AN ANALYSIS OF ADMINISTRATIVE SPENDING ACROSS EDUCATION ORGANIZATIONAL FORMS

by

Tatia Lynn Prieto

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Approved by:

_____
Dr. Mickey Dunaway

_____
Dr. Claudia Flowers

_____
Dr. Corey Lock

_____
Dr. Amy Good

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ABSTRACT

TATIA LYNN PRIETO. An analysis of administrative spending across education organizational forms. (Under the direction of DR.MICKEY DUNAWAY)

This study compared administrative expenditures among 542 traditional school districts and 258 charter schools in Michigan, exploring whether one organizational model might better minimize administrative spending. A non-experimental correlational research design was used with 2014-15 data available from public sources. Both a replication and modification of an earlier study (Arsen & Ni, 2012) were used to model all analyses.

Multiple regression analyses were used to explore the predictive value of inputs on school, central office, and total administrative expenditures. Inputs included student enrollment, total revenues, percentage of students identified for special education services, percentage of students qualified for free/reduced meals, and whether the district/charter was in a rural area. Inputs specific to charter schools included years in operation, grades offered, and type of charter (for-profit, non-profit, or independent).

Replication of the original model found that charter schools spent more dollars and a higher percentage of dollars on administration, whether it was school, central office, or total administration. The results of the regression for total administration (including the additional variables for charter schools) indicated that the model explained 67.0% of the variance (R^2 =.670, F(11,788)=145.17, p<.01). Other than charter type, all variables were statistically significant. The charter variable had the largest coefficient—controlling for other factors, charter schools spent $775 more per student on total administration with $617 going to central office administration and $158 going to school

administration. These findings were consistent with the original study. Based on these data, Michigan charter schools are not minimizing administrative spending in comparison to districts. There was no statistically significant difference in administrative spending among the types of charter schools. Further research is needed as to why this difference in administrative spending persists between the organizational models of traditional school districts and charter schools.

DEDICATION

For Granma Ramona and Granpa Bob – your first granddaughter is finally a doctor, even if “it’s not that kind”.

ACKNOWLEDGEMENTS

This research study would never have been finished without the guidance and support of many people. First, I would like to acknowledge the encouragement and assistance of Dr. Mickey Dunaway, whom I met during my first week as a doctoral student in the Fall of 2010 and whose research into the organizational structure of school district central offices lighted my way through this academic journey. Second, I would like to acknowledge my statistics professors, including Dr. Rich Lambert and Dr. Do-Hong Kim, for imparting the knowledge I particularly sought in pursuing this degree. In particular I need to thank Dr. Claudia Flowers, who opened my eyes to the power of complex statistics and who walked with me through the intricacies of multiple linear regression as many times as I needed to survive Chapter 4. Third, I would like to thank Dr. Corey Lock who not only came out of retirement to serve on my committee but who also gave me a strong appreciation for the thought leadership and research of the education giants from the past 150 years. Finally, much thanks and many hugs to my ever-patient husband, as we travelled this long road together. I can't promise I won't feel the need for more education, but I can promise that any future journeys will be far shorter than this one!

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LIST OF ABBREVIATIONS

CMO	Charter Management Organization – charter school managed by a non-profit company
EMO	Education Management Organization – charter school managed by a for-profit company
MDE	Michigan Department of Education
CEPI	Center for Educational Performance and Information
SPSS	Statistical Package for the Social Sciences
TSD	Traditional School District

CHAPTER 1: INTRODUCTION

The dawn of the 21st Century saw the rise of two organizational structures as alternatives to the traditional school district, the independent charter school and the charter school organized as part of a charter management organization or education management organization (CMO/EMO). Whether the new organizational structures will dominate this century as the traditional school district did in the 20th Century is unknown, but they do offer a lens through which to examine traditionally held assumptions about how education and schooling "should" or "must" be provided.

Purpose of the Study

The overall goal of this research is to compare administrative expenditures among school districts and charter schools. For this study, administrative expenditures are considered in two levels: central office and school. Central office administrative expenditures cover costs for establishing policy, operating schools and the district, and providing facilities and services for staff and students, as well as purchasing, paying, transporting, exchanging, and maintaining goods and services for the school district. Central administrative expenditures typically include the costs for management and leadership positions located in the central office. In this study, central administrative expenditures do not include most costs associated with student transportation, child nutrition programs, or building construction. School administrative expenditures cover costs related to administrative responsibility for a single school, typically considered to

be largely the costs for the principal and other administrative positions within the school. Controlling for factors such as size and poverty, the pattern of both types of administrative expenditures between the traditional district and charter school organizational models could offer insights into how resource allocations vary and whether one organizational model might present an advantage over the other in minimizing administrative spending.

Background

Spending on education in the United States has increased steadily since the 1920s (National Center for Education Statistics, 1993). From 1960 to 2005, per student spending increased almost fourfold (Hanushek & Lindseth, 2009) and the trend is not abating – the National Center for Education Statistics projects that the 2010s will see continued increases in per student spending.

Concurrent with the increasing investment in educational spending, the organization of public education evolved. What were largely one-room independent schoolhouses in 1910 increasingly became part of multi-school districts, until, by the end of the 20th century, the school district overseen by a central office was the organizational norm. School districts numbered 127,442 in 1932, with an average size of just 204 students (U.S. Office of Education, 1960). By 2010, school districts numbered just 13,629, but with an average size of more than 3,600 students (Dillow, 2011). The growth in overall student numbers and the trend toward larger school districts provided the conditions for the development of the central office.

Despite the increasing investment, historically, educational spending in the U.S. has not been shown to have a statistical relationship with various measures of student

achievement (Tyack & Cuban, 1995). Fullan (2007) provided examples of how more money given to the school districts in Chicago, Milwaukee, and Seattle did not result in improved student achievement. Hanushek and Lindseth (2009) concluded that there was no verifiable relationship between overall school funding and student achievement. While money matters (Rebell, 2007), more money does not necessarily mean higher student achievement.

In a similar vein, research has not been able to establish a positive relationship between increased administrative spending and student achievement. Some research has even found a statistically significant negative relationship between administrative spending and student achievement (Brewer, 1996; Bohte, 2001; Walters, 2005). In the face of these data, one wonders why the trend toward larger districts, with their proportionate but nevertheless large central offices, persists. The data would seem to point to greater potential for improved student achievement with less administrative spending, perhaps reallocating administrative dollars to more direct instructional supports for students.

Although the conventional school district model may appear to be problematic, there have been few alternatives. Until the creation of the charter school concept in the late 1980s, the only other organizational models for American education were the private and parochial schools, but their substantial differences in sources of revenue made for difficult comparisons to traditional school districts. The growth of charter schools now provides an organizational counterpoint to traditional school district organization that is easier to study, as charter schools are also public schools. As of 2012-13, there were 6,100 charter schools nationwide (NCES, 2015). Some charter schools can be viewed as a

"school district of one" and are operated independently, while some are organized under a leadership group (charter or education management organization, or CMO/EMO) that approximates the traditional district central office. These relatively new organizational models allow one to ask a number of interesting research questions. If a central office is essential, then how does an independent charter school exist? Are the administrative expenditures of charter schools comparable to those of a public school district? Are the expenses for central office-like functions for CMOs/EMOs comparable to those in a public school district?

Some research has begun to explore these questions. Research on 17 CMOs found an average of 18 percent being spent on central administration in 2007-08, which was higher than the percentages found in other contemporary research on the central office in traditional districts (Toch, 2010). Among Texas schools, Taylor, Grosskopf, and Hayes (2007) found that 34 percent of the charter schools inefficiently allocated resources to administrators, while only six percent of the traditional schools did the same. Among Michigan schools, Arsen and Ni (2012) found that charter schools (independent and those in an EMO/CMO) spent a higher amount on central and school administration. These results seem to fly in the face of some of the arguments made by charter proponents, namely that charter schools would be less likely to have higher administrative costs than traditional school districts.

Research Questions

Because the rise of charter schools is relatively recent, the differences in administrative expenditures between districts and charter schools have not been widely studied. This study replicates one conducted with 2007-08 data from Michigan, using

2014-15 data from Michigan. This study will seek to fill a gap in the existing knowledge base, exploring these research questions:

- What are the recent levels of administrative expenditures in public school districts, independent charter schools, and charter schools in CMOs/EMOs? How do they compare to earlier research in general and to the original study specifically?
- Is there a relationship between organizational size and administrative expenditures per student that corroborates other research on flat economies of scale beyond a certain size? Does the relationship vary by organizational type?
- How do administrative expenditures per student compare between school districts, independent charter schools, and charter schools in CMOs/EMOs, considering both central office expenditures and school-level expenditures?
- To what extent do charter schools make relatively greater administrative expenditures at the school level, to the point that spending administrative dollars “closer to the student” is an important distinction between charter and regular public schools?
- What do the findings indicate for potential future education organizational structures?

Delimitations

Michigan offers a rich dataset with which to explore differences in administrative spending across education organizational types. Michigan was one of the early adopters of charter schools, first authorizing them in 1993. This provides a generally more

seasoned environment in which to examine financial outcomes. In 2014-15, there were 541 school districts and 302 charter schools ("Number of Public School Districts in Michigan"). This included public school districts with only four students all the way to Detroit City Public Schools with more than 40,000 students. It also included charter schools ranging in size from less than 40 to more than 2,300 students and some of all three charter organizational types (independent, CMO, and EMO). This provides natural experimental grounds and, as a number of Michigan school districts are the same size or not much larger than a charter school, the comparisons do not have to be interpreted through considerations of scale.

All traditional school districts and charters for which publicly available data could be gathered were included in the study. Michigan education organizations annually report financial expenditures to the Michigan Department of Education and the State of Michigan Center for Educational Performance and Information (CEPI), using an established common accounting system, the Michigan School Accounting Manual. Reporting is guided by a detailed methodology that helps ensure expenditures are reported in the same manner from one district or charter to the next. For central office administrative expenditures, reporting agencies are instructed to report expenses in one of two function code categories: 23x for general administration and 25x for business office. School administrative expenditures are reported in function code category 24x.

Limitations

Although the districts and charter schools have guidelines by which to classify expenditures, it is possible that those responsible for reporting expenditures across the entities did not do so in a consistent manner. It is also likely that some expenditures

classified as administrative were not entirely so. This is likely to be a bigger problem in the data from small school districts and charter schools where, for example, the superintendent may also regularly fill in as a substitute bus driver or the principal also teaches one period a day but this non-administrative time is not parsed and costed separately.

There may also be underlying differences in the seniority of administrators between school districts and charter schools. The path to principal and superintendent in a school district may take longer than in a charter school, which could result in higher pay and therefore a higher percentage of dollars going toward administration. In addition, there are differences in retirement benefits requirements across the organizational types. Traditional school districts and charter schools that employ their own staffs must participate in the state's pension system, which includes options for defined-benefits and defined-contributions retirement plans ("Public School Retirement Plans"). Staff hired through an EMO charter organization do not participate in the state pension system and may have lower levels of retirement benefits, thereby potentially lowering personnel costs (Arsen & Ni, 2012).

Assumptions

This study assumes that districts and schools provided accurate data on administrative expenditures. Sampling bias was limited, as the entire population of districts and charters schools with reported data and operating general education programs were included. Other biases were minimized as follows:

- Procedural bias was minimized by using original electronic data to avoid re-keying and by comparing re-keyed expenditure data with original documents when re-keying was necessary.
- Measurement bias was minimized by using existing expenditure data from the entities that were collected without prior knowledge of this study.
- Research bias was minimized by analyzing the data with commercially available software.

Definition of Key Terms

The following key terms and definitions are used in this study:

Traditional School District – a grouping of public schools organized under a superintendent.

Charter School – a public school that operates independent of a school district structure, although its funding may flow to it through the local school district. Generally, charter schools are viewed as having greater flexibility while having the same level of accountability as other public schools. In Michigan, charter schools are termed public school academies. For clarity, this terminology is used only sparingly in this report, but the terms are interchangeable.

In Michigan, charter schools can be founded by any individual or group, as long as there is no religious affiliation. The school must be chartered by the governing board of a public entity that is authorized to issue charter contracts, including state universities, community colleges, traditional school districts, and intermediate school districts (Michigan Department of Education, 2016). Once established, the charter school operates as a non-profit corporation with a governing board, similar to a traditional school district.

However, the charter school may contract with a for-profit (or non-profit) firm to provide education services/management.

Virtual charter schools are not included in this study. They represent an entirely different organizational structure in some cases, such as ones where much of the educational content is provided without the benefit of regular interactions with a teacher. They also have fundamentally different costs at the school level, with no need for facilities, custodians, school meal programs, etc. It is surmised that these differences would likely result in differences in administrative cost allocations as well, making virtual charter schools unsuitable for this study.

Charter School in Charter or Education Management Organization (CMO/EMO) – similar to a traditional school district, this organization is a grouping of charter schools that is led by a management organization. Unlike a traditional school district, CMOs and EMOs can cross local and state boundaries. CMOs operate as nonprofits, while EMOs operate as for-profits. In 2009-10, CMOs managed a total of 813 schools, with the largest (Knowledge is Power Program, or KIPP) managing 82 schools (Miron & Urschel, 2010). EMOs managed a total of 729 schools, with the largest (Imagine Schools) managing 79 schools (Molnar, Miron, & Urschel, 2010). In Michigan, roughly 90% of charter schools were operated by CMOs or EMOs in 2011-12, with 79% operated by EMOs and another 10% operated by CMOs. (Miron & Gulosino, 2013). This was an “anomaly” (p. ii) in comparison to other states; only Missouri, Florida, and Ohio had more than 30% of their charter schools operated by EMOs.

Central Office Administration - includes the leadership, managerial, instructional, and administrative support positions located at the district’s central office. For the

purposes of this study, the other non-instructional positions were not considered as a part of central office staffing. Non-instructional positions include maintenance, transportation, food service, and janitorial services. For charter schools, this includes any overhead fees charged by the CMO/EMO for provision of education services or management.

School Administration – includes the positions of principals, assistant principals, deans, and clerical support positions located in a school, plus any associated goods or services purchased for school administration.

Administrative Costs – For this study, administrative costs include both central office and school administration costs. As some research points to a relationship between decreases in central administration and increases in school administration (Pandolfo, 2012), it is appropriate for this study to consider them together as well as separately. With few exceptions, Michigan traditional school districts and charter schools reported administrative expenditures in both categories. The roughly 30 districts/charter schools that reported either no central office or no school administrative expenditures in 2014-15 demonstrate differences in classification decisions at the local level, as well as the difficulty smaller districts/schools can have in making distinctions between accounting categories when, for example, one person may serve as superintendent and school principal.

Overview of the Study's Methodology

This study is a replication of an earlier study by Arsen and Ni (2012), which reviewed educational spending across school districts, independent charter schools, and charter schools in CMOs/EMOs in Michigan. The Arsen and Ni study used 2007-08 data from the State of Michigan's Center for Education Performance and Information (CEPI)

and included financial information (administrative expenditures and overall revenues), student characteristics (free- and reduced-price meals, special education), and charter school characteristics (year opened, grades served, management status). After reviewing descriptive statistics of the 265 charter schools and 552 school districts present in Michigan in 2007-08, Arsen and Ni proposed this model for school resource allocation:

$$Y_i = CS_iB_1 + SDstructure_iB_2 + SDchar_iB_3 + u_i$$

where:

Y_i = a set of measures of administrative spending (separately analyzed as total, central office, and school administrative spending)

CS_iB_1 = indicative of whether the organization is a charter school (in later calculations, the variable includes indicators of characteristics of charter schools, including number of years in operation, grade levels served, and whether the charter is independent or part of a CMO/EMO).

$SDstructure_iB_2$ = a set of indicators of characteristics of the district/charter school that includes enrollment, enrollment squared, total revenue per pupil, and a dummy variable for whether the district/charter school is rural.

$SDchar_iB_3$ = a set of indicators of characteristics that includes percent of students who receive special education services and percent of students eligible for free/reduced price meals.

u_i = unobserved error.

The original study used multiple linear regression to assess the predictive ability of the independent variables on the dependent variables of administrative expenditures. This study replicates the Arsen and Ni analysis using 2014-15 data for Michigan

districts/schools, first using the same characteristic variables and then using a slight modification of the specific indicators for $SDchar_iB_3$. This variable is intended to control for some of the effects of student needs on school resource allocation (p. 11). Having higher proportions of students needing special education services or qualifying for free/reduced-price meals can also result in higher levels of federal revenues through entitlement funding programs. As some research points to increased organizational bureaucracy with increased federal funding (Meyer, Scott & Strang, 1987), a modification substituting the percent of federal revenue received for the special education and free/reduced meal variables is analyzed in a second iteration of analysis.

Organization of the Study

How organizational structure affects the allocation of administrative dollars in education is an important question. Although education spending has risen steadily for nearly 100 years and will likely continue, if a particular organizational structure offers better opportunities for reduced administrative spending, the savings could be redirected to other areas in the education organization. Conversely, if there is little difference in administrative spending based on the organizational structure, this research may provide a baseline for administrative spending, beyond the conventional wisdom of “as little as possible”. Chapter 2 reviews the literature and prior research on education organizational structure and administrative costs in districts/charter schools. Chapter 3 describes the design of the study. Chapter 4 outlines the findings. Chapter 5 discusses the implications of the findings on education organizational structures and administrative costs.

CHAPTER 2: HISTORY OF EDUCATION SPENDING

Growth in School Spending

The debate over education spending is multi-faceted. There is the aspect of *how much,* with battle lines drawn in courtrooms across the country where experts testify about educational funding adequacy. There are other lines drawn in local elections over whether to vote for tax increases or bonds to support education.

There is the question of *how to divide,* with states such as Texas requiring that at least 67% of education dollars be spent in the classroom. At the district level, this discussion often boils down to arguments about priorities, such as whether it is more critical to purchase new textbooks or buy classroom technology, since the budget will not cover both.

Finally, there is the facet of *who decides,* with states like Michigan taking over financially failing school districts and administering them. Historically, in many states and even within school districts, the pendulum swings almost regularly between centralized control and decentralized decision-making as districts attempt to drive improvement by funding new, centrally-determined requirements, then swing back to giving principals the power to make their own spending decisions.

Regardless of historical, current, or emerging beliefs about educational funding, what is certain is that it has consistently increased in the United States for more than 100 years. Data from 1869-70 to 1909-10 suggest little increase in per student spending over

that time period. By 1919-20, level spending was no longer the norm. Over the decade of the Roaring Twenties, expenditures per student also roared, even after inflation adjustments, and increased by 81%.[1] While the rate of increase slowed in the 1930s as the country struggled through the Great Depression, per student spending nevertheless increased by 24% (National Center for Education Statistics, 1993). After calculating the percentages from raw data from the National Center for Education Statistics (1993), the following per student increases emerged in each subsequent decade:

- 1940s – 40%;
- 1950s – 45%;
- 1960s – 69%;
- 1970s – 35%; and
- 1980s – 33%.

[1] All per student spending in this chapter refers to students in average daily attendance, rather than enrollment.

Figure 1 shows the steady upward trend in student spending in the United States since the 1920s.

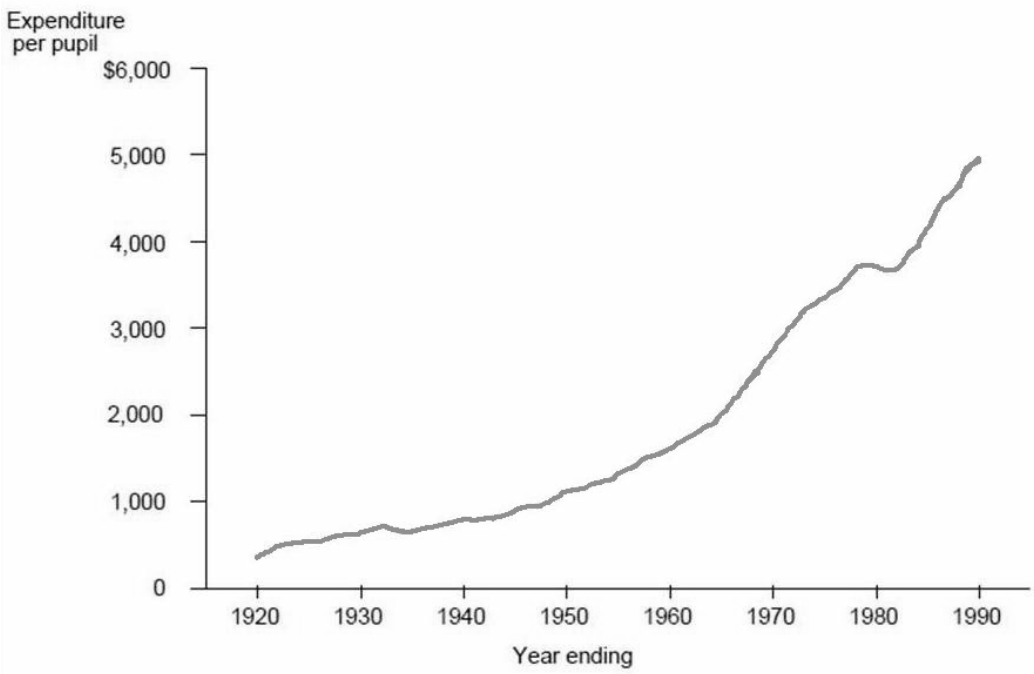

Figure 1. Trend of increasing expenditures per student in average daily attendance, from 1919-20 to 1989-90, in constant 1989-90 dollars. Source: U.S. Department of Commerce, Bureau of the Census, *Historical statistics of the United States, colonial times to 1970*; and U.S. Department of Education, National Center for Education Statistics, *Digest of education statistics*, various years. (As cited and included in *120 years of American education: A statistical portrait* by Thomas D. Snyder, p. 33).

More recent research has also focused on the size of the growth in student spending. Hanushek and Lindseth (2009) examined spending in the last 50 years, finding:

> From 1960 to 2005, spending per pupil on K-12 education in the United States rose dramatically, from $375 to $9,305…Adjusted to 2007 dollars, the spending growth would be from $2,606 in 1960 to $9,910 in 2005…giving school districts almost four times the purchasing power they had in 1960 (p. 45).

Nor is the trend abating. In the decade of the 2000s, spending per student rose by 21% (using constant 2012-13 dollars). As it was with the Great Depression, not even the Great Recession stopped education spending from increasing.

As of 2014, the National Center for Education Statistics projected that the decades of the 2010s would see a seven percent increase in spending per student. After 100 years of double-digit increases for each decade, this rather modest projected increase will largely be due to the years 2010-11 and 2011-12, in which the NCES projected the first ever year-over-year declines in per student spending that were greater than 0.1%. In 2010-11, the projection was a 2.0% decline from 2009-10, while in 2011-12 the projection was a 3.0% decline from 2010-11. The only other year-over-year declines like this in spending per student were recorded in 1991-92, 1992-93, and 1995-96, which each saw a nearly flat 0.1% decrease from the previous year. (National Center for Education Statistics, 2014).

Thus, it appears based on these past trends that for the near future, the question of *how much* is answered by "more". Education spending per student in the United States will likely continue to increase, as measured in constant dollars, although perhaps at a more measured pace than the previous 100 years. Is this a worldwide phenomenon? Not necessarily so, Hanushek and Lindseth (2009) argue. Their research found that "…the United States already spends significantly more per child on education than other developed countries in the world..." (Hanushek & Lindseth, p. 56). Therefore, if the expansion of the *how much* facet is inevitable, in at least the short term, it is important to understand how various competing structures for school funding, particularly traditional school systems in comparison to charter schools, are using their growing resources.

District Consolidation and the Rise of the Central Office

The question of *how to divide* the education purse in the United States is closely linked to the current dominant educational organization structure – the school district.

Although the current organizational form of school districts, with one superintendent, a central office, and any number of reporting schools, may feel ages old, it is instead a rather new organizational structure for the business of schooling and one that has developed concurrently with the growth of education spending and the evolution in the changing sources of funding, from primarily local to increasingly state and federal.

The first U.S. Department of Education was not established until 1867, which limits the view into the past to less than 150 years. School districts did not become an organizational structure until American towns grew into cities and population density became such that the schooling needs of the local populace could not be effectively managed by just one or two teachers. In 1870, the U.S. Department of Education recorded data on schools and school districts in the same category. According to the data, there were nearly 120,000 schools/school districts at that time. Most were individual schools with one teacher (U.S. Commissioner of Education, 1870). By 1880, the department counted slightly more than 280,000 teachers nationwide and 244 "city systems."[2] Found in cities with populations greater than 7,500, these city systems had at least a superintendent position, as the department duly reported the name of each one (U.S. Commissioner of Education, 1882). By 1897-98 the department counted 626 city systems (now defined as cities with populations greater than 8,000 inhabitants). The average enrollment of these city school districts was 6,070 students; the average number of teachers was 125, and the average number of "superintendents and other supervising officers" was seven. Most other "districts" in the country still consisted of less than two

[2] The report did not provide the number of schools/school districts that would be comparable to the 1870 figure. As most schools still housed a single teacher, this figure is provided as an approximation of the number of schools/school districts.

teachers and less than 50 students in a single building (U.S. Commissioner of Education, 1899).

By 1910, the Department counted 265,474 public schools, but the vast majority, 80%, were schools with only one teacher. There were only 1,532 city school districts (in cities of 4,000+ population). This was a doubling of the number of city school districts, perhaps due to the department's use of a smaller population cutoff figure. No data on county or other types of superintendencies were reported (U.S. Commission of Education, 1911).

By 1920, the Department counted 271,319 public schools. The statistics bulletin for 1919-20 reported 4,112 city school superintendents, 3,275 county superintendents, and 3,076 "other" superintendents – in total, 10,463 superintendents of school districts. Nonetheless, 70% of all schools in the United States were still one-room school houses, presumably without the need for any administrative positions (U.S. Commissioner of Education 1920).

The earliest recording of the total number of school districts as a category distinct from schools did not occur until the 1931-32 school year. For that year, the U.S. Office of Education reported 127,422 school districts serving 26 million students (US Office of Education, 1960). The average school district was now serving 204 students, still small enough for perhaps a part-time superintendent who also taught and likely not too many central office positions beyond a full-time superintendent if one was employed. Most, 62%, of the elementary schools recorded were still one-teacher schools but the department also reported information on schools with secondary grades for the first time, and there were 23,930 secondary schools reported. The Department did not provide

separate statistics on the number of city, county, or other superintendents, so it is not possible to calculate the growth from the 10,463 superintendents of 1920 to how many might have been governing a portion of the 127,422 school districts of 1931-32 (U.S. Office of Education, 1960).

Figure 2 shows the trend in the number of school districts from 1931-32 to today. As shown, the period of time before 1930 likely had the maximum number of school districts in the United States. Since then, the number of districts has declined as smaller districts have consolidated into larger districts.

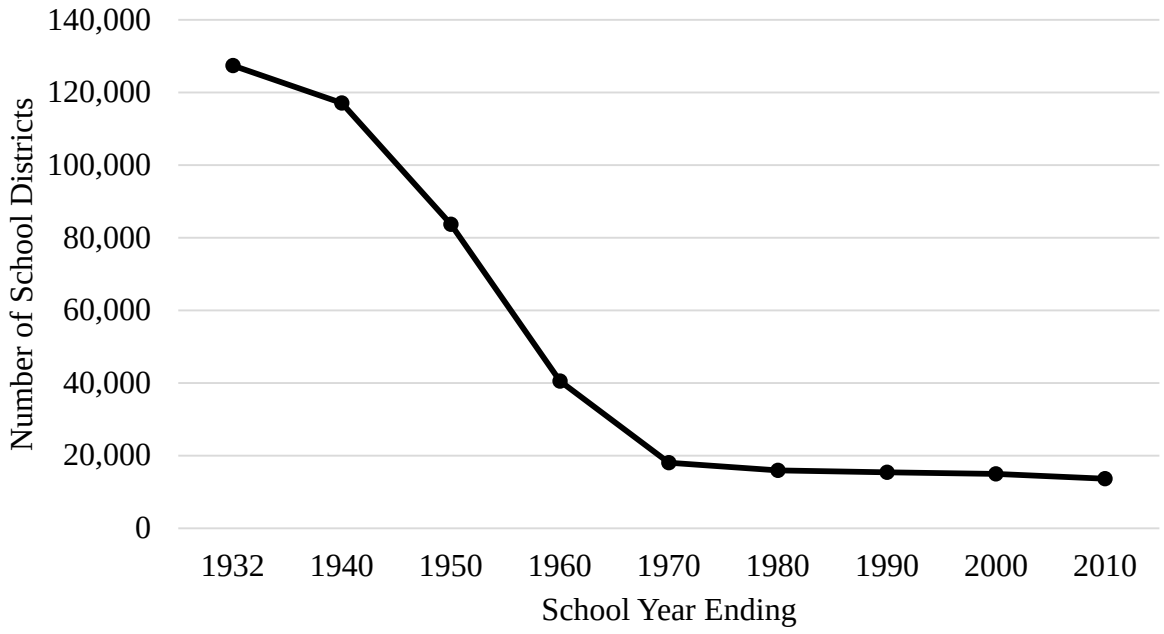

Figure 2. Decline of the number of public school districts from 1931-32 to 2009-10. Adapted from: Dillow, S.A. (2011). *Digest of education statistics 2011*. National Center for Educational Statistics, Washington, DC: U.S. Government Printing Office. Data for 1931-32 from U.S. Office of Education, 1960.

But while the number of school districts has greatly decreased from the zenith before 1930, the size of the average school district has greatly increased. Figure 3 shows the growth of mean school district size. In 1932, the average district enrolled around 200 students. By 2010, the average district enrolled more than 3,600.

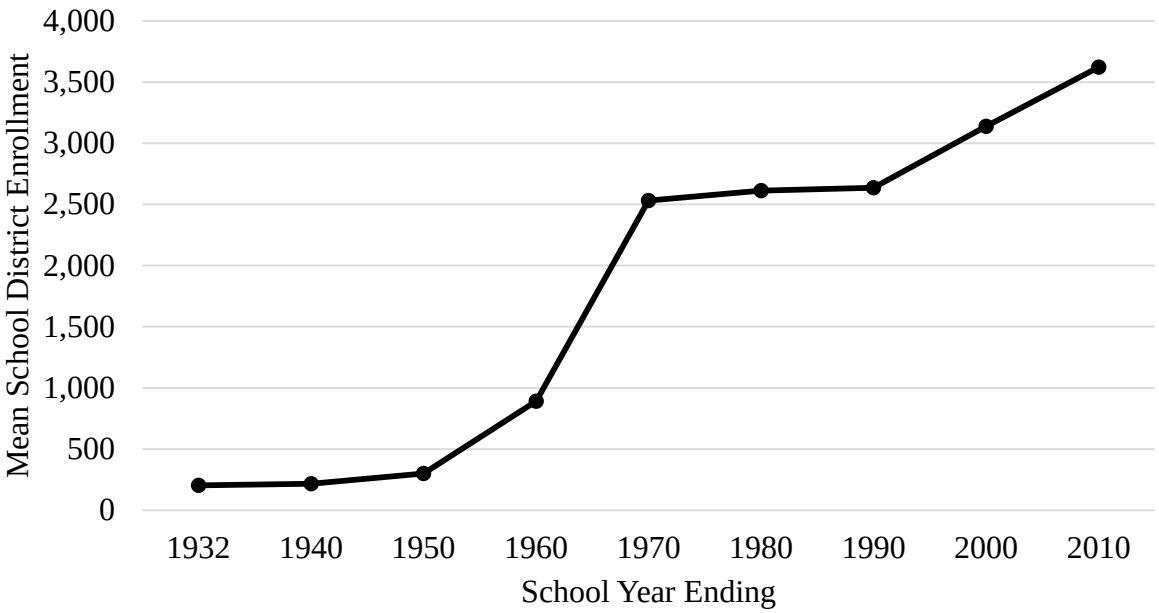

Figure 3. Increase in mean student enrollment in public school districts from 1932 to 2010. Adapted from: Dillow, S.A. (2011). *Digest of education statistics 2011*. National Center for Educational Statistics, Washington, DC: U.S. Government Printing Office. Data for 1932 from U.S. Office of Education 1960.

Figure 4 shows the growth in the number of large school districts at the same time as the dwindling in the number of small school districts for 1980 through 2010. Prior to 2000, school districts with less than 1,000 students comprised more than half of all school districts; by 2000, they comprised only 48%. The decline in the number of the smallest school districts has been even sharper; in 1980, districts with less than 300 students numbered 4,223, 26% of all school districts. By 2010, districts with less than 300 students numbered only 2,710, 20% of all school districts.

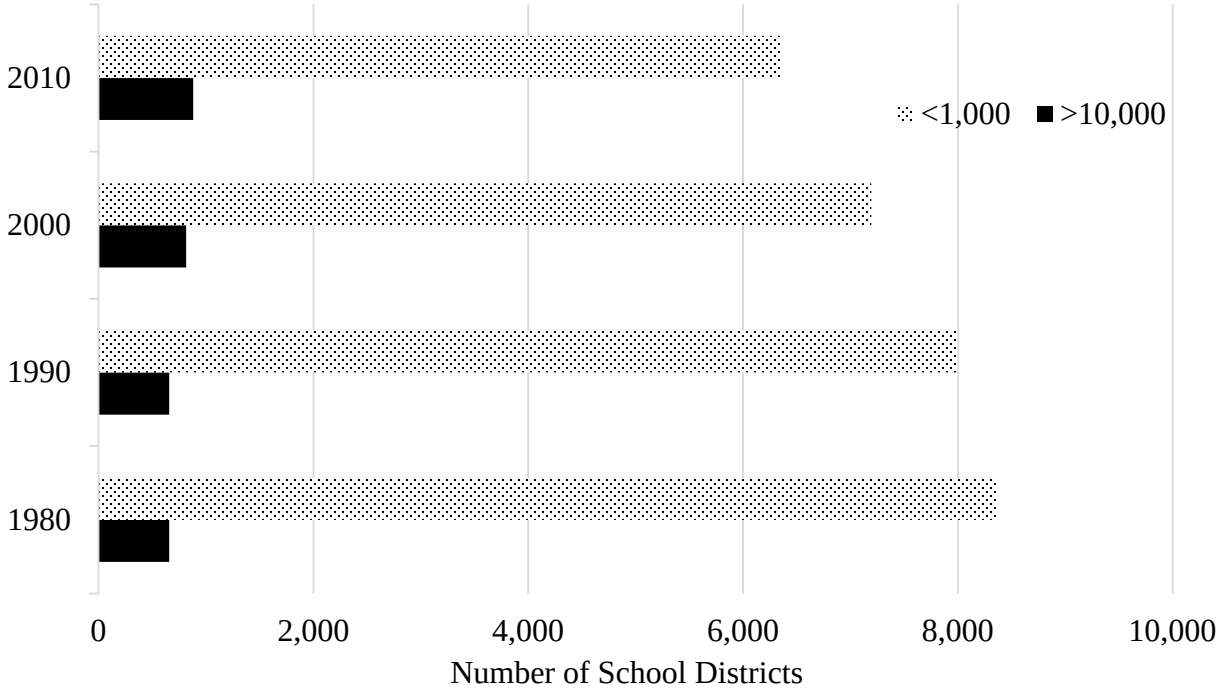

Figure 4. Decline in number of small school districts and increase in number of large school districts. Adapted from: Dillow, S.A. (2011). *Digest of education statistics 2011*. National Center for Educational Statistics, Washington, DC: U.S. Government Printing Office.

By the 1940s, as districts grew in enrollment and the overall number of school districts fell below 120,000, one begins to see greater frequency of central offices, from what were previously "informal community arrangements with little organizational structure" (Strang, 1987, p. 352). A number of factors pressured the previous informal arrangement toward more organized and bureaucratic structures. There was a growing belief after World War I that everyone needed a high school education, that "graduation from high school was the minimum desirable preparation for citizenship" (National Commission on School District Reorganization, p. 30). This had the effect of increasing the number of students wanting to pursue education beyond the elementary school. The near-tripling in the miles of paved roads allowed for easier travel after World War I, making travel to and from school easier. Then, the intersection of a poor economy and a

baby boom after World War II also led to district consolidations and encouraged the formation of larger school districts (Fensch & Wilson, 1964). There was also a general belief that larger districts could provide better education. The National Commission on School District Reorganization (1948) reviewed the work of various studies in that time period and concluded that "efficient" school districts provide a number of services:

> educational and business administration; supervision of attendance, instruction and transportation; school library service, and community library service if the community has no public library; adult education leadership; physical and health examinations of children; specialists for the identification of atypical children; the services of school psychologists, and nurse-teachers; and a research staff. In localities where the schools must of necessity be small, the central staff of the administrative unit should include special teachers in instrumental and vocal music, art, and specialized types of vocational education. (p. 131)

The Commission concluded that in order to employ such a staff "at a cost bearing a reasonable relationship to the total cost of the educational program" (p. 87), a school district must have at least 1,200 students and if possible as many as 10,000 students. "If the number of pupils fall much below 10,000 the unit should become a part of an intermediate unit in order to supplement its services" (p. 131). Below these figures and a school district would either be administratively top heavy if it wanted to provide all the necessary components of a quality education or it would have to sacrifice quality and not offer everything deemed necessary. This reasoning paved the way for continuing down the path of growing larger school districts, as there were few districts of 10,000+ students at the time (U.S. Office of Education, 1948).

By 1960, there were 40,520 school districts, serving 36 million students. The average district enrolled 891 and likely employed approximately 32 teachers, based on the average student:teacher ratio of the time (National Center for Education Statistics, 1993). Coordinating and leading the efforts of that many teachers began to logically call

for a full-time superintendent and at least some central office staffing. By 1964, there were discussions of how the notion of the superintendent, embodied in one person administering to the needs of a few schools, was morphing into the concept of a superintendent and cabinet, which acknowledged that one person was no longer able to do the job alone and needed to be assisted by a number of specialists who then formed the central office (Fensch & Wilson, 1964; Strang, 1987). The creation of larger groupings of students argued for the creation of superintendency teams that are now known as the central office in a school district. This line of reasoning follows the Aston researchers' (as cited in Clegg, Kornberger, & Pitsis, 2008) development of structural contingency theory which argues that, *ceteris paribus*, the greater the number of people employed in an organization, the more likely it would be bureaucratic.

From 1960 through the 1980s, the number of students continued to increase at the same time that the number of school districts continued to decrease. Between 1960 and 1970, the number of school districts dropped by more than 50%, from 40,520 to 17,995 (National Center for Education Statistics, 1993, table 20). Perhaps reflecting the country's growing urbanization and suburbanization, in the same time period the number of one-teacher schools dropped from slightly more than 20,000 to less than 2,000. Concurrently, average school district enrollment grew from 891 to 2,531. Fensch and Wilson (1964) pointed to a "maturation of the unique occupation of school administration" (p. vi) and the increased belief that education beyond the eighth grade was desirable as influencing the direction of school district organizational growth. Writing a decade later, Goldhammer (1974) described the full flowering of the seeds planted by Fensch and Wilson:

> Today's superintendency is affected by multiple contractual agreements, which determine policies, resource allocations, and limitations upon the exercise of authority. All of the complexities associated with these contracts and the agencies with which the school district must now interact and which have legal or assumed control over activities within the school district have produced a proliferation of positions of expertise within the school organization. Subordinate members of the administrative team can no longer be generalists like the superintendent. Most of them are now specialists whose field of expertise are limited areas of organizational operations. (p. 160)

School district consolidation continued from 1970 to 1980, albeit at a slower pace, decreasing by just 11% to 15,944. Average enrollment grew to 2,612. Compared to the previous decade, the 1970s were a period of relative stability in terms of number of school districts and average district size. This relative stability continued through the 1980s, with only a four percent drop in the number of a school districts (to 15,367) and a nearly unchanged average district enrollment (to 2,638).

Between 1990 and 2010, the pattern of school district consolidation continued, dropping by three percent from 1990 to 2000 and another nine percent from 2000 to 2010, leaving just 13,629 school districts (National Center for Education Statistics, 2012). At the same time, average district size increased. As the U.S. added nine million students between 1990 and 2010, reaching 49 million in 2010, average district enrollment grew by 19% in the 1990s and by 15% in the 2000s. By 2010, the average district enrolled 3,622 students. At that size, a superintendent and central office was generally considered a necessity. The data further show a trend towards larger school districts generally. In 1990 there were 658 large districts, enrolling more than 10,000 students each. By 2010, there were 882 large districts. In the same period, the number of districts enrolling less than 1,000 students dropped from 7,994 to 6,351.

In a partial response to the *how to divide* question, the United States has been moving adamantly in the direction of fewer but larger school districts. Since the first recording of city systems by the U.S. Department of Education in 1880, the education system has largely worked toward fewer school districts, each one on average larger than those seen in the previous decade. Part of this trend has no doubt been due to the growth of the country generally, as the school age population has increased more than six times, from 6.7 million in 1870 to 49 million in 2010. This has resulted in greater population densities in some parts of the country, making larger school districts a commonsense approach.

Yet there has also been an underlying assumption that bigger is better for the individual student. Some scholarship on school districts as early as 1880 point to the "most favorable conditions for public education" (U.S. Commissioner of Education, 1880, p. 2343) as being districts of a larger enrollment, so part of the trend also appears to be a striving for increased educational outcomes. As noted by the National Commission on School District Reorganization (1948):

> School district reorganization is imperative. It is imperative for the simple reason that a large majority of the school districts now operating in this country cannot give people the kind of education programs they need to deal with the complex problems of present-day life or adequately prepare youth to cope with the problems of the future. (p. 15)

However, as yet, research has not found solid evidence of a correlation (or causation) between district size and greater student achievement. Walberg and Fowler (1987) found that attending a larger school district in New Jersey was associated with lower student achievement; this negative association began at districts of just 3,900 students. Research by Berry and West (2010) covering the education of white males born between 1920 and 1949 did find some positive but statistically non-significant student

outcomes for those in larger rather than smaller school districts, but it also found statistically significant negative outcomes associated with attending larger rather than smaller schools. As larger districts typically also have larger schools, these findings undermine at least part of the premise of the ongoing trend toward larger districts. There appears to have been little other research in this area to date.

Lack of Relationship Between Education Spending and Outcome Measures

Another aspect of the *how to divide* question is to look at how resources are allocated within an education organization to support organizational goals. Typically, this centers on questions of how best to allocate funding in support of student achievement.

The inability of research to definitively identify a relationship between a given level of spending on education and student achievement has been explored extensively in recent years. Some have found that education spending in the U.S. has not been shown to have a statistical relationship with various measures of student achievement (Walberg & Fowler, 1987; Tyack & Cuban, 1997). Fullan (2007) used the Cross City Campaign for Urban School Reform (2005) as one example to demonstrate a lack of a relationship between a particular input level of spending and a particular output level for student achievement. In the Cross City Campaign, the cities of Chicago, Milwaukee, and Seattle received significantly more money over several years, in addition to other supports, but were still unable to change and improve student achievement.

Hanushek and Lindseth (2009) took on the “funding-achievement puzzle” and seem to have tried to solve it from every conceivable angle. They concluded that there was no verifiable relationship between overall school funding and student achievement. As they stated, “the lack of any consistent relationship between more spending and better

test scores has been documented time and time again, both in actual practice and in hundreds of scientific studies based on empirical data." (Hanushek & Lindseth, p. 52). They further reported:

> No empirical evidence indicates that our current schools, even those with ample resources, are able to systematically turn students at risk of academic failure into high achievers. Although a few individual schools may have succeeded in reaching this goal, no district has come close to achieving and sustaining it on a systemwide basis. Ironically, the states and school districts that seem to have the most success suggest that resources are not the key. For example, in the 1990s North Carolina and Texas were generally recognized as having had the most success in educating their poor and minority populations, yet neither state even approached the national average in their per-pupil expenditures on K-12 education. (p. 131)

Based on a review of the literature compiled thus far, it appears unlikely that research will uncover a definitive production function for education spending and student outcomes, whereby a certain measure of spending can be expected to produce a certain level of learning (particularly if one does not also at the same time account for varying student needs due to circumstances such as poverty). Some contemporary research has explored whether there is a minimum level of spending necessary to have an expectation of acceptable student achievement levels.

Rebell and Wolff (2008) argued for a level of funding that provides "meaningful education opportunity" to all students. Based on a consensus of court cases, meaningful education opportunity has been generally defined as one that provides students with the essential skills needed to function productively in democratic civic life and to compete globally (p. 70). As Rebell (2007) noted in an earlier work, meaningful education opportunity is the logical conclusion of ideals rooted in the Brown v. Board of Education Supreme Court decision of 1954, followed by the seedlings that sprouted in Title I of the Elementary and Secondary Education Act of 1965, which provided federal funding to

support the acknowledged greater needs of students in poverty, in Lau v. Nichols (1974) that required supports for non-English-speaking students and noted that providing such students with only the same treatment as native English speakers did not provide "meaningful education", and in the Education for All Handicapped Children Act of 1975 (later to become the Individuals with Disabilities Education Act, or IDEA) that required supports and related services for students with disabilities so they would have the same educational opportunities.

One seedling that did not sprout was the case of San Antonio Independent School District v. Rodriguez (1973). That case was an effort to directly answer a portion of the who decides question, when the San Antonio school district, acting on behalf of students who reside in high poverty districts challenged the Texas' school district funding. As Texas districts, like districts in many states, funded a major portion of their budgets through local property taxes, wealthier districts were able to provide more funding for their students. The court case questioned whether this was a violation of the equal protection portion of the 14th Amendment of the U.S. Constitution. Had the Supreme Court ruled in favor of San Antonio, states would have been required to distribute funding equally among their school districts. This would have been a sea change in the answer to the who decides question. However, the Supreme Court did not find for the plaintiffs and instead left the states to their own devices in divvying up education dollars. The legacy of the non-federal decision in San Antonio has been a plethora of state-level court cases, each with varying results. As noted by Macchiarola and Diaz (1996), in the absence of federal guidance, "state courts have come down squarely on both sides of the funding issue in their application of state constitutional law" (p. 552) and "there has been

consensus among the state courts as to what constitutes an acceptable non-discriminatory system of public school finance" (p. 570). This has led to state court cases that seek to require educational adequacy or meaningful educational opportunities; to date, none has been decided at the federal level, so the battle is being fought state by state. Thus meaningful educational opportunity can have different meanings in different states or even be ignored altogether in the school funding discussions.

Although Rebell and Wolff (2008) generally argued for more funding, they did not specify exactly how much funding was necessary to provide the meaningful educational opportunities every student deserves at a state or general national level. In outlining the items necessary for meaningful education opportunities, Rebell and Wolff included eight categories of "in-school educational essentials" (p. 157): effective teachers; appropriate class sizes; adequate school facilities; rigorous curricula; additional services for students in poverty; services for English language learners and students with disabilities; learning resources such as textbooks and computers; and, a safe learning environment. Yet some of these terms are left undefined and unquantified. Considering an adequate school facility, is it adequate when it has appropriate lighting, heating, and cooling, or is a football field also required?

To address this, Rebell and Wolff pointed to "costing out studies" as a way to determine what might be needed to fund meaningful education opportunities. Based on such studies in various states, they found that funding increases of 20 to 30% would be minimally necessary (p. 101). None of these costing out studies established a production function equation between funding and achievement. Rather, they either established a funding floor that some might term only minimally adequate or they assumed without

much evidence that replicating the expenditure levels of high-performing school districts would result in higher performance in other districts, ignoring other factors, such as parental involvement, that are known to play some role in student achievement.

The lack of explicit formulas as to the cost to providing meaningful education opportunity is present in current efforts by U.S. lawmakers. House Bill 4013, the Equity and Excellence in American Education Act of 2015, defines meaningful education opportunity as:

> the provision of a combination of educational resources, including programs, practices, technology, physical facilities, wrap-around services, instructional materials, enrichment programs and qualified teaching, administrative and support personnel, necessary to ensure each child attending a targeted school receives a rigorous public education of sufficient quality to allow that child to achieve high academic standards and to graduate high school with the skills needed to be college and career ready.

Introduced in November 2015, H.R. 4013 does not provide any sense of the funding that will be required to achieve meaningful education opportunity in every state. The bill provides for a matching federal grant equal to the funding provided by states to targeted schools and requires states to continue their funding at a level no less than current efforts, but does not specify either a floor or ceiling for the level of funding that is adequate or necessary. H.R. 4013 notes that no federal grant "shall exceed the amount necessary to provide a meaningful educational opportunity… (as determined annually by the Secretary using an evidence-based cost analysis model)", which seems to indicate that no formula has yet been determined.

Perhaps the large nut of overall education spending and student achievement in regards to the *how to divide* question is too tough to crack. This would seem to be a point on which Rebell and Hanushek might agree, with Rebell (2007) noting a basic consensus that "of course, money matters—if it is spent well" (p. 1487) and Hanushek conceding

"that money spent wisely, logically, and with accountability would be very useful indeed." (*Montoy v. State of Kansas*, 2003)

Perhaps instead, one might draw closer to an answer of *how to divide* by identifying relationships between particular types of spending and student achievement. As noted by Brewer (1996), "Surprisingly little is known about how districts use their resources", indicating a lack of refinement in cost-benefit analyses of the time that might shed light on types of district spending and student outcomes. A contemporary of Brewer stated, "while there has been a considerable national investment in public education during the 20th century, the funds have been distributed unfairly and used ineffectively. However many dollars may have been allocated, they do not seem to have been used particularly wisely." (Odden & Monk, 1995, p. 2). Hess (1995) argued that money matters but in helping developing the Chicago School Reform Act of 1990 ultimately employed a comparison to peers as the standard for administrative spending. While this resulted in the rerouting of millions of dollars from the central office to schools, it fails to satisfy at a theoretical level. What if the average was distorted by gross mismanagement in some other Illinois districts?

As Monk and Hussain (2000) succinctly stated it:

> Much less is known about what happens to resources once they reach school districts and are allocated internally, and yet these "micro-level" allocation decisions can be as important to the pursuit of equity, efficiency, and adequacy targets as the more thoroughly studied allocation decisions at the macro levels…This gap in the research base is a significant problem for a field like educational administration, since administrators and policymakers at numerous levels of the educational system need to understand what resources allocation practices are and how they might be modified to promote the aims of reform. (p. 1)

Based on research in Chicago Public Schools in the 1980s and 1990s, Hess (1995) warned:

> It is also clear that the mere presence of more funds will not automatically assure a more productive and effective school district. While it is evident that the absence of funds imposes severe constraints on schools and school districts, the presence of adequate levels of funding does not guarantee that the funds are used either appropriately or effectively. *How* funds are used is as important as *how much money* is available. (emphases in original, p. 165-66)

The outcomes of research that focused on administrative spending and student outcomes have not been encouraging for those who work as administrators in school districts. Brewer (1996) sought to establish the relationship between administrative spending and educational productivity, at least partly in response to William Bennett's comment about educational administrative bloat in 1987 that U.S. schools had seen an increase in the "growth of The Blob" (Associated Press, 1987). In his research, Brewer examined data from 700 New York school districts between 1978 and 1987. In most models, Brewer found negative correlations between district/building administration and student achievement. As he phrased it, "both district and building administrators rarely have a statistically significant effect on achievement, though in most cases the effect of building administrators is less negative (or more positive) than that of district administrators" (p. 118).

Bohte (2001) found a quantifiable negative relationship between school district bureaucracy and student performance. Reviewing five years of data (1991-1996) for 350 Texas school districts that each enrolled at least 1,100 students, Bohte compared student test results with the ratio of central office administrators to all district employees and the ratio of campus administrators to all district employees. For both ratios, student test scores decreased when the ratios increased:

> Specifically, for every 1-percent increase in the ratio of central administrators to full-time district employees, student pass rates on TAAS exams declined by almost one percentage point. Results for the campus administrators variable are even stronger: student pass rates on TAAS exams declined by more than one

> percentage point for every one-percent increase in the ratio of campus administrators to full-time district employees. (p. 94-95)

In slicing expenditures of Arkansas school districts by student achievement levels, Walters (2005) compared the dollars spent on central/school administration and the percent of total expenditures those dollars represented among 90 school districts stratified by a composite index of student achievement. Although Walters found a statistically significant relationship between the lowest performing one-third of school districts and higher dollars per student spent on central and school administration, this was attributed to overrepresentation of small school districts in the lowest one-third. Walters did not find a relationship between the lowest one-third and central administrative or school administrative expenditures as a percent of total current expenditures.

Looking specifically at K-12 campus administrators, McCaffrey (2014) found no studies that explored the relationship between student-to-administrator ratios and student achievement ratios directly. McCaffrey posited that the lack of research in this area may be why there are no commonly recognized best practices for staffing campus administrative positions. Analyzing data from 109 Indiana high schools, McCaffrey found no statistically significant relationship between the student-to-administrator ratio and student academic achievement. Instead, McCaffrey found high performing schools in each category of low and high ratios, as well as a tendency for schools with higher student-to-administrator ratios to outperform low ratio schools in the areas of graduation rate, college career readiness, and English end-of-course tests. These data would seem to suggest that either the number of high school administrators has no discernable bearing on overall student performance or that an increase in high school administrative ratios has a negative relationship to overall student performance. Neither conclusion would

unconditionally support increased administrative spending at the school level as a means to improve student outcomes.

This lack of connection between spending and student achievement is not endemic only to schooling in the United States. Goldspink (2007), speaking on change efforts in South Australian schooling, noted, “Despite many attempts to reform educational systems to make them more effective and efficient, little change has been realized in over a century. Classical bureaucratic, managerial, and economics-based approaches to reform have proven to be limited in effect” (p. 89).

Thus it appears that a definitive response to the facet of *how to divide* within the school district organizational model is lacking. Further, the sub-question of how much should be allocated to administrative expenditures to maximize student achievement also lacks an adequate evidence-based answer.

Why the School District Organizational Model?

Reviewing the historical tendency to create ever-larger school districts instead of a population of smaller districts of a particular size, one might expect that a certain size, or certain minimum size, has been found to be functionally most efficient or most effective in terms of student learning. However, no research has been found to support the argument that a school district of a particular enrollment or number of teachers provides some distinctive advantage in terms of student outcomes. Likewise, no research has been found to support the concept of a school district versus other possible models as offering some advantage for student outcomes. There is, however, some research available to help explain the persistence of the basic school district structure (one central

office commanding a number of schools) and by extension how the United States is currently answering the *how to divide* and the *who decides* questions.

An 1880 publication from the U.S. Commissioner of Education noted that the prevailing opinion of the time was that a population of a certain size provided the best education:

> It is often said that the most favorable conditions for public education exist in the city of moderate size; that is, with a population of about 40,000…in cities of this size the population is sufficiently compact to allow schools large enough for all purpose of grading and classification, which is not the case in the small city, the village or the country district; and on the other hand, the population is usually more homogeneous than in the great cities; there are not such extremes of wealth and poverty, and the people as a whole take more personal interest in the schools. (p. 2343)

Callahan (1962) credited the rise of Taylorism and the application of scientific management principles to education during the Progressive Movement (1890-1920) as largely being responsible for both a desire for and the accomplishment of school district consolidations in the first part of the 20th Century. The period between and after the World Wars saw the further development of the science of management, its application to manufacturing processes, and enthusiasm for applying that science in other venues, including education. Given the almost universal involvement of Americans in both war efforts and the increase in living standards (measured by relatively greater material goods for many) made possible by coordinated manufacturing processes, in hindsight it seems rational (Klein, 2006, might call it common sense) that American state legislations would choose a school district structure that included what could be viewed as elements of military and manufacturing organizations, namely central control, emphasis on following a proscribed procedure to achieve desired outputs, and the beginnings of agreement on

curriculum components. This structure was also the logical extension of the Progressive Movement legacy.

According to Taylorism and scientific management theory, if the product of each school was the same, an educated student, then the best organizational structure for it should be the same. This supports the observations of the period after World War I, namely great similarities between school districts across the country. In this view, schools could be most efficiently managed under a central command structure. In the years after victory in World War II, one can see how such a central command structure would be both appealing and familiar to many Americans.

From the end of World War II through the 1960s Webb (1989) noted a cultural belief within the education community that bigger would be better. Born from the Industrial Revolution, this belief was also underpinned by school administrators "who hungered both for legitimacy within the private sector and the increased prestige and perquisites" (p. 127) associated with presiding over larger school districts. A contemporary meta-analysis of 26 studies supported "optimum" district sizes between 9,800 and 50,000 students, while another contemporary study reported district size recommendations ranging from 400 students (on the basis of a cost residual argument) to 5,000 students (on the basis of school administrative costs) to 20,000 (on the basis of a literature review) (Webb, 1989). Webb notes that the studies resulting in smaller size recommendations were based on some form of costing-out process while those resulting in larger size recommendations "seem to have grown from opinion surveys and literature searches" (p. 128). It appears that the desire for larger school districts outweighed the available scientific support for larger school districts.

Another factor that played a role in the trend toward fewer, but larger school districts was the growing use of the schoolhouse as an instrument of social engineering. Beginning with the 1954 *Brown v. Board of Education* decision, previously marginalized cultural groups began to find their voice and expect the schoolhouse to embrace the diversity it had previously ignored. Only two decades later, Goldhammer (1974) noted, "There could be no question that the schools were a key public agency within an aggressively pluralistic society…public schools were an instrument of social policy and no longer isolated enclaves within the broader society" (p. 154-155). In some cases larger school districts emerged as a way to respond to society's expectation for integrated schools – the Charlotte-Mecklenburg district in North Carolina was but one example of a district reorganized in direct response to those expectations. Charlotte-Mecklenburg consolidated from separate city and county systems in 1960 in part to provide "equal educational opportunities for all children" although general integration took at least a decade longer (Charlotte-Mecklenburg Schools, 2015). The lesser-known *Brown II* Supreme Court decision allowed the courts to compel districts to consolidate to meet the goal of desegregation, among other potential remedies (Urban Law Annual, 1973). Thus, where districts refused to integrate, the courts could compel them to integrate through consolidation, which would result in larger school districts.

As noted by Klein (2006), organizations should organize according to the "logic of [their] production technology and not according to some abstract principle" (p. 1157). Short and Greer (2002) noted that school district organization has been modeled after private industry since the early 20th century, with a reliance on bureaucratic organizational structure predominant in the rise of assembly line manufacturing: "school

leaders attempted to create organizations that resembled those found in private industry" (p. 1). As Short and Greer explained:

> Taylor (1916) believed that all work could be studied, designed, and measured. Through such efforts, the most efficient work behavior of every job could be established. Such thinking had wide appeal among school administrators who were facing the problem of educating ever-increasing numbers of students. (p. 2)

While it does not appear that any researchers have gone so far as to argue that students should be considered solely the raw material for use in mass production of graduates, there also does not seem to be much consideration in the 1960s and 1970s of the education of students in the realm of either unit or small batch production. A tendency to view education through a mass production lens leads one to adopt the major components of Weber's model of bureaucratic control: hierarchy, fixed division of labor, written rules and procedures, and staff training (as summarized by Walton, 2005), and one can see all these components in the school district of the 1970s forward. The central office of a typical school district then and (mostly) now is headed by a superintendent and staffed by a number of professionals in such diverse areas as special education, curriculum, facilities management, and food services. The superintendent is in charge of all actions and ultimately responsible for all successes and failures. In turn, a principal is responsible for all that happens within her school. There are clear divisions of labor: Bus drivers do not generally also cook and physics teachers do not generally also teach kindergarten. School boards develop volumes of written policies that outline their vision for the district. The superintendent and staff translate those policies into still more written volumes titled employee handbooks and procedures manuals. Every large school district includes a specific organizational unit for ensuring that all teachers receive adequate dosages of professional development each year. Thus, one can see a progression from

various external contingencies leading school districts to grow in enrollment and that in turn led to an incarnation of the Weber model.

Influencing the organizational development of school districts through the 1980s included what Strang (1987) identified as a reformist vision of modernization and a desire to emulate a corporate model. This likely also contributed to a national feeling that tiny autonomous districts or schools could not offer the same efficiency that the bureaucracy and standardization of larger districts could. As Strang (1987) termed it, the "small scale, informal organization, and lack of professionalism of small districts made for fiscal inefficiency and educational ineffectiveness" (p. 356). Walberg and Fowler (1987) in studying the expenditures and academic achievement of New Jersey school districts concluded nearly the opposite. They found that:

> [The] consolidation of districts into larger units that has been taking place for the past half century may have been a move in the wrong direction. Generally, it appears that the smaller the district, the higher the achievement when the SES [socio-economic status] and per-student expenditures are taken into account. (p. 13)

However, it does not appear that the works of Walberg and Fowler, as well as that of others cited in their research, were persuasive in countering the prevailing opinion at the time of bigger being better.

Meyer, Scott, and Strang (1987) found evidence of another way in which school districts responded to their external historical environments, specifically how the source of funding dollars impacted the size of administrative staffing in the central office. Reviewing data from the 1930s to 1980, the researchers noted that the balance of funding of school districts shifted from a base of more than 80% local dollars to one where more than 50% were state dollars. At the same time, the percentage of federal dollars increased steadily, although at the time of the analysis was still less than 10%. The researchers'

resulting multivariate regression model suggested that federal funding generated the highest level of administrative complexity. “A local dollar generates about three times the administrative staffing of a state dollar…and ESEA [*Elementary and Secondary Education Act of 1965*] federal dollars about nineteen times as much.” (Meyer, Scott & Strang, 1987) Put simply, the public school dollars that generated the greatest amount of bureaucracy through the 1980s were those that originated the furthest from the classroom of interest. The researchers argued that this expanded bureaucracy was the result of the relatively greater environmental complexity created by the federal oversight that accompanied federal dollars. From the perspective of a school district superintendent in Michigan, it might be logical to be rather more apprehensive about properly spending dollars sent from Washington, DC, than those sent from the local city council. It might also be logical to assume that dollars sent from Washington, DC, would come with relatively greater and more complicated strings attached than those sent from down the street.

Meyer, Scott, and Strang (1987) also noted that there appeared to be advantages to school districts adopting organizational structures that were isomorphic to those of the federal funding agency, namely that districts that did so appeared to have an easier time in obtaining additional federal funding. Thus, it could be argued that federal funding channeled to districts resulted in both coercive and mimetic isomorphism (Clegg et al., 2008). It could also be argued that federal funding supported the continued existence of the school district organizational structure.

Freeman (1979) offered a somewhat different view of the historical contingencies that fostered the creation of school districts and central offices, one that centered on the

contingency of purpose. School districts began by legislative mandate to fulfill two purposes: provide educational services and provide data to superordinate legislatively created organizations as to how well the district is fulfilling the first purpose – as Freeman put it, the "provision of educational services and the provision of bureaucratic information…School districts process paper if they do nothing else" (p. 120). At the time, there was some agreement that experts lacked an understanding of how the parts of the educational process worked to achieve the desired outcome of educated students; Barr and Dreeben (1983) noted:

> Yet it is a remarkable commentary on the state of our knowledge about education that despite the staggering sums invested and the massive efforts to improve and reform the schools, we do not have a clear conception of how they work…while we know a lot about how the amounts of different sorts of resources are associated with learning—the value that schools are supposed to produce—we do not know much about how the different parts of an educational system contribute or about how resources are actually used to produce the value. (p. 1)

Seven years later, Chubb and Moe (1990) decried the lack of research exploring how the school district structure impacted student learning, but noted that this was at least partly due to a lack of existing alternative structures:

> But the brute reality of American educational practice is that there is just one institutional form by which the public schools are governed, the "one best system." A comparative analysis of alternative institutional forms is generally not possible, therefore, unless attention is restricted to relatively minor institutional details—whether the superintendent is elected or appointed, for example… (p. 14)

Thus school districts were structured largely the way they were because the technology of learning was poorly understood and largely continued to exist because of a lack of alternative structures by which to assess their relative merits. This then creates a more political situation for school districts in this way: If districts cannot clearly specify the equation by which each input contributes to a student learning, districts must instead defend their decisions (including structural ones) on more procedural issues. Thus, a lack

of clear technology process leads to isomorphic tendencies among school districts. Clegg et al. (2008) define this as normative isomorphism – the tendency for education professionals to favor certain sorts of organizational designs, likely because they have similar backgrounds in training and socialization. Fensch and Wilson (1964) note that a tendency toward normative isomorphism reflects on the district superintendent as a lack of imagination, an inability to see the differences between local communities, and even a shallow ego (p. 55). Nevertheless, this tendency persists. Today, if one school district appears to be successful on some measure, such as end of grade testing, another district may look to emulate its structure. But, in the absence of groundbreaking structures adopted by highly successful districts, normative isomorphism tends to encourage districts to remain stuck in "old" organizational patterns.

The organizational concept of the school district also remains firmly rooted in federal efforts to support education. Recent federal legislation presumes the existence of a school district. The *No Child Left Behind Act* held school districts accountable for student performance, with responsibilities for overseeing schools. The *Every Student Succeeds Act* continues the presumption of school districts serving as the responsible agent for overseeing schools. Legislation enabling charter school formation in some states presumes the existence of a parent school district, through which at least some funding flows, even though charter schools are often founded as an antidote to the perceived ills of schools lashed together in a district. This is true in North Carolina, where state per student funding flows to school districts who are then expected to send on a fair share to the charter schools located within their geographic bounds.

At times, the conventional school district model appears impervious to change. Some researchers believe the school district structure will remain:

> Educators have long been influenced by the efficiency model of management, and rather than focusing their attention on finding more productive, alternate methods of organizing the instructional effort, school leaders directed their efforts toward perfecting the bureaucracy. (Short and Greer, 2002, p. 3)

The development of technology in the past two decades has offered the school district potential new benefits if district leaders are willing to adopt new structures, such as a network organization. As noted by Baker (1992), network organizations offer several advantages over bureaucratic organizations:

> A network organization can flexibly construct a set of internal and external linkages for each unique project. Unlike a bureaucracy, which is a fixed set of relationships for processing all problems, the network organization molds itself to each problem…The intrinsic ability of the network organization to repeatedly redesign itself to accommodates new tasks, unique problems, and changing environments enables such organizations to escape the plight of forms such as bureaucracy, which ossify and become incapable of change. (p. 398)

A network organization would be defined by "more formal and enduring relationships" (Clegg et al., 2008, p. 563) than a virtual organization, but would free employees from common time and space constraints, as well as free districts from local market constraints. A school district could enter into a network organization to have all payroll handled remotely by a third party or it could contract with a teaching unit in a Japan-based school to offer online, live instruction in the Japanese language to students, with the advantage of native speakers for instruction. To no great extent, however, has either of these improvements been adopted into the school district model, perhaps because both of these examples would require embracing technology and perhaps reducing current local staffing. In an example less reliant on cutting edge technology, school districts in a more network organizational model could agree to cooperatively

arrange for area-based transportation, instead of each managing their own fleet and daily routes. Such a cooperative would allow the individual district to be more responsive to changes in transportation needs from year to year, potentially allowing a district to shrink its transportation use as dictated by student demand. This might also have the effect of trimming local payrolls, which may explain at least in part why it has not been embraced to a greater degree. It may also be indicative of the nature of highly networked organizations as requiring a great degree of coordination and communication with those outside the original organization. Two school districts that would like to share a transportation operation would need to coordinate their schedules for optimal bus usage. They would then need to regularly communicate regarding snow days, sports team transportation, and the like. Historically, school districts have had little incentive to embrace coordination and communication with their neighbors.

Perhaps the same contingencies of decades past are still exerting influence: the population has continued to grow overall and transportation via school bus is commonplace, which makes larger districts possible. Federal funding has continued to flow. The mechanisms of learning are still not well understood. As these contingencies have not changed, Klein (2006) would argue that it would be common sense to expect school districts to continue their dominance as an organizational structure. To expect otherwise would violate Klein's principle that "any structural given will influence organizational behavior" (p. 1160). If the structural givens do not change, in this case, the external contingencies that encouraged a bureaucratic school district organization, then bureaucratic organization will continue. Short and Greer (2002) argued that not only the structural givens but also the focus has not changed, "the twin themes of efficiency and

measurement characterized the approach of the schools during the second half of the 20th century just as they had during the first half." (p. 3).

But a number of variables in the education environment are now changing. Technology has opened new possibilities for not only the delivery of instruction but also the management of the education process. Technology is also making possible unprecedented levels of transparency in how well students are (or are not) learning, raising questions of how organizations should respond in real-time, rather than perhaps just in summer school. The battle over curriculum standards, now embodied in the struggles over the Common Core, is removing some of the discretion of school districts to determine what is taught in the classroom. It is also removing some of the responsibility for curricular decisions, which raises questions about continued need for various organizational components. Finally, the charter school concept is a new variable in the education environment and one that also offers an alternative organizational model.

Alternative Models of Organization

As the debate on funding U.S. education continues, some have suggested that what is needed is at least 20 to 30% more than current funding, in order to provide "meaningful educational opportunities" (Rebell & Wolff, 2008), but these suggestions appear to presume the continuation of the current organization model, namely schools grouped into school districts of widely varying sizes, led by a superintendent and attendant central office staffing. However, Fullan (2007) has found evidence that the current organizational model of school districts does not provide a clear case for more funding resulting in better student achievement, positing that many aspects of the organizational structure itself work against improving student achievement. Yet,

alternative models of organization could provide new responses to all three questions of *how much, how to divide,* and *who decides.*

In discussing how schools and traditional school systems can improve, Schlechty (2005) identified five barriers to strategic action. Four are relevant to this discussion:

- School boards have a tendency to focus decision-making on the short-term interests of constituents rather than on longer term strategic goals. It stands to reason that the larger the school district, the further away from any one school board decision are the specific needs of a single school in the district.
- School systems have a tendency to attempt to incorporate emerging technology into the current way of doing things, rather than drive organizational changes to fully benefit from the emerging technology.
- School systems do not effectively support the experimentation needed for innovation, particularly if it would disrupt existing structures. Swaim (2008) posited that superintendents remain committed to the bureaucratic model for "the comfort of central office coordination connections that the model provides" (p. 38), rather than any discovered advantages of the model in efficiency (lower costs) or effectiveness (higher student achievement). Indeed, Short and Greer (2002) noted that "The appeal of the bureaucratic model obviated any consideration of alternate patterns of educational organization" (p. 3) despite the acknowledged shortcomings of the bureaucratic model as one that "imposes terrible restrictions on professional educators who seek to work with individual students" (p. 10), offering "teachers and students little say in their work life" (p. 85) in a system that "does not allow for the mistakes and the back-to-the-drawing-

board mentality that are essential for organizations that support and cultivate innovative thinking and action" (p. 86).

- Schools and school systems typically have limited capacity "to develop and sustain actions that call for collaboration within the system" (p. 14). As Schlechty phrased it, "Although schools continuously install innovations, they seldom stick with the innovations long enough to ensure that their intended effects will be realized" (p. 17).

Thus, even if traditional school systems are given whatever is decided to be enough money, there appear to be institutional barriers to maximizing resources to effect improved student achievement. These findings suggest that other organizational structures might be needed to improve student achievement. Hanushek and Lindseth (2009) also noted this problem of current organizational structures seeming to stand in the way of student achievement:

> No empirical evidence indicates that our current schools, even those with ample resources, are able to systematically turn students at risk of academic failure into high achievers. Although a few individual schools may have succeeded in reaching this goal, no district has come close to achieving and sustaining it on a systemwide basis (Hanushek & Lindseth, p. 131).

According to Sangster (2007), "questions about the need for and purpose of central offices resulted in the disappearance of districts in New Zealand..." Similar questioning in the United Kingdom led to the abolition of what an American would recognize as a school district and its replacement with a more encompassing organization that integrated schools, health care services, and related social agencies to better serve the whole child (Fullan, 2007). In China, school districts and central administrative offices largely do not exist (Prieto, 2015).

In the United States, Arsen and Ni (2012) recognized the potential for charter schools to become an alternative organizational model to the traditional school district. As they noted, “The charter school movement by contrast has established a widely implemented new model of school organization and governance in which the influence of districts administrators on resource allocation in most cases has been entirely banished” (p. 3).

In summary, little empirical evidence can be found that demonstrates conclusively that a district’s organizational structure has a cause and effect relationship or even a correlative relationship to improved student learning. Charter schools, while sometimes promising, do not yet have the track record to conclusively demonstrate that they are a viable alternative to the traditional district structure in terms of better supporting student achievement. However, they may offer a viable alternative organizational structure that has other benefits, such as a reduced need to spend money in areas not directly related to classroom learning.

Administrative Spending

Components of Administrative Spending

Within federal, state, and local parameters, school districts have latitude in how they spend resources to support student education and achievement. As with central office organizational structures, school districts tend to allocate their expenditures in similar ways. Arsen and Ni (2012) noted that across the U.S. districts tend to devote roughly “59-65 percent of their spending on instruction.”

In the mid-2000s, there was a push in several states to mandate that districts spend at least 65% of their money in the classroom; Texas was a leading state in this effort.

Several studies of the outcomes of this push found no statistical relationship between spending 65% on instruction and student achievement (Jones & Slate, 2010). Some studies have found no floor for classroom spending, meaning no minimum level that seems necessary to support academic achievement, while others have found a correlation between spending below 60% and lower academic achievement, and still others have found what might be a ceiling, meaning a point at which additional spending in the classroom provides no additional benefit in terms of student achievement (Jones & Slate, 2010).

The 65% guideline arose from a desire to try to use limited financial resources most effectively in support of student achievement. Yet, to date, the desire for efficiency in administrative spending tends to outweigh effectiveness concerns, as public policymakers and school district stakeholders typically voice that the best amount spent on district administration is the least amount possible. Beyond that, there seems to be no clear guideline. In the Financial Integrity Rating System of Texas (FIRST), Texas currently awards up to 10 points out of 100 total for what it deems to be an acceptable administrative cost ratio. For a district of 10,000 or more, full points are awarded for an administrative cost ratio of 8.55% or less; no points are awarded once the ratio reaches 18.55%. Districts of 5,000 to 9,999 students get full points at a 10.0% ratio, while districts of less than 500 students get full points at 24.04%. The determination of the cut points was based on Texas' analysis of previous administrative cost ratios and presumably historical cost ratio data, but the rationale for the specific determination that, for example, 8.55% is acceptable but that 8.56% is not worth full points is not shared

with the school districts or the public at large (R. Bunton, personal communication, June 6, 2016).

Spending related directly to the functioning of the central office is defined in varying ways in the state accounting systems used by school districts to report expenditures. Generally, expenditures include those made for the school board, legal services, and salaries and benefits for the superintendent and other positions in the central office whose salary and benefits is not allocated to some other function (e.g. the salaries and benefits of food services staff is typically allocated to the food services budget, which is a separate funding stream, supported by earmarked federal funds). In Michigan, central office administrative expenditures are covered in two function code categories in the statewide accounting system: 23x for general administration and 25x for business office. General administration expenditures include "activities concerned with establishing policy, operating schools and the school system, and providing the essential facilities and services for the staff and pupils" and business office expenditures include "activities concerned with purchasing, paying, transporting, exchanging and maintaining goods and services for the school district." (Center for Educational Performance and Information, 2015). As some research points to a relationship between decreases in central administration and increases in school administration (Pandolfo, 2012), it would be appropriate to consider central administrative and school administrative costs together; school administrative cost are accounted for in Michigan's function code category 24x. As well, the inclusion of school-level administrative expenditures in overall district administrative expenditures is equally supported by the tendency of small school districts to often blur the lines between central office and school administration as district/school

leaders wear many hats, sometimes leading school-specific efforts, sometimes leading district-wide efforts. In the charter structure among charter schools not part of a management organization, the principal's office is the central office, so attempting to separate the relevant central office versus principal administrative expenses is not possible.

With no guidelines for an optimal rate of administrative spending, when public education funding is scrutinized due to economic or political factors the tendency to decry to wasteful central office spending becomes de rigueur for both the public and politicians. So what is the right size for a central office and consequently the right amount of administrative spending? This is a question researchers have been working to answer almost since school districts became the predominant organizational structure for public education but it was not a major area of emphasis until later in the 20th Century.

Focused academic analysis of overall school district expenditures began in the early 1900s (Sexson & Merideth, 1938). Already in that time period, measures of "efficiency" and deconstructions of school budgets by expenditure type were being explored, although administrative expenditures were not a large focus area. The Progressive Movement (1890-1920) and application of Taylor's principles of scientific management to the schoolhouse further fostered explorations of inputs (funding), throughputs (teaching process), and outputs (learning), seeking to find how schools and school systems might operate more cost-effectively (Callahan, 1962). By 1911, the push for overall educational efficiency was rooted in the public conscious. As Callahan (1962) noted:

> The publicity given scientific management and the great claims made in its behalf intensified the public's feeling that great value existed everywhere, and at the

> same time offered a means of eliminating it. One result was that a new wave of criticism was directed against many institutions, especially those large enough to be suspected of gross managerial inefficiency and those supported by public taxation. The schools, particularly in the larger cities, met both of these criteria. Beginning early in 1911 hardly a month passed for two years in which articles complaining about the schools were not published either in the popular or in the professional journals. (p. 47)

This public belief in scientific management gave rise to school surveys, methods by which districts could be assessed regarding efficiency. By 1922, the Journal of Education Research had published Sears' guidelines for conducting a school survey, which included gathering data on the administrative organization of a district and assessing the efficiency of supervision. As they were applied in a survey of Salt Lake City Schools (Cubberly, Sears, Terman, Van Sickle, & Williams, 1917) actually assessing administrative efficiency consisted of comparing administrative/supervisory staffing and administrative/supervisory expenditures as a percent of total expenditures to those of 16 other districts. However, this was not a large portion of the survey – only about five percent of the survey's 332 pages discuss administrative efficiency. The bulk of the survey was devoted to analyzing and improving the curriculum and instructional methods in the classrooms themselves.

Studies of how to manage education dollars took on greater urgency in the 1930s as the country struggled through the Depression. Questions of how to allocate limited government resources became less academic and more practical. However, in none of the states considering ways to reorganize schools and districts were administrative expense reductions a high priority. Several states completed studies seeking to reduce costs overall, but the primary focus was on the reduction of costs associated with one-room schoolhouses where a teacher had only a handful of students. The number of one-room schools declined from 189,227 in 1920 to approximately 113,600 in 1939-40 (Kansas

Legislative Council, 1944). There was a “nation-wide character of the reorganization movement” (Kansas Legislative Council, p. 1) as at least a dozen states worked to improve their systems of schools and districts. The reorganization effort in Wisconsin in 1939 had the goals of “giv[ing] the pupils the benefit of attending conveniently located schools having from 20 to 25 pupils, equalizing teachers loads and tax burdens, and securing reasonable educational returns from state and county aid funds” (Kansas Legislative Council, p. viii). Similarly, in Washington, the purpose of their reorganization study “was to form new districts to provide a more nearly equalized educational opportunity for pupils of the common schools, a higher degree of uniformity of school tax rates among districts, and a wiser use of public schools funds” (Kansas Legislative Council, p. viii). Although Oklahoma is not mentioned in the records of the time as having undertaken a reorganization study, during this same time period it was denying state aid to any elementary school with less than 18 students and any high school with less than 40 students, which would likely have induced some consolidation of schools (National Education Association of the United States, 1948). Again though, greater efficiency was achieved through larger class sizes, not reducing central offices.

The one partial exception in this time period to the seeking of cost reductions largely through increasing teachers’ student counts can be found in West Virginia. There, in 1933, the legislature abolished all of the 398 existing school districts and created new districts that were each coterminous with the 55 county boundaries (Kansas Legislative Council). As reported in a paper at the time, the West Virginia move was made to free small school districts from “petty politics” and to clean up administrative systems burdened by small district administrators being “either related to many of the teachers, or

were neighbors" (Pittsburgh Press, 1935). So this reorganization may have been partially motivated by a desire to improve district administration and had a side effect of eliminating more than a few central offices, but its primary reported savings came from reducing the teacher ranks statewide (West Virginia Encyclopedia).

In 1948, a National Commission on School District Re-Organization released its report and recommendations. Overall, the Commission argued for the creation of larger districts as necessary to improve educational opportunities first, but with the potential to provide financial savings second, largely from increasing the student-teacher ratio. The Commission argued that the biggest problem in education at the time was the small one-teacher school operating at a very low student-teacher ratio, without much support, or current knowledge on instructional practice. As noted by the Commission:

> School district reorganization is imperative. It is imperative for the simple reason that a large majority of the school districts now operating in this country cannot give people the kind of education programs they need to deal with the complex problems of present-day life or adequately prepare youth to cope with the problems of the future. (p. 15)

This philosophy underpinned the great growth in the size of school districts from 1950 through 1970, as previously shown in Figure 3. Research in 1971 pointed to the "encouraging" decrease in the number of school districts in past decades (Educational Research Service, 1971, p. 20). The same research paper outlined the 10 limitations of small school districts, including "barren, meager, insipid curriculum" (p. 21), small class sizes, and the lack specialized services. It did not include potentially higher administrative cost concerns in the 10. This research did note that the optimum school district size necessarily varied from state to state, based on the size of districts with the lowest per student expenditures within a particular state. Thus, the optimum district size in Nebraska was 20,000 students, while in New York it was 160,000. These calculations

had baked into them administrative costs (along with all other costs), but the research did not itemize costs, so no conclusions as to specific cost drivers could be drawn. Further in the same research paper, the authors noted that there were some districts that were overly large, “from the viewpoint of efficient administration” (p. 28). Based on the prevailing research of the time, which noted the largest desirable size to be 50,000 students, there were 83 overly large districts, but there was no discussion of how being over the ideal size contributed to increased administrative costs. The research paper concluded with the 1970 Resolution of the American Association of School Administrators, which recognized “excessive smallness, overpowering bigness, and inadequate responsiveness” (p. 29) as problems that could be overcome by school district consolidation or decentralization, but not in order to save on administrative costs. Rather, they were problems to be overcome in order to improve educational productivity and community responsiveness.

Some studies in the 1990s sought to quantify administrative spending. Hess (1995) found that 1990 administrative costs comprised 14% of total spending in Chicago Public Schools and also found evidence that administrative expenditures had increased in the decade prior. While Chicago student enrollment fell by 6.2% from 1981 to 1988, the percent of central office administrative staffing increased from 9.0% to 11.1% of all staffing. As Hess noted, “one of the primary criticisms of the Chicago Public Schools during the 1980s was the continual growth of the central bureaucracy while local schools were starved for adequate numbers of teachers, texts, supplies, and other resources.” (p. 38). Meanwhile, a State of New York study (1993) found that New York districts were classifying 7.4% of all expenditures as “administration” in 1990 with some individual

districts exceeding 10%. New York also found evidence of increasing administrative staffing per student in the previous five years (up 35%) and underreporting of actual administrative expenses. The study concluded that administrative expenses appeared to "be excessive…especially [in] downstate suburban and city districts" (p. i).

Another study of 645 school districts in New York using 1991-92 data found that 13% of total staff expenditures were for administrative positions (Monk & Hussain, 2000). A 1995 paper identified a national range of 9-11% being spent on administration, with three to four percent on central office and the balance on school administration (Odden & Monk, 1995).

Returning to the earlier question of *how to divide* and recognizing that there is scant research available, how do districts determine the size of the administrative slice of the budget pie? How much is budgeted to administrative areas versus elsewhere is often a matter of tradition and political whim. Ausband, Dunaway, and Kim (2009) found little deliberate intention in the creation of many central office structures, which largely determine the extent of central office expenditures, as personnel is typically the largest category of expense. Instead, they found that central office structures had been inherited from previous superintendents and were simply continued by current superintendents, or were imported from the superintendent's previous district to the new one. Odden and Monk (1995) document "fiscal regularities" among school districts—the idea that districts tend to spend in the same patterns as each other—with high-spending districts tending to spend the same proportion on administration as low-spending districts. They conclude that such fiscal regularities "reflect unimaginative school organizations and uses of education dollars that are unlikely to improve student learning" (p. 2).

In a more nefarious example, Hess (1995) found that the leaders of Chicago Public Schools "seemed to be focused on power accumulation rather than power sharing. [The superintendent's] budget proposals progressively drained resources from the schools while expanding the bureaucratic empire" (p. 51). Yet, in developing a solution through the *Chicago School Reform Act*, lawmakers found little reference for what should be the appropriate proportion of dollars allocated to central office administrative expenditures. Because it was difficult to find a "nonarbitrary criterion" (Hess, p. 39), lawmakers ultimately decided to rein in Chicago administrative spending by limiting it to the average of the administrative expenses of all the other Illinois districts in the previous year, thereby equating reversion to the mean to be ideal.

In the march toward larger and larger school districts, arguments have been made that larger district size offers opportunities for economies of scale, which might reduce the relative size of the slice allocated to administrative expenditures. The idea of economies of scale is often touted during discussions of school district consolidation and is a generally accepted truism in consolidation efforts. The economies of scale concept assumes that a larger school district can yield greater efficiency and effectiveness, not just in purchasing power for things such as smartboards or school buses, but also greater efficiency and effectiveness in intellectual power. Thus, one human resources director in a large district can effectively procure sufficient teachers and support staff for a number of schools and the cost per school (or student) for the director's salary is negligible. In contrast, a smaller school district would still have one human resources director, but in needing to procure fewer teachers and support staff, his salary is higher on a per school or student basis. This line of reasoning would support increased school district size, in order

to spread the director's salary over the greatest possible number of schools and students. But are there economies of scale to be gained in the area of administrative costs?

Some research does find economies of scale for administrative costs in larger school districts. Citing research by the Consortium for Policy Research in Education (CPRE), Odden and Monk (1995) point to the percentage of administrative spending in larger school districts in California, Florida, and New York as being lower than the average for each state. Considering all levels of administrative spending, Monk and Hussain (2000) found evidence of economies of scale in the 1991-92 data of New York school districts. Their regression model focused on size found that a 10% larger school district was associated with a reduction of the number of central administrative positions and a reduction in the portion of overall dollars spent on central administration. However, the changes were small. The 10% gain in student enrollment only reduced central administrative positions by 0.093 and central administrative spending portion by 0.077 percentage points. Moreover, the number of school, subject, and special administrative positions and the proportion of spending on them increased, eliminating the efficiency gains from reduced central administration.

Some research points to an asymptote for administrative costs, a line below which administrative costs do not continue to decrease. Duncombe et al. (1995) found such an asymptote, at which there are negligible increases in economies of scale once a district reached 2,000 students. Using 1990 data from 610 New York school districts, Duncombe et al. (1995) found that per student administrative costs decreased from $1,100 per student in the smallest school districts to $300 per student once the district had 500 students. From there, administrative costs continued to decrease, but the curve flattened

out at slightly more than $100 per student. Districts in the study between 5,000 and 10,000 students spent 1.7% of their total budget on administration, while districts of more than 10,000 students spent 1.5%.

In a review of 2000-01 spending among Iowa school districts, Imerman and Otto (2003) provided data demonstrating an asymptote at approximately 7.8% of expenditures made on administration. The average for all districts was 9.5% spent on administration. The leveling out of administrative expenditures per student was evident once Iowa districts enrolled just 1,600 students.

In a study of 2003-04 spending among Arkansas districts, Walters (2005) found that smaller school districts allocated a statistically significant higher mean percent of total expenditures to both district administration and school administration ($p=.01$). However, this difference petered out as enrollment increased. Walters found no statistically significant difference in administrative spending among districts with 501 to 1,250 students and those with more than 1,250 students.

In a study of all school districts in California using 2007-08 expenditure data, Pandolfo (2012) found more recent evidence of an asymptote. Dividing the California districts into small, medium, and large (<2,500, 2,501 – 10,000, and >10,000 students, respectively), Pandolfo noted a statistically significant difference ($p=.05$) in district administrative expenditures per student. Small districts spent $670 per student, while medium and large spent $548 and $444, respectively. Compared to total expenditures, the percent spent on district administration was 7.4%, 6.5%, and 5.2% (small, medium, and large). These data suggest an asymptote around the five percent level. However, Pandolfo also found that school administrative expenditures did not follow the same pattern.

School administrative expenditures decreased from small to medium districts (from $675 to $582 per pupil), but then increased from medium to large (from $582 to $600 per pupil). Pandolfo proposed that the increase from medium to large might be the result of larger districts pushing some tasks down to schools that medium districts consider to be central office functions. Considering both district and school administrative expenditures as a percent of all expenditures, the pattern was thus 14.9, 13.3 and 12.3% (small, medium, and large). The smaller drop from medium to large suggests perhaps a flattening of the cost curve earlier than when district administrative expenditures are considered alone. These data indicate that while larger school districts can achieve some economies of scale in the area of administrative spending, there is some limit, some percentage of expenditures below which school districts cannot be more efficient.

Other studies have described U-shaped cost functions: As districts grow larger they may encounter diseconomies of scale. Hess (1995) found that results in the late 1980s in Chicago Public Schools supported a U-shaped cost function, with an "inexorable tendency to siphon resources away from schools to the administrative bureaucracy" (Hess, p. 172). Some of these diseconomies may translate into increased administrative spending. There are a number of factors that may contribute to administrative diseconomies of scale, including:

- Larger districts can incur greater transportation costs, particularly if they are under court order to desegregate or working to achieve particular local enrollment goals at each school (such as balancing enrollments to keep schools from exceeding facility capacities). Some large districts offer forms of open enrollment, such as magnet schools, and provide transportation for them, driving up the

number of miles students are bused. While most of the transportation cost itself would be considered an operational expense for the purpose of this research, a number of additional expenses associated with large-district transportation could be considered administrative, such as GIS-based computer systems (similar to consumer products such as Google Maps) and planning staff to handle the increased bus routing complexity and additional layers of management over large numbers of bus drivers and maintenance technicians.

- Larger school districts often can afford to make substantial investments in technology, such as online personnel management systems, that smaller districts may competently handle with a less expensive option, such as an Excel spreadsheet.
- Larger districts may be subject to outsized pressures from businesses, as they represent larger potential sources of revenue. While some tout purchasing power on the part of larger districts to negotiate better deals, Hess (1995) found that Chicago's larger size "resulted in limiting contract bidding to a few large purveyors who could rig higher, not lower, prices and required a massive warehousing and distribution system, diluting the cost savings of mass purchasing" (p. 172-3).
- In some states, larger districts have to negotiate with teacher unions that have greater strength in their greater numbers. This can result in higher teacher compensation packages than those teachers might receive in smaller districts (Rose & Stonstelie, 2010).

- Larger districts, by nature of typically being in more urban areas and therefore having greater population density, tend to have larger schools than those in smaller districts. This often results in more layers of “middle management” at the schools, in the form of assistant principals.
- Larger districts also tend to have greater numbers of schools than smaller districts. This often results in more layers of middle management at the district level, such as that found in the seven area superintendencies in Los Angeles Unified School District and the seven learning communities with nine learning community superintendents in Charlotte-Mecklenburg Schools.

The work of Monk and Hussain (2000) offers evidence of the effect of a U-shaped function underlying district administrative spending, at least for the right side of the U where overall spending is increasing. Their regression models found that increases in overall spending levels resulted in changes in relative spending within a school district and that those changes tend to favor administrative spending. When overall spending increases, Monk and Hussain found that the share allocated to administration increased at the expense of instruction. They found a similar relationship with property wealth: A 10% higher level of property wealth per student in a school district resulted in 0.75% increase in administrative spending, but only a 0.28% increase in instructional spending. At the other end of the spectrum, higher levels of poverty also translated into increased share for administrative spending relative to instructional spending.

If either an asymptote or a U-shaped cost function exists for administrative spending, then bigger is not necessarily better for public school districts, as no studies have been found showing a positive statistical correlation between administrative

spending and improved student outcomes. This returns one to the question of why the public school district organizational structure persists and whether other models might offer an opportunity for reduced administrative spending on a per student basis. Specifically, how might the charter school organizational structure be an opportunity for reduced administrative spending, if they are actually providing similar services with less overhead?

Charter Schools and Spending

The rise of charter schools in the United States has a number of origins, philosophical and political, all rooted in a desire to seek more effective alternatives to the traditional school district structure. In 1988, one of American Federation of Teachers President Albert Shanker's arguments for charter schools was that schools need to have "new structure" (Shanker, 1988, p. 17). Chubb and Moe (1990) argued that the public school system cannot be reformed, as it is beholden to vested interests who defend the status quo, such as teachers unions. They therefore supported school choice (including charter schools) as a way to "break the iron grip of the adult interest groups, unleash the positive power of competition, and achieve academic excellence" (Ravitch, 2010, p. 118). Another researcher (Toch, 2010), upon meeting one of the proponents of charter schools in Minneapolis in the early 1990s stated, "He wanted to combat the bureaucracy of traditional public school systems" (Toch, 2010, p. 70). The climate of the times pointed to the potential for a non-traditional approach to educational administrative spending, with charter schools as the new structure.

Fullan (2007) argued that the required effort to change traditional school districts is massive and perhaps nearly impossible. According to Fullan, the only way to effect

true and sustained change in schools and school districts is to deeply and fundamentally change the culture; “schools are more likely to implement superficial changes in content, objectives, and structure than changes in culture, role behavior, and conceptions of teaching” (p. 79). Although Fullan agreed that charter schools, like vouchers or site-based management, were merely another structural variation (p. 10), others have seen the charter schools as a chance for a complete restructuring, with the potential for a complete reculturing of schooling. A charter school, having no past to overcome, can begin with the heretofore undiscovered culture the founders put into it, free from traditional organizational patterns and expectations, entrenched bureaucracy, and administrative spending patterns found in traditional school districts.

Others, in the debate between centralized and decentralized spending in school districts, have argued that those closest to student needs should have the most say in how spending is determined. According to decision rights theory, decisions made at the school level, where information about student needs and teacher quality is located, may result in optimal decisions for all students assigning. As Jensen and Meckling (1995) stated it, assigning “decisions rights to individuals who have the decision-relevant knowledge and abilities increases efficiency” (abstract). This argument indirectly supports the charter school concept, where there is no central office overseeing the independent charter school. Charter schools in a charter management organization (CMO) offer potentially a middle option in decision rights theory, partway between traditional school districts and independent charter schools, as there is a form of a central office, but perhaps that central office exerts less control over school-based spending than many central offices do over

traditional public schools. As of 2012, approximately one-third of all charter schools were organized within a CMO (Arsen & Ni, 2012).

Charter schools are not free of administrative spending no matter how free of regulations. Currently, there exist two broad categories of charter schools: independent charters and those opened and overseen by a charter management organization (CMO). As school districts of essentially just one or maybe two schools, administrative structures in independent charters are small compared to their traditional public school relatives. Those schools within a CMO, however, may labor under an administrative burden more typical of schools in traditional school districts. Research on 17 CMOs found an average of 18% being spent on central offices in 2007-08, which was not only outside the bounds of the business plans of several of the CMOs (Toch, 2010), but also greater than that spent on central offices in traditional districts.

Some recent research indicates that charter schools in general struggle with large administrative costs. As part of research on whether spending 65% of a school budget on instruction improves student outcomes, Taylor, Grosskopf, and Hayes (2007) studied 2004-05 expenditure patterns for 4,322 urban schools in Texas, including 121 charter schools. In addition to finding a statistically significant difference ($p=.01$) in allocations for instruction (55% in charters versus 66% in tradition public schools), using an *input distance function* method to generate measures of school inefficiency, the researchers found 87% of schools (3,746 of the 4,322 total) allocate their resources efficiently. Among the remaining 576 schools, 308 were found to be inefficiently allocating resources on administrators, a figure which included 34% of the charter schools compared to only six percent of the traditional schools. The researchers cite this as

evidence of a flaw in the charter school archetype. However, their model does not consider all administrative costs in the same manner. Essentially, the researchers divided all labor costs into two types: instructional and non-instructional. Instructional included only teachers and teacher aides employed in schools. Non-instructional included every other employee, from the superintendent to custodians. While this definition of non-instructional costs certainly included central office and school administration costs, it also included a fair amount of noise into the analysis, as counselors, librarians, nurses, clerical staff, cafeteria workers, and maintenance workers were included.

Arsen and Ni (2012) took on the question of administrative spending in various school organizations directly, when they explored administration spending allocations in traditional districts and charter schools in Michigan. Using 2007-08 data from Michigan's 552 school districts/charter schools, the researchers developed a regression model for administrative expenditures and used it to assess administrative spending among traditional school districts, single-building school districts, independent charter schools, and charters schools operating within a CMO. The model included terms to account for age of the charter schools (since it was surmised that newer charters might have higher initial administrative costs), overall student enrollment, rurality, percent of students receiving special education services, and percent of students receiving free/reduced price school meals. Overall, the researchers found that charter schools of either type spent a statistically significant higher amount on each component of administration, defined as 1) general administration and business services, and 2) school administration. Overall, charter schools spent $774 more per student on administration, including $506 more on general administration and $268 more on school administration. As Arsen and Ni noted,

"Controlling for other factors, the share of total spending devoted to administration is 10 percentage points higher in Michigan's charter schools than in school districts" (p. 13). They further found that charters in CMOs spend $312 more per student on administration that independent charters, a statistically significant result.

Conclusion

In conclusion, there appear to be few definitive answers as to truly *how much* educational funding is needed to support student achievement, although the prevailing current opinion in the traditional school district structure is generally *more*. Should alternative structures be able to achieve comparable student outcomes with fewer dollars, they should be considered. There also appear to be few solid answers as to *how to best divide* available funding, either by optimally-sized school districts, ever larger school districts, or other organizational structures, or by cost functions within a selected structure. The current landscape is still generally populated by traditional school districts, but various types of charter schools (independent and managed) are now numerous enough that scientific study between the various organizational structures can offer some insight into what might be better options in dividing education dollars. Such research might help also answer the question of w*ho best decides* how to spend those dollars.

As alternative models of organization could provide new responses to all three questions of *how much, how to divide,* and *who decides,* this research study compares one piece of education spending, administrative spending, among traditional school districts and charter schools. Controlling for various factors, the pattern of administrative expenditures between districts, independent charters, and charters in a CMO/EMO could

offer insights into how resource allocations vary and whether one organizational model might present an advantage over the other in minimizing administrative spending.

CHAPTER 3: METHODS

The overall goal of this research was to compare administrative expenditures between school districts and charter schools. Controlling for factors such as size and poverty, the pattern of administrative expenditures in the two main educational organizational models and within the submodels of various charter school types could offer insights into how resource allocations vary and whether one organizational model might present an advantage over the other in minimizing administrative spending.

Because the rise of charter schools is relatively recent, the differences in administrative expenditures between districts and charter schools have not been widely studied. This study replicates one conducted with 2007-08 data from Michigan, using more recent data from Michigan (2014-15) and then exploring the substitution of one variable (percent federal revenues) for two variables used in the original model (percent special education and percent free/reduced-price meals).

Descriptive statistics and standard multiple regression analyses were used to explore this research question:

1. What are the recent levels of administrative expenditures in public school districts, independent charter schools, and charter schools in CMOs/EMOs? How do they compare to earlier research in general and to the original study specifically?

Standard multiple regression analyses were used to explore the predictive value of various inputs on central office, school, and total administrative expenditures. This included these research questions:

2. Is there a relationship between organizational size and administrative expenditures per student that corroborates other research on flat economies of scale beyond a certain size? Does the relationship vary by organizational type?
3. How do administrative expenditures per student compare between school districts, independent charter schools, and charter schools in CMOs/EMOs, considering both central office expenditures and school-level expenditures?
4. To what extent do charter schools make relatively greater administrative expenditures at the school level, to the point that spending administrative dollars "closer to the student" becomes an important distinction between charter and regular public schools?

Analysis of the results and comparison of the results to prior research was completed in order to explore this research question:

5. What do the findings indicate for potential future education organizational structures?

Research Design

The study used a non-experimental correlational research design to examine the research questions. This study was largely a replication of an earlier study by Arsen and Ni (2012), with some consideration of additional variables of potential interest. The original study examined both administrative and instructional spending; this study

considered only administrative spending. In the original study, the researchers proposed this model for school resource allocation:

$$Y_i = CS_iB_1 + SDstructure_iB_2 + SDchar_iB_3 + u_i$$

where:

Y_i = the expenditure variable of interest - in this case administrative spending

CS_iB_1 = indicative of whether the organization was a charter school in the initial analysis, then a set of variables describing charter schools, including number of years in operation, grade levels served, and whether the charter is independent or part of a CMO/EMO. The original study did not differentiate between a charter school in a CMO (nonprofit oversight) versus one in an EMO (for-profit oversight), while this study did.

$SDstructure_iB_2$ = in the original study, a set of indicators of characteristics of the district/charter school that included enrollment, enrollment squared, total revenue per pupil, and a variable for whether the district/charter school is rural.

$SDchar_iB_3$ = a set of indicators of characteristics that included percent of students who receive special education services and percent of students eligible for free/reduced-price meals. This study initially included these variables, then considered instead the percent of total revenue that comes from federal sources, in order to account for large federal grant programs or other federal revenues, which the literature shows can have a positive growth effect on administrative spending (Meyer, Scott & Strang, 1987). The percent federal revenue variable was substituted for the special education and free/reduced-price meal variables because both those variables are also tied to portions of federal funding. The percent federal revenue variable was hypothesized to be more encompassing of all types of federal funding.

u_i = unobserved error.

The equation was initially estimated using standard multiple linear regression. Figure 5 provides the hypothesized regression model of Arsen and Ni (2012) and Figure 6 provides the modified model proposed in this study.

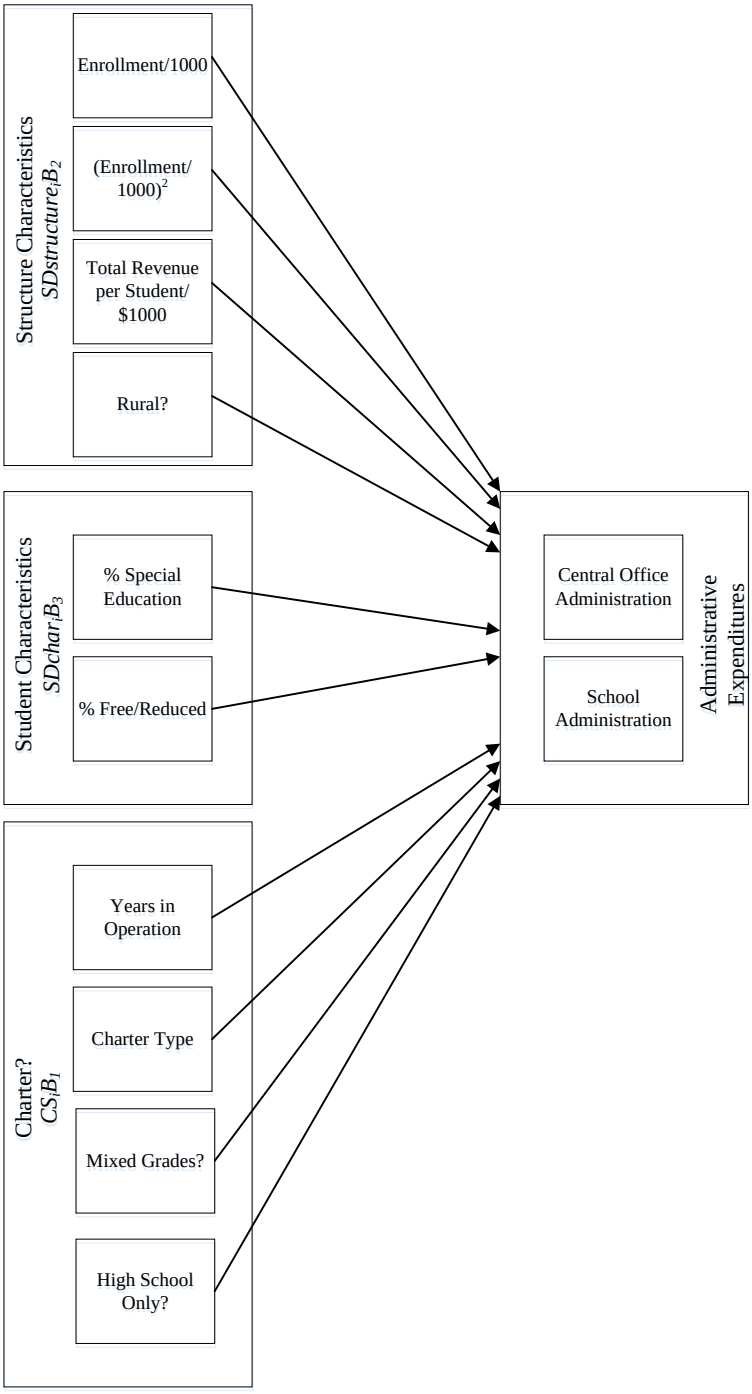

Figure 5. Hypothesized regression model of Arsen and Ni (2012). Predictive values of independent variables of organization type, organizational structure, and student characteristics on the dependent variable of administrative spending.

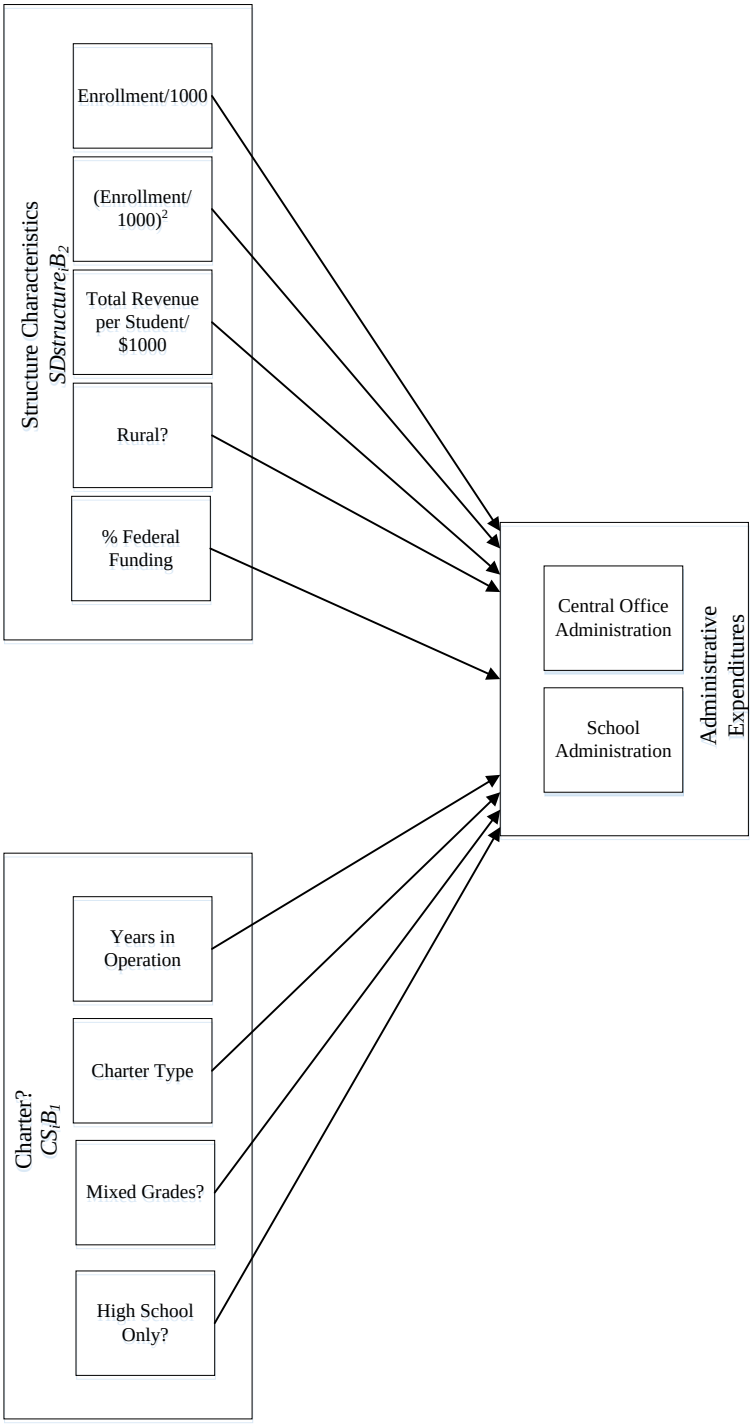

Figure 6. Hypothesized modified regression model of this study. Predictive values of independent variables of organization type and revised organizational structure on the dependent variable of administrative spending.

The major thrust of this current study was to examine the impact of organizational type on administrative spending. To that end, standard multiple linear regression was

used to explore the relationships between administrative spending (the dependent variable) and a number of factors of organization type, organizational characteristics, and student characteristics (the independent variables) among education organizations in Michigan in 2014-15. The use of standard multiple linear regression allowed for an examination of the predictive power of each independent variable on the two types of administrative spending (central office and school) as well as administrative spending overall. Standard multiple linear regression was an appropriate technique for this type of study goal, examining the relationship between a dependent variable and several independent variables, where at least one of the independent variables is continuous (Tabachnick & Fidell, 2013).

Sample

School districts and charter schools in Michigan were selected for this study so that direct comparisons to results of the previous study could be made. They were also selected because they provided sufficient data points for robust analysis. While charter schools are present in other states, in 2013-14 only 15 states, including Michigan, had more than 100 charter schools (National Center for Education Statistics, 2015). Michigan also allows all three types of charter schools of interest for this study: independent, operated by a CMO, and operated by an EMO. Michigan was one of the early adopters of charter schools, first authorizing them in 1993. This provides a generally more seasoned environment in which to examine financial outcomes. Finally, many traditional school districts in Michigan are small in size, providing natural experimental grounds and allowing comparisons that do not have to be interpreted through considerations of scale.

Overall, Michigan provides an opportunity to compare administrative spending across a variety of organizational types and sizes.

Table 1 provides an overview of the public education landscape in Michigan in 2014-15. The state had slightly less than 1.5 million K-12 public school students, with 9.3% in charter schools. There were more than 500 traditional school districts (TSDs) and 300 charter schools. Michigan also had 56 intermediate school districts, which largely function as regional education service agencies for TSDs and charter schools, but which can also provide direct instruction to students, typically prekindergarten or alternative education students. Nearly half of the K-12 students, 46.6%, were eligible for free or reduced-price meals, and 12.8% received some form of special education services.

Table 1

Public Education in Michigan, 2014-15

Data Variable	Count
Total K-12 Student Count	1,499,041
K-12 Charter Student Count	138,949
Traditional School Districts	541
Charter Schools	302
Intermediate School Districts	56
Percent Students Eligible for Free/Reduced-Price Meals	46.6%
Percent Students with IEPs	12.8%

Note. Adapted from MI School Data, retrieved from mischooldata.org/ District/ SchoolProfiles/EntitySummary/QuickFacts/Schools.aspx and various databases within the same website.

Data Collection

Data for this non-experimental study were collected from public sources. Michigan education organizations annually report financial expenditures and other data to the Michigan Department of Education (MDE) and the State of Michigan Center for Educational Performance and Information (CEPI). Nearly all variables of interest for this study were available through various databases provided online by MDE or CEPI. Both TSDs and charter schools annually report financial expenditures to MDE and CEPI using an established common accounting system, the Michigan School Accounting Manual. Reporting is guided by a detailed methodology that helps ensure expenditures are reported in the same manner from one district or charter to the next. For central office administrative expenditures, reporting agencies are instructed to report expenses in one of two function code categories:

- "23x" for general administration – "Activities concerned with establishing policy, operating schools and the school system, and providing the essential facilities and services for the staff and pupils"; and
- "25x" for business office – "Activities concerned with purchasing, paying, transporting, exchanging and maintaining goods and services for the school district.". (Center for Educational Performance and Information, 2015)

School administrative expenditures are reported in function code category "24x", defined as "Activities concerned with overall administrative responsibility for a single school." (Center for Educational Performance and Information, 2015)

One variable that was not available through these two sources was the determination as to whether a charter school was managed by an EMO or CMO. The

MDE provided a database listing the name of the EMO/CMO or a notation that the charter school was independently managed. For those managed by an EMO or CMO, the name of the managing organization was checked against the state corporation database (available online at dleg.state.mi.us/bcs_corp/sr_corp.asp) to determine for-profit (and therefore EMO) or non-profit (and therefore CMO) status.

In most cases, the MDE database provided the "locale" classifications for each district/school. This classification scheme was drawn from that used by the National Center for Education Statistics (NCES) and initially included 12 classifications:

- City: Large;
- City: Midsize;
- City: Small;
- Suburb: Large;
- Suburb: Midsize;
- Suburb: Small;
- Town: Distant;
- Town: Fringe;
- Town: Remote;
- Rural: Distant;
- Rural: Fringe; and
- Rural: Remote.

In the few cases where the MDE database did not have a classification, one was developed by comparing the classification of other districts/schools within the same zip code, town, or county, as appropriate, to others within the NCES database.

Table 2 lists the source of each data variable. In some cases the same data were reviewed from multiple sources. This was done to cross-check data, where possible, and to fill in missing data where needed.

Table 2

Sources of Data for This Study

Data Variable	MDE	CEPI	Other	NCES
Enrollment	X	X		
Total Revenue		X		
Total Expenditures		X		
Total Central Office Administrative Expenditures		X		
Total School Administrative Expenditures		X		
% Free/Reduced Price Meals Eligible		X		
% in Special Education		X		
Rurality	X			X
Charter, Year in Operation	X		X	
Charter Type (Independent/EMO/CMO)	X		X	
Charter, Grade Levels	X		X	
% Federal Funding		X		

Data Analysis

The Statistical Package for the Social Sciences (SPSS) Version 22 was used to analyze the collected data. Prior to analysis, the data were screened using the checklist shown in Table 3.

Table 3

Checklist for Screening Data

Tasks	Subtasks
1. Inspect univariate descriptive statistics for accuracy of input.	a. Out-of-range values b. Plausible means and standard deviations c. Univariate outliers
2. Evaluate amount and distribution of missing data; deal with problem.	
3. Check pairwise plots for nonlinearity and heteroscedasticity.	
4. Identify and deal with nonnormal variables and univariate outliers.	a. Check skewness and kurtosis, probability plots b. Transform variables (if desirable) c. Check results of transformation
5. Identify and deal with multivariate outliers.	a. Variables causing multivariate outliers b. Description of multivariate outliers
6. Evaluate variables for multicollinearity and singularity.	

Note. Source: Tabachnick, B. G., and Fidell, L. S. (2013). *Using multivariate statistics*, 6th ed. Boston: Pearson.

Standard multiple linear regression was used to explore the relationships between the dependent variables or DVs and a number of independent variables or IVs. The standard multiple regression checklist outlined by Tabachnick and Fidell (2013) and shown in Table 4 was followed in the completion of the analysis.

Table 4

Checklist for Standard Multiple Regression

Tasks	Subtasks
1. Issues	d. Ratio of cases to IVs and missing data
	e. Normality, linearity, and homoscedasticity of residuals
	f. Outliers
	g. Multicollinearity and singularity
	h. Outliers in the solution
2. Major analyses	a. Multiple R^2 and its confidence limits, *F* ratio
	b. Adjusted multiple R^2, overall proportion of variance accounted for
	c. Significance of regression coefficients
	d. Squared semipartial correlations
3. Additional analyses	a. Post hoc significance of correlations
	b. Unstandardized (β) weights, confidence limits
	c. Standardized (β) weights
	d. Unique versus shared variability
	e. Suppressor variables
	f. Prediction equation

Note. Source: Tabachnick, B. G., and Fidell, L. S. (2013). *Using multivariate statistics*, 6th ed. Boston: Pearson.

Data were analyzed at the .01 significance level. Descriptive statistics were analyzed to provide a rich description of the dataset. Standard multiple regression was used to test for statistical significance in the hypotheses. Multiple regression analyses

were used to examine the extent to which the selected organizational type, organizational characteristics, and student characteristics predicted administrative expenditures.

Summary

The goal of this research was to compare administrative expenditures between school districts and various types of charter schools. Using publicly available data from Michigan to analyze a dataset that provided cases of small districts, large districts, independent charter schools, charter schools in CMOs, and charter schools in EMOs, this study used standard multiple linear regression to explore differences in school administrative, central office administrative, and total administrative spending.

CHAPTER 4: RESULTS

The overall goal of this research was to compare administrative expenditures between the different organizational models of traditional school districts (TSDs) and charter schools, as well as the submodels within charter schools. This study sought to replicate an earlier study on the same subject (Arsen & Ni, 2012), using more recent data and exploring differences in submodels within charter schools. This study used a non-experimental correlational research design to examine the research questions. The original multiple regression model included enrollment, enrollment squared, total revenue per student, percent special education, percent free/reduced-price meal eligible, and indicators for whether the TSD/charter school was in a rural area to predict total, central office, and school administrative expenditures. This study then explored a modification of the original model, substituting percent federal funding for percent special education and percent free/reduced-price meal eligible. This modification acknowledged that special education and low-income students contributed to the amount of federal funding received but that substantial grant and other federal funding might also be captured in an overall percent federal funding variable. Previous research indicated that increased federal revenues of any kind could result in increased administrative spending (Meyer, Scott & Strang, 1987). Reducing the number of independent variables (IVs) would improve the model, if the modification proved to be statistically better. As noted by

Tabachnick and Fidell (2013), “An optimal set of IVs is the smallest reliable uncorrelated set that ‘covers the waterfront’ with respect to the DVs.” (p. 122)

Standard multiple linear regression was used to explore the relationships between administrative spending (the dependent variable or DV) and a number of factors of organization type, organizational characteristics, and student characteristics (the IVs) among education organizations in Michigan in 2014-15. The use of standard multiple linear regression allowed for an examination of the predictive power of each independent variable on the two types of administrative spending (central office and school) as well as administrative spending overall.

Sample

The initial dataset downloaded from the Michigan Center for Educational Performance and Information (CEPI, 2015) for 2014-15 included expenditures for 902 districts/charters. This included data for 56 Intermediate School Districts (ISDs, also called Regional Education Service Agencies, or RESAs), which in Michigan function as regional service providers to districts and charters in such areas as professional development, and also provide some direct instructional services, primarily to preK and alternative education students. Eliminating the ISDs left 846 cases. Another 46 were eliminated from the dataset for these reasons:

- seven were special circumstances and had no students enrolled in 2014-15;
- four served only special education students;
- 12 were found to be either virtual only or a blended model; and
- 23 served only alternative education students.

None of the last three categories were models intended to be included in this analysis, as it was surmised that their organizational structures, and hence administrative expenditures, were likely to be substantially different from those in TSDs and charter schools that engaged in face-to-face instruction with primarily general education students. For example, schools exclusively for special education students may have extremely low student:teacher ratios and correspondingly higher numbers of administrators, or may need additional administrative expenditures to manage caseloads and required reporting.

The 12 locale codes were collapsed into two values for analysis purposes. All city and suburb classifications were collapsed into an "urban" grouping (coded as 1) while all town and rural classifications were collapsed into a "not urban" grouping (coded as 2).

There were a wide variety of grade spans among the charter schools while nearly all TSDs served grades K-12. The grade spans were collapsed into six categories:

- 1 – All grades (K-12, K-11, K-10, K-9, 4-12, and 1-12);
- 2 – Elementary (1, K-4, and K-5);
- 3 – Elementary and Middle (K-6, K-7, and K-8);
- 4 – Middle (6-8);
- 5 – Middle and High (5-12, 6-12, and 7-12); and
- 6 – High (9-12 and 11-12).

Table 5 provides the breakdown by grade coding in the dataset. These were later recoded in the regression analysis into three variables (for just the charters): have all grades (66

cases); have only elementary, or elementary and middle school (165 cases); and, have only middle, middle and high school, or only high school (26 cases).

Table 5

Number of Schools in Dataset by Grades Served

	Grades Served						
Org. Type	All Grades	Elem. Only	Elem. and Middle Only	Middle Only	Middle and High Only	High Only	Total
TSD	515	4	23	0	0	0	542
Charter	66	10	155	1	7	19	258
Total	581	14	178	1	7	19	800

The resulting dataset had 800 cases, before any statistical data screening. With seven IVs in the original model and six IVs in the modified model, the 800 cases exceeded the minimum requirement for adequate statistical power for standard multiple linear regression analysis (Tabachnick & Fidell, 2013).

Table 6 provides a breakdown of the number of TSDs and charters in the dataset. This was the dataset subject to data screening and subsequent data analysis.

Table 6

Number of Cases by Organizational Type in the Dataset

Organizational Type	Count
Traditional School Districts	542
Charter Schools	258
Independent Charters	31
Charters in CMO	33
Charters in EMO	194

Data Screening

As most data were compiled electronically, there was little manual data entry, which minimized concerns about accuracy of input. A visual inspection of all data yielded no instances of likely errors, such as negative expenditure or enrollment figures. It was found that 28 cases had $0 reported for school administrative expenditures. None of these had $0 reported for central office administrative expenditures, so this was likely not data error. Since all of the 28 cases had student enrollments of less than 380 (mean of 96), it is conceivable that the reporting districts/charters simply considered all their administrative expenses to be of one type.

In 34 cases, the Michigan Department of Education did not provide the specific number of students eligible for special education services within the district/charter because of student privacy concerns owing to a very small number of students. In each of these cases, the number of special education students totaled less than five. Instead of considering these to be cases with missing values, the researcher assumed that each

district/charter had 2.5 special education students and then calculated the percent special education variable.

Table 7 provides the univariate descriptive statistics examined to verify accuracy of data input and initial reasonableness of the dataset. None seemed unreasonable. With the smallest districts/charters, dividing enrollment by 1,000 yielded enrollments that appeared to be zero, but all digits to the right of the decimal were retained so that the enrollment figures used in the regressions were actually greater than zero. The higher administrative expenditure figures were generally districts with unusual characteristics, such as having extremely low enrollment and being in a remote geographic area. The figures for higher revenue per student were generally also remote districts with combinations of low enrollment and high free/reduced-price meal eligibility or special education.

Table 7

Analysis of Means and Standard Deviations in the Initial Dataset

	Min	Max	Mean	Std. Dev.
Fall 2014 Enrollment	4.0	43238.9	1808.5	2971.0
Enrollment/1000	0.0	43.20	1.81	2.97
(Enrollment/1000)^2	0.0	1869.60	12.1	77.23
Total Revenue per Pupil/$1000	$5.53	$69.30	$10.50	$4.70
% Free/Reduced Meals	0.0%	100.0%	55.2%	24.1%
% Special Education	0.7%	62.5%	11.9%	5.2%
% Federal Revenue	0.0%	52.4%	6.5%	5.5%
CO Admin Exp per Student	$102	$14,869	$797	$939
School Admin Exp per Student	$0.00	$3,825	$648	$368
Total Admin per Student	$261	$14,869	$1,445	$1,041

Analyses of univariate outliers found 112 cases that were at least three standard deviations from the mean on one or more of the IVs or DVs. Of these, 16 cases were univariate outliers for three or more variables. In 13 of these cases, the student enrollment was less than 100 students. Comparisons of the data for these 13 with other extremely small districts/charters did not reveal anything that would make them good candidates for deletion from the dataset. One of the other three cases was Detroit City School District, which was the largest school district in the state, at 43,239 students. Examination of univariate outlier cases did not reveal any systemic reason for removing them from the analysis and later regression analyses determined that they did not have a significant impact on the results.

Regarding the assumption of univariate normality, none of the independent variables (IV) fully met this condition. Box plots of each continuous IV show that only one, percent free/reduced eligible, did not violate the assumption of normality (Figure 7). Other statistical analyses indicated the same. The researcher determined that transformation of variables was not desirable because of the loss of the original variable scale, which would make the interpretation difficult to explain.

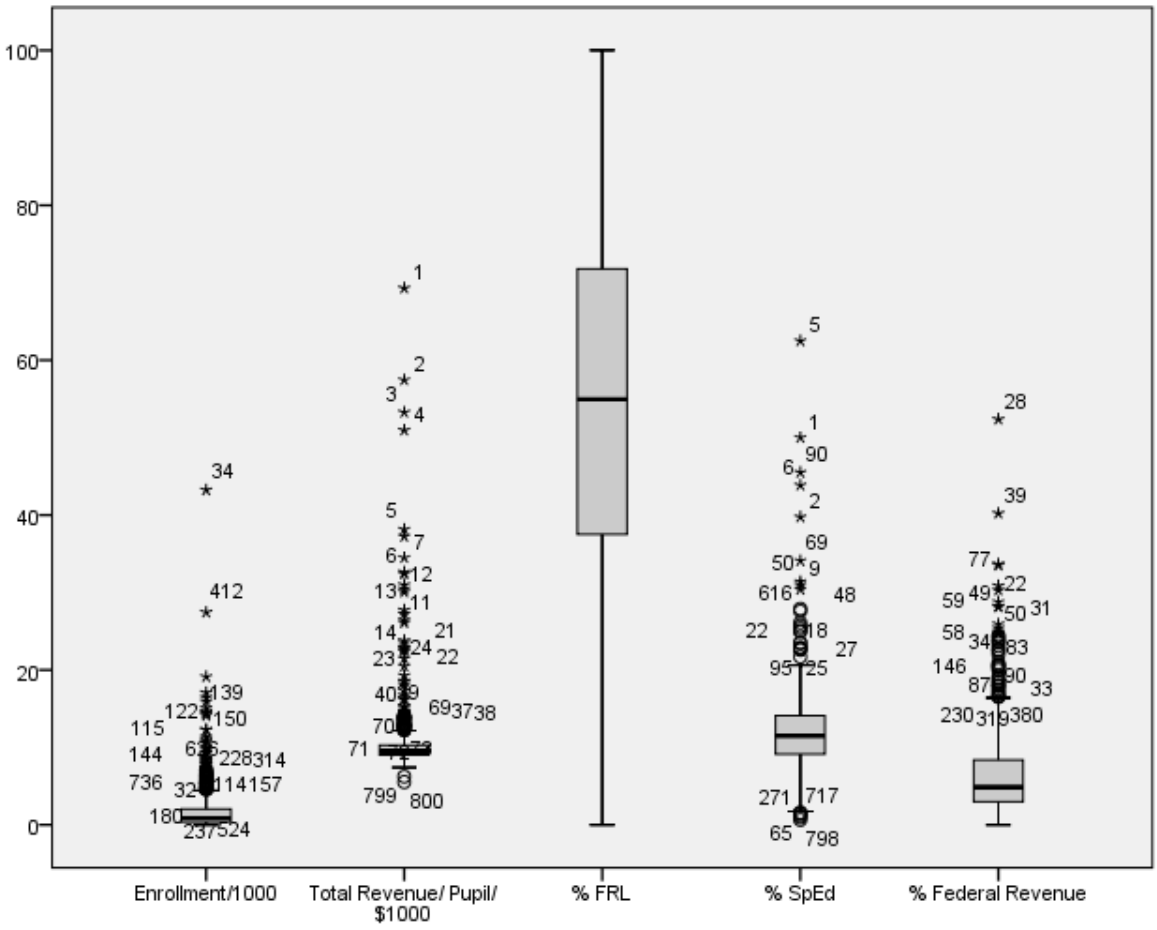

Figure 7. Examination of box plots for each of the five continuous independent variables indicated that all but the percent free/reduced variable violate the assumption of normality.

Examination of pairwise plots revealed substantial nonlinearity. Results from the Kolmogorov-Smirnov test found that the data were not normally distributed, as all the values were statistically significant.

Figure 8 provides one of the Q-Q probability plots of the data, which shows that the observed values for total administrative expenditures per student differed substantially from the expected values and particularly at the lower and higher ends. The other Q-Q probability plots showed similar lack of normal distribution. In the major analyses, the residuals were examined to determine if the lack of univariate normality had a negative impact on the interpretation.

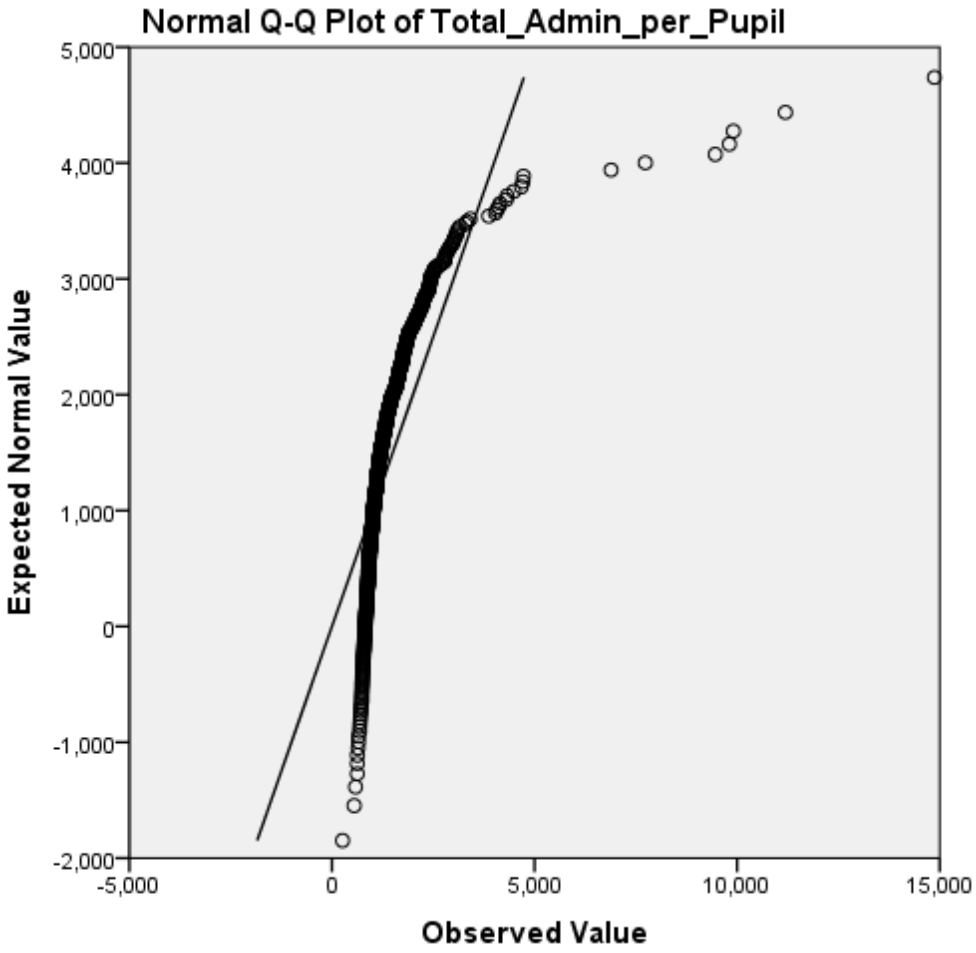

Figure 8. Examination of the Q-Q plot for total administrative expenditures per student indicates substantial deviation of the observed values from the expected values.

In examining the data for multivariate outliers, with the dependent variables used by Arsen and Ni in the 2012 study (enrollment, enrollment squared, total revenue per

student, percent special education, percent free/reduced-price meal eligible, locale, and TSD/charter), Mahalanobis Distance and Chi-Square analyses indicated a potential 28 multivariate outliers. However, 12 of the 28 were among the 13 largest districts in the state, with a range of approximately 12,000 to 43,000 students. These districts appeared to become multivariate problems because of the two enrollment terms included. The other 16 potential multivariate outliers all had enrollments of less than 522 students, with a mean of 91 students. Comparisons of the data for these 16 with other extremely small districts/charters did not reveal anything that would make them good candidates for deletion from the dataset.

Running the original model for just the total administrative expenditures per student DV, the variance inflation factors (VIFs) for the enrollment and enrollment squared term each exceeded 4.0 (5.56 and 4.02, respectively), indicative of potential problems with multicollinearity. Given that Arsen and Ni (2012) initially included the enrollment squared term to account for the observed "tipping point beyond which increasing district size is associated with rising central office expenditures" (p. 11) and which they determined to be of importance when the district enrollment exceeded 55,000 students, it could likely be safely removed from the model. Following the same differentiation steps completed in the original study, the 2014-15 data in this study indicated that the tipping point occurred at a district enrollment greater than 21,500 students. Only two TSDs exceeded that threshold in the 2014-15 data: Detroit City School District and Utica Community Schools (43,230 and 27,445 students, respectively). Removal of the enrollment squared term decreased the adjusted R^2 slightly, from 0.654 to 0.649, but eliminated multicollinearity. As no cases were deleted, the

overall descriptive statistics presented in Tables 6 and 7 were unchanged from the initial dataset to the one used for analysis.

Descriptive Data Analysis

Using the cleaned and screened dataset, Table 8 provides the mean statistics for the overall dataset and then the TSDs in comparison to the charters. Overall, the mean charter school had approximately one-fifth the enrollment of the TSDs. Charters also averaged lower revenue per student but a higher average percent federal revenue. Charters served a higher average rate of students eligible for free/reduced-price meals, but a lower average rate of special education students. In each area of administrative spending, charters averaged higher spending than the TSDs.

Table 8

Mean Statistics of Dataset by Organizational Type

Data Variable	Overall	TSD	Charter
Mean Enrollment	1,808	2,429	505
(Mean Enrollment/1000)^2	12.1	17.6	.4
Mean Total Revenue per Student/$1000	$10.50	$10.89	$9.66
Mean Percent Free/Reduced-Price Meal Eligible	55.2%	49.0%	68.2%
Mean Percent Special Education	11.9%	12.8%	10.0%
Mean Percent Federal Revenues	6.5%	5.4%	8.8%
Mean Total Administrative Expenditures per Student	$1,445	$1,229	$1,897
Mean Central Office Administrative Exp. per Student	$797	$640	$1,126
Mean School Administrative Expenditures per Student	$648	$589	$771

Table 9 provides further descriptive statistics comparing total, central office, and school administrative expenditures per student among the various organizational structures of Michigan public education entities in 2014-15. Table 10 provides the same data as a percent of total expenditures. In all cases, charters spent more per student on administration than districts, whether it was total, just central office, or just school administration. The difference was statistically significant in a one-way ANOVA for just the district/charter split ($p<0.001$) for each type of administrative expenditure. However, the Levene's test was statistically significant for school administrative expenditures, indicating that the homogeneity of variance assumption was violated for that DV. The effect sizes (η^2) for the one-way ANOVA of total, central office, and school administrative expenditures were .09, .06, and .05 respectively. As noted by Tabachnick and Fidell (2013), the .09 would be considered a medium effect, while the other two would be considered between small and medium.

Among charters, CMOs spent more per student on total, central office, and school administration than did the other types of charters. However, post-hoc comparisons using the Tukey HSD test indicated that mean administrative spending by CMOs was not significantly different from that of EMOs or Independents.

Looking at administrative spending as a percent of total spending, in all cases, charters spent a higher percentage of dollars on administration than districts, whether it was total, just central office, or just school administration. The difference was statistically significant in a one-way ANOVA for just the district/charter split ($p<0.001$) for each type of administrative expenditure. However, the Levene's test was statistically significant for

all three types, indicative of violations of homogeneity of variance assumptions. The effect sizes were large in all three cases (0.5, 0.4, and 0.1).

Among charters, CMOs spent a higher percent of their funds on central office administration than did the other types of charters, but EMOs spent a higher percentage on school administration. However, post-hoc comparisons using the Tukey HSD test indicated that mean administrative spending among the various charter types was not significantly different.

Table 9

Administrative Expenditures per Student by Organizational Type

		Total				Central Office				School			
Org. Type	n	Mean	Min	Max	St Dev	Mean	Min	Max	St Dev	Mean	Min	Max	St Dev
TSD	542	$1,229	$261	$14,869	$1,035	$649	$102	$14,869	$1,007	$589	$0	$3,244	$256
All Charters	258	$1,897	$583	$9,807	$901	$1,126	$144	$6,648	$669	$771	$0	$3,825	$509
Ind. Charter	31	$1,863	$1,110	$4,063	$668	$1,097	$343	$2,716	$591	$766	$0	$2,760	$528
EMO Charter	194	$1,879	$583	$9,807	$966	$1,108	$144	$6,648	$695	$770	$0	$3,825	$527
CMO Charter	33	$2,040	$1,100	$4,323	$673	$1,260	$282	$3,628	$577	$780	$279	$2,138	$382

Table 10

Percent Administrative Expenditures of Total Expenditures by Organizational Type

		Total				Central Office				School			
Org. Type	n	Mean	Min	Max	St Dev	Mean	Min	Max	St Dev	Mean	Min	Max	St Dev
TSD	542	11.1%	4.1%	30.6%	3.0%	5.3%	1.0%	29.2%	3.4%	5.8%	0.0%	23.7%	1.9%
All Charters	258	20.5%	6.0%	49.9%	6.1%	12.3%	1.2%	41.9%	5.5%	8.3%	0.0%	34.9%	4.3%
Ind. Charter	31	19.1%	6.0%	34.9%	6.2%	11.4%	3.6%	33.7%	6.7%	7.8%	0.0%	17.6%	4.3%
EMO Charter	194	20.5%	6.7%	47.8%	5.9%	12.2%	1.2%	29.4%	5.1%	8.4%	0.0%	34.9%	4.4%
CMO Charter	33	21.9%	12.4%	49.9%	6.9%	13.8%	2.3%	41.9%	6.5%	8.2%	2.8%	17.4%	3.1%

Table 11 provides the overall fit statistics for the three administrative expenditure DVs in the original Arsen and Ni model (without the enrollment squared term). All models showed initial good fit. The F-test was statistically significant for all models, indicative of a linear relationship between the variables. The adjusted R^2 of the total administrative expenditures model was .649, with an R^2 of .651, meaning that the linear regression explained 65.1% of the variance in the total administrative expenditures per student. Regressing the components of total administrative expenditures individually, the second model explained 61.8% of the variance in central office administrative expenditures and the third model explained 11.3% of the variance in school administrative expenditures.

Table 11

Regression Fit Statistics for the Arsen and Ni Model (Without Enrollment Squared)

DV	R	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin-Watson
Total Admin Exp.	.807	.651	.649	$617.05	2.25
CO Admin Exp	.788	.621	.618	$580.62	2.22
School Admin Exp.	.345	.119	.113	$346.30	1.88

Note. Predictors: (Constant), TSD or Charter, Total Revenue/ Pupil/ $1000, Enrollment/1000, % FRL, % SpEd, Locale.

Multiple Regression Analyses – Arsen and Ni Model

To replicate the Arsen and Ni study, six separate regression analyses were run, first one each for the three DVs considering all organizational types in the dataset, then a second run for each of the three DVs considering additional characteristics for the charter schools in the dataset. Where necessary, SPSS was asked to substitute the mean for missing values among the TSD data, so that the regressions with charter-specific data

would process in a manner similar to that presented in the original Arsen and Ni study. The results are provided in Table 12. Looking first only at the three regressions without the additional charter school variables, one finds that enrollment was significant for only two DVs, total and central office administrative expenditures. There were some economies of scale present, but they were small. For every enrollment increase of 1,000 students, total administrative expenditures decreased by $35 per student.

Total revenue was significant in all three regressions. For every $1,000 increase in revenue per student, spending on administration increased by $171. In other words, for every dollar of increased revenue, 17 cents was spent on administration. Most of that, 15 cents, was spent in central office administration, while 2 cents was spent in school administration.

Whether the district/charter was in an urban area was significant only for central office administrative expenses. Non-urban districts/charters spent $136 more per student on central office administrative expenses compared to urban districts/charters. This may reflect the tendency of rural districts/charters to be smaller overall than urban ones, with an average enrollment of 1,072 students compared to 2,567 students. This negative correlation between locale and enrollment was also reflected in their bivariate correlation of -.25. School administrative spending was lower in more rural areas, but this finding was not statistically significant.

The percentage of special education students was significant on all three categories of administrative spending. For every percentage point increase in special education, total administrative spending decreased by $26 per student, almost evenly split between central office and school administrative spending. While this does not make

initial intuitive sense, it may be indicative of the effect of overall class size reductions, caused when districts/charters with higher numbers of special education students have relatively higher numbers of low-enrollment self-contained classrooms for special education students. The overall effect could be that those districts/charters end up spending a greater proportion on classroom teachers, leaving fewer funds for administration. The percentage of students eligible for free/reduced-price meals was not statistically significant on any category of administrative spending.

Finally, being a charter school strongly impacted administrative spending – this variable had the largest coefficient of all the variables. It was statistically significant in all three categories of spending. Charter schools spent $749 more on administration than did districts. Most of this was spent on central office administration ($602).

Looking next at the three regressions with the additional charter school variables, one finds similar results for the initial variables. For the charter-specific variables, years in operation was statistically significant. For every one year increase in operation, administrative expenditures decreased by $14 per student. Being an EMO or CMO was not a statistically significant predictor of administrative expenditures. Being a charter school that served only high school students did have a statistically significant impact on administrative expenditures. Those schools spent $658 more per student on administration than schools that served all grades.

Table 12

Arsen and Ni Administrative Expenditure Model Unstandardized (β) Model Coefficients and (Standard Error)

DV	Total Admin. Expenditures		Central Office Admin. Expenditures		School Admin. Expenditures	
Constant	-494.33** (136.69)	-710.52** (215.65)	-1057.15** (128.62)	-1243.12** (206.95)	562.82** (76.71)	532.60** (120.96)
Enrollment/ 1000	-35.44** (8.89)	-30.39** (8.74)	-35.50** (8.36)	-33.35** (8.39)	.07 (4.99)	2.96 (4.90)
Total Revenue /Student /$1000	173.04** (5.31)	169.89** (5.23)	151.16** (5.00)	150.06** (5.02)	21.87** (2.98)	19.83** (2.93)
Locale 1 = Urban 2 = Not Urban	92.31 (57.01)	144.48* (56.75)	136.38* (53.64)	161.37** (54.46)	-44.06 (31.99)	-16.89 (31.83)
% Special Education	-25.66** (4.97)	-24.54** (4.89)	-13.58** (4.67)	-13.08** (4.69)	-12.08** (2.79)	-11.45** (2.74)
% Free/ Reduced	2.03 (1.01)	2.47* (1.0)	1.69 (.95)	1.79 (.96)	.33 (.57)	.68 (.56)
Charter School 0=TSD 1=Charter	748.84** (63.01)	775.46** (62.17)	602.23** (59.23)	617.10** (59.67)	146.61** (35.36)	158.36** (34.87)
Charter Only Years in Operation		-14.00* (6.05)		-5.14 (5.81)		-8.86** (3.39)
Charter Only 1 = EMO		228.09 (120.77)		206.65 (115.90)		21.44 (67.74)
Charter Only 1 = CMO		270.39 (157.91)		276.07 (151.54)		-5.68 (88.58)
Charter Only – No HS		-2.48 (90.32)		-31.32 (86.68)		28.84 (50.67)
Charter Only – HS Only		658.39** (147.43)		262.57 (141.48)		395.83** (82.70)
R^2	.651	.670	.621	.626	.119	.166
Change in R^2		.019		.005		.047

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

Multiple Regression Analyses – Modified Model

The modified model replaced the percent special education and percent free/reduced-price meals eligible with percent federal revenue. Then, the same six regression analyses were run. In all six analyses, the R^2 value was lower, indicating that the model modification was not an improvement over the original. In the original model, percent special education was statistically significant in each regression and percent free/reduced was statistically significant in one. In the modified model, percent federal revenue was not statistically significant in any of the six regressions. Therefore, further analysis of the modified model was abandoned.

Research Questions

The first question this study sought to answer was: What are the recent levels of administrative expenditures in traditional school districts, independent charter schools, and charter schools in CMOs/EMOs? How do they compare to earlier research in general and to the original study specifically? This study found an average of $1,445 per student spent on total administration, roughly evenly split between central office and school administration. However, when considering administrative expenditures as a percent of total expenditures, the results varied by organizational type. Table 13 provides the breakdown of differences among the organizational types. Among TSDs, an average of 11.1% of all spending was for administration, 5.3% for central office, and 5.8% for school administration. Among charters as one group, an average of 20.5% of all spending was for administration, 12.3% for central office and 8.3% for school administration. Within charters, independent charters spent the least percentage on total administration (19.1%), followed by EMOs at 20.5% and CMOs at 21.9%.

Table 13

Comparison of Administrative Expenditures as Percent of Total Spending by Organizational Type

	Mean Total Administrative Spending	Mean Central Office Administrative Spending	Mean School Administrative Spending
TSDs	11.1%	5.3%	5.8%
All Charters	20.5%	12.3%	8.3%
Independent Charter	19.1%	11.4%	7.8%
EMO Charter	20.5%	12.2%	8.4%
CMO Charter	21.9%	13.8%	8.2%

All types of charters spent a higher percentage of their total expenditures on administrative categories than did TSDs. This was true at the total administrative level as well as the central office and school administrative levels. The split between administrative spending levels among charters also differed from that of TSDs. A higher proportion of charter administrative spending was found at the central office level, while in TSDs the proportions allocated to central office and school administration were nearly equal.

Table 14 compiles the total, central office, and school administrative expenditures as a percent of total expenditures from previous research, other than the Arsen and Ni study of 2012. The figures included were all discussed in Chapter 2 of this study. As shown, the percent spent on total administration ranged from to 3.1 to 9.5% in previous research. In comparison, this study found a mean for total administration of 11.1% for

TSDs in Michigan and 20.5% for charters in Michigan. Also across past studies, the percent spent on central office administration ranged from 1.5% in large New York school districts to 24.0% in tiny Texas districts, while this study found a mean of 5.3% for TSDs and 12.3% for charters. Finally, across past studies, the percent spent on school administration ranged from 3 to 7.5%, while this study found a mean of 5.8% for TSDs and 8.3% for charters.

In answer to the question of how the results of this study compared to previous research, this study found that both Michigan TSDs and charter schools spent a higher percent on total administration. Both Michigan TSDs and charter schools were within the admittedly large range of central office administrative spending found in prior research. In school administrative spending, Michigan TSDs were within the range found in prior research, while Michigan charters were outside the range and higher.

Table 14

Compilation of Administrative Expenditures in Past Research

Type of Mean Measure	Organizational Type	Figure	Year of Data	Source
Total Administration	"Major" NY School Districts (>8 teachers; mean enrollment was 3,616 among 694 districts)	7.5%	1986-91	State of New York, 1993
Total Administration	Five Largest NY School Districts (range 17,985 - 831,910)	6.8%	1986-91	State of New York, 1993
Total Administration	All Iowa School Districts (n=374)	9.5%	2000-01	Imerman & Otto, 2003
Total Administration	Arkansas school districts, 0-500 ADM	7.8%	2003-04	Walters, 2005
Total Administration	Arkansas school districts, 501-1,250 ADM	5.0%	2003-04	Walters, 2005
Total Administration	Arkansas school districts, >1,250 ADM	3.1%	2003-04	Walters, 2005
Central Office Admin.	School Districts in New York <500 students	4.8%	1990	Duncombe et al., 1995
Central Office Admin.	School Districts in New York 500-1,000 students	3.3%	1990	Duncombe et al., 1995
Central Office Admin.	School Districts in New York 1,000-2,500 students	2.6%	1990	Duncombe et al., 1995
Central Office Admin.	School Districts in New York 2,500-5,000 students	2.2%	1990	Duncombe et al., 1995
Central Office Admin.	School Districts in New York 5,000-10,000 students	1.7%	1990	Duncombe et al., 1995
Central Office Admin.	School Districts in New York >10,000 students	1.5%	1990	Duncombe et al., 1995
Central Office Admin.	National, all school districts	6-7%	1993-94	Odden & Monk, 1995
Central Office Admin.	Charter – CMO	18%	2007-08	Toch, 2010

Central Office Admin.	Small School Districts (<2,500)	7.4%	2007-08	Pandolfo, 2012
Central Office Admin.	Medium School Districts (2,501 - 10,000)	6.5%	2007-08	Pandolfo, 2012
Central Office Admin.	Large School Districts (>10,000)	5.2%	2007-08	Pandolfo, 2012
Central Office Admin.	Districts of <500 (% necessary to earn full points)	<=24.0%	2014-15	FIRST Texas, 2015
Central Office Admin.	Districts of 500 – 999	<=13.1%	2014-15	FIRST Texas, 2015
Central Office Admin.	Districts of 1,000 - 4,999	<=11.5%	2014-15	FIRST Texas, 2015
Central Office Admin.	Districts of 5,000 - 9,999	<=10.0%	2014-15	FIRST Texas, 2015
Central Office Admin.	Districts of >=10,000	<=8.6%	2014-15	FIRST Texas, 2015
School Admin.	National, all school districts	3-4%	1993-94	Odden& Monk, 1995
School Admin.	Small School Districts (<2,500)	7.5%	2007-08	Pandolfo, 2012
School Admin.	Medium School Districts (2,501 - 10,000)	6.8%	2007-08	Pandolfo, 2012
School Admin.	Large School Districts (>10,000)	7.1%	2007-08	Pandolfo, 2012

Tables 15 through 17 compare the results of this study with the Arsen and Ni study (2012) it was intended to replicate and also provide answers to the first research question. Where the data definition was different or could not be verified to be the same, variables are shown on different lines in the tables. For example, the Arsen and Ni study included a variable for rurality that could not be verified to have been defined in exactly the same way as the locale coding used in this study, so they are shown on consecutive lines instead of on the same line.

Table 16 compares the results for total administrative expenditures. In both studies, the enrollment/1000 variable was similar in coefficient magnitude and statistically significant ($p<.01$). As enrollment increased by 1,000 students, total administrative expenditures decreased by $30 to $35 per student. In the 2012 study, the enrollment squared term was statistically significant, but relatively small in coefficient magnitude. In this study, the enrollment squared term was found to cause multicollinearity problems and was therefore excluded. Both studies found total revenue per student to be statistically significant, but the coefficients differed greatly. The 2012 study found only a tiny increase in total administrative expenditure as revenues increased, while the current study found that total administrative expenditures increased by approximately $170 for every $1,000 increase in revenue per student. The two variables meant to classify the TSD or charter school as rural or urban were somewhat similar in coefficient magnitude and generally not statistically significant in either study. The percent special education variables were statistically significant and had negative coefficients in both studies. In the current study, the magnitude of the coefficient was approximately twice that of the previous study. This could be due to the approximately

14% inflation rate from 2007 to 2014 and/or true changes in the relationship between percent special education and total administrative spending. While the percent free/reduced was strongly statistically significant in the original study ($p<.01$), it was only somewhat significant in one of the regressions in this study ($p<.05$). The magnitude of the coefficients was similar across the studies.

In both studies, the charter school variable was statistically significant and had the largest coefficient. Moreover, the coefficients were similar in magnitude across the studies. In the 2012 study, being a charter school resulted in a $774 increase in total administrative spending per student, without the additional charter variables in the model. With the additional charter variables, spending increased to $875 per student. In the current study, being a charter school resulted in a $749 increase in total administrative spending per student; with the additional charter variables, this increased to $775 per student. Assuming that inflation is reflected in the dollar figures of the current study, the overall lower per student spending for charter schools in comparison to the 2012 figures may support hypotheses in other research that establishing new charter schools initially required greater administrative expense than would be expected at a run-rate, once the charter school was more established (Arsen & Ni, 2012). The statistically significant and negative coefficients of the charter variable for years in operation across both studies also support this hypothesis. The decrease from $774 to $749 (and from $874 to $775) may also reflect an overall decline in total administrative spending among charter schools over time regardless of years in operation among individual charters. The rise of charter alliances and support groups among charter leaders could explain this decline.

Among the charter type variables, the original study found that being an EMO was statistically significant and associated with a large coefficient. It did not appear that the original study differentiated between the three types of charter (independent, CMO, and EMO) but rather included CMO organizations as part of the EMO grouping. The current study sought to refine the analysis by charter organization type, but did not find statistical significance in this area. Nevertheless, the coefficients across the studies are similar and indicate that EMOs and CMOs are associated with higher levels of total administrative spending per student than independent charters.

The variables to detect effects of grade levels served by charter schools on total administrative spending showed mixed results. The original study found that total administrative spending decreased by $91 per student in schools with all grades versus those that served only elementary schools and also that spending decreased by $118 per student in schools with only high school versus those that served only elementary schools. These results seem counterintuitive to the conventional wisdom that it is more expensive to provide high school, where department heads may be considered administrative expenses and there may be additional administrative positions, such as assistant principals. However, in the original study neither finding was statistically significant. In the current study, the findings were more in line with conventional wisdom. Charter schools that did not serve high school students had slightly lower administrative costs ($2 less per student, a finding that was not statistically significant) and charter schools that served only high school students had much higher total administrative costs ($658 increase per student, a finding that was statistically significant).

Both the original and current study had similar R^2 values. In each study, the models explained approximately 65-69% of the variance in total administrative expenditures.

Table 15

Comparison of Total Administrative Expenditures

DV	Arsen and Ni Results		This Study	
Constant	100.42	104.16	-494.33**	-710.52**
	(77.05)	(72.77)	(136.69)	(215.65)
Enrollment/1000	-32.86**	-32.79**	-35.44**	-30.39**
	(7.21)	(6.78)	(8.89)	(8.74)
(Enrollment/1000)^2	.30**	.30**		
	(.08)	(.07)		
Total Revenue per Student/$1000	.12**	.12**	173.04**	169.89**
	(.01)	(.01)	(5.31)	(5.23)
Rural	19.80	39.89		
	(36.64)	(34.71)		
Locale 1 = Urban, 2 = Not Urban			92.31	144.48*
			(57.01)	(56.75)
% Special Education	-11.59**	-10.24**	-25.66**	-24.54**
	(2.99)	(2.83)	(4.97)	(4.89)
% Free/ Reduced Meal	3.22**	2.46**	2.03	2.47*
	(.71)	(.68)	(1.01)	(1.0)
Charter School 0=TSD, 1=Charter	773.73**	874.35**	748.84**	775.46**
	(44.67)	(121.30)	(63.01)	(62.17)
Charter Only – Years in Operation		-29.80**		-14.00*
		(8.27)		(6.05)
Charter School - EMO		311.83**		
		(68.52)		
Charter Only – 1 = EMO				228.09
				(120.77)
Charter Only – 1 = CMO				270.39
				(157.91)
Charter Only – Mixed Grade		-90.90		
		(61.24)		
Charter Only – No HS				-2.48
				(90.32)
Charter Only – HS Only		-118.49		658.39**
		(80.78)		(147.43)
R^2	.66	.69	.65	.67

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

Table 16 compares the results for just central office administrative expenditures. The statistical significance was similar to that of the total administration model for most variables. As enrollment increased by 1,000 students, central office administrative expenditures decreased by $33 to $38 per student. The 2012 study found only a tiny increase in central office administrative expenditure as revenues increased, while the current study found that central office administrative expenditures increased by approximately $150 per student for every $1,000 increase in revenue per student. Unlike the total spending models, the two variables meant to classify the TSD or charter school as rural or urban were statistically significant in both studies for the central office spending models. In both models, central office administrative spending was higher in rural/not urban districts and the findings were statistically significant ($p<.01$).

In the 2012 study, being a charter school resulted in a $506 increase in total central office administrative spending per student without the additional charter variables in the model. With the additional charter variables, spending increased to $511 per student. In the current study, being a charter school resulted in a $602 increase in total central office administrative spending per student; with the additional charter variables, this increased to $617 per student. Unlike the total administrative spending model, the coefficients in this study for central office spending were larger than in the original study. This may reflect some inflation effect. However, combined with the finding that total administrative spending decreased from the 2012 study to this one, it appears to suggest either a shift in administrative spending allocations within charter schools, from less school-based to more centrally-based, or a change in accounting requirements that make administrative expenditures to appear to be more centrally-based.

Both studies had similar and statistically non-significant results for the years in operation variable, but both suggest a trend toward lower central office administrative spending as charter schools age. Among the charter type variables, the original study found that being an EMO was statistically significant and associated with a large coefficient for central office administrative spending. The current study did not find statistical significance in this area. Nevertheless, the coefficients across the studies are similar and indicate that EMOs and CMOs are associated with higher levels of central office administrative spending per student than independent charters.

The variables to detect effects of grade levels served by charter schools on central office administrative spending showed mixed results. The original study found that central office administrative spending decreased by $23 per student in schools with all grades versus those that served only elementary schools and also that spending decreased by $312 per student in schools with only high school versus those that served only elementary schools. Only the high school variable was statistically significant. In the current study, not having a high school was associated with a reduction in central office administrative spending but only having a high school was associated with an increase of $263 per student in central office administrative spending. Neither finding was statistically significant.

Both the original and current study had similar R^2 values. In each study, the models explained approximately 62-67% of the variance in central office administrative expenditures.

Table 16

Comparison of Central Office Administrative Expenditures

DV	Arsen and Ni Results		This Study	
Constant	-195.27**	-194.70**	-1057.15**	-1243.12**
	(65.03)	(62.43)	(128.62)	(206.95)
Enrollment/ 1000	-38.40**	-38.34**	-35.50**	-33.35**
	(6.09)	(5.82)	(8.36)	(8.39)
(Enrollment/1000)^2	.33**	.34**		
	(.07)	(.06)		
Total Revenue per Student/$1000	.10**	.10**	151.16**	150.06**
	(.01)	(.01)	(5.00)	(5.02)
Rural	65.66*	79.12**		
	(30.93)	(29.78)		
Locale 1 = Urban, 2 = Not Urban			136.38*	161.37**
			(53.64)	(54.46)
% Special Education	-16.70**	-16.99**	-13.58**	-13.08**
	(2.52)	(2.43)	(4.67)	(4.69)
% Free/ Reduced Meal	2.47**	2.1**	1.69	1.79
	(.60)	(.58)	(.95)	(.96)
Charter School, 0=TSD, 1=Charter	505.60**	511.29**	602.23**	617.10**
	(37.71)	(104.07)	(59.23)	(59.67)
Charter Only – Years in Operation		-9.65		-5.14
		(7.10)		(5.81)
Charter School - EMO		191.55**		
		(58.78)		
Charter Only – 1 = EMO				206.65
				(115.90)
Charter Only – 1 = CMO				276.07
				(151.54)
Charter Only – Mixed Grade		-22.60		
		(52.54)		
Charter Only – No HS				-31.32
				(86.68)
Charter Only – HS Only		-312.12**		262.57
		(69.30)		(141.48)
R^2	.64	.67	.621	.626

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

Table 17 compares the results for school administrative expenditures. The statistical significance was similar to that of the total administration model for most variables, with the exception of enrollment. In both studies, the enrollment/1000 variable was fairly small with regard to coefficient magnitude and not statistically significant. This shows that overall district enrollment would be unlikely to exert a strong effect on the administrative expenditures of individual schools.

In both studies, the charter school variable was statistically significant and had the largest coefficient magnitude. However, the coefficients in the 2012 study were roughly twice the magnitude of those in the current study. In the 2012 study, being a charter school resulted in a $268 increase in school administrative spending per student without the additional charter variables in the model. With the additional charter variables, spending increased to $363 per student. In the current study, being a charter school resulted in a $147 increase in school administrative spending per student; with the additional charter variables, this increased to $158 per student. Combined with the finding that total administrative spending decreased from the original to the current study, but that central office administrative spending increased, these results seem to show a shift in how administrative spending is split in charter schools, with a greater proportion occurring at the central office level.

The result for the years in operation variable was consistent across both years and statistically significant ($p<.01$). Each additional year of operation reduced school administrative spending by approximately $9 per student in the current study. Among the charter type variables, the original study found that being an EMO was statistically significant ($p<.05$)and associated with an increase of $120 per student in school

administrative spending compared to that in an independent charter school. The current study did not find statistical significance in this area, but did indicate that EMOs spend somewhat more per student than independent charters, while CMOs spend somewhat less.

The variables to detect effects of grade levels served by charter schools on school administrative spending showed mixed results. The original study found that school administrative spending decreased by $68 per student in schools with all grades versus those that served only elementary schools and that spending increased by $194 per student in schools with only high school versus those that served only elementary schools. Only the high school only finding was statistically significant. In the current study, the findings were more in line with this conventional wisdom. Charter schools that did not serve high school students had higher school administrative costs ($29 more per student, a finding that was not statistically significant), while charter schools that served only high school students had much higher school administrative costs ($396 increase per student, a finding that was statistically significant).

Both the original and current study had similar and small R^2 values. In each study, the models explained approximately 12-19% of the variance in school administrative expenditures.

Table 17

Comparison of School Administrative Expenditures

DV	Arsen and Ni Results		Study Results	
Constant	295.70**	298.87**	562.82**	532.60**
	(59.61)	(57.92)	(76.71)	(120.96)
Enrollment/ 1000	5.54	5.55	.07	2.96
	(5.58)	(5.40)	(4.99)	(4.90)
$(\text{Enrollment}/1000)^2$	-.04	-.04		
	(.06)	(.06)		
Total Revenue per Student/$1000	.02**	.01**	21.87**	19.83**
	(.00)	(.00)	(2.98)	(2.93)
Rural	-45.86	-39.23		
	(28.35)	(27.63)		
Locale 1 = Urban, 2 = Not Urban			-44.06	-16.89
			(31.99)	(31.83)
% Special Education	5.10*	6.75**	-12.08**	-11.45**
	(2.31)	(2.25)	(2.79)	(2.74)
% Free/ Reduced Meal	.75	.39	.33	.68
	(.55)	(.54)	(.57)	(.56)
Charter School 0=TSD, 1=Charter	268.12**	363.06**	146.61**	158.36**
	(34.56)	(96.54)	(35.36)	(34.87)
Charter Only – Years in Operation		-20.15**		-8.86**
		(6.58)		(3.39)
Charter School - EMO		120.28*		
		(54.53)		
Charter Only – 1 = EMO				21.44
				(67.74)
Charter Only – 1 = CMO				-5.68
				(88.58)
Charter Only – Mixed Grade		-68.30		
		(48.74)		
Charter Only – No HS				28.84
				(50.67)
Charter Only – HS Only		193.63**		395.83**
		(64.29)		(82.70)
R^2	.15	.19	.119	.166

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

The second question this study sought to answer was: Is there a relationship between organizational size and administrative expenditures per student that corroborates other research on flat economies of scale beyond a certain size? Does the relationship vary by organizational type? The regression analysis showed that total administrative expenditures decreased by $35 for every enrollment increase of 1,000 students, with all of the decrease realized in central office rather than school administrative spending. This finding was statistically significant ($p<.01$, for total and central office spending only) and supports prior research noting economies of scale in administrative spending. In analyzing the regression model with respect to the enrollment squared term included in the original Arsen and Ni model, the data in this study also indicated a "tipping point" at which increasing size did not correlate with continued decreasing administrative costs. In these data, the enrollment level needed to reach flat economies of scale was 21,500 students. Only two TSDs exceeded that threshold in the dataset. As both were school districts, no conclusion could be reached as to whether the threshold for flat economies of scale varied by organizational type.

The third question this study sought to answer was: How do administrative expenditures per student compare between school districts, independent charter schools, and charter schools in CMOs/EMOs, considering both central office expenditures and school-level expenditures? For all three administrative expenditure DVs, the study results showed that charter schools spent significantly more ($p<.01$). Charter schools spent $749 more per student on total administration, with $602 going to central office administration and $147 going to school administration. Within the charter school organizational types, there was no statistically significant difference in administrative spending. Both EMOs

and CMOs tended to spend more on administration than independent charters, but the differences were not statistically significant.

The fourth question this study sought to answer was: To what extent do charter schools make relatively greater administrative expenditures at the school level, to the point that spending administrative dollars "closer to the student" is an important distinction between charter and regular public schools? The partial correlations from the regression analysis indicated a positive relationship between being a charter school and increased school administrative expenditures (r=.23, p<.01). The regression analysis showed that charter schools spent $147 per student more on school administration than did TSDs. As a percentage of all expenditures, charters spent 8.3% of all expenditures on school administrative compared to 5.8% percent in TSDs. However, charter schools outspent TSDs in central office administration as well, and did not appear to be shifting administrative dollars from central office to school administration, as was hypothesized in this research question. In examining the split between central office and school administration expenditures, charters averaged a 59% / 41% split, while TSDs averaged a 52% / 48% split, indicating that charters spent a higher percentage of the total administrative dollars in the central office, instead of the school. The regression analysis showed that charter schools outspent TSDs on total administration, spending $749 per student more. Thus, these data indicate that charters do not make administrative expenditures "closer to the student." Rather, TSDs spend a slightly higher percentage of all administrative dollars closer to the student (in school administration).

The fifth question this study sought to answer was: What do the findings indicate for potential future education organizational structures? Discussion of this question is reserved for Chapter 5 of this report.

Summary

Multiple regression analysis was used to test if a collection of district structural characteristics (enrollment, total revenue per student, locale, percent Federal revenue, TSD or charter school, specific charter characteristics) and student characteristics (percent special education, percent free/reduced-price meal eligible) significantly predicted total, central office, and school administrative spending. The results of the regressions including the specific charter characteristics indicated the predictors of enrollment, total revenue, locale, percent special education, and percent free/reduced-price meal eligible, TSD/charter, years of charter operation, and grade level served in the charter schools explained 67.0% of the variance in total administrative expenditures (R^2 =.670, F(11,788)=145.17, p<.01), 62.6% of the variance in central office administrative expenditures (R^2 =.626, F(11,788)=120.04, p<.01), and 16.6% of the variance in school administrative expenditures (R^2 =.166, F(11,788)=14.28, p<.01). Table 18 provides the model coefficients (β) for the significant predictors.

Table 18

Unstandardized (β) Model Coefficients for Significant Predictors

DV	Total Admin. Expenditures	Central Office Admin. Expenditures	School Admin. Expenditures
Enrollment/ 1000	-30.39**	-33.35**	2.96
Total Revenue per Student/$1000	169.89**	150.06**	19.83**
Locale 1 = Urban 2 = Not Urban	144.48*	161.37**	-16.89
% Special Education	-24.54**	-13.08**	-11.45**
% Free/ Reduced Meal	2.47*	1.79	.68
Charter School 0=TSD 1=Charter	775.46**	617.10**	158.36**
Charter Only – Years in Operation	-14.00*	-5.14	-8.86**
Charter Only – HS Only	658.39**	262.57	395.83**

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

Figure 9 revisits the Arsen and Ni model structure hypothesized in Chapter 3. Only those independent variables found to be significant predictors of total administrative spending are still shown. The model coefficients (β) shown are for total administrative spending.

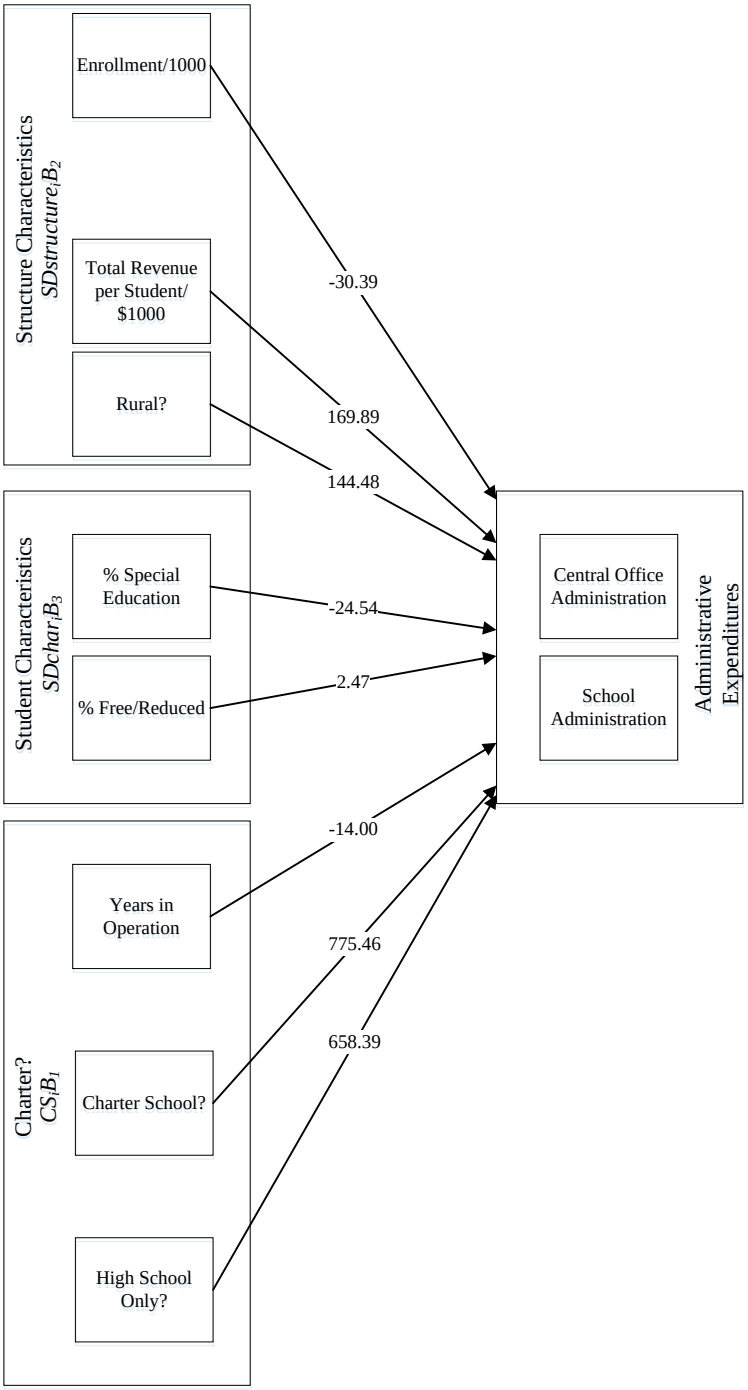

Figure 9. Regression model results. Statistically significant predictive values of independent variables on the dependent variable of administrative spending, final model with unstandardized coefficients.

CHAPTER 5: DISCUSSION

The overall goal of this research was to compare administrative expenditures between the different organizational models of traditional school districts (TSDs) and charter schools, as well as the submodels within charter schools. Administrative expenditures were analyzed at the total, central office, and school levels to better understand the differences between these models, as well as to understand any potential implications for future education organizational structures.

Results Summary

Rather than finding that Michigan charter schools minimized administrative spending more than TSDs, this study confirmed the results of the Arsen and Ni (2012) study. The original study found that charter schools spent $774 more per student on administration than TSDs, with $506 going toward central office administration and $268 going toward school administration. This study found that charter schools spent $749 per student more, with $602 going toward central office administration and $147 going toward school administration. Of all the independent variables included in the regression equations, being a charter school had the highest impact. The variable with the second-highest impact was total revenue but it was only a fraction of the charter variable ($173 per $1,000 increase in total revenue per student). These findings were statistically significant ($p<.01$) and potentially indicate that the charter school model is somehow

fundamentally different from that of the TSD, at least insofar as administrative spending is concerned.

The results for the independent, non-profit (charter management organization or CMO), and for-profit (education management organization or EMO) charters were not statistically significant, which means that among them none of the three offers a superior model for reduced administrative spending. Rather, at 19.1, 21.9, and 20.5%, respectively, the three charter models appear to be closely related in their overall administrative spending.

Implications for Practice

Considering the results of this study for TSDs, one must wonder if administrative spending is not increasing for that organizational type. Assuming that all of the historical research found on administrative spending could be directly compared to the results of this study, current day Michigan TSDs spent a higher percentage on total administration. At 11.1%, they were outside the range of 3.1 to 9.5% established by prior research (which necessarily largely only analyzed TSD organizations). In reviewing the 542 TSDs in the dataset, only 170 had total administrative spending of 9.5% or less; none had less than 4.1%. In the original study, Arsen and Ni (2012), TSDs spent 9.7% on total administration—again, outside the bounds of prior research.

The prior research figures were based on data from 1986 through 2004. The original Arsen and Ni study used data from 2007-08, while this study used data from 2014-15. As more recent data points, they suggest that a higher percentage of funding is earmarked for administration in TSDs presently than was done in the past. Perhaps these data mark a shifting of the TSD organizational model, toward greater oversight,

embodied in the form of greater administrative spending. Alternatively, taking a page from Hess' (1995) dark findings in Chicago Public Schools, perhaps these data mark a trend of "continual growth of the central bureaucracy while local schools [are] starved" (Hess, 1995, p. 38). From 2007-08 to 2014-15, Michigan TSDs shifted from spending 6.1% on school administration to 5.8%. It is an admittedly small decrease, but it occurred at the same time that central office administrative spending increased from 3.6 to 5.8% of total expenditures. Taken together, this suggests a subtext within the overall increase of administrative spending that includes a theme of greater centralization of administrative spending. Whether well-intended or nefarious, a trend of increasing allocations to administration, particularly central office administration, bears further monitoring by practitioners.

Focusing just on the implications for practice with charter schools, as state legislatures and communities contemplate the growth of charter schools, how public funds are spent should be a concern; this would include concerns as to whether charter schools are spending funds wisely. Fullan (2007) and others (Schlechty, 2005; Hanushek & Lindseth, 2009) found evidence that the TSD organizational model did not necessarily support improved student achievement. Some studies have found evidence that charter schools can support better achievement than comparable TSDs (Center for Research on Education Outcomes, 2015), but other studies have yet to find that the charter organizational model provides a clear improvement in that regard. Molnar, Miron, and Urschel (2010) found that only about half of EMOs nationwide made Adequate Yearly Progress in 2009-10. Ravitch (2010) concluded that charter schools "run the gamut" (p. 138) in terms of quality.

So, while research continues into the larger question of whether one organizational model offers advantages over the other in terms of academic outcomes, even less is known about the potential impact of greater or lesser administrative spending on achievement among charter school students. Studies on TSDs in that regard have not yet found a positive statistical correlation between administrative spending and improved student outcomes. Rather, some research has found that increased administrative spending among TSDs has either no or a negative impact on student achievement (Brewer, 1996; Bohte, 2001; McCaffrey, 2014).

Thus, although the education community lacks solid evidence that increased administrative spending supports student achievement in TSDs, this is exactly what is happening in Michigan charter schools. Perhaps the tendency among Michigan charter schools to spend more on administration has an impact on student achievement that has not yet been felt. As noted by Arsen and Ni (2012) in discussing the results of their study:

> One need not attach any normative judgment to charter schools' lower instructional and higher administrative spending. It is certainly possible that there could be new ways of providing educational services associated with this sort of resource reallocation that are beneficial for students. (p. 16)

Nevertheless, as public dollars are always limited, it would be prudent for state legislatures and communities to monitor how their charter schools are spending funds, particularly administrative dollars in comparison to comparable TSDs.

The results of this study also indicate that state legislatures and communities should not blindly assume that the charter model offers greater spending directly in the classroom. If the desire is to have an education organization that spends as little as possible outside the classroom, the charter model has not yet demonstrated itself to be the

correct choice, despite what some of the founders envisioned as a logical outcome (Toch, 2010).

Finally, the results of this study indicate that there is as yet no comparative advantage among the three charter organizational structures. Although one would readily assume that an independent charter, free of the profit motive of the EMO and free of the oversight cost of the CMO, would have significantly lower administrative spending, this was not the case. Independent charters spent an average of $1,863 per student on administration, while EMOs spent $1,879 and CMOs spent $2,040. While slightly less for independent charters, the difference was not statistically significant. All three figures were much higher than the average of $1,229 per student spent by TSDs. Thus, as approving agencies contemplate charter school applications, it should not be assumed that the independent charter model provides an advantage over the other models in the form of reduced administrative spending.

Indications for Future Education Organizational Structures

The fifth question this study sought to answer was: What do the findings indicate for potential future education organizational structures? This research began with an assumption that reduced administrative spending was a desirable outcome and that charter schools might demonstrate such an outcome. For at least the past 50 years, this assumption has been part of the education landscape. Legislative priorities (FIRST Texas, 2015) have implicitly and education leaders such as Bennett (1987) have explicitly stated that administrative bloat in TSDs is bad. In the original study, Arsen and Ni (2012) seemed to enter into the research with the same underlying belief, as they noted that the

"influence of district administrators on resource allocation in most cases has been entirely banished" (p. 3) in the charter school model.

And yet, the results of the original and this study found that Michigan charter schools, free of historical organizational structures, tended to spend more, not less, on administration. As this replication was consistent with the original study, one now has two points on a developing trend line, a line that may point to the persistence of greater charter administrative spending over time. In the dataset for this study, the oldest charter schools had been in operation for 20 years. Clearly past the point at which they could be characterized as novel or working toward lower administrative spending, those 20 charter schools had total administrative expenses ranging from 6.1% to 29.7% (the mean was 21.1%). If the goal of charter school organization is to be the antithesis of a presumed bloated TSD structure, the conclusion one reaches with this study is that the charter school organization model is a dead end.

It may be that charter schools are following their own pattern of normative isomorphism decried in TSDs by Fensch and Wilson (1964), blindly allocating higher percentages to administration because that is what other charter schools are doing. Alternatively, as charters can be founded by teachers and administrators from the TSD world, perhaps the normative isomorphism has transferred from one organizational structure to the other. In either case, the results of this study indicate that the charter school organizational model is not nearly so varied nor unique as perhaps initially envisioned.

It may be that charter school leaders are taking advantage of reduced restrictions to disproportionately reward themselves. The *Detroit Free Press* published details on

loopholes regarding nepotism and insider deals among charter schools, noting “two charters doled out millions of dollars’ worth of business to relatives of the schools’ administrator [while at another charter school] multiple members of the founder’s family were school vendors or employees” (Dixon, 2016). National reports detail a number of instances of fraud among charter schools, including one in Michigan where a charter founder was convicted in 2014 of federal fraud and tax evasion (Strauss, 2015). Of course, TSDs are not immune to illegal dealings, but they tend to have greater financial transparency than charters and more barriers in place to prevent fraud.

Finally, it may also be that the conventional wisdom of administrative expense as being somehow bad is flawed thinking. Although Bohte (2001) found that increasing administrators led to decreasing student achievement in Texas, Walters (2005) did not find a similar result in Arkansas. Brewer (1996) found negative correlations between administrative spending and educational productivity, but correlation is not causation. Despite more than 100 years of experience with the TSD as an organizational model, there are no commonly recognized best practices for staffing the central office or school administrative offices (McCaffrey, 2014). Instead, the conventional wisdom has been that administrative expense is undesirable while at the same time ignoring the fact that all effective organizations require leadership and management, which cannot come without some cost.

The National Commission on School District Reorganization concluded in 1944 that at least 35 central office positions were required to provide “necessary administrative and supervisory functions” (p. 84). The essential functions included such areas as district financial management, student health, and arts education. The Commission then backed

into the size of school district necessary to be able to begin to afford such a structure, coming to a figure of at least 12,000 students. What is lost in this backwards calculation is the idea that all students deserve the kind of education afforded by the Commission's level of central office staffing. Viewed in that manner, the minimum size of a central office is set at 35 regardless of the number of students served, at least until enrollment reaches something beyond 12,000.

Further cracks in the conventional wisdom appear when one considers ideal staffing ratios found in other industries. There are no recognized, one-size-fits-all staffing ratios; however, 10-to-1 is a commonly cited metric, meaning 10 workers to one manager. An elementary school with only 10 teachers for a principal to manage would have approximately 250 students; few elementary schools are that small these days. The 2015-16 accreditation standards for South Carolina do not even require a full-time principal until student enrollment reaches 375, or roughly 15 teachers. Freed from organizational history, the higher spending on administration by the charter schools of this study would seem to indicate that at least some in the education industry believe increased administrative spending to be important.

At the full noon of the digital age, there have been discussions in various industries as to how new technology and new ways of work might impact currently accepted ratios in their fields. Meanwhile, the education world continues to plod on with the idea that all administrative spending is bad, without seriously confronting the possibility that more, not less, resources might be needed in areas (like administration) that might appear to be only indirect factors in student achievement, but which could actually provide the tipping point for dramatic improvement. Returning again to Hess

(1995), "*How* funds are used is as important as *how much* money is available" (emphases in original, p. 165-66).

Recommendations for Further Research

The results of this study point to a need for further research in three areas. First, there is a need to expand comparative analyses of TSDs and charters nationally. Comparing TSDs and various alternative charter structures within the same state helps ensure that the comparisons are not impacted by differences in education spending forced by state legislation. It also provides a uniform accounting system by which to categorize spending. However, it necessarily limits the states in which statistical research can be completed. Many states lack a sufficient number of charter schools for statistical research. Nevertheless, expanding this research to encompass more states, or developing a methodology to account for state legislative differences, would allow a larger picture of the administrative spending differences among TSDs and charter schools to be developed.

Second, there is a need for more longitudinal analysis of charter administrative spending. The magnitude of the difference in administrative spending between TSDs and charter schools does seem to be shrinking. Comparing the Arsen and Ni results and the ones in this study, from 2007-08 to 2014-15, charter school total administrative spending decreased by 3.2% in the initial model and 11.3% in the model with the additional charter variables, without consideration of inflation. It may be that charter schools are taking longer to settle into an organizational structure that minimizes administration. Perhaps results a decade from now will show further administrative reductions among charter schools and a closing of the gap between TSD and charter administrative spending.

Whether the Michigan charters ever achieve administrative expenditures rates comparable to those of TSDs is an interesting question.

Third, further research is needed into why there might be differences in administrative spending between TSDs and charters. Given that this study found that even independent charter schools spent a higher percentage of funds on administration, it is important to understand why this is. It may be that current accounting methods do not provide enough granularity, such as when the administrator of a small charter school also teaches a class one period a day, but her entire salary is accounted for only in the administrative column. It may be that charter schools are operating under different assumptions as to the ideal supervisor to staff ratio. As noted by Hanushek and Lindseth (2009), "Boosting student achievement will clearly require fundamental changes in the operation and financing of schools. No matter how much money we spend, we cannot hope to address this crisis simply by adhering to the practices of the past." (p. 1). Understanding why charters elect to spend higher percentages of their funding on administration may provide lessons that can be applied to TSDs or may help the education community determine that the charter organizational model should be abandoned. For these reasons, continued study of charter organizational structures is warranted.

Summary

This study replicated the work of Arsen and Ni (2012) using more recent data for Michigan TSDs and charter schools. In doing so, it was found that Michigan charter schools of all three organizational types (EMO, CMO, and independent) spent more dollars and a higher percentage of their total dollars on administration, whether it was

total, central office, or school administration. The charter school indicator variable had the largest coefficient of all the variables included in the regression analysis and was statistically significant ($p<.01$). These findings corroborated the original study and most of the regression results were similar across the studies.

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