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School's strategic responses to competition in segregated urban areas: Patterns in school locations in Metropolitan Detroit

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Abstract: School choice is intended to leverage competition between schools to produce better educational opportunities for disadvantaged students. Yet we know very little about how competition impacts entire populations of schools of different types in distributing educational options across segregated social landscapes. We draw on theories from the literatures on institutional environment, organizational behavior, and positioning strategies to investigate how different types of schools (public, private, and charters) respond to market competition within Metropolitan Detroit's highly competitive and segregated environment. Mapping illustrates patterns of school types that have opened, relocated, and closed relative to socioeconomic and demographic neighborhood contexts. Our analysis explores the location incentive of high vacancy rate as proxy for affordable spaces suitable for new schools. Findings suggest that competitive incentives have similar effects on different types of organizations.

Keywords: GIS; mapping; choice; competition.

**Respuestas estratégicas de las escuelas a la competencia en áreas urbanas segregadas:
Evolución de la localización de las escuelas en el área metropolitana de Detroit**

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Resumen: La libre elección de escuelas tiene la intencionalidad de aprovechar la competencia entre las escuelas para obtener mejores oportunidades educativas para estudiantes con desventajas. Sin embargo, sabemos muy poco acerca de cómo la competencia impacta poblaciones enteras de escuelas de diferentes tipos en la distribución de opciones educativas en espacios sociales segregados.

Basandonos en las teorías sobre medio ambiente institucional, comportamiento organizacional, y estrategias de posicionamiento investigamos cómo los diferentes tipos de escuelas (públicas, privadas y charter) responden a la competencia de mercado en el entorno altamente competitivo y segregado del área Metropolitana de Detroit. El mapeamiento ilustra los patrones de tipos de escuelas que abrieron, se mudaron, y cerraron en relación a los contextos socioeconómicos y demográficos barriales. Nuestro análisis explora la noción de incentivo de tasas elevadas de vacancia como una aproximación a la existencia de los espacios adecuados para nuevas escuelas. Los resultados sugieren que los incentivos competitivos tienen efectos similares en los diferentes tipos de organizaciones.

Palabras clave: SIG; la cartografía; elección, competencia; orientación.

Respostas estratégicas da Escola à concorrência em áreas urbanas segregadas: Padrões na localização das escolas na Região Metropolitana de Detroit

Resumo: A escolha escolar tem como intenção a concorrência entre as escolas para gerar melhores oportunidades educacionais para alunos desfavorecidos. No entanto, sabemos muito pouco sobre como a competição impacta populações inteiras de escolas de diferentes tipos na distribuição de opções educacionais em contextos segregação social. Baseados nas teorias da literatura sobre o ambiente institucional, comportamento organizacional e estratégias de posicionamento para investigar como os diferentes tipos de escolas (públicas, privadas e “charter”) respondem à concorrência no mercado dentro da area Metropolitana de Detroit que é um ambiente altamente competitivo e segregado. O mapeamento ilustra os padrões de tipos de escolas que abriram, mudaram, e fecharam em relação ao bairro contextos socioeconômicos e demográficos. Nossa análise explora o incentivo da localização de taxas altas de vacância de espaços como proxy sobre espaços acessível adequados para novas escolas. Os resultados sugerem que os incentivos à competitividade têm efeitos similares em diferentes tipos de organizações.

Palavras-chave: SIG; mapeamento; escolha; concorrência.

Introduction

School choice is one of the most popular school reform movements of the last two decades, with efforts such as charter schools, vouchers for private schools, and open-enrollment plans providing families with new educational opportunities. Market populists see this as a key step toward more equitable distribution of opportunity, since school choices — especially access to the “better” and more highly desirable educational options — were previously limited only to those who had the financial means to pursue alternatives to their local public schools, including purchasing a home on another district (Henig & Sugarman, 1999). Thus, some have argued that school choice is the new civil rights issue of our time, since it provides access to more and presumably better educational options, particularly for disadvantaged communities (Bennett et al., 1998; Holt, 1999; Will, 2003).

Furthermore, not only is choice expected to open up access to existing, high quality schools for families in need of alternatives, but the competitive effects of choice — as schools compete for the choices of consumers — are also expected to generate new and better options for poor families. This is thought to happen in two ways. First, pre-existing schools will be forced to improve. They will have to adopt more effective educational processes in order to attract and retain students, or risk

going “out of business” (Gilder, 1999; Ladner, 2000; Stossel, 2006). Second, in areas underserved by appropriate educational options, new schools (or campuses of existing schools) will emerge as supply responds to market demand of consumers for higher quality options in different areas (Friedman, 1994). If, as education economists have suggested, liberating the supply and demand sides will unleash the market forces needed to pressure schools to respond to the needs of underserved populations, then we should expect to see a private marketplace of schools offering alternatives for families who are the most dissatisfied with the quality of their current schools and therefore have the most to gain from different and presumably better educational options. We know that competition is shaping incentives for individual schools; for instance, some schools add all-day kindergarten to attract families (Arsen, Plank, & Sykes, 1999). Others have noted a beneficial impact of competition on academic outcomes, as in the comprehensive review by Belfield and Levin (2002) on the impact of competition on educational outcomes such as test scores, post-school wages, educational expenditures/efficiency, graduation/attainment, and teacher quality (see also Hoxby, 2002). Yet we know very little about how competition impacts whole populations of public and private schools in distributing different educational options across varied, and often segregated, social landscapes. This is critical because parents report geographic proximity as a central consideration in choosing schools (Henig & MacDonald, 2002; Kleitz, Weiher, Tedin, & Matland, 2000; Schneider & Buckley, 2002; Witte, 2000). Yet, as with some other choice-driven goods and services, competition between schools may cause some organizations to “cherry-pick” clients by offering services in some areas, while not in others, exacerbating overall inequalities in proximity to preferred options.

School choice is intended to generate competition between schools largely to leverage new and better educational opportunities for students attending failing schools. This notion is a form of what Frank (2000) calls “market populism” where competition-based reforms such as charter schools and vouchers can provide equitable opportunities for disadvantaged groups (Chubb & Moe, 1990; Friedman, 1962; e.g., Holt, 1999; McGroarty, 1996). Yet, we do not know how competition between schools actually generates and arranges quality options for families across urban areas. Specifically, how does choice and the consequent competition amongst schools for those choices influence organizational behavior in the education sector in creating options for those disadvantaged students most in need of alternatives?

This paper examines this issue by mapping educational options for families, as different types of schools respond to market competition in a racially segregated urban area. It draws from an ongoing project on the “Social Geography of School Choice” in examining school and organizational strategies in “positioning” themselves and/or their services within a highly competitive environment, as we seek to measure the overall impact of these strategies on alternatives for disadvantaged students. While the larger project is studying school choice across public, private and charter school sectors in metropolitan Detroit, the District of Columbia, and New Orleans, this article focuses on physical location of different types of schools (charter schools, the most mobile of the three sectors) in and around Detroit — the most racially segregated metropolitan area in the nation.

The dearth of school transportation services in Detroit highlights the importance of proximity for parents choosing different options. Therefore, this is a significant issue because the distribution of different choice options is directly related to the educational opportunities of various communities as defined by both demographic and spatial characteristics. In this study, we frame competition in terms of “positioning strategies” — specifically, the opening, moving, and closing of different types of schools relative to the demographic and socioeconomic characteristics of the surrounding neighborhoods. We formulate and operationalize the school’s response to market

competition in terms of its physical proximity to neighborhood characteristics and in relation to other schools nearby. By mapping the physical location of schools over time vis-à-vis demographic and socioeconomic measures of communities, this study determines the extent to which educational options are equitably available to disadvantaged students in the Detroit metropolitan area.

One of the most crucial decisions a start-up school makes is where it will locate. Although numerous studies of the locational patterns of nonprofit and for-profit firms have been made, location for different types of schools has been less studied. This is unfortunate, because schools also need to locate where they will have access to resources (affordable real estate), labor (supply of high-quality teachers), and consumers (students). To date, most research on school location has examined variables such as the racial and ethnic composition of the school's student population, student performance in standardized tests and other observed noncontextual neighborhood characteristics. Among those relevant for this analysis, Lubienski, Gulosino and Weitzel (2009) use industrial location literature to study the locational patterns of types of schools across local education markets. They made the point that geography is important, because different types of schools and educational organizations will locate where potential clients (students with particular socioeconomic and demographic characteristics) are to be found in a metropolitan region. This article uses such analysis to spatially relate education providers and needs within a highly segregated urban landscape. The use of Geographic Information Systems (GIS) techniques illuminates the kinds of schools that have opened, relocated, and closed relative to the demographic and socioeconomic distributions in neighborhoods, providing the supply-side view of market competition since the emergence of choice policies.

In the section that follows, we offer a brief outline of the policy context, considering the equity impetus for choice, and the intended effects as they are expected to reverberate through the organizational behavior of schools. Then we present a more complex, alternative theoretical framework for understanding likely strategic responses from organizations in competitive education markets. In doing this, we draw on theories from the literatures on organizational and locational theories as they apply to what we are calling "local education markets." Next we provide an overview of our methodology and data, concentrating on the tools used in a geographic analysis such as this. In the penultimate section we lay out the results of the geo-spatial analyses, providing descriptive maps to represent the patterns evident in this case. The concluding discussion offers a brief overview of the equity implications for employing the profit motive to expand educational access.

Institutional Environment, Organizational Behavior, and Positioning Strategies

While theories and policies endorsing school choice generally assume static consumer-provider relationships (as supply responds to demand), emerging evidence indicates more dynamic interactions between supply and demand, as schools formulate responses not only to other schools, but also to *differentiated* consumers (Lauder et al., 1999; Lubienski, 2005; Taylor, 2002). Although market-populists see students as a leveled client-pool for schools to pursue (for the per-pupil funding they bring), research indicates that schools competing in uneven social landscapes perceive students as differently-valued clients (Fiske & Ladd, 2000; Lacireno-Paquet et al, 2002; Lubienski, 2005, 2006a, 2006b, 2007a, 2007b). Given the difficulties of enhancing organizational effectiveness (Rothstein, 2004), schools can improve their market position by adopting "positioning" strategies not to produce, but to attract, "better" students.

This analysis draws on organizational and locational theories in outlining possible strategic responses for different organization types in competitive environments. Profit-oriented competitors introduced into a traditionally non-profit sector give non-profit organizations incentives to behave more like for-profits, with firms accounting for costs and profit potential in situating services for potential or preferred clients (McCann, 2002; Sinitsyn & Weisbrod, 2003; Smithies, 1941).¹ Consequent “positional warfare” in sectors such as education (e.g., Kirp, 2003) can take two forms:

- Literal positioning—*where* schools (especially new ones) locate relative to particular student types
- Figurative positioning—*how* schools position their services in the market, through image management, to enhance their relative status

Both strategies have implications for disadvantaged students’ access to quality educational options. However, for the purpose of brevity, we focus here on literal, geographic or physical positioning of school options, with particular emphasis on private schools, for-profit charter schools, and not-for-profit charter schools.² These types of schools, operating in local education markets (LEMs), have more freedom of choice to locate in preferred neighborhoods compared to regular public schools. As a case in point, charter schools regardless of their organizational orientation are often new, and therefore exemplify the advantage of having been recently located in particular neighborhoods as a result of conscious decisions by managers and founders, in light of local contextual factors.

The logic of strategic competition typically posits relatively generic patterns of organizational behavior, where rivals can quickly copy any market position and the incentives operating within an institutional environment shape organizational responses (Porter, 1998). Indeed, there is a strong theoretical basis for this logic. Neoinstitutional theory is particularly important in conceptualizing organizational responses within broader institutional environments. Theorists hold that formal organizational structure is, in varying degrees, a symbolic phenomenon, designed to demonstrate legitimacy and rationality rather than simply to achieve efficiency (Meyer, 1977; Meyer & Scott, 1983; Meyer et al., 1981, 1994). This theory has been leveled at education, where neoinstitutionalists argue that institutional environments cause educational organizations to become isomorphic — to become increasingly similar to one another — largely by shaping societal and professional assumptions about the technical core of schooling (Meyer & Rowan, 1977, 1978; Peterson, 1990). Especially for new entrants entering a strong institutional environment, there is a high priority placed on achieving legitimacy to enhance their chances of survival and resource acquisition, particularly in environments characterized by risk and uncertainty (Brown, 1992; DiMaggio & Powell, 1983) — such as in emerging education markets.

However, while this logic is cogent, it is also important to consider the different organizational types at play in LEMs and how those types may influence the behavior of education organizations in various circumstances. For instance, theorists often distinguish between mission- and profit-oriented organizations, which can extend choice and competition in public services such as education (Osborne, 1999; Osborne & Gaebler 1992). The question, then, is whether a school’s organizational type may distinguish its unique organizational behavior or whether, as incentivist logic

¹ An emerging literature focuses on social patterns around school choice in Britain, (Parsons, Chalkley, & Jones, 2000; Taylor, 2002), and on charter school location in the US (Arsen, Plank, & Sykes, 1999; Cobb & Glass, 1999; Glomm, Harris, & Lo, 2001; Henig & MacDonald, 2002).

² For analyses of figurative positioning in these and other local education markets, see Lubienski (2005, 2006a, 2006b, 2007a, 2007b).

posits, education organizations will respond to market-like pressures in ways that serve students in disadvantaged areas.

Because of the importance of location in business and real estate analysis, theories used to investigate locational decisions are producing useful hypotheses of the distribution of organizations relative to market demand (e.g., Smithies, 1941). Strategic factors that influence the locational choices of organizations include the need to compete on either low costs or by differentiating their products to meet specific client needs. Michael Porter (1998) addresses the role of location in competition using competitive advantage theory, arguing that location choice involves rediscovering the competitive advantages of high-need neighborhoods as a means of spurring development in these areas. To understand the competitive advantage of low-income neighborhoods, Porter (1995, 1998) notes that organizations build on the advantage of strategic location through local orientation. His competitive theory suggests that firms are locally oriented, and neighborhood's customer base (local market demand) and cost savings drive location and investment decisions. For example, location plays a role in organizational behavior within LEMs, including helping organizations to define feasible strategies for competing across different metropolitan areas. Spatial questions of location within and across segregated urban areas are particularly salient for more autonomous and newly created schools, as in the case of many charter schools, and representative of a crucial option for schools in competitive LEMs.

In view of the institutional structures, incentives, and positioning strategies at play in competitive local education markets (LEM), we can work from the following hypotheses with regard to the organizational behavior of LEMs:

- 1) As competition emerges, many schools will embrace competitive strategies that provide access to students with more preferred demographic characteristics, to enhance the schools' market position.

- 2) In these competitive environments, both mission- and profit-oriented organizations will adopt positioning strategies associated with for-profit behavior in shaping enrollment.

In this analysis, competitive pressures exist when multiple, separate providers are located in neighborhoods — providing families with different viable options. Regarding the first hypothesis, we examine the role of competition in generating and arranging educational options, as different types of schools locate themselves in a racially segregated urban area. The studies by Cobb and Glass (1999) and Lacireno-Paquet et al. (2002) explored in what ways charter schools are serving different demographic groups. The exploratory study by Cobb and Glass presented a significant question: to test whether demographic data reflect the racial and ethnic composition of students enrolled in charter schools. Lacireno-Paquet et al, on the other hand, provided interesting empirical evidence on a useful theoretical distinction between market-oriented and mission-oriented charter schools. These studies, however, did not assess where different types of schools locate as a matter of strategy, the contextual attributes of school location, as well as the relationship between schools and educational opportunities. A study by Henig and MacDonald (2002) examined this issue using statistical approaches. Although their study shed some light on political considerations in the distribution of equitable opportunity, the lack of geo-spatial analysis limited the ability of the study to consider multiple local contextual and competitive factors. Understanding how different types of schools are spatially located relative to the socio-demographic characteristics of their neighborhoods, and relative to one another, offers some illumination on the appropriate role of market forces in supporting the goals of public education.

To investigate the second proposition, we consider a school's essence as either a mission or profit-oriented entity in shaping its educational options in attracting competitors and clients (Weisbrod, 1998; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002). Organizational theory and

economic models of industrial organization offer some insights into the dynamics of locational behavior. In terms of their orientation to the market, their missions, and their alliances with various organizations such as EMOs and social welfare agencies, different types of schools may recognize incentives or a calling specifically to address the needs of underserved communities, where current educational opportunities are deficient or are inadequate. Mission-oriented charter schools and private, parochial schools might seek to operate on behalf of poor families to reduce racial and social-class isolation from community to community, to promote a particular value system, or to offer quality academic options where few are otherwise available. Profit-oriented schools — those with ties to corporate entities and those with private, entrepreneurial ambitions — might avoid students in poorer neighborhoods to maximize profits by shirking risks associated with disadvantaged communities.

It is possible that both profit- and mission-oriented schools considering entry into the competitive marketplace may sense incentives to avoid localities perceived to be risky, costly, or detrimental to the school's market position. This may indeed be the case in communities where the resources available to nonpublic providers are insufficient to seek out a higher proportion of "difficult-to-educate" students and to compete with public schools on the basis of cost and quality. Thus, the marketplace competition may in fact generate disincentives to increase the aggregate range of educational opportunities for students in disadvantaged communities. Indeed, the equity consequences of geographic or physical positioning of school options are largely an open question. We know little about institutional structures and incentives at play that guide positioning strategies. The locational attributes of schools have been a relatively underdeveloped area of research, but clearly have a very important role in understanding how the physical location of schools is mediated by organizational responses to competitive incentives within social and institutional contexts.

In regards to the second proposition, we examine the kinds of schools that have opened, relocated, and closed relative to the demographic and socioeconomic distributions in Detroit neighborhoods, providing a comprehensive picture of the locational aspects of schools in competitive local education markets. If a pattern of needs governs the geographic distribution of schools, then schools will attend to the needs of underserved communities, where current educational options are limited or are unsatisfactory. The existence of a private marketplace of schools (i.e., corporate entities, parochial schools, and mission-oriented organizations) calls our attention to investments that address the growing disparities in the social conditions of children and the continuing negative impact on educational performance of students with limited access to social and human capital. Such detailed spatial analyses of local environments are useful for assessing whether the competitive marketplace will produce greater incentives to improve options for students in economically and racially segregated public schools.

It is important to note that positioning strategies in competitive local markets are not expected to be the sole determinants of school locations in LEMs. A number of other factors may influence locations, including: issues of neighborhood stability, differences in public service amenities such as public safety or social structures/services, access to high-quality teachers or volunteers, unmeasured crime, zoning regulations that prevent schools from operating in certain areas or on particular streets, and availability of space on which to build or renovate a school. In addition, charter schools may rely on social networks and access specialized commercial space (office or industrialized) or multifunctional space near partners, business and community sponsors, or funders. Regardless, none of these factors preclude schools from engaging in positioning strategies within certain constraints. Unlike traditional public schools, many new and autonomous schools are not constrained by geographic boundaries and attendance zones and, if properly positioned, may compete for students across multiple neighborhoods. Leveraging these advantages

to pursue preferred clients (students) is an appropriate and, in fact, expected response to competition in the urban education marketplace.

The article's geospatial analyses examine the confounding impact of other variables to explain the presence of public schools, private schools, and charter schools in disadvantaged communities. Specifically, we examine rent levels or real estate costs separately from the level of disadvantage as context variables. Although anecdotal reports suggest that charter schools are likely to seek lower cost inputs such as cheaper rental space for their operations, few empirical studies have attempted to explicate the real estate aspects of school locational decision. Housing vacancy, as defined by the US Census, is the measure of unoccupied housing units in 2000. We use the vacancy rate as a proxy for demand in the real estate market. Considering the housing vacancy rate in terms of supply and demand, high vacancy rates would indicate low demand and thereby resulting in lower rents. On the other hand, high rents can be driven by strong demand and, thus, a low vacancy rate. This simple supply-demand dynamic can be seen in many metropolitan areas where the interconnectedness between housing market and commercial market is exhibited in a symbiotic mix of residential and commercial uses, particularly in high-density urban centers such as Detroit. A growing body of work has explored the spatial patterns of land use in urban centers in terms of mixed-use zoning (i.e., residential and commercial, commercial within residential, housing and non-housing within the same area, and housing units in close proximity to school sites; Howland & Lindsay, 1997; Song & Knapp, 2003).

The study assumes that housing vacancy can be an important measure to LEMs as it provides location incentives for organizations searching for affordable spaces for education. This assumption is supported in empirical studies that show residential housing, commercial real estate, and school site options within the metropolitan area are affected by a common set of conditions such as space utilization, growth in households and employment, and local economic structure (Atack & Margo, 1998; Immergluck, 1999; Marzluff et al, 2008). Fluctuations in commercial real estate tend to mirror the activity of the housing market (Frew & Wilson, 2002). Similarly, school site options in urban areas inherit, by virtue of their close proximity, the market characteristics of residential housing units. A study by Gripe (1973) highlights the similarity of markets in housing units and school sites in his analysis of the economic influences of well-developed and undeveloped elementary school sites that are located in close proximity to residential housing units. Previous research also confirms that there is no readily observed explicit real estate market for educational spaces, hence certain housing characteristics are useful to capture the less tangible attributes that affect the positioning of schools in urban areas (Bogart & Cromwell, 2000). The overall aim of this study is to spatially examine the aggregate response of different types of schools to market competition in terms of their physical proximity to socioeconomic and demographic neighborhood indicators while exploring the location incentive of high vacancy rate as proxy for affordable spaces suitable for new schools.

Research Context

Detroit represents an illuminating case for studying competition and the distribution of education options. Often described as a rusted out and dying industrial city, racially segregated, with a poor central-city ringed by a wealthier suburbia. The Detroit Public Schools district (DPS), which has been in a state of administrative turmoil for over a decade, has been losing about ten percent of its students a year to charter schools and other forms of choice, so that the city — which in the 1950s had almost two million residents — now has fewer than 100,000 students in DPS, while over 50,000 attend charter schools in the city or surrounding suburbs. With more locational freedom,

charter and open-enrollment options are putting pressure on Michigan's public schools, as well as private schools (Miron & Nelson, 2003). Several Catholic schools in the city have recently closed, merged, and/or moved to more affluent suburbs, and as urban public and parochial schools are closing, charter schools have opened. Choice reforms there have created a competitive education market across public and private sectors in which: (1) charter school policies have encouraged entry of new schools into the market, particularly those administered for profit; (2) policies allow students to choose schools across district boundaries; (3) those choices bring per-pupil funding; and (4) an over-supply of seats forces public and private schools to compete for students and funding.

Our geographical approach allows us to see aggregate school responses to competition, and, therefore, the potential of competition across school sectors for providing equitable educational opportunities for disadvantaged students. Moreover, Detroit, the most racially segregated metropolitan area in the nation, provides an excellent study site for how competition is arranging school options for different students. The Detroit metropolitan area is by the far the largest in Michigan, with over three million people in the region and about a third of them within the Detroit city limits. African-Americans make up over 85% of the school-age population in the city of Detroit, yet a small minority of the student population in most suburbs.

Methods & Data

This article uses geo-spatial and content analyses to delineate positioning strategies of schools, focusing on educational options for neighborhoods across metropolitan Detroit, the largest urban area in one of the leading states for school choice. Geo-spatial or "GIS" (geographic information systems/science) methods represent an intriguing approach to questions such as these involving data with spatial characteristics. GIS computer mapping programs produce geographic "layer" data, allowing researchers to perceive spatial relationships and patterns (Haining, 1990; Cobb, 2003). Rather than de-contextualizing data, as with traditional statistical methods, programs such as ESRI's ArcGIS situate school-level data within contextual maps of broader data. While relatively new to educational research, GIS is quite established in other fields, and has great potential for illuminating some key issues of school policy and reform (Cobb, 2003). Using geo-spatial approaches offers an advantage in analyzing data, not only in that it sets data within context, but in that it allows researchers to both test hypotheses as well as to discern unanticipated patterns in the data that might not be apparent using traditional statistical approaches.

Data for this study are drawn from multiple sources. First, longitudinal school-level data encompassing school location are taken initially from the Common Core of Data (CCD) and the Private School Survey from the National Center for Education Statistics (NCES) for Oakland, Macomb and Wayne counties in Michigan for the decade following the emergence of charter school legislation in Michigan in 1993. These data are then checked against state and other sources, and geo-coded to get a match rate of 95% for the 1,934 public, charter and private schools in the K-12 range in the three-county metropolitan area.³

Orientation as a profit- or mission-driven charter school is a key variable in this analysis. Charter schools are classified as mission-driven if they met the following criteria: they are managed by an independent or non-profit group such as a community organization, or if they are chartered by a local chartering authority. This second criteria is deemed to be an important consideration under the logic that local chartering agencies in Michigan (e.g., local or county-level school districts) are not

³ Efforts to include a layer of data on individual students are confounded by unreliable data sources from the state, due by unsystematic collection methods at the school level, and are therefore not reported here.

predisposed to grant a charter to a competitor within their own boundaries; instead, charters authorized by these organizations will be granted to non-adversarial schools, typically those serving a particular need that supports the mission of the district/chartering authority (for instance, a school for students at risk of dropping out of the district's regular educational programs). Schools are classified as profit-oriented if they are managed by one of the several for-profit education management organizations (EMO) active in the area.

Community-level data are drawn from the 2000 US Census tract data SF3 table for Oakland, Macomb and Wayne counties. We chose variables that would offer insights into the demographic, economic, and social characteristics of neighborhoods, and used the following variables for mapping those characteristics:

- percentage population age 0-17 years
- female headed households with children under 18
- unemployed population over 16 not in school or military
- percentage population African American
- percentage population over 25 with less than a high school education
- percentage population with public assistance income

The percentage values for the above variables are calculated in MS Excel. All tabular data are imported into MS Access geodatabases for mapping purposes. Next, we used the following shapefiles (from ESRI): Michigan county polygons, Michigan census tract polygons. The software used for the maps in this paper is ESRI's ArcGIS 9.3 ArcMap. For geo-coding by street address, the compiled table of all charter school addresses opened by 2003 is mapped. The resultant point features for charters include in their attribute table their start date, and type.

Census tract data are mapped using the census tract polygons. Census socioeconomic variables are summed with MS Excel to form a socioeconomic need index at the census tract level. Thus, the need index is the unweighted sum of the average percentages for each of the socioeconomic need variables at the census tract level. Map 1 shows the polygonal boundaries of census tracts shaded by the summed percentage values of socio-economic need or the socio-economic need indices. The shades of color represent the range from the lowest (light) to the highest (dark) need index values. These values are distributed into ten equal interval ranges (light to dark) of socio-economic need.

Maps are assembled with several layers. One or more are points or polygons representing data. School-level data (i.e., charter school orientation as mission- or profit-oriented) are represented with different point symbol shapes (circles, triangles). The variables used in geospatial analyses include school type (private, public, and charter), charter school organizational/orientation types (profit-oriented and mission-oriented) and the location movements of the foregoing school types where they opened, moved to, and closed at. Other layers serve as a contextual background such as polygon features outlining Detroit area counties. The points representing charter, public, and private schools are overlaid on this context map, showing the socioeconomic need indices of their census tract locations (see Maps 1-4). These maps are a necessary contextual background for the meaningful exploration of the literal positioning of schools vis-à-vis their surrounding neighborhoods and nearby schools. For example, profit-oriented and mission-oriented charter schools that opened in new locations (herein called new school entrants) are examined within one mile of closed private schools. Data for mission-oriented and profit-oriented charter schools that opened, moved, and closed are mapped over the spatial layer of socio-economic need indices.

To capture the quantitative values of socio-economic need index for school locations, the overlay technique is taken a step further. The school locations are overlaid on the tract polygon map

of socio-economic need indices with each tract's discrete value. In the process of spatial join, the index value for the census tract for each school falls inside is added to the school's attributes. By a similar method, analysis of real estate demand or rent levels is created with census tract attributes of the percentage of vacant housing units as the proxy attribute value assigned to the census tracts. Table 1 is derived from the analysis of the census need and housing variables for various categories of Detroit area schools.

Results

The geographic variations of socio-economic and demographic characteristics in charter schools within metropolitan Detroit are illustrated in Map 1. When the census tract need indicators are added, the result is the base layer shown in Map 1 and the subsequent three maps. As shown in Map 1, the overall range of census tract need indices is displayed from low to high in graduated shades ranging from .07 to 3.11. Table 1 also describes the socioeconomic need index and real estate demand context values for the different types of schools by spatially joining the school location points to the census tract in which they are located.

Table 1 illustrates that private schools that close are more often found in higher-need areas (mean need index of 1.08), than privates overall (mean need index of .85) in the Detroit metropolitan area between 1995 and 2003. Nearly all of the closed private schools are religious city schools. Map 1 shows nine mission-oriented charter schools that opened within one mile of closed private schools. Map 2 shows that ten opened profit-oriented charter schools are in closer proximity to the locations of closed private schools, suggesting that these charters may be occupying the same building once vacated by the privates that shut down. Both maps would suggest that many neighborhoods are seeing their tuition-funded private schools replaced by charter schools. As Table 1 shows, the locations of closed private schools have a mean need index is 1.08 while the mean need indices for locations of charter that opened (generally referred to as new school entrants) are, 1.26 for profit-oriented and 1.90 for mission-oriented charter schools. It appears that the charters opening near closed privates are in a lower-need market than the mean for mission- and profit-oriented charter schools. These results reveal that the closure of some private schools in Detroit is giving mission- and profit-oriented charter schools a market opportunity to capture the private schools' share of the education market, to gain the benefit of better prepared students from closed privates, and in the case of some profit-oriented benefit from the availability of the private schools' real estate.

Taken together, the results are consistent with the competition hypothesis espoused earlier, that is, many new charter schools will identify locational opportunities that provide access to students with preferred socioeconomic and demographic characteristics to enhance the schools' market position. Viewing locations choices as business opportunities connects location decisions to competition in the market. Thus, we could interpret the location of mission- and profit-oriented charters in proximity to closed private schools as reflecting incentives to use their autonomy to respond to a market opportunity — “better” students and enhanced applicant pool from which they are required to randomly select students.

Table 1
Real Estate Demand and Socioeconomic Need Index of School Locations — Detroit

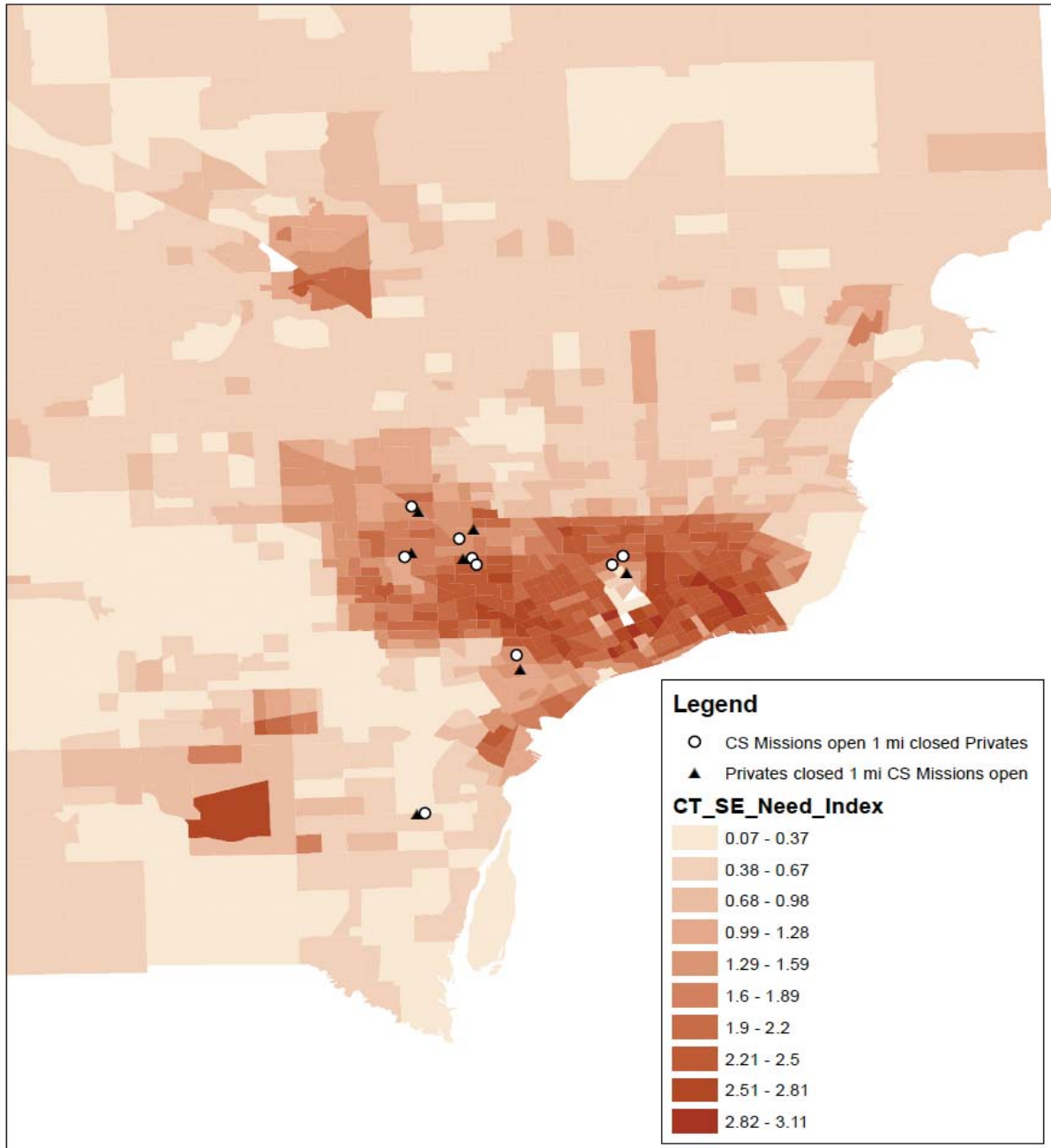
	Count	Pct Vacants (Real Estate Demand)				SE Need Index				Less than High School				PA Income			
		Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
Tracts	1158	0%	58%	6%	0.06	0.07	3.11	0.96	0.75	0%	100%	15%	0.11	0%	31%	5%	0.06
Privates	492	0%	30%	5%	0.05	0.07	2.86	0.85	0.68	0%	54%	13%	0.09	0%	27%	4%	0.05
Move From	15	2%	25%	10%	0.08	0.07	2.28	1.08	0.84	2%	26%	12%	0.07	0%	15%	6%	0.07
Move To	15	0%	14%	5%	0.04	0.20	2.51	1.07	0.84	5%	39%	18%	0.12	1%	26%	7%	0.07
Closed	143	0%	30%	6%	0.05	0.07	2.78	1.08	0.76	0%	49%	17%	0.10	0%	27%	6%	0.06
Publics	1181	0%	30%	5%	0.05	0.07	2.91	0.86	0.71	0%	62%	15%	0.10	0%	30%	4%	0.05
Closed	28	3%	28%	11%	0.06	0.66	2.80	2.07	0.48	14%	49%	26%	0.10	3%	24%	13%	0.06
Charters	80	0%	25%	7%	0.06	0.11	2.54	1.26	0.73	0%	51%	20%	0.11	0%	26%	6%	0.06
Open Locations	21	1%	25%	7%	0.06	1.28	2.52	1.78	0.35	3%	51%	23%	0.12	1%	19%	7%	0.05
Move From	21	1%	14%	6%	0.04	0.28	2.40	1.25	0.68	3%	51%	18%	0.10	1%	14%	6%	0.04
Move To 1	2	3%	5%	4%	0.01	0.66	0.92	0.79	0.13	15%	18%	16%	0.02	3%	5%	4%	0.01
Move To 2	3	2%	9%	4%	0.03	1.17	2.54	1.78	0.57	3%	25%	15%	0.09	1%	17%	7%	0.07
Closed	27	1%	40%	11%	0.09	0.26	3.11	1.90	0.74	4%	63%	27%	0.14	2%	27%	11%	0.07
Mission	3	6%	12%	9%	0.03	2.19	2.68	2.45	0.20	33%	51%	39%	0.09	9%	27%	15%	0.08
Open Locations	3	14%	21%	18%	0.03	1.20	2.01	1.68	0.35	23%	37%	28%	0.07	4%	13%	8%	0.04
Move From	2	6%	14%	10%	0.04	1.20	3.03	2.11	0.92	33%	37%	35%	0.02	5%	27%	16%	0.11
Move To 1	2	8%	17%	12%	0.05	1.40	1.98	1.69	0.29	18%	25%	21%	0.03	10%	15%	12%	0.02
Move To 2	2	8%	17%	12%	0.05	1.40	1.98	1.69	0.29	18%	25%	21%	0.03	10%	15%	12%	0.02
Closed	2	8%	17%	12%	0.05	1.40	1.98	1.69	0.29	18%	25%	21%	0.03	10%	15%	12%	0.02

Source: Authors' calculations using the Private School Universe Survey and Common Core Data (1995-2003) and 2000 US Census Bureau, SF3 Data.

Table 1 (Continued)

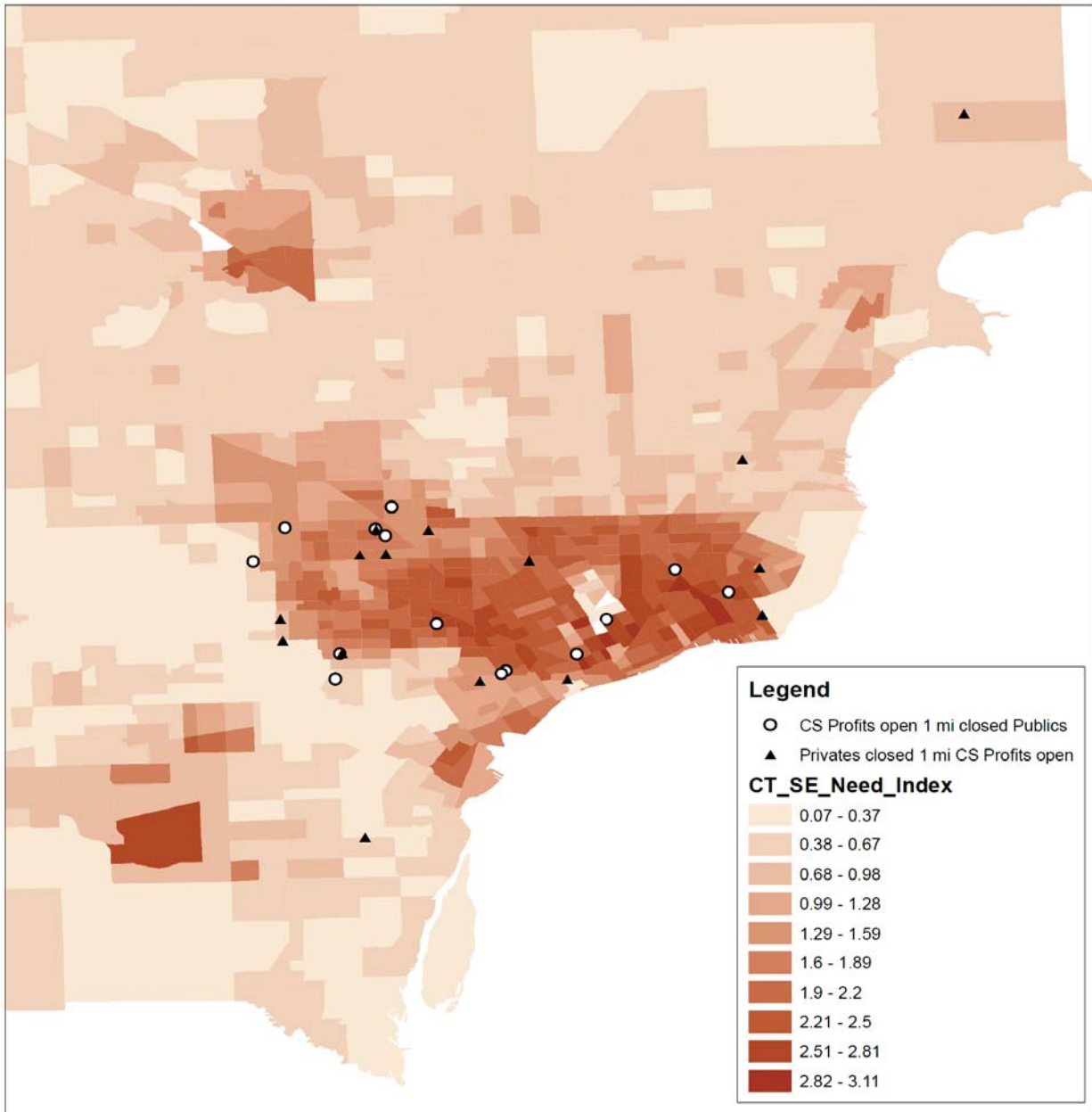
	Count	Pct Vacants (Real Estate Demand)				SE Need Index				Less than High School				PA Income			
		Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
Tracts	1158	0%	58%	6%	0.06	0.07	3.11	0.96	0.75	0%	100%	15%	0.11	0%	31%	5%	0.06
Privates	492	0%	30%	5%	0.05	0.07	2.86	0.85	0.68	0%	54%	13%	0.09	0%	27%	4%	0.05
Move From	15	2%	25%	10%	0.08	0.07	2.28	1.08	0.84	2%	26%	12%	0.07	0%	15%	6%	0.07
Move To	15	0%	14%	5%	0.04	0.20	2.51	1.07	0.84	5%	39%	18%	0.12	1%	26%	7%	0.07
Closed	143	0%	30%	6%	0.05	0.07	2.78	1.08	0.76	0%	49%	17%	0.10	0%	27%	6%	0.06
Publics	1181	0%	30%	5%	0.05	0.07	2.91	0.86	0.71	0%	62%	15%	0.10	0%	30%	4%	0.05
Closed	28	3%	28%	11%	0.06	0.66	2.80	2.07	0.48	14%	49%	26%	0.10	3%	24%	13%	0.06
Charters	80	0%	25%	7%	0.06	0.11	2.54	1.26	0.73	0%	51%	20%	0.11	0%	26%	6%	0.06
Open Locations	21	1%	25%	7%	0.06	1.28	2.52	1.78	0.35	3%	51%	23%	0.12	1%	19%	7%	0.05
Move From	21	1%	14%	6%	0.04	0.28	2.40	1.25	0.68	3%	51%	18%	0.10	1%	14%	6%	0.04
Move To 1	2	3%	5%	4%	0.01	0.66	0.92	0.79	0.13	15%	18%	16%	0.02	3%	5%	4%	0.01
Move To 2	3	2%	9%	4%	0.03	1.17	2.54	1.78	0.57	3%	25%	15%	0.09	1%	17%	7%	0.07
Closed	27	1%	40%	11%	0.09	0.26	3.11	1.90	0.74	4%	63%	27%	0.14	2%	27%	11%	0.07
Mission	27	1%	40%	11%	0.09	0.26	3.11	1.90	0.74	4%	63%	27%	0.14	2%	27%	11%	0.07
Open Locations	3	6%	12%	9%	0.03	2.19	2.68	2.45	0.20	33%	51%	39%	0.09	9%	27%	15%	0.08
Move From	3	14%	21%	18%	0.03	1.20	2.01	1.68	0.35	23%	37%	28%	0.07	4%	13%	8%	0.04
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Move To 2	2	8%	17%	12%	0.05	1.40	1.98	1.69	0.29	18%	25%	21%	0.03	10%	15%	12%	0.02
Closed	2	8%	17%	12%	0.05	1.40	1.98	1.69	0.29	18%	25%	21%	0.03	10%	15%	12%	0.02

Source: Authors' calculations using the Private School Universe Survey and Common Core Data (1995-2003) and 2000 US Census Bureau, SF3 Data.



Map 1. Detroit mission-oriented charter school locations relative to closed private schools and socio-economic need index.

Source: Authors' calculations using the Common Core Data (1995-2003) and 2000 US Census Bureau, F3 Data.



Map 2. Detroit profit-oriented charter school locations relative to closed private schools and socioeconomic need index.

Source: Authors' calculations using the Common Core Data (1995-2003) and 2000 US Census Bureau, SF3 Data.

Maps 3 & 4 analyze the sequence in which both mission-oriented and profit-oriented charter schools opened, moved, and closed during a period of rapid expansion from 1995 and 2003 across the metropolitan Detroit area.⁴ Of the 80 profit-oriented charters that opened, a total of twenty-one

⁴ Initially we began the analysis by disaggregating not only mission- and profit-oriented schools, but also with a sub-category of profit-oriented schools that were authorized by local public universities (the primary

charters moved once, two charters moved twice, and two charters closed down (Table 1). The distribution of charter schools appears to be more-or-less randomly arranged across the metropolitan region. The maps show that though there are many more profit-oriented charter schools than mission-oriented charter schools, the former are also more dispersed over most need levels. Profit-oriented charters show need index values between .07 and 7, suggesting their presence both in higher-need areas and lower-need areas. But over time, profit-oriented charter schools as a whole appear to be increasingly avoiding areas with more disadvantaged student populations. Map 3 reveals three profit-oriented charters closed down in high-need areas. The mean need index is 1.26 for all opened, 1.25 for moved, and 1.78 for closed (Table 1). The black arrows reveal that profit-oriented charter schools appear to move from higher-need areas to lower-need areas (Map 3).

The movement of mission-oriented charter schools that opened, moved, or closed is shown in Map 4. The analysis of the map summarized in Table 1 suggests that mission-oriented schools may be more likely to be located in areas with higher concentrations of high-need populations. Indeed, the only charter schools located in the area of higher need (need index values between 1.29 and 2.5) are mission-oriented. Although they make up 32% of the charter school market share in the area (consistent with the state-wide average),⁵ mission-oriented charters have a disproportionately higher mean need index than private schools, public schools, and profit-oriented charter schools. In the case of mission-oriented charters, the mean need index is 1.90 for all that opened, 1.68 and 2.11 for those that moved, and 1.69 for those that closed (Table 1). The black arrows reveal that mission-oriented charter schools appear to move from medium-high (1.29 need index) to higher-need areas (2.5).

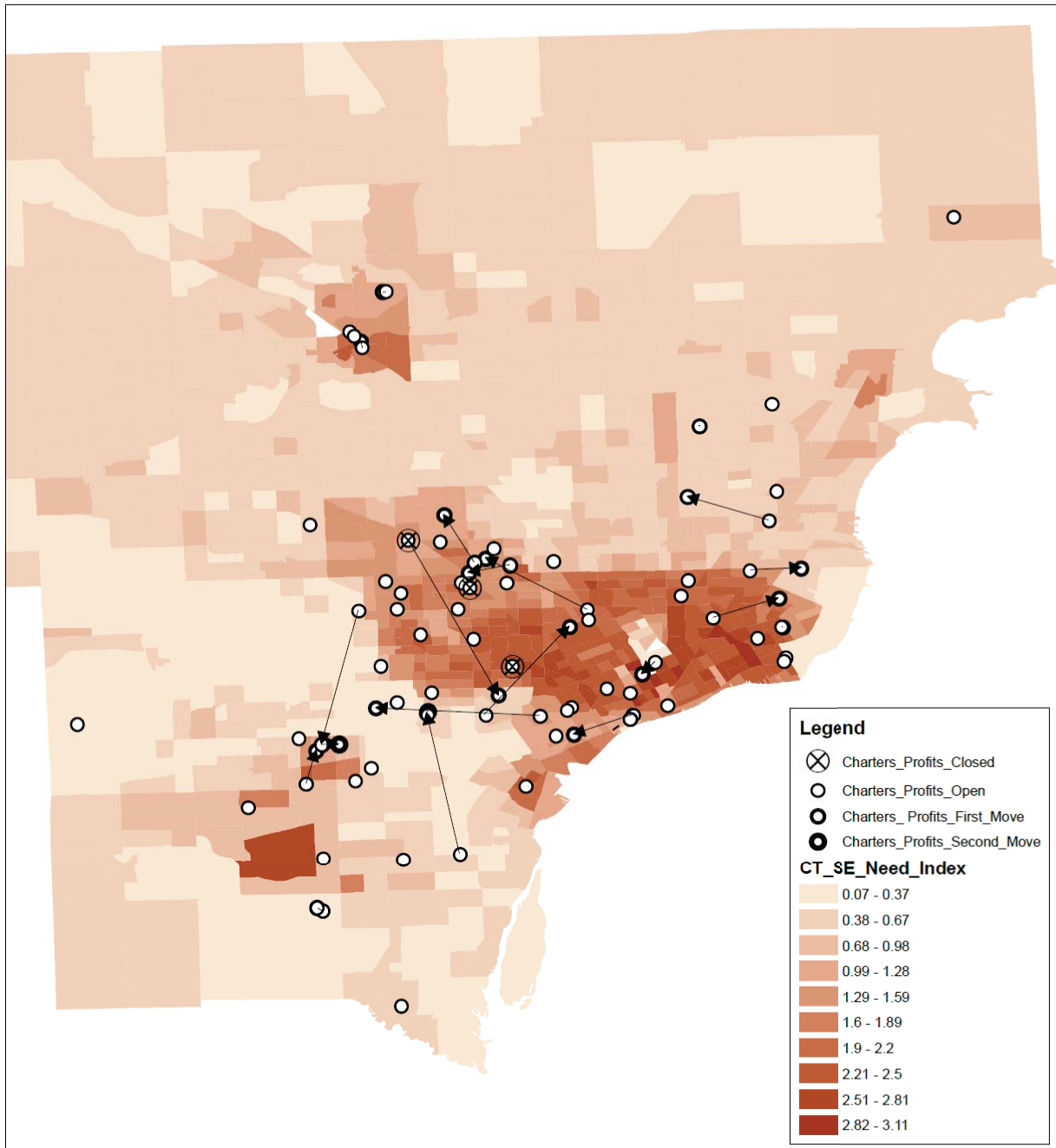
The breakdown of socioeconomic and demographic variables composing the need index is shown in Table 1. Across all variables, mission-oriented charter schools as a whole demonstrate greater attention to high-need areas than do profit-oriented charter and private schools. Mission-oriented charter schools appear to locate in census tracts where 72 percent of the population is African-American, compared with profit-oriented charter and private schools that locate where there are lower percentages of African Americans (46 and 25 percent, respectively). Mission-oriented charter schools appear to gravitate toward census tracts with the highest percentage of children (27 percent) but also to areas with relatively greater disadvantage in general, characterized by less-than high school education (27 percent), unemployment (7 percent), public assistance income (11 percent), and single-headed households with children (54 percent).

Finally, it is useful to consider the locations of school types and their census tract rent levels in order to explore the most likely alternative explanation for the patterns we are seeing: the availability of affordable physical space for schools. Vacancy rates also serve as a generalized proxy for the economic cost of schools moving to a particular location, and examining patterns by school type can shed light on how they respond to market incentives. Table 1 summarizes the vacancy rate (percent) for Detroit metropolitan area census tracts as a proxy for demand and rent levels in the real estate market. The mean vacancy rate in metropolitan Detroit is 5.99%. Profit-oriented charter schools appear to locate in higher rent areas (6.88% vacancy) compared to mission-oriented charter schools that locate in lower rent areas (10.99%). The former move to rent areas with similar ranges of values for higher rent areas (5.58% and 3.65%) and close down in areas with high-rental property (4.36%). Private schools, behaving like profit-oriented charters, appear to occupy similar locations

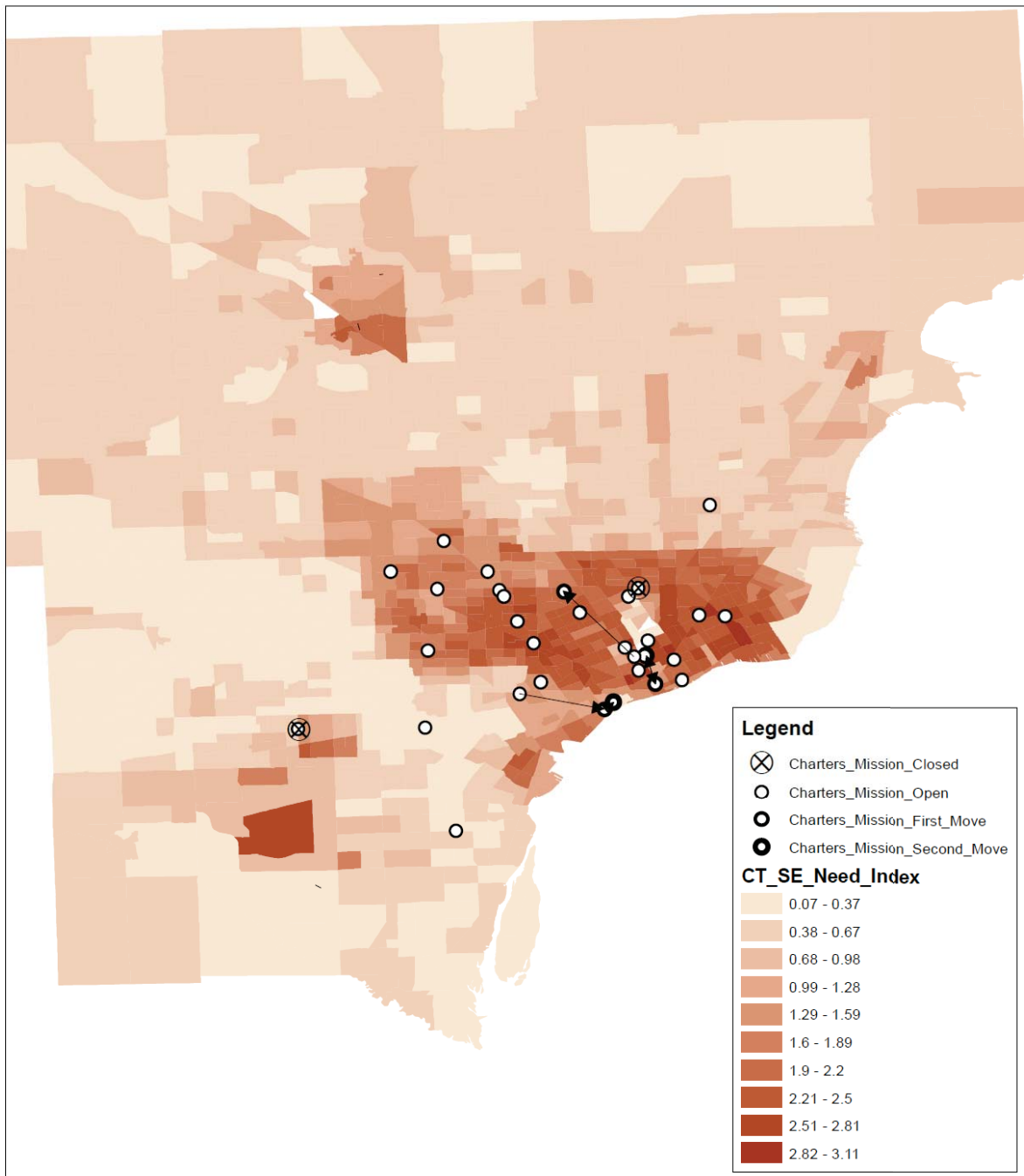
mechanisms for authorization in the state), as opposed to those authorized by public universities in other regions of the state. These last two categories were later combined since no noticeable patterns emerged.

⁵ This may also represent part of a gradual state-wide decline in authorization of mission-oriented schools. It may be that authorizers sought to reduce risk as time went on by authorizing only profit-oriented schools that had the backing of management companies, and the private resources they could bring to the table.

— that is to say, areas with low vacancy rates indicating higher rental property because of higher demand. Private schools open in higher rent areas (5.99% vacancy) and move and close in similar range of values for higher rent neighborhoods (5.46% and 5.80%, respectively).



Map 3. Detroit profit-oriented charter school locations relative to socio-economic need index. Source: Authors' calculations using the Common Core Data (1995-2003) and 2000 US Census Bureau, SF3 Data.



Map 4. Detroit mission-oriented charter school locations relative to socio-economic need index. Source: Authors' calculations using the Common Core Data (1995-2003) and 2000 US Census Bureau, SF3 Data.

Roughly the inverse of the above results, the mission-oriented charter schools appear to locate in lower rent areas (10.99% vacancy). They also move to similar range of values for lower rent areas (17.77% and 9.60%) and close down in areas with particularly low-cost rental property (12.03%).

Of note are the financial tradeoffs in considering rent levels or real estate costs in a school locational decision. It appears that profit-oriented charter schools and private schools are more willing to pay a premium for a good location in areas where they may serve more advantaged students. Both profit-oriented charters and private schools are serving areas of low social need (1.26 and .85 need indices, respectively in Table 1) but paying a higher premium for real estate. In contrast, mission-oriented charter schools appear to target needy areas (1.90 need index) in exchange for paying a lower premium for real estate.

On the whole, the results are consistent with the organizational and locational theories discussed earlier, that is, profit-oriented and mission-oriented charter schools appear to be adopting positioning strategies to gain market advantages — an organizational adaptation to business opportunities promoted by the marketplace. The above findings are notable because these charter schools are some of the more financially successful profit-oriented charters (EMOs) and mission-oriented charters, and they appear to be adopting strategies through which they reduce risk by utilizing the incentives that arise from choice and competition. For profit-oriented charter schools, key decisions about where to locate appear to be driven by the willingness to pay high real estate costs in exchange for “cherry-picking” students in more affluent neighborhoods. While profit-oriented charters have an equal presence in high-need areas (i.e. locate in need areas with need index values from .07 to 2.2 in Map 4), they essentially avoid areas with students who may be most likely to damage the school’s market position.

On the other hand, the physical locations of mission-oriented charter schools suggest that they are driven by business opportunities in areas with disadvantaged socioeconomic and demographic characteristics and where the cost of real estate is low. Mission-oriented charters, however, are more inclined to locate in nearby closed private schools, mostly areas vacated by parochial schools. Similar to profit-oriented charter schools, schools that opened in new locations (the new school entrants) that are mission-oriented may be less likely to serve some high-need populations than other mission-oriented charter schools and traditional public schools that never moved. These patterns over time (Maps 3 and 4) suggest that, not only are profit-oriented charter schools avoiding areas with more disadvantaged students, but that the increasingly competitive climate created through behaviors such as this may also be impacting the locational decisions of mission-oriented schools. In other words, the new entrants in the education marketplace may likely identify business opportunities that provide access to students with more preferred socioeconomic and demographic characteristics to enhance the school’s market position.

Discussion

Although our study does not allow us to delve into causal factors, the underlying premise for charter school locational decisions specified for the analysis is that similar values for nearby features (i.e., need indices and vacancy rates) occur because of similar conditions. A limitation of this approach is that the data at the census tract level date to 2000. For this reason, although school movement data is available over time, in this article it is overlaid on to a statistical “snapshot” of selected economic, social, demographic, and geographic census data for the entire Detroit metropolitan area. Vacancy rates and property values are not collected over time to coincide with the opening, moving, and closing of charter schools in specific locations. Also, with these data, we cannot infer strategic motivations for school locational choices. Nonetheless, the census tract-level data serve as the best available proxy measures for describing a variety of neighborhood-level variables between 1995 and 2003 — a period of rapid expansion of charter schools. The geospatial patterns uncovered in this study may have significant implications and should be investigated further.

A major challenge to this purely geo-spatial approach is that it assumes that the market positioning of different types of schools flows primarily across space, but cannot account for other factors (both spatial and a-spatial) that can independently explain the physical patterns of school location. For example, considering the unique space requirements of building and operating a school, it is entirely logical for new entrants to the school market to search for a vacant school building and locate in the physical space of closed private schools. While the analysis cannot rule out the possibility that some of the variations in the physical location of schools is attributable to the pragmatic features of the physical plant needs, there is still strong reason to suspect that schools enjoy advantages (or suffer consequences) from their proximity to the socio-economic profile of different neighborhoods. Nevertheless, further research should explore a variety of site, structural, and locational attributes such as the commercial or even light-industrial zoned buildings with a range of use-group types such as garages, warehouses, retail stores, factories or churches as a possible alternative explanation to the literal positioning of schools in emerging educational markets.

Another important area for future research involves a careful examination of mission-oriented charter school location behavior. It is plausible to suggest that the spatial arrangement of mission charters in high-need areas is not necessarily driven by altruistic motives at the center of their organizational behavior, but by other conditions independent of the nonprofit sector response to competitive LEMs. Two of several possible explanations are particularly worth exploring in future research. First, local school boards may encourage district-chartered schools (i.e., mission-driven) in disadvantaged neighborhoods to complement and expand upon other models of alternative education or dropout recovery schools. This arrangement is advantageous to high-need districts because mission-oriented charters may serve as place-based partners to expand educational opportunities for at-risk students while creating a competition-induced “ripple-effect” to other traditional public schools. In other words, key policy and institutional players offer a multi-faceted analysis of mission-oriented charters' spatial patterns. Second, further work should concentrate on validating our geo-spatial findings by examining the reasons why mission-oriented charters (including profit-oriented charters) have chosen to leave one place and move to another, and developing an empirical model of the relationship between location choice and organizational characteristics.

Our findings are suggestive of literal positioning and competitive strategies that indicate a high level of market acumen among charter schools. We find that most charter schools locate in areas where they have a competitive advantage, including the opportunity to target students with less-risky socioeconomic and demographic backgrounds. Ultimately, the GIS findings suggest that charter schools may most effectively engage in educational markets not by improving educational practices, but by locating in areas with preferred student enrollments. Specifically, new charter schools may target students in more advantaged neighborhoods where they can maximize business opportunities, but avoid neighborhoods of particular demographic mix or socioeconomic background. The GIS findings on the whole illustrate the market savvy of charter school operators, and once again, raise the importance of locational context in charter schools' locational decisions.

While this analysis represents only one part of a larger effort to understand schools' organizational responses to competition, the focus on different types of charter schools illuminates some important patterns closely associated with equitable educational access.

Current themes and future research from this project includes analysis of several important factors, including:

- overall arrangement of different types of educational options, including different types of district, charter, and private schools
- the types of curricular programs available to different communities

- internal characteristics of schools, including student demographics and academic outcomes
- non-locational strategic responses in areas such as curriculum and marketing
- the nature of different types educational markets.

Yet the current analysis, despite its limits, points to some interesting implications. It appears that efforts to harness the profit motive to promote equitable educational opportunities may not only be off target, but may in fact undercut efforts around such goals. While Michigan is somewhat unique in the extent to which it encourages the participation of profit-oriented organizations in managing charter schools, that unique attribute offers us an interesting case from which to study the impact of the profit motive. Organizational theorists have predicted that the introduction of competitive incentives can re-shape a sector, often leading to sorting of clients as organizations gravitate toward desirable clients, while minimizing risk by avoiding others. Moreover, these competitive incentives may be recognized initially more by profit-oriented organizations, which are more attuned to such incentive structures. However, as competition advances, mission-oriented organizations will also begin to recognize such incentives, and those pressures may also shape their behavior as well. The preceding analysis of different types of charter schools in the Detroit metropolitan area appears to lend some support to these hypotheses. Furthermore, while others have noted a tendency for some charter schools to serve more advantaged students, this analysis may illuminate one of the primary mechanisms by which this happens: location. Further study is needed in other contexts in order to determine the extent to which this is the case. A number of enhancements may be made to the procedure outlined here and to the geospatial methods adopted for its analysis; for example the use of a predictive GIS model for capturing meaningful differences in the character of urban neighborhoods that could well have direct impacts on the locational decisions of different types of schools.

Despite the questions that remain regarding the determinants of school locations in local education markets, the supply-side response to greater competition via literal positioning is an important area of inquiry. The integration of socio-economic and housing vacancy analysis into the locational patterns of schools over time affords us a unique view of the changing availability of schooling options across a segregated urban area. Our geospatial findings have broad implications for current legislative and administrative efforts to fine-tune the current rules governing charter school expansion, particularly among coalition of states awarded Race to the Top funds. For charter school proponents, this study helps to determine the competitive incentives that govern a school's organizational behavior, much of it targeted to encouraging charter school expansion and growth. For those concerned about equity, our findings suggest a need for close monitoring of the distributive patterns of enrollment, racial/ethnic and income groups, and the net effect of charter school location on neighborhood characteristics. As states continue to pursue aggressive education reform through charter schools, policymakers should focus on how market-like incentives may influence the aggregate range of educational opportunities available to underserved students and communities.

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