public school market share were as follows: charter school market share 0.2074, parental educational attainment 0.1273, number of school districts in the state 0.0805, number of religious schools in the state 0.1187, mean per-pupil spending 0.0370, FRPL students 0.0968, Black students 0.1508, Hispanic students 0.0353, special education students 0.0612, and ELL students 0.0499 (Table 5). Charter school market share, parental educational attainment, number of religious schools in the state, number of school districts in the state, Black students, and FRPL students accounted for a disproportionate amount of the explanatory power on their own. Charter school market share, the number

of school districts, and the number of religious schools are measures of having choice as option to the local TPS or private schools. Parental educational attainment may capture parents' preferences for school quality. The adjusted R^2 was 0.5575 for the final PSMS model without fixed effects.

TABLE 5

Public School Market Share Reduced Form Model 1A without State Fixed Effects

Variable	Coefficient	Effect Size
Charter school market share	0.1187*	0.2074
Parental educational attainment	-0.0582*	0.1273
Number of school districts in the state	0.0648*	0.0805
Number religious schools in the state	-0.0271*	0.1187
Mean per-pupil spending	0.0136*	0.0370
Free and Reduced Price Lunch students	0.0891*	0.0968
African-American students	0.0919*	0.1508
Hispanic students	0.0323*	0.0353
Special Education students	0.0444*	0.0612
ELL students	0.0923*	0.0499

Note:

Adjusted $R^2 = 0.5575$; Sample Size = 660; * $p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

PSMS Model with State Fixed Effects

I first estimated the following model to predict public school market share with state fixed effects.

$$\begin{aligned} \text{PubSchMktSh}_{it} = f & (b_0 + b_1\text{ChSchMktSh}_{it} + b_2\text{SATR}_{it} + b_3\text{HSgrd}_{it} + \\ & b_4\text{ParEd}_{it} + b_5\text{SchDis}_{it} + b_6\text{PerPplEx}_{it} + b_7\text{MdHHin}_{it} + b_8\text{frpl}_{it} + \\ & b_9\text{crime}_{it} + b_{10}\text{Black}_{it} + b_{11}\text{Hispanic}_{it} + b_{12}\text{SpEd}_{it} + b_{13}\text{ELL}_{it} + \\ & b_{14}\text{stAlaska}_{it} + b_{15}\text{stAriz}_{it} + b_{16}\text{stArk}_{it} + b_{17}\text{stCA}_{it} + b_{18}\text{stCol}_{it} + \\ & b_{19}\text{stCT}_{it} + b_{20}\text{stDel}_{it} + b_{21}\text{stDC}_{it} + b_{22}\text{stFL}_{it} + b_{23}\text{stGA}_{it} + b_{24}\text{stHI}_{it} + \\ & b_{25}\text{stIDit} + b_{26}\text{stIll}_{it} + b_{27}\text{stIN}_{it} + b_{28}\text{stIA}_{it} + b_{29}\text{stKS}_{it} + b_{30}\text{stLA}_{it} + \\ & b_{31}\text{stME}_{it} + b_{32}\text{stMD}_{it} + b_{33}\text{stMA}_{it} + b_{34}\text{stMI}_{it} + b_{35}\text{stMN}_{it} + \\ & b_{36}\text{stMS}_{it} + b_{37}\text{stMO}_{it} + b_{38}\text{stNV}_{it} + b_{39}\text{stNH}_{it} + b_{40}\text{stNJ}_{it} + \\ & b_{41}\text{stNM}_{it} + b_{42}\text{stNY}_{it} + b_{43}\text{stNC}_{it} + b_{44}\text{stOH}_{it} + b_{45}\text{stOK}_{it} + \\ & b_{46}\text{stOR}_{it} + b_{47}\text{stPA}_{it} + b_{48}\text{stRI}_{it} + b_{49}\text{stSC}_{it} + b_{50}\text{stTE}_{it} + b_{51}\text{stTX}_{it} + \\ & b_{52}\text{stUT}_{it} + b_{53}\text{stVA}_{it} + b_{54}\text{stWI}_{it} + b_{55}\text{stWY}_{it} + e_{it}) \quad (\text{PSMS 1Ba}) \end{aligned}$$

My analysis found 12 variables that had statistically significant effects on public school market share: charter school market share, high school graduation rate, parental educational attainment, number of school districts, mean per-pupil spending, median household annual income, FRPL students, students who are crime victims, Black students, Hispanic students, special education students, and ELL students. Mean SAT reading score was not found to have statistically significant effects. Taking these results into account resulted in the following model.

$$\begin{aligned} \text{PubSchMktSh}_{it} = f & (b_0 + b_1\text{ChSchMktSh}_{it} + b_2\text{HSgrd}_{it} + b_3\text{ParEd}_{it} + \\ & b_4\text{SchDis}_{it} + b_5\text{PerPplEx}_{it} + b_6\text{MdHHin}_{it} + b_7\text{frpl}_{it} + b_8\text{crime}_{it} + \\ & b_9\text{Black}_{it} + b_{10}\text{Hispanic}_{it} + b_{11}\text{SpEd}_{it} + b_{12}\text{ELL}_{it} + b_{13}\text{stAlaska}_{it} + \\ & b_{14}\text{stAriz}_{it} + b_{15}\text{stArk}_{it} + b_{16}\text{stCA}_{it} + b_{17}\text{stCol}_{it} + b_{18}\text{stCT}_{it} + \\ & b_{19}\text{stDel}_{it} + b_{20}\text{stDC}_{it} + b_{21}\text{stFL}_{it} + b_{22}\text{stGA}_{it} + b_{23}\text{stHI}_{it} + b_{24}\text{stIDit} + \\ & b_{25}\text{stIll}_{it} + b_{26}\text{stIN}_{it} + b_{27}\text{stIA}_{it} + b_{28}\text{stKS}_{it} + b_{29}\text{stLA}_{it} + b_{30}\text{stME}_{it} + \\ & b_{31}\text{stMD}_{it} + b_{32}\text{stMA}_{it} + b_{33}\text{stMI}_{it} + b_{34}\text{stMN}_{it} + b_{35}\text{stMS}_{it} + \\ & b_{36}\text{stMO}_{it} + b_{37}\text{stNV}_{it} + b_{38}\text{stNH}_{it} + b_{39}\text{stNJ}_{it} + b_{40}\text{stNM}_{it} + \\ & b_{41}\text{stNY}_{it} + b_{42}\text{stNC}_{it} + b_{43}\text{stOH}_{it} + b_{44}\text{stOK}_{it} + b_{45}\text{stOR}_{it} + b_{46}\text{stPA}_{it} + \\ & b_{47}\text{stRI}_{it} + b_{48}\text{stSC}_{it} + b_{49}\text{stTE}_{it} + b_{50}\text{stTX}_{it} + b_{51}\text{stUT}_{it} + b_{52}\text{stVA}_{it} + \\ & b_{53}\text{stWI}_{it} + b_{54}\text{stWY}_{it} + e_{it}) \quad (\text{PSMS 1Bab}) \end{aligned}$$

The Eta^2 measures for the variables that had statistically significant effects on public school market share were as follows: charter school market share 0.2291, high school graduation rate 0.0958, parental educational attainment 0.0866, number of school districts 0.1154, mean per-pupil spending 0.0411, median household income 0.0075, FRPL students 0.0773, students who are crime victims 0.0453, Black students 0.1133, Hispanic students 0.0464, special education students 0.0602, and ELL students 0.0543 (Table 6). Charter school market share, parental educational attainment, high school graduation rate, number of school districts, African-American students, and FRPL students accounted for a disproportionate amount of the explanatory power on their own. The adjusted R^2 of 0.9618 for the final PSMS model with fixed effects is higher than that for the model without fixed effects.

TABLE 6

Public School Market Share Reduced Form Model 1B with State Fixed Effects

Variable	Coefficient	Effect Size
Charter school market share	0.1293 [*]	0.2291
High school graduation rate	0.0702 [*]	0.0958
Parental educational attainment	-0.0962 [*]	0.0866
Number of school districts in the state	0.0891 [*]	0.1154
Mean per-pupil spending	0.0124 [*]	0.0411
Median household income	0.0056 [*]	0.0075
Free and Reduced Price Lunch students	0.0882 [*]	0.0773
Students who are crime victims	-0.0855 [*]	0.0453
African-American students	0.0951 [*]	0.1133
Hispanic students	0.0303 [*]	0.0464
Special Education students	0.0618 [*]	0.0602
ELL students	0.0842 [*]	0.0543

Note:

Adjusted $R^2 = 0.9618$; Sample Size = 660; $*p < .05$; Effect Size = η^2 ; See Table 7 for variable definitions

Summary for Public School Market Share

I tested two versions of my public school enrollment model to determine the extent to which the charter school market share influenced overall public school enrollment. The first version was without state fixed effects while the second included state fixed effects. My post-hoc analysis found that charter school market share, parental educational attainment, high school graduation rate, number of school districts, African-American students, and FRPL students accounted for a disproportionate amount of the explanatory power on their own. Charter school market share is directly related to public school market share. This suggests that charter school market share increases the overall public school share of the education market by drawing students from private schools into the public education market.

Chapter 5: Conclusion

Discussion

My study investigated predictors of the charter school market share comparing the NAPCS' charter school policies with a research-based set of policies. I included other variables that are indicators of supply and demand influences on charter schools as well as models with state fixed effects to account for unmeasured time-invariant differences among the states. My research was guided by the following research questions.

- To what extent is the NAPCS-based set of policies predictive of charter school market share?
- To what extent is the research-based set of policies predictive of charter school market share?
- Are there individual policies that on their own are strong predictors of market share compared to the set of policies as a whole?
- How well does the research-based set of policies predict market share as compared to the NAPCS-based set?
- To what extent do charter school policies and supply and demand variables influence overall public school enrollment, and does charter school market share have the potential to increase the overall (TPS and charter) public school share of the education market?

Charter School Market Share Models

I found that the literature review-based policies combined with supply and demand variables, with and without state fixed effects, were more significant predictors of charter market share than the NAPCS-based sets. Including state fixed effects improved upon the predictive power of using only the NAPCS or literature review-based policies combined with supply and demand variables. This suggests that unmeasured differences in state contexts and policies have a substantial impact. Possibly these are highly idiosyncratic, but future studies might productively seek to identify and measure the missing variables.

My model, which included the charter school policies that I distilled from the literature review, was a stronger predictor of charter school market share than the NAPCS' charter school policy-based model. My model had more policy variables with significant effects but some of the NAPCS' policy variables also are significant predictors of market share.

I found the following variable types to have statistically significant effects on charter market share:

- 4 NAPCS-based
- 8 literature review-based
- 10 supply and demand

The NAPCS-based policies were independent authorizers, capital funding, for-profit-EMOs, and exclusion from collective bargaining requirements. The literature review-based policies were multiple authorizers, annual cap, statewide cap, geographic cap, autonomy, state has sole approval authority, district BOE has final approval authority, and state has final approval authority. The supply and demand variables included high

school graduation rate, parental educational attainment, median household annual income, FRPL students, crime, Black students, special education students, ELL students, number of consecutive years in which the state has had charter schools, and conversions. Most but not all of the findings were consistent across the different models. I discuss below each of the variables having statistically significant effects on charter market share individually.

Policies regarding authorizers.

Five of the policy variables that predict charter school market share relate to who is given the authority to approve charter schools. Expansive charter laws typically permit multiple authorizers or limit final or sole approval authority to grant charters statewide to the state while restrictive laws tend to restrict the granting of charters to districts' BOEs (Renzulli, 2005; Singleton, 2017). Croft et al. (2010) argue that allowing district BOEs to authorize charters is a conflict of interest because charter and TPSs compete for students, faculty, and funding; incentivizing district BOEs to reject or limit charter approvals. Croft et al. (2010) concluded that state departments of education, universities, non-profit organizations, and independent authorizing boards would be more objective in reviewing and approving charters, and recommend that district BOE's should be granted approval authority only if multiple authorizers are granted approval authority. I theorize that if district BOEs believe charter schools are competitors that will siphon away revenues, then district BOEs that have sole or final charter approval authority would be likely to use their discretion to apply more stringent approval standards and to erect barriers to charter schools.

Two of the findings are readily interpreted. As would be predicted from the literature, charter schools market share is greater when the state is the sole authorizer, and charter share is lower when districts have final say. Both the multiple authorizers and independent authorizers variables were inversely related to charter school market share. The negative effect of multiple authorizers may be a function of having the district BOE included in the measure of multiple authorizers. Why having more independent authorizers should reduce market share is less clear.

Caps.

Caps, whether they are imposed annually, statewide, or geographically, vary in terms of how they limit charter school enrollment, formation, numbers, and growth. State laws imposing the most stringent caps on charter school enrollment, formation, conversions, or location would be likely to limit charter market share. In addition, some policymakers may use their influence or political motives to locate charter schools in certain cities or regions rather than in other areas of the state or to implement caps differently in different cities or regions. State differences in the type of cap such as whether the cap limits charter school numbers, locations, or conversions; or restricts the number, grade or type of students that can enroll in charter schools may explain ways the impact of caps varies by state.

The effect of a cap on the number of charters appears to depend on the type of cap. Annual and geographic caps limit charter market share as would be predicted. A statewide cap tends to increase charter school market share. Possibly, this is because statewide caps are less restrictive and do not target parts of the state where charters are more likely.

Autonomy.

Expansive charter laws typically grant charter schools operating, legal, and regulatory autonomy while restrictive laws tend to subject charter schools to district BOEs' governance and operating control to some extent (Miron, 2017; Morley, 2006). Increased autonomy is positively associated with charter market share. Although the degree to which charter schools enjoy autonomy from state or district laws, regulations, requirements, and procedures but not blanket waivers is difficult to specify, it appears that more autonomy either makes it easier (possibly less expensive) to operate charter schools or increases the attractiveness of charter schools to parents.

Exclusion from collective bargaining requirements.

Exclusion from collective bargaining requirements has a positive association with charter share. Exclusion from collective bargaining likely decreases the cost (lower salaries and benefits) and difficulties of opening and operating a charter school thereby increasing supply. It also might increase demand if it made it easier to offer features like longer hours that were attractive to parents.

EMOs.

Charter school advocates assert that non-profit and especially for-profit EMOs promote market share and manage charter school finances more efficiently than district BOEs manage TPSDs (Miron, 2017; Morley, 2006). The number of for-profit EMOs was found to be positively associated with charter market share in the NAPCS model. However, it was not found to be significant in the models with a broader range of policy variables based on the literature (Table 2).

Capital funding.

The last of the policy variables found to be associated with charter school market share is capital funding. Croft et al. (2010) argue charter schools are underfunded relative to TPSs causing charter schools frequently to require new facilities construction, purchase or lease while TPSs typically have legacy buildings that have been fully amortized leaving TPSs to pay only for operating costs. They argue that this lack of equitable access to capital funding and facilities increases costs and thereby limits charter school formation and market share. The consistent evidence from this study across all models is that charter share increases when capital funding is made available supports that view.

Student achievement.

Parental expectations and preferences for student achievement influence the demand for charter schools. Higher high school graduation rates, but not higher SAT scores, were associated with lower charter school market shares. High school graduation rates may be more widely known and of more general concern than SAT scores. To the extent that high school graduation rates are higher both parents and taxpayers generally may be more satisfied with their state's TPSs.

Student demographic characteristics.

Such demographic characteristics as the percentage of students who are White, Black, Hispanic, Asian, Pacific Islander, ELL, receiving special education, FRPL-eligible, and crime victims are indicators of parental preferences for school choice including demand for charters and contexts that may influence parental demand for choice. Glazerman and Dotter (2017) found parents were more likely to choose a school

with higher percentages of peers of similar racial or ethnic backgrounds and that parental preferences for selecting a school varied depending on the student's race, ethnicity, socioeconomic status, and grade. Lacireno-Paquet and Brantley (2008) found racial composition and poverty-status (e.g., FRPL-eligible) influenced parents' selections of charter schools with White parents preferring mostly White peers and Black families preferring higher percentages of Black students. Lacireno-Paquet and Brantley (2008) concluded that parents might be using "race as a proxy for academic quality" (p. 17). Stoddard and Corcoran (2007) concluded "that there may be a common demand for charter schools that results in greater segregation by race, such as a taste for peers or a taste for curricula that vary by race" (p. 42).

My analyses indicated that charter school market share increased with the percentage of Black students in a state, but was unrelated to the percentage of Hispanic students relative to students in all other categories (primarily White non-Hispanic). This is consistent with the view that race plays a role in the demand for charter schools, possibly as a means of "white flight." It also is consistent with evidence that Black families may benefit less from the availability of charter schools because they have less charter school information and lack access to public transit or district provided transportation constraining their access to charter schools (Lacireno-Paquet & Brantley, 2008; Stoddard & Corcoran, 2007).

The percentage of ELL (English Language Learners) and special education public elementary and secondary school students in the state are both negatively associated with charter market share. This could reflect a greater demand for bilingual and dual language services and for special education services that public schools are believed to be better at

providing, or it could reflect greater satisfaction with TPSs when they are more likely to offer these services. In the case of ELL, it also could reflect differences in parental preferences associated with cultural and immigration backgrounds.

The percentage of public elementary and secondary school students eligible for free-or-reduced-price-lunch (i.e., FRPL) has a positive association with charter school market share. I theorize that parents might view charter schools as a means to escape high poverty schools. Parents might infer that schools with high concentrations of FRPL lack the financial, material, and human resources with which to provide a quality education. In addition, parents might use poverty as a proxy for inferior peer group quality. Some parents may perceive poor students as lacking the resources or ability with which to achieve and with whom they do not wish their children to associate.

The percentage of students who reported being the victim of a crime, or being threatened or injured with a weapon on school property at least one time during the previous 12 months is negatively associated with charter school share. This is inconsistent with the expectation that parental concerns with safety would increase the demand for charter schools and, as a result, charter school market share. Possibly, causation runs the other way with greater availability of charter schools decreasing student exposure to crime.

Parental demographic characteristics.

The percentage of the adult population with a BA degree and state median income were positively related to charter schools. This suggests that demand for charter schools increases with education and income due to preferences for greater education quality and options. They also may be indicators of the capacity to pay for more education options. In

addition, these variables may serve as proxies for an increased willingness to try new schooling alternatives driven by parental dissatisfaction with their expected return on investment on their local school district property taxes. Education level was a much stronger predictor of charter school share than median income, which might indicate that differences in preferences rather than in ability to pay was the stronger influence.

Conversions.

I included policies permitting conversions of public schools to charters in the model as an indicator of parental preferences rather than as a policy determinant. Conversions are an indication of the market potential for converting TPSs into charter schools in the state, drawing enrollment from converted TPSs, and a measure of access to choice as an option to local TPSs. Conversions are negatively associated with charter school share. This result is inconsistent with my expectations for this variable, though it does indicate that policies to allow conversions do not increase the supply of charter schools as charter proponents might suggest. I theorize that parental preferences for conversions vary among the states as well as by race, ethnicity, socio-economic status, and region within states.

Number of religious schools.

The number of religious schools is associated theoretically with parental preferences for choice and alternatives to the TPS. The number of religious schools in 1990 also is an indicator of the market potential for flipping religious schools into charter schools in the state or for drawing enrollment from religious schools and a measure of the extent to which there is private choice as an option to the local TPS. The majority of private schools nationwide are Catholic schools (Schneider, Teske, & Marschall, 2002).

The number of religious schools was negatively associated with charter school market share, though the effect size is small. This suggests that the number of religious schools very modestly influences charter market share as another alternative to the TPS, thereby reducing demand. Alternatively, parental preferences for religious schools might modestly decrease the demand for charters because charters also are secular and not a religious alternative to the TPS. Religious schools (e.g., Catholic schools) also may decrease demand for charters because they offer a lower cost alternative to TPSs compared to private independent schools.

Number of consecutive years.

The number of consecutive years in which the state has had charter schools is associated theoretically with parental preferences for charter schools and sorting options. The number of consecutive years in which the state has had charter schools is a measure of parents being aware of charter schools as an option to local TPSs. Charter school growth may fuel its own momentum stemming from greater parental exposure and familiarity with charter schools. Renzulli (2005) defines this process as “cognitive legitimacy;” the direct relationship between the amount of time a state has had charter schools and the state’s number of charter applications and schools (p. 5). Renzulli (2005) argues that her cognitive legitimacy theory helps to explain charter school market share growth. The modest positive association found between consecutive years with charters and number of charters is consistent with Renzulli’s argument.

Public School Market Share Model

Charter school market share has a positive association with the overall percentage of students in public schools. This finding contradicts the view that charters syphon students from the public schools and suggests that they draw instead from private schools. This could be viewed as an undesirable shift of public funds to those who otherwise would pay for education themselves, a “crowding out” of private education. In this view, charters may provide a lower cost alternative to private schools that allows for increased selection of peer-groups within the public sector. However, it may also be viewed as expanding the options available within the public education system to retain more of the population in that system and thereby strengthen it.

I conclude that charter schools serve as the public school alternative to local TPSs for parents for whom local TPSs fail to meet their preferences and expectations as well as for whom private or religious schools are not suitable, affordable, accessible, or available. In addition, I conclude that charter schools serve as the public school alternative to local TPSs for parents who have the ability to vote with their feet or seat. From my perspective, policies that increase the charter school market share strengthen public education by drawing students who otherwise would attend private schools into public education.

Policy Implications

This study identifies and evaluates different policies as well as supply influences and demand variables that are significant determinants of the charter school share of the public education market and overall enrollment in public education. Understanding what influences the variables that have the greatest predictive strength of charter school market share and overall public school enrollment will help to inform policymakers who make highly consequential decisions on state charter laws and overall state education funding formulae. The major influences of the determinants of the charter school share of the public education market and overall enrollment in public education have public policy implications.

Unlike the NAPCS' reports, this study investigated the determinants of charter school enrollment using a comprehensive model of supply and demand. The NAPCS' research on the determinants of charter school enrollment has tended to focus solely on state policies, which the NAPCS believed would limit or support charter school formation and growth. The NAPCS' analysis, weighting, and ranking of state charter school laws were based primarily on the NAPCS' leaders input, anecdotal evidence, and suggestions from local, state, and national charter school advocacy groups, think tanks, and associations as to the factors that would promote charter school enrollment.

In addition, many of the NAPCS' analyses of state charter school laws seemed to be based on the NAPCS' preferences for charter school formation and growth combined with inferred charter school parental and student expectations, which were presumed to differ from those of their TPS counterparts. This suggests that the NAPCS may have estimated the effects of its state policies without fully accounting for other influences on

supply and demand potentially resulting from the bias of those providing input to the NAPCS' policy analyses. My study finds support for few of the NAPCS policy variables suggesting that it is not the best foundation for policies supporting charter school expansion regardless of whether one favors or opposes charter schools.

I found that parental educational attainment, FRPL-eligible students, high school graduation rate, students who were crime victims, African-American students, ELL students, multiple authorizers, annual cap, autonomy, state has sole charter approval, and exclusion from collective bargaining requirements accounted for a disproportionate amount of the explanatory power on their own. This is important because only one of these is a NAPCS primary policy variable (i.e., exclusion from collective bargaining requirements). The strongest influences are not policy variables. Parental educational attainment accounted for the largest proportion of the total variance across all four CSMS models. An implication is that failing to account for other demand and supply influences can lead to misestimating of the impacts of policy variables.

Proponents and opponents of charter schools can both learn from the findings of this study. The policies likely to have the most influence on charter school market share relate to how they are authorized and approved, caps on charter school growth, and funding. Giving the state sole authority and either no cap or a statewide cap only will tend to increase charter school market share. Allowing districts final approval and having localized caps is likely to decrease charter market share. Provision of capital funding for charters also appears to support substantively charter school expansion.

Prior research has tended to view charter school expansion as entirely at the expense of overall public school enrollment—and thereby taking students away from

traditional public schools. However, my analysis found that my research-based set of policies predicted market share better as compared to the NAPCS-based set. I concluded that charter schools retain children in the public system who otherwise would attend private schools. This may be viewed as a positive outcome or it could be negatively characterized as crowding out private education at public expense.

The PSMS model also suggests that parental interest in public schools is heightened by their preferences for specific peer groups and lower cost alternatives to private and religious schools as well as their ability or aversion to moving to another catchment area or district when local TPSs are perceived as underperforming. Charter schools serve as the public school alternative to local TPSs for parents who have the ability to vote with their feet or seat.

Further Research

This study demonstrates the value of a comprehensive supply and demand framework for research on charter school market share. Future studies should endeavor to better account for parental preferences that influence demand and for contexts as well as policies that influence supply. Although parents have had the choice of private, religious, or TPSs whether intra-district or inter-district for generations, parents have different degrees of freedom in exercising school choice. Finer grained analyses that measure demand-side variables at the local level may be more informative than studies using statewide measures. Similarly, there may be contextual differences that can be better understood when measured at the district or neighborhood level. Of course, the strong explanatory power of state fixed effects indicates that there is still much to be learned about the determinants of differences in charter school market share across states. To the

extent that the otherwise unmeasured influences associated with states are unique to each state or hard to identify and measure quantitatively, qualitative studies may be especially useful for increasing our knowledge.

My study also demonstrates the need for more research on understanding what underlies, shapes, and informs parental preferences and how these preferences manifest in school choice decision-making. There is more to be learned about how parents collect, evaluate, and apply the available qualitative and quantitative information about charter and TPSs. Many interesting questions can be posed. To what extent do parents lack trust in the available quantitative information on schooling options? Do parents rely more on word-of-mouth assessments by respected peers because they lack trust in the quantitative measures of school and student quality? To what extent is the information about the quality of the available schooling options asymmetric and is it more asymmetric for some rather than other parents? How do we measure the asymmetry of information? Answering these questions would help to inform the design of policies that account for and offset the proxies and prejudices parents may use in their decision-making.

In addition, my study suggests the need for more research on how parents make their residential choice because parents purchase access to public education when they purchase their residence. However, place of residence determines not only proximity to schooling options including private, religious, charter or TPSs but also to public transit and other transportation modes that provide access to more options that may be particularly relevant to who enrolls in which charter schools. More research on determining the intensity of parental school and housing preferences and the degree to

which parents are willing to make tradeoffs among school and housing choices would further this understanding.

Answering the aforementioned questions would help to inform policymakers on how to design school and housing policies that could lead to increased integration of schools. Parental use of peer characteristics as proxies for school quality as well as prejudices may drive racial, ethnic, and income segregation and stratification, which exacerbates divisions in our society. A better understanding of the determinants of the charter school share of the public education market, particularly the role of parental preferences is likely to be an important part of the knowledge base for these broader policy decisions.

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