

IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

IMPACT OF A CHARTER SCHOOL ON HOUSE CAPITALIZATION  
IN A TITLE I ENVIRONMENT

A THESIS

Presented to the Faculty of the Helms School of Government at Liberty University

In Partial Fulfillment of Requirements

For the Degree of Master of Arts in Public Policy

Under the Supervision of Dr. David Van Heemst

Lynchburg, VA

March 26, 2018

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SIGNATURE PAGE

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**ABSTRACT**

This study used a mixed-methods approach to determine whether a charter school could influence house capitalization and whether it could induce some families to stay in the school district. It examined home sale values around a charter school in an area covered by underperforming Title I schools. There was a positive but statistically insignificant change in a pre/post comparison of home sale prices, but the increase was consistent with nearby control schools. However, a survey of charter school families found that 25 percent would have left the district had they not been enrolled at the charter school. A plurality said they would leave the district upon completion of their child's time at the charter school. This study finds that the charter school kept some residents in the school district, but the number of families was not large enough to register in the study of home sales.

**DEDICATION**

Thank you to my wife for caring for our family while I work on this thesis. Thank you also to my committee chair and reader for their patient explanations and encouragement.

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## CHAPTER 1: INTRODUCTION

“We moved because of the schools.” Statements such as this are common when speaking to parents with school-age children, and real estate agents aspire to be intimately familiar with local school quality since better school districts command premium prices. Indeed, in the public policy realm, few topics are felt as immediately by families as housing costs and school quality. Local governments in urban areas are also attuned to these issues, as they have direct impact on their property tax receipts. For these governments, school choice may represent a way to both preserve its tax base and provide more efficient and productive educational services.

In the United States, property taxes are the lifeblood of local governments, constituting 71.6 percent of their funding. General sales tax revenue is a distant second at 11.1 percent (Chernick, Langley, & Reschovsky, 2011). Property taxes contribute to general funds, and in some jurisdictions they pay directly for primary and secondary education, sanitary services, environmental programs, and other services. When property values decrease or remain depressed for long periods of time, local governments find themselves more constricted in their ability to fund services.

Educational outcomes weigh heavily on both the input and output ends of the tax revenue equation. Elementary and secondary education is both the largest expenditure for local governments by far (Urban Institute) as well as a significant driver of where families

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choose to live. (Gibbons & Machin, 2008) Educational quality therefore can have a significant impact on the desirability of homes in their districts. If a local government can provide more proficient academic options, could it simultaneously improve its property tax revenue?

A large body of literature indicates that taxpayers with school-age children consider school quality when purchasing a home. The presence of attendance zones serves to sort families. In districts with schools viewed as being of poor quality, many families that would stay within the district tend to move out before their children reach school age. (Lareau, Evans, & Yee, 2016) *Ceteris paribus*, this reduced demand will depress home sale prices, or at least prevent them from rising. This will eventually result in lower tax assessments and revenue for the local government.

Title I schools are particular points of emphasis. Title I refers to a section of the federal Elementary and Secondary Education Act which allocates funds to schools with either a high number of impoverished students, a high percentage of the same, or both. (ESEA, 2017) In 2010, 56,000 schools received Title I funds. Many of these do not meet state measures of academic proficiency. This ongoing issue has forced many urban school districts to experiment with school choice as a means to provide a higher level of educational quality.

In upcoming sections, this paper will outline its purpose and significance. The literature review will examine research into local government sorting behavior, the relationship

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between school quality and house capitalization, and the effects of charter schools on home prices. It will then explain the methodology of this study, report the specific findings, and discuss implications and recommendations.

### **Purpose**

The purpose of this study was to examine whether the presence of a K5 charter school had an effect on house capitalization in an area marked by Title I elementary schools that struggled with low test scores. The results could inform the decision-making process of a local government that is considering school choice options.

Much research indicates that houses in the attendance zones of schools considered to be high quality will command a premium over houses in catchment areas of lesser-valued schools (Nguyen-Hoang & Yinger, 2011). This trait applies to traditional public schools which have clearly delineated attendance zones. It can also apply to entire school districts, and inter- and intra-district school choice (in which students can switch to a public school outside of their designated attendance zone if space is available).

Charter schools are a form of school choice that incorporate aspects of both public and private schools. Charter schools are public but to some extent compete with traditional public schools for students. However, charter schools do not typically make use of attendance zones beyond the school district boundaries themselves, and the charter school in this study was no different.

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Can these charter schools impact housing demand and, ultimately, property taxes? Only a few studies have been conducted on this point, and the results are mixed. On one hand, the fact that students can attend the school without being in an attendance zone militates against a discernible bump in housing demand. (Horowitz, Keil, & Spector, 2009) On the other hand, because there is usually no bus system for charter schools outside of ordinary mass transit, most parents must drive their children to the school, making commuting distance a factor. This would imply that closer is better. Given that house capitalization is depressed in areas with failing traditional public schools, a charter school might attract families to that area because of the less expensive housing costs. A nearby charter school may avert the possibility of families moving out of the zones of the poorly performing schools. Finally, charter schools might exert some pressure on nearby traditional schools to retain their students through the competition effect, thereby spurring improved efficiency and better test scores.

Local governments that wish to preserve and expand their tax base must be cognizant of both public economic theory as well as the empirical research on the impact of education quality upon the residential choices of its citizens. Theory suggests that, in a system of nearby local governments, residents will choose where to live based on the balance of taxes paid to services they deem valuable. In the eyes of the residents, if service levels drop or taxes are raised too high in relation to other nearby local governments, then those residents are more apt to depart to an area with a better value proposition.

## CHAPTER 2: LITERATURE REVIEW

The following literature review explains the theory of residential sorting that occurs between nearby local governments, especially with regard to how the perceived quality of traditional public schools affect home prices. It then examines the growth of charter schools as a response to low traditional school quality and how much charter schools themselves impact house capitalization according to existing research.

Longstanding public economy theory attests that local governments would have difficulty ascertaining their citizens' true desires for public goods, a form of the free rider problem. In 1954, MIT economist Paul Samuelson wrote "The Pure Theory of Public Expenditure," in which he theorized that taxpayers may be loathe to admit which services they would secretly prefer, as they might hope to enjoy them at the lowest possible level of additional taxation. He speculated that some form of signaling other than voting would reveal true preferences. In 1956, economist Charles Tiebout answered Samuelson's suggestion by proposing that residents would "vote with their feet": In a federal system of nearby local governments, household mobility would allow citizens to move to whichever jurisdiction best represents their desired balance between taxes paid and public goods received. (Tiebout, 1956) Tiebout asserted that the free rider problem could be at least somewhat ameliorated through a form of public goods competition, which of course primarily would be viable at the local government level. Tiebout's theory would be limited by real-world considerations such as employment centers, commuting burdens,

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topography, socioeconomic issues, and housing types. Tiebout's sorting hypothesis was little noticed at first, having been cited fewer than fifty times by the time of his death in 1968. But by 2015, Tiebout's 1956 article had been cited more than 11,000 times.

(Singleton, 2015)

When families with school-age children perceive the local educational quality to be low, it can become one of the primary reasons for residential sorting. This can be deleterious for a local government's financial situation. Bayoh *et al.* write that the Tiebout effect of relatively wealthier families moving out of cities creates a negative feedback loop:

“This process is clearly optimal for the households that move, because they can minimize their disutility from city blight and lower their tax liability by moving to a suburban community that is more homogenous in income. The city is left with a declining tax base, and, over time as more middle- and higher-income households move out, an increased concentration of poverty, low-quality schools, and inferior city services.” (2006)

Bayoh's research explored a number of variables for what would increase or decrease the probability of a household moving out of a city and found that a one-percent increase in school quality would lead to a 3.68 percent greater probability of a household choosing to stay in a city. (2006) While that would be helpful to a city, it does not address what is on average a large gap between suburban school quality and central city school quality. The researchers hypothesized that, if central city school quality were raised to the average suburban level, which would be a 10.2 percent change, it would increase the probability of a household choosing a home in the city by 37.5 percent (Bayoh *et al.*, 2006)

Furthermore, test scores have been linked to redevelopment within a city. One study found that the odds of residential property redevelopment in a high-quality school district as measured by test scores were 2.5 times higher than those that were not in a similar

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school district. (Charles, 2012) Similarly, Horn (2015) found correlation between residential reinvestment and improved test scores in math and English in New York City schools. If test scores remained high over a five-year period, reinvestment in housing would occur at an elevated rate. For each one-standard-deviation increase in test scores, 2.5 percent more dollars would be invested into housing. This was independent of demographic changes in the neighborhood.

While families with the means to do so had the option of moving to a different school district, families of lesser means were left with troubled schools and no real option. This widespread dissatisfaction with many public schools led to the school choice movement. School choice refers to a number of mechanisms through which parents and students can choose a school that is outside of the attendance zone of their local public school. School choice options include intra- and inter-district public school choice—a system in which public school students can opt to attend a public school outside of their attendance zone or even outside of their district—voucher programs, magnet schools, and charter schools.

Charter schools are an increasingly common form of school choice. Charter schools arose from a number of philosophical fountainheads, but perhaps one of the most seminal works was that of University of Chicago free market economist Milton Friedman. In Friedman's 1962 book *Capitalism and Freedom*, he proposed a free market form of education in which the government offered some form of choice to parents:

The arrangement that perhaps comes closest to being justified by these considerations — at least for primary and secondary education — is a mixed one under which governments would continue to administer some schools but parents who chose to send their children to other schools would be paid a sum equal to the estimated cost of educating a child in a government school, provided that at least this sum was spent on education in an approved

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school. This arrangement would meet the valid features of the “natural monopoly” argument, while at the same time it would permit competition to develop where it could. It would meet the just complaints of parents that if they send their children to private nonsubsidized schools they are required to pay twice for education — once in the form of general taxes and once directly — and in this way stimulate the development and improvement of such schools. The interjection of competition would do much to promote a healthy variety of schools. It would do much, also, to introduce flexibility into school systems. Not least of its benefits would be to make the salaries of school teachers responsive to market forces. It would thereby give governmental educational authorities an independent standard against which to judge salary scales and promote a more rapid adjustment to changes in conditions of demand or supply. (1962)

Friedman’s idea of a mix of family choice and government oversight would eventually lead to the introduction of charter schools, first appearing in Minnesota in the 1990s.

Funded through local school districts and states, charter schools are free, public, and secular but offer families an educational option. Charter schools are usually freed from many of the strictures on the traditional public schools, and charters compete with them for students. Indeed, that competition effect is often an explicitly desired outcome for policymakers. By 2014, five percent of public school students attended charter schools, which made up seven percent of all public schools. In total, 2.7 million students attended charters that year. (Dept. of Education)

Charter schools have been instituted in a wide variety of environments, but they are more likely to appear in urban areas, areas with higher than average college attainment, areas with higher than predicted dropout rates, and areas with starkly varying income and test scores. In states and districts with more homogenous levels of attainment, there tends to be less demand for charter schools. Students tend to migrate toward charter schools that are more segregated by race. (Stoddard & Corcoran, 2006) In a series of state referenda between 1998 and 2004, low proficiency test scores were a moderate predictor of support

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for charter schools, as were inter-district performance variation, greater Republican voting share, and lesser union membership. At the precinct level, a positive correlation was found between charter school support and more college education as well as more black residents. (Corcoran & Stoddard, 2011) Charter schools that employ “no excuses” disciplinary and accountability factors in high-poverty urban environments seem to perform much better overall than charter schools that were either non-urban or urban but not “no excuses”. (Angrist, Pathak, & Walters, 2013)

The concept of how to measure school quality has been the subject of some debate in the research literature. With regard to public schools with attendance zones, a great deal of research links school quality to higher house capitalization. But how best to measure school quality? Early research debated whether to measure inputs, as measured by expenditures into the public school system, or outputs, such as test scores. Over time, output was considered to be the more optimal measure of school quality, perhaps ultimately because parents did not value expenditures as a measure of quality but did value test outcomes, which Downes and Zabel found were in fact capitalized into house prices. (2002) Within the subset of outcome measures, the question then became whether school quality should be judged by achievement on standardized test scores or on “value-added” efforts by schools— a strict proficiency objective versus how much growth occurred year-over-year. Brasington and Haurin found that value-added measures might be meaningful to researchers and policymakers, but for homebuyers, the average test scores for a school were far more important. (2006) They found “little support for the value-added model,” but a one-standard-deviation increase in test scores would result in a

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7.1 percent increase in home values. The researchers surmised that homebuyers were not particularly responsive to short-term changes in test scores. Rather, they made purchase considerations based on a school's reputation for quality. Put another way, potential homebuyers would consider the average of a school's test scores over a number of years. For many homebuyers, choosing which school for their child to attend is often not well-informed by specific data. In a qualitative study, Holme interviewed several parents who based their educational decisions solely on unofficial social network opinions to ascertain school quality. (Holme, 2002)

Using test scores as the measure of school quality, the literature shows a consistent significant positive effect of high-quality schools on house capitalization. An analysis by Nguyen-Hoang and Yinger found that a range of studies showed a 1-4 percent increase in home values for every one-standard-deviation rise in school test scores. (2011) Sedgley *et al.* found that middle and high school standardized test scores were significantly correlated with increases in house capitalization, while elementary test scores were inconsistently tied to house appreciation. (Sedgley, 2008) Similarly, Machin conducted a meta-analysis of studies concerning school quality and house capitalization and concluded that, for studies both within the United States as well as internationally, results fairly consistently showed about a 4-percent increase in home prices for a one-standard-deviation increase in test scores. (2011) Still other researchers found a familiar relationship between test scores and house capitalization: for every one-standard-deviation increase in a school's test scores, house values would increase about 4-5 percent (Kane, Staiger, & Samms, 2003)

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Of course, there are a number of variables that can interfere with determining how much home prices are influenced by school quality. For example, there could be wide variation in housing stock, topography, and other neighborhood-level effects within a school's attendance zone. In an effort to account for these variables as much as possible, Black was the first to examine house capitalization by looking at house price difference along the borders of attendance zones as a way to compare houses that were presumed to be in identical neighborhoods but with different school effects. She found that five-percent higher test scores at the mean would result in home prices being (or rising) 2.1 percent higher. (Black, 1999)

Dhar and Ross (2012) took up Black's groundbreaking methodology of examining house capitalization along boundaries and applied it at the district level rather than between schools in the same district. This methodology was used on the premise that inter-district boundaries were more permanent than intra-district attendance zones. However, it also introduces more variables between districts, such as property tax differentials.

Nevertheless, the authors report that small but significant effects of school test scores could be found in house capitalization across school district boundaries.

A few studies have examined the connection between Title I schools and house capitalization. Bogin and Nguyen-Hoang examined the effect that the federal No Child Left Behind (NCLB) legislation had on property values. No Child Left Behind was meant to spur underachieving schools to improve test scores. Title I schools that did not

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sufficiently improve proficiency test scores were labeled “in need of improvement.”

Bogin and Nguyen-Hoang found that the label was commonly translated to “failing” in the public mind and that this label led to a “deep and unsettling effect on parents and prospective homebuyers.” (2014) The researchers found that home valuations dropped six percent after the local school was deemed to be “failing.” If the school continued to not meet accreditation standards in future years, further but smaller house capitalization decreases would reveal themselves.

Clapp *et al.* studied how long house sale prices took to respond to school quality changes. In their sample of Connecticut middle school math test scores, a one-standard-deviation increase in scores translated to a home price increase of 7.4 percent. However, when fixed effects were accounted for, it forced the test score impact down to a 1.33 percent increase in property values. The primary significance of Clapp’s study, however, was the discovery of the time effect on house capitalization. Over a ten-year period, homes seemed to have become fully capitalized, meaning that the full effect of test scores, property taxes, or demographic change may only fully resolve itself over a relatively long time frame. Homebuyers may adjust bids only when they are convinced that those elements will be long-lasting. (2008)

Research from the UK found a similar “fuzziness” to homebuyer reasoning toward school quality. Using an attendance zone boundary method to judge whether school quality was a factor in house prices, Gibbons *et al.* concluded that a one-standard-deviation increase in test scores translated to a 3 percent increase in home prices. Researchers sought to

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determine whether the effect was from added value from school efforts—how well the school was teaching—or from a school enrolling high-ability students in the first place, with little above-average progress. However, they determined that neither possibility was predominant. In fact, parents seemed to most value a school’s test scores. Researchers wrote: “One potential explanation is that parents use the headline, end-of-primary test scores as an indicator of academic effectiveness, but do not differentiate between test scores generated by school effectiveness and those due to a school enrolling high achieving pupils from the start.” The authors believed that enrolling a student alongside high-achieving peers would have no benefit to an individual child and thus would be an erroneous and illogical choice for parents. It is possible that if parents are selecting for peer effects, whether or not they directly aid an individual students scores, they do so for a school environment in which other students value the learning process and thus potentially speed classroom pace. (2013)

A school’s proximity also affects home prices. Research suggests that, generally, schools more often are seen as negative additions to a neighborhood. They might be seen as attracting loitering students, occasional rowdiness, or excessive traffic in the mornings and afternoons. (Horowitz, Kiel, & Spector, 2011) Sah, Conroy, and Narwold (2016) found that house values suffered a penalty of more than 14 percent when homes were within 500 feet of a private elementary school. This penalty dissipated as distance from the school increased. Homes near public elementary schools fared better than those near private elementary schools, but even then houses within 500 feet still suffered a penalty of more than 5 percent, which dissipated with distance and disappeared beyond the

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3,000-ft. range. The researchers attributed the “proximity penalty” to nuisance factors—especially traffic. A study of Quebecois elementary schools found that the optimal distance from the school for house capitalization was in the 300-500 meter range, with depressed property values for closer homes and a gradual trailing off in value outside of 400 meters. (Des Rosiers, Lagana, & Theriault, 2001) Some research had a different finding regarding proximity’s effect on home values, however. Studying home values in relation to their distance from schools in Greenville, S.C., Owusu found that proximity to elementary schools was positively correlated: houses within 800 feet were estimated to be 8-13 percent higher than those further out. High schools exerted a negative effect. (Owusu *et al.*, 2007) How widely dispersed schools are from the student population might make a difference in whether school proximity is valued positively or not. In Sah’s study, schools were placed much further apart, likely inducing much more traffic than the schools in Greenville.

Clearly, traditional public school attendance zones affect house capitalization. Since school choice measures by definition weaken the rigidity of attendance zones, they can affect house capitalization as well. Chung (2015) researched an inter- and intra-district school choice system initiated in Seoul, South Korea. The study compared apartment prices on the assumption that renters would be in a better position to move quickly to take advantage of the new system. It used the boundary method and found that apartment prices in high-performing school districts decreased significantly compared to those in low-performing districts because the attendance zone effect had been weakened. Reback found that, in an inter-district school choice system used by Minnesota, families were

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able to live in districts that had more poorly performing schools but send their children to higher-performing districts. Thus, house prices increased three percent in districts that had performed poorly, while house prices in the more expensive proficient districts likewise decreased three percent. When the school choice system begins, however, the house price changes are not instantaneous; house capitalization changes were not fully realized until eight years after the start, echoing Clapp's findings. (2005) A general equilibrium simulation of vouchers to test the effect on housing capitalization and school stratification found a similar result. Nechyba produced theoretical households which each had a house which could be sold at market value, a parental income, and a child—whose talents varied across different households. In the complex model, vouchers led to the creation of new private schools. Districts which had poor public school quality and its accompanying relatively inexpensive housing usually saw capitalization gains as families took advantage of the ability to attend qualitatively superior private schools while enjoying the lower cost of living. In short, Nechyba's model indicated that while school stratification by talent level might increase, residential stratification by income would decrease. (2000)

Research on the effect of charter schools in particular on housing capitalization is mixed. Horowitz, Keil, and Spector (2009) noted that charter school effects on home prices may differ from traditional schools' effects. Since there are generally no attendance zones, what house capitalization effects might occur from charter schools may be realized in a much more dispersed area. Also, charter schools may have unique non-academic qualities that are attractive to parents that measures of school output, such as test scores, will not

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pick up. For example, the “no excuses” model mentioned earlier, in which rigorous behavioral expectations are set, have proven to improve academic proficiency in urban settings. These tend to work best for disadvantaged students and when there is relatively little academic and socioeconomic differential between students. (Wax, 2016) Imberman also found rapid behavioral and attendance improvement in students at charter schools, which he speculated may have been due to smaller school size. (*TRES*, 2011)

Horowitz *et al.* hypothesized that charter schools could affect property values through a number of mechanisms. They studied charter schools in Toledo, Ohio, which were originally instituted in a school district because schools there had been struggling academically. The researchers recognized that improved test scores might impact housing prices even though there were no attendance zones for the charters. However, the charter school test scores were substantially worse than the traditional public schools since they had been specifically designed to educate lagging students. In an effort to determine whether a charter school had a “zone of influence” with regard to property values, these researchers studied assessed values, pre- and post-charter-opening sales prices within a 2,000-foot radius, and expected change in property values based on price trends per census tract. They found no effect of elementary charter schools on house capitalization, and a charter high school had the same undesirable effect on property values as did the nearby traditional public high school. (Horowitz *et al.*, 2009) Similarly, Imberman (2015) found no correlation between Los Angeles County charter schools and nearby home prices. The Imberman results are somewhat constrained by the fact that the time period

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chosen, 2008-2011, is short and was following on the heels of the Great Recession and a collapse in home prices at the beginning of that time frame.

When charter schools used a mechanism similar to attendance zones, positive house capitalization was seen. Andreyeva and Patrick researched charter schools that had “priority” attendance zones. They examined houses along the borders of the priority zones in a similar methodology to Black and others on the assumption that these houses would be substantially similar in all ways except probability of admission to the charter school in question. Children living in Zone 1 were given a higher probability of acceptance to the charter school than those living in Zone 2. Because of this, house prices in Zone 1 rose 6-8 percent compared to Zone 2 houses. Andreyeva also found that the demand for good charter schools was stronger for homes in attendance zones for underperforming traditional public schools. (2017)

Other researchers have also found that charter schools can impact home prices. Shapiro and Hassett (2013) found a positive effect of charter schools on New York City residential capitalization. Looking at a number of school reform efforts under former mayor Michael Bloomberg, these researchers found that the addition of a charter school on average led to a 3.84 percent increase in home prices within a zip code. In an unpublished doctoral dissertation, Buerger estimated that charter schools can increase home prices by six percent in districts with very poorly performing traditional public schools. (2014)

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To an extent, charter schools could serve to attract families. Danielsen *et al.* (2014) examined whether families were enticed to move geographically closer to a K12 charter school. Researchers gathered mailing addresses of the families when they applied to the charter school, then compared them to any changes of address. They also were able to obtain the work locations of both mothers and fathers of school attendees. At the time of application, the median distance that families lived from the school was 4.59 miles. The results showed that families were almost twice as likely to move closer to the school than a neutral effect would suggest even though there was no attendance zone for the school. Additionally, “the child’s school exerts a significantly stronger attraction than parent’s work locations.” The younger the student was, the more likely the family was to move. The Danielsen study then separated the families that had moved into two groups: “slow” and “fast” movers. Slow movers were those who moved after six months or more of acceptance to the school while the fast movers moved within six months of acceptance. Researchers surveyed the families and found that moves toward the school had differing causalities: some applied to the school because the family was already planning to move in that direction, while others moved after applying. It is unclear how generalizable these findings are since the school’s comprehensive inclusion of all grades and preference for selecting siblings of current students provided at least two reasons for families to make such a significant commitment.

The mixed result of charter school impact on property values might be due to a number of reasons. The most obvious reason why charter schools may not have the same effect as traditional public schools is that there is usually no attendance zone associated with them.

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Attendees may live anywhere in a district and attend a charter school, although this is constrained by normal commuting concerns. When there is a form of an attendance zone for charter schools, the usual increase in house capitalization can be seen. A second issue is that many charter schools are founded with particular missions that may reduce their general desirability—they may be designed for at-risk or disruptive students, for example. Third, many charter schools have low enrollment relative to traditional public schools; thus, their impact will necessarily be muted.

With the preceding research in mind, this study sought to determine if a relatively high-performing elementary charter school in an area marked by non-accredited traditional public schools would exhibit any significant impact on house capitalization near it. Sited at an old, abandoned school building, this charter school is in a mixed-income urban area in a central part of the city. The streets are laid out in a traditional grid pattern. There are some modest retail establishments nearby. Any student living in the school district can apply to attend the charter school. If there are more applicants than slots available, a lottery is implemented. Current students and their siblings are admitted pre-lottery.

### **Research Questions**

- What impact, if any, does the installation of an elementary charter school in a Title I environment have on residential house capitalization within a 1,500-foot radius and a 3,000-foot radius?

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- What impact, if any, does the presence of a charter school have on a family's decision to not move out of the attendance zones of elementary schools that are struggling academically?

### **Research Process**

This study examined whether the presence of a K5 charter school that is surrounded by Title I traditional public schools with low academic achievement can induce increased house capitalization. It used a mixed-methods approach to determine whether house prices have increased in the 3000-ft. radius around the charter school.

First, it examined sale prices of residential single-family homes in 2008-2009, before the opening of the school in 2010, and compared them to sale prices in 2016-2017. The data set was pulled from the city assessor's office. Only "verified" home sales were used. This category excludes any sales that are not considered market-rate, including foreclosures, intra-family or related-party transfers, empty lots, and non-market transfers. All verified home sales in the given time periods were gathered from assessment areas that included homes within a 3,000-ft. radius around the charter school as well as radii around two nearby traditional public elementary schools, which served as controls. Home locations and distance from the schools were then verified on Google Maps. Homes outside of the 3,000-ft. radii were removed from the dataset.

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Home sales were chosen as the quantitative method for this study over two other potential methods: property assessments and repeated sales of individual properties. Property assessments have the benefit of covering all homes in a given area, but they are merely estimates of value and by definition are lagging indicators. Repeated sales of individual properties between 2008 and 2017 would provide an accurate assessment of rising or declining value for those properties. However, this method would severely limit the number of properties available for analysis, and the dataset would be subject to the influence of any idiosyncrasies those properties may have.

Several studies in the literature review preferred to examine houses along attendance boundaries in order to isolate the effects of neighborhood differences on house capitalization. This study did not because, though there are attendance zones for the control schools, the charter school is open to any student in the school district. As Horowitz noted, if charter schools are to have an effect on house capitalization, it would be through other means. The comparisons between the charter and the control schools were subject to neighborhood-level variables within their respective radii. To control for that as much as possible, the controls were selected because of physical proximity to the charter (about a mile away in both cases) and similar density due to urban grid street networks. The number of home sales varied significantly within the three 3,000-ft. radii—in 2016-17, there were 100 around the charter school, 37 around control 1, and 144 around control 2. This was addressed through the use of t-tests using unequal variances.

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This study also split the 3,000-ft. radii into inner rings (0-1500 feet) and outer rings (1501-3000 feet) in order to gain a more granular view of whether the charter school had an effect. In order to assess the significance of the change in home sale prices, both in time (pre- and post-charter) as well as between the two control schools and the charter itself, two-tailed t-tests were conducted using two samples with unequal variances. The results are below. Thus, the essential structure of the study was to conduct a pre/post comparison between the 2008-09 and 2016-17 time periods for the radius around the charter school and search for statistical significance, which is defined as  $p < .05$ . Then the study compared changes in strength of statistical significance between the charter school and each of the control schools in the 2008-09 and 2016-17 time periods.

A 3,000-foot radius around the charter school overlaps the attendance zones of three elementary schools, all of which were struggling with standardized testing. In 2016, based on scores from the statewide academic proficiency test, the state denied accreditation to all three, labeling two as “priority” schools and one as a “focus” school. Both priority and focus designations refer to specific levels of state intervention in an attempt to improve outcomes. The charter school was fully accredited. The charter school has no formal attendance zone and there is no tuition to attend.

Second, the study surveyed the parents of students at the charter school to determine how the presence of the school affected their choices of residences. To do this, an online survey was created in Google Forms and a link was distributed by the school staff to the parents. No email addresses or identifying information were made available to the

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researcher in this study, and responses were limited to one per family. The survey was composed of nine questions, which asked the respondents what their educational and residential choices were at the time of their application to the charter school, currently, and in the future. The responses were collected over a period of eight days. Of the 266 families with current students at the school, 28 responded to the survey.

### CHAPTER 3: RESEARCH FINDINGS

The following outlines the findings of both the quantitative and qualitative research. The quantitative findings are below and answer the first research question: what impact did the installation of the elementary charter school have on residential house capitalization within a 1,500-foot radius and a 3,000-foot radius? The descriptive data are displayed first. The findings themselves follow and will comprise the following:

- A comparison of pre- and post-charter home sale prices in the radius around the charter school itself;
- A comparison of statistical significance between the 2008-09 home sale prices for the charter school and the first control school, the 2016-17 home sale prices for the charter school and the first control school, and an examination of how significance changed between those time periods;
- A comparison of statistical significance between the 2008-09 home sale prices for the charter school and the second control school, the 2016-17 home sale prices for the charter school and the second control school, and an examination of how significance changed between those time periods;
- An overall finding for whether the home sale prices clearly implicate the charter school's institution as a driver of house capitalization increases.

The following charts show the bell curve distribution of all houses in the 0-3,000-ft. radius of the charter school in the 2008-09 and 2016-17 time frames. These indicate a

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

normal distribution of home sale prices, although in 2016-17 the bell curve was slightly flatter, with more low- and high-end sales than in the earlier time period.

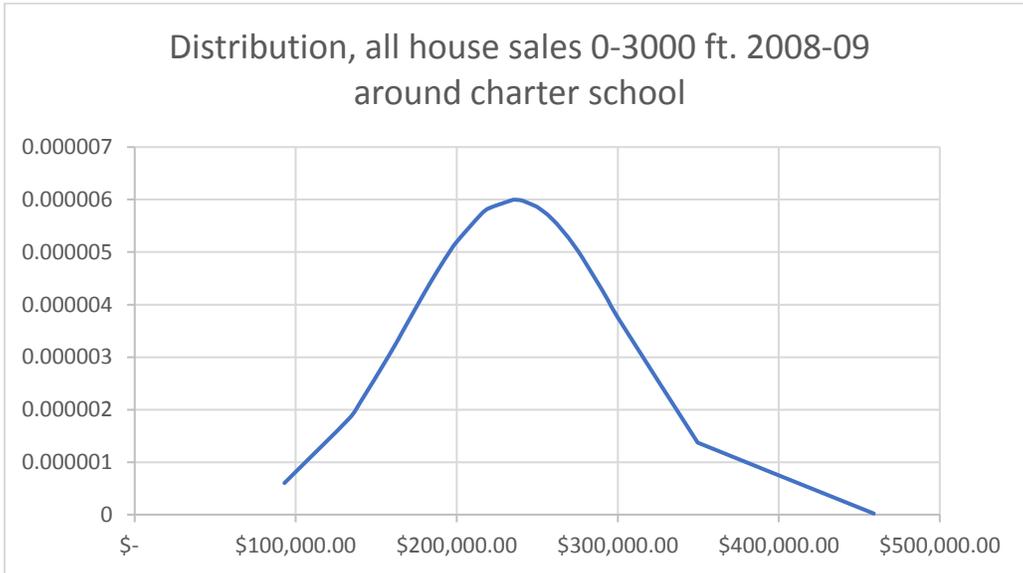


Figure 1: Distribution of all house sale prices in the 0-3000 ft. radius around the charter school in 2008-09.

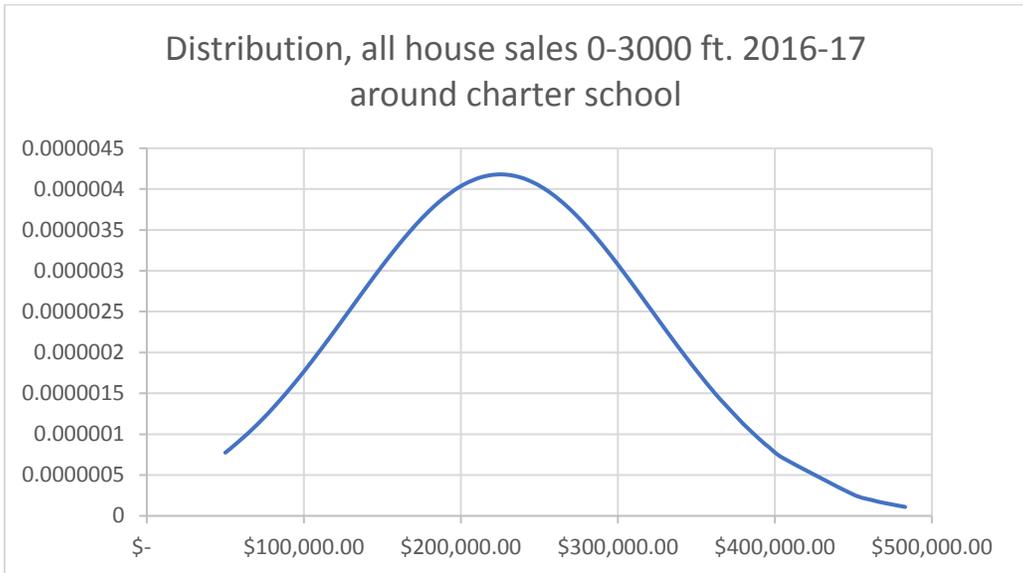


Figure 2: Distribution of all house sale prices in the 0-3000 ft. radius around the charter school in 2016-17.

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Finding 1: There was an increase in average home sale prices between 2008-09 and the 2016-17 time period in the 0-1,500 ft. radius around the charter school but the increase was statistically not significant. In the 1,500-3,000-ft. range, there was a decrease in average prices.

The first finding concerned whether there was a statistically significant change in home sale prices between the time period preceding the institution of the charter school (2008-09) and the most recent home sale data (2016-17). By this time, the charter school had been in existence for enough years to become a known quantity to families with elementary-aged children. Below is the descriptive data:

Table 1

*Mean, Median, Standard Deviation Around Charter School*

	2008-09				2016-17			
	N	Mean	Median	1 Std Dev	N	Mean	Median	1 Std Dev
0-1500 feet	28	\$220580	\$217500	\$64621	47	\$246173	\$260500	\$78842
1501-3000 ft	43	\$228651	\$199999	\$93501	100	\$214721	\$202000	\$101145

The data show that single-family residential home sale prices increased an average of 11.6 percent in the intervening time in the 0-1,500-ft. radius around the charter school. In the 1,501-3,000-ft radius, prices decreased 6.1 percent. Using a two-tailed t-test for

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statistical significance with  $p < .05$ , this study found that the  $p = .109$  (bolded below)—thus, it cannot be said conclusively that the price increase seen in 2016-17 is significant.

Table 2

*Statistical Significance: Pre/Post Charter 0-1500 ft*

	<i>Pre Charter</i>	<i>Post Charter</i>
Mean	220580.3571	247744.6809
Variance	4175883026	6131821221
Observations	28	47
Hypothesized Mean Difference	0	
df	65	
		-
t Stat	1.624531041	
P(T<=t) one-tail	0.05455116	
t Critical one-tail	1.668635976	
<b>P(T&lt;=t) two-tail</b>	<b>0.10910232</b>	
t Critical two-tail	1.997137908	

Pre = 2008-09; Post = 2016-17

Finding 2: The second finding was that the house capitalization was strongly significantly higher in the 2008-09 inner ring of the charter school than the first control school, and that the difference in statistical significance had accelerated by 2016-17.

A comparison of average home prices in the two time periods for the 0-1,500 ft. radii for the first control school and the charter found that the price difference between Control 1 and the charter was large in 2008-09 and grew even larger in 2016-17 in the inner ring at a strongly statistically significant rate. In a similar comparison, but looking at the entire 0-3,000-ft. radius, the data indicate a statistically significant difference in average prices in 08-09 that weakens by 2016-17, but which is still significant.

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Table 3

*Mean, Median, Standard Deviation Around Control School 1*

	2008-09				2016-17			
	N	Mean	Median	1 Std Dev	N	Mean	Median	1 Std Dev
0-1500 feet	16	\$148562	\$160500	\$29899	17	\$136839	\$155000	\$45410
1501-3000 ft	40	\$142935	\$152500	\$47261	37	\$201879	\$171500	\$125036

In the 2008-09 time frame, home prices around Control School 1 were relatively similar in the inner and outer rings (means of \$148,562 and \$142,935, respectively). By 2016-17 prices had escalated in the outer ring, but nearer to the school itself, they actually had decreased 7.9 percent. The following two tables show the accelerating statistical significance of the price differences between Control 1 and the charter school in the inner ring:

Table 4

*Statistical Significance: Control 1 and Charter, 0-1500 ft radii in 2008-09*

	<i>Control 1</i>	<i>Charter</i>
Mean	148562.5	220580.3571
Variance	893995833.3	4175883026
Observations	16	28
Hypothesized Mean Difference	0	
df	41	
t Stat	5.029780707	
P(T<=t) one-tail	5.09544E-06	
t Critical one-tail	1.682878002	
<b>P(T&lt;=t) two-tail</b>	<b>1.01909E-05</b>	
t Critical two-tail	2.01954097	

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When the study compared the entire 0-3,000 ft. radii of Control 1 and the charter, the difference was statistically significant in both time periods but had weakened somewhat by 2016-17.

Table 5

*Statistical Significance: Control 1 and Charter, 0-1500 ft radii in 2016-17*

	<i>Control 1</i>	<i>Charter</i>
Mean	141173.4375	247744.6809
Variance	1859021289	6131821221
Observations	16	47
Hypothesized Mean Difference	0	
df	48	
t Stat	6.785732465	
P(T<=t) one-tail	7.83543E-09	
t Critical one-tail	1.677224196	
<b>P(T&lt;=t) two-tail</b>	<b>1.56709E-08</b>	
t Critical two-tail	2.010634758	

Table 6

*Statistical Significance: Control 1 and Charter, 0-3000 ft radii in 2008-09*

	<i>Control 1</i>	<i>Charter</i>
Mean	144542.8571	225468.2958
Variance	1834284584	6260026316
Observations	56	71
Hypothesized Mean Difference	0	
df	112	
t Stat	7.359155367	
P(T<=t) one-tail	1.65329E-11	
t Critical one-tail	1.658572629	
<b>P(T&lt;=t) two-tail</b>	<b>3.30658E-11</b>	
t Critical two-tail	1.981371815	

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Table 7

*Statistical Significance: Control 1 and Charter, 0-3000 ft radii in 2016-17*

	<i>Control 1</i>	<i>Charter</i>
Mean	181403.7037	225280.1905
Variance	12171682664	9107800161
Observations	54	147
Hypothesized Mean Difference	0	
df	84	
t Stat	2.588327198	
P(T<=t) one-tail	0.005681392	
t Critical one-tail	1.663196679	
<b>P(T&lt;=t) two-tail</b>	<b>0.011362784</b>	
t Critical two-tail	1.988609667	

Finding 3: House capitalization prices between Control 2 and the charter school were statistically similar in the inner rings, both pre- and post-charter. In the outer ring of Control 2, house capitalization accelerated beyond that in the charter’s outer ring to a statistically significant degree.

The third finding compared home sale prices between the second control school and the charter. The differences were statistically insignificant both in 2008-09 and 2016-17 for the 0-1500 ft. radii. For the entire 0-3,000 ft. radii, home sale price differences were statistically insignificant in 2008-09. However, by 2016-17, the differences had become statistically significant, as house capitalization in the outer ring of Control 2 outpaced that of the charter school’s radius.

Descriptive data are below:

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Table 8

*Mean, Median, Standard Deviation Around Control School 2*

	2008-09				2016-17			
	N	Mean	Median	1 Std Dev	N	Mean	Median	1 Std Dev
0-1500 feet	30	\$213,043	\$183,500	\$86,270	53	\$238,659	\$240,000	\$88,067
1501-3000 ft	70	\$248011	\$224250	\$94393	144	\$275568	\$261225	\$117021

Table 9

*Statistical Significance: Control 2 and Charter, 0-1500 ft radii in 2008-09*

	<i>Control 2</i>	<i>Charter</i>
Mean	213043.3333	220580.3571
Variance	7442641678	4175883026
Observations	30	28
Hypothesized Mean Difference	0	
df	54	
t Stat	0.378164408	
P(T<=t) one-tail	0.353395511	
t Critical one-tail	1.673564906	
<b>P(T&lt;=t) two-tail</b>	<b>0.706791022</b>	
t Critical two-tail	2.004879288	

Table 10

*Statistical Significance: Control 2 and Charter, 0-1500 ft radii in 2016-17*

	<i>Control 2</i>	<i>Charter</i>
Mean	238659.4528	247744.6809
Variance	7755867634	6131821221
Observations	53	47
Hypothesized Mean Difference	0	
df	98	
t Stat	0.546074234	

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P(T<=t) one-tail	0.293127955
t Critical one-tail	1.660551217
<b>P(T&lt;=t) two-tail</b>	<b>0.58625591</b>
t Critical two-tail	1.984467455

Table 11

*Statistical Significance: Control 2 and Charter,  
0-3000 ft radii in 2008-09*

	<i>Control 2</i>	<i>Charter</i>
Mean	237521	225468.2958
Variance	8649655009	6260026316
Observations	100	71
Hypothesized Mean Difference	0	
Df	163	
t Stat	0.911969665	
P(T<=t) one-tail	0.181565741	
t Critical one-tail	1.654255585	
P(T<=t) two-tail	<b>0.363131481</b>	
t Critical two-tail	1.974624621	

Table 12

*Statistical Significance: Control 2 and Charter,  
0-3000 ft radii in 2016-17*

	<i>Control 2</i>	<i>Charter</i>
Mean	265638.6497	218888.0943
Variance	12318078696	10135331953
Observations	197	106
Hypothesized Mean Difference	0	
df	234	
t Stat	3.71757306	
P(T<=t) one-tail	0.000125873	
t Critical one-tail	1.651391475	
P(T<=t) two-tail	<b>0.000251746</b>	
t Critical two-tail	1.970153643	

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Finding 4: Overall, no clear pattern emerges from the changes in home sale prices in the three schools' radii.

To summarize the three previous findings, the data show:

- A price increase in the inner ring around the charter school, but not quite to the level of statistical significance when using a two-tailed t-test. There was a price decrease in the outer ring.
- Sale prices were higher in 2008-09 in the charter's inner ring (0-1,500 ft.) than those around the first control, and the difference became even greater in 2016-17. For the entire 0-3,000-ft. radii, sale prices around the charter were statistically significantly higher than those around the first control, and they remained statistically higher by 2016-17 although the strength of the significance had weakened. This was due to the quickly accelerating prices in the outer ring of the control school, as seen in the table below.
- Sale prices were similar in 2008-09 between the second control school and the charter, and they remained similar in 2016-17 in the inner ring. For the entire 0-3,000-ft. radii, prices were similar in 2008-09 but became dissimilar by 2016-17, when average sale prices around the control grew at a time when the outer ring of the charter school saw decreases.

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Table 13

*Comparison of home sale price changes, 0-1500 and 1500-3000 ft radii*

	Percent change in home sale prices pre- and post-charter
Charter School 1500 ft. radius	11.6
Charter School 1501-3000 ft. radius	-6.3
Control School 1 1500-ft. radius	-7.9
Control School 1 1501-3000 ft. radius	41.2
Control School 2 1500-ft. radius	12.0
Control School 2 1501-3000 ft. radius	11.1

The home sales in the 0-1,500 ft. radius around the charter school saw an increase of 11.6 percent—much better than Control 1’s 7.9 percent decrease, but in line with Control 2’s 12.0 percent increase. Likewise, the outer rings were varied, with the outer ring of Control 1 in particular seeing a large increase. Finally, when looking at statistical significance in the inner rings around the schools using two-tailed t-tests, the study found a significant difference between the charter school and Control 1, which increased by the 2016-17 time frame. However, no statistical significance was seen between Control 2 and the charter. Therefore, this study finds no conclusive correlation between the charter school’s presence and increased home values in comparison to its controls based on the home sale data.

The following section answers the research question, what impact, if any, does the presence of a charter school have on a family’s decision to not move out of the

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

attendance zones of elementary schools that are struggling academically? This was accomplished through a survey of parents of current students at the charter school.

Finding 5: Twenty-five percent of the parents said they would have moved out of the school district entirely to secure better educational opportunities if their child had not been enrolled in the charter school, and 29 percent more said they were unsure what they would have done. Thus, the presence of the charter school seems to have retained relatively large numbers of charter families in the urban school district.

Of the 266 families which have children at the charter school, 28 responded to the online survey. All 28 answered each question with the exception of questions four and five, which only applied to families that had moved their residences. The questions and responses are as follows:

1. Thinking back to before you applied to [the charter school], were you in the attendance zone of a traditional public school that you considered low quality/undesirable?

75%	Yes
14%	No
7%	Was not in the school district at all at the time
4%	Not sure

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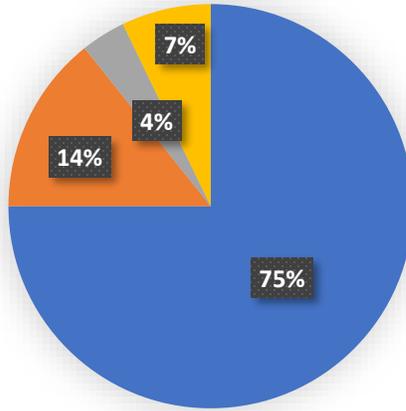


Figure 3: Answers to survey question 1

2. If your child had not been enrolled at [the charter], what educational option would you have taken as a second choice?

- 25% Attended the traditional public school for which you were zoned
- 25% Moved out of the school district altogether and into a suburban or other city's school district
- 11% Enrolled in a private school
- 3% Homeschooled
- 3% Moved to the attendance zone for a different public school
- 4% Attempted to use open enrollment system to attend better traditional school in the district
- 29% Unsure

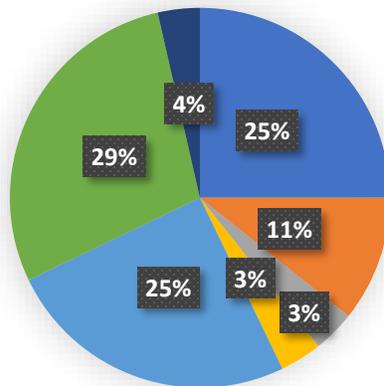


Figure 4: Answers to survey question 2

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

3. When you applied to [the charter], were you renting or did you own your home?

82% Owned home  
18% Rented

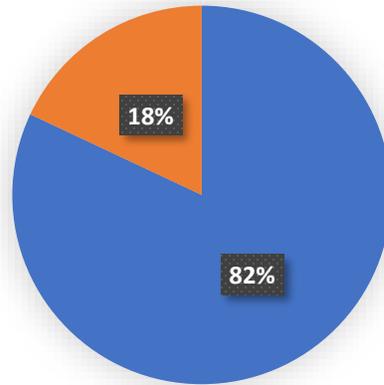


Figure 5: Answers to survey question 3

4. IF you moved your residence either shortly before applying to [the charter] or at some point after acceptance there, did you apply to [the charter] because you already expected to move closer to [the charter] anyway? (If you did not move, please disregard this question.) (10 responses)

50% Yes  
50% No

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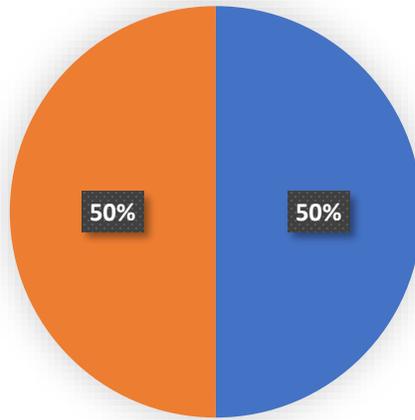


Figure 6: Answers to survey question 4

5. IF you moved your residence either shortly before applying to [the charter] or at some point after acceptance there, did you consider your shorter commute distance to the school as one of the factors? (If you did not move, please disregard this question.) (9 responses)

56% Yes  
44% No

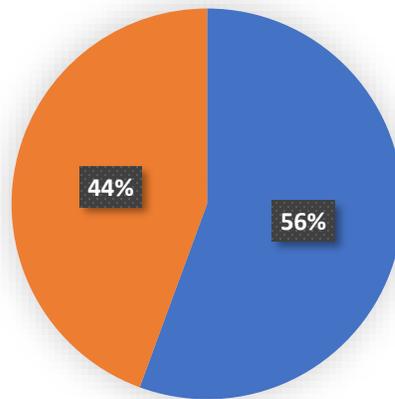


Figure 7: Answers to survey question 5

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6. Approximately how many minutes does it take to drive to [the charter] on a typical school morning?

53%	5-15 minutes
29%	Less than five minutes
11%	More than fifteen minutes
7%	Child walks
0%	Child uses transit

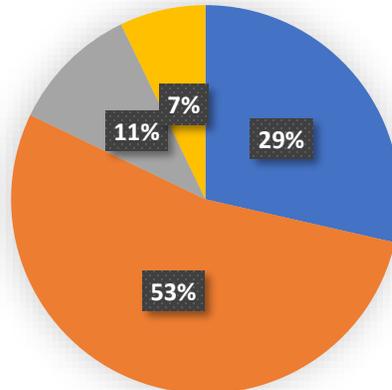


Figure 8: Answers to survey question 6

7. Do you live within eight blocks of [the charter]?

61%	No
39%	Yes

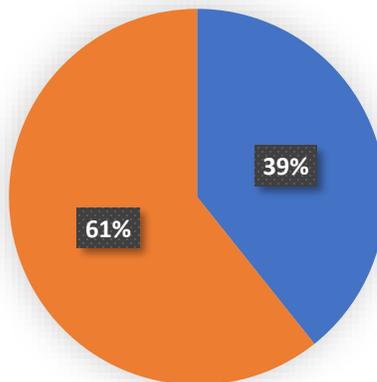


Figure 9: Answers to survey question 7

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

8. Do you currently rent, or do you own your home?

82% Own home  
18% Rent

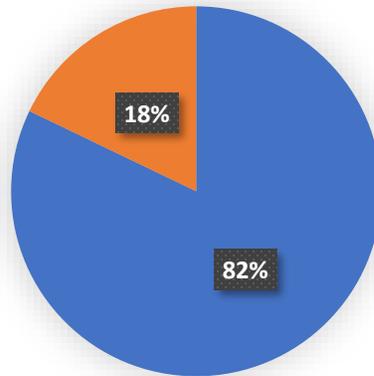


Figure 10: Answers to survey question 8

9. When your child has completed their time at [the charter], what is your plan for his or her education after that?

37% Move out of the school district altogether and into a suburban or other city's district  
15% Attempt to use open enrollment within the school district.  
11% Attend a charter middle school  
7% Homeschool  
4% Enroll in private school  
4% Move to the attendance zone for a different public middle school within the school district  
4% Attempt to pay annually to go to a different school district  
0% Attend the traditional public middle school for which you are zoned  
18% Unsure

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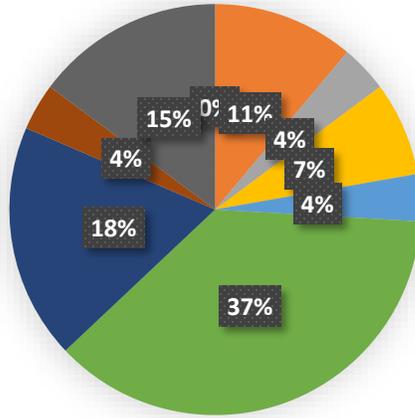


Figure 11: Answers to survey question 9

Nearly three quarters of respondents considered the traditional public school for which their residence was zoned to be inadequate. This is not surprising since respondents all derive from a self-selecting group that applied to go to the charter school. Nevertheless, since the charter school families live across a broad swath of the school district, this may represent more widespread dissatisfaction with the traditional school offerings.

The second question is perhaps most directly related to the topic of this thesis, and responses indicated a majority would have taken steps to avoid their zoned traditional school. When asked what their second educational choice would have been had their child not been enrolled at the charter school, 25 percent would have attended the traditional public school for which they were zoned. Eleven percent would have enrolled in a private school, and one respondent said their family would have homeschooled. But 25 percent said they would have moved out of the school district entirely to attend a

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

school in a suburban district, and another 29 percent were unsure what they would have done had they not enrolled in the charter school.

Questions three and eight inquired into whether charter families had rented or owned their residences prior to enrollment as well as their current status. In both cases, 82 percent of respondents owned their homes while 18 percent rented. These questions were asked in order to determine whether residential decisions related to charter school enrollment would be detected by comparisons of home sale data. For example, if large percentages were renters, this could influence future research. Since 82 percent were homeowners at the time they applied to the charter school, changes in residences would conceivably impact the housing market.

Questions four and five sought to determine if the presence of the charter school influenced families to move closer to it. These questions are identical to those in Danielsen's study. Ten of the 28 families who responded to the survey moved either shortly before enrolling at the charter or at any point after. Of this subset, five indicated they applied to the charter because they intended to move closer to it. Five of nine also incorporated the shorter commute as a factor in their decision on where to live; one respondent chose not to answer question five.

Questions six and seven sought to estimate how far charter school families live from the school. For privacy reasons, specific addresses were not requested. However, 39 percent said they lived within eight blocks of the school, which is a close approximation to the

## IMPACT OF CHARTER SCHOOL ON HOUSE CAPITALIZATION

3,000-ft. radius that was used in the home sale analysis. For commuting time, 54 percent said the drive to school takes between 5-15 minutes on a typical morning; 29 percent said the drive takes fewer than five minutes. Seven percent said their child walks to school, and none indicated their child takes any form of transit. Only 11 percent said the typical morning commute takes more than 15 minutes.

Finally, the ninth question—what were families’ educational plans upon completion of the charter school—was included to observe how the lack of a nearby charter choice at the middle school level may affect families’ choices. On this question there was a wide array of responses, but by far the largest plurality, 37 percent, indicated families intended to move out of the urban school district upon graduation from the elementary charter school. Eighteen percent were still unsure what they planned to do for the middle school level. The remaining respondents were split between enrolling in a private school, homeschooling, attending a charter middle school, moving to the attendance zone of a different traditional public middle school, paying to attend a suburban school, attempting to enter a more desirable middle school through the district open enrollment system, or attempting to enter an international baccalaureate program. Strikingly, none said they planned for their child to attend the traditional public middle school for which they were zoned.

#### **CHAPTER 4: LIMITATIONS**

Since this study examined the house price effects of a single charter school, it was vulnerable to localized reasons for any house price capitalization changes. For example, some parts of the areas studied saw very high appreciation, which could skew results and would be emblematic of forces other than the charter school. And, because the control schools were also local, it is possible that all of them were influenced by regional or national housing market changes. Examining all home sales in this city, or comparing local home sale prices to national baseline changes, might have provided a more homogenized and uniform basis for comparison.

Another limitation to this study was that it did not take into consideration variables in the housing stock between the charter school and the control schools. For example, some studies control for number of bedrooms, exterior finish, and lot size. Others consider neighborhood characteristics such as crime rates. This study relied on the proximity of the control schools to the charter and similarity of street layout to serve as a proxy for these variables, but no direct controls were used.

The survey suffered from at least two other limitations. First, it is unclear how generalizable the responses are to the general population since all respondents came from a self-selected population that almost by definition were unsatisfied with their assigned

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traditional public schools. While the survey showed what this group would have done, it does not necessarily follow that other families in the school district are as dissatisfied.

Second, the survey has large confidence intervals because it received 28 responses out of 266 families with a child at the school. More responses would have better ensured that the sample was representative of the larger population at the school.

Finally, this study did not use advanced statistical methods to analyze the quantitative home sale data. Again, this limits the ability to determine which variables were factors in the house capitalization differences.

## CHAPTER 5: CONCLUSIONS

This study sought to determine whether a relatively well-performing charter school, independent of an attendance zone, might stabilize or increase house capitalization in an area in which public schools were low-performing—an environment out of which families with school-age children may be tempted to move. It is also conceivable that the initiation of a charter might act as a spur to other investment in the local area, separate from the effect on families with children. Comparisons to the control schools showed no unambiguous direction.

Conclusion 1: Evidence is not conclusive that the charter increased house capitalization.

The mixed findings in this study of the impact of the charter school on house capitalization in its immediate area are consistent with the findings of both Imberman (2015) and Horowitz et al. (2009) Their research showed no discernible impact of charter schools on home prices, even when local traditional public schools' quality was accounted for. What are some of the possible reasons for this conclusion?

First, and most obviously, the charter school does not employ an attendance zone, which was the central mechanism in concentrating housing demand in catchments for high-performing traditional public schools. Horowitz suggested that since charters don't often

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use an attendance zone, their effect on family's choices of homes becomes more a question of commuting ability:

The closeness to a charter school may instead become a locational choice, as it makes the commute to school similar to the commute to work. If parents are responsible for delivering children to the school, transportation savings would be capitalized in the value of properties near charter schools. However, if these transportation costs are significantly low, it is quite possible that property values would rise more in areas beyond the normal boundary of a charter school than in areas within the normal boundary. (2009)

As Andreyeva found, charter schools that used a "priority zone" system also realized increased house capitalization. (2017)

Another possible factor weighing against finding a correlation is that families are not as willing to move close to a school that is for elementary grades only. In Danielsen's 2014 study, a K12 charter offered families more reason to move closer if they had decided to form a lengthy commitment. Other studies have shown that quality elementary schools are not as highly sought after by home buyers as are quality middle and high schools. (Horowitz et al. 2009, Sah, Conroy, and Narwold 2016)

The length of time that some research indicates is needed before house capitalization effects are reliably observable may also play a role. Both Clapp's (2008) and Reback's (2005) works indicate that house capitalization changes are most consistently seen after several years. Other researchers doing qualitative analysis, such as Holme (2002), indicated that when families are choosing which school to attend, it is often done so based on school reputation and peer influence. In general, if house capitalization is detectable, it will likely be after enough time has passed that school quality has penetrated the opinions of homebuying families. In this case, the charter school had been

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in existence seven years, a bit less than the eight to ten years indicated by Reback's research.

Also possible is that whatever influence the charter school had on house capitalization was overwhelmed by local factors, such as a larger swell of home prices, which other areas of the city had seen. For example, the 1501-3000-ft. ring around Control 1 saw rapid price rises reflecting significant investment in the northern section. The charter saw overall price decreases in its outer ring, but it may not necessarily reflect negative sentiment. The lowest home sale price in the outer ring in the pre-charter period was \$93,000. However, in the 2016-17 range, nine homes sold for less than that—with five of those occurring in the last quarter of that time frame. The 2016-17 bell curve shows thicker tails on either end of the curve. The lower-priced home sales could be speculative purchases of more marginal properties, with buyers hoping to get ahead of the wave of rapidly rising prices observed in the outer ring of Control School 1.

It is possible that the house capitalization growth around the charter was the leading edge of gentrification, which perhaps had not revealed itself fully in the Census data. Davis and Oakley examined charter schools and their relationship to gentrification in Chicago, Philadelphia, and Atlanta, noting that much gentrification since 2000 tended to overlap with charter school expansion. Using changes in the black and white populations, percent poor, percent homeowner, and total population as a proxy for gentrification, they concluded that the relationship between charters and urban revitalization is complicated—sometimes accompanying gentrification and sometimes not. (2013)

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However, demographic data from the American Community Survey seems to cast doubt on this possibility with regard to this charter school. The 3,000-ft. radius around the charter school is bisected by two zip codes, and these two zip codes roughly align with the two control schools. The poverty rate for all families in these two zip codes are below, as is the poverty rate for families with children under 18:

Table 14

*Poverty rates, all families in zip codes falling within charter's 3000-ft radius, 2011-2016*

	Zip 1		Zip 2	
	%	Margin of error	%	Margin of error
2011	30.2	+/-3.7	12.6	+/-2.9
2012	32.6	+/-4.3	11.2	+/-2.4
2013	31.2	+/-3.7	10.7	+/-2.1
2014	31.9	+/-3.4	11.6	+/-2.9
2015	29.0	+/-3.4	11.2	+/-2.3
2016	29.2	+/-3.3	12	+/-2.8

Census Bureau: American Communities Survey

Table 15

*Poverty rates, families with children under age 18 in zip codes falling within charter's 3000-ft radius, 2011-2016*

	Zip 1		Zip 2	
	%	Margin of error	%	Margin of error
2011	46.3	+/-6.2	18.2	+/-4.9
2012	47.3	+/-6.5	17.0	+/-4.1
2013	44.1	+/-5.5	17.3	+/-3.5
2014	45.4	+/-5.5	18.9	+/-5.1
2015	42.8	+/-4.9	17.8	+/-3.9
2016	40.4	+/-5.1	20.0	+/-5.3

Census Bureau: American Communities Survey

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Table 16

*Total population, percent population by race or ethnic origin, 2011-2016 – Hispanic can be of any race*

	Zip 1				Zip 2			
	Total Pop.	White	Black	Hispanic	Total Pop.	White	Black	Hispanic
2011	34644	31.4	69.0	18.8	38055	44.1	52.4	6.3
2012	35356	32.3	67.1	21.1	38296	43.6	52.7	6.7
2013	35885	30.1	68.4	18.6	39470	45.8	50.6	7.5
2014	36897	27.6	70.2	18.6	40084	47.9	49.3	8.4
2015	36702	25.8	72.0	16.3	40059	49.6	47.6	8.0
2016	37762	26.3	72.1	15.4	42187	49.5	48.1	8.1

Census Bureau: American Communities Survey

These data indicate little change in poverty rates up to 2016. Racial and ethnic origins also do not indicate radical change in either zip code. In zip code 1, the white and Hispanic populations decreased moderately relative to the black population. In zip code 2, the white and Hispanic populations increased somewhat while the African-American population decreased slightly. Zip code 1 experienced a 9 percent population increase, while zip code 2 increased 10.8 percent. On the whole, these are not dramatic changes and do not track with the definition of gentrification that Davis and Oakley used in their study of large cities. (2013)

The zip codes are more geographically expansive than the 3,000-ft. radii, so it is possible that small areas within the zip codes could be experiencing changes faster than the overall zip codes. However, the increase in prices seen in the 0-1500 ft. ring around the charter

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school do not show indications of rapid demographic change. This may indicate that the price appreciation may have at least a partial link to the presence of the charter school.

Finally, test scores may need to contrast even more starkly to result in a noticeable home price increase. The charter school's test scores are higher than nearby traditional public schools. For example, reading and math scores for all students from the past three years are:

Table 17

*Reading scores, all students, 2014-2016: percent passing state proficiency test*

	2014	2015	2016
Charter School	67	72	78
Nearby School 1	53	46	51
Nearby School 2	52	43	35
Nearby School 3	53	54	45

Table 18

*Math scores, all students, 2014-2016: percent passing state proficiency test*

	2014	2015	2016
Charter School	65	70	71
Nearby School 1	66	48	50
Nearby School 2	51	31	21
Nearby School 3	68	59	47

The charter school is outperforming the nearby schools, but the effect may need to be more dramatic to drive any marginal home sale price increases. Buerger determined that charter schools did impact house capitalization in Syracuse, NY, where the traditional schools were testing more than two standard deviations below the state average. The

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charter schools there were relatively better, being .89 standard deviations below the average. (2014)

Conclusion 2: The charter school did not have an adverse effect on home sale prices.

Much of the discussion above centered on reasons why there may not have been house price increases attributable to the charter school. However, it should also be noted that the charter did not decrease prices, either. As the literature review revealed, schools can be a negative neighborhood attribute, decreasing home values in the immediate area around them. (Sah, Conroy, and Narwold, 2016; Des Rosiers, Lagana, & Theriault, 2001) This effect was most notable for high schools; elementary schools showed less effect.

Horowitz et al. directly studied the effect of charter schools on home prices by first creating an underlying hypothetical valuation based on a number of housing variables, such as the number of bedrooms and demographic information, then layering the presence of the charter school on as a final variable. Examining home sales in a 2,000-ft. radius around each charter elementary school, they found that the charter schools had no noticeable effect on the property values in their neighborhoods. (Horowitz, Kiel, & Spector, 2011) This study was in harmony with Horowitz' findings.

Conclusion 3: The charter school's presence allowed a significant portion of charter school families to remain in the overall school district when they otherwise would have moved out.

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The home sale data, which focused on a specific radius around the charter school, were unable to conclusively detect a change in house capitalization due to the charter school's presence. This can be attributed in part to the fact that the charter school draws students from across the school district rather than from a smaller attendance zone. Also, with 266 families with a student at the charter school, it is easily plausible that the numbers are not sufficient to make a noticeable difference in the quantitative data. However, a significant number of parents of charter school students indicated that the presence of an alternative to the traditional public school system compelled them to stay in the city's school district. Only 16 percent of respondents said they were zoned for a traditional public school that they did not consider to be of low quality. When asked what their second educational choice would have been had their child not enrolled in the charter school, 25 percent would have enrolled in the school for which they were zoned. The rest would have taken action to avoid that scenario. Twenty-five percent said they would have moved out of the city school district; another 28 percent were unsure what they would have done.

Similarly, an exodus out of the school district seems destined to happen when students graduate from the elementary charter school. When the families were asked what they planned to do when their child had graduated the charter school, 32 percent said they would move out of the school district. A further 18 percent were uncertain what they would do at that point. The rest were split between various strategies of enrolling in private school, homeschooling, or hoping the open enrollment system would provide a path to a better traditional school. Three respondents said they would attend a charter middle school, although none currently exists in the school district, so it is unclear if the

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respondents were unaware of this or if they were referring to some other type of specialty school. None said they planned to attend a traditional public middle school for which they were zoned.

The desire to move out of the school district altogether seemed especially acute among the eleven respondents who said they lived within eight blocks of the charter school—equivalent to being within the 3,000-ft. radius surrounding the school. Their answers for questions 2 and 9 were:

Table 19

*Choices of respondents who lived within eight blocks of charter school*

	Second choice at time of enrollment	Plans for middle school
1	Move out of district	Move out of district
2	Not sure	Move out of district
3	Move out of district	Move out of district
4	Move out of district	Move out of district
5	Try to use open enrollment	Open enrollment; if not, then move out
6	Go to zoned traditional school	Private school
7	Move out of district	Move out of district
8	Private school	Move to different zone w/in district
9	Not sure	Not sure
10	Private school	Try to use open enrollment
11	Not sure	Try to use open enrollment

Together, the answers indicate that the charter school's presence was in fact retaining some homeowners in the school district, particularly in the area around the charter school, which straddled the attendance zones of three poorly performing schools. Of the seven respondents who said they would have moved out of the school district altogether

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if they could not get into the charter school, four lived within the 3,000-ft. radius around the charter.

According to one study, the instinct to seek higher academic quality is a facet of higher socioeconomic status (SES). Burgess *et al.* examined parents who fell into five quintiles of SES to determine what factors in school choice mattered most to them. On average, academic quality was by far the most important factor in parental preference among schools. With regard to the desire for academic quality, there was significant heterogeneity between SES groups: those in the lowest two SES quintiles reacted negatively to academic quality while the highest three quintiles responded positively, with the highest SES quintile being highly positive with high elastic demand. Demand was moderated by other factors, such as distance from home to school, the number of students receiving free meals, and any special educational needs. (Burgess *et al.*, 2014) A study of students in Washington, DC, found that academic proficiency was the largest predictor of student and family preference for a school (with a similar low-income aversion to schools with higher proficiency, although the effect was much more muted than the Burgess study). (Glazerman & Dotter, 2017) This effect seems to be consonant with the finding in this study. Because the charter's academic proficiency was substantially higher than the nearby traditional schools' results, parents in living in those schools' attendance zones were subsequently more likely to seek better academic attainment however they could—if not through the charter school then through open enrollment or physically moving.

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Conclusion 4: The charter school drew a significant portion of its student body from a relatively local area and had a minor effect of pulling families toward it.

Some of the responses showed evidence that the charter school drew an oversized portion of its students from a local area, although not quite as local as the 3,000-foot radius for most. Question six, which queried respondents on commute time, found that the charter school seemed to pull students from a relatively close area: 89 percent drove fewer than 15 minutes to commute to the school on a typical morning; 36 percent drove fewer than five minutes, or the student walked to school. Question 7 found that 39 percent did in fact live within eight blocks of the school—a very small slice of the overall urban school district. Thus, it can be concluded that the charter school had a local impact on retaining and attracting families, just not to the extent that it could register in the home sale data.

Ten respondents said they had moved either shortly before applying for the charter school or at some point after. Of these, half said they had applied to the charter because they already knew they would be moving closer to it. A slight majority, 55 percent, said the commute to the school was a factor in their decision of where to live. This leads to the observation that the charter school not only retains a relatively substantial number of families in the district, the charter pulled more than half of those who moved closer to it.

Conclusion 5: School choice in all of its forms is very popular among these urban residents and is a key component in their educational strategies.

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The survey clearly shows a strong desire among the respondents to access some type of school choice—if the charter school was not available, then open enrollment to a traditional public school that is deemed to be of better quality, an international baccalaureate program, homeschooling, or a private school. This was true at the time of application to the charter and, if anything, was even more true at the middle school level since none were willing to attend their zoned traditional middle schools. The principal of the charter school stated there are long wait lists for every grade and that this had been the case for “several years.” This would imply there is substantial unmet demand for more charter capacity in this school district. Public surveys reflect a broad acceptance of, and desire for, school choice. In 2016, 75 percent of likely voters supported charter schools, with 22 percent opposed. (Beck Research, 2016) Other forms of school choice also received large majority support. Only vouchers were controversial, with 53 percent in support. Support for charter schools can begin from a number of motivations. Stoddard and Corcoran noted:

Voters, elected officials and families who endorse charter schools may have a range of underlying motivations for their support: dissatisfaction with the performance of traditional public schools, desire for greater parental involvement or control, frustration with stringent state regulations or inefficient local bureaucracies, diverging preferences for education driven by a rise in local population heterogeneity, or other unmet demands for sorting across schools or districts. On the supply side, state-level advocacy groups who lobby for charter legislation or provide technical assistance to upstart charter schools may also explain differences in charter school growth across states and localities. (2007)

Charter schools are administered locally, but legislation authorizing them is a state-level decision. Stoddard and Corcoran’s 2007 study found that one of the larger factors negatively correlated with strong charter laws (i.e., laws that provide more opportunity for charters to form and wider latitude to operate) was the percent of unionized teachers in the state. Teachers’ unions were especially able to prevent or weaken charter laws. The

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researchers found that “a one-standard-deviation increase in the fraction of teachers who are unionized is associated with a twenty percentage point reduction in the likelihood that a law would pass.” Interestingly, they also found that, if a charter law is passed, the percent of students enrolled in charter schools increases with the fraction of teachers unionized, although the correlation is fairly weak. It seems that the interests of parents and teachers’ unions are not aligned.

The survey results provide an interesting “micro” perspective to the home sale data’s “macro” view. Because the charter school draws students from the entire school district, its impact on the 3,000-ft. radius is not as clear-cut as the attendance zone of a traditional public school. However, the survey data indicated that three quarters of the charter school families considered their zoned traditional public schools to be undesirable, and many were more than willing to move to a different city in order to access better educational opportunities. This seemed to have been most pronounced among the families living in the radius around the charter school, which were zoned for poorly performing traditional schools. The issue is even more pronounced at the middle school level: 37 percent of responding families are planning to move out of the school district when their child graduates from the elementary charter school. In short, although the numbers of families at the charter are too small to notice in the home sale data, most of the families are homeowners, and the presence of the charter school loomed large in their decisions to retain their residences in the school district. This was the only elementary charter school in this city. Had there been a larger number of charter schools, it is possible that families’ residence choices might have been more noticeable in the home sale data.

## RECOMMENDATIONS

The following section outlines several avenues of related research that this study did not pursue. Further research can delve into whether improved house capitalization from charter schools would become disadvantageous to the population the policy was designed to benefit. It could examine whether house capitalization could be spurred through the competition effect between charter schools and traditional public schools. Research could be expanded to include other forms of school choice—such as homeschooling, vouchers, and public school choice—and their effect on home prices in the context of poorly performing public schools. Research could also focus on how much school choice measures might draw in residents who are currently outside the urban school district but who might be tempted to move in under specific, stable school choice regimes. Finally, research may be undertaken to examine the relative desire for one form of school choice over another.

The first recommendation is that future research consider whether school choice policies have an unhelpful impact on urban affordability. This study did not address the issue of whether increasing property values and taxes are desirable from all standpoints. From the perspective of the local government, increased tax revenue would be welcome. But the

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purpose of many charter schools, especially in urban areas, is to provide disadvantaged students with a choice in schools. If the charter school were to increase property values enough to raise rents or home prices, it might price out of the area the very people it was meant to help. Research, including this study, seems to suggest that most charter schools in and of themselves would not increase prices to that level. And, by that measure, any kind of urban renewal program, such as enterprise zones or public housing reform, would face similar questions. More likely than being the sole catalyst for gentrification, charter schools may sometimes be part of a larger wave of urban revitalization. Nevertheless, the impact of possible rising house capitalization due to school choice programs on families of lesser means may be an avenue of future research.

The second recommendation is for future research to consider whether competition between charter schools and elementary schools can help to stabilize house capitalization. A substantial body of literature has taken up the question of whether charter schools have induced improvement in local traditional public schools through the competition effect. Given that test score improvements in traditional public schools are correlated with increased house capitalization, improving the proficiency of students in those schools would be a local government's most direct route to sustaining property values. However, this study did not review the effect that the charter school may have had on the performance of the nearby traditional public schools. The bulk of the research indicates there can be a very slight positive response in traditional schools in this circumstance. (Carpenter & Medina, 2011) In order for this competition effect to be realized, there would need to be some level of penalty for traditional public schools to lose students to a

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“competing” charter school. This is a matter of policy, which has been implemented in some states. Whether the changes are enough to impact house capitalization is an open question. This could be another avenue of future research.

The third recommendation is to expand this study’s topic to other forms of school choice. The literature includes a number of studies looking at the effects of inter-district choice, but few studies inquire into the effects of a voucher program, which would pay for part or all of private school tuition. Voucher programs are far more controversial than charter schools, so there are fewer examples. There is also little research into the home value impact of homeschooling. This growing practice, becoming more refined with each passing decade, could have more influence on families’ decisions to stay in attendance zones of poorly performing traditional public schools than voucher programs and perhaps other forms of school choice. To ensure quality educational opportunities to children, especially the poorest, local governments may need to attempt more radical reforms—most likely being a sharp reduction in the regulatory load on schools. In other words, traditional public schools may assume some of the features of charter schools.

The fourth recommendation is to further study residents of school districts surrounding the urban school district to determine how many either moved out of the city without having applied to a charter school or simply never considered living within the city’s school district at all due to the perceived low quality of the school system. Some research already exists and is noted in the literature review. For example, Bayoh et al. used a quantitative model to examine residential choices around Columbus, Ohio, and concluded

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that educational quality (measured by standardized test scores in math and English) was the largest factor in middle class “flight from blight” in the city. However, that 2006 study used data from the 1990s and did not specifically reference charter schools in particular or school choice generally, probably because these elements were still in their infancy then. Similarly, surveying residents on a large scale may yield information not found in home data. Bayoh did survey a large number of residents, but only for demographic information. Future research may seek to determine what the true deterrent effect on demand in school systems or attendance zones of academically struggling traditional public schools.

The final recommendation is that future research may examine the intensity of desire for various school choice options. This study did not rank the options, but it is quite possible that charter schools are seen as more desirable than an open enrollment system among traditional public schools. Other options, such as paying for access to neighboring school districts, homeschooling, or even voucher programs to private schools may have varying levels of desirability among parents. This information could be used by an innovative (and daring!) school district to draw families from competing local jurisdictions into itself. If large majorities of families interested in school choice are homeowners, as those in this study were, then this could conceivably increase demand for housing within that local jurisdiction—perhaps especially so in areas with depressed housing values.

## IMPLICATIONS

The following section will outline some of the policy implications from this study. In urban school districts that have a number of underperforming traditional public schools, school choice is an issue of value and justice for families seeking quality education for their children, which they are already paying for through their municipal and state taxes. Aside from that, governments may have an inherent interest in instituting charter schools or other school choice options because of the stabilizing effect on property values. Urban governments should consider increasing school choice options when demand is evident. An urban government may also consider using a form of attendance zones for charter schools if they are seeking to stabilize a certain area of the city. Finally, an urban government may opt to allow charter schools with particular focuses as a way to appeal to various populations that are at risk of leaving the city.

Charter schools exist primarily to improve the lives of children who otherwise may not have any good educational options. Aside from their effect on property values, charter schools can fulfill an important service by offering poorer families zoned to a poorly performing traditional public school a desirable and effective educational option. The academic performance of charter school students is varied but, on average, performance is at least equal to traditional public schools (Zimmer *et al.* 2012), and much of the variability of assessments of charter performance stem from study design. (Ackerman & Egalite 2017) To the extent that charter schools may exert a form of market competition

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on “competing” traditional public schools, charters may induce educational improvement in those schools as well. (Imberman, *Public Economics* 2011; Holmes, DeSimone, & Rupp 2003; Gray 2012)

However, for many students, the non-academic benefits of charter schools can be at least as important as the curricular ones. For example, one study examined a “no excuses” charter school, notable for relatively strict discipline and accountability among its students, and found that students were 19 percent more likely to enroll in college than incoming ability would have predicted. (Davis & Heller, 2017) Sass *et al.* tracked middle school charter students and found that not only did they persevere through high school graduation and into college better than those who had matriculated into traditional high schools, they had 12 percent higher earnings in the 23-25-year age range. Researchers attributed this to the inculcation of intangible factors such as grit and persistence. (2016) For the local government, those higher earnings could translate into tax efficiency in the future through improved employment, less crime, and more income per capita.

This desire for academic improvement and achievement may have a secondary effect of sustaining or possibly increasing home values in a school district, leading to a positive tax revenue by-product for local governments. If a city government sought to have a charter program positively affect house capitalization, it might consider the following to maximize that possibility.

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The first possible action would be to expand school choice options. Local governments in urban environments have effectively used charter schools to provide students and their families with educational options and improved quality. This study found that the demand for charter schools was greater than the available slots. In this case, there was no charter middle school for parents to consider after finishing the charter K5 school. This will likely lead to a relatively large number of families leaving the city. In places where attractive education alternatives are rare, urban residences tend to fill with younger, childless workers who will in turn leave when their children reach school age if they perceive no desirable educational options. This frequent turnover inhibits long-term residency in the city and decreases commitment to it among the citizens. In addition to charter schools, other forms of school choice, such as open enrollment into other public schools both within a district and between districts, might hold some promise of retaining families.

A second possible action is to consider having priority attendance zones for charter schools. This could be used to give a small but significant boost to housing within the defined boundaries. For most charter schools, their house capitalization impact will be spread throughout the school district. However, if a particular area of the city is facing downward pressure on property values and charter schools are being considered, then a priority zone for the charters might serve to stabilize those values, as Andreyeva's study found. The downside to this action would be to limit the available number of students needed to give the charter school critical mass.

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A third possible action is to create charter schools with a particular focus. One somewhat controversial element of school choice is to institute charters that are oriented toward the needs and/or desires of high-performing students. According to Brown and Makris, who call these “prestige charters,” these are marked by above average test scores, above average parental involvement, niche themes, and a substantially different socioeconomic and demographic profile than surrounding neighborhoods. To an extent, some of these descriptors apply to the charter school in this study. While Brown and Makris (2018) see these as a somewhat disconcerting development, largely for ideological reasons, this study merely notes this type of charter as one possible route for local governments. In some areas, especially those experiencing rapid demographic change, some disjointedness between neighborhood demographic profiles and a charter school student population will be almost inevitable. And from the perspective of preserving a property tax base, local governments may find this type of charter necessary and advantageous so long as the traditional public schools are not denied similar resources to improve at the same time. In fact, the greater the heterogeneity of an area, the more school choice may be preferred in order to satisfy the Tiebout sorting effect. (Stoddard & Corcoran, 2006) Otherwise, it seems, families may opt for the more traditional Tiebout signaling mechanism of voting with their feet.

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This study provided insight into the implications of a charter school on house capitalization in an urban school district, particularly in an area marked by poorly

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performing traditional public schools. The use of quantitative home sale data looked at actual homebuyer activity, which might be more reliable than surveys of what families might have done in the past or what they plan to do in the future. It also may pick up effects not related to academic proficiency at all, such as spurring commercial investment in what had been an economically moribund micro-location. At the same time, the survey can target individual attitudes and plans at a *sub rosa* level that the fairly blunt instrument of home sale data cannot. In the home sale data, the house prices in the immediate area around the school increased but not to a statistically significant degree, and the results were inconclusive when compared to two control schools. The survey results showed that the effects of a charter school on the residential choices of parents with school-age children were real, but they are spread throughout the school district. This seems to be especially true among families who were living in the attendance zones of poorly performing traditional public schools.

Some urban jurisdictions are facing widespread discontent with their traditional public school systems. Education is both the largest expense for local governments and a prime reason for residential choices among residents. (Bayoh, 2006) Many studies have found that house capitalization is influenced by the quality of the local schools, which seems to be ascertained mostly on the basis of tests of proficiency. When cities are faced with poorly performing schools, some residents will be apt to leave if options are not provided. Still others will be dissuaded from living within the urban school district at all due to the perceived low quality of the schools. This study found evidence that relatively high-performing charter schools may provide a way for urban governments to retain or attract

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families. To the extent this study is generalizable, these urban governments should consider providing school choice options such as charter schools, both for the academic benefit of the children in that school district as well as for maintaining their tax bases. They may also consider taking lessons from successful charter schools and applying relevant reforms to their traditional public schools, as these will likely always be host to the greatest number of children. Of course, the realities in urban politics might make both possibilities difficult.

Residents and real estate agents understand at a basic level what Charles Tiebout formally proposed: when the value proposition of a local government's services drop too far relative to their nearest competitors, residents will vote through their actions. For local governments, charter schools can provide one policy avenue to building a measure of municipal health, stability, resiliency, and buy-in.

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**APPENDIX A**

Permission Letter

December 22, 2017

[principal]  
[charter school address]

Dear [principal]:

I am writing to request your permission to invite the parents of your current students to fill out a short online survey. Essentially, I would ask if they consciously chose to move closer to [the charter school] or if they consciously chose to remain in the [charter's] school district because of [the charter school] when they might otherwise have moved out for school reasons.

As a graduate student in the Helms School of Government at Liberty University, I am conducting research as part of the requirements for a master of arts in public policy degree. The title of my research project is "Impact of a charter school on house capitalization in a Title I environment." There is much research into the connection between increased housing prices and school quality, but not as much with regard to the effect that charter schools may have. My intent is to determine whether the presence of a charter school in an urban environment of struggling traditional public schools can lead families to either move into the area or choose to remain in the area instead of moving out of the district. If this is the case, then property values may be bolstered, maintaining or increasing tax revenue to the local government. For this, I can use house sales before and after the beginning of [the charter school].

For part of my research, however, I would like to add a qualitative section that surveys parents of current students at your school to pick up information that might not appear in the quantitative data.

Participants will be presented with informed consent information prior to participating. Taking part in this study is completely voluntary, and there would be no compensation provided. I envision the process as simply being that I provide you/the school with the link to the online survey and you contact the parents directly with the offer to participate. This way I will not have personal email addresses.

I do not foresee any personal data being collected. Nevertheless, results will be stored on a password-protected computer for three years. After that, the data will be destroyed.

Thank you for considering my request. If you choose to grant permission, please provide a signed statement on official letterhead indicating your approval.

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Sincerely,

Mark Haskew

Graduate student in the public policy program at Liberty University  
mnhaskew@liberty.edu

**APPENDIX B**

Recruitment Letter

February 18, 2018

Dear Parents:

As part of the requirements of my studies for a master of arts in public policy, I am conducting research into the effect that a charter school may have on house prices in an area in which traditional public schools are academically struggling. For part of this study, I am examining home sale data directly. But for part of the study, I would like to survey parents of students at [the charter school] to see how the presence of your charter school may have affected your choice of where to live. I am inviting you to participate by filling out a brief online survey, which should take no more than ten minutes.

Your participation will be completely anonymous and no personal identifying information will be collected. You would be free to stop the survey at any time. Only one response per family, please!

To participate, go to: [online survey]

The first section of the survey will be your consent document, which will outline more details of the research. There is no compensation, but your participation could help inform local governments of ways charter schools might influence their city beyond the academic realm.

Thank you in advance!

Sincerely,  
Mark Haskew

**APPENDIX C**

The Liberty University Institutional  
Review Board has approved  
this document for use from  
2/15/2018 to --  
Protocol # 3117.021518

**CONSENT FORM**

Impact of a Charter School on House Capitalization in a Title I Environment

Mark Haskew  
Liberty University  
Helms School of Government

You are invited to be in a research study of how a charter school may influence families' housing choices in an area with academically struggling traditional public schools. As a parent of a student at [the charter school], you are invited to complete this online survey. Please read this form and ask any questions you may have before agreeing to be in the study.

Mark Haskew, a graduate student in the Helms School of Government at Liberty University, is conducting this study.

**Background Information:** The purpose of this study is to examine whether a charter school's presence leads families to either a) move into the school district to be nearer the school, or b) choose to remain in the school district when they might have moved out had the charter school not provided an option to traditional schools that have been denied accreditation.

**Procedures:** If you agree to be in this study, I would ask you to complete an anonymous, 10-15 minute survey. The survey will close within ten days of the initial announcement of its availability.

**Risks:** The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

**Benefits:** There are no direct benefits to survey participants. If the research indicates that charter schools can induce more demand for housing in a school district (or avoid families moving out), then stable or rising property values would lead to sustained or higher tax revenue for the local government. This information could thus inform local government education policy choices.

**Compensation:** Participants will not be compensated for participating in this study.

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2/15/2018 to --  
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**Confidentiality:** The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with [the charter school] or Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

**How to Withdraw from the Study:** If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Contacts and Questions:** The researcher conducting this study is Mark Haskew. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at (434) 592-7616 or at [mnhaskew@liberty.edu](mailto:mnhaskew@liberty.edu). You may also contact the researcher's faculty advisor, Dr. David Van Heemst, at [dbvanheemst@liberty.edu](mailto:dbvanheemst@liberty.edu). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 1887, Lynchburg, VA 24515 or email at [irb@liberty.edu](mailto:irb@liberty.edu).

Please notify the researcher if you would like a copy of this information for your records.  
**Statement of Consent:** I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

**APPENDIX D**

Survey Questions

1. Thinking back to before you applied to [the charter school], were you in the attendance zone of a traditional public school that you considered low quality/undesirable?
2. If your child had not been enrolled at [the charter school], what educational option would you have taken as a second choice?
3. When you applied to [the charter school], were you renting or did you own your home?
4. IF you moved your residence either shortly before applying to [the charter school] or at some point after acceptance there, did you apply to [the charter school] because you already expected to move closer to [the charter school] anyway? (If you did not move, please disregard this question.)
5. IF you moved your residence either shortly before applying to [the charter school] or at some point after acceptance there, did you consider your shorter commute distance to the school as one of the factors? (If you did not move, please disregard this question.)
6. Approximately how many minutes does it take to drive to [the charter school] on a typical school morning?
7. Do you live within eight blocks of [the charter school]?
8. Do you currently rent, or do you own your home?
9. When your child has completed their time at [the charter school] , what is your plan for his or her education after that?