An Analysis of Competitive Stimuli from School Choice Reform and the Resulting Implications on Public Education Outcome Measures

by

Leslie S. Miller

An honors thesis submitted in partial fulfillment

of the requirements for the degree of

Bachelor of Science

Undergraduate College

Leonard N. Stern School of Business

New York University

May 2005

Professor Marti G. Subrahmanyam	Professor Robert Berne
Faculty Adviser	Thesis Advisor

TABLE OF CONTENTS

EXECUTIVE SUMMARY

There exists tremendous disagreement over the expected outcomes of school choice on the provision of public education. This paper considers the impact of competitive stimuli from both public and private choice mechanisms on public school performance by evaluating empirical evidence from charter schools in Arizona, California and Michigan, failing-school vouchers in Florida and means-tested vouchers in Milwaukee. While there is an abundance of research that assesses choice school outcome measures, here we have considered how charter and voucher reforms have impacted the competitive response of the public school. This is of particular relevance given that nearly 90 percent of students in America are enrolled in traditional public schools, with only modest changes in this figure expected.

To contextualize the empirical evidence on school choice, the first section of my analysis provides a framework on the underlying historical, legal and economic argumentation for choice programs. More specifically, I begin with a descriptive analysis of contemporary public and private choice programs, which highlights critical features in the design of such initiatives, including voucher allocation, governance, admissions policies, tuition for private and charter schools, and tuition add-ons.

I proceed by illustrating the conditions under which the wave of school choice reforms emerged by presenting the historical debate on the role of government on the provision of education. To summarize, proponents of school choice argue that public schools are essentially state controlled monopolies. As a consequence, the absence of competition gives little incentive to improve the quality of publicly provided education. Therefore, by dismantling the bureaucracy that exists in the educational sector by providing school choice, the standard of education delivered by the public sector could potentially improve. Conversely, opponents of the educational marketplace predict very different theoretical outcomes. For instance, it is argued that school choice initiatives

detract much needed funding from public schools. Moreover, the opposition contends that public and private choice reform tends to shift the top performing students away from the public schools, causing outcome measures in the public school to decline. This context facilitates a better understanding of the proposed theoretical impacts of school choice that are addressed in the second section of my analysis.

To illustrate these theoretical effects, a simple microeconomic model of utility is employed. This model predicts that households are more likely to operate on the highest possible indifference curve when choice mechanisms are in place. This model however includes a series of very restrictive assumptions that limit its applicability to the educational marketplace. Nevertheless, this positive theoretical outcome highlights the need to evaluate how school choice interacts with the public school system.

The empirical analysis in the third section of this paper was guided by Patrick J. McEwan's methodology for evaluating the net economic impact of choice mechanisms. The net economic impact of choice is given by a combination of three effects: the performance outcomes of the choice participants, the possibility of student sorting, and behavioral and outcome changes in the public school. It should be noted however that the success of choice schools was only evaluated in terms of its potential to impact the public schools; attention was paid to the strength of performance based accountability in choice schools, and the interaction between the quality of the choice school and the quality of public school.

The focus of this paper was on the latter two effects of school choice that McEwan recommends for consideration: sorting effects and changes in public school outcomes. Student sorting effects typically fall into three categories: racial, income, and ability level sorting (cream skimming). Empirical evidence is presented which reveals that sorting effects may be contingent on the design of the charter or voucher scheme. For example, results indicated no evidence of income-based sorting when voucher program designs stipulated that participating private schools must

accept the voucher as full payment. On the other hand, ability level sorting appears to be an unavoidable byproduct of school choice, due to the parental self-selection process. Racial sorting patterns varied across the school choice initiatives profiled.

Most public schools underwent a number of changes following the inception of voucher programs and charter schemes. These changes fell into the following five categories: governance, parental outreach, curricular and extra curricular innovation, financial outcomes and achievement outcomes. However, there are tremendous challenges associated with isolating these responses as a product of school choice reform. It may be that these responses were entirely unrelated to the choice mechanism in place. In many of the cases that were evaluated, there were other policies designed to impact failing schools and disadvantaged students. In addition, there is a powerful stigma effect that is often associated with failing schools that may obviate the role of competitive stimuli from school choice.

Improvements in methodology are needed to generate conclusive evidence on the effects of school choice on the provision of public education. For instance, more accurate measures are needed to produce results on the impact of school choice on public school achievement. The changes in high stakes test scores that are frequently cited may not reflect any real improvements in the achievement of public school students. Furthermore, to ameliorate some of the incongruity that exists on the effects of school choice on public schools, researchers must be careful to avoid question biases in the initial stages of their research. Presently, attitudinal data may be the best reflection of the impact of school choice on public schools. Future research should be mindful of growth rates, community level characteristics, and choice school quality, as these factors can strongly influence the impact of the school choice mechanism on a given public school.

INTRODUCTION

One present day debate on educational reform amongst parents, teachers, politicians, religious leaders, free market advocates and academics alike, has centers on the neo-liberal argument over whether educational services should be delivered to individuals by means of private enterprise. Several states have moved forward with school choice reform as an alternative to the rules and resource based initiatives. School choice reforms are accomplished through a variety of restructuring programs, the implementation of school choice being one of them. School choice offers families the opportunity to have control over how they obtain educational services, thus comodifying education to create an educational marketplace. Not all school choice reforms, however, imply privatization; choice reforms that have been enacted to date fall into two broad categories, public choice and private choice systems, which are often referred to as targeted private vouchers (Levin, 1990).

STATEMENT OF THE QUESTION

Proponents of school choice argue that public schools are essentially state controlled monopolies, and attribute this structure as the reason for decades of public school failure. The absence of the competition gives little incentive to improve the quality of publicly provided education. By dismantling the bureaucracy that exists in the educational sector by providing school choice, the standard of education delivered by the public sector could potentially improve. Public schools would seek to improve efficiency and the quality of their educational services in an effort to attract students. This argument is commonly known as the "market hypothesis" (Clemens, 35).

Antithetically, opponents of the educational marketplace predict very different theoretical outcomes. For example, it is argued that school choice initiatives detract much needed funding from public schools. Moreover, the opposition contends that public and private choice reform tends

to shift the top performing students away from the public schools, causing outcome measures in the public school to decline. This is known as the cream skimming effect, and is ascribed to certain features of choice initiatives, such as admissions policies. The logic underlying this case rests in part with the belief that higher performing students are likely to come from the families that are more involved and concerned with the quality of education, and thus more likely to tap into school choice initiatives.

This paper reviews both public and private choice voucher reform, in the context of the market hypothesis, in an effort to determine the ways in which school choice impacts the provision of public educational services. Given that nearly 90 percent of students in America are enrolled in traditional public schools, with only modest changes in this figure expected, it is important to consider the effect of school choice on the public counterparts in which the vast majority of students attend (Teske, 188). When considering school choice reform, there will be little emphasis on specific categories of public choice reforms, specifically post secondary and second chance options, as these programs are not designed to include a broad range of students within a given region. I will present my analysis in three sections: the historical and legal context of public and private choice initiatives, the theoretical effects of school choice initiatives and a survey of empirical evidence on the impact of choice reform on public education performance measures.

PUBLIC CHOICE VERSUS PRIVATE CHOICE

The differences between public and private choice are paramount to understanding the distinctions between various school choice proposals. Public choice gives families the freedom to choose among a number of educational options, but are limited to those supplied by the public sector. The plethora of alternatives within the public school system fall into the following six categories:

- *Alternative schools* are schools funded by the district and employ district employees. These schools utilize the district curriculum, while applying an alternative approach to the general education setting (Canter, 1). This usually involves creating a different environment from the neighborhood school setting through small classes and individualized instruction.
- *Magnet schools* offer non-traditional curricula to students with well-defined interests. General education requirements are often addressed around a given magnet theme. Magnet schools draw students from outside the district boundaries of the facility, often attracting a culturally and geographically diverse student population (Canter, 1).
- *Self-governed charter schools* are public schools that are entirely independent of the neighborhood schools. They operate according to a set of institutional practices developed by a group of founders that have received state approval and state funding. Charter school founders can range from parents, to community leaders, to profit-seeking organizers. Once the founder receives a charter for the school, he or she can exercise a great deal of autonomy in terms of school budgeting, curriculum and accountability requirements. Exemptions from state regulations vary from state to state, but broadly speaking, charter schools simply must guarantee that they will meet a set of specified state performance standards (Friedman, 1).
- *Intra-district choice plans* allow families to choose from any neighborhood public school in the district.
- *Inter-district choice* plans enable neighborhood school choice at the state level (Murphy, 94). The neighborhood school, as the name suggests, is a traditional school that is drawn from a defined geographic boundary (Canter, 2).
- Two additional public choice options fall into the general category of *high school choice options*. The first of these is *second chance options for dropouts*, which offers students

vocationally targeted coursework. Lastly, *postsecondary options* give students the opportunity to engage in intense college level coursework in preparation for college-degree programs.

Private choice programs provide families with tuition coupons in the form of school vouchers that they can then use to pay tuition at participating private schools. There are three general types of vouchers: *Universal vouchers* allocate government funding amongst parents, who can then send their children to their desired educational institution, private, public, or religious. Universal vouchers "separate the government financing of education from the government operation of schools" (Friedman, 1). *Means-tested vouchers* are targeted vouchers determined on the basis of income. Though not always the case, these vouchers tend to be limited in number, and allow parents to direct funding to public, private or religious schools. *Failing school vouchers* target students attending under-performing public schools that have been designated as failing, and allows those students to attend the educational institution of their choice. There are no income requirements for failing school vouchers, and participation is determined solely on the basis of the public school at hand. It is important to note that funding for all three types of private choice vouchers can come from both public and private sources.

There are four features of school choice that distinguish public choice initiatives from private choice reforms. Perhaps the most noticeable distinction lies with the limitations placed on religious school attendance under public choice programs. Notably, public choice programs restrict public monies from being channeled to sectarian schools. The First Amendment's Establishment Clause, as interpreted in 1947 in Everson v Board is a constitutional guarantee that there will be a "wall of separation" between the church and state. Thus public choice programs, by restricting choice to the public sector, cannot legally direct any funding to faith-based institutions. Private choice programs on the other hand, allow students to attend either public or private parochial schools.

Secondly, public choice initiatives do not contain any selection criteria on the basis of academic talent or behavioral characteristics. Most participants of public choice programs have been selected randomly. Though there are instances of private choice programs that involve random selection, most private choice programs permit an admission process. In most states, private choice programs give private and charter schools the right to give priority to students that fit their admissions criteria more closely, as long as such criteria is constitutional (Weil, 48).

The third difference between public and private choice programs rests with the use of add-ons to the school choice monies allocated. In public choice programs, families cannot send children to public schools that require add-ons, or in other words, tuition in excess of the public funding distributed. Such restrictions are examples of price controls in the educational marketplace. By contrast, the tuition in private choice programs could potentially be higher than the public funding that is allocated to the parents for their child's education. Sometimes, the tuition charged by the private or parochial school is in no way linked to the targeted funding from the private choice initiative. Parents therefore, must make up the difference in tuition with their own private funds if they wish their child to participate in the private choice program (Hoxby, 3).

The fourth and final key distinction between public and private choice programs has to do with accountability for student achievement and the documentation required of the schools participating in choice programs. Public choice schools must display a degree of transparency when reporting the performance of choice participants, as there may be explicit public accountability requirements. Furthermore, the public choice schools must produce results that are on par with the educational standards of the state, and provide evidence of the academic growth of participants. Private choice programs have few, if any, public accountability requirements. Thus, the students participating in private choice initiatives are only required to perform in accordance with the requirements of the private or parochial school.

HISTORY OF CHOICE REFORM

The neo-liberal economic theories that underlie both public and private school choice were first championed by Adam Smith in *An Inquiry into the Nature and Causes of the Wealth of Nations.* His treatise formed the framework for liberal economic theory, advocating the laissez fair capitalism that is expounded today by school choice advocates. The foundation of Smith's argumentation is that the "profit motive, free market economic and competition provide the proper incentives for efficiency and quality in the production of goods and services of a society, and its individuals needs and wants" (Weil, 11). Though Smith argued for little interference by any governmental bodies in the provision of goods and services, both private-choice and public- choice proposals introduce an element of freedom and choice for the consumer. According to Smith, choice is a prerequisite for competition in any given marketplace, as it empowers consumers to reward the most deserving providers of goods and services. For this reason, Smith would reject the notion of a government-controlled educational system in exchange for a system of "free enterprise" comprised of small buyers and sellers in education. Accordingly, he is regarded as one of the very first proponents of school choice.

In 1791, Thomas Paine brought Smith's ideas to the United States through his work The Rights of Man. Both Smith and Paine made a case for state-supported education for lower income brackets, reasoning that a progressive income tax could facilitate the schooling of lower income children (Murphy, 89). Under Paine's plan "every family would receive a specified amount for each child up to the age of fourteen" (Levin, 255). Paine was careful to emphasize the role of parental choice in education, suggesting that parents should be "required to purchase education for their children" (Lindelow, 6).

In the 1859, political philosopher John Stuart Mill addressed the fact that all children are entitled to a minimum education in his work entitled On Liberty. Paramount to Mill's argument is

that we "leave to parents to obtain the education where and how they pleased, and content itself with helping to pay the school fees of the poorer classes of children, and defraying the entire school expenses of those who have no one else to pay for them" (Mills, 119). Thus, Mill recommended targeting and public support for lower income brackets so that they too could seek a private education. Furthermore, Mill raised questions over the competency of the government to provide public education, fearing that government control could lead to homogenization of ideological viewpoints.

The ideas behind school choice found embodiment in the early 1870's when a parochial school voucher program was proposed in France. This program was the first occasion in which Smith's and Paine's conception of "free enterprise" was applied to the market for education. France's voucher program served as a blueprint for many of the school choice programs proposed in the United States nearly a century later. At that time, France was a country out of balance, having been defeated by the Prussians in the Franco-Prussian War (Molnar, 1). Large proportions of the French population blamed the social instability in the country on the public school system. This prompted a French parliamentary commission to devise a school choice initiative that would allocate public funding to church schools. However, a tradition of French anticlericalism led the French assembly to reject the private voucher program (Weil, 45).

School choice entered the realm of modern economics when Milton Friedman addressed privatization of public education in the United States in 1955 in an article entitled "The Role of Government in Education." Friedman, like Smith, rejected the use of most government controls. He was an avid proponent of an educational marketplace, spurred by a universal distribution of vouchers for K-12 funding. Friedman described a system, referred to as "100% child based funding" where parents could use these vouchers to select any school, public or private, for their child to attend (Merrifield, 1). He concurred with the belief that such a system would better allocate educational resources than the government. Friedman saw the implementation of voucher programs

not solely as an end to government monopolization over education, but as a means to stimulate improvement among under-performing schools. Friedman's ideas, though advanced by voucher proponents today, went largely unnoticed, receiving little merit from educational stakeholders.

This is not to say that school choice initiatives did not garner public support in the late 1950s. However, advocates of school choice at that time had little concern for much of the argumentation for vouchers that Friedman had first proposed. The school choice movement was driven predominantly by racist ideals; school choice was simply an effort to resist the court ordered racial integration that followed the US Supreme Court's decision in Brown v. Board of Education in 1954 (Weil, 39). An instance of school choice prompted by a desire to maintain the segregated school systems was the "tuition-grant" program passed by the Virginia legislature in 1956, and the "scholarship plan" four years later (Molnar, 2). These programs distributed tax dollars to families, which they could then use to pay tuition at any non-sectarian schools. Similar school choice programs were passed in many other southern legislatures. The express objective of these programs was to uphold segregation in the wake of racial integration.

Nevertheless, Friedman continued to espouse the economic virtues of vouchers over this time frame, particularly in his book entitled *Capitalism and Freedom*, published in 1962. Over time the political terrain for school choice transformed, in part because vouchers found more widespread support among the Catholic population, who saw voucher programs as a way to finance their parochial schools. The economic merits of vouchers that Friedman highlighted were in fact recognized and a wave of school choice proposals emerged.

In the late 1960's the Federal Office of Economic Opportunity under the Johnson administration began crafting an extensive educational voucher program that was subsequently implemented by the Nixon Administration (Molnar, 3). The program, largely influenced by Christopher Jencks at Harvard University's Center for the Study of Public Policy, targeted low-income students, who could apply vouchers at a plethora of participating public or private schools.

Tuition add-ons to these vouchers were not permitted, which meant that both public and private schools were expected to accept the voucher as full payment for educational services rendered. The program was slated for implementation in Minneapolis, Rochester, Kansas City, Milwaukee, Gary and Seattle. Ultimately, all of these cities rejected the voucher program (Wells, 152). Perhaps the most vocal opponents of this private voucher program were teachers unions, which were able to transform this ambitious initiative into a very limited public choice program in Alum Rock, California, which abandoned it not long after enactment. Similar efforts to implement voucher programs failed in Maryland in 1972, and in Michigan in 1978, both being rejected by popular referenda (Gehring, 24).

In 1983 *A Nation at Risk* was published, which generated much concern over the health of America's public school system. By the late 1980's public school choice initiatives were making headway under the Reagan administration. Both interdistrict and intradistrict choice programs were enacted across the United States, beginning with Minnesota's public choice program in 1988 (Molnar, 3). However, these programs tended to be restrictive in nature. For instance, Nebraska's 1989 interdistrict choice reform stated that students were only entitled to make use of their transfer option once throughout their education. Transfer options were limited on the basis of space and desegregation orders, and transportation was only provided for low income students participating in the National School Lunch Program or disabled students (Kafer, 5).

Though the visibility of school choice increased with the experienced widespread implementation of public choice programs, private choice mechanisms remained riddled with controversy, particularly due to issues over the constitutionality of voucher programs. Controversy heightened when the Wisconsin legislature approved the Milwaukee Parental Choice Program, "the country's first true educational voucher plan" (Molnar, 6). Though initially the program only reached about 1,000 low-income students, public opposition resounded loudly. This was in part due the accountability component of Milwaukee's choice program: "Wisconsin law did not require that

[private schools] meet the same educational standards that the Milwaukee public schools had to meet. It did not require that the teachers at the choice schools be certified. It did not require that the curriculum of the schools be reviewed, or accredited by any outside agency (5).

In response to voucher opponents, President Bush spent much of his term publicly supporting private school vouchers. In an effort to shore up public approval of voucher programs, Bush vocalized support of the voucher ballot initiative in Oregon, as well as Wisconsin's voucher law. Bush's 1991 "American 2000" reform program included private choice mechanisms among the reforms listed. In 1992, Bush incorporated a voucher plan into his proposed budget under the "G.I. Bill for Children" (Molnar, 5). Alongside this political backdrop, the Milwaukee voucher experiment continued, generating much media attention as the yearly comparisons of achievement of choice participants relative to that of public school students were announced. Other voucher programs sprang up during the Milwaukee experiment. The Cleveland Scholarship Tutoring Program received particular attention, as the program permitted parents of students in grades K-8 to use vouchers at either private or religious schools.

Charter and alternative school development was taking place alongside the interdistrict public choice reforms and the voucher experiments. In 1992, Minnesota approved the nation's first charter school. According to the Center of Educational Reform, 40 states and the District of Columbia have approved over 2700 charter schools in the past twelve years. In the 2002 Survey of American Charter Schools, the Center for Education Reform calculated that these charter schools serve a total of 684,000 students. These students, as the earlier general description of charter schools suggested, tend to come from diverse backgrounds and are likely to be better served by the innovative, non-traditional programs that the charter schools offer. Restrictions on school choice through charter school measures vary dramatically from state to state, with charter schools being offered differing levels of flexibility on hiring, curriculum, and length of school year. For example, district oversight over hiring practices varies with state regulations. Some charter schools are

permitted to hire teachers based upon their own standards rather than state certification. The most recent charter school innovations are web-based educational alternatives, known as "virtual charter schools." One such program, devised by former US Secretary of Education William Bennet provides educational programs through the Internet for grades K-12, with students enrolled from nine states.

SCHOOL CHOICE AND ISSUES OF CONSTITUTIONALITY

The Supreme Court first erected a precedent for parental control over the schooling in the 1920's. In 1923 in Meyer V. State of Nebraska, the Supreme Court overturned a state statute, which had restricted educational instruction in languages other than English (Kafer, 3). The court argued that though requirements that teachers shall give instruction in English are within the power of the state, a restrictive mandate that prevented instruction in languages in addition to English violated the Fourteenth Amendment. The amendment states, "No state…shall deprive any person of life, liberty or property without due process of law." By wiping out the use of all languages but English, the State of Nebraska had infringed upon the right of parents "to control the education of their own" (McReynolds, 4). In 1925 an Oregon law was overturned which required all children to obtain educational services from the public sector in Pierce V. Society of Sisters. Justice McReynolds, citing the aforementioned Meyer V. State decision, reiterated the "liberty of parents and guardians to direct the upbringing and education of children under their control" (McReynolds).

Although the precedent for parental rights in education was set early on in the school choice movement, the larger question still remained over whether the Establishment Clause could be used to attack the constitutionality of private choice programs that channeled government funding to parochial schools. Before 1970 there were simply two constitutional tests that were applied to parochial school legislation: the secular legislative purpose test and the primary effect test (Johns, 134). For this reason, the Supreme Courts upheld a rigid interpretation of the Establishment Clause.

The secular legislative purpose test simply ensured that legislation has a purpose "other than aiding religion" (134). The primary effect test evaluated whether the legislation "advanced or inhibited religion" (134).

Soon after Nixon's Presidential Commission on School Finance proposed Parochaid, the Supreme Court set a more explicit precedent that would work to make the use of tax dollars at schools with religious affiliation a challenging endeavor. In the 1971 case Lemon v. Kurtzman, the Supreme Court in an 8-0 ruling set an additional standard for school choice mechanisms that dealt with the effects of the program on the government in addition to the religious impact on the participants and the purpose of the program (Johns, 135). More specifically, the Supreme Court held that to be constitutional, the program must not "excessively entangle the state with religion" (Molnar, 4). In the years that followed, the courts struck down a wide range of efforts to allocate state funds to assist parochial schools. Various forms of allocation mechanism were rejected, including but not limited to tuition grant programs, tax benefit provisions and maintenance and repair of parochial schools, all because the Court held that such programs facilitated governmental advancement of religion.

Despite the fact that the first version of the Milwaukee Parental Choice Program did not include religious schools, the constitutionality of the school choice initiative was called into question upon the program's enactment due to questions of accountability. The Wisconsin Supreme Court upheld the constitutionality of the voucher program in 1992, concluding that the program targeted a narrow segment of children living in poverty. Because the program initially did not channel government funding towards religious institutions, the court concluded that the Milwaukee Parental Choice Program in no way advanced religious ideals. However, the battleground was much fiercer when the Milwaukee Parental Choice Program expanded choice alternatives to include religious institutions. A lawsuit was filed by the American Civil Liberties Union, the teachers union, the National Association for the Advancement of Colored People, Americans United for the

Separation of Church and State, People for the American Way, among other interest groups, arguing that the Milwaukee Parental Choice Program violated both the First Amendment and the Wisconsin Constitution (Kafer, 6).

In 1998 the Wisconsin Supreme Court maintained that the program did not violate the First Amendment because the government funding was being allocated to religious institutions by way of third parties, and moreover, because the overarching purpose of the voucher program was to target students "at or below 175 percent of the poverty level," and supply them with vouchers to obtain high quality education, regardless of religion. In the words of the court "public funds may be placed at the disposal of third parties so long as the program on its face is neutral between sectarian and nonsectarian alternatives and the transmission of funds is guided by the independent decisions of third parties...and that public funds generally may be provided to sectarian educational institutions so long as steps are taken not to subsidize religious functions."

A similar conclusion was reached when the Supreme Court of the US rendered a decision on the constitutionality of the Cleveland Scholarship and Tutoring Program. This program was constructed to give parents of K-8 students the autonomy to choose from several participating private and religious institutions. Each family received a voucher worth up to $2,250 from the government, which could then be used to offset tuition costs at the private and parochial institutions. This program, serving over 5,000 students, generated much opposition among teachers unions and the American Civil Liberties Union. In fact, special interest groups challenged the Cleveland Scholarship and Tutoring Program on both Federal and state constitutional grounds, and a string of legal battles ensued. A conclusion was reached with a 5-4 decision June 27th 2002 in the case of Zelman v. Simmons –Harris. In said case, Chief Justice Rehnquist maintained that the features of the Cleveland Scholarship and Tutoring Program in no way violate the Establishment Clause of the Constitution. Arguably, it is the parents channeling the funding to the religious schools, as they had a range of alternatives to decide amongst. Just as in the decision on Milwaukee Parental Control

Program, the courts perceived Cleveland's school choice construct as "a program of true private choice…as was true in those cases, the Ohio program is neutral in all respects towards religion" (Rehnquist, 1).

In contrast to the debate on vouchers, alternative and charter schools have not catalyzed the same level of legal controversy. One notable challenge to charter school laws transpired in Utah, where the Utah School Boards Association challenged the constitutionality of Utah's charter school laws. Their claim was that the state constitution gives the state board of education the authority to control a homogenous public school system. In 2001, the Utah Supreme Court chose to uphold the charter school laws, ruling that the Legislature could specify schools that could be overseen by the school board but could operate outside the uniform system.

THEORETICAL EFFECTS OF SCHOOL CHOICE

EDUCATION: AN ECONOMIC DEFINITION

Education can be viewed as an *economic good*, which by definition satisfies a human want, and is constrained by scarcity. Economic goods fall into two categories, *material* and *nonmaterial*. While material goods are "physical and tangible," education is a nonmaterial good, or in other words "a service rendered by a free person which satisfies a want" (Johns, 11). Relative to other economic goods, education is the "third largest single item of expenditure in the public sector, behind national defense and social security" (Stiglitz, 114).

Though economists typically limit classifications in terms of durability and usage to material goods, education has the unique feature of being classified as a *durable, multiple-use good*. Durability refers to whether a good can be kept for an extended period of time. The durability of education is limited because with nonuse the value of education diminishes, and with storage, education becomes obsolete due to continuous innovation and development (Johns, 12). Multiple

use goods, as the name suggests, can be used more than one time. Unlike most goods that depreciate with use, education appreciates with multiple usages.

Education comes in both public and private forms. *Public goods* are non rivalrous and are non-excludable, whereas *private goods* are excludable and diminish with usage. Education should not be categorized in this conventional manner, because "the principles of excludability and rivalry discounts or ignores the reasons for establishing education as a public good in the first place" (Halchin, 20). Though there are competing philosophies on whether education is a private or public good, most would acknowledge that both private and public education are neither *purely private* or *purely public goods,* as there are both public and private byproducts of education. For instance, the advantages that an educated individual has in the job market in terms of career alternatives and salary ranges are private results of education are excludable; they are benefits held solely by the individual. By contrast, the polity benefits from the education of this individual since he is capable in participating in the institutions of democracy (20). Thus, education, as a general category is a mixed good because the externalities of education have both private and public components.

In 1970 Albert Hirschman distinguished between conceptions of educations, categorizing views by whether they had public or private good attributes. He considered the locus of control, governance and accountability mechanisms, institutional values, regulatory scope, stakeholders, and associations to determine which preferences would lead to a society that provides education publicly. A society that would be unlikely to have the public provision of education would see education solely as a means to attaining personal goals, with accountability mechanisms and institutional values for education governed by market standards. On the other hand, public schools would exist in a society composed of individuals that preferred to view public education as a means to attaining shared social goals and benefits, with the structure and accountability of education governed by our democratic society. Perhaps the reason that we have an array of educational

alternatives lies with Hirschman's scheme of individual perceptions of education; the institutional arrangements that we exhibit may simply be a product of our preferences.

Not surprisingly, the validation for public education lies with the externalities derived from an educated populace. Arguably, the third party benefits of education such as literacy and basic math skills are necessary for our participatory self-government. Milton Friedman describes these externalities as *neighborhood effects:* "circumstances under which the actions of one individual…yields significant gains to other individuals for which it is not feasible to make them compensate him" (Friedman, 86). The public sector is compelled to intervene when there are significant third party benefits that come from supplying a particular good. The government seeks to prevent the case where society values the widespread positive externalities relatively less than the public sector; in this case the good in question would be undersupplied. Furthermore, the public sector wants to promote equality by preventing the negative distributional implications of private provision of education, which would inhibit the possibility of upward mobility

For this reason public education is supplied as a *fixed quantity subsidy,* which is when "the government makes a certain quantity of a good available at no cost or at a cost that is below the market price (Mabli, 3). When the government carries out a program of fixed quantity subsidies in education, the value of those subsidies are set by the school board. Once the value is established, the recipients of those subsidies have no control over the quantity supplied in the marketplace. In the case of public education, the market price is zero, and taxes have no bearing on the amount of education supplied or consumed on the state level.

Returning to private goods, when allocating resources in an educational marketplace, the consumer makes specific consumption and investment decisions by determining which combination of alternatives will provide the individual with the greatest utility given a certain budget constraint. For example, suppose that you are deciding between two alternatives, education (*e)* and all other

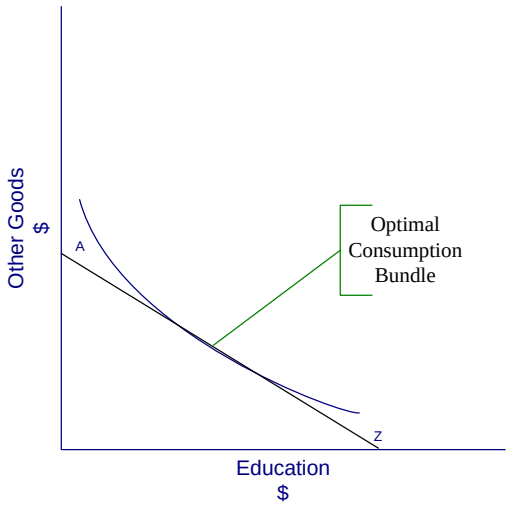
goods (*o)*. The budget constraint, defined by two prices and one income, represents all of the affordable bundles of education and other goods that are in your budget set:

$$p_e x_e + p_o x_o \leq m, \textit{ where m is equal to income}$$

The budget line is the set of bundles that cost exactly m. The slope of this line is the market exchange rate, or the rate with which the market is willing to substitute education for other goods ($-p_e/p_o$). This slope indicates the opportunity cost of consuming education, because in order to consume more education you have to give up more of other goods (Varian, 31).

We can apply preferences to all of the different consumption bundles within the budget set to generate an indifference curve. The indifference curve will show us all of the bundles of education and other goods in which "the consumer would be just as satisfied, according to her own preferences, consuming one particular bundle as she would be consuming another bundle" (Varian, 34). We will begin by limiting our consideration to the well-behaved, Cobb- Douglas indifference curves. Well-behaved indifference curves are characterized by monotonic preferences, and the fact that averages are preferred to extremes; as seen in Figure 1, this geometrically implies that the set of bundles preferred to the extremes is a convex set.

FIGURE 1



These preferences are explained by a function of utility. A utility function "is a way of assigning a number to every possible consumption bundle such that more preferred bundles get assigned larger numbers than less preferred bundles" (Varian, 64). The most simplified form of the Cobb-Douglas utility function for well-behaved indifference curves is $u(x_e,x_o)=x_e^{a}x_o^{1-a}$

Marginal utility of a good is defined quite simply "as the extent of desire for one more unit of it" (Johns, 16). The ultimate objective of a purchase is to increase utility; therefore marginal utility is necessary to determine consumption choice behavior. We can write the marginal utility of education ($MU_{e)}$ as a ratio:

$$MU_e = \Delta U/\Delta X_e = [u(x_e + \Delta x_e, x_o) - u(x_e, x_o)]/\Delta x_e$$

Similarly marginal utility for other goods would take on the same structure:

$$MU_o = \Delta U/\Delta X_o = [u(x_e, x_o + \Delta x_o) - u(x_e, x_o)]/\Delta x_o$$

The incremental satisfaction obtained from each unit of education purchased in a theoretical educational marketplace equals the additional utility received from choosing education over other goods, while holding other goods constant. The transfer of resources towards education will end when the transfer of one good to another no longer increases utility. At this point, a tangency condition exists between the indifference curve and the budget line, as seen in Figure 1. The slope of this optimal point is the marginal rate of substitution (MRS), the rate at which the consumer is willing to substitute education for other goods. The MRS can be written as MU_e/MU_o

Though this approach is useful for understanding resource allocation in the private educational marketplace, it certainly does not provide a useful backdrop for understanding the allocation of resources in the public economy. However, we can use this framework to uncover one surprising effect of fixed-quantity subsidies for public education. It turns out that theoretically speaking, fixed quantity subsidies in education can actually decrease the consumption of the subsidized good. This impact is generated by the very restrictive assumption that households

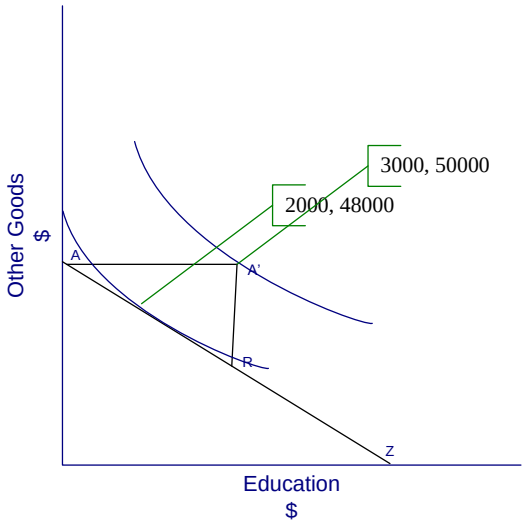
cannot consume any more education if they seek educational services from the public sector. In fact, households can increase their consumption of education through after school enrichment programs, and weekend classes, while obtaining public education. This model also disregards the fact that the value of education can vary between districts due to differing levels of quality. This enables parents to increase or decrease the value of education consumed by moving between districts. Likewise, the preference of home buyers for school districts with higher performance adds to the cost of public education. Therefore, it can be argued that the cost of public education can exceed the value of the fixed income subsidy.

It is useful nevertheless to see the outcome of fixed quantity subsidies within this restrictive model, as households in this case, consume less education as a result of public education being supplied at no cost by the government. For example, suppose a household with an income *(m)* of $50,000, must decide amongst two alternatives, education (*e)* and all other goods (*o).* Education is denominated in units of dollars spent on each pupil, while other goods are denominated in units of dollars. In addition, households can choose between public and private education, however for the purposes of this analysis, we will assume that both forms of education are of equal quality. This means that every dollar spent on public education is precisely equal to every dollar spent on private education, but because public education is paid for by the government, it has a market price of zero. The government allocates $3,000 per student to attend the public school system. The market price of private education is $p_e = 1$ (Mabli, 4).

If we let E= dollars spent on each pupil, and G=dollars spent on other goods, we can write the budget constraint as E + G= 50,000 (recall that $50,000 is the level of income in this example). This budget constraint assumes no public school system. We will not concern ourselves with the calculation of utility to find the optimal point, simply assume well-behaved, Cobb-Douglas indifference curves. In Figure 2, households will now increase consumption of education to point A', where they will reach a higher level of utility. So for instance, if a household chose

(E,G)=(2000, 48000) before the subsidy, the household would increase its consumption of education to $3000 with the subsidy, while being able to maintain its current level of spending on other goods. Thus (E,G)= (3000, 50,000). Note that the budget line has changed has a result of the subsidy from AZ to AA'RZ (Mabli, 5).

FIGURE 2

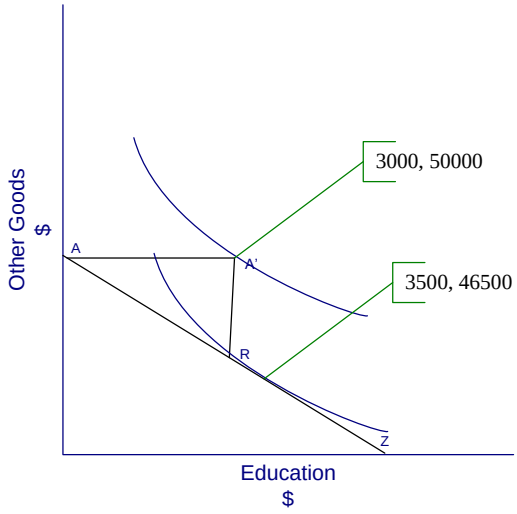


There is a question as to how households that were previously consuming education at a level greater than $3,000 will react to the fixed-income subsidy. Depending on the shape of the indifference curves, some households will remain on their original indifference curves, consuming a level of education greater than what the fixed-quantity subsidy offers. Nevertheless, it is expected that many households will achieve higher levels of utility by decreasing their consumption of private education to zero and moving to point A', since the marginal cost if consuming education is quite high (refer to Figure 3).

To illustrate this, suppose that a household wanted to consume $3,500 worth of education and $46,500 worth of other goods. This household, given the constraints of the model, would have no choice but to consume education in the private sector, as they could not demand $500 more education from the public sector. But in order to consume that extra $500, the household would have to give up $3,500 worth of other goods. Clearly, reducing consumption of education in this

case would be a rational outcome. Therefore, the high marginal costs imposed by the fixed-quantity subsidy, as seen in Figure 3, can cause household consumption of education to decrease (Mabli, 5).

FIGURE 3



This analysis embodies the many positive characteristics of school choice on a theoretical level, yet the restrictions of the model limit its large-scale application. Furthermore, this analysis does not reveal how the government determines the equilibrium level of educational expenditures. As previously highlighted, goods produced in the public economy are provided by way of taxes, yet debate over levels of taxation masks the utility of the public good in question (Peterson, 217). In fact, there is a tremendous range in school district expenditures per student as a result of variance in community level revenues. Wealthier communities have a larger tax base to work with on the district level, and therefore can increase their level of educational expenditures. Consequently, utility functions are difficult, if not impossible, to derive for public goods.

Take New Jersey for example, in the 1980-81 school year, the district expenditures per student ranged from $2,025 to $5,347 (Stiglitz, 306). It is unlikely that the utility each household places on education mirrors the taxes paid for education, and moreover the per pupil tax dollars spent on education in a given district. In addition, initial tax outlays are not equal to the net dollars

spent on education, because state and local taxes can be deducted on federal income tax return. Depending on the marginal tax bracket a household falls in, a certain percentage of those tax dollars are returned. For example, if a household spends $1,000 on taxes channeled towards public education, and that household falls into the 50 percent marginal tax bracket, then $500 is returned to the household and the net cost spent on public education is $500 ($1,000-$500). Antithetically, tuition dollars spent on private education mirror household utility precisely.

In this paper, I will not consider how state governments determine the equilibrium expenditure for public school financing. I will only evaluate changes public expenditure in education in response to school choice measures.

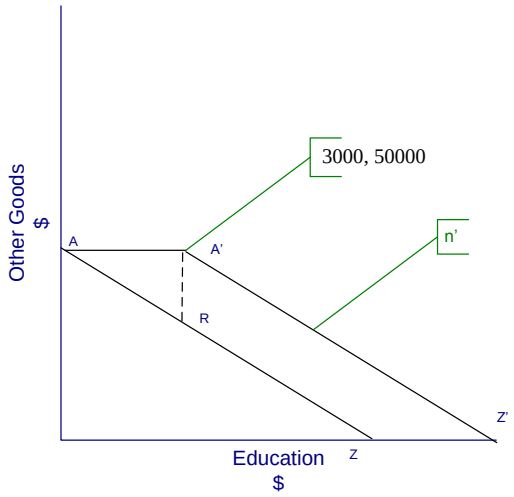
THE ECONOMIC IMPACT OF VOUCHERS

When a system of private vouchers is introduced, a demand side mechanism is injected into the marketplace for education. Typically, this voucher is in the form of a "payment from some public source for each child enrolled under the program" (McMeekin, 86). The voucher, ceteris paribus, decreases the cost of private school attendance, which induces a segment of the market to demand private as opposed to public schooling. Microeconomic theory reveals that school vouchers can increase public consumption in education.

To illustrate this, suppose once again that a household is selecting a consumption bundle made up of two goods, education and all other goods. In this case, the government does not apply a fixed-quantity subsidy for public education. Instead, the household is given a $3,000 voucher that can be used for the consumption of either public or private education. We will presuppose, for the purposes of this example, that this voucher program permits the use of household add-ons, and that the voucher cannot be exchanged for cash. In addition, the same restriction still holds that when educational services are obtained from the public sector, the highest value of education that can be purchased is equal to the amount that the public sector is offering.

Proceeding with the model, if the household chooses to apply the voucher to public education, there is no theoretical change; the outcome is equivalent to when the government provides a fixed-quantity subsidy for education. If however, the voucher is used at a private school the government, through a third party, pays for a portion of private school tuition. The budget line now becomes AA'Z, as shown in Figure 4. Unlike in the case of a fixed quantity subsidy, the household will be able to consume an addition $500 in education at a marginal cost of $500, which causes the household to consume more education than they did with the fixed quantity subsidy, such as at the point n'. Though the indifference curves are not shown in Figure 4 for simplicity, the household is able to reach a higher level of utility than it was under the subsidy program by increasing the level of education consumed to a desired level rather than the value of the fixed income subsidy (Mabli, 5).

FIGURE 4



This analysis, though limited to the demand side of the educational marketplace, reveals an overall increase in demand for education relative to a program of fixed-quantity subsidies. The example depicts the voucher program as a Pareto improvement, since the vouchers increase the utility for some households, without making any household worse off. The households that remain at A' are receiving the exact same level of utility as they did prior to the voucher program.

Nevertheless, up until now, we did not consider the supply side effects of a voucher program. In the long run the overall supply of education is likely to increase in response to the increased demand for education triggered by the voucher program. Direct competition between public schools and private schools may ensue from this supply side effect.

The size of the voucher depends on the type of voucher program. Typically, the size of the voucher payment will be less than or equal to the cost of public education per pupil (McMeekin, 86). Depending on the design of the voucher program, some schemes cover any additional cost in transportation incurred from traveling to the participating school. Voucher schemes can vary in cost of information for parents, which can be a main deterrent in household participation. In addition, some voucher programs permit add-ons to cover the private school tuition. This feature can significantly alter the impact of the voucher on public school performance. This issue will be considered when addressing the net economic impact of competitive stimuli from school choice.

When dealing with vouchers, it is imperative that we consider the time of implementation. As touched upon in the aforementioned supply-side analysis, in the short run, the impact of this demand-side mechanism is very much contingent on local supply. Local supply is equal to the spaces available in the participating private and parochial schools. In the long run, the supply of private and parochial schools will increase if the voucher program entices a large enough segment of the market to demand private schooling. Therefore, the long run supply will adjust through private school entry if there was previously an excess demand in the short run. It is in the long run that we will typically see a public school response to a targeted voucher program, as the entry of new private schools may cause "further reshuffling" due to increased participation in the voucher program (McEwan, 4). Public schools can potentially improve from a voucher program if they follow the market hypothesis response by increasing attendance through the success rate of the student body, the changes in programming and the enhancement of community.

In 2000, Levin set out four criteria for evaluating the impact of the voucher program, which summarizes much of the aforementioned effects (Levin, 12).

- Freedom of choice: the extent to which households can choose among participating private and parochial schools as an alternative to the neighborhood public school
- Productive Efficiency: According to Milton Friedman, introducing private school competition increases efficiency and effectiveness in the educational marketplace because private schools are "free from bureaucratic control" (McMeekin, 87). Voucher advocates Chubb and Moe also add that private institutions are able to operate more efficiently because they remain unaffected by "democratic institutions of political control. The voucher scheme should therefore be evaluated both in terms of the performance of the participating private schools, and the public school response to the threat of competition.
- Equity: The impact that voucher programs have on alleviating the social stratification that transpires when students are held back by under-performing public schools
- Social Cohesion: One of the objectives of public education is to instill a universal core value system that will lend itself well to participation in the various societal institutions that make up democracy's architecture. Therefore, one must consider whether public education is in fact furthering that end, to determine if voucher programs detract from the promotion of shared ideals.

Levin is careful to point out that there are tensions among these criteria that involve tradeoffs. For instance, a voucher program that offers extensive freedom of choice may detract from the objectives of social cohesion and equity. Thus, Levin's criteria cannot be executed at maximum due to contradictory elements. A sound balance between these criteria is precisely what makes for the most effective voucher program design (Levin, 20). Striking that balance can be accomplished through careful financing, regulation in terms of the admissions process, and support services like

transportation and information for parents (14). Nevertheless, we will proceed with a different model for evaluating the impact of school choice on public school performance, which will be detailed when evaluating the net economic impact of school choice.

THE ECONOMIC IMPACT OF CHARTER SCHOOLS

Similar to voucher programs, charter schools merge public financing with the private provision of education (McMeekin, 99). But in contrast to voucher programs, the public sector channels money directly to schools that have been granted charters to operate outside the boundaries of the public school system. Therefore, we would not expect any demand side budget line shifts as a result of a charter school program. Budget line shifts would only occur if there are additional household costs incurred by the charter school program that would cause a shifting from other goods to education. We would however, anticipate marked supply side effects. Though with voucher programs, these supply side effects are not felt in the short run, charter schools trigger immediate shifts in supply. This is not surprising given that this school measure introduces new providers into the educational marketplace upon implementation.

Though charter schools shift students away from the public school system, the relationship between the charter school and public school can take on a very different form than the direct competition that voucher programs can bring about: "Although charter schools constitute a form of competition, and tend to increase competition between schools and between the traditional and charter sub sectors, the atmosphere within most charter schools is not competitive but cooperative" (McMeekin, 99).

By contrast, Hess, Maranto and Millman, in their analysis of Arizona charter schools, identify a variety of public school responses to charter school programs: "districts respond to competition in various ways, including reforming curricula, changing leadership, vilifying charter

competitors, and attempting to absorb those competitors" (Hess, 1). They identify six public school response categories from charter school programs (Hess, 5).

The first is the size of the educational marketplace. In a growing market for education, the effect of the charter school on the public school system is small. Conversely, public school systems that tend to experience stable or declining growth will feel the effects of charter school entry into the educational marketplace. Secondly, the initial quality of the public school system may have an impact on the quality of a charter school entrant. For instance, an underperforming district is likely to be attracted to a charter school that is just marginally better than the traditional public school. The public school, in turn, responds to the quality of the charter school accordingly to maintain their position in the educational marketplace. Thirdly, the constituency of the district at hand is related to the likelihood of school choice competition emerging. Districts that are struggling to educate a highly diversified student body may be more likely to encounter the threats of competition from charter schools. Charter schools in these cases have an opportunity to establish themselves with a niche market. The fourth and fifth responses deal with public school changes to counter the threat of charter school competition: leadership changes and curricula changes to meet the demands of households. Lastly, public schools contending with competitive duress from charter schools may react with hostility to the charter school (Hess, 6)

EVALUATING THE MARKET HYPOTHESIS

When considering the implication of school choice mechanisms on public school performance measures, it is imperative that a cost-benefit analysis of the market hypothesis is conducted. Recall that the market hypothesis presumes that public schools will react to competition through improvement of the educational services rendered**.** There are three agents to be considered when evaluating the market hypothesis: the public school; the private school, and; the households (Chakrabarti, 5).

Applying the model that Chakrabarti used to evaluate the impact of voucher design on public school performance, the public school initially offers a given quality of education, which we will call *q*. One example of a quality measurement function is *q(e,b)* where *e* is equal to public school effort and *b* is public school peer-group quality. When modeling the objective function of the public school, net revenue *(revenue-cost)* is what the public school is seeking to optimize (Hoxby). Public school net revenue in the multiplicative form is simply the per pupil revenue *p*, multiplied by the number of students in the public school *N*, however we can represent revenue by the general function of enrollment as *p(N).* The cost function for the public school (C_P) can be represented as a composite of two variables: effort (*e)*, measured by the amount spent on each student, and the number of students (*N)*. Thus we can represent the general cost function as, C_P *(N, e).* The marginal net revenue per student is equal to revenue per pupil- cost per student, or p-C_N

The benefits of the assumed market hypothesis response come in the form of the per pupil revenue (*p)* that the school would no longer retain if it chose to ignore the competitive stimuli from the choice mechanisms. The benefits of responding to competition are greatest for those schools that will lose most revenue per pupil from competition. Therefore, these given schools are more likely to respond to competition by "reassuring and attracting new families." (Peterson, 216).

The market hypothesis response may include a number of initiatives that increase the value of *e*, including changes to the curriculum, increased efficacy in teaching methods and engagement with the parental community. Such augmentations are the costs of the market hypothesis response. Organizational disruption in the public schools in response to school choice can be one of the primary costs. For this reason, cost is a function of the organization and culture of the public school, and is minimized with increased cooperation between the administration and faculty because this brings down the value of *e*. Naturally, if the costs of enhancing the services offered by the public schools are greater than *p*N,* then the market hypothesis response would no longer be the rational

choice. Opponents of school choice argue that in most cases c> p*N, making the market hypothesis response highly unlikely.

When addressing the public school response to competitive stimuli in the educational marketplace, there are four contextual factors to be considered: actual versus potential competition; the extent of competition faced by the public school; the organizational culture, as it influences competitive response; other factors that change in response to competition. One challenge in evaluating the costs and benefits of the market hypothesis response lies with the question of effective education, used to determine changes in marginal utility as a result of school choice. In fact, there are a wide range of measures that are used to determine if the quality of public education has improved with competition, which range from changes in pedagogical inputs (materials, instructional methods, infrastructure) to changes in student performance, to changes of "community" and levels of parental involvement within the school (McMeekin, 2). Maranto et al. 1999 suggested that there are certain educational outcomes that are widely regarded as educational improvements including "increased administrative focus, more participatory decision making in the school, increased efforts to inform parents about school programs and increased attention to the teachers' professional development" (Maranto, 131). We will pay keen attention to these particular improvements in the upcoming empirical analysis.

EVALUATING THE NET ECONOMIC IMPACT OF SCHOOL CHOICE

If it is determined that the market hypothesis response is the rational choice, Patrick J. McEwan in his study of "The Potential Impact of Vouchers" suggests three separate questions to consider when determining the net economic impact of the school choice mechanism:

- Do the students that participate in school choice option obtain a better outcome than when they were attending their neighborhood public school?

- Does the school choice mechanism encourage student sorting? If so, how does sorting affect outcomes?
- What is the impact on public school as a result of the school choice mechanism?

Though the effect of the school choice participant on the private school and public school may be minimal, particularly in small scale voucher programs, it is necessary to consider if school choice participants are achieving better outcomes than they did at their neighborhood school. In cases where the school choice program requires an add-on payment, it would be expected that the quality of education, and the resulting outcomes would be higher for the participant relative to outcomes in the public school. However, this may not be attributable to higher quality charter or private schools: "One can imagine a transfer student making new expectations, and give greater attention and energy to studying" (McMeekin, 92). Furthermore, parents who have made a financial commitment to the school choice initiative often have a vested interest in the success of their child in the choice school. Thus, parents may be more likely to encourage and work with their children once engaged in the choice program. In addition, parents may engage themselves with the private school faculty to ensure that their children are in compliance with any school specific requirements.

A widespread assertion among school choice critics is that choice mechanisms can lead to segregation by income, race or religion (Mabli, 5). Consequently, consideration should be given to the potential peer effects of the participating private schools in the choice program, as this may be a factor in improved outcome results of the choice participant. This will also aid us in discussion of the resulting sorting effects of school choice on the public school system; if peer group effects are strong, then it would be expected that the quality of the public school would decrease if school choice reform tends to shift the top performing students away from the public schools. This phenomenon is more formally known as cream skimming, and is the main form of student sorting

referred to in the second question. Caroline Hoxby, in her research on the effect of school choice on public school students articulates the theoretical argumentation behind cream skimming succinctly: "if better students leave the regular public schools to attend choice schools, then the students who remain in regular schools will be worse off" (Hoxby, 1).

The contention exists that the supposed effects of cream skimming are positively correlated with the magnitude of the choice program (McEwan, 60). In other words, school choice programs that allow for a larger amount of student participants will have larger cream skimming effects on the public school counterparts. Cream skimming effects may also be reinforced by add-on alternatives in school choice reforms. Intuitively, many of the parents that take advantage of these reforms may be at the top of the targeted income bracket. If higher performing students tend to come from families with more discretionary income, then this feature could exacerbate any negative sorting effect. Naturally, stringent admissions requirements for choice participants could lead to adverse sorting effects as well.

One should consider if home backgrounds increase the return to education. As mentioned, the cream skimming argument maintains that students are more likely to come from households that place a high value on education. Notably, there is disputation over whether a supportive home background is a substitute or a complement for education. If a home background that reinforces education is a complementary factor, then it "reinforces the returns to education" (Stiglitz, 312). If a supportive home background is a substitute for education, "the more education that occurs at home, the smaller the return to formal education (312). In the case where a supportive home background is a substitute for education, it may not be most economically advantageous to select choice participants with strong frameworks for educational support at home.

As to be expected, the response of the public school is largely contingent on the type of school choice program enacted. Responses can fall into the following categories: financing, innovation, quality of teaching, and student performance. In the empirical evaluation that will

follow, to the extent that evidence allows, we will consider studies that evaluate responses in one or more of the aforementioned categories. We will also attempt to look at both district level changes, and school level changes, as district level changes may not signify the actual implementation of new reforms and improved quality of schooling: "the implementation of organizational reform takes years, and in troubled school systems, superintendents typically have four or fewer years in office. Accordingly, superintendents are likely to announce new reforms without ever having the time to implement them" (Maranto, 130). Nevertheless, district level changes will be considered in this study as a type of competitive response to school choice.

In terms of public school financing, there are noted changes in educational expenditure in response to school choice. Districts that are deeply reliant on state funding are more likely to be impacted by school choice mechanisms because the nature of state funding is such that it follows the students. In short, public schools lose money for each choice participant. However, state funding tends to be a lag variable; public schools may therefore not associate the changes in resource flows as a source of competitive stimuli from school choice. The market hypothesis response in this case, particularly in the early stages of school choice reform, would be unlikely. On the other hand, districts that are supported predominantly by local funds are less likely to feel the threats of an educational marketplace; local funding is not lost as students transfer to a participating choice school.

Milton Friedman advocated a scheme of universal vouchers, which would eradicate public sector involvement all together. This may be due to the theoretical outcome of targeted voucher programs that Friedman details: "those areas where parochial schools are important have great difficulty raising funds for public schools. Insofar as quality is related to expenditure, as to some extent it undoubtedly is, public schools tend to be of lower quality in such areas and hence parochial schools are relatively more attractive" (Friedman, 91). As public schools lose students to participating choice schools, it is argued that budget cuts and lost teaching positions will follow. A

common contention among school choice critics is that if public schools are unable to introduce improvements that attract households to the public school system, it will be unlikely that the community will be inclined to pay higher taxes to finance future public school improvement. Supporters of the educational marketplace however cite instances where participating students are educated more cheaply through the private or charter school. As a result, public schools may receive increased funding due to the monetary savings from the choice program.

There is question as to whether school choice leads to greater levels of innovation in traditional public schools. It is often presumed that the participating private institutions are highly receptive to change and innovation in education. However, "not all private voucher paid schools have become models of good institutional environments" (McMeekin, 94). Accordingly, we would not expect significant innovation in the public school because benchmarking activities will prove ineffectual. This is quite different from the response that Milton Friedman anticipates. Friedman suggests that public schools will react to the marketplace just as private sector firms respond to one another in the face of competition with innovation. However, the education sector has not proved itself quite as malleable as businesses have in the past. According to Robert McMeekin, author of Incentives to Improve Education, "education seems, however, to be highly resistant to innovation, regardless of the opportunities offered or the technologies available" (McMeekin, 89). He describes most innovation as minor tweaking to the traditional neighborhood school model of education.

In terms of quality of teaching, proponents of vouchers argue that successful teachers thrive in response to competition, as it highlights the educators that are employing effective teaching methods. As a result, the profession will attract better qualified educators to the public school system. Given the context of a competitive marketplace for education, the public schools will also be more likely to dismiss under performing educators in an effort to improve the quality of their institutions. This shuffling of educators can lead to an enriched pedagogical vision among

community of leaders in the public school. These leaders may be more inclined to rise to the challenge of competition by driving efforts to improve performance (McMeekin, 93).

Conversely, there are concerns amidst opponents of school choice that school choice will lead to narrowing of public school objectives. Instead of concerning itself with "high internal standards for learning," it is theorized that public schools will emphasize what is most likely to improve the rank in response to the competition. Often, this involves boosting test scores to evince competitiveness. For this reason, it is argued that public schools turn into "cramming academies" when an educational marketplace is introduced. In the instance that a school choice program leads to cream skimming effects, public school educators may become disheartened by the competition, finding any improvements in student performance unlikely. Thus, school choice can discourage teachers from improving teaching methods if they are losing their most valued students (McMeekin, 92).

Student performance, typically measured by test scores, is very closely linked to the resulting implication of school choice on student sorting in the public school (presuming the peer group effect), as well as effects on the quality of teaching. Similar to the theoretical argument for innovation, supporters of the educational marketplace argue that student performance will improve in the public school counterparts due to a competitive response, which would include improved teaching methods, and structural changes in the public school to increase efficiency. Critics argue that quality of education can be undermined by school choice reforms, and highlight that improved test scores may not necessarily signify higher levels of student performance. As previously mentioned, standardized testing can potentially override the overarching objectives of the pubic school. But even if we were to proceed by regarding test scores as synonymous with student achievement, we cannot necessarily conclude that improved student performance is a result of competition. For instance, when dealing with failing school vouchers, it is contended that the

stigma of being a "failing school" may lead to improvements in student performance that are unrelated to any choice reform (Ladd).

A final note on the use of this methodology to evaluate the school choice program is in order before proceeding to the empirical results of school choice initiatives. It is possible, and in fact likely that school choice programs will incite competitive stimuli that work in opposite directions (McEwan, 62). For example, it is theoretically possible that cream skimming effects transpire alongside public school improvements. Further theoretical discussion of this argumentation can be found in the research of Hsieh and Urquiola in 2002.

EMPIRICAL EVIDENCE ON SCHOOL CHOICE

In this section we will evaluate a series of large-scale school choice reforms in the United States, with particular focus on the factors that we have established to calculate the net economic impact of choice mechanisms. In order to truly capture the effects of competitive stimuli from choice reforms, we will consider the longer standing charter and voucher schemes, which have non-negligible competitive responses. More specifically, most of the voucher and charter school cases we will profile will attract at least 5 percent of the student population to choice schools, and will cause the public school to face fiscal repercussions. We will also consider one open enrollment program, as it was enacted alongside a charter school initiative. The objective of this narrowing of cases is to illustrate the competitive effects of school choice as closely as possible.

CHARTER SCHOOLS IN ARIZONA

The charter school system in Arizona is a particularly relevant foreground for analysis of competitive stimuli from choice mechanism, as it "closely replicates an educational free market" (Hess, 12). Over 21 percent of the charter schools in the United States are located in Arizona.

These schools have managed to attract more than 5 percent of all public school students in Arizona. Charter schools pose significant competitive challenges in Arizona because over 57% of the funding is channeled to Arizona public schools from the state. This implies that 57 percent of public school funding is linked to student enrollment (12).

In 2000, Hess et al. 2000 studied public elementary schools in four, small Arizona school districts, all located in fairly remote areas: Mormon Springs, Pyramid City, Cattle Crossing and County Seat. The data collected was used to determine how these districts responded to competitive stimuli from charter schools. The data set was narrowed to elementary schools because they tend to have fewer barriers to entry than secondary schools, causing increased visibility of competitive pressures from charter schools (Hess, 13). Three of the districts evaluated had an enrollment of less than 1500, and lost 20 percent or more of elementary school students to charters. The fourth district had a higher level of enrollment, estimated at 10,000 students and lost about 10 percent of elementary school students to the charter school (13).

The advantage of studying the impact of school choice on more isolated school districts is that the effects of competition are highly concentrated in a single district. Frequently, when a school choice mechanism is introduced in a high-density area, the impact of that choice mechanism is spread out amongst several districts. The rationale for choosing smaller districts rests with the funding limitations that face small districts, making it difficult to shield themselves from competitive stimuli. In addition, Hess et al. 2000 highlight that in smaller districts, charter schools have the propensity to open without notice, which makes the effects of competition more transparent (Hess, 12). Thus, the four districts that Hess et al. 2000 evaluated were prone to competitive duress from charter schools, causing enhanced responses from competitive stimuli.

When analyzing the net economic impact of the Arizona charter school case, the only instance noted where the outcome levels of the charter school, in terms of test scores, were below the outcome levels of the district was in Cattle Crossing. This may have been a result of the

unconventional background of the charter school founder and operator: Choice Charter was operated by "a man with a background in business, college teaching, and the home-schooling movement" (Hess, 24). Choice Charter decided to hire uncertified teachers in its infant stages, and within months, their market share dropped from 25 percent to 15 percent. The charter school in Cattle Crossing did however have a chance to recover from their initial mistakes, as a result of widespread community dissatisfaction with the public school system.

By contrast, there were explicit references to improved outcome measures in most of the other charter schools surveyed. Test scores were reportedly higher in the Pyramid City Montessori charter school, and the County Seat charter schools. In three out of four districts, households were typically pleased with the outcome of students in charter schools. The success of the charter schools, reflected in community-based attitudinal data, can be ascribed to the unique curriculum options offered, ranging from highlight standardized "Back to Basics Programs" to "Child Centered Schools" to performing arts schools, as well as several Montessori schools.

There were specific sorting patterns noted in some of the district's charter school counterparts. For instance, the "Back to Basics" program in Mormon Springs was attended by a fairly homogeneous population: "the school was substantially more Anglo and less Hispanic than local school districts" (Hess 16). The charter school in Cattle Crossing seemed to attract a largely white, low income student population, many of which classified as Title 1 students. Though there was no direct reference to peer group effects in the charter schools, there was a question as to whether the improved test scores in the Mormon Springs district could be imputed to demographic changes that the new development in the district was bringing about (16).

This leads us to the responses of the public school district to the competition imposed by the charter schools. As mentioned earlier, the nature of Arizona public school financing is such that significant financial losses are incurred by public schools that lose students to the charter school alternative. In some districts, particularly in Mormon Springs, a classic case of the market

hypothesis response to charter school entry was documented. There were reported improvements in student performance in the public schools, with 15 improvements and no declines in third grade test scores in language and mathematics from 1998-99, and 29 improvements and one decline from 1999-2000 (Hess, 17). Other public schools expressed efforts to improve performance in terms of student test scores, but no other test score improvements were documented. In Cattle Crossing, the test scores may illustrate an unresponsive attitude within the district, as they remained particularly low despite the entry of a charter school.

The greatest magnification of the market hypothesis response came in the form of district level innovation. For instance, as the charter school in Mormon Spring increased in popularity, the public school responded with leadership changes to pave the way for notable innovations. With a new superintendent and several new administrators on board, the Mormon Spring district implemented a single core program, largely modeled after the charter school curriculum, as well as a gifted program and a pre-school (Hess, 16). In Pyramid City the superintendent did not subscribe to the idea that competition prompted much of the district level innovation. However, community observers in Pyramid City reported many changes to the public school system not long after the Montessori School entered the educational marketplace. The district introduced a system of both multi-age and traditional classrooms, the option to have a teacher all day, and "add on programs" such as half day and full day Kindergarten options. In County Seat, the district was particularly vulnerable to competition as a result of shifting age demographics and a declining market for education (20).

County Seat, like Mormon Springs and Cattle Crossing experienced a change in district level leadership. The County Seat school district made concerted efforts to improve levels of parental outreach. This is consistent with the short run response to competition documented by Hess et al. 2001 in their analysis of changes in school outreach measures as a result of competition. In their study of a statewide sample of Arizona schools, they evaluated teachers' perception of

parental outreach measures in 98 schools from both high penetration (greater than 30 percent charter school entry) and low penetration districts. The districts in each category were roughly similar in terms of district enrollment, poverty, and racial composition (Hess, 10). They first evaluated outreach measures in the 1994-95 school year, prior to the introduction of charter schools. Teachers were asked to rate their respective school's effort in terms of outreach on a six-point scale. They compared their 1994-95 results with outreach measures documented in the 1997-98 school year, which may have occurred as a competitive response to charter school entry (Hess, 10).

To correlate these results with levels of competition, Hess et al. 1998 evaluated charter market share by district as well as the percentage of operational subsidies received from the state. These were considered in conjunction with an interactive term, market share multiplied by the subsidies, which considers the synergistic impact of these two variables. Competitive threats are most prominent in districts with a high charter market share and high levels of subsidies. Notably, parental outreach measures were heightened in those districts where competitive threats were the greatest.

Returning to County Seat district level responses, there was heightened innovation at the elementary schools in the form of more curriculum options. The district broadened the alternatives available to households through the development of a magnet school. In addition, County Seat was the only case in which a district made efforts to incorporate the charter school into the district umbrella (30). The market hypothesis response was not as prevalent in the Cattle Crossing school district. Though there were efforts by the superintendent to introduce a "Back to Basics" math curriculum, there was little effort to compete with the charter school, and there existed tremendous animosity between the charter and public school system.

Hess et al. 2000 note that in Cattle Crossing, there was "little attention was paid to its implementation and in other respects the district made no visible attempts to compete with Choice Charter's academic program" (Hess, 28). There are a number of reasons why the public schools in

Cattle Crossing may not have responded in accordance with the market hypothesis. As mentioned earlier, the scores of the charter school counterpart were even worse than those at the public school. In addition, the public school may have found the sorting effects of the charter school favorable, as it attracted a large percentage of Title I students away from the public schools. Nevertheless, the loss of students to charter schools has been politically destabilizing for the public schools in Cattle Crossing. The gradual growth present in the community however may assuage some of the immediate concerns about charter-based competition.

Maranto et al. 1999 documented in their "Reported Reactions of District Schools" that many districts were similar to Cattle Crossing in that they displayed no response at all to charter school entry. This may have been due to the enrollment levels in Arizona school districts, which grew by 6.3 percent from the 1994-95 school year to the 1996-97 school year (Maranto, 132). They note that "many districts were happy to have charters absorb overflow students, especially troubled or at risk students" (132). Thus, the market hypothesis may not hold depending on the quality of the charter school, the types of students targeted by the charter school, and the growth rate of students in the community.

The impact of competitive stimuli from charter schools is summarized as follows: "we find that districts do not react uniformly to competition. Rather, district responses depend upon district size and resources, whether the market is growing or declining, and on the quality of charter operators" (Hess, 14). The Cattle Crossing case in particular reveals the importance of such factors. In the other three public school districts, there was some evidence of the market hypothesis response, especially in the area of innovation by administrators. Maranto et al. 1999 found similar results when measuring ten leadership dimensions for both the 1994-95 and the 1997-98 school year. In particular, the Arizona high competition group exhibited a willingness among administrators to encourage teacher experimentation, and a tendency to introduce add-on programs like all day Kindergarten and extended day care (Maranto, 138). In spite of the fact that it is

difficult to isolate the institutional changes and test score improvements as a direct effect of the charter school programs, the Arizona charter school cases suggest that when competition is accompanied with low growth and high quality charter schools, increases in competition do encourage "slight to moderate behavioral changes" in public schools (139).

CHARTER SCHOOLS IN CALIFORNIA

California was the second state in the US to enact charter school legislation. Like Arizona, California's charter school movement grew into a very expansive choice initiative, acting as a visible alternative to California's public school system. During the 1997-98 school year, California's charter school movement enrolled 50,000 participants-the highest number of participants in any state. In fact, California's charter school reforms have enrolled more than one third of the nation's charter school participants (Wells, 1).

Though California's charter schools are well distributed across the state, 61 percent of charters are located in small towns and suburban neighborhoods (Wells, 2). Notably, there are two ways to form a charter school in California; charter schools can either be converted from existing public schools with the support of at least 50 percent of permanent status teachers, or startup charter schools can be created with a petition signed by one half of the households that will make up the student population of the charter school or by one half of the teachers who will work at the charter schools (2). Some restrictions include the fact that charter schools must be non-sectarian, and cannot be converted from private schools. Nevertheless, the legislation in California facilitated the proliferation of charter schools in California, as it allows for appeals to the county and state courts if the charter is not granted at the local level. For this reason, California is second to Arizona in the number of charter schools in the country (1).

In an attempt to measure the impact of charter reform on public school outcome measures, a UCLA Charter School Study was launched under the leadership of Amy Stuart Wells. The aim of

the study "was to examine some of the assumptions or stated claims about what charter school reform was supposed to accomplish and to see how they were playing out in the experiences of people in these diverse communities" (Wells, 3). The main assumptions espoused by charter school proponents which were evaluated include whether or not charter schools had improved levels of performance-based accountability (3), greater educator autonomy to do "what they think is best for students," higher levels of efficiency due to fewer bureaucratic demands, greater access to education among disadvantaged groups through parental choice (4), improved responsiveness to parental consumers due to charter school competition, and charter school inspired innovation at public schools (5).

Wells' methodology involved handpicking a sample of 17 charter schools from 10 districts, 5 of which were located in urban areas, 3 districts in predominantly rural areas, and 2 in mostly suburban neighborhoods. When selecting these districts, the objective was to identify areas that differed from each other in size, ethnic composition, region and socioeconomic background in order to capture a wide range of response outcomes as they relate to different communities. Data was collected from a myriad of sources; these ranged from 462 interviews with district administrators, charter school founders, teachers, parents, governance council members, among others, to charter school classroom and meeting observations, to documents from both the public schools and their charter school counterparts.

It is hypothesized that charter schools are guided by the pressures of performance-based accountability, due to the fact that charters are temporary and can be taken away if the schools do not meet their stated educational standards. There is supposedly a trade off between autonomy and accountability in charter schools; because charter schools are freed from many of the state regulations faced by public schools, they must adhere precisely to their stated performance standards. This is a threat that does not apply to public schools, which in theory are controlled by a "rules and regulations based" accountability measures. In theory, public schools will have less

accountability for student outcomes, and in turn, lower performance levels. However, when measuring the quality of the charter schools in California, the data available controverts the frequently cited high levels of performance-based accountability in charter schools.

These results may be in part due to the limited accountability measures in place to monitor charter schools. Intuitively, if it is difficult to measure the relative success or failure of a given charter school, the pressures of performance-based accountability for that charter school is constrained. Because the California Learning Assessment System was repealed in 1994, California was left with no statewide exam, making it difficult to generalize the performance outcomes across charter schools (Wells, 5). Though a temporary evaluation tool, the SAT-9, was put into place in the 1997-98 school year, there have been few systematic measures of student performance. In fact, 14 percent of charter schools chose not to employ standardized testing to evaluate students when the tests were available (5), and 17% of charter schools chose not to assign grades to students (20). Even so, standardized accountability measures are not sufficient to truly capture the results of charter schools. In actuality, more extensive base line data are needed to adequately measure the performance of charter school students.

With this in mind, accountability pressures for charter schools are likely much smaller than they seem at first glance according to Wells (5). In addition, charter school accountability is rarely restricted to student performance. Rather, charter school accountability varies in accordance with district level weaknesses, ranging from "the desire for specific curricular focus" to "the desire for more flexibility in the use of public funds" (5). For this reason, it is impractical to hold schools accountable solely for academic performance measures.

In practice, charter schools in California do not face stringent performance requirements, as academic achievement is often unchecked by school boards due to the ambiguity of the requirements (20). Though charter laws in California require the charter school to state student performance objectives, these objectives are written vaguely. For example, one such stated

outcome of the 10 charter schools measured was "enabling pupils to become self motivated competent, and life long learners" (20). In another charter, a startup school stated that they would measure student performance on the basis of "the relationship between the desired student outcome and the means used to assess it" (20). Though this particular charter school noted such measures as GPA, report cards, and attendance as the means to assess student performance, there was no explicit reference to performance objectives.

Thus, in many cases the school boards that are responsible for evaluating the performance outcomes of charter schools neglect their role in assessing charter school achievement because the accountability measures are poorly specified; district officials have shifted their focus towards fiscal measures of accountability (20). School boards commonly lack the necessary information and political authority to impose performance-based pressures on charter schools. In sum, Wells' findings reveal that it is unlikely that charter schools are driven by performance accountability measures, and as a result charter schools are not expected to exhibit the higher student performance outcomes that charter proponents speak of. The trade off between autonomy and accountability does not always occur in practice, with both accountability measures and levels of autonomy varying wildly across the 10 districts measured. Furthermore, given the array of mechanisms utilized to measure charter performance, it is nearly impossible to generate a conclusion on whether charter school participants gain a better outcome than when they attend the neighborhood public school.

In terms of sorting effects, Wells highlighted very distinctive sorting patterns among California's charter schools. Racial sorting patterns included the overrepresentation of Caucasians in charter schools, with a population of 48 charter schools versus 40 percent in California's public school system (Wells, 2). RPR International uncovered that 17 percent of public schools in California had racial compositions that were 80 to 100 percent white, as opposed to 37 percent of all charter schools. While Caucasians tend to be overrepresented in charter schools, Latino students

tend to be underrepresented. The population of charter school students is 34 percent Latino. In contrast, Latinos make up 40 percent of the California public school student population (2). There were only trivial differences in student composition with regard to African American and Asian student populations.

There are also income-based sorting patterns associated with California's charter school initiative. Wells cites within-district comparisons, which reveal that the majority of charter schools (74%) educate fewer students that qualify for the subsidized lunch program than the traditional public schools do (Wells, 3). In terms of the academic background of charter school participants, there are a smaller proportion of limited English-proficient (LEP) students than in public schools, with within-district comparisons indicating that the gap between the percentage of LEP students in public schools versus the percentage in charter schools reaches nearly 8 percent (3). With regards to special education students, it appears at first that there is only a slight difference in the percentage of special education students educated in the charter school system versus the California public school system. However, when charter schools are disaggregated to assess only start up charter schools, it is revealed that charter schools educate a much smaller percentage of special education students than the public schools of California.

Sorting effects may also be linked to the requirement that the parents of all charter school participants sign a contract and volunteer a certain number of hours at the charter school (Wells, 7). Such requirements may trigger cream skimming effects if the logic holds that higher performing students are likely to come from the families that are more involved and concerned with the quality of education, and thus more likely to commit the time to the charter school. Wells alludes to this cream skimming effect when she notes the impact of these requirements on the public school population: "the students left behind in the regular public schools were perceived to be more likely to be those with the least-involved and least-outspoken parents or those who exhibited more troublesome behavior" (9)

This leads us to measuring the responses of the public schools to the charter school legislation in the 10 districts evaluated. Wells did not identify a strong market hypothesis response, which was likely a result of the extent of overcrowding in the California public school districts evaluated. Most of the 10 districts were experiencing strong student enrollment rates, which minimized competitive threats from charter schools. The main concern for public schools in California was not the loss of students, as Wells noted, but rather, the loss of certain types of students that were choosing the charter schools instead of the neighborhood public school.

These concerns caused competition incited by the charter school to have hurt rather than encouraged improvement in California's public school system. As previously mentioned, the requirement of signed contracts and volunteer work for parents of charter school participants frequently attracted top performing students and involved parents from the neighborhood school. For this reason, many public school educators and administrators perceive charter schools as a source of "unfair competition" which they refuse to respond to with widespread district and school level improvements (Wells, 7). Thus, there was little evidence, especially at the school level, that public schools responded to charter school competition.

A specific area of improvement that Wells devotes particular attention to was the spread of innovation from charter school to public school. She highlights the tensions that exist between innovation and competitive improvements, by suggesting that charter school inspired innovation requires a certain level of cooperation between the charter and public school. When interviewed about "positive school level impact across charter and public schools," teachers in both the charter and public schools said that there was very little communication between public and charter counterparts, and virtually no positive impact as a result of the charter legislation (Wells, 8). Wells states, "for the most part, the relationships between the charter schools and the regular public schools in their districts were either non existent, benign or poor" (8). Therefore, even if the charter

school implemented innovative educational techniques, this had no impact on the public school counterpart.

One of the few benefits that charter schools can have on public schools in Wells' research lies with the monetary impact of the charter reform. In 2 of the districts evaluated, the charter schools were able to benefit from the funding brought in by the charter school. Essentially, when charter schools bring in large numbers of students, particularly from outside of their district, they receive funding from outside districts. On occasions, up to 15 percent of that funding was allocated to the local district. Though this effect of charter schools will be restricted by new amendments to charter school legislation, there are instances where local districts can actually experience monetary gains from charter schools in the form of overhead (Wells, 8).

Notably, there is some evidence from Wells' study of the California charter school case that highlights the fact that on the district level, local districts may adapt their operations in response to charter schools. However, for the most part, the market hypothesis response is not present in her findings. This is perhaps due to a combination of public school growth rates, and the perception of an unfair educational marketplace that led to an overall rejection of the competitive spirit. Though Wells' findings indicate that charter schools had little impact on the school level, she notes that "a longitudinal study of some years' duration would be needed to truly assess such an impact" (7).

CHARTER SCHOOLS AND OPEN ENROLLEMENT IN MICHIGAN

In 1994 Michigan was the fourth state in the nation to enact charter school legislation, a reform initiative that grew to include nearly 50,000 students attending 170 charter schools by the year 2000 (Ladner, 11). Any group of individuals in Michigan is permitted to establish a charter school providing it receives approval from an authorizing agency such as a local school district or state university. Schools receive state aid for each charter student they attract to their school on the basis of the state-aid formula, as well as the per-student spending of the district in which the charter

school locates. Michigan's legislation allows for a 10-year life span of charters, with mandatory evaluations at least every seven years (12).

In addition to charter school choice mechanisms, Michigan implemented "schools-of-choice" legislation, an open enrollment program within the local school district. This program enables students to move freely between schools within the neighborhood district, as well as to choose among government schools in nearby districts (12). Placement in the "school-of-choice" program is on the basis of the number of open spaces in the participating districts. The objective of both pieces of legislation is to infuse competition into the public school systems by introducing a dimension of accountability in education. Education would ultimately move away from the assignment system, the classic system of enrolling students in the public schools that is in the closest proximity to their home, and evolve into a system of choice where schools must be accountable to their consumers, namely the parents and the students.

Matthew Ladner and Mathew Brouillete addressed the role of these school choice mechanisms in bringing about improvement in the traditional public school system. Ladner et al. 2000 voice a traditional charter school accountability argument: "because charter school funding depends on the ability of these schools to attract and retain pupils, charter schools that fail to provide what parents want ultimately will go out of business to make way for schools that do" (Ladner, 11). Public schools in turn will have to match these standards to maintain enrollment levels. In addition, the "schools of choice" program encourages public schools to cater to households, as they can select an institution among a plethora of participating government schools.

To evaluate the accuracy of these claims, Ladner et al. 2000 limited their analysis to Wayne County, Michigan. This intermediate school district was selected due to the diversity of school choice offerings in the state (Ladner, 13). In fact, the Wayne Regional Educational Service Agency (hereafter referred to as Wayne RESA) is the largest intermediate school district in Michigan, encompassing 34 urban and suburban school districts, containing 670 schools in 1999 (20). These

public school districts vary in size and quality, which facilitates the analysis of school choice under a wide range of conditions. Moreover, the presence of school choice is strong in Wayne Country, with more than 50 charter schools, referred to as public school academies, enrolling over 14,000 students in the 1998-99 school year (20). In addition, 10 school districts engaged in the "school of choice" program in the 1998-99 school year, with over 2,000 student participants (14).

Ladner et al. 2000 gathered empirical data from Wayne RESA and available data from state funded research projects. In additional to the empirical data that they made use of to analyze outcome measures, Ladner et al. 2000 collected anecdotal data through interviews with district superintendents and charter school administrators to reveal any "attitudinal shift" generated by competition infused through school choice (Ladner, 14).

There is excess demand for charter schools in Wayne County, with many of the charter schools making use of waiting lists to manage the enrollment pressures. Similarly, demand exceeds supply for the "school of choice" program. The districts set out how many students they will enroll for each grade level prior to the 1998-99 school year, and when there are more applicants than spaces, an "impartial lottery" is used to allocate spots among students seeking transfers. In theory, since both charter schools and traditional public schools through the school of choice program are accountable to parents and students for achievement, the assumption could be made that students were obtaining better outcomes through these choice mechanisms.

However, there was little evidence presented in Ladner et al. 2000 that explicitly revealed whether charter schools were generally achieving more successful outcomes than their public school counterparts. To the contrary, Luigi Battagleri, president of the Michigan Education Association concluded that charter schools did not perform above traditional public schools. In his analysis of achievement tests, there were cases that Battagleri noted where charter schools had done worse than the traditional public school counterparts. In 1999 Battagleri stated, "there haven't been

any pedagogical innovations, there has simply been replication of the good programs…that have been working in public schools" (Ladner, 20).

By contrast, Mr. Nick Khouri, of Public Sector Consultants generalized from his findings in the 1999 report of southeastern Michigan charter schools that "on average, charter schools seem to have a greater rate of progress on the Michigan Educational Assessment Program exams than comparable traditional schools" (Moyer, 26). Yet these findings may not be indicative of superior charter school outcomes; Khouri acknowledges that it may be"too early to tell with the methodology available" (26).

Ladner et al. 2000 did not address any sorting effects setting from either the charter school reforms or the "school of choice" programs. Reference to sorting effects with regards to the "school of choice" program was made in a Michigan State University report in October of 1999 by David Arsen, David Plank and Gary Skyes. Arsen et al. 1999 noted that affluent districts tended to disapprove of the "school of choice" program because of the "social sorting" impacts that would bring students with less favorable economic backgrounds into affluent districts.

In terms of public school responses to charter school competition, evidence has been presented which points to the fact that public schools identify charter schools as a threat to their survival. It is important to be mindful of the point that presumed competitive threats may not accurately account for whether or not charter schools are demonstrating superiority over the public schools (Ladner, 11). Nevertheless, early illustrations of the market hypothesis response were presented in a report by Jerry Horn and Gary Miron of The Evaluation Center at Western Michigan University, in January of 1999. Horn et al. 1999 evaluated 51 charter schools across most areas of Michigan between October of 1997 and December of 1998. They concluded that traditional public schools often implement add on programs such as all day kindergarten, before school and after school programs to better contend with competition from charter schools. In addition, traditional schools focused on safety issues by expanding supervision of playgrounds. There was also a

documented increase in communication efforts among district officials to better meet the needs of households (19).

Consistent with the findings of Horn et al. 1999, a report drawn up by Kohuri at Public Sector Consultants in February of 1999 showed evidence of charter schools inciting traditional public schools to develop more innovative programming, to improve their relations with parents and students, and in some instances, self select into the "schools of choice" program (19).

Caroline M. Hoxby, in her research on "How School Choice Affects the Achievement of Public School Students" looked closely at changes in test scores that may have resulted from competitive stimuli from Michigan's charter reforms. In order to conduct this analysis, Hoxby juxtaposed the exams scores of schools in Michigan that faced charter school competition versus those that did not over the same time period in order to isolate the impact from charter school reform, and control for the impact of the school finance reform that was taking place concurrently at that time. (Hoxby, 10). Hoxby then used this data to calculate "difference by difference" statistics on various Michigan test scores. This statistic is particularly useful as it measures score improvements in the schools that faced charter competition "not only relative to the school's own initial performance (the first difference), but also relative to the gains made over the same period by Michigan schools that did not face charter competition" (12).

Using this approach to measure improvements, Hoxby found marked improvements in fourth grade reading and math scores, with scale points 1.21 and 1.11 higher respectively. In addition, seventh grade reading and math scores went up by 1.37 and .96 respectively. These results led Hoxby to the conclusion that charter based competition caused public schools to improve relative to both their initial performance measures, as well as the Michigan public schools that were not impacted by charter school competition.

The research that Ladner et al. 1999 conducted on Wayne RESA brought to the forefront a variety of possible responses to both charter school and open enrollment programs: "some districts

have met the challenge with improved services, other have had to absorb the 'opportunity costs' of failing to attract additional students" (Ladner, 21) Though the market hypothesis response was widespread in Wayne County, there were public districts that perceived the educational marketplace as unfair, and many charter schools that found government funding to be insufficient for successful operation. Nevertheless, many districts responded to the charter school challenge with a combination of proactive and reactive changes that directly benefited public school districts.

For example, Ladner et al. 2000 highlighted the Dearborn case, a large urban district, with 35 percent of the student population qualifying for the federal free or reduced lunch program, and a large number of limited-English speaking students (Ladner, 22). There was a general sense of dissatisfaction with the Dearborn district prior to the infusion of charter school competition. This backdrop encouraged the entry of a four charter schools, and additional charter schools operating in nearby districts to accommodate excess demand. In addition, the district faced competition from the "schools of choice" program, which permitted students to choose schools from a nearby district.

Dearborn district officials did not espouse the frequent perceptions of the "unfair" educational marketplace detracting funding from their schools. Rather, the superintendent embraced the competitive challenge: "the reforms we've enacted would not have happened, at least not as fast, without competition" (Ladner, 23). Dearborn responded proactively to the threats of charter and open enrollment based competition. They created a "Theme Schools and Academies Program" as a way to revitalize their curriculum and directly rival the charter school alternative by providing parents with what they were looking for in the charter schools. Their improvements precisely targeted the complaints that households had on the limited curriculum at Dearborn. Consequently, their enrollment actually increased from 14,229 in the 1994-95 school year before the choice initiatives were in place to 16,263 in the 1998-99 school year, after competition had been injected into the Dearborn district (23).

The market hypothesis response was not quite as apparent in the case of Flat Rock Community Schools. Unlike Dearborn, Flat Rock was a very small district, containing just fewer than 2,000 students. A common concern when injecting competitive stimuli into a small district like Flat Rock rests with the fiscal impact of choice mechanisms. It is more difficult for smaller districts to withstand the costs associated with students leaving the neighborhood public system for nearby public schools or charter schools. Despite the successful operation of Summit Academy, a charter school nearly one-third the size of the public school system, the financial impact on Flat Rock has been described as "negligible" (Ladner, 25). The reason for this has to do with the high growth rates at Flat Rock, and the number of students that the district can accommodate without incurring the expense of expansion. Some evidence even suggests that the Summit Academy actually saved the taxpayers of Flat Rock the expense of building a new school to accommodate the influx of students. Thus the overall fiscal impact of school choice on the Flat Rock community has been positive.

This positive fiscal impact is certainly not a widespread response to Michigan's school choice reforms. To the contrary, the 1999 Public Sector Consultants report documented evidence of public schools on the brink of financial disaster as a result of the charter school. In fact, their research indicates that when districts lose more than 5 percent of their students to charter schools, public schools incur a financial loss.

Public school responses to the "Schools of Choice" program were more limited because of the constraints that public schools can place on this choice initiative. For instance, districts have the autonomy to decide whether or not they want to participate in the choice program, and place caps on the number of seats offered. In spite of this, Ladner et al. 2000 documented evidence of add-on programs such as transitional programs to develop employment skills, and more diverse curricular offerings to attract students from neighboring districts, highlighting such innovations in the Highland Park district (Ladner, 26). They also bring to the forefront the "reverse cream skimming"

effect that can occur as a result the "Schools of Choice" program. This equalizing of educational alternatives was a previously mentioned sorting effect that more affluent communities tended to perceive as a negative outcome.

Ladner et al. 2000 did highlight a case where a public school district continued on a downward trend with the inception of school choice, and found itself in the midst of financial crisis. However, the underperformance of this district was not linked to competitive stimuli from school choice, but rather due to a consistent pattern of poor student achievement outcomes. Similarly, it is difficult to conclude that the upward trends cited are a direct result of competition. Yet the attitudinal data uncovered by Ladner et al. 2000 illustrates that competition, especially from charter schools, can inspire tremendous innovation and improved communication on the district level.

VOUCHER THREATS IN FLORIDA

Florida instituted the A-plus accountability system in 1999. Under this system, students from grades 3-10 are required to take the Florida Comprehensive Assessment Test (hereafter referred to as FCAT). This accountability test has particularly high stakes for both public school students and the schools themselves. For example, students in the fourth grade must receive a passing mark on the FCAT reading section to move to the next grade. The test results are also used to apply a score to public schools on an A through F scale. For our purposes, we will look at the FCAT test as it relates to public schools. Depending on FCAT achievement outcomes, public schools may be subjected to the threat of competition through a scheme of taxpayer-financed vouchers; most vulnerable to the threat of vouchers are those schools that received a grade of F twice in a time frame of four years (Greene, 4). These vouchers are by definition failing school vouchers, since any student living in the attendance zone of a school identified as failing can receive a voucher. The average failing school voucher amount in Florida from the 1999-2000 school year to the 2001-02 school year has been $3330 (Chakrabarti, 3). These vouchers were in all cases

accepted as full tuition for private education. Students applying these vouchers were not subject to any admissions criteria, and were selected randomly when there was excess demand (3).

Notably, the threat of vouchers was just one repercussion among many policies used to improve these under-performing public schools. Other policies include "providing additional resources, implementing a school plan or reorganization, hiring a new principal or staff, and other unspecified remedies designed to improve performance" (Camili, 2).

Before proceeding with our analysis of Florida's A-Plus program, a caveat is necessary: unlike in the other cases analyzed, we are not simply considering the effect of a choice reform once it has been implemented, but rather the effects of the *prospect* of school choice on the public schools through a "threat of voucher" scheme. Thus, the extent of the competition from the A-plus accountability program is not as well defined as in the other cases being considered. It is uncertain if even the districts that qualify for the voucher schemes will face that policy response. Furthermore, the A-Plus program was enacted relatively recently in Florida, making it difficult to measure any of the long-term responses of public schools to competitive stimuli from the threat of vouchers. Most importantly, the effects of the voucher program are difficult to isolate, as stigma effects are occurring simultaneously for failing schools. Nevertheless, the program is unquestionably widespread, involving every public school in Florida to a varying degree. Furthermore, the potential competitive stimuli from failing school vouchers can be much greater than means-tested vouchers, as it qualifies all students enrolled in the school to a government sponsored voucher. Therefore, it is useful to consider this case, as it subjects all public schools to at least some level of competition in the form of voucher threats.

One of the challenges encountered upon evaluation of the A-Plus program in Florida is the lack of available data of achievement measures in private schools. There is no legal requirement in Florida for private schools that receive public funding in the form of vouchers to test students or release test results (PFAW, 1). As a result, we cannot sufficiently determine whether the private

schools that are receiving the taxpayer financed vouchers under the A-Plus program are performing at a higher level than the public schools that had received a grade of F on the FCAT in two out of four years. Additionally, there has been minimal research the sorting effects of the A-Plus program, as only 10 schools as of the 2002-03 schools have failed the FCAT exam twice, and only 2 of those 10 schools have been faced with the direct threat of vouchers (Camilli, 3). However, Rasjashri Chakrabarti noted in his study of the Florida A-Plus Program that were was no identifiable changes in the demographic makeup of F schools in comparison to D and C schools (Chakrabarti, 25).

The central focus of most research on the Florida A-Plus Accountability program is whether or not the threat of vouchers led to improved student outcomes in the public school system. Dr. Jay P. Greene of the Manhattan Institute for Policy Research conducted a study on the effects of vouchers on the public school system in Florida. Greene specified five different categories of low-performing schools on the basis of how likely the school was to encounter a voucher scheme. "Voucher Eligible Schools" face the most competition from the A-Plus program as students in those schools already have access to government-sponsored vouchers. Second on the list are "Voucher Threatened Schools," where one more F on the FCAT exam will qualify these schools for the prospect of vouchers. Next are "Formerly Threatened Schools", which used to be in the category of "Voucher Threatened Schools." Finally, there are two categories of low performing schools, "Always D" and "Ever D" where there are few to no impending threats of voucher schemes (Greene, 2).

Greene hypothesized that Voucher Eligible Schools, which have the highest levels of voucher infused competitions, will experience the greatest achievement gains relative to the other low performing schools in Florida (3). Florida public schools in this category will be motivated by the state funding losses that are tied directly to the student enrollment. Greene measured achievement gains that occurred between the 2001-02 and the 2002-03 school years using school

level (aggregated across grade) FCAT and Stanford-9 scores. The Stanford-9 is a low-stakes standardized exam, used to control for problematic data that may arise with high stakes testing (3). For instance, it is argued that educators teach for the exams when presented with the pressures associated with high stake testing. Greene concluded that given the .96 correlation level between the FCAT and Stanford-9 test at the school level, "whatever gains are made on the FCAT are the results of gains in real learning, not a school's ability to 'beat' a particular test" (3).

Greene's assertion is disputed by Camilli in Bulkley of Rutgers University in "An Evaluation of the Florida-A Plus Accountability and School Choice Program." They highlight the point that aggregate scores, such as the aggregate school level scores that Greene considers when correlating the FCAT and the Stanford-9, tend to have much higher values than those calculated on the basis of individual scores. To controvert Greene's conclusion, they reference the .96 correlation coefficient calculated using aggregate school level averages on the 8th grade FCAT reading section and the FCAT mathematics section. They explain, "this correlation should not be interpreted as meaning that FCAT reading and mathematics test are statistically indistinguishable, but rather, that correlations on aggregate scores tend to be much higher than those for individual scores" (Camilli, 4).

While mindful of the fact that improvements in the school level FCAT scores may not reflect actual gains in learning, we can proceed by considering changes in FCAT outcomes in each of the five categories specified. Greene's research confirmed his initial hypothesis that schools with the greatest levels of infused vouchers-based competition experience the most significant gains in FCAT scores. Aggregate school level scores for Voucher Eligible Schools were 9.3 scale score points higher in FCAT math section and 10.1 scale score points higher in FCAT reading sections than the improvements in public schools between the 2001-02 and 2002-03 school years (Greene, 6). Consistent with Greene's hypothesis, Voucher Threatened Schools exhibited the second highest gains; relative to unthreatened public schools between the 2001-02 and 2002-03 school years,

Voucher Threatened Schools were 6.7 scale score points higher in the FCAT math section, and 8.2 scale score points higher in the reading exam. The gains in "D always" and "D ever" public schools were indistinguishable from that of regular public schools, which Greene anticipated given the reduced threat of voucher schemes in those districts (3). In his 2001 study of the A-Plus Program, Greene's statistic on the effect size of vouchers, which was calculated relative to standard deviation in school level FCAT scores, was recorded at unprecedented levels, ranging from .8-2.23 (Camilli, 7). Notably, past research has found that large educational effect size statistics fall in the range of .4 to .7 (7).

Based upon his results, Greene concludes: "the most obvious explanation for these findings is that an accountability system with vouchers as the sanction for repeated failure really motivates schools to improve" (Greene, 9). This is consistent with the analysis of Chakrabarti, who along with asserting the negligible sorting effects of the A-Plus program, found that "the threatened public schools will unambiguously improve under the Florida-type program" (Chakrabarti, 1). However, there has been much debate over conclusions on the impact of strong voucher prospects on outcome measures of public schools. A study conducted by Dr. Helen F. Ladd and Dr. Elizabeth J. Glennie argued that the improvements exhibited by Voucher Eligible and Voucher Threatened Schools were more likely a consequence of Florida's accountability system rather than the threat of voucher-based competition (Ladd, 1).

To establish this claim, Ladd and Glennie conducted a study in North Carolina, which has an accountability system akin to that of Florida, yet it does not include the threat of vouchers in failing schools. They found that the lowest performing schools in North Carolina, as measured by their state's accountability system, improved significantly in the year after their failing marks. Thus, it may not be fair to conclude that the improvements that Greene documented in Florida's failing public schools were purely a product of voucher threats, or the result of vouchers at all. Rather, Ladd and Glennie maintain that the stigma attached to a failing school is enough to prompt

significant improvements in North Carolina. Analogously they argue, "the increased scrutiny and shame associated with being a low-performing school and the receipt of additional state assistance were likely the driving forces for school improvement in Florida, not its voucher program" (Ladd, 1).

There have also been critiques associated with the methodology of Greene's study. As previously mentioned, Camilli and Bulkley referred to the problem with correlating aggregated FCAT scores. They disaggregate the data from Greene's 2001 evaluation of the Florida A-Plus program to show that the impact of this policy varies significantly across grade levels. Additionally, they highlighted a sampling problem with Greene's study. More specifically, Greene chose to use "standard curriculum" school level data when calculating relative improvements in FCAT exams. In short, "standard" has a bias towards students who typically score higher on the FCAT, since it eliminates certain curriculum groups, such as those with disabilities (Camilli, 7). As a result, the selection criterion used can overstate the success of the school on the FCAT exam. Camilli and Bulkley found such narrowing of the data set especially surprising given the comprehensive reporting of all Florida state, district, and school level test scores for all curriculum groups (8).

Additionally, Camilli and Bulkley felt that Greene did not give sufficient treatment to the regression to the mean phenomenon, that causes scores at the tail ends of the distribution to move towards the mean (Camilli, 9). Regression to the mean may offset the impact of voucher threats, as failing schools would have a natural tendency to drift towards the mean, or in other words improve. Ladd and Glennie emphasize this phenomenon in their evaluation of North Carolina failing public schools. Yet Greene discredits the regression to the mean phenomenon in his research on voucher threats in Florida in 2001: "Regression to the mean is not a likely phenomenon for the exceptional improvement made by the F schools because the scores for those schools were nowhere near the bottom of the scale for possible results" (Greene, 7).

Although it is true that the average F school scores in 1999 were well above the lowest possible scores on the FCAT exams, and thus not extreme relative to the scale of the test, the scores should not be evaluated in the context of the FCAT grading scale. Rather, regression to the mean, according to Camilli and Bulkley, should be calculated by considering the outcomes relative to the group mean as opposed to the lowest possible score on the FCAT (Camilli, 9).

In sum, the Florida A-Plus Accountability program does reveal tangible FCAT outcome improvements in Florida's under performing public schools. However, the empirical debate over this case, particularly over the methodology and accountability effects, brings to the forefront the difficulties of linking FCAT improvements directly to the threat of voucher-based competition.

MEANS-TESTED VOUCHERS IN MILWAUKEE

The first publicly financed voucher program in the United States was set in Milwaukee, Wisconsin. Means-tested vouchers were approved in Milwaukee as early as 1990, and came into practice in the 1990-91 school year (Hoxby, 5). This "voucher shock" was a sudden policy reform targeted at households with incomes at or below 175 percent of the federal poverty level; this translates into households earning $17,463 for a family of four (5). Upon the voucher program's inception, about 67,000 students qualified for means-tested vouchers. However, the participation rate was especially low, limited to only 1 percent of students enrolled in Milwaukee's public school system. In spite of the fact that the limit of students able to access publicly funded vouchers was raised to 1.5 percent in 1993, the competitive impact of the voucher program on Milwaukee's public schools was negligible. This all changed in 1998, when legislation was passed that expanded the reach of Milwaukee's voucher program to 15 percent of enrollment. (6).

The Milwaukee voucher program, distributed a voucher amount of $5,106 per student as of the 1999-2000 school year, unless the cost of the private school was less than the value of the voucher (Hoxby, 5). There were no add-ons permitted under the voucher scheme. Moreover. there

were no admissions criteria associated with the use of vouchers; all eligible students were able to apply their vouchers provided space was available. When there was excess demand for voucher use, private schools were required to select students randomly (Chakrabarti, 3). Enrollment losses due to vouchers were of particular concern to public schools, and accordingly a competitive threat, since they lost state aid equal to half the amount of the voucher per student (5). Given that the per pupil spending in Milwaukee public schools in the 1999-2000 school year was $8,752, a district would lose 29 percent of the per pupil revenue of voucher participants (6).

As with other means-tested voucher schemes, the Milwaukee voucher program exerted varying competitive effects on the public schools. Intuitively, public schools with a larger proportion of poorer students are much more threatened by the voucher program because the potential enrollment losses are higher with more students in the public school qualifying for publicly funded vouchers. While some Milwaukee schools had less than a quarter of their students eligible for vouchers, other schools had as high as 96 percent of the student population voucher eligible (Hoxby, 6). In addition, the competitive stimuli faced by elementary schools exceed the infused competitive threats faced by Milwaukee's secondary schools. This is because private elementary education costs much less than private high school, causing lower add-on costs to households engaged in the voucher scheme. Evidence of this competitive bias towards elementary schools can be found in the patterns of voucher usage in the 1999-2000 school year; greater than 90 percent of voucher participants were in grades one through seven (6).

Given the design and the distribution of competitive effects, Dr Caroline Hoxby set out the type of evaluation that she felt was best suited to study the competitive effects of vouchers on Milwaukee's public schools in her study entitled "How School Choice Affects the Achievement of Public School Students." First, she focused on outcome measures in grades 1-7, as these are the grades where competition from vouchers is most present. She then looked at achievement in the 1996-97 program, before the competitive effects of vouchers had set in, and compared those results

to the performance outcomes in the 1999-2000 school year, after the voucher program had expanded enough to present non-negligible competition to the public schools. Hoxby then divided schools into two categories: those that "faced more competition," or in other words, had 2/3 of the student population voucher eligible, and those that "faced less competition, " where less than 2/3 of the students in the schools were voucher eligible (Hoxby, 7). Hoxby did not consider the outcome of voucher participants attending the private schools.

Hoxby hypothesized that schools that faced a greater degree of competition would be more susceptible to competitive effects than schools that faced less. Hoxby also made use of a control group for her study, which was composed of a group of relatively urban Wisconsin schools that replicated the demographics of Milwaukee public schools as closely as possible. Hoxby does concede that the control group is less disadvantaged than students attending Milwaukee's public schools, which may lead to higher levels of both achievement and achievement growth (7). Yet there is no evidence in Hoxby's analysis which supports the assumption that more advantage students will have higher outcome levels. Nevertheless, the effect of this bias, if it does exist, may cause any competitive effects uncovered from the voucher scheme to be understated. Hoxby explains, "if vouchers had no effect at all, the control schools would be expected to improve relative to Milwaukee schools, simply because more advantaged schools tend to improve relative to less advantaged ones. Thus, the evidence I present is likely to slightly *understate* any improvements that took place in Milwaukee's schools" (7).

In order to analyze any achievement effects as a result of the voucher scheme, Hoxby selected 32 Milwaukee schools that "faced more competition" and 66 Milwaukee schools that faced less competition, as well as a control group of 12 schools outside of Milwaukee, which faced no threat at all from the voucher scheme. To put these schools into context, in the schools that faced the most competition, an average of 81.3 percent of students in the schools were eligible for free or reduced price lunches (and accordingly eligible for vouchers). In addition, these schools tended to

have large minority populations with 65.4 percent African American and 2.9 percent Hispanic. By contrast, schools that faced less competition had a student population composed of 44.5 percent of students eligible for vouchers, 49.1 percent African American, and 13.7 percent Hispanic. In the control group, 30.4 percent of students were eligible for free or reduced price lunch, and in turn the vouchers if they had resided in the city of Milwaukee (8).

This demographic data indicates that one potential sorting effect of vouchers is a greater participation rate amongst minority students. But in Hoxby's research "School choice and school competition: Evidence from the United States" she states that "not only do currently enacted voucher and charter school programs not cream-skim; they disproportionately attract students who were performing badly in their regular public schools. This confirms what theory predicts: there are no general results on sorting consequences of school choice" (Hoxby, 1).

Based upon Hoxby's general finding, one might suggest the possibility of reverse cream skimming effects associated with the Milwaukee voucher program, which could potentially put an upward bias on achievement gains. Hoxby renders any reverse cream skimming effects trivial, amounting to no more than a one to two point increase in fourth grade state-wide test scores. She concludes this by showing that despite the fact that applicants to the voucher program scored lower in language, math and science than the average Milwaukee student, their scores were indistinguishable from other voucher eligible students that chose not to apply for vouchers. Thus, particularly in schools where 2/3 of students were eligible for vouchers, "remaining students were most like the departing students," leading to minimal levels of reverse cream skimming (Hoxby, 26).

Rajashri Chakrabarti also considered whether a voucher program that restricts the use of household of add-ons, and requires private schools to select students randomly, results in any cream skimming or reverse cream skimming effects. Using the Milwaukee Parental Choice Program public release data files, Chakrabarti asserts that although random selection, coupled with a policy

that vouchers as full payment, can prevent sorting by income, ability level sorting still remains (Chakrabarti, 3). This ability level sorting occurs in Milwaukee due to "the demand side factor of parental self selection" (3).

To understand the impact of parental self-selection, we must acknowledge that although restriction of add-ons inhibit tuition costs, there are nevertheless costs incurred by the household's use of vouchers, such as time costs and relocation costs. Thus, only households that place a high premium on education will find it economical to absorb the additional costs of voucher participation (Chakrabarti, 3). We characterize these households as having "high household ability." Chakrabarti makes the claim that successful students disproportionately come from households with "high household ability," and it is therefore household ability that can lead to ability based sorting

More specifically Chakrabarti measures household ability by looking at: "the mother's education, the number of times the parent contacted the school in the prior year over various issues, the number of times per week the parent participates in different activities with the child, whether the parents participated in parent teacher organization and activities in the prior year, educational expectations of the parents and prior test scores of the child" (Charabarti, 12). This result controverts the theory of reverse cream skimming linked to the Milwaukee Parental Choice Program. Additionally, Chakrabarti's findings conflict with Hoxby's evidence, which reflects no relevant sorting effects associated with Milwaukee's Parental Choice Program.

Proceeding to the evaluation of the achievement gains of these schools, Hoxby looked at the state-wide fourth grade examination, which tests mathematics, science, social studies, language and reading. The results are calculated in terms of national percentile rank points (NPR) (Hoxby, 8). Hoxby compared the NPR points between the 1996-97 school year and the 1999-2000 school year for each category of schools. She found that schools that faced the most competition experienced the greatest outcome gains in each of the subject areas tested on the fourth grade state-wide exam. It should be noted however that it is difficult to isolate gains in reading, as an innovate, whole-

language method reading curriculum was implemented in Wisconsin over that time period. According to Hoxby, this curriculum change may understate the gains in reading, as it is charged which negative rates of achievement in schools not threatened by voucher-based competition (Hoxby, 9).

In spite of these concerns, we can move forward by simply recalling that precisely the same patterns were identified in all subject areas. Take mathematics for instance: in the 1999-2000 school year, schools with 2/3 of their student population voucher eligible achieved an annual gain of 6.3 NPR points relative to the 1996-97 school year. In schools where less than 2/3 of the population was voucher eligible, the annual NPR point gain was measured at 4.8. In the control group facing no competition, the annual gain was 3.5 NPR points. Hoxby notes that generally, improvements by more than 4 NPR points are very unusual, thus the threat of vouchers likely increased achievement dramatically according to Hoxby. Hoxby adds that the achievement effects associated with vouchers that she uncovered are understated as a result of the aforementioned biases in the control group (Hoxby, 9).

Hoxby's findings were challenged from Helen Ladd in a comment on Hoxby's work. Ladd cites the difficulty in isolating the achievement gains in public schools to the voucher programs in Milwaukee, because there were a number of other policies in place simultaneously that were targeting disadvantaged students. She states, "it is inappropriate to attribute all the achievement gains to schools that have large proportions of students from low income families, and hence eligible for vouchers, to the effects of the voucher program alone" (Ladd, 7).

In sum, the achievement scores demonstrated on Wisconsin's state-wide 4th grade exam reflect the higher rates of improvement among schools most threatened by competition relative to those that had less than 2/3 the population eligible for vouchers. Though it cannot be concluded that competition alone fosters these achievement gains, it may be viewed as one factor contributing to the improved outcomes.

CONCLUSION

In this thesis, school choice was considered in the context of how public schools respond to competition. When looking at the impact of competitive stimuli from school choice reform, it is apparent that there exists tremendous disagreement over the expected outcomes of school choice on the provision of public education. This is to a certain extent due to the wide range of empirical outcomes that are linked to school choice reform. In addition, theoretical models of infused competition often oversimplify a variety of issues. The assumptions on barriers to entry, information costs, and the restrictive cap on public education limit the applicability of theoretical models.

It is worthwhile to look more closely at the incongruity on public school outcomes as a starting point for addressing the effects of choice initiatives. We will provide a comprehensive overview of the empirical analysis profiled in this thesis by breaking it down into the three effects used to calculate the net economic impact of school choice. Recall that to evaluate the net economic impact of school choice we look at three distinct phenomena:

- Do the students that participate in school choice option obtain a better outcome than when they were attending their neighborhood public school?
- Does the school choice mechanism encourage student sorting? If so, how does sorting affect outcomes?
- What is the response to the public school as a result of the school choice mechanism?

Whenever possible, each of the three effects were considered in the analysis of the voucher and charter schemes profiled. However, the success of choice schools was only evaluated in terms of its potential to impact the public schools. The empirical research that was evaluated in this thesis focused on the outcome measures for the non-participants in the public schools. While other

research assessed the choice school responses here we considered how the success of the charter and voucher schools impacted the competitive response of the public school.

STUDENT SORTING

Student sorting effects typically fall into three categories: racial, income, and ability level sorting (cream skimming). It has been suggested that sorting effects may be contingent on the design of the charter or voucher scheme. Consider for instance how charter schools can target a subset of a district's population both through their raison d'etre and their curriculum offerings, or how voucher programs can target students based on household income and admissions criteria. Thus, the construction of voucher and charter schemes could potentially have marked impacts on sorting patterns.

Instances of racial sorting were highlighted in the Arizona, California, and Milwaukee. The "Back to Basics" curriculum offered in Mormon Springs, Arizona over-represented the white population and underrepresented the Hispanic population in the district, though it is uncertain that the curriculum offerings were what caused this racial sorting. Wells and RPR International found that racial sorting was consistent across charter designs. They cited an overrepresentation of Caucasians across all charter schools in California, and disproportionately fewer Latinos represented among charter school participants. In the voucher schemes considered, we uncovered very different racial sorting patterns. The means-tested voucher design in Milwaukee, led to a bias towards minority participation. Though there was no evidence documented on specific racial sorting patterns in the failing school vouchers in Florida, research conducted by Chakrabarti did not find any demographic changes in the schools most threatened by vouchers, relative to other public schools. This however might be due to the limited size of the voucher scheme.

Income-based sorting patterns were also suggested as a consequence of charter and voucher schemes. In California, Wells finds evidence that the majority of charter schools educate fewer

students that qualify for the subsidized lunch program than the traditional public schools do. However, there were documented instances where charter schools educate a disproportionate amount of underprivileged students, as was the case in Cattle Crossing, Arizona. Attitudinal data from affluent districts in Michigan also pointed towards a greater propensity for lower income students to participate in the school choice initiative. Based upon the empirical data presented, voucher schemes considered in this analysis did not result in income based sorting (Chakrabarti, 1). This result is imputed to the stipulation that participating private schools must accept the vouchers as full tuition payment. However, this finding may have been different if we had considered voucher schemes that permit household add-ons.

It is suggested that when top students leave the public schools as a result of choice reform, they may be causing negative peer group effects for the students that remain behind in the public school system; this phenomenon is often referred to as cream skimming, and stems from ability level sorting. Chakrabarti evaluated whether ability level sorting was a byproduct of the Milwaukee and Florida voucher schemes. He concluded that ability level sorting was occurring in both Milwaukee and Florida as a result of the parental self-selection process, making the claim that high performing students are more likely to come from "high ability households." Wells came to a similar conclusion in her analysis of California charter schools. Wells linked ability level sorting to the requirement of the parents of all charter school participants to sign contracts and allocate a certain number of hours towards volunteer time at the charter school (Wells, 7). Hoxby explored the possibility of reverse cream skimming, which would have the opposite effect of cream skimming on public schools. She concluded that sorting biases in this direction are negligible. Notably, this is a very different conclusion that Chakrabarti came to when evaluating sorting effects in Milwaukee.

While it may be that the add-on restrictions of the voucher schemes prevented income based sorting, there is little evidence to support that a given type of voucher scheme or charter school

leads to racial or ability based sorting. Any sorting patters uncovered may be due to community and household level preferences rather than a product of policy construction.

PUBLIC SCHOOL RESPONSES TO SCHOOL CHOICE

Most public schools underwent a number of changes following the inception of voucher programs and charter schemes. These changes fall into the following five categories: governance, parental outreach, curricular and extra curricular innovation, financial outcomes and achievement outcomes. Before presenting more specific data to illuminate such responses, we must be mindful of the challenges associated with isolating these responses as a product of school choice reform. It may be that these responses were entirely unrelated to the choice mechanism in place. In many of the cases that were evaluated, there were other policies designed to impact failing schools and disadvantaged students. In addition, there is a powerful stigma effect that is often associated with failing schools that may obviate the role of competitive stimuli from school choice. Thus, we must look at these four outcome categories as only a potential byproduct of competitive stimuli from school choice mechanisms.

Hess et al. 2000 presented evidence on the role of competitive stimuli from charter schools on governance changes on the public school counterparts. It appears that in the face of charter school competition, leadership changes ensue to pave the way for innovation. The tendency for these leadership changes may be exacerbated by the propensity of charter schools to spring up in areas where the community is frustrated with the unresponsiveness of district and school level leadership. Thus, tensions may have already existed between the community and the districts that were being surveyed. Nevertheless, these leadership changes usually started at the level of the superintendent, and then trickled down to the reassignment of various school level administrators.

Maranto et al. 1999 documented that one of the short run effects of school choice is increased parental outreach. Parental outreach is often linked to the other changes in the public

districts, as schools tailor their responses to the needs of the community. There were several curriculum changes noted in both the Michigan and the Arizona charter school cases. These curriculum changes ranged from the implementation of a single core program to gifted programs, to the use of both multi aged and traditional classrooms. In many cases, these programs closely resembled the curriculum offerings of the charter school counterparts. In one case, a district introduced a magnet school into the district umbrella to offer greater variety in the curriculum for households to choose from. In addition to curriculum development, there were many add-on programs introduced as well in both Michigan in Arizona. These included both half day and full day Kindergarten, and increased after school offerings. Safety measures were also heightened in Michigan, where they increased supervision in the playgrounds during recess, not long after the inception of charters and open enrollment. Importantly, there are varying views among district level leaders on whether it was the choice reform that incited these responses. While some district officials espouse the virtues of the competitive educational marketplace, others reject the notion that it was competition from charters or vouchers that provoked such innovation.

It should be noted that just as there were many schools that implemented both curricular and extra curricular changes not long after school choice mechanisms were in place, there were several cases noted where schools exhibited no response to choice reforms. This occurred in Cattle Crossing, Arizona, where the competitive stimuli were weakened by the poor performance of the charter school. Thus, public schools will have less of an incentive to compete with charter schools that struggle to retain students.

However, there are other reasons for unresponsiveness among public schools. Wells highlights the natural tensions that arise with the simultaneous of objective of innovation and competitive improvements. She notes that innovation requires a certain level of cooperation between charter and public schools. There were several instances in which the relationship between the public school and the charter school counterparts were nonexistent, or even worse, contentious.

In these cases, collaboration between the public and choice counterpart on curriculum design are unlikely. Wells cites that in California, there was very little positive school level impact between the charter and public schools due to reportedly small amounts of communication between the two schools. Many public schools, such as those referenced in the Michigan charter school case, argue that the choice schools have an unfair advantage in the educational marketplace, and as a result, they choose to ignore the presence of the charter school.

A hotly debated topic in the realm of school choice lies with the monetary effects of such reforms. Typically we see that increased choice school enrollment leads to a fiscal penalty for public schools that significantly outweighs any financial benefits of funding from outside districts. Districts that are deeply reliant on state funding are more likely to be impacted by school choice mechanisms because the nature of state funding is such that it follows the students. Ladner et al. 2000 highlighted a case where a public school district continued on a downward trend with the inception of school choice, and found itself in the midst of financial crisis.

There are however exceptions to this traditional financial response. Wells cited instances where charter schools led to monetary benefits for the public school counterpart by bringing in funding from outside districts. A percentage of that increased funding gets allocated to the local district where the charter school resides. Thus, a successful charter school that can lure in students from outside districts can actually bring about monetary gains for the traditional public schools. Another example of this effect occurred in Michigan where the taxpayers in an overcrowded public school district did not have to contend with the costs of expansion due to the entry of a nearby charter school.

In terms of improvements in student achievements, significant rates of change occurred in the public schools in Mormon Springs, Arizona, with 15 improvements and no declines in third grade test scores in language and mathematics from 1998-99, and 29 improvements and one decline from 1999-2000. Yet in several of the charter schools evaluated in Arizona, there were negligible

improvements in achievement outcomes. In her analysis of the Michigan charter school case, Hoxby found marked improvements in fourth grade reading and math scores.

In addition, both Hoxby and Greene looked exclusively at the achievement outcomes in public schools in response to competitive stimuli from school choice. Hoxby concluded that schools that educated a majority of voucher eligible students demonstrated the highest rates of improvements on Wisconsin's state wide 4th grade exam. Greene analyzed school level improvements and concluded that schools with an impending threat of vouchers exhibit the most significant gains on FCAT scores. Yet both of these conclusions are not without dispute; many attribute stigma effects in Florida, and other policies for disadvantaged students in Milwaukee to the improved achievement outcomes. In addition, improved test results don't necessarily reflect improved educational quality. It is theorized that schools in an effort to improve their rankings will turn into "cramming academies" where they are simply teaching to the standardized tests.

Many of the aforementioned changes transpired on the district level. But district level changes may not signify the actual implementation of new reforms and improved quality of schooling. As cited in the Arizona charter school case, superintendents, particularly in troubled schools, are usually not in office long enough to follow through an organizational reform; reforms; many organizational reforms end up being announcements rather than actual changes.

In addition to delays in public school reforms, there is a lag time associated with many of the competitive stimuli from school choice reform, such as the loss of public school funding. Because of these market delays, public school responses to infused charter or voucher based competition may only be seen in the long run. Responses tend to be less prominent in growing districts, where both charter schools and district schools can coexist. As mentioned earlier, public school districts may welcome the entry of charter schools and voucher programs to alleviate the pressures of overcrowded schools.

RECOMMENDATIONS

This thesis reveals the difficulty in isolating vouchers or charter schools as a source of public school improvement. One should be critical of evidence reflecting achievement gains as a response to competitive stimuli, as there may be stigma effects, or other educational policies at work. Similarly, it is challenging to link any downward trends in public schools to the entry of choice mechanisms. These difficulties are in part due to the widespread contention over the methodology used to uncover achievement gains and innovation in public schools.

One area for improvement in the methodology used lies with the measurements of achievement gains in public schools. There is an obvious problem with evaluating high stakes exams to quantify public school achievement gains: increased scores may not reflect real gains in student performance. Though in the analysis of voucher threats in Florida, efforts were made to correlate high stakes test scores with low stakes exams, the methodology used remains far from the sophistication and accuracy needed to truly link improvements in high stakes exams with measures of real achievement.

Perhaps one reason for the wide variation in responses to competitive stimuli from school choice lies with biases in the questions being evaluated. In 2003, Robert Maranto proposed that while choice proponents are likely to look at why choice schools are *more* accountable and innovative when addressing their impact on public schools, school choice opponents are more likely to consider whether choice schools are *perfectly* accountable, or if they "embarrass or inconvenience the district school" (Maranto, 2). In order to generate some conclusive results on school choice, fair and balanced tests of school choice initiatives are imperative.

Further inquiry is unarguably needed to better understand the impact of school choice on public school performance. Presently, it seems that attitudinal data sheds the most light on how public schools respond to competitive stimuli from school choice. Such data reveals that

community and district level characteristics, such as growth rates and choice school quality, strongly influence the nature of competitive responses within public schools.

WORKS CITED

Camilli, Gregory. Katrina Buckley. "Critique of 'An Evaluation of the Florida A-Plus Accountability and School Choice Program'" *Rutgers University Educational Policy Analysis*> Vol. 9., No. 7, (Mar., 2001)

Canter, Andrea. "What's the Best Public School for My Child? Solving the Dilemma of School Selection," *National Association of School Psychologists*> (2005)
Stable URL: http://www.teachersandfamilies.com/open/parent/pschoice2.cfm

Chakrabarti, Rajashri. "Do Vouchers Lead to Sorting even under Random Private School Selection? Evidence from Milwaukee Voucher Program"
Stable URL: http://www.ncspe.org/publications_files/OP100.pdf

Chakrabarti, Rajashri. "Impact of Voucher Design on Public School Performance: Evidence from Florida and Milwaukee Voucher Programs," October, 2003.
Stable URL: http://repec.org/esNASM04/up.2034.1075271881.pdf

Clemens, Elisabeth S., Melissa Fry, Brayden King. "Making a Market in Education? Arizona's Charter Schools as an Experiment in Institutional Change"
Stable URL: http://www.business.uiuc.edu/sonali/Clemens.pdf

Friedman, Milton. "About School Choice"
The Milton and Rose D. Friedman Foundation> (Apr., 2005)
Stable URL: http://www.friedmanfoundation.org/schoolchoice/index.html

Friedman, Milton. Capitalism and Freedom,
Chicago: University of Chicago Press, 1963.

Gehring, John. "Voucher Battles Head to State Capitals"
Education Weekly >. (July,2002) pp. 24.

Greene, Jay P, Marcus A. Winters, "When Public Schools Compete: The Effects of Vouchers on Florida Public School Achievement," *Education Working Paper*> No. 2 (Aug., 2003)
Stable URL: http://www.manhattan-institute.org/ewp_02.pdf

Hess, F., R. Maranto, S. Milliman.
"Coping with Competition: The impact of charter schooling on the public school outreach in Arizona," *Public Studies Journal*> Vol. 29, No. 3 (2001) pp. 388-404.

Hess F, R Maranto & S. Milliman. "Maybe They Can Teach, But Can They Sell? The Impact of Competition on School Outreach" 2001.

Hess, F., R. Maranto, S. Milliman."Small Districts in Big Trouble: How Four Arizona School Districts Coped With Charter Competition," Teachers College Record. (Dec., 2001)

Hoxby, Caroline M., "How School Choice Affects the Achievement of Public School

Students" (2001).
Stable URL: http://post.economics.harvard.edu/faculty/hoxby/papers/choice_sep01.pdf

Hoxby, Caroline M. "School choice and school competition: Evidence from the United States" *Swedish Economic Policy Review*> Vol. 10 (2003).
Stable URL: http://post.economics.harvard.edu/faculty/hoxby/papers/hoxby_2.pdf

Jackson v. Benson, 213 Wis. 2d 1, Ct. App. 1997.
Stable URL: http://lw.bna.com/lw/19980616/970270b.htm

Johns, Roe. Edgar L. Morphet, Kern Alexander.
The Economics and Financing of Education. Englewood Cliffs: Prentice-Hall, Inc., 1983.

Kafer, Krista. "School Choice in 2003: An Old Concept Gains New Life"
The Heritage Foundation Policy Research and Analysis> (2003)

Khouri, Nick. "Public Sector Consultants," Michigan State Board of Education Meeting
Sec. Moyer, Feb., 1999
Stable URL: http://www.michigan.gov/documents/minutes299_16416_7.pdf

Ladd, Helen F., Elizabeth Glennie. "Claims for School Voucher Success in Florida not Justified" *Education Reform*> Vol. 1, No. 1 (2001).
http://www.pubpol.duke.edu/centers/child/briefs/Florida%20Vouchers.pdf

Ladner, Matthew and Matthew J. Brouillette.
"The impact of limited school choice on public school districts," Midland, MI: Mackinac Center for Public Policy, 2000.

Levin, Henry M. "The Public-Private Nexus in Education"
American Behavioral Scientist> Vol. 43, No. 1 (1999), pp. 124-37
Stable URL: http://abs.sagepub.com/cgi/content/abstract/43/1/124

Mabli, James. "Public Schools and Voucher Proposals"
Applications of Consumer Choice Theory. 2003.

Maranto, Robert. "Scholarly Research on Charter Schools and Why it Matters"
NCSC Review> (July 2003).
Stable URL: http://www.nationalcharterschoolclearinghouse.net

McEwan, Patrick J. " The Potential Impact of Vouchers" *Peabody Journal of Education*>
Lawrence Erlbaum Associates Inc., Vol. 79, No. 3 (2004).
http://www.wellesley.edu/Economics/mcewan/Papers/voucherupdaterevised.pdf

McMeekin, Robert W. Incentives to improve education: a new perspective.
Northhampton: Edward Elgar, 2003.

Merrifield, John. "School Choice: Agent of Change"
University of Texas at San Antonio, Division of Economics and Finance. October, 2000.

Meyver v. State of Nebraska, 262 US. 390, US Supreme Court, 1923
http://ccat.sas.upenn.edu/~haroldfs/540/handouts/supcourt/mnebrask.html

Mill, John Stuart. *On Liberty*.
London: Longman, Roberts & Green, 1869
Stable URL: www.bartleby.com/130/.

Molnar, Alex. "School Choice"
***Educational Issues Series*> (Nov., 1996).**
Stable URL: http://www.weac.org/resource/nov96/vouchers.htm

Murphy, Joseph, Scott W. Gilmer, Richard Weise.
Pathways to Privatization in Education. London: Ablex Publishing Corporation, 1988.

Peterson, Paul E., David E. Campbell "Charters Vouchers and Public Education"
Washington: Brookings Institution Press, 2001.

Stiglitz, Joseph. Economics of the Public Sector.
New York: W.W. Norton Company, 1988.

Varian, Hall. Intermediate Microeconomics
New York: W.W. Norton Company, 1999.

Weil, Danny. School Vouchers and Privatization.
Santa Barbara: ABC-CLIO, Inc., 2002.

Wells, Amy Stuart. "Charter School Reform in California:
Phi Delta Kappan> Vol. 80, Issue 4 (Dec., 1998)

Wells, Amy Stuart. Time to Choose: America at the Crossroads of School Choice
Policy. New York: Hill and Wang, 1993.

Wells, Amy Stuart. "Beyond the Rhetoric of Charter School Reform: A Study of10
California School Districts," UCLA Charter School Study. 1999.

Zelman v. Simmons Harris et al. 536 U.S. 639 US Supreme Court, 2002.