

Charter School Closure in Ohio's Largest Urban Districts: The Effects of Management Organizations, Enrollment Characteristics and Community Demographics on Closure Risk

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Abstract

This study builds on previous research investigating management organizations (MOs), charter school locations, and closure by examining the effects of MO type (EMO, CMO and freestanding schools), racial enrollment, student achievement, and the community characteristics surrounding each charter school in Ohio's eight largest counties with the largest urban school districts on the likelihood of closure between 2009 and 2018. We conducted a discrete-time survival analysis using life tables and binary logistic regression. Findings indicated that freestanding charter schools experience higher risks of closure than EMO and CMO managed charter schools in those counties. Although they are more likely to close, freestanding schools have higher student achievement in math and reading. Higher math proficiency reduces the likelihood of closure by 2.8%. However, community and enrollment characteristics are not statistically significant predictors of closure.

Keywords: charter schools, Ohio, management organizations, student achievement, closure, school choice

1. Introduction

During the early years of charter school development, most charter schools were opened by teachers, parents, and other community members as stand-alone schools (Bulkley & Fisler, 2003; Henig et al., 2005). Originally, the intent of the charter school movement was to support the development of independent and innovative schools that addressed the local needs of communities (Lubienski, 2004). However, administrators and teachers at independently run charter schools are often faced with the burden of running their schools with minimal external support (Wells, 2002). Consequently, the last five years have seen significant growth in management organizations (MOs). Now, the individual school approach coexists with a different organizational model that provides charter schools with established capacities to deal with many of the tasks involved in establishing and running a charter school while also providing a way for charter schools to attain a larger scale (Miron et al., 2012; Roch & Sai, 2017; Scott & DiMartino, 2010).

While MOs have continued to play a larger part in the school choice movement, researchers and policymakers have yet to fully understand the relationship between MOs and the risk of closure. Several studies have investigated organizational differences and working conditions among charter schools affiliated with for-profit educational management organizations (EMOs) or non-profit charter management organizations (CMOs) (Finnigan, 2007; Lake et al., 2010; Roch & Sai, 2018; Torres, 2014). Other studies have explored the enrollment characteristics of charter schools managed by EMOs and CMOs (Chubb, 2002; Booker et al., 2005; Ertas & Roch, 2014; Finnigan et al., 2004; Garcia et al., 2009; Lacireno-Paquet et al., 2002; Lacireno-Paquet, 2006; Miron & Nelson, 2002; Wamba & Ascher, 2003) or the strategic positioning of charter schools in areas that ultimately shape their racial and socioeconomic enrollment characteristics (Gilblom & Sang, 2019a; Gulosino & d'Entremont, 2011; Lubienski et al., 2009; LaFleur, 2016; Saultz & Yaluma, 2017). Moreover, several studies exist that examine predictors of charter school closure, including student achievement, age of school, early adopter status, and enrollment characteristics (Burdick-Will et al., 2013; Carlson & Lavertu, 2016; Gilblom & Sang, 2019b; Paino et al., 2014, 2017).

This study builds on previous research investigating MOs, charter school locations, and closure by examining the

effects of MO type (EMO, CMO and freestanding schools with no MO), racial enrollment characteristics, student achievement and the community characteristics surrounding each charter school on the likelihood of closure in Ohio. While other researchers have investigated one or several of these variables, no research exists that investigates the predictive value of these variables together on charter school closure. Therefore, this study contributes to charter school and closure literature by incorporating each of these variables in a discrete-time survival analysis using life tables and binary logistic regression to investigate charter school closure in Ohio's eight largest counties with the largest urban school districts between 2009 and 2018. In this paper, we refer to these geographical areas as Ohio's Big Eight Urban Counties (OBEUC).

OBEUC are fitting sites for investigating the connections between MOs and closure because more than half of charter schools in Ohio are affiliated with MOs, some of which are the largest MOs in the country (David, 2018). Also, charter schools in OBEUC with predominantly White or Black enrollments have higher closure risk in OBEUC, even when controlling for other factors (Gilblom & Sang, 2019b). However, the role of community characteristics on charter school closure in combination with MO type, racial enrollment characteristics, student achievement has yet to be investigated in these urban counties. Understanding these connections will help researchers and districts to support charter schools, and ultimately students, that are engaged in the school improvement process in Ohio's urban counties.

2. Literature Review

2.1 *Forms of Charter School Management*

Charter schools have the choice to determine how their school is managed, within the limits of the state's charter school laws. Three primary variations of the charter school organizational form exist—the freestanding, independent school, the education management organization (EMO), and the charter management organization (CMO).

Freestanding schools, often referred to in the literature as independent, stand alone or regular schools, are single schools that are independently managed and locally operated by school-specific boards. These schools are often started by groups of parents, teachers or neighborhood leaders who are dissatisfied with the rules and regulations of their local traditional public schools (Henig et al., 2005). Standalone schools started by groups of parents or community leaders are typically mission-oriented schools “whose missions are more likely to be defined by norms and ideas associated with educational professionalism, provision of social services, and grassroots visions tied to community and parental involvement, and local economic development” (Henig et al., 2005, p. 489). Some standalone schools are “formed to pursue the interests of a geographically defined group of citizens” (Henig et al., 2005, p. 493). These schools are often linguistically, culturally, or ethnically oriented and are shaped by localized values (Henig et al., 2005). Other mission-oriented schools are driven by a particular pedagogical practice, provision of social services, or vocational training (Henig et al., 2005).

Evidence suggests that freestanding charter schools have more financial, technical, and organizational issues than schools affiliated with a MO (Wilkins, 2013). Besides being an education institution, freestanding schools are required to perform business functions including payroll, applying for grants, negotiating a lease for the school, contracts and finances, among others. Many teachers, parents and community leaders can perform some of these tasks, but some do not have the expertise, or time, needed.

Other charter schools contract with a MO that has established network offices to manage multiple schools, either within one state or across several states, or to consolidate administrative activities, including personnel and information management, and curricular development (Hoxby, 2003; Scott & DiMartino, 2010; Scott, 2016). Two types of MOs exist: EMOs and CMOs. Generally speaking, an EMO is a MO with a for-profit tax status and a CMO is a MO with non-profit tax status (David, 2018).

In the 2016–2017 school year, nearly two-thirds (65%) of charter schools were standalone schools (David, 2018). Of the remaining 35%, 23% contracted with a CMO (24% of national charter school enrollment) and 12% contracted with an EMO (18% of national charter school enrollment) (David, 2018). In terms of national enrollment, the 10 largest EMOs served 78% of all EMO students while the 10 largest CMOs served only 36% of CMO students (David, 2018).

Although commonly used in school choice and education reform research, the term “charter management organization” continues to be defined differently by researchers and policymakers (CREDO, 2017; Farrell et al., 2012). For example, Miron and Urschel (2010) define CMOs as a subset of non-profit education management organizations, distinguished by “receiving substantial financial support from private foundations for the purpose of helping bring what they believe are successful models to scale” (p. 7). In their 2017 report, the Center for

Research on Education Outcomes (CREDO) defines a CMO as a non-profit or for-profit organization that oversees the operation of at least three charter schools and who is the charter holder for all of the schools they operate. Lake et al. (2010) defines a CMO as, “A nonprofit charter school operator managing more than one school with a unified management team responsible for delivering the educational program and supervising school leaders” (p. 10). The National Alliance for Public Charter Schools defines CMOs as non-profit entities that manage two or more charter schools and often provide back-office functions and services, including personnel decisions, professional development, data analysis, public relations and advocacy (National Alliance for Public Charter Schools, 2011). Also, they define EMOs as for-profit charter school managers that perform similar functions as CMOs (National Alliance for Public Charter Schools, 2011). In our study, CMOs are non-profit organizations that manage charter schools and EMOs are for-profit entities that manage charter schools. Our methods section provides more detail about our analytic approach.

2.2 Contrasting the Structures and Behaviors of EMOs and CMOs

Non-profit CMO and for-profit EMO-operated charter schools are generally viewed in the literature as two distinct organizational forms due to a variety of factors. First, the literature generally agrees that EMO-operated charters are private businesses with access to private equity to pay school start-up costs, including school construction or acquisition, and they are motivated by profit generation for the organization’s owners (Addonizio & Kearney, 2012; Bulkley, 2002, 2004; Huerta & Zuckerman, 2009; Miron & Nelson, 2002; Roch & Sai, 2018; Scott, 2016; Wilson, 2006). Given this, the motivation to create profit shapes the schools themselves. For example, for-profit EMOs operate according to a business model that includes large schools (Brown et al., 2004; Garcia et al., 2009; Henig et al., 2005; Miron & Gulosino, 2013; Molnar et al., 2006). Wilson (2006) estimates that an EMO-run school requires at least 500 students to be financially viable, as measured by the school’s return on investment. If a school enrolls less than 500 students, they will be unable to pay management fees or they will take years to recoup the organization’s initial investment in the school (Wilson, 2006).

To balance larger and more demanding classroom work environments for teachers, and to reduce costs, research indicates that charters managed by EMOs work to reduce the enrollments of students with special needs who require more resources to educate, including English learners, students who are poor, and students with disabilities (Chubb, 2002; Ertas & Roch, 2014; Garcia et al., 2009; Lacireno-Paquet et al., 2002; Lacireno-Paquet, 2006; Miron & Nelson, 2002; Wamba & Ascher, 2003). Lubienski and Gulosino (2007) found that many profit-oriented charter schools are located in more affluent areas and avoid areas with disadvantaged students while mission-oriented charter schools are located in higher need areas. Also, research indicates that EMOs are likely to engage in high-cost marketing campaigns to recruit students who require less resources to educate (Henig et al., 2005; Wells, 2002).

Additionally, EMOs also grant less autonomy to school-level decision making than intended by original charter school reformers (Brown et al., 2004; Bulkley, 2002). Frequently, school-level staff have less decision-making authority than those in other charter schools, including hiring, curriculum, instruction, assessment, and professional development (Brown et al., 2004; Bulkley, 2005; Miron & Nelson, 2002). Research also indicates that teachers working in schools managed by EMOs are often younger, less experienced and have lower salaries, which reduces costs, but may lead to higher levels of turnover (Anderson, 2005; Brown et al., 2004; Bulkley, 2002, 2005; Garcia et al., 2009). Oftentimes, EMOs incorporate standardized curricula across schools in an effort to differentiate their schools from others through branding (Anderson, 2005; Finnigan, 2007; Garcia et al., 2009; Bulkley, 2002). However, CMOs may also limit autonomy within their schools as they work towards a scale-oriented educational model or brand across all their schools (DeArmond et al., 2012; Hoxby & Murarka, 2009; Scott & DiMartino, 2010).

The term CMO was formed by the NewSchools Venture Fund, a San Francisco-based venture philanthropy, to differentiate non-profit MOs from their for-profit EMO counterparts (Wilson, 2006). In contrast with the profit-seeking motive of EMOs, CMOs have a community service orientation and may be more compelled to achieve their school’s mission or service goals (Henig et al., 2005; Scott, 2016). CMOs are distinguished by receiving substantial financial support from private foundations for the purpose of helping bring what they believe are successful models up to scale (Quinn et al., 2014; Scott & DiMartino, 2010). The first CMO is Aspire Public Schools which opened in 1999 in California with support from the NewSchools Venture Fund and later received additional multimillion dollar grants by the Bill & Melinda Gates Foundation, the Broad Foundation, and the Walton Family Foundation (Wilson, 2006; Quinn et al., 2014).

CMOs are non-profits that manage networks of charter schools that are typically located one region or state and use “common instructional models and school designs to achieve consistency and alignment across their schools”

(Huerta & Zuckerman, 2009, p. 420). The central organization of charter schools is a purposeful strategy that allows a CMO to “leverage their size and resources to help charter school principals and teachers overcome the entrepreneurial challenges of building and sustaining new schools in the complex environment of public education” (Huerta & Zuckerman, 2009, p. 420).

CMOs frequently operate in high-poverty and predominantly-minority neighborhoods that surround low-performing and historically underserved schools (Booker et al., 2005; Finnigan et al., 2004). There is also evidence that CMOs tend to manage schools with higher than average concentrations of high-needs students, students living in poverty, and minority students, giving these organizations experience with student populations similar to those commonly found in high-needs schools (Booker et al., 2005; Finnigan et al., 2004). Additionally, research indicates that charter schools managed by CMOs rely on young teachers who are energetic and are able to work more hours per week, they have work cultures that support long work hours of between 60 to 80 hours per week, and have challenging expectations for teachers that are positioned on meeting the mission and goals of the school (Torres, 2014; Lake et al., 2010).

2.3 The Geographic Locations of Charter Schools

A large body of research exists on the locational patterns of charter schools in the United States. Several studies employ geographic information systems (GIS) and U.S. Census data to create maps that uncover the locational positioning of charter schools in areas that are near, but not directly within, high poverty communities. For example, Gulosino and d’Entremont (2011) used geographic information systems (GIS) the percentages of non-White and White populations in New Jersey charter schools to the racial characteristics of their surrounding areas to investigate racial segregation in charter schools. Their findings indicated that larger shares of Black students are enrolled in charter schools than reside in the areas surrounding the schools. They state that the clustering of charter schools in areas adjacent to predominantly Black neighborhoods, areas that encircle the homes of the students they will likely enroll, may contribute to this pattern of racial segregation. Similarly, Saultz and Yaluma (2017) found that charter schools in Ohio’s city centers and avoid census tracts in which predominantly Black individuals reside or areas with the highest levels of poverty.

LaFleur (2016) also used GIS and data from the U.S. Census American Community Survey to analyze the socioeconomic characteristics of the local census tracts surrounding Chicago’s charter schools. Her results indicated that charter schools position themselves in lower socioeconomic areas and avoid the most disadvantaged areas. This finding coincides with other researchers who suggest that charter schools purposely avoid the most disadvantaged areas because students who are considered high-need require more resources (d’Entremont, 2012; Lubienski et al., 2009).

In an investigation of Cuyahoga Metropolitan School District (CMSD) in Cleveland, Ohio, Gilblom and Sang (2019a) found that charter schools cluster more tightly on the east side of Cleveland in predominantly Black and lower income neighborhoods than traditional public schools. However, while charters cluster in the east side of Cleveland, they locate in census tracts outside of predominantly Black neighborhoods. Consequently, these charter schools are more racially and socioeconomically mixed than traditional public schools located in predominantly Black communities (Gilblom & Sang, 2019a). This positioning may signal that charter schools intentionally locate near census tracts with larger shares of poor, Black individuals to benefit from the continuous enrollment of poor, Black students with limited mobility, while attracting students with higher academic achievement who require minimal educational resources and who could potentially boost the school’s performance (Gilblom & Sang, 2019a).

2.4 Predictors of Charter School Closure

Several studies have explored reasons for charter school closure. Carlson and Lavertu (2016) used a regression discontinuity design to examine the effects of the automatic charter school closure law in Ohio and concluded that students who were enrolled in at-risk charter schools experienced statistically significant math and reading score gains three years later, apparently because these students attended a higher performing school (Carlson & Lavertu, 2016).

Paino et al. (2014) conducted a mixed-methods analysis to investigate the “macro” and “micro-level processes” that affect charter school closure in North Carolina (p. 500). Using event history analysis, Paino et al. (2014) found that a poor financial condition increased the likelihood that a charter school would close, while market and bureaucratic accountability has less of an effect. They found that nearly 63% of closures were due to financial reasons and 29% for mismanagement. However, most of those closed schools were underperforming when compared to other schools. Also, Paino et al. (2014) indicated that reading scores are significant predictors of closure. As reading scores increase, the likelihood that a charter school will close decreases. However, when

federal financial per-pupil funding is included in their predictive model, reading achievement is no longer a significant predictor of closure (Paino et al., 2014).

Paino et al. (2014) also suggest that it may be easier to investigate a charter school for financial mismanagement than academic and bureaucratic problems. Paino et al. (2014) suggest, “North Carolina investigates and revokes charters due to ‘finances’ as a formal explanation, but perhaps tries to isolate academically poor charter schools in order to “weed out” those that are ineffectual” (p. 30). Given this, “these cases demonstrate the importance of financial mismanagement to the charter revocation process, a finding that in some ways contradicts the general perception that the success and accountability of a charter school is primarily measured in terms of academic outcomes” (Paino et al., 2014, p. 31).

In another study of charter school closure, Paino et al. (2017) examined the relationships between race and charter school closure, arguing that as charter schools tend to enroll larger proportions of Black students, Black students may be disproportionately disadvantaged by charter school closures. Using district-level data from the Common Core of Data (CCD), state academic performance data and demographic data from the Center for Education Reform (CER), they conducted an event history analysis and found that charter schools across the United States that enroll larger percentages of Black students are more likely to close. They also find that charter schools that are older and that have greater enrollments are less likely to close. However, academic achievement was not a significant predictor of closure, even among charter schools with larger Black enrollments (Paino et al., 2017).

Gilblom and Sang (2019b) conducted a survival analysis of charter school closure in OBEUC to investigate the potential relationships among racial and socioeconomic enrollment characteristics, charter school age and early adopter status, student achievement with the likelihood of closure. This analysis did not include the community characteristics surrounding each charter school. Using district-level data from the CCD, they examined 3,204 charter school years (424 charter schools) in OBEUC from the arrival of charter schools in 1998 through 2015 and find no evidence that student performance predicts charter school closure in OBEUC. However, when compared to charter schools with integrated enrollments, charter schools with predominantly White or Black enrollments face higher risks of closure in OBEUC, even when controlling for other factors.

Burdick-Will et al. (2013) investigated elementary charter school closures and openings during the late 1990s and 2000s in Chicago and their relationships with neighborhood and enrollment characteristics. Using data from the Chicago Public Schools, CCD, and the U.S. Census, they conclude that underperforming and underenrolled charter schools in disadvantaged neighborhoods were more likely to close and after controlling for educational demand, new charter schools were more likely to open in communities that showed signs of socioeconomic revitalization, areas with fewer White residents.

2.5 The Ohio Context

Enacted in 1997, The Community Schools Act, H.B. 215, added Ohio to the group of states that permits charter schools, or community schools, as they are referred to in the Ohio Revised Code. The Ohio Revised Code 3314.03 (2019) defines a community school as a public school that is independent of any school district, but is still part of Ohio’s public education system, like traditional public schools. However, while traditional public schools are overseen by elected board members, community school boards are not elected. Boards are accountable and responsible for all aspects of school performance, including the operational, financial, and academic performance of community schools and they also sign contacts with sponsors specifying the requirements that community schools must follow, including academic goals, performance standards for evaluation purposes, focus of the curriculum, financial plans, and qualifications of teachers (33 Ohio Rev. Code, 2019a).

Ohio has two types of charter schools: conversion schools and start-up schools. When all or part of an existing facility converts into a community school, this school is labeled a conversion school (Ohio Department of Education, 2019). Conversion schools are independent of the district, managed by a sponsor, and are permitted to operate in any Ohio public school district (Ohio Department of Education, 2019). Start-up charters are permitted to operate only in districts identified by the state as “challenged” or in Academic Emergency or Academic Watch status. Start-ups are permitted to operate in each of Ohio’s eight largest urban districts (Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Toledo and Youngstown); districts with low student achievement; districts that receive grades of D’s or F’s on the Performance Index on the Ohio School Report Cards and F’s on report card measures that report knowledge growth in math and reading; and in the lowest 5% of districts in Ohio’s Performance Index score rankings (Ohio Department of Education, 2019). No caps exist on the number of charter schools permitted operate in these “challenged” districts.

During the 2016–2017 school year, 26% of the 365 charter schools that operated in Ohio were CMO-affiliated, 28% were EMO-affiliated, and 46% were independent (David, 2018). Of the largest ten EMOs in the country, five operated in Ohio in 2016–2017: National Heritage Academies, K12 Inc., The Leona Group, LLC, Connections Academy, ACCEL Schools, and EdisonLearning (David, 2018). Of the 10 largest CMOs, four operated in Ohio in 2016–2017: KIPP, Imagine, Concept Schools and Summit Academy Schools (David, 2018).

2.5.1 Ohio's Automatic Closure Law

Ohio's automatic closure law was first enacted in 2006, became effective in 2008, and was last revised in 2019. Under Ohio Revised Code 3314.35 (2019b), charter schools face automatic closure by the state if they meet one of the following criteria: 1) The school has been in academic emergency for the last three school years; 2) if the school received a grade of "F" in improving literacy in grades kindergarten through three or the school has received a grade of "F" for the performance index score and for the value-added progress dimension; or 3) the school receives an overall grade of "F". Before the 2019 revision, charter schools were automatically closed if they were in academic emergency two of the last three years (33 Ohio Rev. Code, 2019b). Dropout recovery schools, special education schools, and schools in their first two years of operation are exempt from automatic closure (33 Ohio Rev. Code, 2019b). The closure law does not penalize MOs when the charter schools they manage meet academic closure criteria.

Ohio began identifying charter schools for closure during summer 2008 based on performance from the 2008 school year. The state notified 30 charter schools between 2008 and 2017 that they were required to close under the law for failing to meet minimum performance standards. No charter school has been automatically closed beyond the 2017 academic school year.

However, the ODE posts a spreadsheet listing closed charter schools and their respective reasons for closure on the Community School page of the ODE website (Ohio Department of Education, n.d.). After analysis of the 308 charter schools that closed between 2000 and 2020 in ODE's closure spreadsheet, we determined that one primary reason for closure is financial viability (111 closures). The second highest listed reason of closure is academic performance (55 closures). Contact nonrenewal or expiration is the third highest listed reason (41 closures) and merging with another school is fourth (24 closures). These reasons for closure were not included in our survival analysis due to the irregularity of the data.

3. Method

The purpose of this study was to identify a model of the likelihood of charter school closure in Ohio's eight largest counties with the largest urban school districts. The methods and variables we utilized were drawn from studies conducted by Paino et al. (2014, 2017) and Burdick-Will et al. (2013), studies analyzing the likelihood of closure across the United States and Chicago, respectively. We conducted a discrete-time survival analysis using life tables and binary logistic regression to examine the effects of enrollment characteristics, student achievement, community characteristics, and MO type (EMO, CMO and freestanding) on the likelihood that a charter school will close.

3.1 Data Sources

We created a longitudinal dataset that incorporates data from the U.S. Census, the U.S. Department of Education's National Center for Educational Statistics (NCES) Common Core of Data (CCD), and the Ohio Department of Education (ODE). CCD data included school enrollment characteristics and location. ODE data provided student achievement in math and reading, PI scores, and information about the year of and reason for school closure. The U.S. Census data referenced is the American Community Survey (ACS), 5-year estimates for the years 2009–2018 and includes census tract racial characteristics, income, educational attainment, home ownership, employment status, and the percent of households with school-age children.

3.2 Sample

Charter schools included in this study are brick and mortar charter schools located in Ohio's Big Eight Urban Counties (OBEUC): Cuyahoga, Franklin, Hamilton, Lucas, Mahoning, Montgomery, Stark and Summit. The largest eight urban school districts (Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Toledo and Youngstown) are located in these counties. Schools selected for this study are classified as 'regular' schools, meaning they are neither virtual schools nor vocation/alternative or special education schools. The sample included charter schools that operated or opened during the 2009 academic year. We chose the 2009 academic year because that was the first full academic year following the implementation of the automatic closure law. Charter schools that opened after the 2018 academic year were not included. Therefore, the sample includes 355 charter schools accounting for 2,417 school years. Of these schools, 133 closed between the 2009 and 2018

academic years.

3.3 Survival Analysis

Survival analysis is a collection of statistical method developed to model the timing of an event, as well as the causes and pattern of change, in longitudinal data (Allison, 2014; Yamaguchi, 1991). Discrete-time is used when the time span is large, such as half-year or year mark, whereas continuous-time is used to measure precise time unit, such as a minute, hour, or day (Allison, 1982; Kim et al., 2018). We use discrete time because we measure closure at a discrete time, at the end of the school year. Schools that operated in the 2018 academic year were censored because the observation period of this study ended and they had not yet closed. Our survival analysis includes a life table and binary logistic regression.

3.4 Life Table

We estimated the probability of closure for each period (each school year), and the overall probability of closure for each management organization type. The life table and charts were created using the Survminer package (Kassambara & Kosinski, 2018) in R (R Core Team, 2013).

3.5 Binary Logistic Regression

Four binary logistic models were tested to identify the variables’ predictive abilities on closure, which are shown in Table 1. The logistic regression analysis was conducted by the binary logistic regression procedure in SPSS version 24 (IBM Corp, 2016) and statistical significance was determined at a level of $p < .05$ or less.

Table 1. Binary logistic models tested in this study

Variable	Model 1	Model 2	Model 3	Model 4
School Age	X	X	X	X
MO Type	X			X
Enrollment racial composition		X		X
PI score		X		X
Reading proficiency		X		X
Math proficiency		X		X
Community racial composition			X	X
Neighborhood advantage			X	X
School demand			X	X

3.6 Variables

We drew upon variables and variable definitions previously used in other studies investigating closure, such as Burdick-Will et al. (2013), Paino et al. (2014, 2017), and Gilblom and Sang (2019b).

3.6.1 MO Type

This variable identifies each charter schools’ management organization (MO) as CMO, EMO, or freestanding. In this study, we define CMOs as non-profit organizations that manage the back-office functions and/or services including personnel management, daily management, professional development, information management, and educational program management for charter schools. EMOs are considered for-profit organizations that perform the same or similar functions. We identified the MO used by each school on the ODE website. We identified each MO as a CMO or EMO by entering the business name on the Ohio Secretary of State (SOS) business listing and cross-referencing with the U.S. Internal Revenue Services (IRS) website to determine non-profit or for-profit status. MOs were designated as a CMO if they were listed as a non-profit organization in either of the SOS or IRS website. EMOs were not listed as non-profit organizations. Charter schools without a MO, meaning those that were managed directly by a school board, were identified as freestanding (David, 2018).

3.6.2 Enrollment Racial Composition

We considered several measures of racial composition, including percent of White Students, percent of Black students, percent of minority students, and a school entropy index. We decided against using the separate race percentage variables because they were highly correlated. The school entropy index provided an interesting measure of segregated versus diverse schools but fell short in identifying the specific segregation that affected closure. Since the urban areas in Ohio still experience high level of segregation between White and Black residents, we calculated a composite variable that compared charter schools with predominantly Black, predominantly White, and diverse student bodies. Community racial composition and enrollment predominance

level was set at 75% or more, as used by Gilblom and Sang (2019b) and Paino (2017). We used the same process to calculate community racial composition.

We calculated *community advantage* and *community disadvantage* following the methods used by Burdick-Will et al. (2013). However, as was also identified by Burdick-Will et al. (2013), community advantage and community disadvantage were highly correlated and could not be included in the same model. Since the advantage variable had slightly better explanation of variance score (Naglekere R^2), it was included in subsequent models.

4. Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for all charter schools in OBEUC between 2009 and 2018. The ‘all schools’ column is calculated by averaging school and community data for all charter schools in the sample for all years of operation, while ‘closed schools’ is calculated from the last year of operation. The majority (67%) of charter school enrollment is Black, while only 46% of the residents in living in the census tracts surrounding the schools are Black. Slightly more than one-quarter (27%) of the households in census tracts with charter schools have school-age children. Table 2 also shows that overall, the characteristics of closed schools are not very different from operating schools. Other than math proficiency scores, which are slightly higher among operating schools, and Black percentage of enrollment, which is higher among closed schools, the enrollment and neighborhood characteristics are similar between operating and closed schools. In 2018, the last year of this study, 1,087 students in OBEUC experienced school closure. Throughout the results, we refer to charter schools that contract with education management organizations as “EMOs”, and charter schools that contract with charter management organizations as “CMOs”.

Table 2. Descriptive characteristics of schools

	All Schools N = 2,417	Closed Schools N = 133
PI score	63.98	61.00
% of students considered proficient or above in reading	54.33%	52.62%
% of students considered proficient or above in math	47.28%	41.44%
Median household income	\$30,283	\$30,104
Total enrollment (2018)	66,818	1,087
% White people in census tract	22.50%	23.51%
% Black people in census tract	45.84%	46.48%
% Asian people in census tract	34.19%	32.68%
% all other races in census tract	17.09%	16.20%
% Black enrollment	66.98%	72.47%
% White enrollment	19.33%	18.18%
% Asian enrollment	0.75%	0.31%
% Hispanic enrollment	7.65%	4.79%
% other race enrollment	1.74%	1.52%
% of census tract families with children 6-17 years	27.28%	26.70%
Neighborhood advantage Z-score	-0.0426	0.0191

Table 3 describes the neighborhood and enrollment characteristics of charter schools based on MO type. During the 2009–2019 school years, freestanding schools operated for 770 school years, CMOs operated for 538 school years, and EMOs operated for 1,109 school years. CMOs had higher PI scores and percentage of students who scored proficient or higher on Ohio’s reading achievement tests, while freestanding schools had the highest math proficiency scores and median household incomes. Freestanding schools and EMOs had similar percentages of Black enrollment—68.68% and 68.8%, respectively—about eight percentage points higher than CMOs. Conversely, CMOs had the highest percentage of Hispanic enrollment. Freestanding schools had the highest neighborhood advantage score. In 2018, EMOs served the highest number of students (33,748), compared with students in CMOs (17,489) and freestanding schools (16,668).

Table 3. Descriptive characteristics of charter schools by management organization type

	Freestanding N = 770	CMO N = 538	EMO N = 1,109
PI score	67.04	68.07	59.87
% of students considered proficient or above in reading	60.88%	55.56%	49.19%
% of students considered proficient or above in math	52.79%	49.61%	42.33%
Median household income	\$31,194	\$30,565	\$29,513
Number of students served	16,668	17,489	33,748
Mean school enrollment (2018)	321	302	284
% of White people in census tract	22.42%	23.07%	22.27%
% of Black people in census tract	45.37%	46.93%	45.63%
% of Asian people in census tract	35.12%	32.06%	34.57%
% all other races in census tract	17.09%	16.97%	17.14%
% Black enrollment	68.68%	60.81%	68.80%
% White enrollment	21.90%	21.67%	16.41%
% Asian enrollment	0.63%	0.84%	0.80%
% Hispanic enrollment	4.46%	11.27%	8.10%
% census tract families with children 6-17 years	26.18%	28.54%	27.44%
Neighborhood advantage Z-score	0.083	-0.059	-0.121

Figure 1 provides descriptive information for CMOs, EMOs, and freestanding schools in each academic year in the study. The number of charter schools peaked in 2013 with 266 schools, but by 2018 dropped to 229, just 20 schools more than the number of operating schools in 2009. The number of freestanding schools decreased annually, from 98 in 2009 to 52 in 2018. CMOs and EMOs, however, increased their presence in the Ohio urban charter school markets, rising from 38 and 73 in 2009, respectively, to 58 and 119, respectively, in 2018.

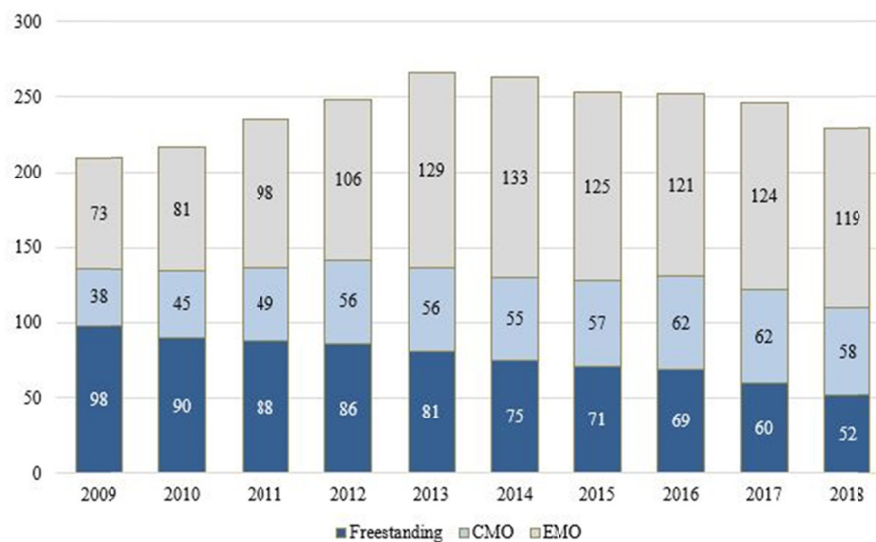


Figure 1. MO type by academic year

Table 4 illustrates that in the 2018 academic year, four CMOs operated between three and five schools, two CMOs operated six to 15 schools, and one CMO operated 16 schools. Conversely, five EMOs operated between three and five schools, five EMO operated between six and 15 schools, and one EMO operated 35 schools. Among CMO and EMO in 2018, about one-third of the companies operate two-thirds of the market: 62% of CMOs are managed by three companies out of a total of 13 CMOs, and 71% of EMOs are managed by six companies out of a total of 24 EMOs.

Table 4. Number of charter schools managed by each organization type

Management type	3–5 schools	6–15 schools	16–25 schools	26+ schools
CMO	4	2	1	0
EMO	5	5	0	1

Of the 67,905 students attending brick and mortar charter schools in OBEUC in 2018, 33,509 students (49.3%) attended schools managed by EMOs, 17,728 students attended schools managed by CMOs (26.1%), and 16,668 students (24.55%) attended freestanding schools. The largest EMO operating in OBEUC, Accel Schools, managed 35 schools that served a total of 10,584 students, accounting for over 15% of all students in OBEUC. National Heritage Academies, Inc. was the second largest EMO with 10 schools serving 6,189 students (9.11% of all students in OBEUC). Of all CMOs, Concept Schools operated 16 schools in 2018, serving 5,964 students (8.78% of all students in OBEUC). Overall, four EMOs (Accel Schools, National Heritage Academies, Inc, Imagine Schools, Inc, and Performance Academies, LLC) and two CMOs, (Concept Schools and Constellation Schools, LLC) served almost half (49.86%, or 33,855) of all students.

4.2 Life Table

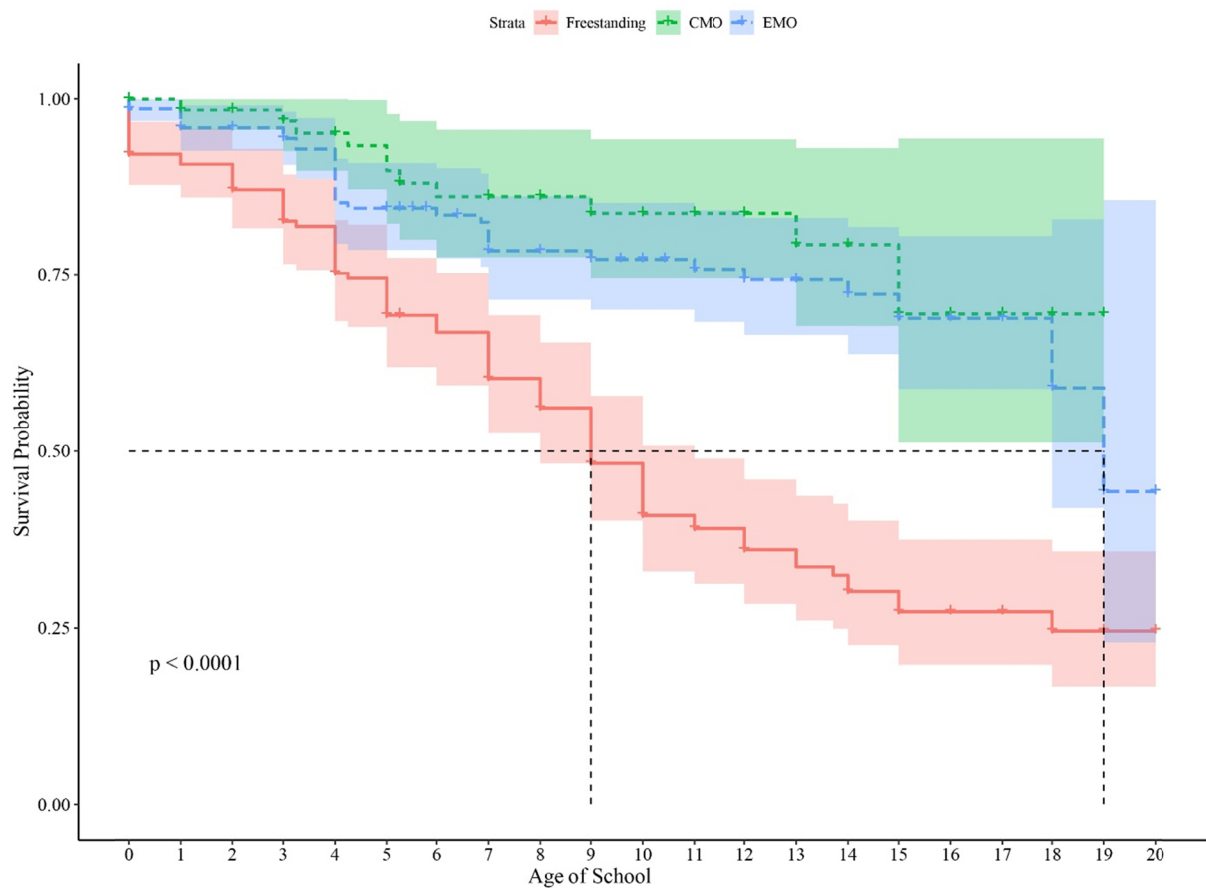


Figure 2. Survival probability by MO type

Figure 2 illustrates the survival functions of all schools divided by MO type in OBEUC from their first year of operation until their 20th year. The differences between the survival curves were statistically significant $\chi^2(2, N = 355) = 46, p < .01$, indicating that the probability of survival varies significantly depending on the MO type. The median survival time for freestanding schools ($n = 140$) is 9 years and for EMOs ($n = 148$) is 19 years. Eighty-eight freestanding schools and 34 EMOs closed between 2009 and 2018. There is no median survival time for CMO ($n = 67$) because the survival probability for CMO does not reach and fall below 0.5, as only 11 CMOs closed during this study. Results from the life tables analysis indicate that for schools operating in

OBEUC between the 2009 and 2018 academic years, CMOs have 69.5% probability of survival, compared with 44.3% for EMO and only 24.5% for freestanding schools.

4.3 Binary Logistics Regression Modelling

Our logistic regression modelling in Table 5 produces interesting and important findings regarding the variables that impact school closure in OBEUC that would not be fully understood by looking at the descriptive data. In Table 5, model 1, we find that the type of MO is a significant predictor of closure. Compared with freestanding schools, CMOs are 84% less likely to close (SE = .326, Wald = 32.630), while EMOs are 76% less likely to close (SE = .209, Wald = 47.941).

Table 5. Discrete survival analysis of charter school closure—odds ratios

Variable	Model 1 (95% CI)	Model 2 (95% CI)	Model 3 (95% CI)	Model 4 (95% CI)
School Age	.954 (.918–.992)*	.981 (.944–1.019)	.969 (.932–1.007)	.964 (.927–1.002)
MO Type (ref. Freestanding)				
CMO	.156 (.082–.295)**			.163 (.085–.313)**
EMO	.236 (.156–.335)**			.213 (.138–.327)**
Enrollment composition (ref. Diverse)				
75% or more Black		1.690 (1.139–2.508)**		1.433 (.946–2.169)
75% or more White		4.263 (1.912–9.503)**		2.215 (.912–5.379)
PI score		1.000 (.992–1.008)		1.000 (.991–1.008)
Reading proficiency		1.019 (1.005–1.032)**		1.009 (.995–1.022)
Math proficiency		.970 (.955–.984)**		.972 (.958–.986)**
Community composition (ref. Diverse)				
75% or more Black			1.002 (.626–1.604)	1.164 (.707–1.917)
75% or more White			.937 (.405–2.166)	1.234 (.501–3.039)
Neighborhood advantage			1.061 (.870–1.294)	.971 (.779–1.210)
School demand			.586 (.100–3.427)	.523 (.089–3.086)
Nagelkerke R ²	9%	4%	0.4%	12.3%
-2 Log Likelihood	952.854	995.920	1026.269	924.121
Hosmer-Lemeshow	.165	.565	.427	.123

Note. * p < .05; ** p < .01.

Model 2 examines the impact of school characteristics on the likelihood of closure. We discovered that schools with predominantly Black enrollment are 1.7 times as likely to close as diverse schools (SE = .201, Wald = 6.791), and schools with predominantly White enrollment are 4.2 times as likely to close as diverse schools (SE = .409, Wald = 12.567). The impact of academics on closure does not have a distinct directional effect on the probability of school closure. PI scores have no statistically significant impact on closure. Higher reading achievement slightly increases the likelihood of closure, while higher math proficiency reduces the likelihood of closure by three percent (SE = .007, Wald = 15.116).

In model 3 we examined neighborhood characteristics (racial composition, neighborhood advantage and school demand) as predictor of closure, and none of the variables returned as statistically significant predictor of closure.

Lastly, model 4 examined all variables together as predictors of closure. In this model, none of the variables other than math proficiency and MO type were statistically significant predictors at the .01 level of closure in OBEUC. These findings indicate that freestanding schools are the most likely of all MO types to close and that math achievement slightly reduces the probability (2.8%) of closure. Compared to freestanding schools, CMOs are 83.7% (SE = .333, Wald = 29.657) and EMOs are 78.7% (SE = .220, Wald = 49.570) more likely to survive, or not close. This also means that when considering all other variables, enrollment racial composition and reading achievement are no longer significant predictors of closure.

5. Discussion

Results of both the BLR and life table analyses indicate that community characteristics have no statistically significant impact on the probability of closure among charter schools operating in OBEUC between the 2009 and 2018 academic years. This finding diverges from Burdick-Will et al. (2013) that found that charter schools in disadvantaged neighborhoods experienced higher risks of closure, schools that were found to be also

underperforming and under-enrolled.

One reason our study may find no connections among certain racial and socioeconomic characteristics and the likelihood of closure in OBEUC may be due to the fact that start-up charter schools are only permitted to open in the following areas: school districts with the academic emergency or academic watch designations, urban districts with a poverty level greater than 30% and total enrollment exceeding 12,000, or any district ranked in the lowest 5% of school districts. The descriptive statistics displayed in **Table 2** highlights the similarities of the community and enrollment characteristics between open and closed schools. As start-ups in Ohio are only permitted to locate in high poverty, urban areas with larger shares of minorities, the community characteristics of the communities surrounding closed charter schools may not be significantly different from schools that remain open.

In the full BLR model with all tested predictor variables, MO type (EMO, CMO and freestanding) and the percentage of students scoring at or above the proficient level in Ohio's standardized test in math are the only statistically significant predictors of closure. Higher percentages of students scoring at or above proficient in math decreases the likelihood of closure by 2.8%. This finding contrasts with Paino et al. (2014) who indicated that reading scores and not math are significant predictors of closure.

However, while higher math proficiency reduced the likelihood of closure in OBEUC between 2009 and 2018, the impact of math and reading proficiency levels on future charter school closures will require investigation due to the revisions of Ohio's automatic closure law in 2019, which increased the number of years a charter school is permitted to operate while having academic emergency status from two years to three years. Under the previous rules, 52 charter schools across Ohio, the majority of which are in OBEUC, were at risk of being closed in 2019 (O'Donnell, 2019). However, due to the 2019 revisions, none of these schools were closed and they had an additional year to increase their grades. Future research that examines the connections among Ohio's updated automatic closure law, student achievement and closure is needed.

Regarding the finding that freestanding schools experience the highest risk of closure out of all MO types, one possible explanation is that freestanding schools lack the support systems established by CMOs and EMOs. As freestanding charters do not have a district or management organization to assist with the business and operations aspects of running a school, compounded with the possibility that some school leaders may not have the financial and business expertise necessary to manage these responsibilities, a realistic assumption is that freestanding schools are more likely to close. Figure 1 illustrates that the number of freestanding schools and their total enrollment in OBEUC are decreasing over time in OBEUC, which may be due to both difficulties in securing funding to open and/or operate a charter school and the challenges of operating a school without assistance from a MO. This finding may also correspond to the number one listed reason by ODE for charter school closure: financial viability. Therefore, charter schools managed by MOs may reduce their likelihood of closure because MO's offer the financial and operational benefits that ultimately prolong their longevity.

While freestanding charter schools have the highest risk of closure, the students who attend them have higher academic performances than students who attend schools managed by EMOs and CMOs. Table 3 indicates that freestanding charter schools outperform CMO and EMO managed schools in math and reading proficiency levels. EMO managed schools also have the largest share of charter schools and serve the largest share of students in OBEUC but perform the poorest of the MO types. The PI scores and math and reading proficiency of students at EMO managed schools are lower than CMO managed and freestanding schools. Therefore, freestanding schools have the highest achievement and the highest risk of closure while EMO managed schools serve the largest share students in OBEUC and are less likely to close. Charter schools with less risk of closure (EMO and CMO managed schools) do not have the best academic performance, but they have better longevity, perhaps due to operational and financial stability.

One concern regarding the growing number of lower academic achieving students enrolled in EMO managed schools is the mounting evidence that EMOs have not been financially transparent. Baker and Miron (2015) examined the ways in which "charter school policy functions to promote privatization and profiteering" (3). Some findings include: a substantial portion of public expenditure is being extracted for personal or business financial gain; the unnecessary transfer of public assets to private individuals and organizations; education organizations charging "lucrative management fees and rent extraction which further compromise the future provision of "public" education" (Baker & Miron, 2015, p. 3). The emergence of venture philanthropy in public education is also a concern as they have the capital to make decisions without direct involvement of the government and the community.

Gulosino and Miron (2017) argue that the dominant and dualist perspective that EMOs are "focused on

competition and profit maximization” while CMOs “do not define themselves by financial returns but by their mission” may not consider “emerging evidence [that] indicates a growing crossover between them” (363). For example, Wilson (2006) states that CMOs diverge from EMOs in five ways: “they are organized as nonprofit corporations to soften political resistance, manage only charter schools, limit or eliminate independent client school boards, operate initially in one state or region rather than nationally, and hew to a philosophy of cautious growth” (98). From this perspective, Wilson (2006) argues that the CMO non-profit structure is “a decisive advantage in the current political environment” when discussing the development of new schools with board members and community partners (98). Similarly, in their study of venture philanthropies and CMO development and expansion, Quinn et al. (2014) state that some charter leaders prefer the CMO organization form over EMOs because while CMOs have desirable traits of EMOs, including, “managerial acumen, administrative centralization, and rapid growth” they have the “the legitimacy of a nonprofit” (p. 957).

These issues suggest that private involvement in public schools, primarily that private entities can profit from public education, and they can legally limit public access to information due to private property rights, is a legitimate concern for public education (Baker & Miron, 2015). Policy makers, parents and community organizations must be aware of the entities involved in their local districts, entities that may be advancing school choice policies, to ensure the protection of the academic futures of students and the most efficient use of public funds.

6. Limitations and Future Directions

Some neighborhoods and cities in our study of OBEUC are racially segregated, which may have affected the analysis of the community racial segregation variable in the BLR. Future studies investigating communities surrounding public schools in Ohio would benefit from the examination of smaller geographies or the use of GIS methods that can account for racial similarities or differences in census tracts. Also, this study groups all charter schools together and does not differentiate between the grades served by each charter school (e.g., K-3, middle school or high school). The literature would benefit from a study that investigates the longevity of charter schools by grade levels served. This study does not investigate the role that sponsors play or the predictive value of sponsors in charter school closure. Future research that investigates the risk of closure or the general closure of charter schools by each sponsor would benefit ongoing discussions of school choice policy. Additionally, this study does not investigate the roles of a charter school’s revenues or expenditures on the risk of closure. Research that investigates these relationships would help to uncover further insights about predictors of closure. Finally, more research is needed to understand whether or not the charter school market in OBEUC are similar to other places in the country. Research that investigates predictors of charter school closure in other geographies will continue to inform the debate surrounding charter school effectiveness.

Researchers, community leaders, administrator and government officials should continue to evaluate the role charter schools within public education. For example, should EMOs be permitted to rapidly expand and profit from OBEUC when their students do not perform as well as freestanding charter schools? Should freestanding charter schools in OBEUC be given additional supports since their student achievement is higher? Does Ohio’s automatic closure law have the best interests of students or companies? These questions and others should continue to be pursued by researchers, as they explore how to improve public education and best serve students.

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