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Examining The Costs Of Providing An Adequate Education For Michigan's K-12 Public School Students

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EXAMINING THE COSTS OF PROVIDING AN ADEQUATE EDUCATION FOR MICHIGAN'S K-12 PUBLIC SCHOOL STUDENTS

by

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DISSERTATION

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DEDICATION

This research study is dedicated to all of Michigan's public school children and to those seeking to find a practical way to fund it adequately.

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CHAPTER 1

INTRODUCTION

There are a little more than 820 public school districts and public school academies receiving state funding that are responsible for educating approximately one and a half million students in the State of Michigan (Michigan Department of Education, 2011a, 2013). All of them are required by the Federal No Child Left Behind Act of 2001 to ensure their students reach 100% proficiency in both reading and math by the year 2014 ("No Child Left Behind Act," 2001). This mandate has been cited by many to be next to impossible to attain without the necessary resources to adequately support this objective (Haas, Wilson, Cobb, & Rallis, 2005; Hoff, 2006; Stern, 2005; Wiley, Mathis, & Garcia, 2005). Regardless, states are annually required to demonstrate a minimum prescribed level of student progress towards meeting this goal (Gamble-Risley, 2006). The term used to describe this process of meeting annual student proficiency targets is Adequate Yearly Progress or AYP.

The primary intent behind NCLB is to hold schools more accountable for their students' academic achievement. Additionally, it was established in an effort to erase the learning gap between black and white students which has beleaguered the United States since it was revealed through research conducted during the 1950's and early 1960's (Coleman, 1966; Haas et al., 2005). Recently, many states have applied for waivers from NCLB's performance mandates as they move closer to the 100% proficiency deadline. However, the procedure to obtain one has been difficult, as several states have applied two or more times (Riddle, 2012). Presently, 32 states and Washington D.C. have obtained a waiver from one or more provisions outlined under the act (Resmovits, 2012). State proposals that have been accepted include: Arizona, Arkansas, Colorado, Connecticut,

Delaware, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, Washington, Washington D.C., and Wisconsin (Resmovits, 2012). In order to obtain these waivers, states were required to develop rigorous alternative academic standards and accountability systems to measure their schools' progress annually in working towards achieving these new learning goals (The Education Trust-Midwest, 2012).

Although the NCLB Act is a Federal law, states were given the authority to set the annual measuring standards by which to meet the act's accountability criterions. Michigan utilizes its state standardized testing instrument called the Michigan Educational Assessment Program or MEAP to accomplish this task. This assessment annually evaluates the knowledge and understanding of third through eighth grade students in both math and reading. Additionally, assessments in writing are given to fourth grade students each year as well as science to children in the fifth grade. In the past, Michigan elementary students have been considered proficient in both reading and math by answering approximately 34% of the questions correctly on the MEAP (Wilkinson, Chambers, & Donnelly, 2011).

Recently, Michigan's State School Board of Education, which is comprised of an 8 member elected panel, voted to raise the performance standards on these tests requiring students to respond to nearly 65% of the questions correctly in order to be considered proficient. It is expected that fewer students will meet these higher expectations, resulting in fewer schools meeting their target student academic outcomes, thus failing to make AYP. Members of the State School Board support this decision, citing it as a necessary step to ensure better student preparedness for future academic success and employment opportunities (Martin, 2011). However, districts have been vocal

in their disapproval regarding these changes, citing the increased possibility of their students not being able to meet these new rigorous standards. Approximately 48% of state districts did to not meet annual AYP standards in 2011, as compared to roughly 7% the year previous (Ackley, 2012). This concern has been heightened as districts move closer to the mandated 100% student proficiency target required under NCLB. However, with Michigan's newly acquired federal waiver this provision has since changed. The State's new academic proficiency target for all students has now been set at 85% instead of the previous 100% objective (The Education Trust-Midwest, 2012). Additionally, the time to achieve this objective has been extended to the year 2022, with the baseline year beginning in 2012 (The Education Trust-Midwest, 2012).

Another potential reason why it will be increasingly difficult for Michigan's public schools and public school academies to reach these new expected achievement levels is because of the limited resources available to achieve them. Many states, similar to Michigan, have been forced to initiate reductions to public services and programs to help balance their budgets (Farkas & Duffett, 2012; McNeil, 2012). The root cause for these budget cutbacks is attributed to the prolonged recession and poor economy in the United States since 2008 (Hanushek, 2009). This has especially proven to be true in Michigan as its economy has suffered through one of the most difficult financial periods since the Great Depression of the 1930's (Scorsone & Zin, 2010)

One of the best gauges of a state's overall economic health is the average level of income per person (Scorsone & Zin, 2010). In 2008, Michigan's total personal income was valued at approximately $350 billion dollars, making it the 9th largest economy in the United States (Scorsone & Zin, 2010). However, after calculating the average level of income per person during this fiscal period, Michigan ranked 39th among states with its workforce earning an average of $35,288 annually (Bureau of Business and Economic Research, 2013). Recently, there has been some signs

of an economic recovery in the State as worker average incomes jumped to $37,497 per person in 2012. This marginal increase helped move Michigan up four slots to35th on average national per capita comparisons (Bureau of Business and Economic Research, 2013). However, despite this improvement there has been a recognizable decline in personal income that has occurred since 2000 when the state ranked a respectful twentieth in national per capita income (Bureau of Business and Economic Research, 2013). One of the major contributing factors to this decline in average income has been the number of jobs that have been lost during the recession, which produced high levels of unemployment. Michigan has lost an estimated 18% of its past employable jobs, as compared to only 0.7% across the rest of the nation, with most of those declines occurring in manufacturing, construction and the information sectors of the job market (Scorsone & Zin, 2010).

This prolonged recession, dependency on the auto industry and the loss of jobs has made it increasingly difficult for the State of Michigan to generate enough tax revenue to continue to sufficiently subsidize essential government services such as municipal fire, police, libraries, parks and public schools. As a result, many of them have been consolidated, reduced or shared between communities. In some cases, they have been completely eliminated because of the lack of revenue available to maintain them (e.g Pontiac, Benton Harbor, Flint, etc.). Over the past few years, schools have been fortunate not to have encountered these drastic reductions in operating expenses. The primary reason they have not experienced these significant budget reductions is because of the subvention provided by the United States Federal Government under the American Recovery and Reinvestment Act of 2009 or ARRA of 2009 (Rentner & Usher, 2012; The Recovery Accountability & Transparency Board, 2009).

The purpose of the AARA was to help create new jobs, spur economic growth, and to help make government more transparent. Approximately $840 billion was allocated to states by Congress

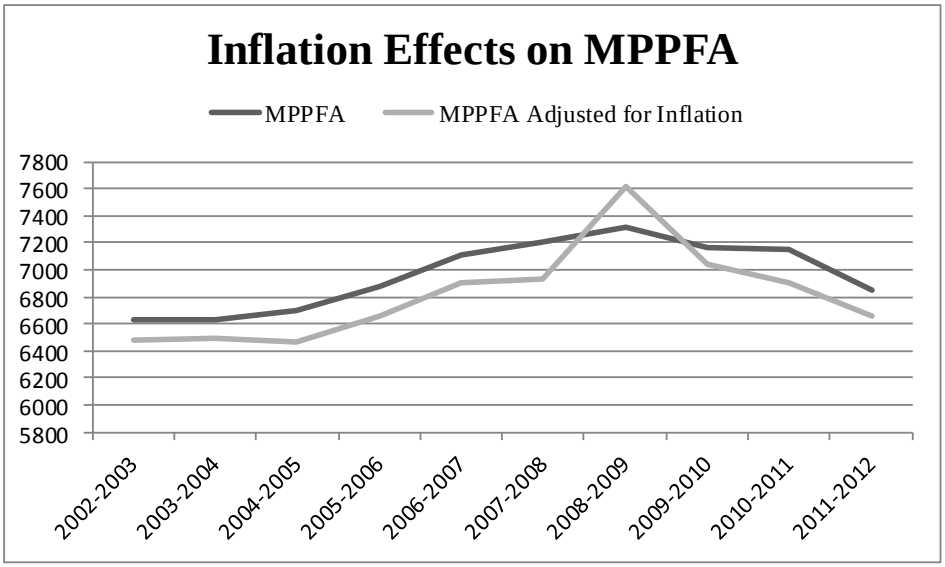
under this act to accomplish the aforementioned goals. Of this amount, Michigan was awarded a little over $8.8 billion. Of that amount, $1.2 billion was earmarked specifically for K-12 public education (The Recovery Accountability & Transparency Board, 2009). These extra dollars helped to keep thousands of teachers on the job between FY 2009-2011 and helped to stabilize Michigan's School Aid Fund. However, these monies are no longer available through the Federal Government which is not good news for Michigan's schools or for those around the country who have made use of them to help subsidize public education services (Picus & Odden, 2011). This has forced Michigan lawmakers into having to make some very difficult decisions in prioritizing funding for various state services and programs.

The State of Michigan has two major accounts that are used to assign fiscal resources to provide various public services: The School Aid Fund and the General Fund. The School Aid Fund generates the majority of its revenue through sales and property taxes, while the General Fund uses monies raised through individual and business income taxes to pay for other municipal services. These two revenue sources have proven to be very volatile during the past few years, as incomes have fallen steadily, resulting in fewer sales of goods. This income loss has materialized into a 10% reduction in taxable revenue for the state, which has placed tremendous strain on both the School Aid and General Fund (Scorsone & Zin, 2010). Hence, as personal incomes have fallen, the revenue used to support K-12 public education has correspondingly dropped proportionally. This has left schools hard pressed to find the resources necessary to provide the essential services and programs their students need to continue making academic progress. Despite lower incomes, the primary factors contributing to the decline in revenue available for schools can be attributed to the state's current funding system and politics.

Michigan's current school finance system provides funding to schools based on student enrollment. The amount of money each district receives for a child attending one of their schools is based on an set level of funding established by legislators. This amount, which is referred to as a district's per pupil foundation allowance or PPFA, varies by district. Some receive higher levels, with the majority receiving the minimum provided by the state. Presently, approximately 55% of all public schools and public school academies receive the minimum PPFA (Michigan Senate Fiscal Agencey, 2013) . In FY 2010-2011 the minimum PPFA was $7,146. However, in FY 2011-2012, that amount decreased to $6,846 as districts in the state endured a $300 reduction in their allotted per pupil foundation allowances. Although Michigan's economy has shown some signs of recovery, similar reductions will likely persist until Michigan's economy becomes more stable or until other sources of revenue can be raised by the state or local municipalities to subsidize their schools. This represents a substantial change from past practices, as schools have often received more or the same level of funding even in difficult economic times (Picus & Odden, 2011).

Overall funding levels in Michigan have fluctuated over the past ten years. After adjusting for inflation, the minimum Per Pupil Foundation Allowance has quickly eroded, leaving schools with less revenue to utilize in providing educational services and programs for their students, which can be seen in Figure A. (Agency, 2012a, 2012b; Calculator, 2012).

Figure A. *Michigan Minimum Per Pupil Foundation Allowance Adjusted for Annual Inflation Rates (MPPFA)*

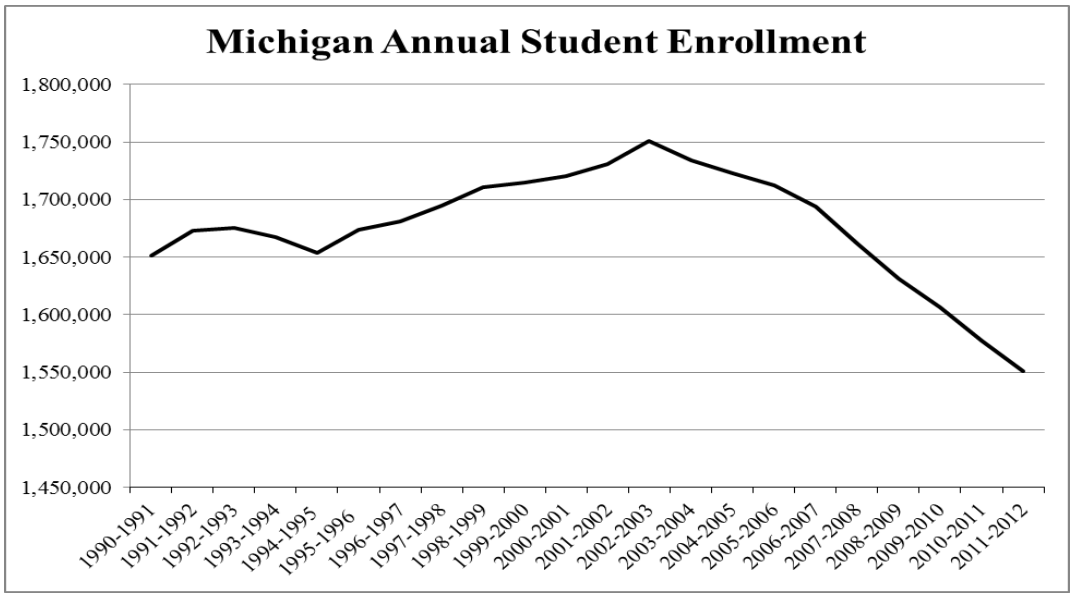


Inflation Rates obtained from http://www.usinflationcalculator.com/inflation/historical-inflation-rates/ and investigators own calculations (*see appendices A1.)

Although the state has approved of several annual increases, they have not kept up with the costs of inflation. Equally staggering are the declines Michigan has seen in student populations attending public schools since 2008, which can be viewed in Figure B (Michigan Department of Education, 2012). The primary reason for this gradual decline in student population has been credited to the poor economy and recession Michigan has been experiencing. As a result, families have left the state in search of other opportunities for work around the country or abroad (Michigan Department of Education, 2012; Michigan Department of Information Technology, 2009). This statistic is pertinent because school expenditures are allocated by the State based on a per pupil basis which has a direct impact on the available resources schools and districts have to provide for educational services and programs for their students. The combined result of all these factors: inflation, legislative budget cuts and reduced student populations has been devastating to schools

(Addonizio & Kearney, 2012; Arsen & Plank, 2003). As a result, many districts are operating under budget deficits. Presently, 49 districts out of 827 in the state are under financial duress in FY 2012-13 (Jennifer Chambers, 2013; MI School Data, 2012; Michigan Senate Fiscal Agencey, 2013). Additionally, 27 of those districts have deficits of over one million dollars (Jennifer Chambers, 2013). This number is expected to climb in subsequent years, as costs to provide essential services and school personnel rise while available revenue drops.

Figure B. *Michigan Student Enrollment 1990-2012*

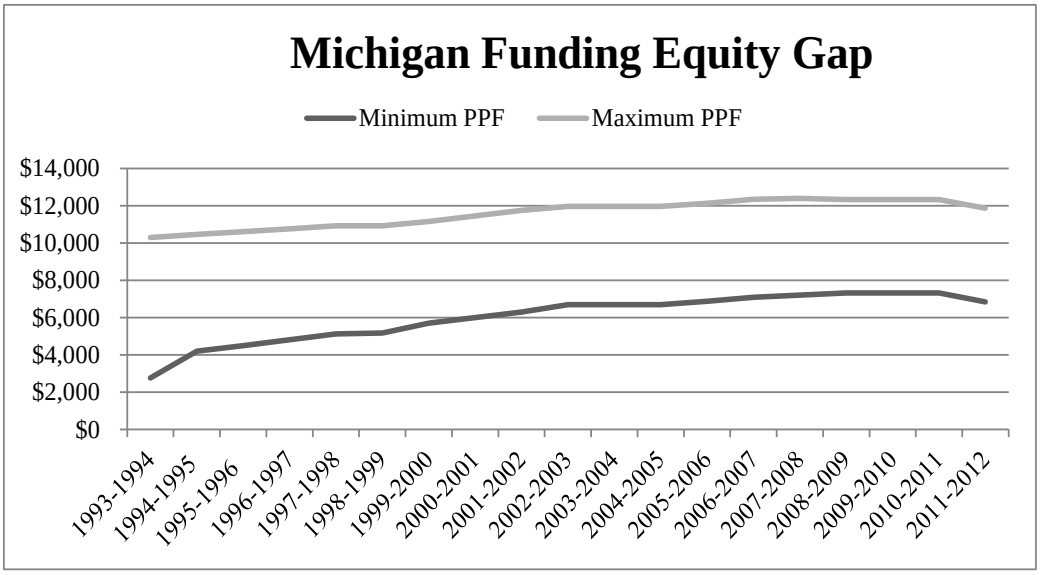


Pupil count information for FY 2011-2012 was obtained from Center for Educational Performance and Information (CEPI) website, http://www.michigan.gov/cepi/0,4546,7-113-21423_30451_30460---,00.html, accessed 5-21-12
(**see appendices A2.)

Michigan legislators have attempted to create more equity between their schools through its present funding system by slowly closing the equity gap between poor and wealthy districts, which can be viewed in **Figure C**. Although the funding equity gap between poor and wealthy districts has narrowed, the range between the highest and lowest districts is still considerably wide, having more

than a $5,000 difference. Because schools are primarily funded through student enrollment, those schools with declining student populations have had more difficulty maintaining adequate funding levels to provide essential educational services. This has been especially problematic for urban and even some rural districts in the State which have seen considerable losses in student enrollment. This problem has compromised the overall effectiveness of attempting to close the funding equity gap as it has placed districts who are already struggling to provide essential services and programs with even fewer resources to accomplish this task.

Figure C. *Michigan Funding Equity Gap*



*Source: Information obtained for Figure C. was acquired from actual minimum and maximum per pupil foundation amounts which can be found at: http://www.senate.michigan.gov/sfa/Departments/DataCharts/DCk12_BasicFoundationHistory.pdf (*see appendices A3.)

As policymakers implement cuts to address revenue losses, schools have been forced to reduce educational services in an attempt to offset funding reductions. These reductions have increased concern over the level of resources needed to adequately fund educational programs to

meet expected student proficiency goals (A. Odden, M. E. Goetz, & L. O. Picus, 2008). This dilemma has brought about a key question that has been the focus of deliberation by state policymakers, courts and education community which is: *How much money is enough to adequately educate a child to achieve mandated academic standards?* This question is relevant because it helps to bridge the connection between educational inputs, costs of educational programs and services, with outputs, student academic outcomes (Lynn, 2011). Much of the dialogue and effort directed at addressing this question has been shaped through federal and state policy initiatives brought about because of school finance litigation surrounding issues of educational equity and adequacy over the past 30 years. Additionally, researchers have also made progress attempting to identify an adequate level of funding to subsidize expected levels of student performance.

In order to find solutions to the aforementioned question, researchers have developed ways to observe the relationships between education inputs, processes and student achievement outcomes. Four "costing out" methods have been developed by education policy analysts to identify adequate spending levels needed in order for students to achieve at a defined standard of academic performance. The four methods utilized by researchers to accomplish this task include: Statistical Modeling, Empirical Observation/Successful School, Professional Judgment, and Evidence-Based (Addonizio, 2003a; Daniel, 2010; Hanushek, 2007a; Ochalek, 2008; Odden, 2003). The following is a brief description of each approach in achieving the goal of calculating the costs of providing an adequate education.

The *Statistical Modeling* method, also referred as the *Econometric* or *Cost Function* approach, is the most analytical and complicated of the four models. Investigators engaged in this research technique attempt to quantify the factors that influence the cost of an education using multiple measures of student performance (Rebell, 2006). This method first identifies a satisfactory

level of student academic performance and then uses multiple regression analysis to approximate the dollar cost figure of multiple education inputs thought to influence student achievement outcomes (Addonizio, 2003a; Rebell, 2006). Once these costs are obtained, they are used to determine the level of funding necessary for schools to educate their students to the prescribed levels of academic performance (Rebell, 2006).

Another more practical method attempting to identify an adequate level of resources to achieve a set educational standard is the *Successful Schools* method. This costing out approach, also known as the *Empirical Observation* method, attempts to estimate the costs in providing an adequate education based on student academic achievement objectives and actual spending of school districts (Addonizio, 2003a; J. Augenblick & Myers, 2001; Ochalek, 2008; Picus, 2001; Rebell, 2006; Rucker, 2010). This model seeks to identify school districts where academic performance is seen as being satisfactory based on criteria established by the researcher (Addonizio, 2003a, 2003b; Lefkowits, 2004; Ochalek, 2008; Picus, 2001; Rucker, 2010). However, in order to determine this, an operational definition of satisfactory student performance must be established. To accomplish this, typically investigators will use preexisting state student proficiency standards established to meet NCLB achievement provisions on state standardized testing instruments. Once this has been accomplished, the researcher uses a regression analysis to relate district inputs (e.g. teacher salary, teacher experience, student characteristics, district resources, student to teacher ratios) to outputs (student outcomes) (Addonizio, 2003a; J. Augenblick & Myers, 2001; Ochalek, 2008; Picus, 2001; Rucker, 2010). Successful districts are then identified by the investigator based on the results of the regression analysis. A model district is then selected from this group to serve as a benchmark to establish a cost to educate students in the state. This method assumes that any district or school can reproduce another's results with the same per pupil resources adjusted for differences in resource

costs and pupil needs (Addonizio, 2003a, 2003b; Ochalek, 2008; Rebell, 2006).

An additional approach attempting to quantify an adequate level of funding for education has been explored through the *Professional Judgment* approach. This approach relies on the judgment of professional educators in helping to identify essential educational services and programs needed to assist students to perform at high levels of achievement (Addonizio, 2003a; Picus, 2001; Rebell, 2006; Rucker, 2010). Researchers employing this method select a body of educational experts and ask them to identify the most effective educational programs and services for elementary, middle and high school students (Odden, 2003). The ingredients needed to implement the recommended programs and services are then costed out to ascertain a final cost (Addonizio, 2003a; Odden, 2003; Picus, 2001; Rebell, 2006).

The final approach that researchers have utilized to calculate the resources required to provide a high quality education is the *Evidence-Based* approach. This cost analysis model attempts to identify an adequate level of resources needed to promote improved student outcomes by making use of current and past research. Investigators attempting to accomplish this goal review the results documented from auspicious education studies and select those that have the potential to best influence learning (Hanushek, 2007b; Picus, Odden, & Goetz, 2009). Once these programs and services have been identified, the researcher determines an adequate expenditure level based on their components and aggregates them to produce a total budget (Odden et al., 2007). Researchers also attempt to estimate the expected student achievement gains schools should realize if the education programs and services they recommend are implemented by a school. Investigators calculate these academic gains based on the results and findings obtained from research utilizing specific education programs, teaching strategies and professional training aimed at improving student outcomes. Researchers employing the Evidence-Based method contend schools should be able to reasonably

attain similar academic gains if the same or comparable programs and services are offered (Hanushek, 2007b, p. 75).

Statement of Problem

Because of the multiplicity of state school funding systems and legislative education policies throughout the United States, this study will focus on schools in the State of Michigan. In 1994, Michigan taxpayers voted to eliminate the use of property taxes as the primary source of income to pay for public education. Instead, they elected to increase the state sales tax from 4% to 6% which would be used as their main source of revenue to fund schools (Kearney & Addonizio, 2002). This new funding system helped to reduce the property tax burden for both homeowners and businesses by approximately 22% as well as generated a net 4% increase in K-12 revenue when compared to monies levied in 1993 (Kearney & Addonizio, 2002). Additionally, the financial obligation of paying for public education shifted from local municipalities to the state.

Prior to 1994, the majority of school revenue was generated through local property taxes. Since then, the State of Michigan has become responsible for providing nearly 75% of the needed funding for public schools with the remaining portion obtained through local and federal sources (Kearney & Addonizio, 2002). This proportion has remained relatively constant. However, in recent years, this increased fiscal responsibility has become a problem for the state largely because of the lack of stability of this new funding system, especially in poor economic times when there is less retail sales volume resulting in less revenue used to subsidize education in Michigan (Kearney & Addonizio, 2002). Additionally, political debates over policy decisions made at the state level have a direct impact on the level of resources made available to schools as legislators wrestle over prioritizing budget items.

Michigan, similar to other states, has been going through a very difficult financial period which is attributed to its heavy reliance on the auto industry as its primary source of jobs and income. Currently, the state ranks 45th, with 9.4 percent of its workforce unemployed, as compared to the 8.1 percent national average (Bureau of Labor Statistics, 2012). The flaws in Michigan's funding system have become more critical to resolve than ever before in its history. One of the primary reasons for this is because of the new student accountability measures established under the State's federal waiver, specifically in meeting the 85% student proficiency target in both reading and math by the year 2022. This objective will be equally difficult to attain, as it was in meeting the original 100% target under NCLB, if an adequate level of funding cannot be identified by the state. Additionally, it will be more remote for schools to achieve under the State's current economic circumstances. Presently, fewer dollars have been appropriated to K-12 public education as compared to previous years. This has resulted in schools needing to consolidate, prioritize and cut education programs and services to students. This practice may pose a larger problem for Michigan's future, as students lack the skills and training necessary to become successful contributing members of the greater society.

School funding policy concerns have been the center of court proceedings since the decision of *Brown v Board of Education* was handed down by the U. S. Supreme Court in 1954. The outcome of this court case, along with those that followed, has influenced school finance legislation over the past 50 years. The emphasis of these funding systems has shifted from equity (equal distribution of funds) to adequacy (the minimum amount of funding necessary to support academic achievement levels). This shift has also been influenced by federal and state government standards based education reform policies aimed at improving the performance of students.

There have been numerous adequacy costing out studies designed to reveal the amount of funding necessary to provide all students with the opportunity for an adequate education (Addonizio, 2003a, 2003b; Imazeki, 2008; "N.J. Const.," 1947; Picus, 2001; Rebell, 2006). Since 1990, 30 states have conducted their own adequacy cost studies, with many of them done as a result of court decisions relating to school funding lawsuits (e.g, Arizona, Arkansas, New York, Ohio & Wyoming) (Duncombe, 2006). However, critics argue that these adequacy costing out studies are simply forms of "alchemy" that have very little to do with science because they fail to answer the basic question: What level of funding would be needed to attain a designated level of student academic performance (Hanushek, 2005; Rebell, 2006)? Researchers who have engaged in these studies agree that no economic analysis can fully establish a definite causal connection between an exact funding amount and a specific educational outcome (Hanushek, 1994a, 2005, 2007a; Rebell, 2006). This is primarily because educational processes are influenced by so many individual and environmental factors (Hanushek, 1994a, 2005, 2007a; Rebell, 2006). Additionally, it has been difficult for researchers to identify positive relationships between resources and educational programs and services because of the way districts are required to report their expenditures to states (Duncombe & Yinger, 2011). However, contemporary adequacy costing out studies, even with their imperfections, provide a more rational and suitable approach to education budget planning than past ad hoc political deal-making (J. Augenblick, Palaich, & al., 2007; Duncombe, 2006; Rebell, 2006).

All state legislatures have been faced with the challenge of adjusting their education finance systems so they are more aligned with their education accountability standards (Duncombe & Yinger, 2011; Imazeki & Reschovsky, 2005). Michigan legislators have yet to initiate a cost analysis study of their own to see if the funds they are providing schools are adequate enough for students to achieve at the standards to which schools are being held accountable. If an adequate

amount of money can be identified to ensure desired student academic achievement levels, state legislators will be able to better determine a consistent budget for K-12 public education in which every child will be afforded the opportunity to be successful in the classroom.

The purpose of this study was to determine an adequate per pupil funding level to educate all school aged children in the State of Michigan so they will perform at the minimum proficiency standards on the Michigan Educational Assessment Program (MEAP) as outlined by the State Department of Education. In order to accomplish this goal, this research study attended to the following research questions:

1. What variables best predict district academic proficiency on the MEAP?
2. Which are Michigan's exemplary districts?
3. What are "adequate" per pupil funding levels for school districts, conditional on educational costs and needs?

The Successful Schools or Empirical Observation approach was used to provide the results for this analysis. It was selected because it is the most practical and reliable of the four costing out methods because the results are based on actual past student performance data and the resources utilized to obtain them. Additionally, it also takes into consideration the added costs needed to educate students with special needs, as well as those who are at risk for failing based on the model district's student characteristics. Because it is essential for the researcher to establish a standard of achievement in order to calculate the costs of providing an adequate education when utilizing this costing out method, this analysis made use of a composite of both the fifth grade math and reading portions of the MEAP. The composite score for both of these sections was based on current State

proficiency levels established by the Michigan Department of Education for the 2012-2013 school year. Other factors that will be taken into consideration include: *district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location, for-profit charter, non-profit charter*

Assumptions and Potential Limitations

This study assumed that the amount of funding a school district receives impacts the level of student achievement either negatively or positively depending on the level of efficiency with which the funds are managed. For the purpose of this analysis, efficiency will be defined as the least amount of resources utilized to achieve prescribed student achievement levels (Hanushek, 2007a). With that, it was also assumed the more efficiently a district allocates its resources, the better its students will perform on state standardized testing instruments. Conversely, the less efficiently a district utilizes its resources, the lower student achievement will be. Hence, schools having students who perform two standard deviations above their predicted achievement levels in both the reading and math portions of the fifth grade MEAP will be considered efficient districts. This approach presumes any district or school can reproduce another's results with the same per pupil revenue adjusted for variations in student needs and the cost of educational resources (Addonizio, 2003a).

Because it is understood there are efficiency differences between schools residing within a district, the results obtained from this study will not effectually identify these within district differences. One of the main reasons for this limitation is because data reported to the state is disclosed primarily at the district level. Furthermore, this research design may be limited because it encompasses data from public school districts and academies with not less than 500 students attending. Finally, the results obtained from this study will make use of data obtained from FY 2012-13. This will provide an overall snapshot of district and student performance within the state which is the primary objective of the researcher.

Definition of Terms

For the purposes of this study, the following definitions of terms will be used:

The *Michigan Education Assessment Program* or *MEAP* is a criterion-referenced state assessment test used to assess students in grades 3-11 annually in Math and English Language Arts developed by the Michigan Department of Education (Ochalek, 2008, WSU Dissertation). It will be used to identify the overall level of achievement school districts are attaining for this research design in both Math and Reading.

Per Pupil Foundation Allowance refers to the amount of unrestricted revenue a school district receives from the State of Michigan for each child attending their schools (Kearney & Addonizio, 2002). The amount of money a school district receives varies from district to district.

Minimum Per Pupil Foundation Allowance is established by Michigan Legislature annually and refers to the minimum amount of money a school district could receive for each child attending their schools.

The term *Adequate Funding* refers to the level of funding necessary to allow all students the opportunity to achieve at minimum standards of academic performance as measured by state assessment devices (Addonizio, 2003a; Daniel, 2010; Imazeki, 2008; Kearney & Addonizio, 2002; Ochalek, 2008; Odden, 2003; A. R. Odden, M. E. Goetz, & L. O. Picus, 2008; Picus et al., 2009; Rebell, 2006). This term will be used to help identify a minimum level of funding necessary to educate all children, including those coming from low socio-economic communities in the State of Michigan to perform at minimum academic achievement levels as prescribed by the Michigan Department of Education.

Adequacy Grants are proposed grants for schools based on student educational need and costs. (Addonizio, 2003a; Ochalek, 2008).

Efficiency will be defined as the least amount of resources required to achieve prescribed student achievement standards (Hanushek, 2007a).

At-risk are students who come from low socioeconomic backgrounds and qualify for Federal free and reduced lunch benefits under Title I of ESEA.

Adequate Yearly Progress (AYP) is the term used to describe student academic performance working towards meeting the 100% proficiency objective in both Reading and Math by the year 2014 as prescribed under the provisions of the No Child Left Behind Act of 2001 ("No Child Left Behind Act," 2001).

Michigan Education Assessment Program or *MEAP* refers to the State of Michigan's standardized testing program utilized to measure student academic progress towards meeting annual AYP targets established under the NCLB act of 2001.

Student proficiency standards refer to the standards of proficiency established by the Michigan Department of Education for students taking the fifth grade MEAP

Exemplary Districts are districts that have been identified to have exceeded their predicted student achievement levels by at least two standard deviations based on the regression analysis conducted for this study (Ochalek, 2008).

Value added measure refers to the annual change in student performance outcomes (Imazeki & Reschovsky, 2004).

This study will estimate an adequate level of funding to financially support school districts in the State of Michigan to perform at the academic standards outlined by the No Child Left Behind Act. It may also provide state legislators with insight as to how much additional revenue is needed to

achieve educational adequacy. It could also lead to further inquiry into exemplary schools; that is, schools that are exceeding their predicted levels of student achievement with the resources they are allocated.

CHAPTER 2

LITERATURE REVIEW

Introduction and Overview of Chapter 2

In light of today's economic climate, many have argued the most central issue surrounding the success or failure of public education today in the United States involves the concept of adequacy (Odden, Picus, & Goetz, 2010; Picus & Odden, 2011; Rebell, 2004). There is a lot of merit to their argument, as schools need adequate resources to provide quality educational services to their students. This need to adequately fund public education is likely more important today than ever before because of the expectations that have been placed on schools to ensure their students achieve at prescribed academic standards established by both federal and state government legislators.

Over the past three decades, there has been increasing pressure put on schools to improve the quality of educational programs and services they offer and provide students ("No Child Left Behind Act," 2001; Rebell, 2008). The primary driving force behind this push to improve educational quality stems from the concern over the competitiveness of our nation's children and the United States in the current and future global economy (Guthrie & Springer, 2004; "A Nation at Risk: The Imperative for Educational Reform," 1983; Rebell, 2008). However, worries over the level of resources needed by schools to achieve these standards have brought about some concerns which are centered on two questions: How much money is needed to accomplish this task? and To what degree are the federal and state governments liable for providing these resources? The answers to these questions have been shaped through years of rigorous debate and analysis in many arenas which include the courts, research community and political realm.

In an effort to better understand the importance of adequacy and how it has evolved as a central theme in the overall success or failure of students obtaining an education in today's public schools, it is essential to review and understand past court litigation involving key issues of equity which has been identified as the precursor to the concept of adequacy (McDonald, Kaplow, & Chapman, 2006). In addition to reviewing the central court cases that have helped bring about and shape the concept of adequacy, some of the important policies that have been established by both the Federal and state governments which have furthered the need to consider adequacy as a valuable tool in developing more effective education funding systems will be discussed. Furthermore, many of the resolutions devised by researchers attempting to identify an adequate level of funding will also be examined, along with the methods they have employed to obtain their results and recommendations. Finally, because this research design is specific to Michigan, information explicit to its history and background will also be reviewed in an attempt to reveal the importance of identifying an adequate level of funding to meet the needs of their diverse student population.

State Fiscal Responsibility Takes Hold

The United States Constitution makes no reference to education. Rather, this duty was reserved for states to undertake which was addressed in the drafting of their constitutions. Education is possibly the most important responsibility of state and local governments (Dayton & Dupre, 2006). It is essential in providing people with the training and skills needed to know and exercise their responsibilities in a democratic society. In general, education helps to provide people the opportunity to obtain skills needed to succeed in life (Dayton & Dupre, 2006). Today, all states, with the exception of Mississippi, have provisions in their state constitutions describing how they will provide public education (Lynn, 2011; Thro, 1993). The vast majority of these provisions have

language explaining the organization and development of a "system of free common schools" (Rebell, 2002). Additionally, most state education clause language includes information relative to the state's degree of commitment they would provide these services by including phrases such as "thorough and efficient" (CO, ID, IL, KN, MD, MN, NJ, OH, PA, TX, WV), "general and uniform" (AZ, ID, IN, MN, NC, OR, SD, WA), "adequate public education" as well as other specific language (GA) (Hunter, 2011; McDonald et al., 2006; Rebell, 2002, 2008). These clauses established both the states' and local taxpayers' obligation to provide and thereby fund public education (McDonald et al., 2006). However, state fiscal obligation did not immediately take hold after education language was added to state constitutions. Rather, it gradually occurred as early education systems in the United States were chiefly supported through private and religious sources (Rebell, 2008; Sutton, 2008). It was not until the latter half of the nineteenth century that broad publicly supported and financed educational institutions were established by state governments through the help of Horace Mann and the "Common School" movement (Rebell, 2008; Sutton, 2008).

The problem with the vast majority of these state public school systems, however, is that they were minimally funded, which resulted in providing a minimal education. This practice changed over time as the fiscal responsibility of state governments' role in education persistently increased (Sutton, 2008). In 1919, state governments accounted for roughly 16% of all financial support for public elementary and secondary education in the United States, with the majority coming from local revenue sources (Hall, 2006). By the 1950's, that figure more than doubled to 40% and increased further to almost 50% by the year 2002 (National Center for Education Statistics, 2010a). In 2008 that figure was even higher, depending on the state. For example, nearly 60% of the revenue used to fund Michigan's public schools and public school academies was supported by the state, with the remaining coming from local (33%) and federal (7%) sources (National Center for Education

Statistics, 2010b). Of all the states, Vermont and Hawaii contribute the most to their schools by providing approximately 85% of their states total expenditures towards public education (National Center for Education Statistics, 2010b). Their remaining revenue is generated from local and federal sources. In contrast, the state of Illinois contributes the least. It generates the majority of its funds to subsidize their schools primarily through local revenue sources which account for nearly 60% of their total expenditures, with the remaining balance provided by the state (31%) and federal government (8%) (National Center for Education Statistics, 2010b).

There are a number of factors that have contributed to this marked increase in state fiscal responsibility which includes: successful school finance lawsuits, federal education initiatives as well as findings disclosed from important educational research. Of these factors, the most influential stems from successful school finance litigation. Arguments surrounding the fairness in the amount of funds provided to schools and how they should be distributed have been the subject of contention in both federal and state courts for decades (National Research Council, 1998). Early cases centered arguments over issues of equity and equal educational opportunity. These cases set the framework for later court proceedings which helped define the concept of adequacy. The decisions that were handed down in these influential school finance trials directly impacted how schools are funded, as well as how education policy is initiated in the United States. The following is a brief history documenting the leading cases that have made the biggest impact on the interdependence between adequate financial resources and student outcomes in both federal and state litigation. Other influential factors, such as federal education initiatives as well as important educational research findings, will also be shared.

The Infancy of Adequacy:

In 1954, *Brown v. Board of Education of Topeka* was the first landmark court case that set precedence for later litigation which centered on issues of race and equal educational opportunity for children (Dayton & Dupre, 2006; McDonald et al., 2006; Rebell, 2008). It is strongly believed this court case marked the beginning of the modern school funding revolution (Dayton & Dupre, 2006; McDonald et al., 2006). This case was brought to trial on behalf of a young African American girl, Linda Brown, who was denied admission to her local elementary school in Topeka, Kansas because of her skin color ("Brown v. Board of Education of Topeka," 1954). Prior to the *Brown* litigation, many states had laws, known as *Jim Crow Laws*, making it illegal for people of minority races to use the same public facilities and services as whites ("Plessy v. Ferguson," 1896). These laws were permitted based on the verdict rendered in 1896 by the United States Supreme Court under *Plessy v. Ferguson* where the "separate but equal" doctrine was established. Under this doctrine, it was permissible for states to pass laws which segregated their citizens, in particular blacks and whites, as long as these separate facilities and services were equal. However, it was revealed that African American facilities and services were far from equal in comparison to those of whites. As a result, these laws systematically produced inferior opportunities and inequity for blacks living in the United States which became an increasing problem.

It wasn't until the *Brown* verdict that this issue was addressed. The Supreme Court Justices' verdict found that racial segregation of public educational facilities was unconstitutional. Additionally, it was established that no child, regardless of race or national origin, should be deprived equal protection of the laws based on the Fourteenth Amendment of the U.S. Constitution ("Brown v. Board of Education of Topeka," 1954). Hence, the *Brown* decision effectively overturned *Plessy v. Furguson* and the *Jim Crow Laws* in the United States.

Brown also brought national attention to educational inequity. However, the courts did not tie its verdict to how schools were funded. Instead it required states to allocate more money to them to address these inequalities (National Research Council, 1998). Regardless, the *Brown* decision helped to motivate future litigation aimed at addressing inequity in school finance (Rebell, 2008). Its verdict, along with other cases that followed, helped to guarantee that schools provide equitable offerings for all students as well as prohibited the legal basis for racial segregation in schools and other municipal facilities (McDonald et al., 2006). Additionally, it established broader fiscal responsibility of states in providing their children with a public education (McDonald et al., 2006).

As states became more active in financing their schools, state policymakers began to undertake the task of designing funding systems, which are a set of formulas and rules established by state legislatures that use publicly collected revenues to pay for K-12 public education, that would distribute monies to districts (McDonald et al., 2006; National Research Council, 1998). Although the intended outcome of states' school finance systems was aimed at providing equitable educational opportunities for all children, their funding mechanisms produced a wide variation in the level of resources distributed between districts (McDonald et al., 2006). They systematically failed to address the problem of ensuring that financial resources used to supply these offerings would be distributed equitably. The idea of equity as it relates to school finance refers to the fairness with which public schools are funded (National Research Council, 1998).

Over the past 40 years, judicial arguments based on equal educational opportunity began to shift their emphasis to concerns over equitable distribution of resources (McDonald et al., 2006; Rebell, 2008). These arguments eventually transcended into claims embedded in the concept of adequacy. However, the exact point at which this occurred is difficult to identify (West & Peterson, 2007). Legal scholars and educational researchers have generally characterized this development to

have taken place in three waves (Daniel, 2010; Ochalek, 2008). Each of these waves has been classified based on the legal strategies and arguments employed by its litigants (Daniel, 2010; West & Peterson, 2007). Furthermore, each wave experienced varying levels of success in court proceedings, as well as implementation by legislative bodies required to comply with verdicts handed down (Daniel, 2010). In addition to court litigation, other important happenings were also occurring during these periods which played an active role in how schools would be funded.

The 1st Wave-1960-1973

The first wave of school finance litigation occurred between 1960 and 1973. It was a period where equity in school finance was closely being examined. In addition to the active school finance litigation that occurred during this period, other outside influences helped to reveal the importance of providing more equitable funding to schools, in particular, those schools educating poor minority students. These influences were wrought based on the tumultuous political and social era of the 1960's. During this period, the United States witnessed the assassination of President John F. Kennedy, the involvement in the Vietnam War and the emergence of the Civil Rights Movement led by Dr. Martin Luther King, who also was assassinated. The eventual passage of the Civil Rights Act of 1964, along with the *Brown v Board of Education Topeka* decision, prompted the passage of a number of Federal government initiatives aimed at providing interventions to assist minority and impoverished groups living in the United States. One of the most important and costly of these initiatives was the passage of the Elementary and Secondary Education Act of 1965, or ESEA.

Elementary and Secondary Education Act of 1965

This act, which was established during Lyndon B. Johnson's presidency as part of his attempt to address the persistence of poverty in the United States, provided the legal authority for the Federal Government to provide financial support to the nation's public schools and institutions (Eversley-Gilling, 2011). There were five components to ESEA that Congress allocated approximately one billion dollars annually to over a period of 5 years (Eversley-Gilling, 2011; Milkis & Mileur, 2005). One of the most far reaching and costly of these was Title I. It provided funds to states who in turn disbursed them to public schools and districts who educate large concentrations of children who come from poor socioeconomic conditions (Eversley-Gilling, 2011). The funds were intended to be used to provide additional educational programs and services to help less affluent children improve their academic skills and knowledge (Rebell, 2008). It was expected this added help would supply less fortunate children the opportunity to compete with their more affluent peers in the classroom as well as in the job market once they completed high school.

This was the first time in history the Federal Government provided financial support to schools on such a grand scale in the United States (Eversley-Gilling, 2011; Kosters & Mast, 2003). However, like many other Federal initiatives and programs that came before it, there were strings attached. Specifically, the money could only be used to help students who were categorized as coming from low income families. Another stipulation outlined under Title I was the specific evaluation requirements made by Congress holding states accountable for receiving these additional funds (Eversley-Gilling, 2011). Many believe this marked the beginning of the broad educational evaluation systems that we have come to know today (Eversley-Gilling, 2011; Fitzpatrick, Sanders, & Worthen, 2011).

Since the inception of ESEA in 1965, it has been reauthorized by Congress 7 more times. With each of these reenactments, the amount provided to states also increased. This trend of providing increased revenue to schools is consistent with those of the states. In FY 1961-1962 the country spent on average $393 in unadjusted dollars on each child attending a public school (National Center for Education Statistics, 2012). That amount more than doubled by FY 1970-1971 to $842. Much of the reason attributed to the significant increase in spending on education during this timeframe was because of the aforementioned influences. However, a report written just one year after the enactment of ESEA would change the perspectives of many regarding the role and level of influence financial resources play in providing children with an education.

The Coleman Report and its influence on school finance

The need to address inequity in education was reinforced further with the findings disclosed in a research study conducted and written by John's Hopkins University sociologist James C. Coleman in 1966 entitled the Equality of Educational Opportunity Study. This study, which later became known as the Coleman Report, was commissioned by the United States Department of Health, Education and Welfare. It was initiated in response to the Civil Rights Act of 1964 in an effort to better understand the inequality of school resources, as well as their effects on student achievement (Ladd, Chalk, & Hansen, 1999b). The purpose of this research design was to analyze the equity of educational offerings provided to children of differing races, color and national origins (Coleman & et al., 1966). The data collected for this report came from a national sample of schools involving over 600,000 students and teachers.

The research method for this study was multivariate regression analyses which attempts to measure the degree of association among potential variables of educational inputs (e.g. total district

revenue, teacher experience, teacher salary, student demographics, teacher to student ratios, etc.) and their outcomes or outputs (e.g. student academic achievement) (Rucker, 2010; Wenglinsky, 1997). This type of analysis has been referred to by researchers as a production function. One of the key findings revealed from this study was how little influence even the best designed schools and other public programs had in overcoming the negative influence that poverty has over educational success (Coleman & et al., 1966; Schrag, 2005). Equally compelling was the revelation that a child's socioeconomic background (i.e. parent's income level, parent's education level, student peer group influence etc.) impacts a child's level of academic achievement more than anything a school could offer in terms of remediation and educational services (Coleman & et al., 1966). Researchers have verified this observation and depending upon the study, this influence accounts from anywhere between 66-80% of a child's total academic performance (Schrag, 2005). Another dismal statistic exposed by the Coleman report relates to the black-white test score gap. Findings disclosed in the report revealed that black children enter kindergarten well behind their white peers in their early literacy and math skills. This delayed academic proficiency was found to persist and even increase over the course of a child's years in school.

The findings of the Coleman Report led many to assert that money did not matter in education (Minorini & Sugarman, 1999b). However, the report also revealed that schools and the resources used to fund them also influence student achievement, albeit not as momentously. As a result, many scholars and policymakers maintained that schools and the resources used to fund them do have a positive influence on student outcomes. This led many to become concerned over how equitably resources were being distributed to schools and the differences in educational opportunity it afforded students (Minorini & Sugarman, 1999b). These issues and concerns were primarily

examined and addressed through litigation, as the courts did not buy into the argument that money does not play an influential role in providing a child's education.

School Finance Litigation

During the 1960's and early 70's, legislative changes to school finance law often occurred as a result of successful court litigation (Ladd et al., 1999b). Plaintiffs seeking remuneration during this time frame claimed their right in obtaining an equitable education was being denied because of the way their state's funding systems appropriated educational resources to districts. They argued this policy violated their equal protection rights established under each state's constitutional equal protection clause and the 14th Amendment of the United States Constitution (Minorini & Sugarman, 1999b; Ochalek, 2008; Rucker, 2010; West & Peterson, 2007).

One of the first important challenges to school finance systems occurred in an Illinois Federal District Court in 1968 with *McInnis v. Shapiro* (Ladd et al., 1999b). The suit was brought to trial on behalf of a large number of disadvantaged high school and elementary students seeking to equalize expenditure variations between local school districts ("McInnis v. Shapiro," 1968; Salmon & Alexander, 1976). Plaintiffs argued their current state's funding system was ineffective in meeting the educational needs of poor and disadvantaged students (Addonizio, 2004; Rebell, 2002). Furthermore, plaintiffs contended that funding disparities created by this system prevents poor and disadvantaged children from obtaining a quality education ("Burruss v. Wilkerson ", 1969; McDonald et al., 2006; "McInnis v. Shapiro," 1968). They maintained there was a federal constitutional obligation for their education finance system to provide resources to districts based on student educational need (Rebell, 2002).

The theory behind this argument held that both wealthy and poor students have the right to have their educational needs met equally which would necessitate unequal spending (Minorini & Sugarman, 1999b). The case was found to be nonjusticiable because the court had no discoverable and manageable standards by which to determine if the states funding system statues were in violation of the plaintiffs' constitutional rights (Addonizio, 2004; "McInnis v. Shapiro," 1968; Minorini & Sugarman, 1999b; Rebell, 2002; Salmon & Alexander, 1976). In particular, the court had no way to ascertain what the educational needs were for both wealthy or poor children, nor were they able to decipher whether they were being sufficiently met (Minorini & Sugarman, 1999b). The court also justified their decision because there was no language in the United States Constitution declaring how public school expenditures should be provided.

A subsequent case tried in Virginia Federal District Court, *Burruss v. Wilkerson*, with nearly identical claims made by plaintiffs, was also dismissed by the court supporting the same ruling made in the *McInnis* trial (Addonizio, 2004; "Burruss v. Wilkerson ", 1969). Both cases were appealed to the United States Supreme Court which upheld the lower courts decisions without comment (Minorini & Sugarman, 1999b; Rebell, 2002). The primary reasons why both of these cases' were unsuccessful was because there was no broadly accepted definition of what educational need meant and the courts had no standard by which to measure the effectiveness of state school funding mechanisms that were established and being utilized(Addonizio, 2004; Minorini & Sugarman, 1999b).

Although both *McInnis* and *Burruss* were unsuccessful in proving their states' school finance systems were in violation of the United States Constitution, other legal strategies aimed at confronting school finance inequities were devised (Addonizio, 2004; Minorini & Sugarman, 1999b; Rebell, 2002). These strategies avoided the difficult task of trying to find a way to connect

education resources to student need. Rather, they centered their arguments on how current funding systems, which were primarily subsidized through local property taxes, created a system of inequity especially between schools located in communities of low property wealth. Additionally, they attempted to establish that education was a fundamental interest. *Serrano v. Priest* was the first case that applied these strategies which later paved the way for similar school finance litigation in other states (Addonizio, 2004; Minorini & Sugarman, 1999b; Rebell, 2002).

Unlike *McInnis and Burruss*, the plaintiffs in *Serrano* were able to provide the court with the manageable standards needed to support their testimony (Addonizio, 2004; Daniel, 2010; McDonald et al., 2006; Ochalek, 2008; Rebell, 2002). The plaintiffs in this State of California case focused their argument on revealing the unfairness of the funding disparities between local districts (Addonizio, 2003a, 2003b, 2004; "Serrano v. Priest," 1971). Like most states during this period, California's funding system generated the majority of its revenue to pay for public educational services through local property taxes (Addonizio, 2004; Daniel, 2010; Rebell, 2002; "Serrano v. Priest," 1971). Hence, people living in affluent neighborhoods had more available resources to support their local schools as compared to those located in less affluent areas.

This system of funding was declared unconstitutional by the California Supreme Court because it was established that it violated the state's equal protection clause. The court based their judgment on the "fiscal neutrality principle" which was devised by Northwestern University law professor John Coons and two law students, William Clune and Stephen Sugarman (Addonizio, 2003b; Coons, Clune, & Sugarman, 1970; Minorini & Sugarman, 1999b; Rebell, 2002). Much of their strategy was based on earlier research conducted by Arthur Wise in his doctoral dissertation entitled Rich Schools, Poor Schools: The Promise of Equal Educational Opportunity for the University of Chicago (Schrag, 2005; Wise, 1968). The theories he presented in his investigation,

which were primarily aimed at analyzing equity of educational resources between schools, were central to the success of this historic school finance equity case (Ladd et al., 1999b). In particular, his theory which states "the quality of a child's education in the public schools of a state should not depend upon where he happens to live or the wealth of his local community," was paramount to the overall success of the case (Ladd & Hansen, 1999a; Wise, 1968, p. xi). Clune, Coons & Sugarman made use of Wise's work when they formulated the "fiscal neutrality principal" which supports the funds available for a child's education should not be based on the wealth of the community they live in, but rather on the wealth of the state as a whole (Addonizio, 2004; Rebell, 2002). That is, the state has a constitutional responsibility to equalize the taxable resources shared among districts (Rebell, 2002). The verdict rendered in *Serrano* was unlike others that had occurred earlier. The California Supreme Court determined education was a fundamental right based on the language found in its equal protection clause of their State Constitution.

Unlike other previous cases, *Serrano* avoided the difficult task of trying to link a connection between educational funding and student need. Instead, it focused its efforts on revealing the financial disparities between wealthy and poor districts (Rebell, 2002). This approach proved successful because it provided a way of determining if equal treatment for each school district was being met based on the State of California's Constitutional Equal Protection Clause regardless of the wealth of their community (West & Peterson, 2007).

In the wake of the *Serrano* case, similar lawsuits began to be filed on behalf of poorer districts throughout the United States seeking remuneration and changes to state funding systems(Addonizio, 2003a). Because of the precedent set in the *Serrano* case, many states struck down and initiated changes to their funding systems in an attempt to equalize financial disparities between wealthy and poor districts (e.g. Texas, Minnesota, Kansas, New Jersey, Arizona and

Michigan) (Rebell, 2002; Tractenberg, 1974). Additionally, challenges to similar school finance statutes were brought to trial in more than 43 other states, resulting in many school finance statues being overturned (Addonizio, 2003a; Tractenberg, 1974). However, these victories were intermittent, as many states were reluctant to make these changes and those that did had little effect on equalizing the disparity across districts (Addonizio, 2003a, 2003b; Ladd & Hansen, 1999a). Much of the rationale behind this attitude has been attributed to the 1973 United States Supreme Court verdict which was handed down in *Rodriguez v. San Antonio Independent School District*.

Much like the *Serrano* case, plaintiffs' in *Rodriguez* challenged the constitutionality of the State of Texas's education finance system because of the severe inequities it created between poor and wealthy school districts (Rebell, 2002; Sutton, 2008). However, it was filed in federal court and did not make use of the "fiscal neutrality principle" which helped to establish a means or standard by which the court could measure the level of disparity between wealthy and poor districts. Initially, federal district court judges in Texas ruled in favor of the plaintiffs' arguments, stating the Texas' education finance system was in violation of the federal equal protection clause cited under the Fourteenth Amendment (Rebell, 2002; "Rodriguez v. San Antonio Independent School District," 1971; Sutton, 2008). However, this ruling was later reversed by the United States Supreme Court in a contentious 5-4 vote ("Rodriguez v. San Antonio Independent School District," 1971; Sutton, 2008).

The Supreme Court majority opinion held that education was not among the afforded rights explicitly protected under the Federal Constitution (Daniel, 2010; Minorini & Sugarman, 1999a; Rebell, 2002; "Rodriguez v. San Antonio Independent School District," 1971). Additionally, the court ruled that wealth does not create a suspect class since students were not being denied an education despite differences in educational resources (Rebell, 2002; "Rodriguez v. San Antonio

Independent School District," 1971). This ruling ended the Federal Court's role in future school finance litigation (Addonizio, 2003b, 2004; Sutton, 2008). However, the outcome of this decision led to the development of new school finance litigation strategies which were centered on testing the constitutionality of state equal protection clauses (Daniel, 2010; Rebell, 2002; Sutton, 2008; Wood, 2004). This methodology opened a new wave in school finance litigation which occurred between 1973 and 1988 (Daniel, 2010; Ochalek, 2008).

The 2nd Wave-1973-1988

Although the federal courts were no longer sympathetic to school finance reform, new challenges were taken up in state courts, as plaintiffs continued to seek out a solution to resolve the financial disparities between poor and wealthy districts (Addonizio, 2003b; McDonald et al., 2006; West & Peterson, 2007). Plaintiffs in these cases continued to argue their right to a quality education was being denied because existing state school finance systems failed to provide adequate funding to schools located in property poor communities. Their claims were again founded in equal protection language written in both the federal and state constitutions(Hunter, 2011). However, with the recent *Rodriguez* ruling, which eliminated the potential for school finance reform at the federal level, lawyers readdressed their litigation strategy by testing if fiscal policies of states satisfied state education clauses which describe their responsibility in providing educational services to citizens (Addonizio, 1992; McDonald et al., 2006). The first case to employ arguments based on both federal and state constitutional equal protection rights as well as language found in state education clauses occurred in New Jersey in 1973 with *Robinson v. Cahill,* whose verdict was reached barely two weeks after the *Rodriguez* decision (Addonizio, 1992; Daniel, 2010; Dayton & Dupre, 2006; Ochalek, 2008; Tractenberg, 1974).

Arguments presented in the *Robinson* case were filed in New Jersey Superior Court on behalf of students, parents, taxpayers and city municipalities claiming the unconstitutionality of the state's current school finance system (Goertz, 1983; "Robinson v. Cahill," 1973; Tractenberg, 1974). Additionally, litigants argued the funding system was unlawful because it violated the State's "thorough and efficient" education clause (Addonizio, 1992; Goertz, 1983; "N.J. Const.," 1947; Tractenberg, 1974). The foundation for the claims made in the *Robinson* case is very reminiscent of those employed in *Serrano*. At the time, the primary source of revenue raised for public education in the State of New Jersey came from local property taxes. This policy broadened the range of financial disparity between high and low spending districts. This was especially true for schools located in urban property poor communities where revenue is roughly one third less than the then current average state per pupil expenditure (Goertz, 1983).

Not surprisingly, the decision handed down by the New Jersey Supreme Court relative to violations of both federal and state equal protection clauses were not found to be unconstitutional, as the court had very little room to deviate from the *Rodriguez* opinion (Dayton & Dupre, 2006; Goertz, 1983; "Robinson v. Cahill," 1973; Tractenberg, 1974). However, the court did declare the New Jersey school finance system unconstitutional based on its "thorough and efficient" education clause found in its state constitution which reads: "The Legislature shall provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all the children in the State between the ages of five and eighteen years" ("N.J. Const.," 1947). This decision was asserted because the current funding system was proven to not provide all of the State's children with the opportunity to obtain a "thorough and efficient" education (Addonizio, 1992; Goertz, 1983; "Robinson v. Cahill," 1973). As a result, the court ordered the New Jersey legislature to replace the existing school finance system with one that would better prepare students to become

citizens that could readily compete in the job market (Goertz, 1983; "Robinson v. Cahill," 1973; Tractenberg, 1974). Furthermore, court justices required state legislators to devise a definition of what "through and efficient" meant (Goertz, 1983).

Other than the requirements handed down by the court, no direction was provided to the New Jersey legislature in devising a solution to the school funding problem (Addonizio, 1992; Goertz, 1983). Instead, this responsibility was left up to the legislative branches to resolve. In 1976, three years after the Cahill verdict, new school finance legislation was enacted to meet the courts objections which included changes to its state school funding system (Addonizio, 1992; Goertz, 1983). Despite these changes, disparities between poor and wealthy districts remained and in some cases even increased under the new funding system's provisions.

In response to this, another lawsuit was filed in 1981, *Abbott v Burke*, on behalf of all students attending poor and urban schools in New Jersey (Education Law Center, 2011-2112a). This case helped to maintain the momentum of school finance legal proceedings aimed at finding a solution to ending the fiscal disparity between poor and affluent districts. After nearly ten years, the New Jersey Supreme Court rendered its verdict in 1990 under *Abbott v Burke II*, ordering the state to provide funding to poorer districts on par with those found in more affluent suburban communities (Education Law Center, 2011-2012b). Over the years, several other decisions were rendered by the New Jersey Supreme Court, with the most recent in 2011, to ensure state compliance with the *Abbott II* ruling.

Results of school finance litigation in the 2nd Wave

Since 1971, the majority of states were challenged over the way their education funding systems were structured (J. G. Augenblick, Myers, & Anderson, 1997). These cases were brought to

trial based on state constitutional language in hopes of obtaining greater equity in funding among school districts or an assured level of funding for public schools to provide an adequate education (Sims, 2011). Numerous state supreme courts handed down decisions striking down their education funding systems and formulas because they were found to be unconstitutional (Harpalani, 2010). This occurred in over 20 of 29 states that had their education clauses challenged (Harpalani, 2010). Those states whose school finance structures were found to be unconstitutional after court litigation included: Arkansas, California, Connecticut, New Jersey, Washington, West Virginia and Wyoming (McDonald et al., 2006). Legislators in these states began researching and developing more fiscally neutral ways to finance their schools (e.g. Connecticut, Wyoming & Arkansas) (Rebell, 2002). Their resolution came in the form of foundation formulas.

Foundation formulas were created to ensure a minimum level of per pupil revenue for each child (Addonizio, 2004). Forty-four out of 50 states opted to fund their schools utilizing foundation formulas or incorporated foundation formula components into their school funding designs (Addonizio, 2003a; Sielke, Dayton, Holmes, & Jefferson, 2001). The idea behind this finance approach is to provide a more equitable distribution of revenue to support public schools. However, despite efforts to equalize funding levels between local districts, disparities still persisted (Addonizio, 2003a). In addition to this, little focus was placed on the impact these formulas had on student academic achievement.

States whose finance systems were upheld in the highest courts during this volatile period were Colorado, Georgia, Illinois, Maryland, Michigan, Oregon and Pennsylvania (Hunter, 2003). One of the primary reasons why many of the courts in these states were reluctant to rule in favor of plaintiffs is because there was no working definition of what encompasses an adequate or thorough education. The notion that state finance systems should consider need-based differences between

student populations across districts and should provide adequate, rather than equitable, funding for all students was initially explored in *Robinson v Cahill,* 1973 (Sims, 2011). However, years would pass before this issue would be resolved, as no significant school finance litigation occurred between 1983-1989.

A Nation at Risk

In addition to school finance litigation, increased public concerns over the quality of American schools surfaced during this period. This occurred primarily because of a publication produced at the request of President Ronald Reagan's then Secretary of Education T.H. Bell, seeking to analyze the status and quality of education in America ("A Nation at Risk: The Imperative for Educational Reform," 1983). This report, which later became known as A Nation at Risk, identified several areas of concern in student achievement. In particular, the report indicated students in the United States were lagging behind those in other industrialized nations, especially in the areas of math and science (Minorini & Sugarman, 1999a; "A Nation at Risk: The Imperative for Educational Reform," 1983; Rebell, 2008). It also documented that students in the United States were performing lower on 19 academic tests as compared to those living in other industrialized nations. Furthermore, U.S. students did not finish first or second on any of these tests and finished last 7 times ("A Nation at Risk: The Imperative for Educational Reform," 1983). Investigators also estimated that 13% of all 17 year olds in the United States were categorized as being functionally illiterate, having reading and writing skills insufficient to perform real-world daily applications ("A Nation Accountable: Twenty-Five Years after "A Nation at Risk"," 2008; "A Nation at Risk: The Imperative for Educational Reform," 1983). This percentage was estimated to be higher among minority students, with approximately 40 percent being considered functionally illiterate.

The concerns that were disclosed in *A Nation at Risk* led to the perception that the economic competitiveness and future of the United States was in jeopardy because of the poor education students were receiving (Addonizio & Kearney, 2012; Minorini & Sugarman, 1999a; Rothstein, 2008). However, the findings of this report were later refuted by researchers. It was revealed that *A Nation at Risk* investigators based their conclusions primarily on average SAT college entrance test score data (Rothstein, 2008). Despite these data revealing an approximate one-half standard deviation decline by students between the years of 1963 and 1980, more careful analysis has attributed this decline to a larger and more diverse population of students taking the exam as compared to those who took it in 1963 (Rothstein, 2008). Other assessments during the time that *A Nation at Risk* was published paint a much different picture of education during this period. The National Assessment of Educational Progress (NAEP) test, which is a national norm referenced test used to assess student achievement, reveals that test scores during this timeframe were actually on an upward trend for both black and white children (Rothstein, 2008). Furthermore, it was later revealed by researchers and analysts that the true reason for the stagnant economy experienced by American industries during the early to mid-1980's was due to poor planning and investment decisions made by business leaders in both the private and public sectors (Addonizio & Kearney, 2012; Guthrie & Springer, 2004; Rothstein, 2008). Additionally, increased international trade, the transferring of jobs overseas and political influences were also found to be contributing factors (Addonizio & Kearney, 2012).

A National Education Summit occurred in 1989 as a result of the findings disclosed in *A Nation at Risk* (Rebell, 2008). Participants of this summit included governors from all 50 states as well as the then president, George Bush (Rebell, 2008). Among the other attendees participating in the summit were a number of prominent business CEO's. The objective of the conference was to

establish a number of education and achievement goals for all states (Rebell, 2008). This summit has been recognized as the beginning of the standards-based education reform movement which places emphasis on student outputs (Rebell, 2008). Another outcome resulting from the release of *A Nation at Risk* was the attention public education received from legislators, educators and parents to address the issues and concerns that were raised (Guthrie & Springer, 2004). It also garnered the urgency of issuing fundamental changes in our system of education, as well as the need to develop a system of accountability (Guthrie & Springer, 2004). Despite these positively viewed aspects of this report, it diverted attention away from other more important issues affecting school quality such as the issue of educational adequacy. This issue would finally be addressed in the 1989 landmark Kentucky school finance case *Rose v. Council for Better Education.* This case marked the beginning of the third wave of school finance litigation.

The 3rd Wave 1989-Present

By the end of the 1980's, nearly every state had changed how they distributed their funds to schools, paying more attention to how equitable they were among districts (Hoxby, 2001). However, disparities persisted despite state legislative efforts to eliminate them. It was evident that a definition of what necessitates an adequate education would be necessary to help with the next step in determining an adequate level of funding to provide it.

In 1985, a lawsuit was filed in Kentucky Circuit Court on behalf of plaintiffs representing 66 local school districts, along with several other school boards, charging that the State's school funding system was inadequate because it created a wide disparity in available resources between schools (Minorini & Sugarman, 1999a; Rebell, 2002; "Rose v. Council for Better Education," 1989). This was especially true between those located in more urban and rural communities as compared to

those in more affluent suburbs. The main cause for their concern was that the state utilized property taxes as their primary source of revenue to subsidize their schools ("Rose v. Council for Better Education," 1989). Plaintiffs based the validity of their position on their state's education clause found under Section 183 of its constitution, which reads: "The General Assembly shall, by appropriate legislation, provide for an efficient system of common schools throughout the State" (Kentucky Legislative Research Commission, 2010, p. 55). Additionally, plaintiff arguments made claims of violations based on the due process clause of the United States Constitution's 14th Amendment as well as equal protection language found under its own state constitution ("Rose v. Council for Better Education," 1989).

After four years of deliberation, The Kentucky Supreme Court dismissed claims of Federal violations. However, it did acknowledge the state "failed to establish an efficient system of common schools" and therefore needed to redesign and rebuild a new structure of common schools ("Rose v. Council for Better Education," 1989). The court asserted that education is a basic, fundamental right that should be available to all children within the state ("Rose v. Council for Better Education," 1989). The Rose decision brought about many reforms, one of which involved changing Kentucky's education funding system which relied heavily on local property taxes. By 1990, a new funding system was implemented by the Kentucky legislature which provided significantly more resources to its public schools. The courts also provided guidance in developing a description of what constitutes an adequate education which included several learning goals (Minorini & Sugarman, 1999a; National Educatoin Access Network, 2008; "Rose v. Council for Better Education," 1989):

1. Sufficient oral and written communication skills to enable students to function in a complex and rapidly changing civilization;

2. Sufficient knowledge of economic, social, and political systems to enable the student to make informed choices;
3. Sufficient understanding of governmental processes to enable the student to understand the issues that affect his or her community, state, and nation;
4. Sufficient self-knowledge and knowledge of his or her mental and physical wellness;
5. Sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage;
6. Sufficient training or preparation for advanced training in either academic or vocational fields so as to enable each child to choose and pursue life work intelligently; and
7. Sufficient levels of academic or vocational skills to enable public school students to compete favorably with their counterparts in surrounding states, in academics or in the job market.

Although equity and adequacy claims often coexist in arguments presented by plaintiffs engaged in school finance litigation, researchers have identified Kentucky's 1989 Supreme Court verdict in *Rose v Council for Better Education* as the beginning of contemporary school finance litigation (Minorini & Sugarman, 1999a). The primary reason for this is the court's decision to define the concept of educational adequacy (Sims, 2011). These seven learning goals helped serve as a benchmark for other similar school finance litigation cases around the United States and established precedence that money does matter when providing children with an education (Minorini & Sugarman, 1999a; National Educatoin Access Network, 2008; Sims, 2011). With the success of the Rose case, many other states encountered school finance litigation. Between 1989 and 2002, there were numerous court decisions involving disputes over state school finance systems and how resources are distributed (Minorini & Sugarman, 1999a; Sims, 2011). Notably, nearly two thirds of

all these cases happened during this 14 year period (Sims, 2011). The verdicts handed down in these cases were evenly distributed, with 18 verdicts being decided in favor of the plaintiff and the other 18 in favor of the state (Sims, 2011).

An analysis initiated by David P. Sims was conducted to see if the lawsuits that occurred between 1989-2002 resulted in more resources provided to districts having student populations with higher needs (Sims, 2011). He identified higher need schools based on their populations qualifying for free and reduced lunch benefits, ethnicity and eligibility for special education services. Sims made use of regression estimates as his primary method to investigate his question. His results verified what other previous research analyses indicated relative to the level of resources distributed between districts following the *Rose* decision. He confirmed that very little change in resource distribution occurred among schools as a result of court decisions handed down during this period. However, plaintiff victories in states involved in litigation during this period did result in more resources diverted to districts with higher need students. Sims also reported that most districts, even those considered highly affluent, showed some gains in additional monies as a result of these cases. He also concludes that spending on education is a relative measure of school resources and is not of primary importance when the goal is to provide an adequate education (Sims, 2011). Instead, he suggests that resources be given to schools based on students' needs rather than providing equitable funding for everyone. Sims contends that this goal should be one of the primary objectives for future contemporary adequacy litigation.

Adequacy advocates found additional support for their legal disputes through education policy legislation passed during this period, in particular, the No Child Left Behind Act (NCLB) of 2001 approved by Congress and President George W. Busch on January 8th, 2001 (Hanushek, 2007a; Rudalevige, 2007; E. Smith, 2005).

No Child Left Behind Act of 2001

The No Child Left Behind Act (NCLB), which is the reauthorization of ESEA, tied Federal Title I categorical funding to student academic performance standards (Rudalevige, 2007; E. Smith, 2005). This marked a fundamental change in how Federal Title I resources were distributed as compared to previous reauthorizations of ESEA. It brought about standards based education reform linking the distribution of funding to testing and student achievement (E. Smith, 2005). It did so by requiring states to develop assessment systems to evaluate the progress and performance of third through eighth grade students annually in both Reading and Mathematics and at least once for students in ninth through twelfth grade (E. Smith, 2005). To comply with this new law, 48 states established standardized testing instruments in both of these curricular areas and made it a part of their statewide school accountability programs (Phelps & Addonizio, 2006; E. Smith, 2005). Furthermore, NCLB had much more ambitious provisions that emphasized improving the academic achievement levels of minority and disadvantaged students as compared to other previously reauthorized versions of ESEA (E. Smith, 2005).

Hence, closing the achievement gap between black and white students was a high priority. In an attempt to accomplish this objective, NCLB provisions required states to set a baseline threshold for measuring student growth on their standardized testing instruments. This threshold was then to be used as a basis to monitor student progress of meeting the 100% academic proficiency goal by the year 2014 as outlined under the provisions of NCLB (Rudalevige, 2007; E. Smith, 2005). If public schools receiving Federal funds do not demonstrate improved academic proficiency annually towards this goal (Adequate Yearly Progress or AYP) on state standardized testing instruments, sanctions would be placed on them based on the guidelines prescribed under the new act (E. Smith, 2005). These sanctions would commence if a school or district failed to meet AYP two consecutive

years and would progressively become harsher with each successive year of inadequate performance. Some of the sanctions that schools would have to endure include: withholding of funds, developing a school improvement plan, offer parents with children in the district transportation to another school, provide supplemental services to struggling students or school closure (E. Smith, 2005).

The concept of adequacy combined with accountability, as prescribed under NCLB, has helped plaintiffs to present their arguments in school funding lawsuits (Hanushek, 2007a; Rudalevige, 2007). It has done so by helping them to affirm their position of states failing to meet their constitutional obligations of providing a public education based on their individual education clauses (Hanushek, 2007a; Rudalevige, 2007; Sims, 2011).

Defining Adequate Funding

Although there is some consensus as to what an adequate education should include, there is no uniform standard by which to determine what the costs are to provide one (Sims, 2011). There has been a series of methods developed by researchers to estimate the costs associated with meeting various student needs to achieve prescribed levels of academic performance. However, these methods have produced a broad range of results, making it difficult to ascertain what level of spending would feasibly produce an adequate education. This has especially been challenging for diverse student populations (Imazeki & Reschovsky, 2004; Sims, 2011). Generally, it has been stated by experts that adjustments made to resources can lead to academic gains (J. Augenblick et al., 2007; Greenwald, Hedges, & Laine, 1996a, 1996b; A. Odden et al., 2008; Rebell & Wardenski, 2004). However, it is uncertain which inputs under which circumstances can lead to improved

student academic outcomes (Ferguson & Ladd, 1996; Hanushek, 1986, 1997; Ladd & Hansen, 1999a; Mosteller, 1995).

It has been difficult for researchers to pinpoint a causal relationship between school expenditures and student achievement (Greenwald et al., 1996b). Many of the investigations seeking to do so over the past 30 years have utilized the same research methods employed by the Coleman Report to measure the connections between school inputs and student outcomes (Greenwald et al., 1996b; Rucker, 2010). These early research studies made use of *production function* statistical models which measure associations between various educational inputs and student outputs. These education production function studies have also produced mixed results concerning the relationship between school resources and student academic achievement (Greenwald et al., 1996b; Hanushek, 1981, 1986, 1997). Initial findings from the Coleman Report suggested that resources have a relatively small impact on student achievement (Coleman & et al., 1966). Many researchers reviewing the data collected from the Coleman Report revealed opposing findings, while others supported its legitimacy. Eric Hanushek, who has conducted numerous production function studies over the past 15 years concludes, based on the data he has reviewed, there is no consistent evidence showing student achievement is linked to school resources (Hanushek, 1981, 1986, 1997).

However, there has been some criticism over the methodology that Hanushek and other researchers have employed which has placed serious doubt on the validity of their findings (Greenwald et al., 1996a, 1996b; Hanushek, 1997; Hedges, 1994; Schrag, 2005). Many of the studies reporting no connection between school expenditures and student outcomes were conducted utilizing small sample sizes which significantly lowers the reliability of its results (Greenwald et al., 1996a, 1996b; Hedges, 1994). Additionally, Hanushek and other researchers have been accused of giving more weight to studies providing multiple estimates rather than larger studies with single

pooled estimates (Greenwald et al., 1996a, 1996b; Hedges, 1994; Schrag, 2005). They did this by treating each reported subgroup result as its own individual and separate study (Greenwald et al., 1996a; Schrag, 2005).

Other analyses conducted by researchers using different statistical techniques yielded much different results, showing that resources do in fact correlate with student academic achievement (Greenwald et al., 1996a, 1996b; Schrag, 2005). A meta-analysis conducted by Greenwald, Hedges & Laine that was directed to reexamine a comprehensive body of production function studies revealed this to be the case. After careful examination of a broad range of inputs (e.g. teacher quality, student to teacher ratios, teacher salary, per pupil expenditures, socioeconomic factors, class size, ethnicity, etc.), it was concluded that school resources are systematically related to student achievement (Greenwald et al., 1996b). Furthermore, it was deduced that moderate increases in spending on educational services may be associated with significant increases in student achievement (Greenwald et al., 1996b). In particular, Greenwald, Hedges and Laine report that an increase of approximately $500 in per pupil expenditures potentially could increase student achievement by 1/6 of one standard deviation (Greenwald et al., 1996b). Additionally, they suggest that increases in teacher salaries as well as retaining experienced teachers could also boost student academic performance by 1/6 of one standard deviation correspondingly.

However, some research investigating the impact that teacher salaries have on student achievement has shown very little influence (Lin, 2000; Miller, 2000; Talibah, 2001). The smallest plausible increase in student achievement was attributed to using additional revenue to reduce class sizes. However, Greenwald, Hedges and Laine contend their analysis did not accurately reflect true teacher/pupil ratios because much of the data they reviewed used comparisons that included all teaching staff working within a school (social workers, psychologists, speech pathologists, special

education, physical education, art, etc.). Regardless, their data provided evidence to support the idea that class size reductions do produce greater student academic gains, which is consistent with other studies (Bingham, 1993; Mosteller, 1995; Nye, 1992). These findings were contested by Hanushek, but were later acknowledged with him recognizing that money could indeed matter (Hanushek, 1994b). But to what extent is still relatively unknown.

The level of financial responsibility for public education has significantly increased for a good number of states because of court mandated decisions, as well as federal education initiatives (Hanushek, 2006a; Hanushek & Lindseth, 2009). As a result, state policymakers have reacted accordingly by increasing education budgets. However, these increases have also garnered demands for more accountability from schools and control over educational offerings and services (e.g. increased achievement levels on standardized tests, all-day kindergarten, class size reductions, additional teacher training, etc.) (Hall, 2006; Timar & Roza, 2010). The rationale behind these expectations is to ensure that funds are spent more efficiently and wisely by school districts.

However, there is evidence that policymaker accountability demands fail in leading to improved student outcomes (Hanushek, 2006a). A study conducted by Joshua Hall verifies this fact in his analysis of Ohio public school districts (Hall, 2006). His investigation involved looking at the relationship of school district characteristics (e.g. community demographics, teacher certification, student to teacher ratios, size of school, teacher quality, per pupil expenditures, differences in total funding allotments, etc.) and student academic performance outcomes (e.g. graduation rates & 10^{th} Grade math proficiency scores) of the 1999-2000 school year. His research revealed that the most important factors influencing a school district's graduation rate and test performance are the education level of adults living within the district, the percentage of students eligible for free and reduced lunch and a school district's attendance rate. Interestingly, all of these variables, with the

exception of student attendance, do not rely on district resources or finances. Rather they are variables that cannot be controlled for by schools or state policymakers.

One variable that schools could potentially have some level of control over relates to student attendance. Based on Hall's results, the higher a school district's attendance rate, the more students graduate. Additionally, his results suggest that if a district raised its attendance rate by only 1 percentage point, a district could potentially expect to see an increase in their graduation rate of almost 2.5 percentage points. However, the researcher also cautions on placing too much emphasis on any one result largely because there are "few one size fits all solutions" (Hall, 2006, pp. 184-185). He states this because not all districts have the same problems or issues. Different districts have different problems that need to be addressed which is why Hall encourages a decentralized finance model where financing decisions should be made by those who know their students educational needs. He also suggests that policymakers have had very little control over these variables with a state centralized education system. This finding has been supported by other researchers (Hanushek, 2006a).

Although it has been difficult to assign a cost to provide an adequate education, there have been attempts to accomplish this task which have proven to be very controversial. Those attempts have been conducted through investigations conducted by the research community.

Costing Out Studies:

Over the past 10 years, there has been a number of independent and publicly funded costing out analyses aimed at determining the costs needed for a child to obtain an adequate public education. Many of these studies came as a result of court litigation requiring state legislators to change their funding systems because they were found to be insufficient (Ochalek, 2008; Rebell,

2006). Several legislatures have relied on the results of these costing out studies to help them formulate their education funding systems to calculate appropriate budget levels to meet all student needs (Hanushek & Lindseth, 2009; Rebell, 2006). Courts have also utilized the results from costing out studies to determine the constitutionality of state funding systems based on individual state education clauses (Hanushek & Lindseth, 2009; Rebell, 2006).

These studies, however, have also come under scrutiny from others in the research community citing that they are not scientifically valid since they do not answer some of the basic scientific questions such as: What level of funding would be required to achieve a given level of student performance (Hanushek, 2005, 2006b; Ochalek, 2008)? Researchers and scholars would admit that it would be difficult to produce a precise or exact amount based on these economic analyses to answer this question (Duncombe & Yinger, 2011). However, critics have been unable to provide alternative models to accomplish this task either (Duncombe, 2006; Duncombe & Yinger, 2011; Rebell, 2006). Despite potential flaws with costing out studies, they provide a rational basis for their findings that is supported by research and empirical evidence (Duncombe & Yinger, 2011). Additionally, they also attempt to calculate the added expenses necessary to provide adequate funding amounts to students based on their backgrounds and educational needs. This process is very different from what has traditionally been done by policymakers where political deal making and previous years' expenditure levels have been used to set education budgets (Rebell, 2006, 2007).

As the science of costing out studies improves its methods and statistical accuracy, more precise estimates will be able to be calculated, which will provide legislators and the courts with more reliable guidance when developing future education budgets to meet student needs (Ochalek, 2008). Currently, there are 4 costing out methods used by researchers to determine adequate funding amounts. These include: Professional Judgment, Evidence-Based, Statistical Modeling or

Econometric, and Empirical Observation or Successful Schools Methods (Addonizio, 2003a; Daniel, 2010; Minorini & Sugarman, 1999a; Ochalek, 2008; Odden, 2003; Rebell, 2006). Each one of these methods has positive and negative aspects to the process they employ in calculating the costs of providing an adequate education.

Professional Judgment Approach:

The Professional Judgment approach is one of the most widely used costing out study methodologies (Rebell, 2006). This method developed by James Guthrie and Richard Rothstein and has close ties to earlier research conducted by Jay Chambers through his Resource Cost model (Ochalek, 2008). States that have made use of this method to estimate the costs of providing an adequate education include Kansas, Maryland, Oregon and Wyoming (Odden, 2003). This approach relies primarily on the knowledge and experience of professional educators to identify programs, services, as well as strategies aimed at improving student achievement (Addonizio, 2003a; Lefkowits, 2004; Odden, 2003; Rebell, 2006). Once this has been done, the costs to provide these services are estimated based on the ingredients needed to implement them (Odden, 2003). Additional expenditures are also calculated to provide appropriate academic support to students who have special learning problems or needs (e.g. low income, disabilities, language barriers, etc.). Once a comprehensive education model has been developed and estimated, economists and researchers ascertain the costs of the inputs required to achieve the desired outcomes by conducting a series of economic investigations to produce an accurate target cost (Augenblick Palaich and Associates Inc., 2003; Myers & Silverstein, 2002; Rebell, 2006).

The following sections present two research studies incorporating the Professional Judgment method. The objective of both is to identify an adequate funding level to support improved student performance.

Professional Judgment Example: *Kentucky*

As a result of the landmark school finance court decision, *Rose v. the Council for Better Education,* Kentucky developed a three-tiered finance system to financially support their K-12 public schools (Verstegen, 2004). This new funding system was established under the Kentucky Education Reform Act of 1990 (KERA) which has been referred to as one of the most comprehensive educational reforms ever adopted in the United States (Verstegen, 2004). This new funding system provided a minimum level of funding per pupil and issued additional funds to schools which have students with higher needs. In response to the *Rose* decision, numerous research designs have been undertaken aimed at identifying the cost of an adequate education in Kentucky. One of those was steered by Deborah Verstegen and her associates who utilized the Professional Judgment method to ascertain the funding levels needed for school districts in the state to meet the rigorous academic standards and objectives defined by the courts. The costs to achieve these academic performance standards were also calculated based on students meeting the 100% proficiency target on the State's CATS (Commonwealth Accountability Testing System) standardized test by the year 2014 as required under NCLB.

Verstegen made use of three Professional Judgment panels in this process, with each one focusing on specific tasks. The first two panels utilized for the study were established at the building and district level. Members of the building level panel consisted of professional educators (e.g. veteran teachers, principals and curriculum specialists). They helped to identify the programs and

services needed to provide an adequate education for students at the elementary, middle and high school levels. These panelists were also directed to make their recommendations, taking into account Kentucky's student demographics and differing building sizes (small, medium, and large). The second panel commenced at the district level which encompassed other highly qualified school and district educators and administrators. These members reviewed the recommendations made by the previous panel of educators and were asked to make adjustments and changes, if deemed necessary, in areas of programs and their costs. They were provided with actual district budgets to better determine expenditures with the exception of transportation. This expense was specifically left out because the State initiated its own analysis to ascertain these costs. The final or expert panel convened and was asked to review the work done by the other previous two groups. These committee members were invited by the researcher and her associates to accomplish this task. They issued refinements and finalized estimated costs and figures to meet the State's objectives.

The results of the research indicated that the State of Kentucky would need to increase their current K-12 budget of $4.102 billion to $5.199 billion to accomplish its task of providing an adequate education to its children. The guaranteed per pupil base amount provided to schools under Kentucky's new three tiered funding formula was $3,066 in fiscal year 2001-02. That amount would more than double based on the research presented by Verstegen and her associates depending on the size of the district. Small districts would require $7,186, as compared to moderate to large districts which would require $6,788 and $6,551 respectively to accomplish their objectives. The primary reason why smaller districts would need these additional funds is that despite having fewer students, costs to provide recommended programs and services would still require funding. Moderate to large districts can offset these costs much more readily because of the money they receive based on their higher student enrollment levels. The researcher also made accommodations for costs related to

educating students with higher needs for support. These cost adjustments were added to the base per pupil amount provided under Kentucky's finance system. Students who were identified as being "at risk" or Limited English Proficient would receive $858 in small, $834 moderate, and $817 in large districts. Conversely, those categorized needing special education services would receive $1,449 in small, $1,550 in moderate and $1,679 in large districts.

Professional Judgment Example: *California*

Another example of a Professional Judgment costing out study was conducted by the American Institutes for Research (AIR). The purpose of this analysis was to assist California lawmakers in identifying the amount of resources needed to adequately educate students in the state to achieve at designated proficiency levels established by the California Department of Education (Jay Chambers, Levin, & DeLancey, 2006). A team of researchers, Chambers, Levin and DeLancy, coordinated this analysis which made use of two independently selected panels comprised of highly qualified professional educators. Their responsibility was to devise an education plan that would promote improved student achievement. Additionally, the costs to implement these programs would be projected.

The members of these panels met together over a three day period to deliberate and make their recommendations. They produced multiple plans which were guided based on specific criteria established by the research team. In particular, education programs were designed taking into account student demographics, school size, and instructional level (e.g. Elementary, Middle or High). Once these programs were devised by the panels, they were then asked to specify the level of funding necessary to provide them. Members of the panels allocated additional resources to reduce class sizes, extend the length of the school day and year, and included specialized ancillary staff.

Resources were also earmarked for early childhood intervention programs as well as teacher professional development and training.

The results of the study indicated that California would need to spend an additional $24 to $32 billion dollars, on top of the already $45 billion currently spent in 2004-05. This increase would necessitate allocating approximately 53 to 71 percent more funds to the State's K-12 annual public education budget. Researchers contend that students will be more likely to achieve at the education standards prescribed by the state in all major content areas as if these added funds were provided. They also report that of the 984 public school districts in the state, only 15 to 28 were currently spending at a level high enough to achieve at these standards. On average, California spends $7,246 per pupil. Based on the results of this analysis, that amount would need to increase from $11,094 to $12,365 in order for the students in the state to perform at proficient levels.

The investigators acknowledge the wide range in recommended additional costs associated with the results of this study. Much of the discrepancy in costs has been attributed to the differences in recommended education programs selected by the two panels. Chambers, Levin and DeLancy also admit that "costing out educational adequacy is not an exact science" and that some of the added expenses in these types of studies rely on assumptions making them open to criticism, such as those associated with building operations, maintenance, transportation, and utility costs (Jay Chambers et al., 2006, p. x.). It is because of this that the examiners emphasize full transparency of this process in order to share the rationale behind the choices and decisions that were made. This would encourage further analysis and dialogue between constituents in coming to a consensus as to what is feasible.

Positive and negative aspects of the Professional Judgment Approach:

One of the positive aspects of this approach is it can be tailored to meet the needs of differing school sizes as well as varying student populations (Odden, 2003). Additionally, the education programs selected to be implemented to support student learning in this research method are made by highly qualified practitioners (Rebell, 2006). Of the four methods, the Professional Judgment methodology has proven to be the most effective in identifying the academic needs of students who are at risk for failing because of socioeconomic and family circumstances (Rebell, 2006). Additionally, costs associated with these programs have been justified and calculated because of the recommendations of professional judgment panels that have firsthand knowledge of their academic needs (Rebell, 2006).

Despite the positive aspects of the Professional Judgment method, there have been some reported drawbacks utilizing this design. One of those drawbacks, which has also been cited as being one of its strengths, stems from the level of influence coming from those professionals who help to design the program (Rebell, 2006). Because this design method relies so heavily on the knowledge and input of the professionals who are selected, the credentials of those making recommendations and proposals could be considered suspect depending on the panel members' qualifications (Rebell, 2006). Furthermore, there has been some evidence suggesting panel members have at times had difficulty coming to a consensus when agreeing upon prescribed educational services and programs(Addonizio, 2003b).

Another potential downfall to this method is its expense. Analysts employing this research model often do not limit costs (Hanushek, 2005, 2007b). Without placing restraints on costs or focusing on realistic financial budgeting, results produced using the Professional Judgment model are a less practical way to estimate true educational costs. The main reason for this is because they

invariably produce inflated estimates which are contrary to efficiently utilizing resources (Hanushek, 2005). Finally, researchers employing the Professional Judgment method suggest that student achievement will improve significantly if the programs and services recommended are employed by schools. However, no evidence has been documented indicating the resources spent on providing the recommended programs have led or will lead to improved student academic gains (Hanushek, 2005, 2007b; Odden, 2003).

Evidence Based Approach:

Another research approach aimed at identifying effective education programs and their costs is the Evidence Based costing out method. This research design was developed by University of Wisconsin professor Allan Odden and University of Southern California professor Lawrence Picus and has been utilized by several states seeking to determine adequate funding levels to meet specified student academic performance outcomes(Ochalek, 2008). Some of the states that have utilized this approach include: Wisconsin, Kentucky, Arkansas, Wyoming and Arizona (Hanushek, 2007b). This method attempts to identify a set of ingredients that are necessary in delivering a quality school wide education at all grade levels (Odden, 2003). The selection of these ingredients (e.g. educational strategies and programs) is different from the procedure used in the Professional Judgment approach. Instead of relying on the presumptions and recommendations of professional educators, selections of education programs and teaching strategies are based on past and current research whose results support improved student achievement (Odden, 2003; Odden, Picus, & Fermanich, 2003a). Once ingredients or programs have been identified by the researcher (e.g. smaller student to teacher ratios, full-day kindergarten, summer school, teacher professional development and training, etc.), the costs to implement them are calculated (Odden, 2003; Odden et

al., 2003a; Odden, Picus, & Fermanich, 2003b). When undertaking this task, investigators take into account the costs associated with student academic needs, staffing, materials, supplies, and equipment(A. R. Odden et al., 2008). Furthermore, facility maintenance and utility costs are also factored into the final approximation of total expenditures (Odden, 2003).

Two examples of the Evidence-Based approach, conducted by independent companies, are provided to illustrate how this method is utilized to assist in identifying the costs associated in providing an adequate education to students in the states of Wisconsin and California.

Evidence Based Example: *Wisconsin*

Allen Odden, Lawrence Picus, and colleagues conducted an Evidence Based costing out analysis for the Wisconsin School Finance Adequacy Initiative in 2007. This purpose of this task force, which was comprised of lawmakers, educators and citizens, was to focus on how to best improve student academic outcomes. What prompted the study were recent results produced by students on the National Assessment of Educational Progress (NAEP) which is a national test used to compare students with one another in the United States as well as those from other countries. Approximately 35 percent of Wisconsin students scored proficiently on this exam which raised serious concerns over the lack of skills students have to compete in a global society. As a result, the Wisconsin task force issued an objective of doubling student academic outcomes on the NAEP (Odden et al., 2007). To achieve this, strong instructional programs and strategies would need to be employed by all Wisconsin's public schools and adequate resources would be necessary to implement them (Odden et al., 2007).

Several schools in the state were already performing at the desired level. The education programs and teaching methods of these schools were carefully analyzed by the investigators and

compared to those strategies and education programs supported by educational research. Odden, Picus, and their colleagues identified several practices that would be necessary to double student outcomes. Some of these included: analyzing test data to determine weaknesses and strengths, set higher academic standards and goals, research evidence of effective teaching and curriculum, invest heavily in teacher professional development, provide extra help for students beyond regular school hours, establish lower class sizes in early primary grades, and adjusting the daily schedule to create more instructional time. Once these were identified, the researchers determined the costs that would be necessary to provide these programs and services. This was done by establishing the inputs necessary to carry out the desired programs. Therefore, costs were established based on essential components such as: school characteristics (e.g. level of school, school size, and student demographics), personnel (tutors, paraprofessionals, ancillary staff, teachers, principal, substitutes, and secretary), central office expenditures (staff, building operations and maintenance, transportation, food services), and equipment and supplies. Teacher and administrator salaries and benefits were also estimated in this process to assist in identifying an accurate cost.

The findings provided by the researchers to fund these programs to assist students in doubling their performance levels on the NAEP test totaled $9,820 per student. This amount included a base per pupil allocation of $8,520, with the additional $1,300 provided to at risk students and those who have special learning needs. These added coasts amount to $719 above the 2005-06 per pupil base amount which was $9,001. Under this proposal, the total increase in expenditures to the State of Wisconsin would equate to $786.1 million, which is a 9.2 percent increase in the total revenue for K-12 public education in Wisconsin. The researchers disclose this increase is one of the lowest estimates that have been provided under an adequacy study.

Critics of this study have pointed out some of the potential problems with this model. One of those involves the objective of doubling student performance levels on the NAEP. This would prove to be a very ambitious outcome, since the cut scores on the NAEP are very high. Very few countries in the world have had half of their student populations score proficiency on this assessment (Samberg, 2007). Hence, the costs this study reports to improve student performance would invariably be much higher than what was recommended. Another identified issue of the study involved the level of funding that investigators provided for middle and high school programs; in particular, the cost of providing non-core subject classes. The funds that were allocated to secondary education were estimated much lower than the costs needed to efficiently run a high school (Samberg, 2007).

Evidence Based Example: *California*

An independent Evidence Based adequacy research design was conducted by Ryan Douglas Smith entitled Making the Golden State Glitter Again: How the Evidence Based Adequacy Model Can Save Struggling Schools In Difficult Times (R. D. Smith, 2010). The purpose of this investigation was to identify how lower achieving high schools in the State of California are utilizing their resources to improve student academic outcomes. In particular, how they were coping with budget reductions made by the state. Additionally, the researcher intended to reveal if the services and programs provided by these struggling schools were being implemented based on proven education strategies and programs that have been validated through research. Smith made use of a mixed methods approach, utilizing both quantitative and qualitative data, to obtain his results. Information was collected from a sample of five public high schools located in Southern California identified as underperforming. The criteria established by Smith qualifying a school as

underperforming, thus making them eligible to be potentially included in the study, was based on two standards. The first involved whether the high school received Federal Title I funding. The second involved if the high school failed to achieve Adequate Yearly Progress, as outlined under the Federal No Child Left Behind Act of 2001, for two consecutive years. Once the schools were identified for the research analysis, quantitative data were input showing how funds and staff were allocated at the building level. The information obtained for this portion of the analysis originated from data sets collected by the state and made available to the public. Additionally, qualitative data were obtained of how funds were assigned at the building level to reinforce academic programs and services provided by the schools. This was done with the assistance of other researchers who interviewed administrative members of the selected high schools, asking them questions about the academic programs and services they provide their students. This was done to allow the researcher to make comparisons between schools to help identify similarities and differences.

Smith made use of previous research to assist him in identifying eight areas that have shown to improve student academic outcomes (Odden, Picus, Goetz, Mangan, & Fermanich, 2006). These areas include: Instructional leadership, curriculum improvements, professional development and teacher training, use of data to drive instruction, parent involvement, instructional time, interventions to assist struggling students, and teacher collaboration. It was concluded that none of the schools selected for the analysis were allocating sufficient resources to reinforce the recommended areas to improve student achievement. All the schools had fewer core and specialized instructors, larger class sizes, and little funds allotted for teacher training and professional development. It was also revealed that all of the buildings had insufficient staff levels to assist students struggling in core subjects. Specifically, this was true for students who are English

Learners and those with disabilities. All of the schools included in the study had large Hispanic populations which would attest to this problem.

Other areas that were of concern relate to the support programs provided to struggling students. None of the schools make use of certified tutors to assist students both during and after school hours. Additionally, remedial programs, such as after school tutoring and summer school, were not adequately staffed. Finally, the eight areas that have demonstrated to improve student performance were minimally or ineffectively implemented. Part of the reason for this issue is because of reductions made to school resources, which have resulted in teacher layoffs, increased class size as well as elimination of student support services.

Smith reported the reductions these schools have experienced have not had a negative impact on student performance measures. He states this because most schools have shown some growth in student achievement despite having fewer dollars to spend on programs and services. This likely would be attributed to the level of efficiency these schools are allocating their resources, keeping only the most essential and crucial education services in place. The investigator concludes that it is highly unlikely, under the current economic conditions, that this trend will continue. He suggests this because schools in California will not be able to follow the recommendations of Evidence Based researchers until more funds can be allocated to schools. Unless this is done, districts will not be able to effectively implement the suggested evidence based programs and services to meet the mandated education standards set by the State of California. Additionally, more resources are needed for student intervention programs in California schools for at-risk students, especially in areas of math and reading.

Smith revealed a number of concerns that need to be addressed in California if students are to make academic gains. However, he failed to provide a cost or figure attached to these needs, which

makes his argument less valid in terms of assessing an adequate level of resources to implement the recommended Evidence Based programs. Additionally, students in all five of these schools have shown upward trends in academic outcomes on the state's standardized assessment, which would tend to lead others to believe that what these schools are doing is working in favor of the learner despite having fewer resources.

Positive and negative aspects of the Evidence-Based Approach:

The Evidence-Based approach is appealing to many because if its overall simplicity in design, transparency and versatility in organizing the interaction of a broad range of educational inputs and outputs (Odden, 2003; Rebell, 2006). It also makes use of research that has shown evidence of improving student achievement, thus helping schools focus where to spend their resources efficiently (Odden, 2003). Investigators utilizing this approach also emphasize and attempt to quantify the level of improved student achievement and its effect size, and the measurement of change in standard deviations of achievement, based on the implementation of recommended programs and services that are supported by research (Hanushek, 2007b, 2007c). Finally, this approach also employs the use of comprehensive school reform methods emphasizing best practices, as well as establishes a basis for accurate cost estimates from the building level up (Addonizio, 2003b; Odden, 2003). These aspects, along with its focus on obtaining results, help make the Evidence-Based approach one of the more appealing costing out methods used to estimate the resources needed to support improved student achievement.

Despite these positive aspects, one of the biggest disadvantages to this approach is the potential for researchers to base their selection of education programs on studies that are suspect (Hanushek, 2007a, 2007c). In particular, it has been reported that investigators utilizing this method

have made program recommendations based on results coming from studies with very narrow sample sizes, as well as from research conducted two or three decades ago (Hanushek, 2007c). Hence, the potential for lower than expected student gains is highly plausible (Hanushek, 2007b, 2007c). Another shortcoming of the Evidence-Based research is the potential for districts to spend resources inefficiently by using funds to implement education programs that may not produce the results investigators claim they will reach (Hanushek, 2007c). Based on these shortcomings, there is little reason to expect that student academic gains would correspondingly improve with the level of spending researchers have projected (Hanushek, 2007c).

Statistical Modeling Approach:

The Statistical Modeling method, or Cost Function approach, is the most comprehensive and complicated of the four models due to the vast number of variables or ingredients included in the research design (Addonizio, 2003b; Odden, 2003). Its primary objective is to determine what different levels of achievement would cost a particular district based on set performance goals, while taking into consideration differences in district and student characteristics (Ochalek, 2008; Odden, 2003; Rebell, 2006). Prior to beginning the analysis, the researcher utilizing this method identifies the level of (or improvement in) student performance they consider to be adequate or satisfactory (Addonizio, 2003b). Once this level (or improvement) is determined, the investigator uses multiple regression analysis to approximate the dollar cost of each of the ingredients potentially influencing the prescribed student performance goals (e.g. academic programs, special services, student characteristics, district characteristics, teacher experience, student/teacher ratios, family characteristics, etc. (Addonizio, 2003b; Ochalek, 2008; Odden, 2003). Two examples of this method are described below.

Statistical Modeling Example: *Kansas*

The Legislative Post Audit Committee of the State of Kansas, which is comprised of five senators and five state representatives, initiated a statistical costing out analysis to determine the estimated expenses of K-12 public education. This was accomplished with the help of the audit agency of the State of Kansas which is called the Legislative Division of Post Audit. The audit department conducted the research for this study using an output based approach to determine their estimates. In particular, they explored the base costs associated with providing students with a "regular education" (Kansas Legislative Division of Post Audit, 2006, p. 17). Costs were calculated based on various class size distribution models. The following averages were calculated in the study: 25 students per class, 18-23 students per class, 20 students per class. Considerations were also made to costs associated with educating students with special needs. Finally, costs to maintain vocational training and district transportation were also factored in the study, as well as variation in teacher salary based on geographic location.

The output methods used to estimate the base costs of providing a "regular education" revealed that more funding is necessary to provide essential programs and services to students under all three class size models. The current per pupil base funding level for fiscal years 2005-2007 was established at $4,257 by state legislators. In comparison, the results obtained from the statistical modeling method yielded slightly lower costs. This demonstrated the Kansas funding model provided more than adequate resources to its schools, as the estimated base cost utilizing the statistical modeling approach yielded a $4,167 per pupil for FY 2005-2006. This estimate, which was later identified as a cost level for a student to be able to obtain a "regular education", was based on the State Board of Education's student performance index on the State's standardized assessment. However, after future projections were calculated, that amount would need to increase in the

subsequent year to $4,659. The primary reason cited for this increase was because expected student academic performance outcomes would be raised. Hence the costs necessary to achieve this standard increased.

The study also revealed the expenses used in providing services to at-risk students would also need to increase in order to perform at the academic levels required by the State. In FY 2005-2007, Kansas allocated a 1.193 weight to help pay for the added costs needed to educate their students who qualify for free and reduced meal benefits. Furthermore, no additional monies were provided for at-risk students attending inner city school districts. Results from this analysis yielded a much higher weighted measure for both these student populations. Researchers recommended a 1.484 weight be assigned to students qualifying for free and reduced meal benefits, and 1.726 measure for similar students attending urban school districts.

Special education costs were also revealed to be higher than what was currently budgeted. The state allocated $10,736 in 2005 and $12,185 in 2006 per FTE student. Based on the auditors' results, these amounts would need to increase to $14,232 in 2005 and $15,159 in 2006. However, the additional resources provided by the state for vocational training, which are funds provided to schools in excess of the base per pupil amount, was recommended to be reduced by the investigators. The state provided $2,129 for each student receiving vocational training in both 2005 and 2006. This amount was suggested to be reduced to $1,375 in FY 2005 and $1,420 in FY 2006. Finally, it was disclosed that teacher salaries be adjusted to a range between -2% and +5%. This information obtained was based on the comparable variables analyzed between districts in the state. Some of the variables that were controlled for in the analysis to determine this calculation included: district location, teacher experience and education level, cost of living, school working conditions, and

district efficiency in spending. Higher salary increases were recommended to be given to staff employed in districts located in poor urban communities.

Based on the findings of this study using the statistical modeling method, the total costs for K-12 public education in the State of Kansas would need to increase between $316.2 to 399.3 million to meet the prescribed academic outcomes of its Board of Education. Additionally, as levels of academic performance expectations increase, the costs associated with meeting them was estimated to also increase. This is further reinforced by the studies final results citing that a 0.83 percent increase in spending would garner a 1 percent increase in district student performance outcomes. The confidence level of this finding was established at 0.01.

Statistical Modeling Example: *California*

Another example of a costing out study utilizing the Statistical Modeling method was conducted by Jennifer Imazeki, entitled Assessing the Costs of K-12 Education in California Public Schools: A Cost Function Approach (Imazeki, 2008). This study was one of several conducted for the Getting Down to Facts California school finance project. The purpose of the analysis was to estimate the costs needed for district students to meet the State of California's assessment standards. Additionally, the researcher examined the cost differences of districts with diverse student characteristics (Imazeki, 2008). The dependent variable utilized in this analysis was per pupil expenditures in FY 2004-2005. The independent variables used for the study include: overall student achievement indexes for the State of California's student assessments, regional teacher salary indexes, district enrollment, percentage of students in poverty, percentage of non-English speaking students and percentage of student with special needs. The final independent variable utilized in this analysis involved the concept of efficiency.

The researcher examined how to best quantify this variable. The Statistical Modeling method assumes that districts utilize their resources efficiently to maximize academic achievement (Imazeki, 2008). However, the investigator points out that many researchers make the mistake of evaluating a district's level of efficiency through a comparison of total district expenditures and student achievement. She reports this approach is less effective in measuring district efficiency because it is sensitive to district choices and preferences in curriculum and student academic goals (Imazeki, 2008). To offset this problem, the investigator makes use of the Herfindahl Index which assesses district efficiency levels based on the principle of competition between education markets. This method makes the assumption districts are more efficient in their spending of education resources if parents have a choice where they may send their child to school. Hence, the closer schools are in proximity to each other the more likely schools will spend their resources efficiently to attract more students.

The results of the study indicated that most of the independent variables were shown to be statistically significant in their influence over total costs. It was revealed that education costs rise for districts' with higher student populations coming from impoverished families. This was also found to be true for students who require special education services. Teacher salary indexes by region also supported higher yields in education resources. This was also the case for non-English speaking students. However, this result was not found to be statistically significant. Imazeki also reported larger districts require more resources than smaller districts because they were found to be less efficient in how they utilize their resources. Finally, based on the Herfindahl index, further supporting evidence was made indicating schools spend their resources more efficiently in areas where parents have more choice in where to send their child to school as compared to districts located in less competitive education markets.

Total per pupil cost estimates were made by Imazeki based on students meeting the performance target of 800 on the state's assessment. These estimates revealed a wide range in per pupil expenditures among districts in the state. This range fell between $5,832 to over $23,800 per student. Despite this range, approximately ninety percent of the 937 districts in the State of California fell between $6,678 and $11,011 per student. Based on this model, legislators would need to allocate over $45 billion for all districts to potentially bring students to the achievement level that has been identified by the researcher.

The researcher also devised pupil weights to determine the additional costs needed to educate students coming from poor families, as well as those needing special education services and support learning how to read and speak English. Imazeki identified impoverished student weights at 1.3, meaning the cost to educate these students would require 30% more resources than a regular student to educate to have the opportunity to meet the 800 proficiency target. Additionally, non-English speaking students would require between 1.08 and 1.24 additional resources, depending on the degree of services required to assist them. Much larger student weights were allocated to students with severe learning disabilities, ranging between 1.13 and 6.68.

Positive and negative aspects of the Statistical Modeling method:

The benefit of this approach is that it directly attempts to quantify the relationship between costs and outcomes by considering a variety of influencing variables, as well as current education expenditure levels (Hanushek, 2007a; Imazeki, 2008; Odden, 2003). This can be very helpful for policymakers and researchers interested in establishing a rational basis for estimating K-12 education budgets. Additionally, this cost analysis method also excels at identifying the differences in funding needed by districts' based on student characteristics (Imazeki & Reschovsky, 2004;

Odden, 2003). However, unlike the Evidence-Based and Professional Judgment methods, it does not provide any insight or recommendations on how best to utilize these resources to service students (Imazeki, 2008). Another potential problem with this model is it assumes that future spending, student and district characteristics as well as academic outcomes will remain constant over time (Imazeki, 2008). This issue of consistency makes the long term viability of this type of analysis less promising. In order to circumvent this problem, new investigations would need to be conducted annually to determine costs. This method is also susceptible to the same pitfalls of any other research design in that it is highly sensitive to the reliability and quality of data available to the researcher. Hence, the more reliable and consistent the data, the less bias and potential for calculation errors will occur (Imazeki, 2008).

Another issue that has been a consistent problem for researchers utilizing the Statistical Modeling approach involves the concept of efficiency in how a district makes use of its available resources. This research design inherently makes the presumption that inefficiency is a random occurrence across districts (Addonizio, 2003b; Duncombe & Yinger, 2011). A further drawback to this approach is its complexity in design and its inability to accurately ascertain which variables or combinations of variables produce a given outcome (Addonizio, 2003b; Imazeki & Reschovsky, 2005; Ochalek, 2008; Odden, 2003; Rebell, 2006). Plaintiffs, legislators and school policymakers have been reluctant to utilize this approach in determining an adequate level of funding (Costrell, Hanushek, & Loeb, 2008). However, the Empirical Observation or Successful School District method has shown some promise when looking for a more practical analysis.

Successful Schools or Empirical Observation Method

Similar to the statistical modeling or cost function approach, this approach is designed to analyze the relationship between student academic achievement and the actual spending of school districts (Addonizio, 2003b; Daniel, 2010; Odden, 2003; Rebell, 2006). This is accomplished by identifying school districts within a particular state which are currently meeting or exceeding state academic performance standards (Addonizio, 2003b, 2004; Hanushek, 2007a; Lefkowits, 2004; Ochalek, 2008; Odden, 2003; Rebell, 2006). Once a pool of districts has been identified, spending on remedial categorical programs are removed from their total expenditures to help establish a base cost of educating the average child (Daniel, 2010; Hanushek, 2007a; Odden, 2003). When doing so, researchers typically exclude extremely high and low spending districts from the selection process (Daniel, 2010; Hanushek, 2007a; Odden, 2003). This helps to eliminate their potential to influence the results of an analysis. An average cost is then calculated from this pool of identified successful schools which is believed to be an adequate level of funding for other schools to produce similar academic achievement levels with their student populations (Hanushek, 2007a). Other costs associated with educating higher need students are estimated and added to the base cost to provide the necessary additional services and programs to accommodate these children (Addonizio, 2003b, 2004; Hanushek, 2007a; Ochalek, 2008; Odden, 2003).

The premise of this approach is that any efficient school district should be able to produce similar student performance outcomes to successful districts if equivalent levels of funding are provided (Addonizio, 2003b, 2004; Rebell, 2006). However, in order to accomplish this, an operational definition of satisfactory student performance must be established by the researcher (Addonizio, 2003b, 2004). Additional criteria are also taken into consideration as the researcher

attempts to identify successful schools such as: pupil/teacher ratios, teacher experience, teacher salary, average school population, district size, etc. (J. Augenblick & Myers, 2001; Rebell, 2006).

The following sections describe two independently directed research analyses employing the Successful Schools method. The first explores the resources needed by urban schools in Michigan to provide an adequate education. The second explores the resources needed to provide all students in the state with an adequate education utilizing the results from the Michigan Merit High School Exam which is given to eleventh grade students annually as a requirement for graduation.

Successful Schools Example: *Michigan Urban Schools*

An investigation of the cost of providing an adequate education using the Successful Schools method was conducted by Addonizio (2003b). He applied this model to Michigan's schools by analyzing 30 of the state's neediest metropolitan districts. Districts targeted for the analysis had greater than 50% of their student populations qualifying for free and reduced meal benefits. They also accounted for approximately 30% of the state's total K-12 student enrollment (Addonizio, 2003b). The purpose of the analysis was to identify a cost that would support specific academic achievement standards (Addonizio, 2003b). These achievement levels were established based on the selection of an exemplary district. An exemplary district was selected based on comparisons made from three criteria: district student achievement on the 1998-1999 MEAP, base district per pupil amounts, and percentage of at risk students.

Two districts were identified by the researcher to serve as exemplary districts which would be used to determine a base cost to provide an adequate education. The two districts selected were Kalamazoo and Ypsilanti public schools. They were selected because of their better than predicted performance on the MEAP in comparison to their high levels of disadvantaged students.

Additionally, their levels of resources utilized to accomplish this task were moderately lower than many of the other districts. This observation characterized both of them to be efficiently using their resources. Kalamazoo was the more efficient district in terms of dollars spent to produce their students' academic outcomes by utilizing $7,948 per pupil. Ypsilanti was higher spending $8,822 per student. Recognizing the need to provide more funds to schools which have higher at-risk populations, Addonizio also developed a formula to raise all districts to the achievement levels of the selected exemplary districts. These added funds would be provided to schools above and beyond their base per pupil amount.

The final estimate produced from the analysis revealed roughly $414,294,646 of additional revenue would need to be earmarked by the state to raise student achievement levels to those attained by students attending Kalamazoo Public Schools. This amount was nearly three times higher if Ypsilanti were selected as the baseline exemplary district, requiring the state to allocate $1,273, 879, 983 more revenue to produce similar results. Kalamazoo proved to be the more efficient of the two identified exemplary districts, spending fewer resources to achieve their student outcomes.

Addonizio demonstrated that the selection of a benchmark district is crucial in estimating adequate funding levels. That is, the more efficient the exemplary district, the lower the level of funding the state would need to allocate for K-12 public education in order to provide an adequate education to its students (Addonizio, 2003a; Daniel, 2010; Ochalek, 2008).

Successful Schools Example: *Michigan High Schools*

Ochalek (2008) makes use of the Successful Schools research method to estimate the cost to adequately fund education for all students attending Michigan's public schools. Her study compared

results of 515 K-12 districts in the State, excluding public school academies, non K-12 districts and districts with less than 100 students. The researcher made use of a number of variables to assist in identifying potential exemplary schools. The dependent variable for her study was 11th grade MEAP English and Math results. The independent variables utilized by the investigator were: district operating expenditures per pupil, district size, district geographic location, class size, highly qualified teachers, economically disadvantaged student population, special education student population, English language learner population, percentage of white students in district, percentage of African-American students in district, and percentage of Hispanic students in district.

Ochalek made use of the successful/exemplary schools definition developed by Augenblick as well as Addonizio's previous research to assist in identifying potential exemplary districts who would serve as a baseline for funding in Michigan (Addonizio, 2003b; Augenblick & Myers, 1997). This definition takes into consideration a district's relative academic performance while also considering the above stated dependent variables along with the efficiency of how they utilize their financial resources to produce their academic results. In addition to selecting an exemplary district, the researcher made use of Addonizio's adequacy grant formula which takes into account the cost of educating students with higher academic needs (Addonizio, 2003b). These additional funds were provided to districts if they provide services to a higher ratio of disadvantaged children than the selected exemplary district.

Ochalek's findings revealed that ten of the selected independent variables were found to be significant in helping to identify an exemplary district. These included: percent of students who are economically disadvantaged, special education students in district, percentage of African-American students in district, class size, highly qualified teachers, district operating expenditures per pupil, and district geographic location. The largest contributing independent variable was economically

disadvantaged. A negative relationship was identified, meaning achievement decreased as each variable increased, with the following independent variables: percent of students who are economically disadvantaged, percentage of African-American students in district, special education students in district and class size. In contrast, a positive relationship was identified between achievement and the following independent variables: current operating expenditures per student, number of highly qualified teachers. Geographic location of a district also had a positive relationship with test scores. Specifically the further away a district was from large cities, the higher was student performance.

Ochalek found that the range in estimated costs to provide an adequate education in Michigan was very broad depending on the exemplary district selected. She identified 9 potential exemplary districts which brought the range in additional revenue from as little as $25.7 million dollars to in excess of $8 billion. This wide range is not surprising because it is highly dependent upon the selection of the exemplary district, which is determined based on the criteria established by the researcher. Hence, if a researcher selects an exemplary district which has higher per pupil expenditures for a given level of student achievement (i.e., a relatively inefficient district), the higher the costs will be to the state. Contrastingly, if an exemplary district is selected that receives similar academic results than a higher spending district, but with lower costs (i.e., a more efficient spending district) the level of resources needed by the state would be less. Efficiency generally is defined as finding the least expensive way to achieve a desired outcome (Hanushek, 2007a). This is primarily why the researcher must be sensitive to the level of efficiency with which an exemplary district utilizes their resources.

Positive and negative aspects of Successful Schools Method:

The strength of the Successful School district approach is its ability to validate a quantifiable base cost to produce desired student outcomes based on past student performance (Rebell, 2006). Additionally, the results and findings of these studies are also appealing to policymakers and the public because expenses and student performance are directly linked (Rebell, 2006). This research method also focuses its attention on the characteristics of districts that have proven to successfully educate their students to meet set state performance expectations (J. Augenblick et al., 2007). It also provides a measurable connection between education costs and academic outcomes (Rebell, 2006).

However, the drawback of this model is its failure to control for variation in student characteristics and backgrounds, resulting in studies that are prone to skewed results (Addonizio, 2003a, 2003b; J. Augenblick & Myers, 2001; Odden, 2003). Similar to Statistical Modeling, results of this method are also highly dependent upon the quality of data available to the researcher (Rebell, 2006). This method is also highly sensitive to the way in which the researcher defines student and district success (Hanushek, 2005; Odden, 2003). Case in point, some schools that perform comparatively well utilizing fewer resources to educate their children can be overlooked by the investigator. Finally, there is no substantiated evidence indicating that schools receiving resources in line with the identified successful schools would be able to produce similar student performance levels (Hanushek, 2005).

Another issue that has been seen as problematic with this research method is the sensitivity involved in the selection of a model or exemplary district to establish a base cost (Addonizio, 2003b, 2004; Hanushek, 2007a; Ochalek, 2008; Odden, 2003). This is the case because the selection of a model district invariably impacts the total level of expenditures needed by a state to subsidize their K-12 public education system (Addonizio, 2003b, 2004; Ochalek, 2008; Odden, 2003). Hence, if a less efficient district is selected (one who utilizes more resources to obtain their results), the costs

will be much higher to a state as compared to a district who obtains their results utilizing fewer funds. Another potential drawback with this research method is districts would receive the same base per pupil level of funding under this model as the identified exemplary benchmark district. The problem with this funding approach is those districts currently receiving higher per pupil expenditures could be reduced to that of the selected exemplary district (Addonizio, 2003a).

The Successful Schools method has also been criticized for not effectively delineating the added costs needed to educate both ELL students as well as those with special needs (Addonizio, 2003a, 2003b; Hanushek, 2005, 2007a; "N.J. Const.," 1947). It fails to meet this objective largely because schools that have been identified as successful at educating their students to prescribed achievement standards are typically wealthy and have very low at risk student populations (Rebell, 2006). To address this problem, researchers utilizing this method often omit the costs associated with educating these high need students from their analysis to help establish a base cost. Once this is established, the researcher later formulates an added cost or weight to address the additional resources needed to educate these types of students (Rebell, 2006). Finally, this research design implicitly tries to forecast future student achievement levels from what is known about the present (Hanushek, 2007a). As a result, this method has difficulty predicting the potential for students to achieve at higher academic standards (Hanushek, 2007a). Hence, there is little evidence demonstrating how their costs will rise in order to improve student academic achievement levels. Rather, districts can only attempt to replicate the achievement levels of the selected exemplary or benchmark district.

Literature Review Summary:

There has been a great deal of contention and debate over the level of resources needed to provide children in the United States with an education. This responsibility has primarily been the states' to address. However, because of social and political pressure surrounding the inequalities that schools with large populations of minorities were operating under, the federal government has increased its role to help address these differences. Their intervention began as a result of the decision rendered in the 1954 landmark Federal court case *Brown v. Board of Education Topeka.* This case helped to begin the long process of seeking methods to ensure equal educational opportunity. It also inspired future litigation seeking to equalize funding disparities between wealthy and poor schools. Furthermore, it prompted the United States government to increase its role in providing additional resources to schools.

One of the first initiatives implemented by the federal government to accomplish this task was the passage of the Elementary and Secondary Education Act of 1965. This legislation helped to provide additional funds to schools for students who come from low income families as well as those who have disabilities. It also marked the beginning of holding schools accountable for the additional resources they have been provided by requiring them to disclose how they have been utilized.

Another outcome that occurred as a result of the *Brown* decision was an increased interest in understanding the reasons why differences in educational opportunity exist. One of the most influential of these research investigations was the 1966 Coleman Report. One of the many findings of this report revealed that the level of resources utilized in providing an education for a child has much less influence over their academic achievement than does their socioeconomic status. This conclusion became one of the central arguments employed by researchers suggesting that money did not matter in education. Despite this declaration, equity in funding became a central issue for litigation which intended to argue otherwise.

Early court cases involving concerns over the distribution of educational resources during the 1960's and 1970's were brought to trial in both federal and state courts. The arguments presented in these cases cited inequities in student educational opportunities because of the way states funded their schools. During this period, the vast majority of resources raised for public education were obtained from local property taxes. This type of funding system became increasingly unpopular, as schools located in property poor areas had fewer resources available to provide educational services and programs as compared to more affluent neighborhoods. This inequity prompted plaintiffs living in property poor areas to bring their arguments to court. However, the vast majority of these cases were unsuccessful in proving their state's funding systems to be unconstitutional ("Burruss v. Wilkerson ", 1969; "McInnis v. Shapiro," 1968). This was largely because there was no standard by which the courts could measure a state's ability in meeting the academic needs of students based on the funds used to provide them. Despite these setbacks, other strategies were being devised by litigants during this period seeking to address inequity in school funding. However, these strategies would not be tested again under federal law because of the decision handed down in 1973 by the United States Supreme Court in *Rodriguez v. San Antonio Independent School District*. The majority decision proclaimed that education was not a fundamental right protected under the United States Constitution. This abruptly ended the federal courts' role in future school finance litigation. However, new strategies employed by plaintiffs seeking to equalize funding disparities between poor and wealthy districts were brought to trial in state courts.

The landmark State of California school finance court case of *Serrano v. Priest* was the first to successfully argue their position in state court. Unlike previous cases, the legal team representing the plaintiffs in *Serrano* avoided focusing their arguments on linking educational resources to student need. Rather they attempted to confirm that education was a fundamental right protected

under the state's constitution. They accomplished this by providing the court with a manageable standard it could use to measure equity in funding between districts. The premise behind this standard, which became known as the "fiscal neutrality principal", maintained that the quality of a child's education should not be based on where they live and go to school, but rather on the wealth of the state as a whole (Addonizio, 2003b; Coons et al., 1970; Minorini & Sugarman, 1999b). The California Supreme Court rendered its verdict on behalf of the plaintiffs in *Serrano,* citing education was a fundamental right based on the equal protection language found under its constitution. The success of this case led to a litany of other state school finance litigation seeking to equalize the distribution of educational resources between poor and wealthy districts. Many of these cases occurring between 1973-1983 were successful in utilizing the wealth discrimination strategies established by the Coons team in *Serrano* (Minorini & Sugarman, 1999a). However, court proceedings involving equity in funding began to slow down, as no significant litigation took place until 1989. By this time, new strategies were being employed by legal teams interested in shifting emphasis from issues of equity to issues surrounding the concept of educational adequacy. The verdict handed down in Kentucky's *Rose v. Council for Better Education,* which resulted in the complete overhaul of the State of Kentucky's public education system, marked the starting point in what many to believe to be the "adequacy movement" (Minorini & Sugarman, 1999a, p. 175).

The legal arguments presented in the *Rose* case and those that followed during the third wave of school finance litigation (1989-present) centered their arguments on issues of adequacy. In particular, they attempted to get states to provide children with a high minimum quality education (Minorini & Sugarman, 1999a). However, in order to provide this, it would be necessary for funding systems to consider educational differences in students and their costs (Minorini & Sugarman, 1999a). This emphasis is a recognizable change from theories surrounding previous equity cases

which were primarily interested in equalizing educational resources (Minorini & Sugarman, 1999a). Additionally, adequacy cases focused much of their attention on the outcomes that are a result of a child's educational experiences as well as the costs necessary in providing them (Minorini & Sugarman, 1999a).

During the post *Rose* era, litigation involving claims of educational inadequacy spread rapidly and occurred in 45 of 50 states (Hanushek, 2009; Minorini & Sugarman, 1999a). Of these cases, plaintiffs triumphed in two-thirds of them (Hanushek, 2009). The success of plaintiffs coincided with the standards-based education reform movement emphasizing student academic outcomes, a movement that immediately followed the 1989 National Education Summit and states' adoption of education achievement goals (Rebell, 2008).

In recent years, additional government policies aimed at improving student achievement have been initiated. One of the most far reaching of these to have a dramatic impact on public education is the Federal No Child Left Behind Act of 2001. This act, whose purpose is to hold schools accountable for student performance, tied Federal Title I monies, funds used to provide additional support for at risk learners, to academic achievement. The provisions of this act require states to test all third through eighth grade students in both math and reading annually as well as ninth through eleventh graders once. Additionally, it requires schools to work toward reaching 100% proficiency in both the aforementioned curricular areas by the year 2014. It is primarily because of these federal mandates that it is imperative to identify an adequate level of funding necessary to accomplish this goal. Although there has been some effort by legislators in recent years to close the funding equity gap, the difference in available resources between wealthy and poor districts remains substantial. To address this issue, methods have been devised by researchers to estimate the costs of providing an adequate education. These methods include: Professional Judgment, Evidence-Based,

Statistical Modeling or Cost Function, and Empirical Observation or Successful Schools Methods. Each of these methods has their own unique way of calculating the costs of providing an adequate education to meet or address specified academic outcomes.

The challenge today for state and federal legislators is to develop fiscally adequate education funding systems which reinforce student achievement expectations. Strong arguments have been made in both support and opposition to the methods employed by investigators to calculate adequate education costs. Those in support agree that more refinement of these research techniques must be made in order to improve their accuracy and validity in the estimates they provide. However, despite the shortfalls of these studies, they do provide a rational basis for the costs they report which are both practical and transparent. This is in sharp contrast to the opaque political process that has been utilized by both federal and state legislators. Additionally, as methods are refined and improved, they will provide more accurate data for policymakers to assist them in making better and more informed decisions. This process can only help lead policymakers to build a more modern education funding system which supports expected student achievement levels.

CHAPTER 3

RESEARCH METHODOLOGY

The Successful Schools method was utilized in this study to estimate the cost of an adequate education for students attending Michigan's public schools and public school academies. This non-experimental research design was employed because it provides impartiality in how findings are obtained, since variables cannot be influenced to skew results. Another reason why this methodology was employed is because it has been utilized in numerous other costing out studies which have provided plausible evidence to state policymakers of the costs needed in providing adequate public education services and programs to students (J. Augenblick et al., 2007; Ochalek, 2008).

Although this research methodology has been criticized for its limitation on predicting the costs of future student achievement, it is still the most promising and practical of the four methods developed by researchers seeking to meet desired levels of student proficiency. It does so by analyzing current levels of student performance based on the resources used to obtain them. Additionally, these data will help serve to provide valuable insight into the level of funding needed by schools to achieve at expected student performance standards.

This production function research design was developed to analyze the relationship between a dependent variable, the composite score of two outcome variables, percentage of district students scoring proficient on the State of Michigan fifth grade math and reading portions of the MEAP, and a set of selected independent variables which include: district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation

allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location (SELP, NELP, SWLP,NWLP, & UP), for-profit charter, non-profit charter. The unit of measurement for both the dependent and independent variables was established at the district level.

A weighted least squares (WLS) multivariate regression analysis was conducted to obtain the results and findings for this study. It was used to estimate the relationships between the dependent and independent variables to provide assistance in answering the three research questions posed in this study. The successful schools method has been employed by investigators interested in seeking clarification and answers to complex problems involving a variety of independent variables which could have a potential influence on a given outcome or observation (Hair, Black, Babin, & Anderson, 2009).

Because of the vast number of independent variables that have the potential to influence student achievement levels, those included for this study were based on those incorporated by researchers who have conducted similar production function studies in the past (Addonizio, 2003b; J. Augenblick et al., 2007; Greenwald et al., 1996b; Imazeki, 2008; Ochalek, 2008; Wise, 1968). Additionally, these variables were selected because their values could be quantified, unlike other unobserved variables such as curriculum, scheduling, teacher professional development and training, selected teaching strategies and classroom management techniques, which are more difficult to calculate, measure and assign a value to (Hair et al., 2009). Furthermore, since the reliability of results obtained from any research analysis are highly dependent upon the trustworthiness of the data sources used to produce them, this analysis made use of data obtained from official State of Michigan school data archives.

Finally, because it has been well documented that additional funds are essential to provide supplemental services and programs to assist students having special learning problems, language barriers and socioeconomic limitations, additional monies were calculated to meet these additional financial needs (Addonizio, 2003a; Coleman & et al., 1966; Coons et al., 1970; Ochalek, 2008; Wise, 1968; Wise & Gendler, 1989). The process that was used to estimate these supplemental funds, which are above and beyond a district's minimum per pupil foundation allowance provided by the State, is presented in more detail later in this chapter. It was the intent of this study to estimate the added educational costs for all public schools and public school academies included in this analysis.

Sample

Presently, there are approximately 1.5 million students attending over 827 public school districts and academies in the State of Michigan (Michigan Department of Education, 2013; Michigan School Data, 2012). Of these public school districts and academies, approximately 400 receive the minimum State per pupil foundation allowance of $6,966, with the remaining receiving higher levels of revenue (Wicksall & Wolf, 2012). Furthermore, 72% of the state's total student population attend schools which receive the foundation minimum (Wicksall & Wolf, 2012). The list of public school districts and public school academies included in this study was obtained from the Michigan Department of Education.

In order to calculate the cost of an adequate education in Michigan, districts proven to be successful in educating their students was essential to identify in order to determine an adequate funding level for the State. For the purposes of this study, districts and public school academies with not less than 500 students attending were included for this investigation. Hence, those districts with fewer than 500 students were excluded. Furthermore, because this research design was focused on obtaining more insight on the costs needed to provide an adequate education for Michigan's public schools and public school academies, both parochial and private education systems were excluded from consideration.

Methodology

In order to delineate the costs required to provide an adequate education, an academic standard students are required to perform at was needed. This process, which was a critical aspect of this analysis, dramatically affected the final recommendation of expenditures needed to meet the adequacy goal recommended by the researcher for the state (Rebell, 2006). Districts identified as exemplary, those efficiently educating their students to exceed predicted student performance levels, were selected based on the percentage of their students who have successfully attained proficiency on the fifth grade math and reading portions of the MEAP. The criteria used to measure this standard was based on 2012 State of Michigan MEAP proficiency cut scores established by the by State Board of Education.

School districts considered exemplary for this analysis were determined based on the regression model's residual results controlling for independent variables noted in equation 3.1 below. Public school districts and academies showing positive residuals of two or more standard deviations above their predicted levels of student achievement on the fifth grade math and reading sections of the MEAP were identified to be exemplary districts.

The following regression equation will be utilized to predict district student achievement levels:

(3.1)

$$Y = a + b_1DSIZE + b_2GEOLOC + b_3CLSIZE + b_4ECDISPCT + b_5ELL\% + b_6SPEDPCT + b_7WHITEPCT + b_8AFRAMPCT + b_9HISPPCT + b_{10}PPFA + b_{11}CH + b_{12}AVGTSAL + b_{13}HIQUAL + E$$

Where:

a = Constant

E = Error Term

Y = District Achievement: Composite of the percentage of district students scoring proficient on State of Michigan fifth grade math and reading MEAP test. This variable was calculated based on the average total number of students scoring proficient on the fifth grade math and reading portions of the MEAP. It is important to note the data obtained for this variable was acquired from the State of Michigan's Department of Education (MDE). At the time this study was conducted, preliminary MEAP data was made available prior to it being released to the public. Hence, the calculation of composite MEAP test scores for each district may not reflect the official data provided to the public by the MDE which was made available in September of 2013. Regardless, the data obtained for this analysis was the most accurate available and likely reflects the student achievement trends of the districts included in this investigation.

DSIZE = District Size: This variable included the average full time equivalent, FTE, students attending a given public school district or academy.

GEOLOC = Geographic Location: Because it was necessary to assign a value to all independent variables in a regression equation, a set of dummy variables was used to designate the geographic location of each district included in this study. The researcher divided the state into five areas to delineate where each district was located in proximity to one another for comparison. The omitted category selected for this analysis was the Southeast Lower Peninsula. The following numerical assignments were given to each districts' locale:

Southwest Lower Pensula (SWLP)= 1 if district in region, otherwise equals zero
Northeast Lower Peninsula (NELP)= 1 if district in region, otherwise equals zero
Northwest Lower Peninsula (NWLP)= 1 if district in region, otherwise equals zero

Upper Peninsula (UP)= 1 if district in region, otherwise equals zero
Southeast Lower Peninsula (SELP)= omitted category

CLSIZE = Class Size: This variable was determined based on the total number of students attending a public school district or academy divided by the total number of classroom teachers employed by a district or academy.

$$\text{Class Size} = \frac{\text{Total Enrollment (FTE)}}{\text{Total number of classroom teachers}}$$

ECDISPCT = Economically Disadvantaged. This variable represented students coming from low socioeconomic backgrounds, which has proven to be a strong predictor of student success in schools. It was calculated based on the total number of district students eligible to receive Federal free and reduced meal benefits divided by a district's total student enrollment. This percentage served as a measure for a district's proportion of students who were academically at risk to fail due to low socioeconomic status (SES).

ELL% = English Language Learners: This variable included the percentage of students who are not proficient in English based on State of Michigan's criteria. It was calculated based on the total number of students qualifying for ELL services divided by each district's total student enrollment. This percentage served as a measure for a district's proportion of students who were at risk academically because of limited English speaking skills.

SPEDPCT= Special Education: This variable included the percentage of district students who receive educational support services and programs through both State and Federal special education funds. This variable was calculated based on a district's total number of students who have qualifying Individual Education Plans (IEP) as prescribed under

provisions of the Elementary Secondary Education Act of 1965 divided by a district's total student enrollment.

WHITEPCT = Percentage of Caucasian students within a district.

AFRAMPCT = Percentage of African-American students within a district.

HISPPCT = Percentage of Hispanic students within a district.

PPFA = Current district operating expenditures per pupil based on State of Michigan foundation allowance.

HIQUAL = Highly Qualified Teachers. This variable included the total percentage of teachers categorized as highly qualified by the State of Michigan based on requirements Established under the No Child Left Behind Act of 2001 (i.e. teacher certification and bachelor's degree).

CH= For profit or non-profit public school academies receiving state funding with not less than 500 students. As was done with the variable categorizing a district's geographic location, a set of dummy variables was developed to distinguish between non-profit and for-profit charter schools. Non-profit charters were identified as having non-profit education service providers (ESP) licensed by the State of Michigan's Department of Licensing and Regulatory Affairs (LARA). Additionally, charters which were identified as self-regulated education authorities were also categorized as non-profit entities for the purposes of this analysis. Conversely, for-profit charters were identified as having for profit education service providers (ESP) licensed by the State of Michigan's Department of Licensing and Regulatory Affairs (LARA). These entities included domestic, foreign and limited liability companies. Traditional public schools, those schools that have provided educational services for the local community prior to the inception of charter and public school academies, was the omitted category.

NPCH = 1 if case is a non-profit charter school, otherwise equals zero
FPCH = 1 if case is a for profit charter school, otherwise equals zero
TPS = traditional public school is omitted category

AVGTSAL= Average teacher salary in a district. The data obtained for this variable was acquired from Bulletin 1011 from the 2011-2012 Michigan Department of Education school financial database archive. It is important to note that not all average teacher salary data was available for each district in the bulletin. Particularly, no average teacher salary data was documented for the majority of charter school districts. It is because of this reason, these districts will not be considered in the selection of an exemplary district, as this data is essential in helping estimate the costs of providing an adequate education for Michigan's students.

The multiple regression model was estimated by the method of weighted least squares (WLS), with each case (district) weighted by the square root of its total enrollment. This statistical technique was an appropriate step to take because it was suspected the variance of the error term would not be the same for all observations, thus violating the assumption of homoskedasticity within the model. The potential for violating this assumption is often an issue when aggregate data is used, such as district level education statistics. Because this analysis exclusively employed this type of data, where the dependent variable is a mean value for the subjects in the observational unit, observations obtained from larger units (e.g. larger school districts) were presumed to provide more reliable output. Hence, the observations made from larger units or districts, in theory, were believed to provide more accurate results than data drawn from smaller districts having fewer students. For further discussion of heteroskedasticity see Eric Hanushek and John Jackson, Statistical Methods for Social Scientists, (San Diego, CA: Academic Press, 1977), 142-153.

After the WLS multiple regression model was estimated, three districts were selected as model exemplary districts. Each of these districts served in providing an estimation of the added costs needed to fund Michigan's schools adequately, resulting in each district receiving the same per pupil funding as the selected model exemplary districts, adjusting for differences in educational costs and needs. This calculation provided a feasible base cost needed by the State to plan and budget for K-12 public education dependent upon total student proficiency levels. However, as noted, it was necessary to also calculate the additional costs needed to provide supplemental educational support for students coming from challenging socioeconomic circumstances, which has been shown to be strongly associated with poor academic success (Addonizio, 2003b; Coleman & et al., 1966). The intent behind this process is to provide districts with the resources necessary to enable their student populations to achieve at similar standards to those identified model exemplary districts (Addonizio, 2003b). This was accomplished through the use of an adequacy grant formula which was developed and utilized in previous research (Addonizio, 2003b; Ochalek, 2008).

For the purposes of this analysis, each school district had their own proposed adequacy grant applied to them. The amount of grant dollars available to a district (i) was determined based on the characteristics of the selected exemplary district (j). This was calculated by comparing the ratio of a non-exemplary district's proportion of economically disadvantaged children to the ratio of the selected exemplary district and the district's cost index. The difference between the calculated adjusted revenue and actual total revenue of a non-exemplary district became the maximum number of adequacy grant dollars they would receive. Districts obtaining a positive dollar grant would receive per pupil revenue equal to that of the exemplary district. They will also receive additional funds based on the district's adjusted ratio of economically disadvantaged students and the cost of local educational resources (Addonizio, 2003b; Ochalek, 2008). Districts that are reported as having

a negative dollar grant total will be awarded a grant of zero. That is, no district would sustain a reduction in operating revenue below what they currently are being appropriated.

Below is the formula that was used in calculating each district's adequacy grant based on the selected exemplary district:

$G_{ij} = \text{Max}\ [(AR_{ij} - TR_i, \varnothing]$

Where:

G_{ij} = per pupil grant to district i based on exemplary district j

AR_{ij} = estimated target, or adjusted revenue per pupil in district $_i$ based on selected exemplary model district j = TR j * (ECDISPCT i/ECDISPCT j) * (C i/C j)

TR_i = Total district operating revenue per pupil in district i coming from all sources of income (i.e. State foundation allowances, Federal Title I, State of Michigan Section 31A, etc.)

TR_j = total revenue per pupil in selected exemplary model district j

$ECDISPCT_i$ = percent of students in district i eligible for Federal free & reduced lunch

$ECDISPCT_j$ = percent of students in exemplary district j eligible for Federal free & reduced lunch

C_i = Cost index of district i

$$C_i = \frac{\text{Average salary district i}}{\text{Predicted average salary of district i}}$$

C_j = Cost index of selected exemplary district j

Because it is recognized there are variances in educational costs across the state, a cost index for each school district (C_i) was determined based on inter-district salary differences between teachers with similar credentials and qualities following the method utilized in Addonizio's urban schools adequacy research (Addonizio, 2003b). This process helped to delineate the differences between actual and predicted teacher compensation and served as a representation for education costs in each

district (Addonizio, 2003b; Ochalek, 2008). It is important to note the vast majority, roughly 90%, of for-profit and non-profit charters included in this study had no documented teacher salary data available in State of Michigan school finance databases. Because this statistic is a key element in the formula used to calculate an adequate funding level for Michigan's students, charter schools were excluded from this portion of the investigation. As a result, traditional public school districts were used to calculate the average predicted instructional salaries of each district.

$$AVGTSAL = b_0 + b_1ADVDEGREE + b_2AVGYRS$$

Where:

AVGTSAL = Average teacher instructional salary in a district.

ADVDEGREE= Total percentage of teaching staff in a district holding an advanced degree beyond a bachelors.

AVGYRS = Average years of total teacher service in a district. This variable was calculated based on the total number of combined years of service of all teaching staff in a district divided by its total teacher employees. The data obtained for this variable was obtained from the 2011-2012 State of Michigan CEPI database documenting teacher longevity. To obtain this variable it was necessary to calculate the total number of combined teacher years of service of all teaching staff within a district. The longevity data provided by CEPI included 14 individual categories documenting the number of years each teacher could be classified to have experience. These included: >1 year, 1 year, 2 years, 3 years, four years, 5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, 26-30 years, 31-35 years, 36-40 years, and >40 years. In an attempt to quantify those teachers grouped in multi-year categories, averages were calculated and assigned in place of their original descriptions. Hence, the 6-10 year category was averaged to 8

years, 11-15 year category was averaged to 13 years, etc. The total number of teachers in each longevity category was then multiplied by each category's years of service. This provided the total years of service for all teaching staff in a district. This statistic was then divided by the total number of teaching staff within a district to obtain average teacher years of experience.

Data Collection Procedures

All school district data came from administrative data files which are readily available online from the Michigan Department of Education and from the Center for Educational Performance and Information (CEPI). The data sets created by the Michigan Department of Education and CEPI are available to the public. They represent the most current public school data that are available regarding Michigan's public schools and their academic levels of achievement. All the information collected for this study was entered manually into a data file for further analysis and testing using IBM SPSS for Windows v. 21. The dependent variable for this study is a composite of district fifth grade math and reading MEAP scores. Furthermore, the independent variables used for this study include: district per pupil foundation allowance, total district student enrollment, district geographic location (set of dummy variables), district average class size, district average teacher salary, student socioeconomic status (percentage of students who qualify for free and reduced meal benefits), student ethnicity, percentage of student population qualifying for special education services, and percentage of English as a secondary language learners**.** All statistically significant findings were based on an alpha level of .05 which reveals a 95 percent probability that a given result is not due to chance.

Table I. STATISTICAL MATRIX

Research Question(s)	Variables	Data Collection Instrument	Data Analysis Technique
1. What variables (district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location (SELP, NELP, SWLP,NWLP, & UP), for-profit charter, non-profit charter) best predict district academic proficiency on the fifth grade math and reading sections of the MEAP	**WLS Regression Dependent Variable**: Fall 2013 MEAP (fifth grade math & reading composite Score) **WLS Regression Independent Variables:** district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location (SELP, NELP, SWLP,NWLP, & UP), for-profit charter, non-profit charter **Adequacy Grant OL Regression Dependent Variable**: district average teacher salary	Figures utilized for this question will be obtained from pre-existing data sets available from the Michigan Department of Education.	A multivariate regression Analysis will be used to determine which independent variables best predict district academic proficiency on the fifth grade MEAP (math & reading). Dummy coding will be applied to selected independent variables, as noted above.

	<u>Adequacy Grant OL Regression Independent Variables</u>: district average teacher years of service, district percentage teacher's holding advanced degrees beyond a bachelors		
1. Which are Michigan's exemplary districts?		The data collection instrument used for this question will be the same instrument used to answer question 1.	Analysis of residuals from the multivariate regression model described above will be used to report findings relating to this question.
2. What are "adequate" per pupil funding levels for school districts, conditional on educational costs and needs?		The data collection instrument used for this question will be the same instrument used to answer question 1	A sensitivity analysis will be done to determine how the State's costs will vary based on the selection of an exemplary district.

CHAPTER 4

RESULTS

The criteria used to select districts to be included in this analysis were public schools and public school academies with not less than 500 total students attending. Of the approximately 850 public school districts and public school academies who receive state funding, 551 were identified to have met this criterion. Those districts with less than 500 students and not having elementary schools were excluded from the analysis. Relationships were analyzed between the dependent variable, composite fifth grade math and reading MEAP test scores, and several independent variables (district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location, for-profit charter, non-profit charter). In an attempt to avoid giving smaller districts undue weight or influence over the results of this investigation a weighed least squares, WLS, multiple regression analysis was conducted using the square root of each district's total FTE student enrollment. This was done to address the potential concern for violating the assumption of homoscedasticity. Furthermore, the assumptions of normality, linearity, and collinearity were tested and met to support the reliability of the results obtained in this investigation. A summary of the WLS multiple regression's descriptive statistics can be viewed on Table II listed below.

Table II. *WLS Independent Variable Descriptive Statistics*

Descriptive Statistics: Independent Variables

	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
CLSIZE	18.33	9.30	27.63	16.7399	2.25299	.225	2.302
DSIZE	65629	503	66132	2683.11	4055.436	8.390	113.165
AFRAMPCT	100%	0%	100%	16%	.281445	2.044	2.895
HISPPCT	92%	0%	92%	6%	.094330	4.522	27.098
ECDISPCT	94%	7%	100%	46%	.207992	.456	-.302
PPFA	$5,008	$6,846	$11,854	$7,115	595.710	4.231	23.166
SPEDPCTG	26.000	2.4%	28%	12%	3.470	.416	1.355
ELL%	8%	0%	8%	4%	.007103	5.155	35.187
AVGT SAL	65035.00	20690.00	85725.000	58181.41420	8156.196497	-.200	2.505

The dependent variable, composite fifth grade math and reading portions of the State of Michigan's criterion referenced MEAP test, was calculated by averaging the sum of each district's total student performance levels on each assessment. The mean for all 551 districts included in this study was 57.46%. The range of student achievement between districts was extreme with the lowest posting a composite score of just 8.35% with the highest achieving at 91.4%. Of the bottom 100 districts having the lowest composite MEAP test scores, 43 were charters 7 of which were non-profit with the remaining being for-profit. It is important to note that of the bottom 100 performing districts, 90 had economically disadvantaged student populations of 49% or more. Additionally, 53 of the bottom 100 performing districts had African American student populations of 50% or higher. Of the bottom 50 districts having the lowest composite MEAP test scores, 28 were charters with 6 of them being non-profit and the remaining for-profit. Of the top 100 performing districts having the highest composite MEAP test scores, 9 were for profit-charters with the remaining being traditional public schools. Furthermore, 6 of the top performing 100 districts had economically disadvantaged

student enrollments of 50% or more. Additionally, 1 of the top 100 performing districts had an African American student population of 27% or less, as the remaining had 17% or less. Of the top 50 performing districts, 5 were for-profit charters with the remaining being traditional public schools. It is also important to note, 230 districts out of the 551 included in this study scored 60% or higher on their composite MEAP test score. Moreover, 79 districts out of the 551 included in this study had a composite MEAP test score of 70% or higher.

District size (DSIZE) was calculated based on each district's total fall 2011-12 full time equivalent (FTE) student head count data. The mean district size for all 551 cases included in the study was 4,608 students, with district populations ranging from a minimum of 503 to over 66,000 students. Additionally, the independent variable of class size (CLSIZE) was also utilized in this analysis which was based on a district's total student enrollment divided by their total number of qualified teachers. The mean class size for all districts was approximately 17 students. The minimum class size was 9, with a maximum of approximately 28 students.

Student ethnicity percentages for African American (AFRAMPCT), White (WHITEPCT) and Hispanic (HISPPCT) ethnicities were included in the analysis to better understand the demographic differences between selected districts. The African American student population mean for all districts was 16%. District ranges for this variable varied the most among the ethnicity predictor variables having student FTE counts of zero to 100%. White student demographic data also showed great variance in their population sizes. The total mean for all district enrollments was 73%, with a maximum range of approximately 99% to a minimum of zero. Finally, Hispanic student populations ranged between zero to nearly 92% of a district's total enrollment. The mean for all districts was roughly 6%.

The percentage of economically disadvantaged students (ECDISPCT) attending a given school district was determined based on the total number of students qualifying for Federal free and reduced meal benefits. The mean percentage for all districts was approximately 45%. However, the range of students who qualify for these services varied extensively from one district to another, with a minimum of 7% and a maximum of 100%. Furthermore, of the 551 districts included in this investigation, 220 have economically disadvantaged populations of 49% or higher.

The mean per pupil foundation allowance (PPFA) for all 551 districts included in this analysis was $7,115. However, the amount of resources provided to each child varied broadly between districts, ranging from a minimum of $6,966 to a maximum of $11,854.

The Special Education (SPEDPCTG) student population variable, which was determined based on the total number of students qualifying for Federal Title I and State Section 31A funding, had a mean percentage of approximately 12% and a range between 2% and 28%. Subsequently, the mean percentage for the predictor variable English Language Learner (ELL%) was 4%, having a range of zero to almost 8% Finally, average teacher salary (AVGT SAL) for all districts participating in this analysis was $58,181, with a minimum range of $20,690 to a maximum of $85,725.

For the independent variable of Geographic Location (GEOLOC) and Charter Schools (CH) a set of dummy variables was devised to disaggregate output specific to various regions within the state. This was done by placing districts into one of 5 geographic locations. These geographic locations were created based on the county boundaries established by the State of Michigan's Department of Natural Resources(Michigan Historical Museum, 2013). These include: Southeast Lower Peninsula (SELP), Northeast Lower Peninsula (NELP), Southwest Lower Peninsula (SWLP), Northwest Lower Peninsula (NWLP), and Upper Peninsula (UP). The number of districts included

in this study coming from each geographic location is documented on Table III. The region having the fewest number of school districts identified for this investigation was the UP, having only 28 participating districts. The next region with the fewest participating districts was NELP with 58. The geographic location having the most districts included in this study was SELP which had 268 districts meeting the minimum 500 total student enrollment threshold. This category was also selected to be the omitted category for this.

Table III. *Geographic Location Frequencies*

Descriptive Statistics: Geographic Location (GEOLOC)

	Frequency	Percent	Valid Percent	Cumulative Percent
SELP	268	48.6	48.6	48.6
NELP	58	10.5	10.5	59.2
SWLP	135	24.5	24.5	83.7
NWLP	62	11.3	11.3	94.9
UP	28	5.1	5.1	100.0
Total	551	100.0	100.0	

The final variable included in this study involved categorizing charter schools as either for profit (FPCH) or non-profit (NPCH) business entities. This was necessary to ascertain the differences, if any, of how well each district educated their students to meet their predicted performance level of composite fifth grade math and reading MEAP test scores. This was accomplished by first obtaining the Education Service Provider's (ESP) names, organizations who oversee the educational services and programs of charter public school districts, from their issuing charter authorizers. Each ESP's name was investigated on the State of Michigan's Department of

Licensing and Regulatory Affairs (LARA) database to determine whether a chartering agency is a for profit or non-profit business entity (Department for Liscensing and Regulatory Affairs, 2013). A set of dummy variables was created to classify each category and the frequencies of each can be viewed in Table IV. Of the 87 public school charters included in this study, 76 were categorized as for profit business entities. The omitted category, traditional public schools (TPS), had 464 districts included in the investigation.

Table IV. *For-profit & Non-profit Charter School Frequencies*

Descriptive Statistics: For-profit (FPCH), Non-profit (NPCH) & Traditional public school (TPS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TPS	464	84.2	84.2	84.2
	FPCH	76	13.8	13.8	98.0
	NPCH	11	2.0	2.0	100.0
	Total	551	100.0	100.0	

The WLS multiple regression model was estimated to address the first of three questions posed in this research design: *What variables (district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location, for-profit charter, non-profit charter) best predict district academic proficiency on the fifth grade math and reading sections of the MEAP?*

The following regression equation was estimated to answer this question:

$$Y = a + b_1DSIZE + b_2GEOLOC + b_3CLSIZE + b_4ECDISPCT + b_5ELL\% + b_6SPEDPCT + b_7WHITEPCT + b_8AFRAMPCT + b_9HISPPCT + b_{10}PPFA + b_{11}CH + b_{12}AVGTSAL + b_{13}HIQUAL + E$$

Where:

Y = Composite score of district students scoring proficiently on State of Michigan Fifth Grade Math and Reading MEAP test.

DSIZE = Total number of full time equivalent, FTE, students in a district

GEOLOC = Dummy variables were utilized to categorize the following geographic locations of each district: Southwest Lower Peninsula (SWLP), Northeast Lower Peninsula (NELP), Northwest Lower Peninsula (NWLP), Upper Peninsula (UP), with the omitted category being Southeast Lower Peninsula (SELP)

CLSIZE = Total students attending a public school district or academy divided by district total number teachers.

ECDISPCT = Percent students qualifying for federal free and reduced meal benefits.

ELL% = Percent students not proficient in English receiving educational support services.

SPEDPCT= Percent students qualifying for State and Federal special education support services.

WHITEPCT = Percent Caucasian students.

AFRAMPCT = Percent African-American students.

HISPPCT = Percent Hispanic students.

PPFA = Current district operating expenditures per pupil.

CH= Dummy variables were used to identify non-profit, NPCH, and for-profit, FPCH, public charter schools with the omitted category being traditional public schools, TPS.

AVGTSAL= Total teacher expenditures, excluding insurance costs, divided by the total teachers.

HIQUAL= Total percent district highly qualified teachers.

The results of this estimation reveal that the WLS multiple regression model was a good fit for the dependent and independent variables. This is evident based on the regression's $\boldsymbol{R^2}$ value of .754. Finally, the residuals obtained from the investigation were independent of errors, as verified by a Durbin-Watson statistic of 2.031 (the closer this test is to 2 the less likely the potential for correlations occurring between residuals).

It is important to note the results of the analysis revealed a multicollinearity problem between the independent variables of WHITEPCT and AFRAMPCT. This was made evident based on the Pearson Correlation Coefficient value of -.922 which is higher than the acceptable statistical threshold of .7. The concern was further reinforced as both variables posted lower than acceptable Tolerance values of .038 (To satisfy this test, each variable should not post a value of less than .l). This issue is consistent with findings obtained from other researchers utilizing WLS multiple regression and similar school data sets (Ochalek, 2008). A common method employed by researchers to address this type of concern is to drop one of the confounding or offending variables from the analysis. After careful consideration, the researcher excluded the independent variable of WHITEPCT to address this concern. This decision was made because of the consistent research that has been done revealing the many academic challenges faced by African American students.

The regression findings, which are summarized in Table V, reveal that district size (DSIZE), geographic location (specifically: UP, NELP, & SWLP), percent African American (AFRAMPCT),

percent Hispanic (HISPPCT), percent economically disadvantaged (ECDISPCT), percent special education (SPEDPCTG), per-pupil foundation allowance (PPFA) were all statistically significant in predicting Fifth Grade composite Math and Reading MEAP test scores, having an ANOVA F ratio of $F(16, 534)=2500.35$, $p<.05$.

Table V. *WLS Regression Coefficient Table*

Coefficients[a,b]

	B	Std. Error	Beta	t	Sig.
(Constant)	91.776	8.677		10.577	.000
DSIZE	.000	.000	.059	2.318	.021
AFRAMPCT	-31.343	6.065	-.566	-5.168	.000
HISPPCT	-15.235	7.611	-.094	-2.002	.046
ECDISPCT	-45.067	2.735	-.644	-16.479	.000
CLSIZE	-.135	.177	-.020	-.761	.447
PPFA	.002	.001	.076	2.756	.006
SPEDPCTG	-.574	.118	-.131	-4.882	.000
ELL%	-96.301	71.561	-.044	-1.346	.179
For Profit	1.004	1.495	.019	.671	.502
Non Profit	1.729	3.122	.013	.554	.580
AVGT SAL	1.984E-005	.000	.011	.422	.673
HIQUAL	.004	.007	.044	.568	.570
NELP	4.432	1.260	.086	3.519	.000
SWLP	2.104	.884	.062	2.382	.018
NWLP	2.314	1.260	.046	1.837	.067
UP	-4.689	1.885	-.060	-2.488	.013

a. Dependent Variable: COMP

b. Weighted by SQTOTSTU

c. Adj. R^2=.754

Several correlations were identified based on the WLS multiple regression's independent variable beta values. This statistical value describes the total number of standard deviations the dependent variable will change as a result of one standard deviation increase or decrease in a given independent variable (Ochalek, 2008). The statistically significant independent variables having a

negative correlation with Fifth Grade Composite MEAP Reading and Math test scores include: percentage African American, percentage Hispanic, percentage economically disadvantaged, percentage special education, and districts located in the Upper Peninsula. The statistically significant variables showing the largest negative influence over student academic achievement include: percentage economically disadvantaged, percentage African American, percentage Hispanic and percentage special education. Therefore, the data obtained from this analysis suggests districts with high concentrations of economically disadvantaged, African American, Hispanic and Special Education students are less likely to perform proficiently on the MEAP. Evidence also suggests this to be the case for students attending districts located in the Upper Peninsula of the State.

Standardized beta values also revealed several positive correlations related to district composite MEAP test scores. The statistically significant independent variables showing a positive relationship include: district size, per pupil foundation allowance, districts located in Northeast, and Southwest Lower Peninsula, as well as per pupil foundation allowance. Of those variables, per pupil foundation allowance and districts located in the Northeast and Southwest Lower Peninsula had the the largest positive correlations. The data suggests students attending districts located in the Northeast and Southwest portions of the State with higher per pupil funding levels are more likely to perform better on the State of Michigan MEAP.

The residuals obtained from the WLS multiple regression were also utilized to answer the second question posed in this study, *Which are Michigan's exemplary districts*? The benchmark used to identify exemplary districts in this analysis was based on the researcher's definition. This definition involved comparing each district's actual composite fifth grade math and reading MEAP test scores to their predicted levels of student achievement which was provided from the residuals

produced from the WLS multiple regression used in this investigation. Districts were considered exemplary if their actual level of student achievement on the fifth grade math and reading portions of the MEAP were 2 or more standard deviations above their predicted levels. Nineteen districts were identified to have met this condition which can be viewed on Table VI. Of the 19 identified exemplary model districts selected for this investigation, 8 were located in the Southeast Lower Peninsula of the State. Furthermore, 5 other districts were identified from the Northwest Lower Peninsula with 4 others coming from the Southwest region. The final 2 districts meeting the researcher's criteria came from the Northeast Lower Peninsula. There were no Upper Peninsula districts identified to serve as a model district in this research design.

Table VI. *Michigan's Exemplary Model Districts*

District Name	Std. Dev. Residual
*1. Detroit Merit Charter Academy	4.519
*2. Ridge Park Charter Academy	3.16
3. Onaway Area Community School District	3.113
*4. West MI Academy of Environmental Science	3.035
5. Glen Lake Community Schools	2.926
6. Detroit Service Learning Academy (NP)	2.827
7. Edwardsburg Public Schools	2.805
8. Hudson Area Schools	2.794
9. Napoleon Community Schools	2.51
10. Edison Public School Academy (NP)	2.424
*11. International Academy of Flint	2.414
12. Deckerville Community School District	2.256
*13. Detroit Premier Academy	2.243
14. Kingsley Area Schools	2.172
15. Crawford AuSable Schools	2.126
16. Wyandotte, School District of the City of	2.124
17. Bridgman Public Schools	2.119
18. Mesick Consolidated Schools	2.081
19. Cheboygan Area Schools	2.045

*Denotes no average teacher salary data available
(NP) Non-profit charter

The mean student enrollment for all selected exemplary districts was 1,276. The populations of these districts ranged from the largest, School District of the City of Wyandotte, having approximately 4,000 students to the smallest, West Michigan Academy of Environmental Sciences, with just 568 pupils. The average number of economically disadvantaged students qualifying for federal subsidized meal benefits for all selected model districts was approximately 56%. The mean percentage of student's receiving federal Title I special education support for selected model districts was 11%. The average number of English Language Learning (ELL) students for all model districts was less than 1%.

The range in district average class sizes also varied with the largest having a little over 21 students per qualified teacher and the lowest having 11. The average years of experience for teachers working in these exemplary model districts was approximately 9 years. Furthermore, the mean per pupil foundation allowance (PPFA) for all identified model districts was $7,019 per child. The PPFA amounts for each district ranged from as high as $8,075 per student to a minimum of $6,846.

The mean composite fifth grade math and reading MEAP proficiency score for all identified exemplary model districts was approximately 70%. However, the test results produced by students attending these model districts were very diverse. Of the 19 identified exemplary districts, the lowest composite MEAP test score was 43%, while the highest had over 91% of their students performing proficient on both the Math and Reading portions of the MEAP.

Of the exemplary districts identified in this analysis, the students of Detroit Merit Charter Academy posted the most noticeable differences in student achievement after comparing their predicted and actual levels of academic performance. Based on the residuals produced from the

WLS regression, their students were found to have performed 4.5 standard deviations above their predicted level of achievement which was 29%.

Onaway Area Community Schools posted the highest positive standardized residual for traditional public schools, producing a 3.1 standard deviation residual. Their district's predicted level of achievement was estimated at 56%. However, their actual student composite test scores were much higher, having a little over 80% of their students scoring proficiently on the composite MEAP. In contrast to Detroit Merit, roughly 95% of Onaway's student population is Caucasian. However, approximately 55% of their total enrollment has been categorized coming from economically disadvantaged circumstances.

The final question posed in this investigation was: *What are "adequate" per pupil funding levels for school districts, conditional on educational costs and needs?* In order to answer this question, it was necessary to select an exemplary model district from those districts having met the criteria of performing 2 or more standard deviations above their predicted level of student achievement. As noted previously in the literature review, the successful schools costing out model has been criticized for selection bias made by researchers in identifying potential model exemplary districts. This concern has been raised because the estimated costs in providing an adequate education for students in the state is highly sensitive to the characteristics of the selected exemplary model district (Addonizio, 2003a; Ochalek, 2008). Typically, researchers have selected model districts which are predominantly white, affluent and have high test scores, thus resulting in much higher educational cost estimates. This investigation made every effort to address this bias by selecting potential exemplary model districts based on the residual output produced from this studies WLS multiple regression analysis. As a result, a list of 19 potential model exemplary districts was identified that could potentially be used to estimate the costs of providing an adequate education for

Michigan's schools. However, it is important to note that although several charter districts made this list, they were not able to be given further consideration for this portion of the investigation to calculate an adequate per pupil funding level for the State of Michigan. The primary reason for this is because no documented average teacher salary data could be found for the majority of these districts in State financial databases. This statistic, which is a key component in the formula used to estimate an adequate level of funding, was also void for the vast majority, nearly 90%, of the for-profit and non-profit charters included in this investigation. As a result, these charters were omitted from the adequacy grant calculation process. Hence, the remaining 464 traditional public school districts were used to serve in calculating the added costs needed by the state in providing an adequate education for all students.

When calculating an adequate funding level for all students in the State, it is necessary to take into consideration each of their educational needs so as to provide enough potential resources for students to have the opportunity to achieve at specified academic standards. In order for students coming from low socioeconomic backgrounds to have the opportunity to achieve at similar academic levels of selected exemplary model districts, additional resources were calculated to support their academic requirements. The formula listed below, which has been utilized in similar research, was employed to estimate these added costs (Addonizio, 2003a; Ochalek, 2008):

$G_{ij} = \text{Max}\ [(AR_{ij} - TR_i, \varnothing]$

Where:

G_{ij} = per pupil grant to district $_i$ based on exemplary district $_j$

AR_{ij} = estimated target, or adjusted revenue per pupil in district $_i$ based on exemplary district $_j$ = $TR_j * (F_i/F_j) * (C_i/C_j)$

TR_i = total revenue per pupil in non-exemplary district $_i$

TR_j = total revenue per pupil in model exemplary district $_j$

F_i = percent of students in non-exemplary district $_i$ eligible for free & reduced lunch

F_j = percent of students in model exemplary district $_j$ eligible for free & reduced lunch

C_i = cost index for non-exemplary district $_i$

$$C_i = \frac{\text{Actual average salary district}_i}{\text{Predicted average salary of district}_i}$$

In order to complete the cost estimation to adequately provide students in the State of Michigan with an adequate education, a cost index for each district was calculated by dividing each district's actual average teacher salary by their predicted average teacher salary. This served to provide a representation for the cost differences between districts in educating their students with the teaching staffs they employ (Addonizio, 2003a; Ochalek, 2008). To obtain each district's predicted average teacher salary, the following linear regression equation was established:

$$AVGTSAL = b_0 + b_1ADVDEGREE + b_2AVGYRS$$

Where:

AVGTSAL = Average teacher salary.

ADVDEGREE= Percentage of district teachers holding advanced degrees beyond a bachelors.

AVGYRS = Total district average teacher years of service

Of the traditional public school districts remaining after the 7 for-profit and non-profit charters were omitted from the exemplary model district list, the districts of Onaway Area Community School District, School District of the City of Wyandotte, & Glen Lake Community Schools were selected to serve as model districts to estimate the added costs of providing an adequate education for all students in the State. Each of these districts was carefully selected based on their unique characteristics. Onaway was chosen because it posted the highest standard deviation difference between its student's predicted and actual achievement levels of all traditional public schools. Wyandotte was nominated because it was the largest district of all the exemplary model districts. Finally, Glen Lake was selected because its students posted the highest composite MEAP test scores for all exemplary districts, including charters. A summary of the total added costs and total percentage of additional operating expenditures needed by the State to provide an adequate education to its students can be viewed on Table VII below.

Table VII. *Model District's total cost to State of Michigan*

District Name	District Cost Index	Total Revenue Per Pupil	% Economically Disadvantaged	Adequacy Grants Awarded	Composite District MEAP Score	Total Cost to State	*Percentage of total State Revenue
Wyandotte	1.25	$8,780	.511	33	62%	$90,915,573	.6%
Onaway	.89	$9,045	.554	148	81%	$741,851,417	4.5%
Glen Lake	.95	$11,150	.242	423	91%	$15,201,391,883	93%

*Total Revenue for K-12 public education from all sources in the State of Michigan for FY 2011-12 was $16,279,632,189. This information was obtained from Michigan Department of Education Bulletin 1011, http://www.michigan.gov/mde/0,4615,7-140-6530_6605-21539--,00.html

The School District of the City of Wyandotte, which is located in Southeast Lower Peninsula of the State, was the most efficient spending of the three model districts selected. They spend an average of $8,780 per student based on the revenue they receive from all funding sources. The district's student average composite fifth grade math and reading MEAP test score was 62%. It also

boasts the largest student population of all exemplary model districts, providing services to nearly 4,000 children. A little over 51% of that population is categorized coming from economically disadvantaged circumstances. The district student population is nearly 90% Caucasian with the remaining 10% being evenly distributed between African American and Hispanic ethnicities. Roughly 26% of their students also qualify for Federal and State Title I special education services. The average teacher years of experience in the district is 12.54 years with their average salary being $74,832.

Based on the adequacy grant formula, only 33 districts out of the 464 included in this grant calculation process would receive additional monies to assist their students to achieve at similar academic levels as Wyandotte. Furthermore, the total cost to the state would be approximately $91,000,000. It would be presumed that the other 428 districts not receiving these added funds would be able to feasibly replicate their current test score levels with the resources they are currently being provided by the State. A summary of the non-exemplary districts qualifying to receive adequacy grant monies based on Wyandotte's adequacy grant statistics can be viewed on Table VIII below (Because of the breadth of information provided in this table, adequacy grant summaries for selected exemplary districts of Onaway and Glenn Lake are documented in the appendices section of this investigation for reference.).

Table VIII. *Wyandotte Adequacy Grant Awards*

District Name	Cost Index	District Size	District PCT_ECDIS	Wyandotte Adequacy Grant PP	Wyandotte Adequacy Grant Total
Lincoln Park, School District of the City of	1.14	4773	0.69	$2,180.85	$10,409,177
Westwood Community School District	1.38	2748	0.67	$3,085.62	$8,479,272
Hamtramck, School District of the City of	1.07	2984	0.89	$2,774.05	$8,277,757

Orchard View Schools	1.28	2656	0.65	$2,921.84	$7,760,406
Bendle Public Schools	1.09	2183	0.72	$2,607.52	$5,692,223
Clintondale Community Schools	1	3715	0.71	$1,495.48	$5,555,698
Jackson Public Schools	1.16	6055	0.68	$725.89	$4,395,256
Roseville Community Schools	1.12	5233	0.64	$823.66	$4,310,197
Oak Park, School District of the City of	1.12	4181	0.73	$1,028.19	$4,298,852
Dearborn Heights School District #7	1.29	2909	0.56	$1,410.58	$4,103,371
School District of the City of Inkster	1.02	2660	0.87	$1,512.32	$4,022,764
Godwin Heights Public Schools	1.16	2143	0.76	$1,624.84	$3,482,032
Godfrey-Lee Public Schools	1.04	1775	0.79	$1,406.86	$2,497,184
Fitzgerald Public Schools	1.17	2852	0.73	$855.95	$2,441,155
Whittemore-Prescott Area Schools	1.03	1017	0.75	$2,289.34	$2,328,256
Melvindale-North Allen Park Schools	1.13	2844	0.58	$806.95	$2,294,963
Farwell Area Schools	1.19	1453	0.56	$932.38	$1,354,752
Kelloggsville Public Schools	1.09	2289	0.69	$585.97	$1,341,289
Detroit Community Schools	0.8	1040	0.87	$1,190.93	$1,238,572
Harrison Community Schools	1.01	1581	0.67	$775.65	$1,226,304
Chippewa Hills School District	1.12	2207	0.60	$552.26	$1,218,839
Atherton Community Schools	1.06	866	0.67	$849.56	$735,723
Hart Public School District	1.1	1269	0.65	$484.86	$615,281
Baldwin Community Schools	1.05	599	0.88	$879.47	$526,805
Mt. Morris Consolidated Schools	1	2519	0.70	$199.77	$503,208
Van Dyke Public Schools	1.01	3088	0.78	$140.56	$434,037
Constantine Public School District	1.01	1475	0.59	$260.78	$384,651
Bangor Public Schools (Van Buren)	0.93	1265	0.72	$273.19	$345,588
Genesee School District	1.02	825	0.62	$317.42	$261,870
Kingston Community School District	1.01	628	0.61	$362.38	$227,573
Carrollton Public Schools	0.93	2050	0.66	$41.20	$84,456
Bloomingdale Public School District	0.91	1256	0.73	$41.22	$51,768
Mancelona Public Schools	1.06	982	0.62	$16.59	$16,295
Wyandotte, School District of the City of	1.25	3961	0.51	$0	$0
				Total to State	**$90,915,574**

Onaway Area Community School District is located in the Northeast Lower Peninsula of Michigan. It was the second most efficient spending model exemplary district averaging $9,045 per student based on all revenue sources. Approximately 81% of its students scored proficiently on the composite fifth grade math and reading portions of the 2012-13 MEAP. The district educates

approximately 660 students of which 95% are Caucasian with 3% of the remaining coming from African American and Hispanic descent. Furthermore, roughly 55% of the districts total student population qualifies for Federal free and reduced meal benefits. Additionally, a little over 7% of their enrollment meets requirements to receive Federal Title I Special Education support services. The district's average teacher salary is approximately $53,000 with their staff working an average of 14.5 years.

Of the 464 traditional pubic school districts included in the adequacy grant portion of this analysis, 148 would receive extra adequacy grant dollars if Onaway were selected as the exemplary model district. Furthermore, the total additional costs to the state would equate to approximately $742,000,000. A summary of the non-exemplary districts receiving adequacy grant monies based on Onaway's adequacy grant statistics can be viewed in the appendices portion of this investigation (pg. 173).

Glen Lake, which is located in the Northwest Lower Peninsula, had the highest composite Fifth grade math and reading MEAP test scores having a little over 94% of their students scoring proficiently. It also was the least efficient district of all the exemplary model districts, spending $11,165 per student after accounting for all revenue sources. The district services a little over 800 students with the majority being Caucasian, approximately 95%. Its student demographic is also comprised of roughly 2% Hispanic and less than 1% African American children. Glen Lake also had the fewest number of students, of all the exemplary model districts, qualifying for Federal free and reduced meal benefits, having only 24%. Additionally, roughly 8% of its students receive Federal Title I. and State Section 31A special education services. The average teacher years of experience in the district was a little over 11 years of service and the average teacher salary is $58,014.

If Glen Lake was selected as the model exemplary district for the State, 423 of the 464 districts included in the adequacy grant portion of this analysis would receive additional adequacy grant monies. The total cost to the state to provide these adequacy grants would be roughly $15.2 billion dollars of additional State aid. A summary disclosing the total funds each non-exemplary district would be provided if Glen Lake was selected as the State's model exemplary district can be viewed in the appendices portion of this investigation (pg.177).

After careful analysis it has been deduced that the total costs to the state are highly dependent upon the model exemplary district's adequacy grant statistics, particularly their cost index, percentage of economically disadvantaged enrollment, and total per pupil operating expenditures. It was also found if the model exemplary district had a higher percentage of economically disadvantaged students than a non-exemplary; non-exemplary districts would receive fewer adequacy grant dollars per student. Conversely, if a selected model exemplary district had a lower percentage of economically disadvantaged students as compared to a non-exemplary district, the non-exemplary district with a higher enrollment of disadvantaged students would receive more adequacy grant dollars. This was also found to be the case for the cost index statistic used in the adequacy grant calculation. Finally, the level of resources used by an exemplary model district to educate their children has a direct influence on the total amount of adequacy grant dollars a non-exemplary district would have available to them. Hence, non-exemplary districts that are less efficient spending their resources, spending more money to educate their students, as compared to a selected model exemplary district spending less, were likely to receive fewer adequacy grant dollars per student based on the adequacy grant formula.

Of course, the values of all three of these variables differ significantly from district to district, depending on their unique characteristics which resulted in varying levels of adequacy grant

dollars allocated to each district. Regardless, those districts having higher cost indexes, larger percentages of economically disadvantaged students and spend more efficiently than a selected model exemplary district were more likely to receive larger adequacy grant dollars per pupil than those districts who do not. This demonstrates the importance in the selection of a model exemplary district and the sensitivity in the selection process as it directly impacts the final added cost to the State. It is also important to note, that the level of student proficiency of the selected model exemplary district directly impacts the level of added resources needed by the State to adequately educate its students. Hence, the higher the desired level of student achievement, the higher the level of resources needed by districts for students to have the potential to attain them.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

There has been a great deal of contention over the level of resources needed to provide children in the United States with an adequate education. Much of the debate has ensued because in order to determine a funding level, it was essential to determine what constitutes an adequate education. This process has taken roughly 40 years to delineate and has been shaped through the relations of three central bodies: the courts, Federal and State governments, as well as the research community. However, much of the proprietorship of developing a definition of what constitutes an adequate education has occurred because of verdicts rendered through several important school finance and equity cases ("Brown v. Board of Education of Topeka," 1954; "Burruss v. Wilkerson ", 1969; Education Law Center, 2011-2012b; "McInnis v. Shapiro," 1968; "Robinson v. Cahill," 1973; "Rodriguez v. San Antonio Independent School District," 1971; "Rose v. Council for Better Education," 1989; "Serrano v. Priest," 1971).

It was not until 1989, that a definition of what constitutes an adequate education would be established. This was achieved however, through the decision handed down in the momentous State of Kentucky *Rose v. Council for Better Education* court case. The judgment helped to define what a high minimum quality education entailed (e.g. sufficient oral and written communication skills, sufficient knowledge of economic, social, and political systems, sufficient understanding of governmental processes, sufficient self-knowledge and knowledge of his or her mental and physical health, sufficient grounding in the arts, sufficient training or preparation for advanced training in either academic or vocational fields). On the other hand, it did not provide a clear cost of what it would take in providing one ("Rose v. Council for Better Education," 1989). The task of “costing

out" an adequate education has proven more difficult to solidify. Though, because of the education policies initiated in recent years by both the Federal and State governments, these cost estimates have become more tractable for researchers because of the achievement standards outlined in them. The No Child Left Behind Act of 2001 requires all fifth grade students, despite their circumstances, achieve 100% proficiency in both Math and Reading on state standardized testing instruments by the year 2014. This lofty objective provided a measuring stick of the levels students are expected to achieve which, in turn, provided a standard that could be used to feasibly estimate a cost associated in achieving this goal.

Researchers have designed several costing out methods to effectively estimate these expenses. They have been successfully used by plaintiffs in court cases to provide added support in their arguments alleging the inadequacy of state school funding systems (Ochalek, 2008; "Robinson v. Cahill," 1973; "Rose v. Council for Better Education," 1989). Additionally, many of these analyses were conducted as a result of mandated court judgments seeking to ascertain adequate funding levels. Not surprisingly, these adequacy studies have come under fire by critics (Hanushek, 2005, 2006a, 2006b, 2007a, 2007b). This has occurred primarily because of the broad cost variances these studies have produced. Researchers would agree that the science of estimating the costs of providing an adequate education is far from perfect (Duncombe, 2006; Hanushek, 2007a; Hanushek & Lindseth, 2009; Imazeki, 2008; Ochalek, 2008). Additionally, the results they suggest are also not a be all or end all to the school funding debate. However, since their initial use, researchers have refined their techniques which have provided a more lucid and scientific basis for projecting the added costs needed to adequately fund our nation's schools. This has significantly helped to move the debate in the right direction, as past school funding policies were and still are, to a large degree, at the mercy of the political process. However, much has still yet to be done.

Many states have initiated their own adequacy studies. However, Michigan has yet to produce one of their own. Part of the reason may be attributed to previous failed attempts made by litigants seeking to equalize the State's funding system ("Milliken v. Green," 1973). Thus far, two independent costing out analyses utilizing the Successful Schools Method have been conducted by researchers interested in estimating an adequate level of funding for Michigan's students. One of those studies focused on identifying the added costs needed to educate urban student populations in Michigan, while the other focused on identifying total costs to the State based on predicted student achievement levels on the eleventh grade MEAP, Michigan Educational Assessment Program (Addonizio, 2003a; Ochalek, 2008).

This study, which attempts to extend the findings obtained from the previous two, also made use of the Successful Schools Method for its results. A weighted least squares (WLS) multiple regression model was specified to predict district student achievement on a composite total of fifth grade math and reading sections of the MEAP. Those districts whose composite math and reading test scores met or exceeded two or more standard deviations above their predicted level of student achievement were considered exemplary districts. Of the 551 districts included in this study, 19 met this criterion. To estimate the added costs needed to adequately fund all students in the State, an "adequacy grant" formula developed by Addonizio was utilized (Addonizio, 2003a). Public school academies were excluded from this portion of the analysis because financial data essential in calculating these added costs, was not available for the vast majority of these institutions. Hence, the estimates provided for this portion of the investigation were applied to the remaining 464 traditional public school districts.

The purpose of this study was to determine an adequate level of funding to educate all school aged children in the State of Michigan so they will perform at the minimum proficiency standards on

the fifth grade math and reading portions of the MEAP assessment as outlined by the State Department of Education. This research study attended to three questions related to the estimation of the additional funds needed by the State to provide its children with an adequate education. The questions were as follows:

1. *What variables (district total enrollment, district percentage African American students, district percentage Caucasian students, district percentage Hispanic students, district percentage economically disadvantaged students, district per pupil foundation allowance, district percentage students qualifying for special education services, district percentage students who are English language learners, district average teacher salary, district geographic location, for-profit charter, non-profit charter) best predict district academic proficiency on the fifth grade math and reading sections of the MEAP?*
2. *Which are Michigan's exemplary districts*?
3. *What are "adequate" per pupil funding levels for school districts, conditional on educational costs and needs?*

Findings:

- The independent variables utilized for this analysis explained a little over 75% of the variability in the dependent variable, fifth grade math and reading composite MEAP proficiency scores.
- The WLS regression's findings confirmed a district's size, geographic location, percent African American, percent Hispanic, percent economically disadvantaged, percent special education, and per-pupil foundation allowance were all shown to be statistically significant in predicting fifth grade composite math and reading MEAP test scores.

- Of the statistically significant variables, those having the largest negative influence on student academic achievement include: district percentage economically disadvantaged, percentage African American, percentage Hispanic, and percentage special education.
- The statistically significant independent variables having the biggest positive influence on student academic achievement include district per pupil foundation allowance and geographic location (specifically districts located in the Southwest & Northeast Lower Peninsula).
- The mean composite fifth grade math and reading MEAP test score (percent proficient) for all 551 districts included in this study was 57.46%.
- Of the bottom 100 districts whose students obtained the lowest composite MEAP proficiency scores, 90 had economically disadvantaged student populations of 49% or higher.
- Of the top100 performing districts having the highest composite MEAP proficiency scores, only 6 had economically disadvantaged student enrollments of 50% or more.
- Of the top 100 performing districts, 99 had African American student populations of 17% or less.
- Charter districts identified for this analysis were categorized as either a for-profit or non-profit charter district. Of the 87 public school charters included in this study, 76 were categorized as for-profit business entities.
- Of the Top 100 districts having the highest composite MEAP test scores, 9 were for-profit charters.
- Of the 100 districts having the lowest composite MEAP test scores, 43 were charters with 7 of those being non-profit.

- Of the 50 districts having the highest composite MEAP proficiency scores, 5 were charters all of which were for-profit.
- Of the 50 districts having the lowest composite MEAP proficiency scores, 28 were charters with 6 being non-profit.
- Costs significantly increase to the State as expected student achievement levels increase.
- Costs to the State increase as total per pupil revenue of selected exemplary district increases.
- Costs to the State decrease if the selected exemplary district has higher percentages of economically disadvantaged student populations in comparison to non-exemplary districts.
- School districts with larger disadvantaged student populations, as compared to selected exemplary districts, receive larger adequacy grants than those who do not.
- Urban districts with larger minority and socioeconomically disadvantaged populations tend to receive higher adequacy grant levels than districts with lower percentages.
- The range of the added costs to adequately fund education for all students in the State varied greatly depending on the characteristics of the selected model exemplary district. This ranged from as low as $90 million to as high as $15 billion.

Conclusion:

After analyzing composite student performance data on the fifth grade math and reading portions of the MEAP, there is strong evidence that children are not achieving in the State. This is specifically the case for those children coming from poor socioeconomic backgrounds and areas with high concentrations of African American students. There has been a great deal of debate whether increased funding would improve overall student academic achievement in this country. Some findings suggest money doesn't matter. However, others indicate otherwise (Addonizio,

2003a; Addonizio & Kearney, 2012; Archibald, 2006; Daniel, 2010; Greenwald et al., 1996a, 1996b; Hanushek, 1994b; A. Odden et al., 2008; Picus & Odden, 2011; Rebell, 2006). Recent findings suggest that money does indeed influence student achievement (Daniel, 2010; Rucker, 2010). The results of this analysis also support this premise. This study provided a glimpse into how Michigan's public school districts and public school academies have fared in terms of student achievement based on the resources they are provided by the State and Federal governments. Interestingly, this investigation took place during one of the most difficult economic downturns the State of Michigan has witnessed since the Great Depression. These circumstances afforded a unique opportunity to provide insight on the viability of the State's education funding system during these lean years of economic growth. The State's present funding system collects the vast majority of its revenue for its schools through its sales tax. This source of revenue has been very volatile during this period, which has limited the State Legislature's ability to appropriate increased revenue for schools. As a result, districts with lower per-pupil foundation allowances have shown signs that their students are struggling on the MEAP. This is especially the case for districts with large populations of economically disadvantaged and African American children. Conversely, students attending wealthy districts, receiving higher per pupil funding allowances, and having lower concentrations of African American children have fared better on the State MEAP assessment.

According to the United States Census Bureau, Michigan's total population rose a little over 13,100 people from 2012 to 2013(Associated Press, 2013). This equates to approximately a one tenth of a percent increase from the previous year's total of 9,882,519 to 9,895,622. This is good news for the State in terms of potential increased revenue for schools. However, recent unemployment figures have painted a much bleaker financial picture. The State of Michigan presently ranks 45th in the nation, having 9.4 percent of its workforce unemployed, as compared to

the 8.1 percent national average (Bureau of Labor Statistics, 2012). Additionally, incomes have stayed relatively flat over the past several years, as salaries and hourly wages have not kept up with inflation (Harger, 2014). This statistic could threaten the financial stability of schools in the future because as discretionary income shrinks for Michigan's citizens, the potential of raising additional revenue to fund schools through its sales tax decreases. Hence, districts will likely continue to struggle because they do not have adequate resources to provide the essential education programs and services needed by those who would most benefit, particularly African American children and those coming from low socioeconomic backgrounds.

It will also be equally difficult for children to meet the prescribed academic standards established by the State's newly adopted Federal NCLB waiver if additional funds are not assigned to schools. Based on the provisions stipulated in it, 85% of a district's students are expected to perform proficiently in both math and reading by the year 2022. Without an adequate level of funding to accomplish this goal, it will be next to impossible to achieve. This outcome is inevitable based on the snapshot of student achievement revealed in this investigation. Furthermore, if the State continues to fail in their attempt to adequately fund Michigan's schools, they can expect the same return on their investment in public education. Schools have struggled over the past several years to provide the necessary educational services and programs to students who are most at risk. Much of the reason for this can be attributed to budgetary freezes and reductions made to K-12 public education because of the political process. Earnestly, districts have witnessed a decrease in State funding 8 out of the last 10 years after accounting for inflation and legislative imposed reductions.

Despite the financial setbacks the State has witnessed over the past several years and its uncertain future economic outlook, there have been some signs of an economic recovery. Since this

research study was begun, the State of Michigan has accumulated a surplus in their General Fund for the past two Fiscal Years of 2012 and 2013, having an excess of $457 million and $500 million respectively (Davey, 2012; Egan, 2013). Political debates and discussions have recently ensued as to how best to utilize these resources, including restoring the $600 total per pupil reduction made by the State since 2011. Because State legislators are the ones primarily responsible for establishing a budget to fund various government services and programs, they will have the ultimate say on where and how this additional revenue will be put to use (e.g. K-12 education, higher education or some other use, including a tax cut). For the short term, it would make sense for the State to reinstate the funds they rescinded from schools, as these resources would have an immediate impact on the lives of millions of children. However, because there has been much concern over the way in which schools utilize their resources, it is likely stipulations will be made by legislators on how these funds should be utilized if they were to be restored. This type of policy could hinder districts if they come with "strings attached". Research suggests students fare better in districts that have authority to make decisions on how best to make use of added resources (Hall, 2006; Timar & Roza, 2010).

The state currently funds three K-12 public education systems which include: traditional public schools, public school academies and virtual academies. Both public school academies and, most recently, virtual academies have been founded as alternatives to traditional public education systems. Because school district funds are distributed on a per-pupil basis, all three of these systems are competing for students to help subsidize their education services. Although it is too early to tell if virtual academies will be able to produce student achievement levels on par or superior to traditional public schools and public school academies, the results of this investigation show students attending public school academies do not perform as well on state standardized tests as compared to those attending traditional public schools. Of the 87 public school academies included in this

investigation, 43 were found to be in the bottom 100 performing districts having the lowest student composite math and reading test scores. Equally alarming was the fact that 26 were also found to be in the lowest 50 performing districts. Although these statistics are disappointing, it is important to note the vast majority of these public school academies service populations which are largely comprised of low income and African American children. If the State wishes to continue to provide parents and students with an alternative to traditional public education, they will need to look more closely at how these public school academies use their resources. This can be accomplished by requiring them to disclose how they utilize their funds similar to traditional public schools. By doing so, this would provide insight as to how these schools educate many of the State's most needy children. It would also provide the opportunity for State Legislators to make objective financial comparisons between the two education models to determine which alternative best serves children.

There can be no debate over whether money matters in education, because all evidence and common sense tells us otherwise. The question now that needs to be answered is how much will be enough to adequately provide each child with the academic support required to be successful on standardized assessments? This study attempted to attend to this question specifically for the State of Michigan. The findings of this investigation produced three cost estimates to adequately fund education in the State. It was revealed the cost to educate students is highly dependent upon the criteria established by the researcher. Additionally, it is also highly dependent upon the standard at which students are expected to perform. This is reflective on the evidence obtained from the results of this investigation. The School District of the City of Wyandotte was one of the most efficiently spending districts of the model exemplary districts identified in this study. It also was one of the lowest achieving exemplary districts, having roughly 62% of its students performing proficiently on the composite score of the fifth grade math and reading sections of the MEAP. If the State

establishes its criteria to select an efficiently spending district with relatively low test scores to serve as its model to adequately fund its schools, the total costs would be less. Such is the case if the School District of the City of Wyandotte were selected. The state would need to budget approximately $91,000,000 in additional revenue above what they currently spend on K-12 education. This would equate to approximately a .6 percent increase to its already over $16 billion dollar education budget. In contrast, if the State selected an exemplary district that is less efficient in their spending but obtains relatively high test scores, the cost significantly increases. Glen Lake, which was one of the least efficient spending districts of the identified model exemplary districts, had the highest composite fifth grade math and reading MEAP test scores. If the State selected Glen Lake to serve as their model district to adequately fund Michigan's schools, the added costs to the State would skyrocket to over $15 billion dollars above what is currently financed. This would necessitate a 93% increase to the States K-12 budget, coming from all sources of revenue, which is highly unfeasible.

One final cost estimate, which took into account both a district's spending efficiency and test scores, may provide a more practical and representative cost measure for the State to begin its course to adequately fund its schools. Onaway Area Community Schools, which was in the middle of the pack in terms of its spending efficiency while supporting relatively high test scores, afforded a modest 4.5% increase to the State's K-12 budget system. The total cost to the State if it were selected as the model exemplary district would be approximately $741,000,000 above what it already appropriated to K-12 education.

Future Research:

Although it has been deduced that money does indeed matter in education, the way it is spent is certainly as important as how much is allocated. This premise is not surprising, as other researchers have alluded to this fact. It is recommended that future researchers investigate districts that are beating their expected student achievement levels based on the resources they are provided, particularly those districts with higher percentages of disadvantaged and African American populations. This insight will provide evidence into how best to utilize government resources to support student academic gains. Furthermore, a deeper understanding of how resources support academic achievement should also be explored. This would give schools valuable guidance on how to best make use of their resources to help improve their spending efficiency. Theoretically, this would provide valuable data on lowering the cost of any given aggregate level of achievement or increasing aggregate achievement for any given expenditure level.

Moreover, more research must be conducted to investigate the other confounding variables that are not currently known influencing student achievement. It is clear these unobserved variables have an equal, if not larger, impact on student achievement than those included in this study. Finally, it would be recommended the State of Michigan initiate a costing out study of their own that analyzes longitudinal student performance data based on the resources it provides districts. This will help provide a more clear cost estimate of the total funds needed to subsidize K-12 education adequately. This can be done through cost comparisons from each fiscal year to create more accurate approximations. Of the methods utilized to estimate these costs, the Successful Schools model, has proven to be the most practical and versatile of the costing out models developed by researchers. It is practical because it makes use of past student performance and financial data to forecast future expenses. Additionally, the data utilized to accomplish this task is annually reported

to the State by districts which helps support the reliability of the results obtained from this method. Regardless of the model utilized to develop a cost estimate, adequacy studies are a valuable tool which can be used to help legislators to make more informed decisions about the costs needed to adequately educate our children. Every state should employ the use of one or more of them to ensure we are on track to meet all of our children's educational needs regardless of their circumstances.

APPENDIX A1: *INFLATION EFFECTS ON STATE OF MICHIGAN'S MINIMUM PER PUPIL FOUNDATION ALLOWANCE*

Fiscal Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Minimum PPFA	6626	6626	6700	6875	7108	7204	7316	7162	7146	6846
Difference from previous year	-	-	+74	+175	+233	+96	+112	-154	-16	-300
U.S. Average Annual Rate of Inflation	2.3	2.7	3.4	3.2	2.8	3.8	-0.4	1.6	3.43	2.1
Minimum PPFA adjusted for inflation	6474	6491	6472	6655	6909	6930	7609	7047	6900	6702
Adjusted Minimum PPFA Difference accounting for Inflation	(152)	(179)	(228)	(220)	(199)	(274)	+293	(115)	(246)	(144)
Total Net Loss or Gain in annual revenue per pupil	(152)	(179)	(153)	(45)	34	(178)	405	(269)	(262)	(444)

*Michigan minimum Per Pupil Foundation Allowance (PPFA) information obtained from Michigan Senate Fiscal Agency website: accessed 5-23-12, http://www.senate.michigan.gov/sfa/Departments/DataCharts/DCk12_BasicFoundationHistory.pdf

APPENDIX A2: *MICHIGAN ANNUAL FALL PUPIL COUNT*

Academic Year	**Per Pupil Headcount**
1990-1991	1,651,502
1991-1992	1,673,020
1992-1993	1,675,465
1993-1994	1,667,041
1994-1995	1,653,949
1995-1996	1,673,879
1996-1997	1,680,693
1997-1998	1,694,320
1998-1999	1,710,365
1999-2000	1,714,815
2000-2001	1,720,335
2001-2002	1,731,151
2002-2003	1,750,631
2003-2004	1,734,019
2004-2005	1,723,087
2005-2006	1,712,133
2006-2007	1,693,436
2007-2008	1,661,414
2008-2009	1,631,200
2009-2010	1,605,971
2010-2011	1,577,123
2011-2012	1,559,847

*Pupil counts were obtained from Bulletin 1011 published annually by the MDE, accessed 5/23/12 at: http://www.michigan.gov/mde/0,4615,7-140-6530_6605-21539--,00.html

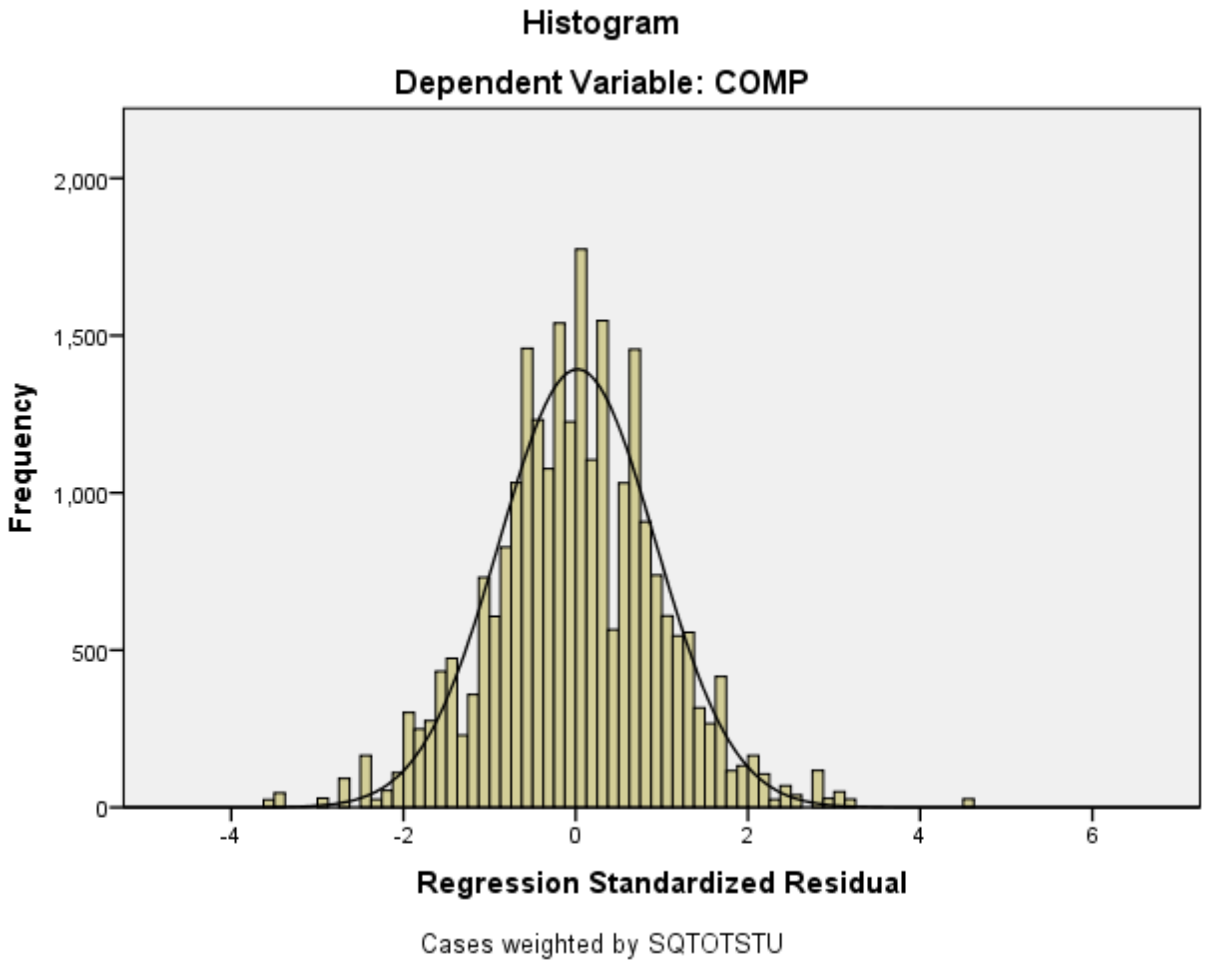
APPENDIX A3: *MICHIGAN FUNDING EQUITY GAP*

Fiscal Year	**Minimum**	**Maximum** [1]	**Equity Gap**
1993-94	$2,762	$10,294	$7,532
1994-95 [2]	4,200	10,454	6,254
1995-96	4,506	10,607	6,101
1996-97	4,816	10,762	5,946
1997-98	5,124	10,916	5,792
1998-99	5,170	10,916	5,746
1999-2000	5,700	11,154	5,454
2000-01	6,000	11,454	5,454
2001-02	6,300	11,754	5,254
2002-03 [3]	6,700	11,954	5,254
2003-04 [3]	6,700	11,954	5,254
2004-05	6,700	11,954	5,254
2005-06	6,875	12,129	5,254
2006-07	7,085	12,339	5,231
2007-08	7,204	12,387	5,183
2008-09	7,316	12,443	5,127
2009-10	7,162	12,170	5,008
2010-11	7,146	12,154	5,008
2011-12	6,846	11,854	5,008

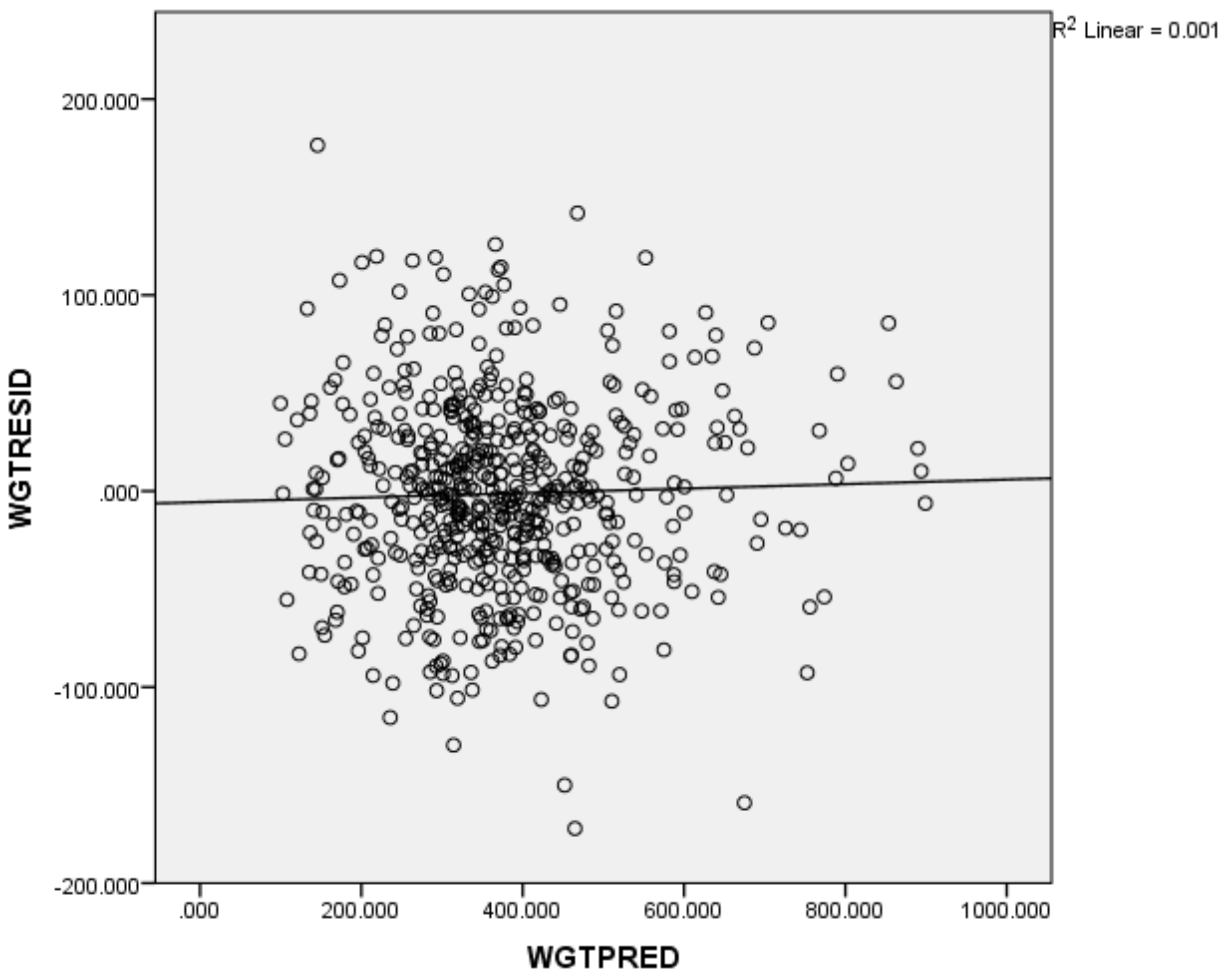
1) This maximum per pupil foundation allowance is for Bloomfield Hills which has a comparatively similar population to traditional public schools and public school academies. There are 2 other districts in the state which have fewer than 10 pupils.
2) New funding system, Proposal A, was initiated
3) For FY 2003-04 and FY 2004-05, proration occurred; this did not statutorily reduce the foundation allowance, but reduced per-pupil funding by approximately $74 each year.

*Source: Information obtained for this table was acquired from actual minimum and maximum per pupil foundation amounts which can be found at: http://www.senate.michigan.gov/sfa/Departments/DataCharts/DCk12_BasicFoundationHistory.pdf

APPENDIX A4: *HISTOGRAM OF STANDARDIZED RESIDUALS FROM WLS REGRESSION*



APPENDIX A5: *SCATTERPLOT OF WLS RESIDUALS*



APPENDIX A6: *DISTRICT FIFTH GRADE MATH AND READING MEAP COMPOSITE AND PREDICTED STUDENT ACHIEVEMENT LEVELS*

Casewise Diagnostics[a]

District Name	Std. Residual	COMP	Predicted Value	Residual
Academy for Business and Technology	-.034	27.350	27.59336	-.243356
Academy of Warren	-.343	19.850	22.34393	-2.493930
Achieve Charter Academy	-.855	78.950	85.15760	-6.207597
Addison Community Schools	.933	66.300	59.52267	6.777327
Adrian, School District of the City of	-.028	51.500	51.69992	-.199917
Advanced Technology Academy	-.469	30.900	34.30740	-3.407402
Airport Community Schools	-.287	57.200	59.28730	-2.087295
Albion Public Schools	.956	42.000	35.05957	6.940426
Alcona Community Schools	.303	62.750	60.54622	2.203783
Algonac Community School District	.024	58.850	58.67423	.175773
Allegan Public Schools	-1.067	55.650	63.39623	-7.746228
Allen Academy	-.423	23.350	26.41997	-3.069966
Allen Park Public Schools	-.725	61.150	66.41407	-5.264068
Allendale Public Schools	-.926	62.100	68.82706	-6.727058
Alma Public Schools	-.171	54.950	56.19119	-1.241193
Almont Community Schools	.400	65.550	62.64775	2.902253
Alpena Public Schools	.283	63.500	61.44338	2.056625
Anchor Bay School District	-.062	66.350	66.80033	-.450328
Ann Arbor Public Schools	.785	80.900	75.19813	5.701873
Armada Area Schools	-.649	67.250	71.96123	-4.711227
Athens Area Schools	.025	62.250	62.06623	.183766
Atherton Community Schools	-2.954	22.150	43.60419	-21.454191
Avondale School District	.254	69.250	67.40846	1.841544
Bad Axe Public Schools	.627	67.800	63.24782	4.552179
Baldwin Community Schools	-.482	28.550	32.05038	-3.500385
Bangor Public Schools (Van Buren)	.870	53.250	46.92862	6.321376
Bangor Township Schools	.110	60.650	59.84789	.802109
Baraga Area Schools	-2.649	40.300	59.53747	-19.237473
Bark River-Harris School District	-.584	52.050	56.29015	-4.240153
Bath Community Schools	-1.820	52.250	65.47053	-13.220529
Battle Creek Public Schools	-.748	35.650	41.08388	-5.433880
Bay City School District	.015	59.850	59.74055	.109445
Beal City Public Schools	-1.628	55.550	67.37650	-11.826500
Beaverton Rural Schools	1.165	61.700	53.24094	8.459057
Bedford Public Schools	.664	72.700	67.87468	4.825322
Beecher Community School District	-1.051	22.450	30.08384	-7.633840
Belding Area School District	1.187	61.700	53.08077	8.619235
Bellevue Community Schools	-1.060	46.400	54.10155	-7.701549
Bendle Public Schools	-.183	40.350	41.68017	-1.330170
Bentley Community School District in the County of Genesee	-.833	42.850	48.90051	-6.050513
Benton Harbor Area Schools	-.996	17.450	24.68261	-7.232605
Benzie County Central Schools	1.975	68.350	54.00549	14.344512
Berkley School District	1.926	81.500	67.51070	13.989297
Berrien Springs Public Schools	1.709	69.650	57.24181	12.408189
Big Rapids Public Schools	1.165	65.350	56.89067	8.459334
Birch Run Area Schools	-.211	62.600	64.12983	-1.529832
Black River Public School	-.221	74.550	76.15385	-1.603850
Blissfield Community Schools	.269	64.200	62.24977	1.950233
Bloomfield Hills School District	.505	82.050	78.38530	3.664703

Bloomingdale Public School District	1.349	51.250	41.45324	9.796761
Boyne City Public Schools	1.404	69.800	59.60324	10.196762
Bradford Academy	-1.033	28.700	36.20166	-7.501662
Brandon School District in the Counties of Oakland and Lapeer	.235	63.900	62.19426	1.705735
Brandywine Community Schools	.406	58.550	55.60460	2.945398
Breckenridge Community Schools	.976	69.250	62.16060	7.089399
Breitung Township School District	.667	60.400	55.55240	4.847598
Bridge Academy	-.709	33.450	38.60148	-5.151482
Bridgeport-Spaulding Community School District	-.838	34.200	40.28667	-6.086670
Bridgman Public Schools	2.119	82.550	67.15825	15.391748
Brighton Area Schools	.510	76.350	72.64448	3.705518
Britton Deerfield Schools	-.724	61.250	66.50696	-5.256955
Bronson Community School District	.335	59.000	56.56898	2.431017
Brown City Community Schools	.308	61.550	59.31503	2.234969
Buchanan Community Schools	-.209	59.450	60.97042	-1.520421
Buena Vista School District	-1.637	10.350	22.23829	-11.888294
Bullock Creek School District	-.739	59.700	65.06392	-5.363924
Burton Glen Charter Academy	.294	36.550	34.41772	2.132282
Byron Area Schools	-1.014	55.450	62.81157	-7.361569
Byron Center Public Schools	.950	79.050	72.15175	6.898247
Cadillac Area Public Schools	.209	59.200	57.68457	1.515426
Caledonia Community Schools	-.903	69.600	76.15473	-6.554731
Camden-Frontier School	.225	55.600	53.96504	1.634961
Canton Charter Academy	-.538	81.550	85.45482	-3.904818
Capac Community Schools	.279	60.350	58.32486	2.025139
Carman-Ainsworth Community Schools	1.677	56.000	43.81823	12.181769
Caro Community Schools	-.391	53.800	56.64090	-2.840899
Carrollton Public Schools	.794	49.200	43.43077	5.769230
Carson City-Crystal Area Schools	.741	65.350	59.96755	5.382449
Carsonville-Port Sanilac School District	.438	58.350	55.16769	3.182306
Cass City Public Schools	1.750	73.050	60.34226	12.707740
Cassopolis Public Schools	-.521	48.650	52.43166	-3.781662
Cedar Springs Public Schools	1.736	71.100	58.49349	12.606507
Center Line Public Schools	-.319	53.300	55.61783	-2.317833
Central Academy	1.224	52.750	43.85779	8.892207
Central Montcalm Public Schools	-.566	51.250	55.35795	-4.107945
Centreville Public Schools	.504	64.900	61.23824	3.661763
Cesar Chavez Academy	.096	36.800	36.09943	.700572
Chandler Park Academy	.721	36.800	31.56080	5.239202
Chandler Woods Charter Academy	-.026	72.250	72.43729	-.187295
Charlevoix Public Schools	1.034	74.350	66.83794	7.512065
Charlotte Public Schools	.027	61.450	61.25353	.196474
Charyl Stockwell Academy	-.839	69.700	75.79357	-6.093571
Cheboygan Area Schools	2.045	72.900	58.04738	14.852616
Chelsea School District	.757	79.150	73.64995	5.500045
Chesaning Union Schools	-.201	62.300	63.76168	-1.461680
Chippewa Hills School District	.954	57.600	50.66934	6.930664
Chippewa Valley Schools	-.582	63.800	68.02887	-4.228867
Clare Public Schools	-1.495	50.400	61.26089	-10.860893
Clarenceville School District	.418	57.100	54.06514	3.034856
Clarkston Community School District	-.018	68.800	68.92916	-.129157
Clawson Public Schools	-.325	61.800	64.16098	-2.360978
Climax-Scotts Community Schools	-3.586	37.650	63.69033	-26.040328
Clinton Community Schools	.819	71.600	65.65215	5.947855
Clintondale Community Schools	1.588	48.600	37.06912	11.530884
Clio Area School District	-.237	55.500	57.22419	-1.724194

Coldwater Community Schools	-1.001	49.850	57.12063	-7.270633
Coleman Community Schools	.445	59.800	56.56593	3.234074
Coloma Community Schools	-.431	50.000	53.13129	-3.131292
Colon Community School District	-2.468	38.500	56.42761	-17.927612
Columbia School District	.433	60.850	57.70182	3.148176
Comstock Park Public Schools	-1.957	45.500	59.71095	-14.210950
Comstock Public Schools	-.246	50.300	52.08628	-1.786283
Concord Community Schools	-.437	53.100	56.27649	-3.176492
Conner Creek Academy East	-.332	29.250	31.66396	-2.413961
Constantine Public School District	1.005	59.100	51.80280	7.297202
Coopersville Area Public School District	-1.584	53.200	64.70374	-11.503743
Corunna Public Schools	-.911	50.650	57.26303	-6.613034
Covert Public Schools	-1.381	26.000	36.02985	-10.029847
Crawford AuSable Schools	2.126	67.950	52.51047	15.439530
Creative Montessori Academy	.207	64.700	63.19971	1.500287
Crescent Academy	1.268	42.950	33.74180	9.208197
Crestwood School District	1.048	60.450	52.83569	7.614306
Cross Creek Charter Academy	-.479	70.900	74.38009	-3.480085
Crossroads Charter Academy	-1.021	49.900	57.31729	-7.417286
Croswell-Lexington Community Schools	.759	67.500	61.99048	5.509516
Dansville Schools	-.735	58.350	63.68451	-5.334508
David Ellis Academy West	-.331	36.600	39.00526	-2.405264
Davison Community Schools	.552	65.700	61.68952	4.010479
Dearborn City School District	.926	55.250	48.52412	6.725881
Dearborn Heights School District #7	-.103	49.450	50.19825	-.748248
Decatur Public Schools	-.601	48.250	52.61398	-4.363978
Deckerville Community School District	2.256	73.200	56.81422	16.385779
Delton Kellogg Schools	-1.558	45.600	56.91862	-11.318619
Detroit Academy of Arts and Sciences	-1.824	19.550	32.79827	-13.248271
Detroit City School District	-.404	30.750	33.68087	-2.930867
Detroit Community Schools	-1.026	18.950	26.39840	-7.448399
Detroit Enterprise Academy	-1.279	18.200	27.48612	-9.286120
Detroit Merit Charter Academy	4.519	61.900	29.08168	32.818319
Detroit Premier Academy	2.243	43.300	27.01258	16.287425
Detroit Service Learning Academy	2.827	54.450	33.91692	20.533076
DeWitt Public Schools	-.995	68.950	76.17641	-7.226412
Dexter Community School District	-.726	69.950	75.22023	-5.270231
Dowagiac Union School District	.604	52.950	48.56594	4.384065
Dr. Joseph F. Pollack Academic Center of Excellence	1.638	51.200	39.30693	11.893070
Dryden Community Schools	.529	68.400	64.56132	3.838675
Dundee Community Schools	.015	65.750	65.63881	.111190
Durand Area Schools	-1.228	46.150	55.06832	-8.918320
Eagle Crest Charter Academy	.201	72.400	70.93946	1.460543
East China School District	.856	72.650	66.43208	6.217924
East Detroit Public Schools	-1.517	27.550	38.56817	-11.018167
East Grand Rapids Public Schools	.734	85.400	80.06754	5.332457
East Jackson Community Schools	-1.447	38.700	49.21178	-10.511781
East Jordan Public Schools	-.381	55.850	58.61969	-2.769686
East Lansing School District	.552	72.850	68.84102	4.008984
Eaton Academy	-2.184	17.100	32.96327	-15.863273
Eaton Rapids Public Schools	-1.268	52.300	61.50684	-9.206843
Eau Claire Public Schools	1.752	59.600	46.87818	12.721822
Ecorse Public Schools	-1.939	22.400	36.48471	-14.084708
Edison Public School Academy	2.424	59.250	41.64468	17.605316
Edwardsburg Public Schools	2.805	84.450	64.07552	20.374480
Elk Rapids Schools	-.343	65.450	67.94270	-2.492699
Elkton-Pigeon-Bay Port Laker Schools	1.068	68.950	61.19502	7.754979

EMAN Hamilton Academy	-2.405	8.350	25.81637	-17.466375
Endeavor Charter Academy	-.236	60.800	62.51119	-1.711188
Escanaba Area Public Schools	-.651	49.250	53.97602	-4.726021
Essexville-Hampton Public Schools	-.797	62.000	67.78532	-5.785315
Evart Public Schools	-2.174	37.800	53.58692	-15.786921
Excel Charter Academy	-.505	64.500	68.16707	-3.667072
Farmington Public School District	-1.076	64.050	71.86117	-7.811169
Farwell Area Schools	-.289	50.400	52.49584	-2.095839
Fennville Public Schools	1.063	57.600	49.87697	7.723026
Fenton Area Public Schools	1.085	73.100	65.21873	7.881266
Ferndale Public Schools	.198	49.300	47.86275	1.437253
Fitzgerald Public Schools	.349	47.300	44.76491	2.535094
Flagship Charter Academy	.781	30.600	24.92707	5.672925
Flat Rock Community Schools	-.177	59.400	60.68583	-1.285829
Flint, School District of the City of	-.232	29.600	31.28535	-1.685354
Flushing Community Schools	-.575	59.100	63.27775	-4.177747
Forest Area Community Schools	1.473	61.000	50.30094	10.699056
Forest Hills Public Schools	.207	81.400	79.89645	1.503553
Fortis Academy	-.902	49.200	55.74902	-6.549021
Fowler Public Schools	-.630	70.500	75.07654	-4.576536
Fowlerville Community Schools	.265	64.250	62.32433	1.925668
Frankenmuth School District	.109	73.250	72.45483	.795166
Frankfort-Elberta Area Schools	.737	67.750	62.39705	5.352951
Fraser Public Schools	.553	65.300	61.28664	4.013361
Freeland Community School District	.087	73.100	72.46861	.631389
Fremont Public School District	-.908	52.100	58.69349	-6.593486
Fruitport Community Schools	-.206	59.550	61.04584	-1.495839
Fulton Schools	-.576	65.650	69.83365	-4.183646
Galesburg-Augusta Community Schools	-.690	55.800	60.81218	-5.012184
Garden City, School District of the City of	-2.633	36.350	55.47398	-19.123984
Gaylord Community Schools	.765	65.850	60.29701	5.552995
Genesee School District	-2.491	26.300	44.39263	-18.092633
Gibraltar School District	.062	63.650	63.20012	.449879
Gladstone Area Schools	-1.095	51.000	58.94975	-7.949750
Gladwin Community Schools	.749	62.100	56.66280	5.437203
Glen Lake Community Schools	2.926	91.400	70.15281	21.247186
Gobles Public School District	-.181	58.300	59.61420	-1.314198
Godfrey-Lee Public Schools	-1.061	33.100	40.80357	-7.703571
Godwin Heights Public Schools	1.082	51.900	44.04373	7.856269
Goodrich Area Schools	-1.197	62.000	70.68971	-8.689714
Grand Blanc Community Schools	.654	72.500	67.75133	4.748668
Grand Haven Area Public Schools	-.742	62.000	67.38710	-5.387098
Grand Ledge Public Schools	-.475	63.850	67.30275	-3.452755
Grand Rapids Public Schools	.345	37.100	34.59493	2.505074
Grand Traverse Academy	-.798	62.100	67.89837	-5.798368
Grandville Public Schools	.658	73.600	68.81825	4.781750
Grant Public School District	-.129	56.250	57.18837	-.938374
Grass Lake Community Schools	-.229	64.950	66.61196	-1.661959
Great Oaks Academy	1.651	46.750	34.76008	11.989916
Greenville Public Schools	-.836	51.350	57.41838	-6.068384
Grosse Ile Township Schools	-1.066	69.400	77.14270	-7.742697
Grosse Pointe Public Schools	1.186	82.650	74.03537	8.614625
Gull Lake Community Schools	-.433	69.950	73.09155	-3.141548
Gwinn Area Community Schools	.626	48.050	43.50587	4.544128
Hale Area Schools	1.540	58.350	47.16680	11.183202
Hamilton Community Schools	-.175	68.450	69.71891	-1.268914
Hamtramck, School District of the City of	-.027	39.450	39.64867	-.198671

Hancock Public Schools	.616	68.800	64.32733	4.472669
Hanley International Academy	-1.060	28.750	36.44587	-7.695872
Hanover-Horton School District	-.381	61.400	64.16951	-2.769508
Harbor Beach Community Schools	1.899	78.250	64.45982	13.790175
Harbor Springs School District	-.109	72.800	73.58816	-.788159
Harper Creek Community Schools	-1.584	53.100	64.60477	-11.504772
Harper Woods, The School District of the City of	.562	37.350	33.26646	4.083538
Harrison Community Schools	-.340	42.400	44.87103	-2.471028
Hart Public School District	.164	48.700	47.50867	1.191330
Hartford Public Schools	.563	59.500	55.41053	4.089467
Hartland Consolidated Schools	-.744	68.000	73.40271	-5.402713
Haslett Public Schools	1.236	78.650	69.67256	8.977445
Hastings Area School District	.124	62.800	61.89679	.903212
Hazel Park, School District of the City of	.045	41.100	40.77670	.323296
Hemlock Public School District	-1.377	55.750	65.74891	-9.998908
Henry Ford Academy: School for Creative Studies (PSAD)	-.731	34.700	40.00821	-5.308209
Hesperia Community Schools	-.188	51.100	52.46220	-1.362196
Hillman Community Schools	.162	55.350	54.17142	1.178576
Hillsdale Community Schools	.305	51.850	49.63393	2.216067
Holland City School District	.035	52.000	51.74915	.250853
Holly Academy	-.511	68.200	71.90876	-3.708764
Holly Area School District	.987	63.350	56.18093	7.169066
Holt Public Schools	.373	65.750	63.04309	2.706912
Holton Public Schools	.274	49.100	47.11049	1.989513
Homer Community School District	-.347	51.750	54.27187	-2.521865
Hope Academy	1.453	29.450	18.89871	10.551293
Hope of Detroit Academy	-.051	31.050	31.41773	-.367734
Hopkins Public Schools	.949	73.050	66.15788	6.892115
Houghton Lake Community Schools	.060	47.400	46.96606	.433943
Houghton-Portage Township School District	.317	66.650	64.35063	2.299368
Howell Public Schools	1.399	75.750	65.59205	10.157953
Hudson Area Schools	2.794	73.700	53.41060	20.289396
Hudsonville Public School District	.796	79.300	73.51919	5.780805
Huron Academy	-1.500	47.600	58.49347	-10.893468
Huron School District	-1.339	55.750	65.47380	-9.723800
Huron Valley Schools	.521	70.200	66.41570	3.784305
Ida Public School District	.807	74.250	68.38688	5.863122
Imlay City Community Schools	-.602	53.950	58.32053	-4.370531
Inland Lakes Schools	-1.170	48.350	56.84861	-8.498611
International Academy of Flint	2.414	48.200	30.66968	17.530317
Ionia Public Schools	-.053	51.150	51.53806	-.388059
Iron Mountain Public Schools	.784	63.650	57.95304	5.696957
Ironwood Area Schools of Gogebic County	.635	52.000	47.38722	4.612775
Ishpeming Public School District No. 1	.108	51.500	50.71482	.785175
Ithaca Public Schools	-1.249	55.450	64.52038	-9.070378
Jackson Public Schools	-.226	41.450	43.08806	-1.638065
Jefferson Schools (Monroe)	-3.488	43.350	68.68547	-25.335466
Jenison Public Schools	-.584	68.100	72.33839	-4.238386
Johannesburg-Lewiston Area Schools	1.080	66.950	59.10962	7.840377
Jonesville Community Schools	.042	58.750	58.44555	.304449
Kalamazoo Public Schools	-.453	42.950	46.24256	-3.292556
Kaleva Norman Dickson School District	1.024	57.350	49.91042	7.439585
Kalkaska Public Schools	.004	52.300	52.27143	.028575
Kearsley Community School District	.009	52.750	52.68315	.066845

Kelloggsville Public Schools	.200	48.400	46.94822	1.451781
Kenowa Hills Public Schools	-1.642	51.800	63.72183	-11.921832
Kent City Community Schools	1.553	72.800	61.52395	11.276046
Kentwood Public Schools	1.238	60.750	51.75810	8.991899
Keystone Academy	-.250	68.600	70.41372	-1.813720
Kingsley Area Schools	2.172	74.650	58.87788	15.772120
Kingston Community School District	.220	52.700	51.10422	1.595777
Knapp Charter Academy	-.382	58.850	61.62167	-2.771669
L'Anse Area Schools	.241	58.600	56.84798	1.752019
L'Anse Creuse Public Schools	.368	64.650	61.97947	2.670528
Laingsburg Community Schools	-1.089	62.100	70.01120	-7.911197
Lake City Area School District	-.287	51.150	53.23383	-2.083835
Lake Fenton Community Schools	-.554	66.700	70.72518	-4.025184
Lake Linden-Hubbell School District	-.341	49.450	51.92928	-2.479278
Lake Orion Community Schools	1.255	81.150	72.03377	9.116229
Lake Shore Public Schools (Macomb)	-.067	62.000	62.48329	-.483286
Lakeshore School District (Berrien)	1.738	82.550	69.93102	12.618978
Lakeview Community Schools (Montcalm)	-1.798	51.500	64.55722	-13.057219
Lakeview Public Schools (Macomb)	.349	69.750	67.21241	2.537591
Lakeview Sch. District (Calhoun)	-1.498	53.900	64.77728	-10.877282
LakeVille Community School District	1.111	63.300	55.23178	8.068216
Lakewood Public Schools	.663	67.150	62.33429	4.815711
Lamphere Public Schools	.210	61.350	59.82238	1.527620
Landmark Academy	-2.426	42.300	59.92247	-17.622471
Lansing Charter Academy	.317	47.850	45.54857	2.301432
Lansing Public School District	-.778	38.750	44.40377	-5.653774
Lapeer Community Schools	.679	62.900	57.96531	4.934686
Laurus Academy	.742	44.700	39.31239	5.387609
Lawrence Public Schools	-.979	48.650	55.76110	-7.111102
Lawton Community School District	.361	58.750	56.12506	2.624940
Legacy Charter Academy	.557	27.600	23.55725	4.042747
Leslie Public Schools	-1.753	47.250	59.98425	-12.734254
Lincoln Consolidated School District	.006	51.500	51.45366	.046344
Lincoln Park, School District of the City of	-.857	37.200	43.42096	-6.220960
Linden Charter Academy	1.069	35.250	27.48765	7.762355
Linden Community Schools	.091	62.600	61.93976	.660242
Livonia Public Schools School District	.360	71.850	69.23454	2.615456
Lowell Area Schools	-.046	68.650	68.98074	-.330741
Ludington Area School District	1.844	71.500	58.10913	13.390874
Madison Academy	.051	46.700	46.32735	.372652
Madison District Public Schools	1.631	50.400	38.55543	11.844568
Madison School District (Lenawee)	1.106	59.800	51.77000	8.029997
Mancelona Public Schools	.354	52.900	50.33265	2.567346
Manchester Community Schools	1.342	77.050	67.30590	9.744104
Manistee Area Public Schools	-1.439	51.000	61.44833	-10.448330
Manistique Area Schools	.149	55.450	54.36949	1.080514
Manton Consolidated Schools	.076	55.850	55.30155	.548446
Maple Valley Schools	-.413	52.150	55.15248	-3.002478
Marcellus Community Schools	.533	61.200	57.32712	3.872881
Marion Public Schools	-.872	44.300	50.63157	-6.331570
Marlette Community Schools	-1.254	49.850	58.95547	-9.105474
Marquette Area Public Schools	.700	65.400	60.31321	5.086790
Marshall Public Schools	.693	70.350	65.31910	5.030901
Martin Public Schools	-1.363	53.550	63.44578	-9.895782
Marvin L. Winans Academy of Performing Arts	-1.378	28.200	38.20696	-10.006960
Marysville Public Schools	.612	70.500	66.05861	4.441394
Mason Consolidated Schools (Monroe)	-1.607	49.350	61.02389	-11.673889

Mason County Central Schools	.942	61.550	54.70627	6.843735
Mason Public Schools (Ingham)	.070	66.300	65.79083	.509169
Mattawan Consolidated School	.630	79.500	74.92452	4.575484
Mayville Community School District	-1.475	43.300	54.01236	-10.712356
McBain Rural Agricultural Schools	-.327	62.900	65.27722	-2.377218
Melvindale-North Allen Park Schools	-1.226	43.300	52.20444	-8.904440
Memphis Community Schools	.628	65.550	60.99209	4.557908
Mendon Community School District	-.172	59.800	61.04920	-1.249202
Menominee Area Public Schools	-1.077	45.950	53.77436	-7.824356
Meridian Public Schools	-1.564	51.200	62.55849	-11.358488
Merrill Community Schools	1.274	69.200	59.94772	9.252281
Mesick Consolidated Schools	2.081	65.000	49.89001	15.109988
Metro Charter Academy	1.679	60.400	48.20314	12.196858
Michigan Center School District	.278	54.100	52.08385	2.016147
Michigan Connections Academy	-.037	52.700	52.96676	-.266764
Michigan Technical Academy	.118	27.000	26.14157	.858425
Michigan Virtual Charter Academy	-1.112	48.500	56.57868	-8.078678
Midland Public Schools	-.506	69.900	73.57660	-3.676602
Milan Area Schools	.170	65.100	63.86266	1.237338
Millington Community Schools	-.233	58.000	59.69306	-1.693055
Mio-AuSable Schools	.860	56.650	50.40420	6.245804
Mona Shores Public School District	-.293	63.900	66.02923	-2.129232
Monroe Public Schools	-.841	46.850	52.95510	-6.105096
Montabella Community Schools	-1.823	36.550	49.79266	-13.242663
Montague Area Public Schools	.746	62.400	56.98227	5.417734
Montrose Community Schools	-.634	47.950	52.55284	-4.602844
Morenci Area Schools	.076	54.050	53.49773	.552266
Morley Stanwood Community Schools	-.666	47.300	52.13350	-4.833497
Morrice Area Schools	-1.940	43.400	57.48891	-14.088910
Mount Clemens Community School District	-.513	26.900	30.62375	-3.723750
Mt. Morris Consolidated Schools	1.565	53.200	41.83543	11.364565
Mt. Pleasant City School District	-.771	57.250	62.85204	-5.602041
Munising Public Schools	.231	55.550	53.87144	1.678561
Muskegon Heights School District	-1.677	13.400	25.58266	-12.182662
Muskegon, Public Schools of the City of	-.398	30.050	32.94290	-2.892904
Napoleon Community Schools	2.510	77.150	58.92001	18.229993
Negaunee Public Schools	.675	68.350	63.44670	4.903300
New Buffalo Area Schools	-.630	65.800	70.37697	-4.576972
New Haven Community Schools	-.281	48.500	50.53811	-2.038111
New Lothrop Area Public Schools	-1.396	59.000	69.13530	-10.135304
Newaygo Public School District	1.016	62.300	54.92205	7.377949
NICE Community School District	-.379	54.850	57.60231	-2.752307
Niles Community Schools	1.594	63.400	51.82590	11.574104
North Branch Area Schools	.807	63.050	57.18562	5.864382
North Muskegon Public Schools	1.150	79.200	70.84511	8.354887
Northview Public Schools	.252	64.200	62.36641	1.833585
Northville Public Schools	-.157	79.200	80.33964	-1.139636
Northwest Community Schools	-.477	53.800	57.26609	-3.466086
Norway-Vulcan Area Schools	-1.236	49.100	58.07985	-8.979854
Novi Community School District	-.569	78.300	82.43283	-4.132834
Oak Park, School District of the City of	.018	34.100	33.96831	.131687
Oakland International Academy	.799	36.750	30.94617	5.803825
Oakridge Public Schools	-1.921	41.850	55.80213	-13.952132
Okemos Public Schools	1.389	86.250	76.16460	10.085396
Old Redford Academy	-.891	27.750	34.22217	-6.472169
Olivet Community Schools	.455	69.000	65.69473	3.305274
Onaway Area Community School District	3.113	80.950	58.33922	22.610778

Onsted Community Schools	.410	67.200	64.22474	2.975258
Orchard View Schools	.337	50.600	48.15547	2.444525
Oscoda Area Schools	.467	51.300	47.90584	3.394161
Otsego Public Schools	-1.053	58.450	66.09588	-7.645877
Ovid-Elsie Area Schools	.979	69.850	62.74117	7.108828
Owosso Public Schools	.610	55.500	51.06978	4.430216
Oxford Community Schools	.182	70.850	69.52724	1.322759
Paragon Charter Academy	.298	61.850	59.68351	2.166487
Paramount Charter Academy	.092	64.000	63.33015	.669847
Parchment School District	-.567	55.950	60.06525	-4.115254
Paw Paw Public School District	-.310	57.950	60.20099	-2.250988
Pellston Public Schools	-.623	56.500	61.02203	-4.522030
Pennfield Schools	-1.270	51.850	61.07162	-9.221616
Perry Public Schools	-1.691	48.200	60.48433	-12.284335
Pewamo-Westphalia Community Schools	-1.781	63.000	75.93159	-12.931589
Pickford Public Schools	.283	62.500	60.44544	2.054556
Pinckney Community Schools	-.964	60.550	67.55434	-7.004336
Pinconning Area Schools	-.214	57.700	59.25111	-1.551107
Pine River Area Schools	-.056	58.200	58.60714	-.407144
Pittsford Area Schools	-2.378	40.900	58.16745	-17.267453
Plainwell Community Schools	.246	66.900	65.11161	1.788392
Plymouth Educational Center	-1.684	29.500	41.73379	-12.233792
Plymouth-Canton Community Schools	.063	76.650	76.19439	.455609
Pontiac Academy for Excellence	-2.066	19.650	34.65297	-15.002966
Pontiac City School District	.487	36.150	32.61231	3.537689
Port Huron Area School District	-.733	48.150	53.47633	-5.326328
Portage Public Schools	-.159	70.550	71.70220	-1.152196
Portland Public Schools	.594	71.750	67.43257	4.317431
Potterville Public Schools	-2.490	38.150	56.23667	-18.086671
Prevail Academy	.779	55.250	49.59251	5.657490
Public Schools of Calumet	1.729	64.200	51.64192	12.558082
Public Schools of Petoskey	.381	69.400	66.63346	2.766539
Quest Charter Academy	.839	52.000	45.90753	6.092466
Quincy Community Schools	-.630	56.450	61.02316	-4.573158
Ravenna Public Schools	-.777	56.600	62.24201	-5.642005
Reach Charter Academy	-.841	41.900	48.01091	-6.110910
Reading Community Schools	1.394	61.750	51.62936	10.120640
Redford Union Schools, District No. 1	-1.586	27.550	39.06937	-11.519374
Reed City Area Public Schools	.687	59.100	54.11214	4.987862
Reese Public Schools	-1.889	50.000	63.71906	-13.719061
Reeths-Puffer Schools	-.136	57.200	58.18625	-.986246
Richfield Public School Academy	1.279	44.300	35.01112	9.288878
Richmond Community Schools	-.596	59.950	64.27889	-4.328893
Ridge Park Charter Academy	3.160	66.100	43.14953	22.950472
River Rouge, School District of the City of	-1.507	17.550	28.49363	-10.943627
River Valley School District	1.104	68.500	60.48033	8.019670
Riverside Academy	.662	39.200	34.39560	4.804402
Riverview Community School District	-1.480	55.150	65.89568	-10.745676
Rochester Community School District	1.264	85.000	75.82245	9.177548
Rockford Public Schools	-.273	75.050	77.03253	-1.982530
Rogers City Area Schools	-2.109	55.750	71.06591	-15.315915
Romeo Community Schools	-1.180	57.700	66.27313	-8.573126
Romulus Community Schools	.685	46.250	41.27688	4.973123
Roscommon Area Public Schools	-.151	50.700	51.79911	-1.099109
Roseville Community Schools	.058	44.850	44.42792	.422080
Rudyard Area Schools	-1.385	41.500	51.56144	-10.061439
Saginaw Township Community Schools	.036	64.550	64.28755	.262447

Saginaw, School District of the City of	-.051	35.950	36.31976	-.369763
Saline Area Schools	1.193	82.700	74.03389	8.666114
Sand Creek Community Schools	-.554	57.000	61.02201	-4.022014
Sandusky Community School District	-.853	54.300	60.49738	-6.197385
Saranac Community Schools	1.511	72.300	61.32603	10.973970
Saugatuck Public Schools	1.259	77.800	68.65341	9.146588
Sault Ste. Marie Area Schools	1.030	65.550	58.06957	7.480432
School District of the City of Birmingham	.244	83.350	81.57955	1.770450
School District of the City of Inkster	.768	30.800	25.22198	5.578023
School District of the City of Royal Oak	.159	71.050	69.89755	1.152452
School District of Ypsilanti	-.232	39.550	41.23308	-1.683083
Schoolcraft Community Schools	-.519	69.150	72.91936	-3.769360
Shelby Public Schools	-1.402	39.750	49.93499	-10.184994
Shepherd Public Schools	-.808	53.200	59.06929	-5.869294
South Arbor Charter Academy	1.045	83.150	75.56331	7.586691
South Canton Scholars Charter Academy	-.067	80.100	80.58573	-.485731
South Haven Public Schools	-.292	52.750	54.86758	-2.117581
South Lake Schools	-.198	55.450	56.88622	-1.436219
South Lyon Community Schools	1.301	78.450	68.99819	9.451807
South Redford School District	-.566	45.050	49.16208	-4.112076
Southfield Public School District	-.083	47.800	48.40370	-.603700
Southgate Community School District	.524	60.300	56.49379	3.806213
Sparta Area Schools	.022	59.700	59.53797	.162031
Spring Lake Public Schools	1.430	83.150	72.76388	10.386116
Springport Public Schools	-.708	49.350	54.48885	-5.138851
St. Charles Community Schools	-.420	57.800	60.84775	-3.047747
St. Ignace Area Schools	-2.086	48.000	63.15238	-15.152376
St. Johns Public Schools	-.997	60.950	68.19108	-7.241083
St. Joseph Public Schools	-.555	71.700	75.73136	-4.031357
St. Louis Public Schools	.365	60.100	57.45000	2.649995
Standish-Sterling Community Schools	-.925	53.250	59.97009	-6.720091
Star International Academy	.190	49.200	47.82304	1.376956
Stephenson Area Public Schools	.629	61.250	56.68464	4.565359
Stockbridge Community Schools	.660	64.500	59.70348	4.796524
Sturgis Public Schools	.540	58.000	54.07613	3.923867
Summerfield Schools	-1.553	55.150	66.42815	-11.278150
Summit Academy North	.230	56.150	54.48112	1.668882
Suttons Bay Public Schools	-2.339	43.250	60.23760	-16.987598
Swan Valley School District	.052	66.550	66.17472	.375282
Swartz Creek Community Schools	.105	59.000	58.23718	.762816
Tahquamenon Area Schools	.004	50.000	49.97311	.026893
Tawas Area Schools	.460	63.350	60.01015	3.339850
Taylor Exemplar Academy	-1.662	42.150	54.21891	-12.068907
Taylor School District	.311	46.700	44.44011	2.259885
Tecumseh Public Schools	-1.833	54.650	67.96210	-13.312100
The Dearborn Academy	-.693	24.850	29.88205	-5.032047
Thornapple Kellogg School District	-.291	66.150	68.26509	-2.115088
Three Rivers Community Schools	1.000	62.650	55.38936	7.260645
Traverse City Area Public Schools	-.622	60.650	65.16378	-4.513784
Trenton Public Schools	-.004	66.750	66.77952	-.029522
Tri County Area Schools	-1.536	49.250	60.40677	-11.156765
Trillium Academy	-1.693	41.400	53.69714	-12.297135
Triumph Academy	-.598	59.150	63.49135	-4.341354
Troy School District	.653	86.550	81.80571	4.744290
Ubly Community Schools	-.282	63.200	65.24656	-2.046563
Union City Community Schools	-.355	51.700	54.28157	-2.581566
Unionville-Sebewaing Area S.D.	-.950	57.150	64.04988	-6.899877

Universal Academy	-2.009	22.250	36.84334	-14.593345
Universal Learning Academy	-.514	38.250	41.97935	-3.729351
University Preparatory Academy (PSAD)	1.764	48.700	35.88812	12.811877
Utica Community Schools	-.034	69.450	69.69458	-.244585
Van Buren Public Schools	-.486	46.500	50.03071	-3.530712
Van Dyke Public Schools	1.206	43.900	35.14311	8.756892
Vandercook Lake Public Schools	-.183	52.350	53.67856	-1.328558
Vanguard Charter Academy	-.675	62.800	67.70316	-4.903158
Vassar Public Schools	.767	57.500	51.93056	5.569441
Vestaburg Community Schools	-.560	49.000	53.06698	-4.066975
Vicksburg Community Schools	.078	68.800	68.23693	.563074
Vista Charter Academy	.204	44.350	42.86762	1.482380
Voyageur Academy	-.075	29.500	30.04776	-.547759
Walker Charter Academy	-.125	65.300	66.20659	-.906589
Walled Lake Consolidated Schools	.961	76.300	69.31831	6.981693
Walton Charter Academy	.361	42.250	39.62583	2.624175
Warren Consolidated Schools	-1.957	46.250	60.46477	-14.214768
Warren Woods Public Schools	-.874	51.300	57.64670	-6.346704
Warrendale Charter Academy	.856	33.600	27.38151	6.218488
Washington-Parks Academy	-.747	38.450	43.87165	-5.421649
Waterford School District	-.285	55.600	57.66772	-2.067715
Watervliet School District	-.666	50.200	55.03496	-4.834958
Waverly Community Schools	-.523	55.150	58.94523	-3.795233
Wayland Union Schools	.280	65.250	63.21615	2.033850
Wayne-Westland Community School District	-.427	45.050	48.15376	-3.103761
Webberville Community Schools	-.597	56.350	60.68929	-4.339290
West Bloomfield School District	.635	73.750	69.14173	4.608271
West Branch-Rose City Area Schools	.222	58.900	57.28828	1.611719
West Iron County Public Schools	-.206	44.500	45.99510	-1.495097
West MI Academy of Environmental Science	3.035	78.050	56.00994	22.040059
West Ottawa Public School District	1.298	71.550	62.12187	9.428131
Western School District	.884	68.200	61.77713	6.422872
Westwood Community School District	-1.150	30.150	38.50270	-8.352697
Westwood Heights Schools	.548	40.450	36.47316	3.976840
White Cloud Public Schools	-.589	42.100	46.37702	-4.277023
White Pigeon Community Schools	.463	55.450	52.08446	3.365543
Whiteford Agricultural School District of the Counties of Lenawee and Monroe	.662	72.100	67.28910	4.810901
Whitehall District Schools	-.063	60.350	60.80738	-.457382
Whitmore Lake Public School District	.349	62.350	59.81729	2.532714
Whittemore-Prescott Area Schools	-.305	42.050	44.26478	-2.214785
William C. Abney Academy	-.764	23.000	28.54640	-5.546403
Williamston Community Schools	-.220	67.800	69.39815	-1.598154
Willow Run Community Schools	.750	39.600	34.15587	5.444125
Windemere Park Charter Academy	-1.021	52.150	59.56249	-7.412492
Woodhaven-Brownstown School District	-.348	58.450	60.98075	-2.530749
Woodward Academy	-.024	28.000	28.17662	-.176616
Wyandotte, School District of the City of	2.124	62.000	46.57501	15.424990
Wyoming Public Schools	-.250	46.800	48.61215	-1.812151
Yale Public Schools	.449	64.850	61.59234	3.257665
Zeeland Public Schools	-.608	68.400	72.81463	-4.414628

a. Dependent Variable: COMP

b. Cases weighted SQTOTSTU

APPENDIX A7: *ONAWAY ADEQUACY GRANT AWARDS*

District Name	Cost Index	District Size	District PCT_ECDIS	Onaway Adequacy Grant PP	Onaway Adequacy Grant Total
Dearborn City School District	1.09	18931	0.658	$13,183.68	$62,556,069.69
Lincoln Park, School District of the City of	1.14	4773	0.694	$14,515.53	$27,827,363.34
Jackson Public Schools	1.16	6055	0.684	$14,547.67	$26,540,804.41
Roseville Community Schools	1.12	5233	0.641	$13,203.58	$21,681,046.61
Grand Rapids Public Schools	0.87	17091	0.818	$13,138.68	$21,372,048.96
Hamtramck, School District of the City of	1.07	2984	0.885	$17,364.86	$21,304,887.68
Oak Park, School District of the City of	1.12	4181	0.733	$15,126.51	$20,198,873.75
Westwood Community School District	1.38	2748	0.665	$16,853.94	$20,123,132.30
Orchard View Schools	1.28	2656	0.648	$15,237.64	$17,935,177.21
Clintondale Community Schools	1	3715	0.709	$13,054.61	$17,748,442.63
School District of the City of Inkster	1.02	2660	0.874	$16,406.24	$14,994,347.58
Dearborn Heights School District #7	1.29	2909	0.56	$13,257.84	$13,799,428.53
Fitzgerald Public Schools	1.17	2852	0.725	$15,642.02	$13,656,720.97
Bendle Public Schools	1.09	2183	0.722	$14,441.31	$13,617,949.72
Muskegon, Public Schools of the City of	0.99	4652	0.831	$15,107.08	$12,266,425.05
Godwin Heights Public Schools	1.16	2143	0.76	$16,227.98	$12,225,131.31
Van Dyke Public Schools	1.01	3088	0.78	$14,427.63	$11,634,890.68
Wyandotte, School District of the City of	1.25	3961	0.511	$11,729.64	$11,624,069.05
East Detroit Public Schools	0.99	3677	0.704	$12,851.55	$11,126,922.61
Melvindale-North Allen Park Schools	1.13	2844	0.575	$11,946.13	$10,836,493.98
Kentwood Public Schools	1.06	8720	0.561	$10,901.37	$10,664,154.40
Saginaw, School District of the City of	0.86	7896	0.801	$12,691.51	$10,223,363.90
Kelloggsville Public Schools	1.09	2289	0.688	$13,774.61	$9,268,198.92
Godfrey-Lee Public Schools	1.04	1775	0.794	$15,118.84	$9,243,947.50
Carman-Ainsworth Community Schools	1.14	4369	0.63	$13,225.79	$9,122,129.34
Mt. Morris Consolidated Schools	1	2519	0.696	$12,851.69	$8,642,132.23
Sturgis Public Schools	1.01	3287	0.582	$10,780.57	$8,546,197.60
Chippewa Hills School District	1.12	2207	0.599	$12,359.68	$8,076,696.96
Benton Harbor Area Schools	0.75	3089	0.9	$12,387.57	$7,386,498.92
Wayne-Westland Community School District	1.02	12266	0.554	$10,400.23	$7,016,838.65
Holland City School District	1.07	4050	0.599	$11,838.77	$6,509,590.85
Kalamazoo Public Schools	0.93	12504	0.644	$10,981.61	$6,395,870.65
Center Line Public Schools	1.22	2728	0.582	$13,016.26	$6,362,867.24
Harrison Community Schools	1.01	1581	0.67	$12,407.74	$6,158,080.01
Battle Creek Public Schools	0.93	5393	0.752	$12,840.85	$6,031,661.98

Whittemore-Prescott Area Schools	1.03	1017	0.749	$14,156.03	$5,947,693.01
Carrollton Public Schools	0.93	2050	0.66	$11,347.47	$5,932,781.54
Farwell Area Schools	1.19	1453	0.56	$12,211.81	$5,815,671.87
Port Huron Area School District	1.07	9757	0.504	$9,937.76	$5,805,353.29
Dowagiac Union School District	0.92	2397	0.639	$10,755.35	$5,708,644.16
Kearsley Community School District	1.14	3155	0.49	$10,253.59	$5,290,833.53
Crestwood School District	1.04	3398	0.531	$10,130.77	$5,176,998.53
Ferndale Public Schools	1.18	3712	0.542	$11,782.72	$4,840,226.73
Owosso Public Schools	1	3322	0.526	$9,631.79	$4,796,084.24
Hart Public School District	1.1	1269	0.645	$13,061.96	$4,782,522.50
Detroit Community Schools	0.8	1040	0.866	$12,814.35	$4,589,065.01
Constantine Public School District	1.01	1475	0.589	$10,904.16	$4,428,203.97
Mount Clemens Community School District	1.07	1534	0.799	$15,672.26	$4,413,290.45
Bangor Public Schools (Van Buren)	0.93	1265	0.72	$12,375.09	$4,281,247.79
Lansing Public School District	1.03	12754	0.629	$11,936.87	$4,238,733.60
Wyoming Public Schools	0.93	4596	0.621	$10,632.35	$4,101,918.27
Bridgeport-Spaulding Community School District	0.93	1449	0.756	$12,932.84	$3,928,376.21
Madison District Public Schools	0.89	1332	0.723	$11,829.49	$3,925,021.77
Bloomingdale Public School District	0.91	1256	0.728	$12,126.36	$3,880,887.63
Garden City, School District of the City of	1.27	4758	0.417	$9,753.51	$3,805,086.57
Benzie County Central Schools	1.06	1695	0.53	$10,288.35	$3,766,173.67
Coldwater Community Schools	1.02	2974	0.497	$9,348.02	$3,728,395.58
Harper Woods, The School District of the City of	1.1	1231	0.682	$13,770.71	$3,630,335.92
Atherton Community Schools	1.06	866	0.667	$12,996.15	$3,565,233.89
Redford Union Schools, District No. 1	1.06	2968	0.54	$10,480.32	$3,498,688.06
Fennville Public Schools	0.84	1473	0.642	$9,927.39	$3,374,674.82
Reed City Area Public Schools	1.13	1533	0.504	$10,501.71	$3,264,565.78
Madison School District (Lenawee)	1.02	1521	0.586	$11,027.19	$3,255,773.94
Vassar Public Schools	1.18	1405	0.536	$11,622.10	$3,188,618.96
Baldwin Community Schools	1.05	599	0.881	$16,986.17	$3,084,807.99
Houghton Lake Community Schools	0.88	1595	0.665	$10,771.30	$3,075,880.82
Big Rapids Public Schools	1.12	1938	0.458	$9,424.39	$3,075,112.61
Hillsdale Community Schools	0.98	1535	0.558	$10,042.76	$3,018,133.68
Comstock Public Schools	0.95	2100	0.621	$10,851.74	$3,013,094.56
Mancelona Public Schools	1.06	982	0.618	$12,096.89	$3,002,805.89
White Cloud Public Schools	1.02	1123	0.612	$11,521.22	$3,001,054.26
Pontiac City School District	1.11	5430	0.76	$15,540.75	$2,941,851.21
Genesee School District	1.02	825	0.619	$11,628.70	$2,673,795.08
St. Louis Public Schools	1.11	1152	0.517	$10,525.09	$2,566,961.25
Oakridge Public Schools	1.04	1873	0.516	$9,909.20	$2,526,098.26
Vandercook Lake Public Schools	1.13	1275	0.5	$10,371.21	$2,513,959.49

Ionia Public Schools	0.97	3081	0.518	$9,244.21	$2,487,858.07
Manistee Area Public Schools	1.25	1692	0.405	$9,325.11	$2,472,466.18
Hudson Area Schools	1.07	979	0.502	$9,843.27	$2,380,525.78
Michigan Center School District	1.06	1375	0.508	$9,941.82	$2,335,941.08
Ecorse Public Schools	1.06	1016	0.707	$13,826.24	$2,270,807.54
Oscoda Area Schools	0.93	1294	0.631	$10,741.63	$2,078,768.73
Caro Community Schools	0.98	1884	0.499	$8,978.27	$2,031,424.11
Kingston Community School District	1.01	628	0.613	$11,383.26	$2,024,808.73
Flint, School District of the City of	0.96	9606	0.806	$14,221.07	$2,018,993.69
East Jackson Community Schools	0.95	1244	0.569	$9,992.83	$2,014,373.27
Warren Consolidated Schools	1.28	15473	0.465	$10,984.28	$1,968,077.95
Holton Public Schools	0.97	911	0.645	$11,515.86	$1,952,847.74
Crawford AuSable Schools	1.03	1667	0.529	$10,040.61	$1,924,131.50
Cheboygan Area Schools	1.02	1912	0.542	$10,183.95	$1,870,692.63
Homer Community School District	1.1	1054	0.508	$10,269.10	$1,815,269.80
Hartford Public Schools	0.91	1466	0.565	$9,502.80	$1,790,576.04
Fremont Public School District	1.11	2308	0.416	$8,489.14	$1,785,585.89
Van Buren Public Schools	1.1	5274	0.457	$9,214.65	$1,755,130.88
White Pigeon Community Schools	0.92	783	0.613	$10,353.85	$1,721,434.20
Central Montcalm Public Schools	0.95	1862	0.526	$9,205.09	$1,683,457.74
Newaygo Public School District	1	1718	0.533	$9,785.14	$1,670,178.03
Shelby Public Schools	0.98	1505	0.591	$10,637.82	$1,625,437.70
Vestaburg Community Schools	1.06	710	0.524	$10,183.21	$1,575,829.37
Bronson Community School District	0.98	1146	0.527	$9,451.31	$1,396,203.61
Kaleva Norman Dickson School District	0.96	626	0.617	$10,861.65	$1,375,552.91
Morley Stanwood Community Schools	1.02	1356	0.505	$9,439.70	$1,304,751.42
Bentley Community School District in the County of Genesee	0.88	863	0.613	$9,913.15	$1,269,979.06
Beaverton Rural Schools	0.94	1328	0.526	$9,069.55	$1,240,909.38
Mesick Consolidated Schools	0.9	712	0.598	$9,900.96	$1,182,435.50
South Redford School District	1.15	3280	0.463	$9,811.16	$1,153,077.49
Marion Public Schools	1.03	526	0.635	$11,982.82	$1,135,443.41
Montabella Community Schools	0.86	832	0.63	$9,916.54	$1,113,582.67
Westwood Heights Schools	0.9	949	0.666	$11,082.56	$1,079,292.60
Hale Area Schools	0.72	590	0.702	$9,275.63	$1,046,209.22
Manton Consolidated Schools	0.96	949	0.545	$9,660.03	$1,013,713.34
Greenville Public Schools	1.01	3764	0.444	$8,274.73	$993,905.80
Mason County Central Schools	1.01	1436	0.52	$9,638.35	$986,833.39
Coloma Community Schools	0.86	1838	0.565	$8,933.66	$951,598.21
Romulus Community Schools	1	3336	0.65	$11,898.65	$927,126.80
Kalkaska Public Schools	0.87	1574	0.565	$9,020.03	$835,141.30
South Haven Public Schools	0.88	2225	0.526	$8,520.72	$834,620.24

Watervliet School District	0.92	1338	0.519	$8,747.20	$833,848.38
Mio-AuSable Schools	1.06	639	0.559	$10,888.26	$795,987.35
Decatur Public Schools	0.87	953	0.574	$9,194.04	$765,317.90
Deckerville Community School District	0.99	622	0.506	$9,215.57	$755,082.78
Adrian, School District of the City of	0.99	3187	0.57	$10,383.45	$678,703.70
Springport Public Schools	1.03	1050	0.48	$9,114.72	$678,418.82
Gaylord Community Schools	1.06	3104	0.445	$8,640.65	$665,563.77
Alma Public Schools	1	2287	0.479	$8,846.25	$644,016.21
Lawton Community School District	0.91	1015	0.503	$8,427.57	$607,500.82
Ironwood Area Schools of Gogebic County	0.97	918	0.511	$9,081.65	$592,002.69
Mayville Community School District	0.94	779	0.535	$9,217.03	$587,665.79
Lake Linden-Hubbell School District	0.84	515	0.584	$9,046.31	$581,224.32
Morenci Area Schools	1.06	740	0.465	$9,068.38	$473,355.00
Eau Claire Public Schools	0.7	801	0.758	$9,761.48	$462,712.25
Roscommon Area Public Schools	0.99	1403	0.545	$9,924.98	$439,303.00
Forest Area Community Schools	0.91	638	0.594	$9,947.68	$428,149.45
Brandywine Community Schools	0.89	1410	0.513	$8,427.85	$411,139.67
Kingsley Area Schools	0.95	1462	0.447	$7,773.25	$380,755.80
Evart Public Schools	1.15	958	0.45	$9,485.71	$313,469.95
Muskegon Heights School District	0.92	1368	0.87	$14,734.54	$266,351.07
Clio Area School District	1.05	3652	0.43	$8,340.27	$241,115.67
Napoleon Community Schools	1.05	1528	0.416	$8,035.25	$228,096.56
Cassopolis Public Schools	0.92	1101	0.544	$9,216.37	$165,085.17
Tawas Area Schools	0.91	1304	0.465	$7,761.91	$153,798.94
Laingsburg Community Schools	1.04	1166	0.417	$7,955.17	$137,316.10
West Branch-Rose City Area Schools	0.97	2205	0.518	$9,225.42	$111,711.74
Union City Community Schools	0.97	1140	0.49	$8,744.98	$70,757.15
Pinconning Area Schools	1	1473	0.442	$8,112.85	$57,026.75
Ludington Area School District	1	2209	0.464	$8,514.72	$28,603.33
Lawrence Public Schools	0.87	682	0.503	$8,033.86	$27,084.35
Carsonville-Port Sanilac School District	0.89	600	0.523	$8,579.08	$2,148.69
Onaway Area Community School District	0.89	664	0.554	$9,069.05	$0
				Total to State	**$741,851,417.77**

APPENDIX A8: *GLEN LAKE ADEQUACY GRANT AWARDS*

District Name	Cost Index	District Size	District PCT_ECDIS	Glen Lake Adequacy Grant PP	Glen Lake Adequacy Grant Total
Detroit City School District	0.88	66132	0.81	$34,585	$1,410,833,822
Dearborn City School District	1.09	18931	0.66	$34,809	$471,952,967
Grand Rapids Public Schools	0.87	17091	0.82	$34,691	$389,716,039
Warren Consolidated Schools	1.28	15473	0.47	$29,002	$280,760,070
Lansing Public School District	1.03	12754	0.63	$31,517	$253,968,963
Kalamazoo Public Schools	0.93	12504	0.64	$28,995	$231,637,859
Flint, School District of the City of	0.96	9606	0.81	$37,548	$226,102,097
Wayne-Westland Community School District	1.02	12266	0.55	$27,460	$216,273,926
Utica Community Schools	1.29	28697	0.24	$15,303	$186,694,532
Saginaw, School District of the City of	0.86	7896	0.8	$33,510	$174,605,522
Jackson Public Schools	1.16	6055	0.68	$38,411	$171,032,208
Kentwood Public Schools	1.06	8720	0.56	$28,783	$166,594,994
Port Huron Area School District	1.07	9757	0.5	$26,239	$164,857,403
Lincoln Park, School District of the City of	1.14	4773	0.69	$38,326	$141,474,502
Pontiac City School District	1.11	5430	0.76	$41,033	$141,364,186
Roseville Community Schools	1.12	5233	0.64	$34,862	$135,019,331
LAnse Creuse Public Schools	1.12	11768	0.38	$20,446	$129,737,112
Muskegon, Public Schools of the City of	0.99	4652	0.83	$39,888	$127,546,601
Taylor School District	0.9	7443	0.63	$27,563	$124,347,647
Oak Park, School District of the City of	1.12	4181	0.73	$39,939	$123,940,560
Battle Creek Public Schools	0.93	5393	0.75	$33,904	$119,626,481
West Ottawa Public School District	1.13	7389	0.44	$24,012	$109,715,836
Hamtramck, School District of the City of	1.07	2984	0.89	$45,849	$106,302,031
Southfield Public School District	1.12	7561	0.5	$27,024	$106,006,884
Carman-Ainsworth Community Schools	1.14	4369	0.63	$34,921	$103,906,796
Bay City School District	0.96	8543	0.43	$19,807	$103,838,668
Clintondale Community Schools	1	3715	0.71	$34,469	$97,301,534
Westwood Community School District	1.38	2748	0.67	$44,500	$96,094,955
East Detroit Public Schools	0.99	3677	0.7	$33,932	$88,641,487
Wyandotte, School District of the City of	1.25	3961	0.51	$30,970	$87,836,142
Fitzgerald Public Schools	1.17	2852	0.73	$41,300	$86,834,083
School District of the City of Inkster	1.02	2660	0.87	$43,318	$86,579,821
Holland City School District	1.07	4050	0.6	$31,258	$85,159,107
Van Dyke Public Schools	1.01	3088	0.78	$38,094	$84,716,265
Orchard View Schools	1.28	2656	0.65	$40,233	$84,321,747

Wyoming Public Schools	0.93	4596	0.62	$28,073	$84,259,339
Van Buren Public Schools	1.1	5274	0.46	$24,330	$81,472,555
Monroe Public Schools	0.93	6217	0.48	$21,834	$81,172,627
Garden City, School District of the City of	1.27	4758	0.42	$25,753	$79,928,721
Dearborn Heights School District #7	1.29	2909	0.56	$35,005	$77,062,571
Ferndale Public Schools	1.18	3712	0.54	$31,110	$76,584,595
Hazel Park, School District of the City of	0.8	4490	0.68	$26,436	$73,374,713
Benton Harbor Area Schools	0.75	3089	0.9	$32,707	$70,154,510
Chippewa Valley Schools	1.14	16207	0.22	$12,395	$70,016,233
Godwin Heights Public Schools	1.16	2143	0.76	$42,847	$69,270,580
Sturgis Public Schools	1.01	3287	0.58	$28,464	$66,672,923
Melvindale-North Allen Park Schools	1.13	2844	0.58	$31,542	$66,566,784
Romulus Community Schools	1	3336	0.65	$31,417	$66,038,682
Bendle Public Schools	1.09	2183	0.72	$38,130	$65,330,348
Southgate Community School District	1.06	5387	0.4	$20,316	$64,744,300
Center Line Public Schools	1.22	2728	0.58	$34,367	$64,608,699
Traverse City Area Public Schools	0.9	9769	0.34	$14,870	$63,179,740
Mt. Morris Consolidated Schools	1	2519	0.7	$33,933	$61,745,561
Crestwood School District	1.04	3398	0.53	$26,749	$61,644,682
Lapeer Community Schools	0.95	6026	0.4	$18,581	$61,429,946
Kelloggsville Public Schools	1.09	2289	0.69	$36,370	$60,988,313
Fraser Public Schools	1.08	5277	0.39	$20,616	$59,451,441
School District of Ypsilanti	1	3654	0.59	$28,663	$58,731,756
Kearsley Community School District	1.14	3155	0.49	$27,073	$58,355,997
Owosso Public Schools	1	3322	0.53	$25,431	$57,281,764
Davison Community Schools	1.04	5541	0.36	$18,301	$55,819,343
Adrian, School District of the City of	0.99	3187	0.57	$27,416	$54,960,989
Redford Union Schools, District No. 1	1.06	2968	0.54	$27,672	$54,522,494
South Redford School District	1.15	3280	0.46	$25,905	$53,940,252
Godfrey-Lee Public Schools	1.04	1775	0.79	$39,919	$53,264,052
Lincoln Consolidated School District	1.05	4550	0.43	$21,803	$53,023,761
Chippewa Hills School District	1.12	2207	0.6	$32,634	$52,821,647
Alpena Public Schools	1.01	4054	0.44	$21,551	$52,301,073
Greenville Public Schools	1.01	3764	0.44	$21,848	$52,084,122
Walled Lake Consolidated Schools	1.18	15402	0.23	$13,093	$51,384,100
Waterford School District	0.7	10933	0.42	$14,248	$51,046,815
Clio Area School District	1.05	3652	0.43	$22,021	$50,203,733
Saginaw Township Community Schools	1.06	5060	0.35	$18,095	$50,073,047
Coldwater Community Schools	1.02	2974	0.5	$24,682	$49,331,556
Ionia Public Schools	0.97	3081	0.52	$24,408	$49,207,095
Dowagiac Union School District	0.92	2397	0.64	$28,398	$47,997,589

Warren Woods Public Schools	1.08	3409	0.44	$22,974	$47,242,289
Niles Community Schools	0.81	3781	0.54	$21,279	$46,799,007
Brandon School District in the Counties of Oakland and Lapeer	1.46	3262	0.33	$23,189	$46,795,757
Gaylord Community Schools	1.06	3104	0.45	$22,814	$44,660,494
Reeths-Puffer Schools	1.05	3802	0.41	$20,709	$44,371,256
Huron Valley Schools	1.13	9918	0.24	$13,365	$44,353,185
Carrollton Public Schools	0.93	2050	0.66	$29,961	$44,090,916
Mount Clemens Community School District	1.07	1534	0.8	$41,380	$43,849,161
Woodhaven-Brownstown School District	1.15	4764	0.32	$17,855	$43,538,807
Livonia Public Schools School District	1.21	15251	0.22	$12,685	$43,315,465
Swartz Creek Community Schools	1.04	3963	0.38	$19,244	$41,202,629
Comstock Public Schools	0.95	2100	0.62	$28,652	$40,394,288
Cadillac Area Public Schools	0.91	3073	0.49	$21,381	$39,828,204
Cedar Springs Public Schools	1.01	3358	0.42	$20,600	$38,441,937
Harrison Community Schools	1.01	1581	0.67	$32,761	$38,336,072
Lamphere Public Schools	1.13	2739	0.44	$24,240	$37,382,621
Howell Public Schools	1.01	8065	0.26	$12,618	$37,277,659
Lake Shore Public Schools (Macomb)	1.08	3554	0.41	$21,585	$37,207,821
Flushing Community Schools	1.18	4240	0.3	$16,862	$36,932,803
Farwell Area Schools	1.19	1453	0.56	$32,243	$34,921,501
Bridgeport-Spaulding Community School District	0.93	1449	0.76	$34,147	$34,667,870
Holt Public Schools	1.02	5846	0.32	$15,881	$34,504,507
Waverly Community Schools	1.15	2823	0.4	$22,308	$33,983,044
Fremont Public School District	1.11	2308	0.42	$22,414	$33,924,693
Alma Public Schools	1	2287	0.48	$23,357	$33,830,380
Cheboygan Area Schools	1.02	1912	0.54	$26,889	$33,810,964
Three Rivers Community Schools	0.84	2704	0.51	$20,731	$33,591,829
West Branch-Rose City Area Schools	0.97	2205	0.52	$24,358	$33,479,615
Muskegon Heights School District	0.92	1368	0.87	$38,904	$33,330,465
Sparta Area Schools	1.16	2844	0.38	$21,102	$33,073,278
Big Rapids Public Schools	1.12	1938	0.46	$24,884	$33,035,093
Oakridge Public Schools	1.04	1873	0.52	$26,164	$32,970,738
Grand Haven Area Public Schools	1.07	5963	0.3	$15,349	$32,601,420
Benzie County Central Schools	1.06	1695	0.53	$27,165	$32,371,701
South Lake Schools	1.13	2160	0.46	$25,279	$32,152,619
Hart Public School District	1.1	1269	0.65	$34,488	$31,972,209
Grand Blanc Community Schools	1.04	8740	0.24	$12,163	$31,949,921
South Haven Public Schools	0.88	2225	0.53	$22,498	$31,933,220
Harper Woods, The School District of the City of	1.1	1231	0.68	$36,359	$31,436,982
North Branch Area Schools	1	2433	0.43	$20,774	$31,332,685

Houghton Lake Community Schools	0.88	1595	0.67	$28,440	$31,257,323
Bangor Township Schools	0.98	2533	0.42	$20,235	$31,221,582
Ludington Area School District	1	2209	0.46	$22,482	$30,881,834
Fruitport Community Schools	1.03	3048	0.39	$19,580	$30,829,272
Constantine Public School District	1.01	1475	0.59	$28,791	$30,810,869
Northview Public Schools	1.07	3435	0.35	$18,336	$30,776,067
Madison School District (Lenawee)	1.02	1521	0.59	$29,116	$30,768,157
Northwest Community Schools	0.93	2871	0.41	$18,305	$30,341,960
Vassar Public Schools	1.18	1405	0.54	$30,686	$29,973,847
Bangor Public Schools (Van Buren)	0.93	1265	0.72	$32,674	$29,959,956
Central Montcalm Public Schools	0.95	1862	0.53	$24,305	$29,798,714
Caro Community Schools	0.98	1884	0.5	$23,706	$29,777,905
Madison District Public Schools	0.89	1332	0.72	$31,234	$29,771,688
Kenowa Hills Public Schools	1	3311	0.37	$18,001	$29,742,604
Reed City Area Public Schools	1.13	1533	0.5	$27,728	$29,672,620
Whittemore-Prescott Area Schools	1.03	1017	0.75	$37,377	$29,563,164
Crawford AuSable Schools	1.03	1667	0.53	$26,511	$29,379,668
Belding Area School District	0.92	2060	0.52	$23,037	$29,374,637
Newaygo Public School District	1	1718	0.53	$25,836	$29,245,753
Bloomingdale Public School District	0.91	1256	0.73	$32,018	$28,864,457
Imlay City Community Schools	1.01	2189	0.43	$21,187	$28,677,526
Manistee Area Public Schools	1.25	1692	0.41	$24,621	$28,353,919
Hillsdale Community Schools	0.98	1535	0.56	$26,516	$28,305,054
Shelby Public Schools	0.98	1505	0.59	$28,087	$27,887,186
Coloma Community Schools	0.86	1838	0.57	$23,588	$27,886,131
Fennville Public Schools	0.84	1473	0.64	$26,212	$27,361,460
Corunna Public Schools	1.01	2243	0.42	$20,739	$27,314,210
Riverview Community School District	1.22	2832	0.31	$18,075	$27,194,735
Willow Run Community Schools	0.87	1672	0.68	$28,634	$27,118,407
Escanaba Area Public Schools	1.01	2573	0.38	$18,611	$27,000,469
Clarenceville School District	1.08	1856	0.46	$24,267	$26,903,503
Mt. Pleasant City School District	0.95	3493	0.37	$17,255	$26,617,408
Detroit Community Schools	0.8	1040	0.87	$33,834	$26,449,777
Beecher Community School District	0.77	1500	0.82	$30,722	$25,932,280
Pennfield Schools	0.97	2100	0.42	$19,977	$25,829,941
Grandville Public Schools	1.14	5672	0.25	$13,787	$25,681,372
Berrien Springs Public Schools	0.83	2140	0.52	$20,939	$25,595,247
Ecorse Public Schools	1.06	1016	0.71	$36,506	$25,313,434
Midland Public Schools	1.12	8137	0.23	$12,660	$25,300,535
River Rouge, School District of the City of	0.92	1147	0.85	$38,152	$25,278,959
Hastings Area School District	0.97	2857	0.36	$16,825	$25,204,246

Mona Shores Public School District	0.98	3793	0.32	$15,398	$25,125,638
Oscoda Area Schools	0.93	1294	0.63	$28,362	$24,878,980
Gladwin Community Schools	0.91	1824	0.5	$22,146	$24,798,274
Michigan Center School District	1.06	1375	0.51	$26,250	$24,759,423
Hartford Public Schools	0.91	1466	0.57	$25,091	$24,642,337
White Cloud Public Schools	1.02	1123	0.61	$30,420	$24,224,334
Vandercook Lake Public Schools	1.13	1275	0.5	$27,384	$24,204,679
Kalkaska Public Schools	0.87	1574	0.57	$23,816	$24,123,944
Western School District	1	2927	0.34	$16,308	$23,852,568
Berkley School District	1.24	4606	0.25	$14,961	$23,844,907
Mason County Central Schools	1.01	1436	0.52	$25,449	$23,690,264
Airport Community Schools	0.95	2648	0.38	$17,601	$23,350,414
Roscommon Area Public Schools	0.99	1403	0.55	$26,205	$23,280,644
Comstock Park Public Schools	0.99	2344	0.4	$18,902	$23,169,748
Allen Park Public Schools	1.16	3777	0.26	$14,623	$23,068,447
Standish-Sterling Community Schools	1	1711	0.45	$21,680	$22,757,451
Grant Public School District	0.86	2071	0.47	$19,821	$22,682,769
Sault Ste. Marie Area Schools	0.92	2435	0.4	$17,900	$22,548,114
Mancelona Public Schools	1.06	982	0.62	$31,940	$22,488,670
East China School District	1.06	4657	0.27	$13,862	$22,464,583
St. Louis Public Schools	1.11	1152	0.52	$27,790	$22,455,953
East Jackson Community Schools	0.95	1244	0.57	$26,384	$22,405,595
Gibraltar School District	1.1	3761	0.27	$14,680	$22,333,254
Morley Stanwood Community Schools	1.02	1356	0.51	$24,924	$22,301,510
Croswell-Lexington Community Schools	0.86	2150	0.44	$18,582	$22,134,714
Atherton Community Schools	1.06	866	0.67	$34,314	$22,026,733
Edwardsburg Public Schools	0.94	2718	0.34	$15,587	$21,940,493
Wayland Union Schools	0.94	2820	0.35	$15,965	$21,569,254
Tri County Area Schools	0.89	2267	0.4	$17,373	$21,438,715
Hesperia Community Schools	1.15	1132	0.57	$32,112	$21,285,869
Durand Area Schools	1.01	1628	0.43	$21,336	$21,152,267
Beaverton Rural Schools	0.94	1328	0.53	$23,947	$20,997,770
Paw Paw Public School District	0.87	2304	0.4	$16,982	$20,886,842
Shepherd Public Schools	1.03	1803	0.39	$19,526	$20,769,618
Napoleon Community Schools	1.05	1528	0.42	$21,216	$20,367,989
Portage Public Schools	1.06	8671	0.22	$11,018	$20,312,698
Whitehall District Schools	0.99	2221	0.36	$17,432	$20,198,295
Charlotte Public Schools	0.88	2678	0.38	$16,141	$20,142,479
Eaton Rapids Public Schools	0.96	2618	0.36	$16,618	$20,052,911
Watervliet School District	0.92	1338	0.52	$23,096	$20,032,003
Delton Kellogg Schools	0.98	1515	0.46	$21,767	$19,958,353

Brandywine Community Schools	0.89	1410	0.51	$22,252	$19,903,756
Clare Public Schools	1.01	1543	0.43	$21,196	$19,864,720
Baldwin Community Schools	1.05	599	0.88	$44,849	$19,774,816
Otsego Public Schools	0.96	2353	0.35	$16,504	$19,769,890
Pinconning Area Schools	1	1473	0.44	$21,421	$19,659,480
Columbia School District	1.12	1533	0.39	$21,098	$19,649,818
Public Schools of Petoskey	0.96	2947	0.33	$15,174	$19,607,399
Homer Community School District	1.1	1054	0.51	$27,114	$19,569,716
Montrose Community Schools	0.99	1405	0.48	$22,746	$19,518,845
Parchment School District	0.93	1743	0.45	$20,271	$19,250,240
Bronson Community School District	0.98	1146	0.53	$24,955	$19,163,069
Holton Public Schools	0.97	911	0.65	$30,406	$19,161,581
Kingsley Area Schools	0.95	1462	0.45	$20,524	$19,022,408
Plainwell Community Schools	0.97	2713	0.32	$15,038	$18,824,594
Romeo Community Schools	1.08	5373	0.24	$12,429	$18,732,261
Allegan Public Schools	1.01	2700	0.32	$15,449	$18,686,136
Montague Area Public Schools	1	1472	0.43	$21,129	$18,531,277
Lakeview Sch. District (Calhoun)	0.91	3920	0.3	$13,208	$18,501,393
Genesee School District	1.02	825	0.62	$30,704	$18,410,703
Westwood Heights Schools	0.9	949	0.67	$29,262	$18,331,335
Hudson Area Schools	1.07	979	0.5	$25,990	$18,187,781
Gwinn Area Community Schools	0.88	1212	0.57	$24,500	$17,987,846
Public Schools of Calumet	0.85	1505	0.48	$19,764	$17,260,698
Fowlerville Community Schools	0.97	2998	0.29	$13,448	$17,221,599
Jonesville Community Schools	0.95	1469	0.42	$19,234	$17,146,967
Cassopolis Public Schools	0.92	1101	0.54	$24,334	$16,809,997
Birch Run Area Schools	1	1886	0.34	$16,740	$16,766,015
Tawas Area Schools	0.91	1304	0.47	$20,494	$16,756,560
Union City Community Schools	0.97	1140	0.49	$23,090	$16,423,784
Springport Public Schools	1.03	1050	0.48	$24,066	$16,377,237
Meridian Public Schools	1.18	1291	0.37	$21,140	$16,297,792
Lakeview Public Schools (Macomb)	1.13	3795	0.24	$13,202	$16,265,304
Kent City Community Schools	1.08	1291	0.41	$21,647	$16,124,897
Manton Consolidated Schools	0.96	949	0.55	$25,506	$16,051,326
Maple Valley Schools	0.92	1223	0.49	$21,907	$16,044,386
Buena Vista School District	0.92	644	0.92	$41,135	$16,005,557
Anchor Bay School District	1.05	6226	0.21	$10,898	$15,991,838
Holly Area School District	0.86	3441	0.35	$14,604	$15,875,330
Lakewood Public Schools	0.87	2072	0.37	$15,679	$15,806,029
Pine River Area Schools	0.97	1168	0.47	$22,037	$15,791,147
New Haven Community Schools	1.05	1328	0.41	$20,981	$15,675,088

Fenton Area Public Schools	1	3546	0.26	$12,542	$15,673,926
Quincy Community Schools	0.99	1278	0.42	$20,090	$15,569,177
Coopersville Area Public School District	1.12	2475	0.29	$15,587	$15,551,896
Algonac Community School District	0.9	1907	0.38	$16,649	$15,549,188
Menominee Area Public Schools	0.93	1675	0.39	$17,457	$15,450,816
Laingsburg Community Schools	1.04	1166	0.42	$21,004	$15,352,683
Bentley Community School District in the County of Genesee	0.88	863	0.61	$26,174	$15,303,187
Thornapple Kellogg School District	1.05	3050	0.27	$13,624	$15,229,535
Evart Public Schools	1.15	958	0.45	$25,046	$15,219,770
Decatur Public Schools	0.87	953	0.57	$24,275	$15,137,861
Millington Community Schools	0.87	1402	0.45	$19,108	$15,044,717
White Pigeon Community Schools	0.92	783	0.61	$27,338	$15,019,789
St. Charles Community Schools	1.04	1108	0.43	$21,567	$14,759,009
East Jordan Public Schools	1.02	1027	0.47	$23,310	$14,723,873
Montabella Community Schools	0.86	832	0.63	$26,183	$14,647,318
Lawton Community School District	0.91	1015	0.5	$22,252	$14,638,953
Bullock Creek School District	1.03	1980	0.32	$15,762	$14,625,654
Yale Public Schools	0.98	2083	0.32	$15,312	$14,409,172
Edison Public School Academy	0.74	1201	0.59	$20,981	$14,328,040
Marlette Community Schools	0.97	1022	0.48	$22,633	$14,300,909
Ironwood Area Schools of Gogebic County	0.97	918	0.51	$23,979	$14,267,457
Essexville-Hampton Public Schools	1.11	1771	0.3	$16,175	$14,260,750
Linden Community Schools	0.98	2966	0.27	$12,718	$14,249,562
Cass City Public Schools	1	1104	0.44	$21,450	$13,995,076
Buchanan Community Schools	0.88	1552	0.41	$17,473	$13,892,947
Kingston Community School District	1.01	628	0.61	$30,056	$13,751,100
Chesaning Union Schools	1.07	1621	0.32	$16,844	$13,708,365
Vestaburg Community Schools	1.06	710	0.52	$26,887	$13,435,625
Boyne City Public Schools	0.97	1304	0.42	$19,846	$13,338,310
Eau Claire Public Schools	0.7	801	0.76	$25,774	$13,288,449
Albion Public Schools	0.75	820	0.78	$28,286	$13,215,248
Ovid-Elsie Area Schools	1.06	1704	0.32	$16,389	$13,177,984
Lakeview Community Schools (Montcalm)	1.04	1337	0.35	$17,775	$13,007,206
Flat Rock Community Schools	0.99	1892	0.33	$16,016	$12,786,612
Mesick Consolidated Schools	0.9	712	0.6	$26,142	$12,745,993
Carson City-Crystal Area Schools	0.91	1062	0.44	$19,667	$12,633,217
Perry Public Schools	1.02	1510	0.35	$17,158	$12,538,471
Kaleva Norman Dickson School District	0.96	626	0.62	$28,678	$12,528,880
Harper Creek Community Schools	0.9	2532	0.32	$14,129	$12,476,901
Portland Public Schools	1.16	2029	0.25	$14,113	$12,439,931
Mayville Community School District	0.94	779	0.54	$24,336	$12,365,431

Covert Public Schools	0.99	531	0.94	$44,987	$12,330,104
Olivet Community Schools	0.97	1561	0.33	$15,684	$12,294,173
Mio-AuSable Schools	1.06	639	0.56	$28,749	$12,208,828
Lowell Area Schools	1	3791	0.25	$11,923	$12,165,797
Sandusky Community School District	0.88	1090	0.45	$19,339	$12,109,242
Galesburg-Augusta Community Schools	0.92	1160	0.43	$19,228	$11,889,307
West Iron County Public Schools	0.89	872	0.51	$22,163	$11,846,497
East Lansing School District	1.06	3423	0.27	$13,692	$11,819,274
Brown City Community Schools	0.92	918	0.48	$21,309	$11,813,333
Inland Lakes Schools	0.93	869	0.49	$22,016	$11,790,513
Grand Ledge Public Schools	1	5087	0.22	$10,577	$11,691,019
Stockbridge Community Schools	0.98	1570	0.33	$15,932	$11,568,547
Morenci Area Schools	1.06	740	0.47	$23,944	$11,481,039
Marion Public Schools	1.03	526	0.64	$31,639	$11,474,458
Swan Valley School District	0.95	1815	0.31	$14,058	$11,473,211
Bad Axe Public Schools	1.02	1144	0.36	$17,791	$11,383,091
Richmond Community Schools	1.09	1683	0.27	$14,496	$11,366,970
Ithaca Public Schools	0.99	1322	0.35	$17,042	$11,259,645
Capac Community Schools	1.01	1371	0.35	$17,197	$11,214,635
Reading Community Schools	0.92	843	0.49	$21,765	$11,199,305
Allendale Public Schools	1.02	2389	0.27	$13,386	$11,180,658
Avondale School District	1.06	3573	0.26	$13,378	$11,044,419
Breitung Township School District	0.94	1676	0.32	$14,423	$11,037,863
Rudyard Area Schools	0.93	814	0.53	$23,956	$10,940,027
Forest Area Community Schools	0.91	638	0.59	$26,265	$10,838,779
Coleman Community Schools	0.97	766	0.48	$22,710	$10,784,628
St. Johns Public Schools	0.97	3204	0.24	$11,446	$10,750,921
McBain Rural Agricultural Schools	1.07	1097	0.34	$17,415	$10,462,376
Gladstone Area Schools	1	1565	0.29	$14,079	$10,431,080
Alcona Community Schools	1.09	772	0.44	$23,372	$10,243,996
Deckerville Community School District	0.99	622	0.51	$24,332	$10,157,660
Hopkins Public Schools	0.96	1595	0.31	$14,652	$10,046,354
Johannesburg-Lewiston Area Schools	0.97	786	0.46	$21,774	$10,028,367
Hale Area Schools	0.72	590	0.7	$24,491	$10,023,178
Blissfield Community Schools	1.01	1250	0.33	$16,049	$9,973,640
Lake City Area School District	0.95	1158	0.36	$16,763	$9,935,621
South Lyon Community Schools	1.08	7056	0.18	$9,484	$9,857,898
Concord Community Schools	0.98	805	0.44	$20,886	$9,855,323
Onaway Area Community School District	0.89	664	0.65	$28,195	$12,699,847
Jefferson Schools (Monroe)	1	2074	0.31	$15,174	$9,749,581
Potterville Public Schools	0.88	981	0.43	$18,198	$9,650,941

Hanover-Horton School District	1.13	1288	0.28	$15,388	$9,645,664
Saranac Community Schools	0.95	1152	0.35	$16,022	$9,526,118
Elkton-Pigeon-Bay Port Laker Schools	0.94	940	0.4	$18,254	$9,426,211
Reese Public Schools	0.98	911	0.4	$18,889	$9,393,652
Marcellus Community Schools	0.83	797	0.5	$20,152	$9,376,417
Leslie Public Schools	0.84	1378	0.37	$14,938	$9,204,942
Almont Community Schools	1	1624	0.27	$13,216	$9,109,864
LAnse Area Schools	0.98	726	0.45	$21,519	$9,088,206
Lawrence Public Schools	0.87	682	0.5	$21,212	$9,014,668
Pittsford Area Schools	1.01	671	0.43	$20,931	$8,723,131
Marquette Area Public Schools	0.97	3007	0.25	$11,854	$8,708,271
Vicksburg Community Schools	0.89	2506	0.27	$11,727	$8,687,932
Manistique Area Schools	0.85	842	0.47	$19,418	$8,683,036
Mason Public Schools (Ingham)	1.04	2992	0.23	$11,769	$8,669,008
School District of the City of Royal Oak	1	5172	0.24	$11,650	$8,660,484
Fulton Schools	1.03	1059	0.32	$15,823	$8,562,418
Bellevue Community Schools	0.87	616	0.53	$22,359	$8,486,197
Milan Area Schools	0.98	2586	0.26	$12,583	$8,449,166
Carsonville-Port Sanilac School District	0.89	600	0.52	$22,652	$8,445,726
Tahquamenon Area Schools	0.94	755	0.46	$20,945	$8,409,994
Byron Area Schools	1.06	1154	0.3	$15,527	$8,389,564
Marysville Public Schools	0.98	2662	0.24	$11,363	$8,379,818
Onsted Community Schools	0.91	1550	0.3	$13,402	$8,328,813
Ravenna Public Schools	0.93	1064	0.37	$16,566	$8,240,963
Lake Linden-Hubbell School District	0.84	515	0.58	$23,885	$8,223,332
Addison Community Schools	0.97	897	0.38	$17,991	$8,184,259
Elk Rapids Schools	1.02	1414	0.28	$13,837	$8,127,210
Bath Community Schools	1.05	1010	0.31	$15,633	$8,038,636
Huron School District	1.03	2399	0.25	$12,593	$8,020,145
Frankfort-Elberta Area Schools	1.16	531	0.44	$24,828	$7,970,178
Ishpeming Public School District No. 1	0.92	841	0.4	$17,626	$7,959,149
Pinckney Community Schools	1.02	4158	0.2	$10,061	$7,839,344
Gobles Public School District	0.81	859	0.43	$16,853	$7,783,210
Marshall Public Schools	0.86	2334	0.29	$11,901	$7,538,347
Centreville Public Schools	0.88	917	0.38	$16,377	$7,503,160
Bark River-Harris School District	0.96	691	0.4	$18,431	$7,445,646
Charlevoix Public Schools	0.97	1101	0.34	$16,186	$7,441,075
Farmington Public School District	1.18	11269	0.23	$13,031	$7,380,905
Iron Mountain Public Schools	0.86	1180	0.34	$13,983	$7,374,384
Breckenridge Community Schools	0.91	799	0.4	$17,603	$7,342,420
Baraga Area Schools	1.16	509	0.45	$25,220	$7,290,308

Clawson Public Schools	1.11	1794	0.3	$16,038	$7,269,499
Sand Creek Community Schools	0.92	952	0.35	$15,603	$7,246,001
Clarkston Community School District	1.11	8012	0.19	$10,349	$7,217,936
Unionville-Sebewaing Area S.D.	0.94	810	0.38	$17,144	$7,122,489
Ubly Community Schools	0.99	793	0.35	$17,070	$7,036,441
St. Ignace Area Schools	0.93	660	0.43	$19,404	$6,940,265
Mason Consolidated Schools (Monroe)	0.88	1178	0.38	$16,191	$6,912,845
Dundee Community Schools	0.97	1614	0.26	$12,199	$6,907,746
LakeVille Community School District	0.95	1628	0.27	$12,666	$6,793,142
Clinton Community Schools	1.02	1165	0.27	$13,316	$6,602,258
Martin Public Schools	1	586	0.38	$18,672	$6,345,480
Stephenson Area Public Schools	0.92	660	0.39	$17,194	$6,225,863
Colon Community School District	0.81	630	0.48	$18,859	$6,156,555
Trenton Public Schools	1.05	2617	0.23	$11,467	$6,117,022
Oxford Community Schools	1.03	4875	0.2	$10,049	$6,084,087
Hillman Community Schools	0.77	511	0.54	$20,269	$6,083,829
Camden-Frontier School	0.83	600	0.45	$18,114	$5,955,020
Munising Public Schools	0.96	659	0.39	$18,045	$5,899,951
Suttons Bay Public Schools	0.85	649	0.46	$19,110	$5,788,177
Pellston Public Schools	0.85	618	0.46	$18,915	$5,654,404
North Muskegon Public Schools	1.22	997	0.23	$13,839	$5,613,974
Zeeland Public Schools	1.05	5784	0.19	$9,644	$5,545,391
Merrill Community Schools	0.81	722	0.4	$15,658	$5,509,709
Hemlock Public School District	0.97	1259	0.26	$12,446	$5,498,155
Houghton-Portage Township School District	0.97	1333	0.24	$11,153	$5,286,369
Morrice Area Schools	0.94	552	0.38	$17,459	$5,247,670
Jenison Public Schools	1.08	4652	0.2	$10,427	$5,238,759
Grass Lake Community Schools	1.06	1273	0.24	$12,174	$5,194,600
NICE Community School District	0.94	1230	0.28	$12,696	$5,172,219
Tecumseh Public Schools	0.92	2962	0.21	$9,219	$5,167,276
Mendon Community School District	0.74	709	0.41	$14,781	$5,144,207
Byron Center Public Schools	1.05	3478	0.2	$10,049	$5,093,620
Athens Area Schools	0.87	612	0.39	$16,355	$4,575,686
Bridgman Public Schools	0.87	988	0.32	$13,403	$4,556,124
Norway-Vulcan Area Schools	1.02	749	0.3	$14,575	$4,474,603
Climax-Scotts Community Schools	0.94	578	0.35	$16,186	$4,465,549
Harbor Beach Community Schools	0.93	535	0.35	$15,758	$4,390,765
Dryden Community Schools	1.11	692	0.26	$13,822	$4,244,549
Hamilton Community Schools	1.05	2648	0.2	$10,282	$4,090,792
Pickford Public Schools	0.95	566	0.39	$17,877	$4,089,286
Beal City Public Schools	0.99	671	0.29	$13,794	$3,932,742

Lake Fenton Community Schools	1.16	1869	0.19	$10,508	$3,612,663
Whitmore Lake Public School District	0.98	1104	0.29	$13,568	$3,560,547
Saugatuck Public Schools	1.02	838	0.28	$13,649	$3,528,418
River Valley School District	0.76	688	0.43	$15,886	$3,387,835
Britton Deerfield Schools	1.03	772	0.27	$13,367	$3,377,182
Bedford Public Schools	1	4810	0.19	$9,189	$3,217,115
Memphis Community Schools	0.91	944	0.27	$11,980	$3,102,088
Negaunee Public Schools	0.9	1452	0.22	$9,753	$2,731,416
Webberville Community Schools	0.78	616	0.35	$13,124	$2,369,731
New Buffalo Area Schools	1.15	657	0.37	$20,580	$1,986,766
Rogers City Area Schools	0.97	548	0.25	$11,551	$1,716,978
Dansville Schools	0.77	902	0.26	$9,734	$1,522,688
Freeland Community School District	1	1843	0.18	$8,514	$1,419,936
Goodrich Area Schools	1.04	2145	0.17	$8,719	$1,313,254
Spring Lake Public Schools	1.07	2461	0.18	$9,446	$1,163,507
Williamston Community Schools	0.95	1872	0.2	$9,057	$1,103,108
Hancock Public Schools	0.9	838	0.2	$8,690	$1,022,286
New Lothrop Area Public Schools	0.92	881	0.19	$8,634	$995,684
Summerfield Schools	0.89	698	0.22	$9,466	$383,062
Manchester Community Schools	1.04	1203	0.18	$9,201	$179,135
Glen Lake Community Schools	0.95	807	0.24	$11,150	$0
				Total to State	**$15,201,391,883**

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ABSTRACT

EXAMINING THE COSTS OF PROVIDING AN ADEQUATE EDUCATION FOR MICHIGAN'S K-12 PUBLIC SCHOOL STUDENTS

by

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Because the Federal No Child Left Behind Act of 2001, which requires students to perform at predefined proficiency levels on state standardized testing instruments, adequate school funding has become arguably the single most important factor influencing the success of children in schools. Because State legislators are the one's primarily responsible for establishing annual budgets for K-12 public education, it is essential they are made aware of the importance of appropriating adequate resources to ensure every child has the potential to succeed on State standardized tests. Over the course of its history, Michigan lawmakers have relied on past funding system formulas and the political process to establish their annual education budgets. New methods will need to be implemented to more accurately identify the actual costs needed for all children in the State to meet rising student academic performance expectations.

The purpose of this study was to determine an adequate per pupil funding level to educate all school aged children in the State of Michigan so they will perform at the minimum proficiency standards on the Michigan Educational Assessment Program (MEAP). The Successful Schools or Empirical Observation approach was used to estimate the total costs needed by the State to

adequately fund its K-12 public school and public school academies to meet State prescribed student proficiency standards on the fifth grade math and reading portions of the MEAP.

A Weighted Least Squares (WLS) multiple regression analysis was conducted which assisted in identifying several public school and public school academies whose students were achieving two or more standard deviations above their predicted level of student achievement. Three districts were selected from this list and were further analyzed based on their unique demographic and cost differences to determine the added expenditures needed by the state to adequately fund its schools. Based on this study's findings, the costs to the state varied depending on the selected model district's student performance levels and demographics. The amounts ranged as low as $90 million to over $15 billion dollars.

The WLS regression analysis also revealed a district's size, geographic location, percent African American, percent Hispanic, percent economically disadvantaged, percent special education, and per-pupil foundation allowance were all statistically significant in predicting fifth grade composite math and reading MEAP test scores.

When Michigan lawmakers are serious about adequately funding the State's schools so every child will have the opportunity to realize success on its standardized assessment (MEAP), they will need to employ the use of one or more costing out method to provide a more scientific rationale to better forecast future education budgets.

AUTOBIOGRAPHICAL STATEMENT

My higher education experience began as a Criminal Justice major attending Illinois State University located in Normal, Illinois while playing men's basketball alongside my twin brother, Shawn. After our coach lost his job and landed a new one at Western Michigan University, both my brother and I transferred to play for him there. While balancing a full class load and playing college basketball, I finished my undergraduate degree in Art Education. Shortly thereafter, I obtained my first job as an art teacher at Bloomingdale High School located in Bloomingdale, Michigan. From there I went on to become an elementary art teacher for Romeo Public Schools in Romeo, Michigan. While in Romeo, I continued to advance my education and earned a Masters Degree in teaching through Saginaw Valley State University. I then went on to obtain my current position as an elementary art teacher for West Bloomfield Public Schools located in West Bloomfield, Michigan. After several years of teaching in the district, I decided to go back to school to obtain my Education Specialist certificate in General Administration and Supervision which brings me to where I am today.

My future goals include obtaining an elementary principalship and opening up my own school for the Fine and Performing Arts. Additionally, I would like to teach at the university level again and continue creating my own artwork and spend more time with my family.