Indiana University of Pennsylvania
Knowledge Repository @ IUP

Spring 5-2016

A Mixed Method Examination of Student Achievement Indicators

Michael E. Sable

Follow this and additional works at: http://knowledge.library.iup.edu/etd

A MIXED METHOD EXAMINATION OF STUDENT ACHIEVEMENT INDICATORS

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Education

Michael E. Sable

Indiana University of Pennsylvania

May 2016

Indiana University of Pennsylvania
School of Graduate Studies and Research
Department of Professional Studies in Education

We hereby approve the dissertation of

Michael E. Sable

Candidate for the degree of Doctor of Education

_____   _____

David Piper, Ed.D.
Professor of Employment and Labor Relations,
Advisor

_____   _____

Joseph Marcoline, Ed.D.
Associate Professor of Professional Studies in
Education

_____   _____

Kelli Jo Kerry-Moran, Ph.D.
Associate Professor of Professional Studies in
Education

ACCEPTED

_____   _____

Randy L. Martin, Ph.D.
Dean
School of Graduate Studies and Research

Title: A Mixed Method Examination of Student Achievement Indicators

Author: Michael E. Sable

Dissertation Chair: Dr. David Piper

Dissertation Committee Members: Dr. Joseph Marcoline
                                Dr. Kelli Jo Kerry-Moran

The purpose for this study was to explore the relationship between economic and noneconomic indicators and their influence on student achievement in Pennsylvania. The secondary purpose was to discover perceived barriers to student achievement and provide recommendations from experts about methods to improve student success by overcoming both economic and noneconomic factors. The economic indicators included in this study are basic education funding, district wealth (MV/PI), average daily membership (ADM), weighted average daily membership (WADM), total local revenue, local mill value, adjusted Act 1 Index, expenditures, fund balance, debt, and socioeconomic disadvantage rates. The noneconomic indicators are total enrollment, truancy rates, reportable discipline infractions, staff size, and teacher experience and education credentials. Student achievement is represented by graduation rates, dropout rates, post-secondary education rate, and high-stakes tests, such as the PSSA and SAT scores.

This study has determined that there are several economic and noneconomic indicators that affect a school district's ability to ensure student achievement. The economic indicators that have a negative impact on student achievement are socioeconomic disadvantage rate, MV/PI ratio, adjusted Act 1 index, equalized millage rate, basic education funding, and average special education instruction expenditures. The economic indicators having a positive impact on student

achievement are local revenue, average instructional expenditures, and average regular education expenditures. The noneconomic indicators having a negative affect on student achievement are truancy rate and reportable disciplinary infractions. Finally, teachers' education level and experience are noneconomic indicators that have a positive influence on student achievement.

This study concluded that student achievement rate is largely determined by a school district's ability to generate local revenue and state funding. It has also been determined that the socioeconomic disadvantage rate within a school district is the most predictive indicator of student achievement. Interviews were also carried out with superintendent and business manager teams to validate the quantitative findings of the study. The interviews also indicated that changes in school district funding policies at the state level are needed to help provide a more fair and equitable distribution of state funds to the school districts that are serving the students with the most need.

ACKNOWLEDGMENTS

Finishing this dissertation is my greatest educational achievement and would not have been possible without the help and support of many people. The most important would be my family. Thank you to my wife, Mandy, who made sure I was constantly working to finish despite many obstacles. You accepted many additional responsibilities I abandoned during my class and dissertation work. Your support has motivated me in every step of my educational and personal accomplishments. Thank you to my parents, Patrick and Mary, who have always supported me in my academic and personal accomplishments. Your help with proofreading each of my papers since high school is invaluable. I would not be here without your help an support. Finally, thank you to my two sons, Zane and Zeke. This is an accomplishment I have completed to show you that hard work and dedication pay off. You do not have to be the best or the smartest at everything; you just have to set goals and do everything possible to reach your goals. I love each of you more than these few words can express.

Thank you to my dissertation committee. Each of you has inspired me to become a better student and professional. Thank you to Dr. Kelli Jo Kerry-Moran: your teaching has forever instilled in me desire to continue to learn at a high level. Thank you to Dr. Joseph Marocline: through your courses I have learned many concepts on how I want to develop as a professional. Finally, thank you to my dissertation chair, Dr. David Piper. Your help and support through the entire dissertation process was incredible. You helped me develop my thoughts during every step of this process. You have provided me the guidance and support

necessary for me to complete this document. I will forever be indebted to each of you for helping me complete my dissertation.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

THE PROBLEM

Introduction

"Our public education system is the key to opportunity for millions of children and families. It needs to be the best in the world. Of particular concern is the growing achievement gap between middle and low-income students, which has continued to expand despite some overall national achievement."

President Barack Obama

Public school districts across the nation face ever-growing demands for student achievement as measured by high-stakes test scores, high school graduation and dropout rates, and the percentage of students that attend post-secondary education institutions. The current high-stakes testing system was designed to ensure student achievement across the United States, as the goal of the public school system is to graduate students from high school who are ready for post-secondary education or the work force. Demands for student success have been incorporated differently within each state's school system, including Pennsylvania. In Pennsylvania, required tests include the Pennsylvania System of School Assessment (PSSA) and the SAT exam.

Since the introduction of the No Child Left Behind Law (NCLB), school districts have been required to meet increasing academic achievement goals in reading and mathematics for "all" students. To succeed at this endeavor, many school districts are obligated to examine their local economic and noneconomic resources to implement programs in anticipation of enhancing student achievement

percentages. Despite these efforts, many schools and school districts across the country are not attaining the annual yearly progress (AYP) in the academic requirements of NCLB. Furthermore, the achievement gap between students from school districts with greater resources increased compared to those with lesser resources.

Annually, the *Pittsburgh Business Times* releases a ranking guide of Western Pennsylvania schools *(Pittsburgh Business Times' Guide to Western Pennsylvania Schools*, 2012) in which the rankings of local school districts are based on the annual PSSA test scores. The guide employs two ranking systems, Honor Roll Ranking and Overachiever Ranking. The Honor Roll Ranking system identifies the top-ranked schools in the region based upon their overall PSSA test scores. The Overachiever Ranking scale acknowledges that there is an equity problem with the school districts of Pennsylvania based on socioeconomic factors in the school district. This system incorporates socioeconomic disadvantage rates by identifying the percentage of eligible free and reduced lunch applicants and then excludes these from the Honor Roll Ranking system. The rankings are then reorganized to as an acknowledgment of these economic indicators. In this way, school districts with a lower socioeconomic population have a leveled playing field within the Overachiever Ranking system. The schools that appear in the top five on the Honor Roll Ranking scale are school districts with a sound socioeconomic status but are ranked lower on the Overachiever Ranking scale. Conversely, the schools that appear in the top five on the Overachiever Ranking scale are ranked lower on the Honor Roll Ranking scale.

Statement of the Problem

Though the press release from the *Pittsburgh Business Times* strongly focuses on rankings, the PSSA exam is the only source of data used to represent student achievement. Thus, the picture provided may be skewed, and any conclusions drawn possibly faulty. This study, a sequential explanatory study of economic and non-economic indicators and their impact on student achievement in Pennsylvania, combines data from the *Pittsburgh Business Times* release with additional sources to represent a more comprehensive student achievement factor. Other sources used to indicate student achievement include SAT data, graduation and dropout rates, and percentage of students who attend post-secondary education. This comprehensive approach helps to provide a broader, more robust representation of student achievement than does one that is based on an isolated source.

The purpose of this study was to explore the multiple economic and noneconomic indicators that exist throughout Pennsylvania and their influence on student achievement. For this study, the following economic indicators were examined and used for all 500 traditional public school districts across the Commonwealth of Pennsylvania: basic education funding, district wealth (MV/PI), average daily membership (ADM), weighted average daily membership (WADM), total local revenue, local millage values, adjusted Act 1 index expenditures, fund balance, debt, and socioeconomic disadvantage rates. The noneconomic indicators included total enrollment, truancy rates, reportable discipline infractions, staff size, teacher experience, and education credentials. The study also addresses possible solutions through the use of focus group panels and individual interviews. These

discussions help to identify obstacles to student achievement and methods to overcome the challenges.

Operational Definitions and Terms

Act 1 Index – Formula used to determine the maximum tax increases for each tax the school district levies without PDE exception or voter approval. The base index is calculated by averaging the percent increases in the Pennsylvania statewide average weekly wage and the Federal employment cost index for elementary/secondary schools (PDE, 2013a).

Average Daily Membership (ADM) – The number of all resident pupils of the school district for whom the school district is financially responsible.

Basic Education Funding – The amount of money Pennsylvania gives school districts beyond all categorical aid (Bissett & Hillman, 2013).

District Wealth – Market Value/ Personal Income Aide Ratio (MV/PI AR) formula. This formula is a composite measure using both the market value of taxable property in the district and the amount of personal income of district residents (Dady, 2010).

Economic Indicators - Financial elements related to student achievement. For the purposes of this study, the economic indicators include the following: basic education funding, district wealth (MV/PI), average daily membership (ADM), weighted average daily membership (WADM), total local revenue, local mill value, adjusted Act 1 Index, expenditures, fund balance, debt, and socioeconomic disadvantage rates.

Expenditures – Money spent for a specific purpose. These are classified into three

categories: 1) actual instruction expenses, including salary and benefits; 2) regular education expenditures, which include money spent on students without an individualized education plan; and 3) special education expenditures, which involve money spent on students with an individualized education plan.

Fund Balance – The amount of money that remains after all expenditures and revenue are accounted for within a school budget.

Mill – 1/1000 or 0.001. The value used to calculate real estate revenue by multiplying the assessed value of property times the millage rate.

Noneconomic Indicators – Non-financial elements related to student achievement. For the purposes of this study, economic indicators include total enrollment, truancy rates, reportable discipline infractions, staff size, and teacher experience and education credentials.

Post-secondary Education – This term may refer to a two- or four-year college or university, a specialized associate degree-granting institution, or a non-degree-granting postsecondary school (PDE, 2013a).

Student Achievement – A group of elements for measuring student success. For the purposes of this study, student achievement is measured by high-stakes test scores, high school graduation and dropout rates, and the percentage of students who attend post-secondary educational institutions.

Total Local Revenue – All revenues received from taxes and earnings at the local school district level.

Weighted Average Daily Membership – Assignment of weight by grade level to

ADM: half-time kindergarten = 0.5, full-time kindergarten and elementary (grades

1-6) = 1.0, and secondary (grades 7-12) = 1.36 (Keagy & Piper, 2010; PDE,

2013d).Research Questions

Research Questions

1. Is there a relationship between economic and noneconomic indicators and

   student achievement?

   a. Relationship between economic and noneconomic indicators and

      PSSA Scores

   b. Relationship between economic and noneconomic indicators and SAT

      Scores

   c. Relationship between economic and noneconomic indicators and

      graduation rate

   d. Relationship between economic and noneconomic indicators and

      drop out rate

   e. Relationship between economic and noneconomic indicators and

      students who attend post secondary education

2. Is there a strength and rank in the relationship of these indicators with student

   achievement?

   a. Economic indicators and student achievement

   b. Noneconomic indicators and student achievement

   c. Economic and noneconomic indicators and student achievement

3. What economic and noneconomic indicators do superintendents and business managers perceive as barriers that impede student achievement?

4. How do superintendents and business managers believe the perceived economic and noneconomic barriers can be addressed to improve student achievement?

Null Hypotheses

1. There is no relationship between economic and noneconomic indicators, and any aspect of student achievement.

2. There is no strength or rank of the relationships between any indicators that relate to any aspect of student achievement.

Theoretical Framework

This study uses a combination of theoretical frameworks provided by two researchers, Eric Hanushek and Bruce Baker. These recognized researchers have provided significant information through their work on student achievement in regard to economic and noneconomic resources, but their positions on the factors that affect student achievement are fundamentally different. Eric Hanushek focused his research on the impact of funding and spending effect on student achievement. He concluded that there appears to be no strong or systematic relationship between school expenditures and student performance (Hanushek, 1986). Hanushek (1989) believes that the money used is important, but he has also pointed to evidence that over the past 20-30 years, per pupil expenditure has increased over 3% per year, whereas test scores as measured by NAEP (National Assessment of Educational Progress) and SAT have not increased. Hanushek's (1986, 1989, 1994) research

emphasized that money spent on education does not necessarily lead to increased student achievement unless the money is used in a focused manner.

In his research report, Bruce Baker (2012) focused his attention on the political landscape of education and how the money really does matter in student achievement. Baker concluded that money does matter when considering cost per pupil expenditures, teacher salaries, educational programs, and funding across local and state levels.

This study draws from the research and findings of both Hanushek (1986, 1989, 1994) and Baker (2012) to examine economic and noneconomic indicators in Pennsylvania and their impact on student achievement. The economic indicators include school district budgets, district wealth, mill values, total local revenue and expenditures (which include actual instruction expenditures, regular education expenditures, and special education expenditures), fund balance, short- and long-term debt, and socio-economic status percentages. Truancy rates; reportable discipline infractions; and staff size, gender, experience, and education credentials are used for the noneconomic indicators. Student achievement will be measured by school district ranking on the PSSA exam, SAT results, dropout and graduation rates, and percentage of students who attend post-secondary education.

Significance

The debate over public school resources pertaining to equity and adequacy has been a topic of many studies over the past 50 years. The debate has raged since 1966, when one of the first published reports, commonly referred to as "The Coleman Report" was released (Coleman et al., 1966). The focus of the report was to

investigate the disparities in the quality of education between schools for white

students those for minority students. The factors explored in this report were

economic financial resources and expenditures. Coleman (1970) concluded that

spending large amounts of money is "unimportant" and would not close the

achievement gap. He suggested that the family background, gender, ethnicity, and

other socioeconomic factors, such as culture, are responsible for student

achievement. The current study, by way of extension, focused on the variances

between economic and noneconomic variables. These are not extensively discussed

in the Coleman report, as it fails to elaborate on the revenue stream responsible for

funding, which may be filtered through a national, state, or local taxation system.

Even if a national formula for all students is established, local governments can

disagree with the final educational allocations (Pregot, 2012). Any such

augmentation would be driven primarily by revenue received from local real estate

taxes.

As a result of the Coleman report findings, studies that focused on the

educational assertion that school spending is associated with students' achievement

decreased because of the socioeconomic factors Coleman referenced in his report

(Wenglinsky, 1997). However, subsequent studies on socioeconomic factors have

purported that academic spending does have an impact on student achievement.

Wenglinsky's (1997) study on the effects of instructional expenditures and their

effects on achievement focused on four factors: money spent on instruction, money

spent on administration, class size, and school environment. The study determined

that increased expenditures on instruction and administration increased student

achievement (Wenglinsky, 1997). Wenglinsky's work challenges the Coleman findings through the assertion that greater financial resources produce positive results in student achievement.

A complementary study that addressed spending focused on 89 public elementary schools in Ohio (Condron & Roscigno, 2003). The study determined that higher spending promotes increased achievement. The authors maintained that spending from local sources on instruction, operation, and maintenance promoted achievement through the school's physical condition and the degree of order consistency in the learning environment. A school's physical condition includes such environmental conditions as appropriate lighting, air quality, air conditioning, classroom size, and technology equipment (Abrams & Madaus, 2003). Schools that cannot provide these important environmental conditions result in a substandard learning environment. These types of learning environments are usually associated with school districts with low local revenue. Condron and Roscigno's study validated that adequate resources are necessary to continue progress pertaining to student achievement goals.

In 2009, 39 low achieving urban elementary schools in Miami were given resources that were used to implement such programs as extended reading and math periods, mandated common curriculum, intense professional development, and extended school days. The report indicated that infusing attention and resources into the neediest schools can influence change throughout the system (McFadden, 2009). Through careful implementation of special local funding for these programs, the 39 low achieving urban schools increased student achievement.

McFadden's study was yet another to conclude that when there is adequate local revenue available to dedicate to student achievement initiatives, sufficient achievement will be accomplished.

Thus, a number of researchers have found that the economic status of a school district does, in fact, have a direct impact on student achievement, contradicting the findings in the Coleman report. It has been concluded that the best methods for closing the achievement gap would be to provide schools and their districts with the necessary financial resources to implement researched-based programs that demonstrably improve student achievement. The 2011-2012 state budget for education in Pennsylvania slashed approximately $900 million in state and federal funds for local school districts (PASA & PASBO, 2012).   These budgetary constraints forced school districts, including the most fiscally challenged, to furlough staff and left more than 14,000 teaching positions unfilled statewide. It also caused increases in class size in 70% of the districts, and 44% of the school districts were forced to reduce or eliminate elective courses. Because of budgetary constraints, school districts were also required to eliminate tutoring programs designed to help students with the most academic needs. Technology purchases, such as computers, were delayed in 58% of school districts because they did not have necessary funds, and 70% of the school districts indicated they were using reserve funds to balance their budgets in the 2011-2012 school year (PASA & PASBO, 2012). As a result of the state funding cuts, combined with reductions in staff and other expenditure reductions, the reliance on local resources, including reserve funds, has caused those school districts with limited resources to suffer the

greatest negative impact. Based upon a study done in New Jersey high schools (Bao, Romeo, & Harvey, 2010), many in Pennsylvania believe that the aforementioned budget reductions and cut backs will result in a decline in student achievement progress.

The National Educational Association (2012) has reported that a school district's budget relies on 48% state resources and 43% local resources. To further complicate financial matters for Pennsylvania school districts, compliance with the provisions of Act 1 of 2006, known as the Taxpayer Relief Act, limits the ability for school districts to raise local revenues by increasing property taxes. A public referendum is incorporated into the provisions of Act 1, meaning that a vote is required to approve a property tax increase beyond the adjusted Act 1 index by a majority of the local voters. In testimony provided by the Pennsylvania Association of School Business Officials to the House Finance Committee in May of 2011, it was reported that more than 93% of public referendums have failed. Of the 14 school districts in Pennsylvania that have gone to a public referendum for increasing taxes, only one school was successful in the voting process (Himes, 2011). The confluence of these budgetary constraints is causing school district officials to be concerned about meeting increasing student achievement goals. The school districts with more economic and noneconomic resources will be better able to cope with budgetary constraints than those school districts with significant economic concerns.

Research Design

This study followed an explanatory sequential mixed method research design (Creswell, 2012). A mixed method design was employed because both quantitative and qualitative approaches were used to discover and understand the degree of correlation between economic and noneconomic indicators and student achievement, and to identify methods for overcoming the challenges. The sequential explanatory approach was selected because quantitative research precedes the qualitative exploration. The first part of the study uses a multiple regression and correlational design, and the stepwise model is used to confirm predictive data during analysis. The standard multiple regression model was selected because, by definition, it is a statistical procedure for examining the combined relationship of multiple independent variables on a single dependent variable (Creswell, 2012, p. 624).

The second phase of the research included superintendent and business manager team interviews. Participant teams were selected on the basis of having at least 5 years of experience within their job descriptions and 3 years working together as a team. The quantitative findings from school districts throughout Pennsylvania were sorted and the schools ranked into thirds. Then, at least two school district teams from each third were selected for the interview process. A total of 7 team interviews with 14 people in all were conducted across Pennsylvania to obtain a variety of data. The interviews were each about 45 minutes in length, and they were audio recorded and later transcribed into digital documents. Interviews

also took place with the Executive Directors of the Pennsylvania Association of School Administrators (PASA) and the Pennsylvania Association of School Business Officials (PASBO). These associations represent school administrators and school business officials throughout Pennsylvania.

Limitations

Some of the limitations of this study stem from the methodological approach and the sample size. The limitations as determined by the researcher are as follows:

Limitation 1 – Information gathered through the entire study focused on student achievement in public schools within Pennsylvania. The study does not take into account students from private, charter, or cyber charter schools.

Limitation 2 – This study excludes community beliefs regarding the educational system within the school district. These beliefs include school choice through vouchers and charter schools.

Limitation 3 – The makeup of the school district's community support and stability are not examined within this study. The focus was primarily on school district operations.

Limitation 4 – Data from the Keystone State Assessments, a new high-stakes test within Pennsylvania, are not used in this study. These data were excluded because the exam has not been administered to students for all the years included in the study.

Limitation 5 – This study includes interviews to identify perceptions of superintendents and business managers. The interviews included experts in a variety of school districts with different compositions of economic and noneconomic

indicators. It was not possible to represent all the school districts in the Commonwealth of Pennsylvania in focus groups or interviews.

Summary

Studies have revealed that student achievement is affected, positively or negatively, by the amount of local economic and noneconomic resources available for student achievement initiatives. Graduation and dropout rates, the post-secondary education rate, and high-stakes tests (such as the PSSA and SAT) have provided measures for schools' academic reputations and for determining student achievement. These factors are used to brand a school district's status. Because they have a dramatic impact on a school district's academic reputation, it is important to understand the rationale behind the success or failure of school systems by examining the relationship of economic and noneconomic indicators to student success. This study employs a sequential explanatory mixed method design and uses both empirical and interpretive data to examine the relationship of economic and noneconomic indicators to student achievement. Phase 2 of the study looks at the factors experts believe are the barriers to student achievement and how they can be remediated.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

This study focuses on economic and noneconomic indicators in relation to

public schools and their influence and impact on student achievement. The purpose

of this chapter is to examine the historical research pertaining to the factors that

affect education, funding for education, and student achievement measures. This

literature review has six major sections. The chapter begins by exploring the major

historical works of James Samuel Coleman, Erik Hanushek, and Bruce Baker. The

purpose of this section is to set up the framework for the major research findings

involving school finance and student achievement. Major historical legislation

regarding school funding is outlined in section 2. Section 3 of this chapter discusses

equity and adequacy in schools. Section 4 explores the literature and research on

the economic indicators that affect student achievement. In section 5, the literature

is examined that deals with noneconomic indicators. Concluding the chapter is a

discussion on student achievement with an emphasis on the history of high-stakes

testing, including the SAT and PSSA, within Pennsylvania.

A Historical Perspective of Economic Resources and Student Achievement –

Research Findings from Coleman, Hanushek, and Baker

James S. Coleman was an American sociologist, a pioneer in mathematical

sociology, empirical researcher, and social theorist whose studies influenced United

States education policy. With PhD earned from Columbia University in 1955,

Coleman and his work had a far-reaching impact on government education policy

and sparked repeated controversy (Cooper & Valentine, 2012).

In 1964, Congress ordered the U.S. Commissioner of Education to investigate

the lack of availability of equal education opportunities for individuals by reason of

their race, color, religion, or national origin. The subsequent report, *Equality of

Educational Opportunity*, was nicknamed "The Coleman Report." The study,

overseen by Coleman and carried out with six other academics, was one of the

largest ever undertaken. It consisted of 600,000 students, 60,000 teachers, and

4,000 public schools nationwide, and attempted to correlate family background

(including race and socioeconomic status) and school equity variables (including the

integration of white and African-American children) to students' test results and

their attitudes toward attending higher education(Cooper & Valentine, 2012).

"Coleman et al. (1966) found that students' test outcomes were unrelated to

the usual characteristics of schools, such as the quality of school facilities, programs,

and teachers (Cooper & Valentine, 2012). Instead, the improvement in academic

results among minority children was significantly linked to the quality of the

student body (Cooper & Valentine, 2012)." He concluded that the greatest

determining factor for student success was family background, mother's education,

family income, gender, ethnicity, and that other socioeconomic factors, such as

culture, are also responsible for student achievement (Coleman et al., 1966; Kiviat,

2000). Coleman et al. stated, "These minority children have a serious educational

deficiency at the start of school, which is obviously not a result of school; and they

have an even more serious deficiency at the end of school, which is obviously in part

a result of a segregated school." Socioeconomic status was, according to this study, the key social factor in improving student outcomes (Cooper & Valentine, 2013).

Some of Coleman's later research in the 1970s indicated that forced bussing of students for "racial balance" was actually compromising the education of bussed students by the loss of middle-class students in urban schools. In a study on school choice, Coleman explained that the equalizing effects of the common school are greatest when students of diverse backgrounds, but who live in the same locality, attend school together(Coleman et al., 1977). He believed that forced bussing tended to further the disparity of opportunity between the wealthy and non-wealthy. This was because affluent parents could buy their way out of low achieving schools either by moving to better neighborhoods, such as the suburbs, or by enrolling their offspring in private schools (Coleman et al., 1977; Coleman, 1978).

In 1982, Coleman, along with Kilgore and Hoffer, analyzed the High School and Beyond (HSB) data set—the nation's largest longitudinal study of schools effects, involving a sample of 28,000 students attending 1,015 public and private schools (Cooper & Valentine, 2013). Coleman et al. used results from a 1980 test in which sophomore and senior students from public and private high schools were tested in language arts, science, social studies, and mathematics. Using the data as a synthetic cohort, Coleman et al. found that Catholic schools upheld the common school ideal. That is, the effects of family background on achievement were lower in the Catholic schools. Average students were more likely to take rigorous academic courses, thereby producing better results (Cooper & Valentine, 2013). As a result, Catholic schools avoided the stratifying practices. Coleman believed that the public

school system no longer included several sections of students from the American population. The public school system appeared to be no more unrestricted than private Catholic education (Coleman, Hoffer, & Kilgore, 1982a, 1982b; Cooper & Valentine, 2013). These three major studies from Coleman established his theoretical position: that a student's socioeconomic status and family background would establish the ability to achieve within the public school setting.

Eric Hanushek is a Paul and Jean Hanna Senior Fellow and a member of the Koret Task Force on K–12 Education at Stanford University. He is an expert on educational policy and the economics of education, and a leader in the development of the economic analysis of educational issues. His research is wide-ranging, including the impact of teacher quality on achievement of teacher quality, high-stakes accountability, and class-size reduction. Hanushek pioneered measuring teacher quality on the basis of student achievement, the foundation for current research into the value-added evaluations of teachers and schools. He is perhaps best known for the controversial assertion that the amount of money spent in an American school district is not related to the amount of student learning in that district (Hanushek, 1986; Hoover Institution, 2011).

Hanushek (1986) examined the economics of education and schooling, looking at what has been learned and where major gaps remain, focusing on the production and efficiency aspects of schools as opposed to the ultimate uses of education. Hanushek's review also concentrated on public education for lack of comparable research in the private sector. Hanushek indicated that the United States avoided the problems of drawing inferences from cross-country data where

basic educational patterns differ substantially. In this early study, Hanushek

concluded, as noted earlier, that there was no strong or systematic relationship

between school expenditures and student performance.

Hanushek, like Coleman, believed that students' home lives, particularly the

participation of their parents, had a great impact on student achievement.

Hanushek (1994) stated that a student's performance would improve if more

parents motivated their children to do better in school and if more parents took an

active interest in their children's schooling. Parental attitude, he said, contributes

directly to the academic proficiency of students. However, Hanushek did believe

that school reform initiatives could affect student achievement if the focus were

concentrated solely on schools and teachers.

Hanushek and Coleman shared the perception that family has a greater

influence on student achievement than does money. Hanushek has stated that "we

have little reason to believe that an increase in funding of current school programs

will lead to a noticeable improvement in performance of schools" (Hanushek 1989,

p. 48). It is not that money is not important at all; rather, it is how the money is used

that is important (Hanushek, 1989). Hanushek also pointed to evidence that over

the past 20-30 years, per pupil expenditure has increased over 3% per year,

whereas test scores as measured by the NAEP and SAT have not. In sum,

Hanushek's (1986, 1989, 1994) main assertion throughout his research has

emphasized that money spent on education does not necessarily lead to increased

student achievement.

Finally, it is important to recognize the work of Bruce R. Baker, a professor in the Graduate School of Education at Rutgers, the State University of New Jersey, where he teaches courses in school finance policy and district business management. His recent research has focused on state aid allocation policies and practices, with particular attention to the equity and adequacy of aid for special need student populations.

In a 2012 report from the Albert Shanker Institute, Baker described Coleman's findings as being limited from using the statistical techniques of the day, Coleman et al. (1966) having concluded that the strongest correlations with student outcome measures were with factors related to parental income and education levels and resources in the home. Baker disagreed with Coleman's conclusions, noting that more sophisticated statistical analysis indicates that Coleman's findings are inaccurate and that schooling does matter in student achievement. He cited two more recent reviews of the Coleman Report, indicating that while family makeup is important, school quality explains a substantial portion of the variation in student outcomes (Baker, 2012).

Baker (2012) also examined Hanushek's (1986) belief that there appears to be no strong or systematic relationship between school expenditures and student performance. Baker provided evidence from recent investigations that have invariably found a positive, statistically significant relationship between student achievement gains and financial inputs. These studies included Wenglinsky's (1997) research, which focused on the effects of instructional expenditures and their effects on achievement. The study examined factors of achievement and

determined that increased expenditures in instruction and administration increased student achievement (Wenglinsky, 1997).

Baker's (2012) overall findings resulted in three major conclusions. First, money does matter in schooling. Per-pupil spending is positively associated with improved or higher student outcomes. Money must be spent wisely to yield benefits and, on balance, in direct tests of the relationship between financial resources and student outcomes, money matters. Second, scholastic resources costing money, including class size reduction or higher teacher salaries, are positively associated with student outcomes. Educational programs cost money; and the money spent on these programs benefit students. Finally, sustained improvements to the level and distribution of funding across local public school districts can lead to improvements in the level and distribution of student outcomes. More equitable and adequate allocation of financial inputs to schooling provide a necessary underlying condition for improving the equity and adequacy of outcomes (Baker 2012).

Historic Legislation for School Funding in Pennsylvania 1949–2013

This section of the literature review explores the major legislation enacted by the Pennsylvania General Assembly that established the methodology and practices of school funding in the state (Bissett & Hillman, 2013). The first major act of legislation is commonly referred to as the Public School Code of 1949. Despite its age, this act still remains as the main source of legislative authority for public education in Pennsylvania (Bissett & Hillman, 2013). The School Code Act consolidated all laws pertaining to the provision of public education in Pennsylvania. Reimbursement to public school districts was based on "District

Teaching Units" multiplied by a legislatively fixed figure (in 1948-49 $2400; 1949-1950 $2500; and 1950-1951 $2600) and the district's standard reimbursement fraction (Bissett & Hillman, 2013).

The next major change occurred with Act No. 391, P.L.860 of 1957. This amended the Public School Code of 1949.

Act 391 changed the calculation of District Teaching Units in determining the Basic Account Standard Reimbursement Fraction, the Subsidiary Account Reimbursement Fraction and the Capital Account Reimbursement Fraction. The amendment defined the term "Valuation," and the phrase "Actual Instruction Expense" (AIE); which now appears in the School Code and is utilized for AIE per elementary teaching unit, AIE per secondary teaching Unit, AIE per joint elementary teaching unit, AIE per joint secondary teaching unit, AIE per Area technical school teaching unit. Further, Act 391 provided for supplemental payments to districts of residence that had students enrolled in elementary schools or high schools operated by joint boards, of which the district is a member, or enrolled in area technical schools in which the district participates, or in schools operated by union or merged districts. (Bissett & Hillman, 2013, p. 22)

The specific reason for this act was to encourage the formation of joint and union districts.

Act No. 580, P.L. 1642 of 1966 again amended the Public School Code of 1949 and substantially altered the school funding formula. Several new components were defined and added to the formula. They included Weighted Pupil, A Weighted

Average Daily Membership (WADM), Actual Instruction Expense per ADM, Aid

Ratio, and Minimum Subsidy (Bissett & Hillman, 2013).

Act 580 also defined (in Section 2501 Definitions clause) the "State's Share of

Total Cost." This language clearly stated that the "State's share of total

reimbursable costs shall be fifty percent (50%)." "Total reimbursable costs"

was defined as the lesser of actual expense per WADM...or a maximum

amount to be fixed by the General Assembly from time to time to represent

the estimated average actual expense per WADM...."The "District's Share of

Total Cost" was determined by subtracting the State's share from 1.0. (Bissett

& Hillman, 2013, p. 23)

Act 59 of 1977, P.L. 199, also amended the Public School Code of 1949 and

introduced the following new definitions: Personal Income Valuation, Real Property

Valuation, Equalized Millage, Median Equalized Millage, Median Actual Instruction

Expense Per Weighted Average Daily Membership, Market Value/Income Aid Ratio,

and Based Earned for Reimbursement (Bissett & Hillman, 2013). Base Earned for

Reimbursement is the maximum amount a district could be paid under the basic

instructional subsidy. This newly introduced definition provided a series of

computations that could result in 301 separate reimbursement levels. The statewide

maximum reimbursement was the median Actual Instructional Expense per

Weighted Average Daily Membership among the state's school districts, and the

minimum level of state per-pupil aid was the median less $200 (Bissett & Hillman,

2013).

A $72 million dollar supplement was added to the subsidy formula, called the

Equalized Supplement for Student Learning under Act No. 115, P.L. 397, of 1982.

The supplement was calculated by multiplying the district's weighted average daily

membership by the district's market value/income aid ration. The results were then

divided by the product of the Statewide weighted average daily membership and the

Statewide market value/income aid ratio, and the result multiplied by the amount

appropriated in the payment year in excess of the amount appropriated in 1981-

1982 (Bissett & Hillman, 2013).

In 1983, Act 73 was passed in Pennsylvania, which moved the language

contained in Act 31 to the Public School Code of 1949.

Act 31 placed into law the Equalized Subsidy for Basic Education (ESBE) and

removed the Commonwealth's obligation to provide 50% of the costs of

public education. A new term, "Factor for Educational Expense (FEE)," was

utilized in determining a district's base subsidy component. This was a dollar

amount set by the legislature. Act 31 set the FEE at $1,650. The formula for

the base subsidy was: District's market value/income aid ratio(x) the FEE(x)

the Weighted Average Daily Membership (WADM) of the district. Under the

heading of "Economic Supplement," Act 31 provided additional funds to

school districts based on poverty and another based on local tax effort and

population per square mile. Language was also added so that no district

would receive less than two percent more than they received in the prior

year (hold harmless). New language was included that payments earned by

districts would be proportionately reduced if the amount appropriated by

the General Assembly was not sufficient. (Bissett & Hillman, 2013, p. 27)

Act 31 of 1985 continued the ESBE formula. A new supplement was added to the funding formula-Small District Assistance (SDA). The formula for determining eligibility and amount of the SDA included a factor to identify if a district had an average daily membership of 1,500 or less and a market value/income aid ratio of 0.5000 or greater (Bissett & Hillman, 2013). If eligible, the district received an amount equal to $50 multiplied by the district's average daily membership. In effect, the concept of a minimum or maximum amount of ESBE was introduced with this Act. No district would receive less than a 2% increase in ESBE funding over the previous year; and no district would receive more than 7.45% over the previous year's subsidy (Bissett & Hillman, 2013). Even if a district had earned more than a 7.45% increase over the previous year under the provisions of the ESBE formula, the payment was capped at the 7.45% increase. ESBE would limit the number of school districts eligible for any increase, so the Legislature guaranteed them at least a 2% increase over the previous year (Bissett & Hillman, 2013).

Act 25 of 1991 implemented a major change to the funding formula. Act 25 stated that Pennsylvania would no longer provide "excess cost" funding to school districts for the provision of programs and services to children identified as needing special education. This would have had a devastating impact on local school budgeting, not through ESBE or supplements to ESBE, but because of the change in how the Commonwealth funded special education expenditures. Act 25 provided a simple formula to distribute state funds to school districts that did not take into consideration the actual location of eligible children but made the assumption that each school district would have the same percentage of mildly and severely disabled

children. This measure resulted in some districts' receiving more state dollars than they actually needed and severe underfunding in other districts (Bissett & Hillman, 2013). This is considered the legislative move of the 1990s that had the greatest impact.

In the summer of 2006, the state passed Act 1. This Act limited the amount of a tax increase a school district could levy on the residential taxpayers without a referendum. They could raise the tax rate only by the Act 1 index as determined by the state average weekly wage increase and other factors, such as exceptions. If a school district required a tax increase beyond the Act 1 index, a public referendum to increase taxes would require a majority vote of the citizenry. Currently some exceptions are allowed for increased special education costs, some school construction projects, retirement and health care expenses, emergencies, and disasters. The Act also allocated gambling revenues to decrease local property taxes (Bissett & Hillman, 2013). Overall, the Act 1 limitation of tax rates would limit school revenue.

In 2008 the legislators voted for a "Costing Out Study" to determine the adequate base cost for student education. It was determined that there was a shortfall of 4.3 billion dollars that would be required to meet the base cost. The state increased the basic education funding 5.5% for this year, using Federal stimulus subsidies to help offset the shortage. However, one of the largest economic crashes since 1929 occurred during this year. Once the stimulus funding stopped in 2010, the 2011-2012 state budget for education in Pennsylvania slashed

approximately $900 million in state and federal funds for local school districts

(PASA & PASBO, 2012).

The Equity Versus Adequacy Debate

Adequacy is based on the principle that states should provide sufficient

funding for all students to be able to meet academic expectations. According to data

available from the National Center for Education Statistics, nationwide, the average

state spending per pupil was $10,297 in 2008—ranging from a high of $11,572 in

New York to a low of $3,886 in Utah (Zhou & Johnson, 2010). It is difficult, however,

to determine exactly the amount of money that is needed to give all students an

adequate education (Editorial Projects, 2011).

The notion of equity in school funding focuses on strategies for closing the

gap between local districts' abilities to raise revenues for their schools. Since local

funds are commonly based, at least in part, on property taxes, less wealthy

communities are unable to raise as much money for schools as wealthier districts,

leaving their children at a considerable disadvantage. The greater the share of

funding that states provide for education and the more states designate that money

for education, the better the chances for increasing equity in the system (Editorial

Projects, 2011).

There is a wide range of estimates for what researchers and educators

believe a "sound, basic education" actually costs. There are three main concepts

related to this research: First, researchers typically use one of four main methods to

estimate these costs (professional judgment, successful schools, cost function, and

evidence-based), and each method has strengths and weaknesses. Second, not all of

the studies incorporate the additional costs for students that are more expensive to educate, such as students with disabilities or those in poverty. Finally, cost estimates vary because the authors base their judgments on different standards for what an adequate education entails (Editorial Projects, 2011).

The Educational Testing Service (ETS) reported that the opinions expressed by those surveyed fail to provide policymakers with a clear mandate. "In the end, Americans resist making hard choices to either limit education spending or raise additional revenue" (ETS 2004, p. 1). The poll found that while a majority of Americans believe it is appropriate to reallocate funds raised in other areas to provide increased funds to schools in low-income areas,

> They do not offer a clear direction in the debate between the equity model and the adequacy model. The equity model (preferred by 40 percent) suggests that states should make efforts to ensure that an equal amount of money is spent on every student. Nearly as many (37 percent) Americans choose the adequacy model, which suggests that states should make efforts to ensure that each school receives the funds necessary for each of its students to succeed. (ETS, 2004, p. 4)

Americans are divided over the equity model and adequacy model issue according to the article. It is important to note that the adequacy model does account for students with disabilities, which require more funds to educate.

Americans are also uncertain about how to balance funding between state and local governments. When asked to choose between two statements about education funding at the state level, half of those surveyed said they preferred the

state to increase the amount of money it adds to the funding pie "even if it means an increase in state taxes" (ETS, 2004, p. 4). Meanwhile, nearly as many of those surveyed (44%) didn't want state taxes to increase, "even if it means no additional funding for education" (ETS, 2004, p. 4), stating that existing taxes were adequate, and that there was "already too much waste in the system" (ETS, 2004, p. 4).

The equity and adequacy debate takes place in other countries as well. Bernard Mwere (2010) researched unequal educational opportunity with regard to fiscal equity and adequacy in Canada. This study largely focused on disparities between school boards and, to some extent, individual schools in the same province. Disparities among provinces, a problem less emphasized by the research in Canada, offer a significant lens through which public education funding can be examined. A comparative rather than individual province analysis provides policy makers with rich information that can assist funding policy comparisons and decisions. This study analyzed fiscal equity and perceptions of adequacy across 10 provinces from 1996 to 2006. The results of the study revealed that the disparities have disproportionately affected the Atlantic Provinces. Furthermore, the study shows that inter-provincial disparities in spending are linked to provincial resource endowment, thus highlighting the need for a federal role in upgrading inter-provincial disparities in educational standards. Further analysis of the research revealed that emphasis on the perceptions of adequacy has increased and that across most provincial jurisdictions, policies are geared towards student attainment of performance standards (ETS, 2004).

In a South African study, adequacy as a concept or philosophy has recently

emerged as part of school finance literature and policy in South Africa. In one

article, adequacy was defined as sufficient input levels to ensure student

achievement of learning goals. In recognition of the realization that equity was not

easily attainable, plaintiffs in North American states embraced and pursued

adequacy as an alternative to, or step in the direction of, attaining equity. South

Africans have also embraced the adequacy approach to education as the evolution of

the school funding debate from equity to adequacy in the United States has been

translated into the South African context (Mwere, 2010).

A study exploring equity by Wu, Liu, and Wu (2009) states that well-rounded

development of the Chinese people is the goal of Chinese educational equity

practice. Whereas well-rounded development is the ideal pursuit of education,

educational equity is the fundamental condition for realizing people's all-round

development.   This article also interprets educational democratization as the

process orientation of Chinese educational equity practice. Educational

democratization is the foundation of and manifests the direction in educational

equity practice (Amsterdam, 2006).

Larson and Barton (2013) asserted that equitable education begins with

district and school leaders educating themselves about racial and cultural biases

(Wu, Liu, & Wu, 2009). Viewing education through an equity lens challenges

educators to acknowledge that the need to close achievement gaps and address

disparities that continue to undermine education systems is not driven merely by

federal or state mandates (Larson & Barton, 2013). It requires a willingness for

everyone to look deeply at their personal beliefs and attitudes toward educational

adequacy and equity (Larson & Barton, 2013).

Having explored the national and international view, we may now look at

equity and adequacy in Pennsylvania. The Pennsylvania Association for Rural and

Small Schools (PARSS) has developed a four–tier formula called "A Blueprint for

Equity." The mission of PARSS is to promote equal opportunity for quality

education for all students in every school and community in Pennsylvania (Larson &

Barton, 2013). The "Blueprint for Equity" was developed to give every school and

student in Pennsylvania a chance at an equitable and adequate education. Tiers 1

and 3 specifically dealt with equity and adequacy.

Tier 1 of the blueprint was focused on equity. The foundation of the system

used a state appropriation to fund all school districts equitably so they could

provide equivalent high quality educational programs. Payments to districts were

be based on the number of pupils in the district. With statewide taxes providing all

the funds for Tier 1, local school districts had an opportunity to significantly reduce

local property taxes and to eliminate most Act 511 "nuisance taxes." Tier 3 provided

funding for additional resources for school districts with students whose

educational needs are greater than the norm. Studies have shown that children

growing up poor, under disadvantaged conditions at home or in the community, are

more likely to be unprepared to undertake a rigorous educational program (PARSS,

2010). Educators have recognized that schools serving poor children must address

their learning disadvantages to the maximum extent possible. Tier 3 provided

support for such programs. Fully state funded, Tier 3 was for districts that qualify

based on an educational needs index measuring three factors that have been shown

to contribute to the difficulty of the district's educational task. The three factors are

the percentage students living in poverty in the school population, non–high school

graduates among district residents, and single parent families in the district

(Coleman, 1978; Coleman et al., 1982a, 1982b; Coleman et al., 1977; Coleman et al.,

1966; Hanushek, 1986, 1989; PARSS, 2010). PARSS stated that Pennsylvania's

school children and taxpayers alike are hurt by the inequities in the way we

currently fund public education. PARRS contended that inequities in funding equal

inequities in education. Students in poor school districts have been deprived of

many of the educational resources and advantages available to students in wealthy

school districts. Local taxpayers have had to raise $1.8 billion in property taxes in

the last few decades to cover the failure of state government to pay its share of

educational funding. Significant inequities exist in the tax burden borne by

communities across the state; often those in poorer communities make a greater

effort to pay for education than do those in richer communities (PARSS, 2010).

Thus, the next section will explore economic indicators in Pennsylvania and will

look at how Pennsylvania finances education.

Economic Indicators – School Finance in Pennsylvania

An annual Gallup Poll conducted by Phi Delta Kappa showed that the biggest

challenge for public schools is lack of funding (Bushaw & Lopez, 2012, 2013). The

response relating to school funding overshadowed the prior year's responses of

fighting, drugs, and poor discipline. This response relating to lack of financial

support has grown 20% since 2002. Today 43% of public school parents believe

that funding and finance are the most significant problems facing American schools (Bushaw & Lopez, 2012, 2013).

Even as this national Gallup poll stated that the number one concern of the American public school parents was funding (Bushaw & Lopez, 2012, 2013), Pennsylvania's 2011-2012 state budget for education slashed approximately $900 million in state and federal funds for local school districts (Bushaw & Lopez, 2012, 2013).   These budgetary constraints forced school districts, including the most fiscally challenged, to furlough staff and left more than 14,000 positions unfilled statewide. It also caused increased class sizes in 70% of the districts and a reduction in or elimination of elective courses in 44%. Because of budgetary constraints, school districts were also required to eliminate tutoring programs designed to help students with the most academic needs. Fifty-eight percent of school districts delayed purchases of technology, such as computers, because they did not have necessary funds, and 70% of school districts indicated they were using reserve funds to balance their budgets in the 2011-2012 school year (PASA & PASBO, 2012) As a result of the state funding cuts, combined with reductions in staff and other expenditure reductions, reliance on local resources (including reserve funds) has most negatively affected those school districts with limited resources. Based upon the "School Socioeconomic Classification, Funding, and the New Jersey High School Proficiency Assessment" study, many in Pennsylvania believe that the aforementioned budget reductions and cut backs will result in a decline in student achievement progress (PASA & PASBO, 2012).

The National Educational Association (Bao et al., 2010) reported that on average nationally, a school district's budget relies on 48% state resources and 43% local resources. To further complicate financial matters for Pennsylvania school districts, compliance with provisions of Act 1 of 2006, known as the Taxpayer Relief Act, constrains the ability for school districts to raise local revenues by increasing property taxes. A public referendum is incorporated in the provisions of Act 1, which requires a majority vote to approve a property tax increase if the millage increase is beyond the adjusted Act 1 index limit. In testimony provided by the Pennsylvania Association of School Business Officials to the House Finance Committee in May 2011, it was reported that more than 93% of public referendums have failed. Of the fourteen school districts at that time in Pennsylvania that undertook a public referendum for increasing taxes, only one school was successful in the voting process (NEA, 2012). The confluence of these budgetary constraints is causing school district officials to be concerned about meeting increasing student achievement goals. The school districts with more financial resources will be better able to cope with budgetary constraints than those school districts with significant socioeconomic concerns.

District Budget – Total

A budget is a financial tool used to measure and monitor revenue and expenditures for an entity during a specific amount of time, usually a 12-month period. The budgets for 500 school districts across the state of Pennsylvania vary greatly in size, from smaller budgets as low as 2.5 million dollars to budgets as high as 2.6 billion dollars for the Philadelphia City School District (Himes, 2011). The

variances in a district's budget stem from many different economic indicators. A

district's wealth, average daily membership, weighted average daily membership,

revenue, mill value, equalized mill value, expenditures, socioeconomic

disadvantaged rate, debt, demographic status, and enrollments are the main

economic indicators used for this study. On average, however, a school district's

budget consists mostly of salary and benefits for its employees.

Basic Education Funding (BEF)

Basic education funding is defined as the amount of money Pennsylvania

gives school districts beyond all categorical aid (PDE, 2013b). This is one of the

largest appropriations from the state for each school district in Pennsylvania. The

money distributed by the state follows a formula that includes three variables: the

number of students, wealth of the district, and amount of money available from the

state (Bissett & Hillman, 2013). This funding element has come under scrutiny in

recent years, and many organizations oppose the methods by which Pennsylvania

distributes these monies to school districts. These organizations include the Basic

Education Funding Commission, Pennsylvania School Funding Project, Educational

Policy and Leadership Center, and Pennsylvania Association of Rural and Small

Schools. These organizations make claims of inadequacies and inequities in the

formula and the distribution of money. They, along with more than fifty other

organizations, are currently working to change the formula, which is now the major

source of funding for all school districts across the state.

District Wealth

Pennsylvania's primary measure of school district wealth is the market value/personal income aid ratio (MV/PI AR). All public school districts in Pennsylvania have a MV/PI AR. The wealthiest school districts have an aid ratio of .15, whereas the poorest districts have an aid ratio approaching .90. To fully understand this measurement, one must first understand each component of the ratio. The market value (MV) is the value of taxable real estate within a school district as determined by the State Tax Equalization Board (STEB; Cowell, 2014). STEB calculations consider and certify the different assessment system used by Pennsylvania's 67 counties, making them equal so they can be compared. The market value is assigned to each individual school district and is one of the most important statistics in the Pennsylvania subsidy system (Keagy & Piper, 2010). The STEB certifies the final market values in a community two years after the values become public, and these certified amounts are used by the PDE to calculate school district subsidies.

The next component of the MV/PI AR formula is the personal income value (PI), which is the total income in a school district as determined by the Pennsylvania Department of Revenue (Keagy & Piper, 2010). Information is accumulated from the state tax form PA-40, known as the individual income tax return. It includes earned wages and profits as well as taxable unearned income, such as interest and dividends.

The aid ratio (AR), the final element in the MV/PI AR formula, reflects a district's wealth in relation to all other districts in the state. The use of aid ratios in

subsidy formulas generates greater distributions to the poor school districts and smaller distributions to the wealthy school districts (Keagy & Piper, 2010). Aid ratios are stated in decimal fractions, and as noted earlier, the higher the decimal fraction, the poorer the district. The inverse is true for wealthier districts (Keagy & Piper, 2010; PDE, 2013d).

Dady (2010) described the MV/PI AR as a composite measure that uses both the market value of taxable property in the district and the amount of personal income of district residents (Keagy & Piper, 2010; PDE, 2013d). This overall aid ratio comprises two other separate aid ratios: the market value aid ratio (MV AR), and the personal income aid ratio (PI AR). The market value aid ratio measures the estimated market value of taxable property per student for the district compared to the state average. The personal income aid ratio measures the personal income per student of the district compared to the state average. The overall index is a weighted average of two individual aid ratios: 60% of the market value aid ratio and 40% of the personal income aid ratio (Dady, 2010). The MV/PI AR indicates a mathematical representation of the district's actual market value and actual personal income compared to the state-wide average market value and personal income on a per student basis. The higher the MV/PI aid ratio, the poorer the district; and the lower the ratio, the wealthier the district ("Act 59," 1977). This allows the MV/PI AR to be used directly in the state aid formulas as an equalization multiplier since poorer districts with higher ratios would qualify for more state aid in the calculations (Keagy & Piper, 2010). It is often known as the "Robin Hood" formula, because it gives more to the poor and less to the rich districts.

Average Daily Membership (ADM) and Weighted Average Daily Membership (WADM)

Average daily membership (ADM) represents the count of all resident pupils of the school district for whom the school district is financially responsible. It is calculated by dividing the aggregate number of days of membership for all children on active rolls by the number of days the school district is in session. Weighted average daily membership (WADM) is the term used for assigning weight by grade level to ADM. The current weighting is half-time kindergarten at 0.5, full-time kindergarten and elementary (grades 1-6) at 1.0, and secondary (grades 7-12) at 1.36 (Dady, 2010). The weighting factor uses Carnegie units to determine the values. ADM and WADM are recognized student counts for the state of Pennsylvania. These counts are also utilized to determine state subsidies for school districts.

Total Local Revenue

A school district receives revenue from three primary sources: federal, state, and local. Nationally, on average, 9% of a district's budget is generated from federal resources, 48% from state resources, and 43% from local resources (Keagy & Piper, 2010; PDE, 2013d). In Pennsylvania the numbers differ. Approximately 4% of revenue is generated from federal sources, 32% from state resources, and 64% from local sources.

Revenue coming from the federal government accounts for a small amount of a school district's budget. Most federal funding goes to large cities within the state. Usually, public education is a state responsibility and the federal government provides limited revenue to school districts. In Pennsylvania, education is a state

mandate. Nearly all revenue from federal sources comes in the form of specific grants intended for a specialized purpose. This money is a result of federal public policy (NEA, 2012).

State revenue is generated when a school district receives money from several state agencies including the Department of Health (dental, medical, nursing), Department of Agriculture (school lunches), or the Department of Environmental Protection (sewage treatment). The primary source of state revenue, however, is the Department of Education (Keagy & Piper, 2010).

Local revenue refers to income from sources directly within the school district's property boundaries (Keagy & Piper, 2010). Property tax, which represents the highest source of local revenue for Pennsylvania school districts, remains the mainstay of school districts revenues, providing on average 90% of the total local taxes (Keagy & Piper, 2010). Local revenue, on average, provides 66% of the funding stream for public education in Pennsylvania.

The Mill

A mill is a variable used to calculate real estate revenue by multiplying the assessed value of property times the millage rate, a tax value applied to the assessed value of real estate to calculate revenue. Millage rates are expressed not as regular percentages but rather in tenths of a penny. For example, a millage rate of two mills would mean two tenths of a penny. An equalized mill is a measure of local tax efforts. It is defined by calculating the total local taxes by the market value (MV) and multiplying by 1000 (Dady, 2010; Keagy & Piper, 2010). The value of a mill is different in each district because the market value of the district property differs by

size and value between school districts. The equalized mill allows all the districts in

Pennsylvania to be compared and ranked. The mill and the equalized mill are

important economic indicators because they measure the amount of revenues

derived from local taxes.

Expenditures – Actual Instruction, Regular Education, Special Education

An expenditure is an appropriation of money spent for a specific purpose.

For the purpose of this study, expenditures are divided into three categories: actual

instruction (including salary and benefits), regular education, and special education.

Regular education expenditures include all general fund expenditures as reported

on the annual financial report by the school districts, except those expenditures for

health services, transportation, debt service, capital outlay, homebound instruction,

early intervention, community/junior college education programs and payments to

area vocational-technical schools. Deductions are also made for selected local, state

and federal revenues and for refunds of prior year expenditures and receipts from

other local education agencies. Expenditures are calculated in accordance with

Section 2501 of the "Pennsylvania Public School Code of 1949" (Keagy & Piper,

2010). Regular education expenditures are for activities designed to provide K–12

students with learning experiences to prepare them for activities as citizens, family

members, and non-vocational workers, as contrasted with programs designed to

improve or overcome physical, mental, social and/or emotional handicaps (PDE,

2013e). Special education expenditures are designated for activities designed

primarily to deal with students with special needs. The special programs include

support classes for pre-kindergarten, kindergarten, elementary, and secondary

students that have been identified as exceptional (PDE, 2013e). The

aforementioned expenditures indicate the amount of money spent on general

education purposes. This economic indicator is essential because it identifies the

amount of money spent on instruction within a school district.

Fund Balance

In simple terms, the fund balance is the amount of money remaining after all

revenues and all expenditures have been recognized (PDE, 2013e). Fund balance is

money that is not automatically replenished. This reserve money can be classified

into three groups: committed, assigned, and unassigned. The committed fund

balance is funds committed by the school district for a specific purpose within the

school system. Assigned fund balances are assigned for a specific need within the

district. Unassigned balances are funds that available for general purposes. Act 48

of the Pennsylvania School Code regulates the amount of unassigned fund balance

that a school district can maintain, which is based on the amount of a school

district's budget. Used as an economic indicator, the fund balance is significant

because it also provides funds for extraordinary or unexpected expenditures.

Debt

The amount of debt incurred by a district is the amount of money borrowed

to finance long term expenditures, usually for capital projects. The general types of

debt are: loans, bonds, bond pools, and leases (Keagy & Piper, 2010). Debts are

divided into two types: short-term and long-term. Short-term debt must be paid

within 13 months, whereas long-term debt is paid over a period longer than 13

months (Keagy & Piper, 2010). School district debt is important because it draws

against the amount of money that would otherwise be used annually for classroom expenditures.

Socioeconomic Disadvantage Rate

Pennsylvania's Local Education Agencies (LEA) report to the PDE those students, enrolled as of October 1st of each school year, who are considered economically disadvantaged. The low-income students are reported through the Pennsylvania Information Management System. The low-income enrollment information, reported by the Local Education Agencies, is used by the federal government as a component of the qualifications in designating low-income schools. According to federal guidelines, schools are listed in the federal designated low-income school directory one year following the submission of qualifying data (Keagy & Piper, 2010). This indicator is important because it identifies the population of socioeconomic disadvantaged students. In most cases, the higher the disadvantage rate, the lower the MV/PI AR. This is critical because there is usually less money available from local revenue for a school district with a high disadvantage population rate.

<div align="center">

Noneconomic Indicators and Student Achievement

</div>

Enrollment - Community Size/District Size

A school district's enrollment, the final economic indicator used for this study, is the total number of students that are educated within the school district, pre-K through 12th grade. Pennsylvania's publically funded school districts report students who were enrolled and attending as of October 1st of each school year (NCES, 2010). The enrollment numbers provide information on the student count

size of a school district. This information can also be used to determine the amount of local revenue generated by a school district using ADM and WADM calculations. The enrollment within a school district can also influence educational opportunities. In many cases, if the school district has a large enrollment, it may have a greater ability to offer education with higher level and advance placement courses than a smaller school district that would have fewer students eligible for these classes.

Truancy

Truancy is any unexcused absence from obligatory school attendance (PDE, 2013c). An unexcused absence, which is defined by school policy, occurs when no written notification by a parent or guardian is provided to the school in a timely fashion (PDE, 2014b). Truancy is punishable when it becomes habitual, which is defined as a student's accumulating three days of unexcused absences (PDE, 2014b). When such an offence occurs, the school must notify the parents that any additional unexcused absences can result in a referral to the magisterial district judge, who may impose fines and educational classes. If the student is under the age of 13, he or she may be referred to a county child and youth agency for possible disposition as a dependent child (PDE, 2014b). Making sure that students attend school is a priority for Pennsylvania, sparking the creation of a Pennsylvania Truancy Toolkit for every school district across the state. This resource is designed to help schools and communities design strategies for ensuring that students attend school, feel an attachment to school, and achieve their educational goals (PDE, 2014b). The toolkit was developed through a recommendation from the Pennsylvania Truancy Task Force, and it is the culmination of a cross-system effort coordinated by the

Pennsylvania Department of Education in conjunction with the Pennsylvania Department of Public Welfare, the Juvenile Court Judges' Commission, the Special Court Judges Association of Pennsylvania, and the Center for Schools and Communities (PDE, 2014b).

The *Assessment of Risk Factors for Truancy of Children in Grades K-12 Using Survival Analysis* determined some risk factors for truancy by examining data from students at 21 schools within a large mid-western school district. Survival analysis was used for a quantitative assessment of risk factors for truancy. This study found that students with lower socioeconomic statuses are at a greater risk for truancy. The student's age-to-grade ratio and being in special education classes also increased truancy rates (PDE, 2014b). Special Education truancy can be addressed by increased counseling and contingency contracts to increase attendance (Nolan, Cole, Wroughton, Clayton-Code, & Riffe, 2013). Students who transfer to a different school, even within the same district, show an increased risk of truancy (Nagle & et al., 1979). The timing of a school transfer may shape students' transitions to college (Nolan et al., 2013); for example, a transfer that occurs during the summer is less likely to cause major disruptions, including truancy for students.

In a recent study by De Witte and Csillag (2014), the authors studied the relationship between truancy and school dropout. They used fixed effects regressions and controlling for truancy peer group effects and observed that truancy positively correlates to dropping out. A truant student has a 3.4% higher risk of leaving school without a qualification.   The results of this study indicate that improved truancy reporting significantly reduces school dropout by 5% (Sutton,

Muller, & Langenkamp, 2013). This study suggests that improved truancy reporting and monitoring will help improve graduation rates and increase student achievement.

Discipline and School Safety

Each year Pennsylvania reports various school safety incidents to the state. These incidents are compiled and written as a Safe School Report. This report, which provides information for the safety of the school district, is disseminated by the Office for Safe Schools. This division of the Pennsylvania Department of Education coordinates school safety and security programs, collection of the annual school violence statistics, coordination of antiviolence efforts, and development of policies and strategies to combat school violence. The office supports and provides technical assistance and professional development programs in the following areas, as well as security-related activities to support school safety: crisis intervention, school police training, violence prevention, and social and emotional wellness and safety provides services to all local school entities (De Witte & Csillag, 2014). This report outlines various reportable incidents that affect school safety and result in school discipline. These incidents are calculated by local school districts and are reported yearly to the state.

Discipline is an indicator of school safety. However, studies suggest that the impact of exclusionary discipline on students causes negative results. The impacts of exclusionary discipline have been negatively linked to the academic and social development of disciplined students. Exclusionary and zero-tolerance approaches to school discipline are not the best techniques for creating a safe climate in

contemporary education settings (PDE, 2014a). Pennsylvania allows for exclusion discipline, however, and major violations are reported to track safety. This study will use multiple pieces of information from the Safe School Report as noneconomic indicators of student achievement.

Staff Size/Class Size

The size of the staff creates a student-to-teacher ratio. A higher number of teachers creates a smaller student-to-teacher ratio and results in smaller class sizes. It has been assumed by legislators, policy-makers, educators, and parents that class size reduction in classrooms is a method for improving student achievement. Research on the topic has been substantial, but results have been uneven and inconclusive (Ryan & Goodram, 2013).

Webb (2003) explored the effects of smaller class size in elementary classrooms in a Midwestern school district. Most of the comparisons indicated that students in kindergarten through grade 4, assigned to sections within a specific class size range, outperformed students assigned to large class sizes (Webb, 2003). The study also suggested a tendency for a smaller class sizes to have a positive impact on the achievement of students from low socioeconomic households and for minority students (Webb, 2003). However, these finding did not yield positive and definitive results. Hill also discovered that a smaller class size could provide a lower number of distractions in the classroom, which has a consistent, positive effect on student achievement (Webb, 2003). Both researchers suggest that the size reduction has a positive benefit for minority student. These assertions are supported in a 2012 study by Shin (2012), which indicated that minority Black

students benefit more than other students from reduced class size in first, second, and third-grade academic achievement (Hill, 2003). Shin also reports that reducing class size increases a student's reading, mathematics, listening, and word recognition test scores from kindergarten through third grade (Shin, 2012). An international test study found that students from classes with below 23 students achieved higher mean scores than their peers from larger classes (Shin, 2012; Shin & Raudenbush, 2011). Various studies indicate that a smaller class size in elementary school has a positive effect but is not statistically significant. However, sufficient teaching staff is necessary to gain these smaller class sizes.

Teacher Experience and Teacher Education Level

Years of experience and possession of a graduate degree are factors commonly considered when assessing teacher quality (Koniewski, 2013). Hanushek has suggested that teachers in their first three years of service do a less effective job than their peers who have more than three years of service (Jacob, 2012). Experience in teaching builds capacity for more effective teaching, particularly if the experience is at the same grade level (Hanushek & Haycock, 2010). Conversely, Zhang (2012) found that teaching experience did not directly influence student achievement (Huang & Moon, 2009). The study did reveal that advanced degrees in specific subject matter and experience did have a positive influence on student achievement (Zhang, 2008). Swan (2006) studied teacher experience and advanced degrees, and her results showed that the students of middle school mathematics teachers with higher seniority and advanced degrees performed significantly better than students in other classrooms (Zhang, 2008).

Teacher level of education is another means of measure for student achievement. A level of early childhood education is positively related to classroom quality scores (Swan, 2006). Elementary education teachers with an advanced degree are more likely to be more emotionally sensitive and to have better instructional interactions in the classroom (Mims, Scott-Little, Lower, Cassidy, & Hestenes, 2008). Secondary teachers with advanced degrees within their subject area also provide quality education resulting in increased student achievement (Cadima, Peixoto, & Leal, 2014). Not all research results suggest a statistically significant impact, however. Other studies have found that teachers with master's degrees have a limited positive impact on student reading and math achievement (Huang & Moon, 2009; Swan, 2006; Zhang, 2008). In general, educational experience and advanced degrees have a positive impact on student achievement. This impact may not be statically significant every time, but it is usually positive.

Student Achievement

The ultimate goal of any school district is to use instructional strategies, curriculum, or educational initiatives to raise student achievement. As the standards-based education movement has gained power in recent decades, measuring and reporting student achievement has become an even more critical component of public education. State and federal accountability systems have raised the bar for school performance and have led to an increased reliance on standardized tests of student achievement (Badgett, Decman, & Carman, 2013, 2014). Assessments at the international, national, and state levels are frequently used to evaluate student achievement in core subjects, such as reading and math.

The results of these assessments reveal where students are achieving proficiency and where much work remains to be done. Further, these results are used to compare student performance in different countries and among various states (Georgia Partnership for Excellence in Education, 2013). Analysis of student achievement often reveals different levels of performance between males and females; between urban, suburban, and rural students; and among various ethnic or racial groups (Georgia Partnership for Excellence in Education, 2013).

Given the evidence regarding spending, many researchers believe that the socioeconomic status of a school district, in fact, does have a direct impact on student achievement, in contrast to the findings in the Coleman study. It is believed that the best method for closing the achievement gap would be to provide schools and their districts with the necessary financial resources to implement research-based programs that have been proven to improve student achievement. As mentioned earlier, the 2011-2012 state budget for education in Pennsylvania slashed approximately $900 million in state and federal funds for local school districts (Georgia Partnership for Excellence in Education, 2013).

The following sections will explore educational accountability, start of high stakes testing, student achievement, high stakes testing in Pennsylvania, and value added model for achievement. The purpose of the following sections is to investigate how students are evaluated and classified to determine their academic achievement.

Educational Accountability and the Transformation of High Stakes Testing in the United States

The Elementary and Secondary Act passed in 1965 (PASA & PASBO, 2012) included requirements for standardized testing to measure student achievement (Lipscomb, Chiang, Gill, & Mathematica Policy Research). The movement did not gain much momentum until the 1983 publication of *A Nation at Risk: The Imperative for Educational Reform*. The article stated, "Our nation is at risk . . . . If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war" (Marion & Sheinker, 1999).

According to *A Nation at Risk*, 13% of 17-year-olds were functionally illiterate, with minority student illiteracy at 40%. Many 17-year-olds did not have sufficient skills to draw inferences from written material, solve complex mathematical problems, or write persuasive essays. High school and college achievement test scores had declined since the 1960s. Colleges, military, and business leaders complained that high school graduates lacked the basic skills in reading, writing, spelling, and mathematics that were necessary to succeed in postsecondary institutions and workplaces (Good, 2010).

The *Nation at Risk* report and pressure for education accountability transformed high stakes testing from indicators of basic competency to a benchmark of high standards for learning (Togut, 2004).   In the late 1990s, there was a call for increasing educational standards nationwide (Coleman, 1998). A 1998 Gallup poll revealed that 73% of those surveyed favored requiring students to

pass a standardized test in order to obtain a high school diploma. A strong vocal

minority, however, cautioned against the use of testing to make placement,

promotion, and diploma decisions (Stedman & Riddle, 1998; Togut, 2004). This

group feared that students educated in poorly financed school systems would be

unduly penalized and that minorities would suffer unfair consequences for their

poor performance on such tests. As a result the high-stakes movement has created

considerable controversy. Educators, school administrators, professional and

advocacy organizations, associations, parents, and other stakeholders weighed in

with comments, criticisms, and suggestions for how high-stakes tests should be used

(Togut, 2004).

Student Achievement – High-Stakes Testing

High-stakes tests are used to determine which individual students get

rewards, honors, or sanctions. Some examples of such high-stakes tests include

college entrance examinations, tests for being promoted to the next grade, and

standardized tests affecting the status of schools, such as those on which a given

percentage of students must receive a passing grade, (Marchant, Paulson, & Shunk,

2006; Peters & Oliver, 2009; Supovitz, 2009; Togut, 2004). High-stakes testing is a

longstanding controversial issue across the United States. The logic behind high-

stakes testing is that it informs the public about school quality, focuses learning on

what is important in the state curriculum, provides a measure of accountability, and

gives information about student achievement (ASCD, 1997, 2015). Proponents

believe that testing is an equitable and objective means of evaluating the progress of

students. High-stakes tests can ensure that students who are diverse in terms of

culture, race, native language, or gender are treated equally because they can take tests under the same conditions, and their responses are scored in identical ways. These proponents believe that high-stakes tests can increase creativity, higher order thinking skills, problem solving abilities, self-efficacy, and self-esteem (Jones, 2003; Madaus, 2009).

All students who take high-stakes test have the opportunity to achieve test scores that qualify them to attend gifted classes, to attend college and universities, and to graduate from professional and graduate schools (Scheuneman, 1998). Some research indicates that test scores are lower for some minority group members than would be expected if their actual score were known, even though scores correlate with the same criterion measures as for majority of students (Tingey, 2009). Louisiana's Department of Education has argued that poverty should not be considered a factor in high-stakes tests because academic expectations should be an overall consideration of students regardless of background. They believe that considering poverty lowers expectations and results in discrimination against low socio-economic students (Scheuneman, 1998).

Opponents of high-stakes testing programs believe that testing does not achieve these outcomes. Testing seems to be an efficient method for attaining information on all students, but the practical realization has proven much more difficult. Also, many reject high-stakes testing on the basis of viewing the negative consequences of testing to be greater than the positive consequences (Jones, 2003; Tingey, 2009). While many believe that high-stakes testing is an acceptable and accurate way to measure student learning, researchers continue to debate the

effectiveness of high stakes testing (Jones, 2003). Baker and Johnston believe that there is a need to continually review and examine the possible impact high-stakes testing may have on children from differing socioeconomic backgrounds, especially disadvantaged youth (Baker & Johnston, 2010)

The SAT

The SAT is a globally recognized college admission test that is intended to demonstrate to colleges what students know and how well they can apply their knowledge. The SAT assesses knowledge of reading, writing and math, core subjects that are taught every day in classrooms around the world. Almost all colleges and universities use the SAT to make admissions decisions (Baker & Johnston, 2010). The SAT is not designed to test a student's basic logic or abstract reasoning. It tests the fundamental skills in reading, writing, and mathematics that students are learning daily in school. The test contains a critical reading section, which includes reading passages and sentence completion questions. Writing involves the construction of a short essay and multiple-choice questions to identify grammar errors. In the mathematics section, students are required to solve questions on arithmetic operations, algebra, geometry, statistics, and probability (SAT, 2014c).

A History of the SAT

In the late 1800s, a group of leading American universities were concerned about not having a universal way to decide if students were equipped academically for college-level course work (SAT, 2014b). At this time the group decided to form the College Entrance Examination Board. Working together they created and

administered the first standardized exam in 1901 (SAT, 2014a). This was an all-essay exam administered to high school students. This was a turning point for students and American universities. Students could now take one exam for several universities instead of taking separate exams for each university.

The first multiple-choice SAT exam was administered in 1926 and was created to give equal opportunity for all students. The multiple-choice format allowed students to demonstrate their skills and knowledge regardless of their economic status and their specific high school curriculum (SAT, 2014a). In 1926, more than 8,000 students took the first SAT. These multiple-choice exams had to be checked by hand until 1939. The SAT group then created a bubble sheet which resulted in a more efficient and accurate method of scoring the exam (SAT, 2014a).

Students were permitted to take the SAT a few times a year. Colleges received SAT scores from several different versions of the test throughout each school year. In 1941 the test was normalized, in order to make sure that the scores from one version of a test could be compared to scores from a different version (SAT, 2014a). For the next 54 years, every form of the SAT was linked back to the 1941 exam. In 1995, this system was revised again to ensure that today's scores are as fair as possible for the modern student (SAT, 2014a). In 1958, students were, for the first time, permitted to view their scores. Prior to this year the scores had been kept private, and could be accessed only by the universities and high schools. In 1971 the scores were mailed to the students homes (SAT, 2014a).

The College Board was notified during the Civil Rights Movement that many African American students were being turned away from SAT testing centers (SAT,

2014a). Only a few African American students were afforded the opportunity to

take the SAT. During testing they were separated from their white classmates in

basements and other subpar facilities. In the early 1960s, college board officials

began visiting testing centers. These visits ensured that all students were being

tested under equal conditions. By the mid-1960s, the SAT exam was given to each

student, and they were given equal opportunity to show what they knew, regardless

of race (SAT, 2014a).

In 1994 several key changes were made to the SAT. Questions that focused

on antonyms were removed, to provide a greater focus on reading passages.

Calculators were permitted for the first time in the math sections (SAT, 2014a).

Even more changes were made to the SAT in 2005. These amendments reflected the

subjects being taught in high school classrooms. At this time quantitative

comparison and analogy questions were removed. Third-year math content was

added, and the largest addition of a newly formed writing section (SAT, 2014a).

SAT and Student Achievement Controversies

The SAT exam is not immune to controversy. From the acronym to the

disparities in achievement in gender and race, the SAT has been thoroughly

researches through the years. The SAT acronym has multiple meanings, from its

original name Standard Assessment Test (SAT, 2014a), to other variations, such as

Stanford Achievement Test, Scholastic Aptitude Test, and Scholastic Achievement

Test. However, at this time the SAT acronym has no official meaning.

The SAT test has also experienced criticism because of disparity in

achievement according to gender and race. Nankervis (2011) suggested that males

have a significantly higher average scores than females on the SAT (SAT, 2014a). He

explained that the gaps in performance based on the SAT have little to do with

college readiness and success (Nankervis, 2011).   Some believe that the difference

in performance between women and men is a result of the social and personality

factors of test anxiety and performance-avoidance goals (Nankervis, 2011). Race

issues have also been subject to much scrutiny with the SAT exam. Throughout the

history of the SAT, African American students' average scores have been the lowest

among all racial groups (Hannon, 2012). Research has shown that the predictive

validity of success on the SAT is better for Black students in Black colleges, but white

students score higher on the tests overall (Toldson & McGee, 2014). Finally, the

results of one study revealed that although more black students were taking the

SAT, the racial scoring gap was widening (Fleming, 2002).   The SAT exam may have

various faults; however, it is within the scope of this study is to explore the SAT

exam as a measure of achievement only and not the various shortcomings of the SAT

exam. This exam remains a major requirement for entrance to universities and

colleges across the commonwealth.

The History of High-Stakes Testing in Pennsylvania: The PSSA

In 1990, leadership staff at the Pennsylvania Department of Education (PDE)

began working on a method to set true performance goals. School-based

performance data and system evaluation was the initial political and district focus,

precluding the production of individual student data ("More Blacks," 2009). In

1992, a small committee at the PDE developed the initial Pennsylvania System of

School Assessment (PSSA). Rauch (2008) stated that the initial assessments created

were broader, less focused, and included more measures of thinking skills than does the current PSSA assessment. Kepler (2006) noted that the initial PSSA was a voluntary, standards-based assessment model (Rauch, 2008). Approximately 230 committee members formed a new team consisting of both educators and PDE staff members, who further refined the test over the next few years. Approximately 60 participants developed each grade level measure (Kepler, 2006).

In the 1990s, Pennsylvania adopted state standards in reading, writing, speaking and listening, and mathematics. These standards identified the competencies that students should know and perform at each tested grade level. With the creation of these standards, school districts were required to design curriculum frameworks and instruction techniques to ensure that students were achieving the expectations set forth by the state standards. At that same time, Chapter IV was passed, and the standards were first measured (Pash, 2010).

In 2001, the results of the PSSA were used to provide an understanding of the local school's achievement. Public criticism led to an effort for more defined assessment standards and, in 2004, more specific assessment anchors. The anchors condensed eligible testing content and allowed students and schools to direct their performance towards greater success rates. This led to a bell curve regarding the performance on the PSSA. The academic anchors were measured for the first time in 2005. The limited rigor that currently exists is a reflection of these anchors (Pash, 2010). In July 2010, the Pennsylvania State Board of Education adopted the Common Core State Standards, which are initiatives set forth by the national government to ensure that all states adopt the same anchors for English, language

arts, and math. The mission of the Common Core State Standards is to provide a consistent, clear understanding of what students are expected to learn. This allows teachers and parents to use the data to help determine strategies for addressing the challenges. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers (Rauch, 2008). The Common Core establishes a K-12 staircase to prepare students for college or a career (CCSSO, 2012). In order to communicate results to the general public and state policy makers, the Pennsylvania State Board of Education, in compliance with § b(4) of the PA School Code, approved "specific criteria for advanced, proficient, basic, and below basic levels of performance" (Pennsylvania State Board of Education, 2011). The current rubric measures a student's performance on the PSSA according to Pennsylvania's General Performance Level Descriptors, as follows.

Advanced: The Advanced Level reflects superior academic performance. Advanced work indicates an in-depth understanding and exemplary display of the skills included in the Pennsylvania Academic Content Standards. Advanced responses demonstrate a thorough understanding of textual complexity and demonstrate personal, critical, and evaluative elements. Additionally, the advanced response makes connections to personal, cultural or background knowledge.

Proficient: The Proficient Level reflects satisfactory academic performance. Proficient work indicates a solid understanding and an adequate display of the skills included in the Pennsylvania Academic Content Standards. Proficient responses are coherent, with no major comprehension errors and some elaboration or extension

of understanding.

Basic: The Basic level reflects marginal academic performance. Basic work indicates a partial understanding and limited display of the skills included in the Pennsylvania Academic Content Standards. This work is approaching satisfactory performance, but such a level has not been reached. There is a need for additional instructional opportunities and/or increased student academic commitment to achieve the Proficient Level. Basic responses consist of literal responses to the text, with continued factual errors and disjointed production.

Below Basic: The Below Basic level reflects inadequate academic performance. Below Basic work indicates little understanding and minimal display of the skills included in the Pennsylvania Academic Content Standards.

There is a significant need for additional instructional opportunities and/or increased student academic commitment to achieve the Proficient Level. Below Basic responses demonstrate limited understanding of the text, include errors in text-based facts, and are disjointed, incomplete, or irrelevant (PDE, 2013g).

In 2009, the PSSA was recognized as an annual standard-based, criterion-referenced assessment used to measure students' attainment of the academic standards while determining the degree to which school programs enable students to attain proficiency of the standards. Every student in Pennsylvania in grades 3, 4, 5, and in 8 must take the PSSA in the areas of reading and math. Students in grades 5, 8, and 11 are assessed in writing, and students in grades 4 and 8 are tested in science (PDE, 2013f). Students' scores are provided only to their respective schools and can be used to assist teachers in identifying students who may need additional

educational opportunities. School scores provide information to districts for curriculum and instruction improvement planning (PDE, 2013f).

Federally-mandated, high-stakes tests, such as the PSSA, are based on the theory that students learn at higher levels when states define expectations for student performance (Pash, 2010). Each year an increasing percentage of students must score at the proficient or advanced level, which is known as Adequate Yearly Progress (AYP; Elmore 1999). By 2014, every student in the country was expected to score at the proficient level for their grade. In an attempt to reach this goal, districts would be required to increase the annual AYP percentage. Schools that did not reach these increased percentages in AYP would be required to develop an "Improvement Plan" for both teachers and administrators. To address the deficiency, districts would be asked to implement research-based programs approved by the Pennsylvania Department of Education. In March of 2010, the Obama Administration sent Congress a *Blueprint for Reform of the Elementary and Secondary Education Act,* addressing the issue of proficiency created by No Child Left Behind Act with the pursuit of higher common standards (PDE, 2012).

If a school continues to be identified as needing improvement after the implementation of this plan for a specified number of years, the state has the authority to make any and all changes it deems necessary to ensure student improvement on the test (Government, 2013). This may include the replacement of staff, implementation of new curriculum, extension of the school day or academic year, parental choice options, and ultimately, reorganization (PDE, 2012). However, the PDE has introduced an alternative to strict proficiency percentages. This model

measures growth in students across years and is called Pennsylvania Value Added

Assessment System (PVAAS). While PVAAS uses different measuring techniques, it

still relies on the PSSA as a basis for data.

High-stakes tests continue to drive curricula design in order to meet the

standards set forth in the tests rather than meet the needs of the learner. Mandatory

testing is here, like it or not, and parents, teachers, and students must deal with it

(Abrams & Madaus, 2003; McColskey & McMunn, 2000; Stecher & Hamilton, 2002).

High-stakes testing, like PSSA, causes educators to feel pressure because they must

prepare their students to perform at the proficient level on the test. These

assessments guide the design of English Language Arts and Math curriculums,

dictate the selection of teaching objectives and content, and strongly recommend to

teachers the selection of certain materials and resources in their classrooms which

will align with the assessment (Dessoye, 2007). Arguments that the PSSA tests do

not accurately measure children's work, force teachers to teach to the test, narrow

the curriculum, provide insufficient funding, and many more issues deeply concern

educators (Dessoye, 2007).

Pittsburgh Business Times Rankings

As previously mentioned, the *Pittsburgh Business Times* rankings are based

on students' scores on the PSSA exam. Students in grades 3 through 8 are ranked

using 3 years of PSSA scores. Rankings are calculated by gathering all available

scores over the past 3 years and are included in the formula, meaning that 57

individual components are used in the ranking. Students in grades 3 through 8 and

in the 11th grade take the standardized tests. All grades take math and reading

tests. Science tests are administered to students in grades 4, 8, and 11. Students in grades 5, 8, and 11 were also to take a writing exam, but those were discontinued for the 2013 testing year (Pash, 2010).

A district's score is based on the percentage of students that place in the advanced and proficient categories. That score is then compared to its departure from the average for the set. This is also known as a standard score or "z-score." This z-score is a measurement of the number of standard deviations by which a school or district scored above or below the mean for the data set being examined. The z-scores for each component in a grade are summed to create a grade score. The sum of all the grade scores makes up a school or district's overall score. The scores then rank all school districts across the state of Pennsylvania (Lott, 2014).

Keystone Exam

In 2008 the Commonwealth of Pennsylvania instituted a comprehensive graduation competency assessment for students across Pennsylvania. At the same time, the Keystone Exam was created. This is a high stakes exam designed to assess proficiency in Algebra I, Algebra II, Geometry, Literature, English Composition, Biology, Chemistry, U.S. History, World History, and Civics and Government at the end of each course (PDE, 2015a). This exam was administered as a pilot in the fall of 2010 across Pennsylvania for Algebra I, Literature, and Biology Composition. The inaugural graded exams occurred during the spring of 2011. The exam was not used during the 2011-2012 school year owing to lack of funding in the state for the exam. The testing, which resumed in 2013, is one of the components of Pennsylvania's new system of high-school graduation requirements. The Keystone

Exams will help school districts guide students toward achieving state standards (PDE, 2015a). Currently, the exam assesses students in Algebra I, Literature, and Biology. This assessment also provides new high-stakes data elements that fall outside the scope of this study time-wise.

School Performance Profile

The School Performance Profile (SPP) provides school officials and the public with a comprehensive overview of student academic performance in every Pennsylvania public school (PDE, 2015b). The SPP is a complex calculation which, in Pennsylvania, has replaced AYP (PDE, 2015c). The SPP will provide a quantitative score for each school and district based on a 100-point system. The data to calculate this score includes Indicators of Academic Achievement (40%), Indicators of Closing the Achievement Gap (PDE, 2015b) (5%), Indicators of Closing the Achievement Gap of Historically Underperforming Students (5%), Indicators of Academic Growth/PVAAS (40%), other academic indicators (10%) and extra credit for advanced achievement up to 7 points (PDE, 2015c). This score has been developed and assigned to schools within the state starting in 2013. The SPP is a new ranking system designed to incorporate more data for ranking schools and school districts. Because of the limited data released, these school rankings also fall outside the time scope of this study.

Summary

This chapter has reviewed major research from Coleman (1970; Coleman et al., 1966), Hanushek (1986, 1989, 1994), and Baker (2012). This historical research perspective has identified the reasons research findings have changed throughout

the years. Coleman believed that student achievement was affected mostly by the parents' education level, whereas Hanushek, while believing that parents' attitude towards education has a great impact, also thought that educational advancements could occur if school and teacher improvements were made. Baker stated that money does matter and that it can increase student achievement when properly managed within the education setting. The history of legislation from the formation of the Public School Code in 1949 to extensive budget cuts in 2011 was reviewed and the major changes in the school funding formula identified that have arisen, in part, from the economic condition of Pennsylvania. The ongoing debate of equity versus adequacy was examined from the perspective of both national and international studies, as well as research focused within the state of Pennsylvania. All of the economic and noneconomic indicators for the study were defined and detailed. The final section of the literature review detailed and analyzed student achievement and high-stakes testing, specifically the SAT and PSSA exams.

CHAPTER 3

PROCEDURES

Introduction

This chapter outlines the explanatory sequential mixed-method procedures employed to conduct this study. The quantitative processes were completed before the qualitative phase of the study was implemented. The overall purpose for this study was to explore the relationship between economic and noneconomic indicators and their influence on student achievement in Pennsylvania. The secondary purpose was to find and provide recommendations from experts about methods to improve student achievement by overcoming both economic and noneconomic factors. The research design, data population, data source, research procedures, and data analysis are outlined here.

Rationale

This study explores multiple economic and noneconomic factors in Pennsylvania and their influence on student achievement, using the following indicators: district wealth (MV/PI), average daily membership (ADM), weighted average daily membership (WADM), total local revenue, local mill value, adjusted Act 1 index expenditures, fund balance, debt, and socioeconomic disadvantage rates. The noneconomic indicators include total enrollment, truancy rates, reportable discipline infractions, and staff size, and experience and education in all 500 traditional public school districts across Pennsylvania. This population was selected because it provided an all-inclusive comprehensive analysis. These indicators were compared to each school district's student achievement. Student achievement was

measured by high-stakes testing results including the average student score on the

SAT, PSSA ranking, high school graduation and dropout rates, and percentage of

students who attend post-secondary education.

The reason for employing a mixed-method design that uses both quantitative

and qualitative approaches was to discover and understand the degree of

correlation of the effects of economic and noneconomic indicators on student

achievement and to find methods for overcoming this relationship. The sequential

explanatory approach was selected because the quantitative research preceded the

qualitative method. A standard multiple regression and correlation design was used

for the first part of the study, followed by data analysis. The multiple regression and

correlation models were selected because, by definition, it is a statistical procedure

for examining the combined relationship of multiple independent variables on a

single dependent variable (Creswell, 2012, p. 624). The regression and correlation

models provided and ranked the economic and noneconomic indicators that have

the most influence on student achievement, providing the empirical data for this

study. When this relationship was established and identified, two qualitative focus

group and individual interviews sessions took place to collect the interpretative

data. The second phase of the research included team interviews of school district

superintendents and business managers. By using both quantitative and qualitative

designs, the researcher anticipated both statistical significance and interpretive

meanings (Barclay, 2012).

Research Questions

This study examined the following research questions:

1. What is the relationship between economic and noneconomic indicators and student achievement?

    a. Relationship between economic and noneconomic indicators and PSSA Scores

    b. Relationship between economic and noneconomic indicators and SAT Scores

    c. Relationship between economic and noneconomic indicators and graduation rate

    d. Relationship between economic and noneconomic indicators and dropout rate

    e. Relationship between economic and noneconomic indicators and students who attend post-secondary education

2. Is there a strength and rank in the relationship of these indicators with student achievement?

    d. Economic indicators and student achievement

    e. Noneconomic indicators and student achievement

    f. Economic and noneconomic indicators and student achievement

3. What economic and noneconomic indicators do superintendents and business managers perceive as barriers that impede student achievement?

4. How do superintendents and business managers believe the perceived economic and noneconomic barriers can be addressed to improve student achievement?

Null Hypotheses

1. There is no relationship between economic and noneconomic indicators within any area of student achievement.

2. There is no strength and rank to the relationship between any indicators within any area of student achievement.

Data Population

For this study, all 500 traditional public school districts were selected as the population group. This population was selected because it provided an all-inclusive comprehensive homogeneous analysis across the state of Pennsylvania. Another reason for selecting all the traditional public schools in Pennsylvania is that they follow the same funding rules, regulations, and formulas from which the economic indicators for this study were selected. Only traditional public schools were included; charter schools, cyber charter schools, and private schools within the state were excluded because they are funded differently than traditional public school districts. Any school district that has made significant economic changes, such as merging or giving students to another district was also disqualified. Using the selected traditional public schools in Pennsylvania, the economic, noneconomic, and academic data were accessed to determine the relationships between the indicators and the overall student achievement measured by the PSSA rankings from the *Pittsburgh Business Times*, SAT scores, district graduation percentage, dropout rate, and percentage of student who will attend post-secondary schooling.

Data Sources and Collection

Phase One – Quantitative

The economic indicator data (independent variables) for this experiment were drawn from the Pennsylvania Department of Education database, with information being gathered through various links on the Pennsylvania Department of Education website. These links detail the economic and noneconomic variables listed below for all the public school districts in Pennsylvania. The following data were extracted from historical files maintained by the Pennsylvania Department of Education, and information was extracted from comprehensive databases and spreadsheets that are updated annually by the Pennsylvania Department of Education. This information was then used in the correlation and regression models to determine significance and rank in terms of their impact on student achievement. The economic variables (independent variables) used in this study are as follows:

Basic education funding

District wealth (MV/PI ratio)

Average daily membership (ADM)

Weighted average daily membership (WADM)

Total local revenue

Local mill value

Adjusted Act 1 index

Actual instruction expenditures

Regular education expenditures

Special education expenditures

Fund balance

Debt

Socioeconomic disadvantage rate

The noneconomic indicator data (independent variables) were also drawn from the

Pennsylvania Department of Education database. These variables include the

following:

Enrollment

Truancy rate

Dicipline infractions reported to the state of Pennsylvania

District teaching staff size

Average teaching experience level

Average teacher education level

Every economic and noneconomic indicator has numeric data information which

was extracted and entered into an Excel worksheet. Each column represented the

data derived for each economic indicator. The 500 traditional public school districts

were represented in rows on the spreadsheet.

PSSA and SAT data, graduation and dropout percentages, and the percentage

of students who attend a post-secondary educational institution were all used as

indicators of student achievement. The numerical values were included after the

economic and noneconomic indicators on the Excel spreadsheet during the data

collection process.

Data were collected for a period of 5 years, from the 2008 - 2009 through the 2012- 2013 school years. All the data were entered for each year, for all eligible schools, and was charted on separate spreadsheets for each year.

Phase Two – Qualitative

For this phase of the study, seven superintendent and business manager teams were selected. To be selected, all of the participants must have had at least 5 years of experience working within their job descriptions, and each participant pair needed to have been working together as a team for at least 3 years. Using the quantitative findings, the school districts throughout Pennsylvania were sorted and ranked into thirds. After that, at least two school district teams from each third were selected for the interview process. A total of seven team interviews with 14 participants took place throughout Pennsylvania to obtain a variety of data. Interview numbers 3 and 7 were selected from the upper third, interview numbers 1 and 6 were from the middle third, and interviews 2 and 4 were from the bottom third. Interview 5 took place with the Executive Directors of PASA and PASBO. The interviews were each about 45 minutes in length, and they were audio recorded and later transcribed into digital documents.

Interviews were also conducted with Executive Directors of the Pennsylvania Association of School Administrators (PASA) and Pennsylvania Association of School Business Officials (PASBO). These associations represent school administrators and school business officials throughout the state of Pennsylvania

Research Procedures

Phase One – Quantitative

The collected data were entered into the Statistical Package for Social Sciences (SPSS) for statistical manipulation. A standard correlation and multiple regression design was followed in order to analyze the data for this study. The standard multiple regression model was selected because by definition it is a statistical procedure for examining the combined relationship of multiple independent variables to a single dependent variable (Creswell, 2012, p. 624). This statistical procedure allowed for the multiple economic indicators (independent variables) to be evaluated simultaneously within one equation. Each economic indicator was assessed in terms of its predictive power, over and above the predictive power of all the other economic indicators. This approach also explained how much unique variance existed in each element of student achievement (Pallant, 2011).

Phase Two – Qualitative

The seven interviews were conducted during the second phase of the research with superintendents and business manager teams. These interviews were conducted with the superintendent and business manager together as a team interview. Purposeful sampling was used to select the participants, who numbered 14 in all. Data obtained through the quantitative portion was used to separate the school districts across the state into thirds, and eligible school district teams were identified from each third. In order to be eligible for the interviews, must have had at least 5 years of experience working within their job descriptions, and each

73

participant pair needed to have been working together as a team for at least 3 years.

The information needed to make a selection was obtained through the PASA and

PASBO organizations. An e-mail letter of invitation was sent to the superintendents

of these teams to e-mail addresses obtained through the school district website.

Follow-up phone calls were made to eligible superintendents after one week. The

phone numbers for these phone calls were obtained through the school district

website. The interviews were each about 45 minutes in length, and they were audio

recorded and later transcribed into digital documents.

Interviews were also done with the Executive Directors of the Pennsylvania

Association of School Administrators (PASA) and Pennsylvania Association of

School Business Officials (PASBO). These associations represent school

administrators and school business officials throughout Pennsylvania. The contacts

were made through an e-mail letter of invitation. The e-mail addresses were

obtained through the PASA and PASBO websites. A follow-up phone call was made

to PASA and PASBO directors after one week, the phone numbers having been

obtained through the PASA and PASBO websites.

<div align="center">**Data Analysis**</div>

Phase One – Quantitative

The data were measured according to assumptions regarding sample size,

multicollinearity and singularity, outliers, normality, homoscedasticity, and

linearity. Correlation and multiple regression is one of the fussier of statistical

techniques. It recognizes a number of assumptions regarding collected data, and it

is not very forgiving if these assumptions are violated. The standard multiple

<div align="center">74</div>

regression technique is not to be used on small samples, wherein the distribution of scores is skewed (Pallant, 2011). When testing for sample size, the issue is generalizability because using a small sample may mean that the results are not generalizable and hence cannot be repeated with other samples. If the results do not generalize to other samples, they are of little value (Pallant, 2011). Multicollinearity and singularity are tested because they refer to relationships among the independent variables. Multicollinearity exists when the independent variables are highly correlated $r = .9$ and above). Singularity occurs when one independent variable is actually a combination of other independent variables. It must be recognized that standard multiple regression does not like multicollinearity or singularity (Pallant, 2011).

Standard multiple regression is very sensitive to extreme data numbers, either high or low, which are referred to as outliers. Checking for outliers was carried out during the initial data screening process for both dependent and independent variables. Outliers for this study were either deleted from the data set or were given a score for the variable that is high but not too different from the remaining cluster of scores (Pallant, 2011).

Once these assumptions were tested and any necessary modifications made, correlations were explored. The data were analyzed with the R^2 coefficient to determine how much of the variance in the dependent variable could be explained by the independent variable. Next the variables were analyzed to determine which contributed to the prediction of the dependent variable. The Beta coefficient was used to rank each economic indicator by its relative importance. The higher the

Beta, the more important it is for student achievement (Pallant, 2011).

Phase Two – Qualitative

Individual contact was made with each eligible participant team with an e-mail letter of invitation. The interviews were carried out during the summer of 2015. The qualitative data were analyzed and interpreted through a six-step process (Creswell, 2012). The first step was to prepare and organize the data for analysis. The data were transcribed and then analyzed. To validate accuracy, the transcriptions were distributed to the interviewees so that they could add or delete any data from the transcription if they wished. The results were coded according to themes. These codes were used to develop descriptions and to locate common interconnections in the data (Creswell, 2012). The results are presented in the next chapter.

Summary

This study explored the relationship between multiple economic and noneconomic indicators and student achievement. This purpose of this study was to clarify how economic and noneconomic indicators affect student achievement across Pennsylvania. Experts in the field were consulted to ascertain how they perceive these economic and noneconomic barriers that affect student achievement and how they can be addressed for an increase in student achievement. The sample populations included all 500 public school districts in Pennsylvania because they all share the same funding rules and formulas from the state. The data for each indicator, as well as SAT scores, graduation and dropout rates, and numbers of students attending post-secondary education were derived from the Pennsylvania

Department of Education database. The PSSA ranking was acquired from the

Pittsburgh Business Times news publication database. A sequential explanatory

mixed-method research design was chosen for this study, and regression and

correlational models were used to determine the degree to which the economic

indicators affect student achievement. Finally, the relative importance, in rank

order, of the indicators that have the most impact on student achievement was also

determined. Individual interviews were carried out with school district

superintendents and business administrators as well as the executive directors of

the PASA and PASBO to collect the qualitative data. All interviews were conducted

with both participants together as a team interview.

CHAPTER 4

DATA AND ANALYSIS

Introduction

This chapter will detail the analysis of the data used in this study and the

findings. The explanatory sequential mixed-method procedure was employed to

collect and conduct all statistical tests before any interviews took place.

Quantitative data were collected from the Pennsylvania Department of Education

and *Pittsburgh Business Times* databases. Data used for this study were collected for

each year from the 2008 - 2009 through the 2012- 2013 school year. The

qualitative portion of the study was carried out via interviews with superintendents

and business manager teams. To be selected, each participant must have had at

least 5 years of experience working within their job descriptions, and each

participant pair needed to have been working together as a team for at least 3 years.

A total of seven team interviews with 14 participants were conducted across the

state of Pennsylvania to obtain a variety of data. The overall purpose for this study

was to explore the relationship between economic and noneconomic indicators and

their influence on student achievement in Pennsylvania. The secondary purpose

was to find and provide recommendations from experts about methods to improve

student achievement by overcoming both economic and noneconomic factors.

Quantitative Data and Findings

To gain an accurate and equivalent data sample for each school district

across Pennsylvania, certain independent variable data were transformed to gain an

average per ADM representation. The data transformation was used for the

following independent variables: basic education funding, total revenue, instructional expenditures, regular education expenditures, special education expenditures, fund balance, and debt. Using the average per ADM representation limits the impact of large urban districts that receive large sums of financial resources from the state and allows for a more equitable method for evaluating the selected independent variables. The district average daily membership was used to develop the average per pupil representation for each independent variable divided by each of the selected independent variables. The average daily membership number was applied because it is a count of all resident pupils of the school district for whom the school district is financially responsible. It is calculated by dividing the aggregate number of days of membership for all children on active rolls by the number of days the school district is in session. The average daily membership is a common form of analysis used by the Pennsylvania Department of Education and is commonly recognized as an official student count in Pennsylvania. The outcome of the division process resulted in an average per pupil representation. This process was employed to balance districts having large budgets with districts having small budgets and to give an average per ADM expenditure.

PSSA Data Findings

PSSA data were collected in rank form, with one being the highest average PSSA score and 500 being the lowest. The ranking score was inverted for this study to display the highest-ranking school district as 500 and the lowest ranking school district as one. The data were manipulated in order to demonstrate positive correlations as increasing student achievement and negative correlations as

decreasing student achievement. The collected rankings are calculated by gathering all available scores over the past 3 years and are included in the formula for each year. A district's score is based on the percentage of its students that placed in the advanced and proficient categories. That score is then compared to its departure from the average for the set. This is also known as a standard score or "z-score," which is a measurement of the number of standard deviations a school or district scored above or below the mean for the data set being examined. The z-scores for each component in a grade are summed to create a grade score, and the sum of all the grade scores makes up a school or district's overall score. The scores are then used to rank all school districts across Pennsylvania (Lott, 2014), and these ranks are reported yearly through the *Pittsburgh Business Times*. Yearly district scores are also available yearly from the Pennsylvania Department of Education website.

Pearson Correlations for PSSA and all Indicators

Table 1 outlines the Pearson correlation coefficients between the PSSA exam and all economic and noneconomic indicators.

Table 1
Pearson Correlation Among PSSA Ranking and Economic Indicators

	PSSA	SED Rate	MV/PI ratio	Adjusted Act 1	Eq Mills	BEF Per ADM	Revenue per ADM	Avg. inst. Exp per ADM	Avg. Reg Exp per ADM	Avg. SPED Exp per ADM	Fund Bal Per ADM	Debt per ADM
PSSA	1											
SED rate	-.714**	1										
MV/PI ratio	-.612**	-.729**	1									
Adjusted Act 1	-.182**	-.105**	-.281**	1								
Equalized mills	-.064**	-.081**	-.013	-.005	1							
BEF Per ADM	-.538**	-.676**	-.846**	-.229**	.242**	1						
Revenue per ADM	.491**	.582**	.880**	.335**	-.300**	-820**	1					
Avg. inst. exp per ADM	.164**	.147**	.468**	.388**	-.249**	.254**	-.678**	1				
Avg. reg exp per ADM	.137**	.088**	.397**	.262**	-.243**	.171**	-.594**	-.838**	1			
Avg. SPED exp per ADM	-.041*	-.083**	.284**	.218**	-.315**	.191**	-.511**	-.686**	-.575**	1		
Fund bal per ADM	.023	-.033	-.048*	.175**	.228**	-.257**	-021	-.124**	-.099**	.025	1	
Debt per ADM	.026	-.013	.020	.124**	-.001	-.036	-.040*	-.093**	-.073**	-.025	-.096**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 1 shows that significant correlations could be made for socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized millage rate, basic education funding per ADM, revenue per ADM, average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. There was no significant correlation between fund balance per ADM, debt per ADM, and PSSA ranking.

Significant negative correlations were demonstrated between the PSSA ranking score and socioeconomic disadvantage rate, r (2473) = -.714, $p < .01$, and MV/PI ratio, r (2473) = -.612, $p < .01$. This signifies that as a school district's socioeconomic disadvantage rate and MV/PI ratio increase, its PSSA ranking will fall. Other economic indicators with a negative correlation are the adjusted Act 1 index, r (2468) = -.182, $p < .01$; equalized millage rate, r (2473) = -.064, $p < .01$; basic education funding per ADM, r (2473) = -.538, $p < .01$; and average special education expenditures per ADM, r (2473) = -.041, $p < .05$. An increase in any of the six negatively correlated variables will have a negative impact on PSSA rank.

A significant positive correlation was indicated between three economic indicators. These indicators are revenue per ADM, r (2473) = .491, $p < .01$; average instructional expenditures per ADM, r (2473) = .164, $p < .01$; and average regular education expenditures per ADM, r (2473) = .137, $p < .01$. An increase in these variables indicates a positive effect on PSSA rank.

Table 2
Pearson Correlation Among PSSA Ranking and Noneconomic Indicators

	PSSA	Enrollment	Truancy	Infractions	Staff size	Avg. teach ed.	Avg. teach exp.
PSSA	1						
Enrollment	-.022	1					
Truancy	-.371**	-.194**	1				
Infractions	-.151**	-.710**	-.277**	1			
Staff size	-.024	-.997**	-.198**	-.720**	1		
Avg. teach ed.	.376**	-.005	.135**	.077**	-.007	1	
Avg. teach exp.	.122**	.084**	.171**	.067**	.085**	-.093**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 2 shows the Pearson correlations coefficients between the PSSA ranking and all noneconomic indicators. Significant correlations can be associated between truancy rate, reportable disciplinary infractions, average teaching education level, and average teaching experience. There was no significant correlation between the PSSA exam and enrollment size and teaching staff size.

Significant negative correlations were demonstrated among the PSSA ranking score and truancy rate, r (2473) = -.371, $p < .01$, and disciplinary infractions, r (2462) = -.151, $p < .01$. This signifies that as truancy and disciplinary infractions increase, the PSSA ranking will get worse.

Significant positive correlations were indicated between PSSA and average teaching education level, r (2473) = .376, $p < .01$, and average teaching experience, r (2473) = .122, $p < .01$. The positive correlation of these noneconomic independent variables suggests an increase in the PSSA rank.

Table 3
Hierarchical Multiple Regression Models for PSSA Ranking and Economic Indicators

Independent Variables	Model 1 Dependent Variable PSSA			Model 2 Dependent Variable PSSA			Model 3 Dependent Variable PSSA			Model 4 Dependent Variable PSSA			Model 5 Dependent Variable PSSA		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
<u>Wealth</u>															
Socioeconomic disadvantage Rate	-.570	-28.306	.000***	-.575	-22.992	.000***	-.548	-24.275	.000***	-.541	-24.131	.000***	-.541	-24.131	.000***
MV/PI ratio	-.198	-9.851	.000***	-.245	-7.031	.000***	-.199	-8.121	.000***	-.219	-9.185	.000***	-.219	-9.185	.000***
<u>Revenue</u>															
Adjusted Act 1				-.084	-5.735	.000***	-.080	-5.462	.000***	-.074	-4.992	.000***	-.074	-4.992	.000***
Equalized mills				-.132	1.507	.132	.005	.345	.730	.020	1.344	.179	.020	1.344	.179
Basic education funding Per ADM				.024	.846	.398	.034	1.229	.219	.022	.754	.451	.022	.754	.451
Revenue per ADM				.028	-2.898	.004**	-.061	-1.595	.111	-.024	-.688	.492	-.024	-.688	.492
<u>Spending</u>															
Avg. instructional expense per ADM							.041	2.279	.060	-.005	-.252	.801	-.005	.-252	.801
Avg. regular expense per ADM							033	1.864	.023*	.033	1.864	.062	.033	1.864	.062
Avg. special expense per ADM							-.088	-4.927	.000***	-.069	-4.273	.000***	-.069	-4.273	.000***
<u>Savings</u>															
Fund balance per ADM										.040	2.837	.005**	.040	2.837	.005**
<u>Debt</u>															
Debt per ADM													.019	1.376	.169
R²	.528			.532			.535			.535			.536		
Δ in R²				.004			.003			.000			.001		

*p<.05, **p<.01, ***p<.001

Hierarchical Multiple Regression Models for PSSA Rank and Economic,

Noneconomic, and All Other Indicators

Table 3 presents the results of multiple regressions models for the PSSA

ranking and economic indicators.   Model 1 includes the dependent variable of the

PSSA ranking and the economic independent variables subset, district wealth. This

subset includes the economic indicators of socioeconomic disadvantage rate and

MV/PI ratio. Model 2 includes the dependent variable of the PSSA rank and the

economic independent variable subset of district wealth, adding the subset of

district revenue. The district revenue subset includes the economic independent

variables of the adjusted Act 1 index, equalized millage, basic education funding per

ADM, and revenue per ADM. Model 3 includes the dependent variable of the PSSA

rank and the economic independent variables within the subsets of district wealth

and district revenue, adding a third subset titled district spending. District spending

includes the economic independent variables of average instructional expenditures

per ADM, average regular education expenditures per ADM, and average special

education expenditures per ADM. Model 4 includes the dependent variable of the

PSSA rank and the economic independent variable subsets of district wealth, district

revenue, and district spending, adding the subset district savings. The district

savings subset includes the economic independent variable of fund balance per

ADM. Model 5 includes the dependent variable of the PSSA rank and the economic

independent variable subsets of district wealth, district revenue, district spending,

and district savings, adding the final subset district debt. District debt includes the

economic independent variable of debt per ADM.   Each model will display the R^2

and the change (Δ) in R^2 at the bottom. The significance level had been set a $p < .05$.

Model 1 establishes that the district wealth economic independent variables

of socioeconomic disadvantage rate ($\beta = -.570$) and MV/PI ratio

($\beta = -.198$) explained 53% of the variance in the dependent variable PSSA ranking.

Both of these variables have a negative β, which indicates a drop in PSSA ranking.

Model 2 adds the economic independent variable subset of district revenue.

District revenue includes the adjusted Act 1 index, equalized millage, basic

education funding per ADM, and revenue per ADM. These variables increase the R^2

from 52% to 53%. In particular, the predictive variables in this model include

socioeconomic disadvantage rate ($\beta = -.575$) and MV/PI ratio ($\beta = -.245$), which

maintain their predictiveness, as well as the adjusted Act 1 index ($\beta = -.084$) and

revenue per ADM ($\beta = .028$). Socioeconomic disadvantage rates, MV/PI ratio, and

Act 1 index all have a negative β, which indicates a poorer PSSA ranking. Revenue

per ADM has a positive β, which signifies a better PSSA ranking.

Model 3 includes the economic independent variable subset district

spending. Average instructional expenditures per ADM, average regular education

expenditures per ADM, and average special education expenditures per ADM are

included within this subset. These variables increased R^2 slightly to 54%. The

predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.548$),

MV/PI ratio ($\beta = -.199$), and adjusted Act 1 index ($\beta = -.080$), and they remain

negative predictors. These indicators also show a decrease in PSSA rank. Average

regular education expenditures per ADM ($\beta = .033$) and average special education

expenditures per ADM ($\beta = -.088$) are also predictive within this model. As with the previous models, a negative β indicates a drop in PSSA rank. Inversely, a positive β indicates an improved PSSA rank. The impact of revenue per ADM diminishes and is no longer predictive within this model.

Model 4 introduces the economic independent variable subset of district savings, which includes fund balance per ADM. The R^2 remains exactly the same within this model at 53%. The independent variables of socioeconomic disadvantage rate ($\beta = -.541$), MV/PI ratio ($\beta = -.219$), adjusted Act 1 index ($\beta = -.074$), and average special education expenditures per ADM ($\beta = -.069$) continue to be negative predictors within the model. These variables suggest a drop in PSSA rank. The fund balance per ADM ($\beta = .040$) is found to be predictive within Model 4. This positive β identifies a positive impact on PSSA ranking. Average regular education expenditure loses its predictiveness within the model.

Model 5 presents the economic independent variable subset of district debt, represented by debt per ADM. This model explains 54% of the variance in the PSSA ranking. The final model introduces debt per ADM, but this variable is not predictive. The independent variable of socioeconomic disadvantage rate ($\beta = -.541$), MV/PI ratio ($\beta = -.219$), adjusted Act 1 index ($\beta = -.074$), the average special education expenditures per ADM ($\beta = -.069$), and fund balance per ADM ($\beta = .040$) are the independent variables within the model that remain predictive. As indicated in previous models, a negative β indicates a drop in PSSA rank, resulting in

a decrease in student achievement. Inversely, a positive β indicates an increase in

PSSA rank, which would result in an increase in student achievement.

Table 4
Hierarchical Multiple Regression Models for PSSA Ranking and Noneconomic
Indicators

Independent Variables	Model 1 Dependent Variable PSSA			Model 2 Dependent Variable PSSA		
	β	t	Sig	β	t	Sig
Student						
Enrollment	.170	6.442	.000***	.136	5.467	.000***
Truancy	-.355	-18.367	.000***	-.309	-16.767	.000***
Infractions	-.173	-6.421	.000***	-.134	-5.277	.000***
Teacher						
Staff size				-.073	-.327	.744
Avg. teach ed.				.318	17.982	.000***
Avg. teach exp.				.043	2.406	.016*
R^2	.152			.254		
Δ in R^2				.102		

*p<.05, **p<.01, ***p<.001

Table 4 presents the results of the multiple regression models for the PSSA

ranking and noneconomic indicators. Model 1 includes the dependent variable of

the PSSA rank and the noneconomic independent variable subset that is student

related. This subset includes district enrollment, truancy rate, and discipline

infractions. Model 2 includes the dependent variable of the PSSA rank and the

subset of noneconomic independent variables related to students, adding the new

subset of teacher-related variables, which include teaching staff size, average

teacher education level, and average teaching experience. Each model will display

the *R^2* and the change (Δ)in *R^2* at the bottom. The significance level was set at *p* <

.05.

Model 1 indicates that all student related variables are predictive with 15% of the variance in the dependent variable of PSSA ranking. The predictive variables are district enrollment ($\beta = .170$), truancy rate ($\beta = -.355$), and disciplinary infractions ($\beta = -.173$). Within this model district enrollment has a positive β, indicating a positive effect on PSSA rank. Truancy rate and disciplinary infractions are negative and denote a negative effect on the PSSA rank.

Model 2 includes the noneconomic independent variables that are student related and introduces the subset of teacher-related variables, which include staff size, average teacher education level, and average teaching experience. Truancy rate ($\beta = -.309$) and disciplinary infractions ($\beta = -.173$) are both negative predictors, which suggest a lower PSSA ranking. The positive predictive variables include average teacher education level ($\beta = .318$), average teaching experience ($\beta = .043$), and district enrollment ($\beta = .134$).   An increase in these variables would result in a positive impact on PSSA rank. These variables indicate about 25% of the variance in the PSSA rankings.

Table 5

Hierarchical Multiple Regression Models for PSSA Ranking and All Indicators

Independent Variables	Model 1 Dependent Variable PSSA			Model 2 Dependent Variable PSSA			Model 3 Dependent Variable PSSA			Model 4 Dependent Variable PSSA			Model 5 Dependent Variable PSSA		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	-.570	-28.306	.000***	-.575	-22.992	.000***	-.548	-24.275	.000***	-.541	-24.131	.000***	-.541	-24.131	.000***
MV/PI ratio	-.198	-9.851	.000***	-.245	-7.031	.000***	-.199	-8.121	.000***	-.219	-9.185	.000***	-.219	-9.185	.000***
Revenue															
Adjusted Act 1				-.084	-5.735	.000***	-.080	-5.462	.000***	-.074	-4.992	.000***	-.074	-4.992	.000***
Equalized mills				-.132	1.507	.132	.005	.345	.730	.020	1.344	.179	.020	1.344	.179
Basic education funding per ADM				.024	.846	.398	.034	1.229	.219	.022	.754	.451	.022	.754	.451
Revenue per ADM				.028	-2.898	.004**	-.061	-1.595	.111	-.024	-.688	.492	-.024	-.688	.492
Spending															
Avg. instructional expense per ADM							.041	2.279	.060	-.005	-.252	.801	-.005	.-252	.801
Avg. regular expense per ADM							033	1.864	.023*	.033	1.864	.062	.033	1.864	.062
Avg. special expense per ADM							-.088	-4.927	.000***	-.069	-4.273	.000***	-.069	-4.273	.000***
Savings															
Fund balance per ADM										.040	2.837	.005**	.040	2.837	.005**
Debt															
Debt per ADM													.019	1.376	.169
R²	.528			.532			.535			.535			.536		
Δ in R²				.004			.003			.000			.001		

*p < .05, **p < .01, ***p < .001

Table 5

Hierarchical Multiple Regression Models for PSSA Ranking and All Indicators cont.

Independent Variables	Model 6 Dependent Variable PSSA			Model 7 Dependent Variable PSSA		
	β	t	Sig	⎵β	t	Sig
Wealth						
SED rate	-.529	-22.171	.000***	-.508	-21.185	.000***
MV/PI ratio	-.212	-8.550	.000***	-.302	-6.961	.000***
Revenue						
Adjusted Act 1	-.082	-5.323	.000***	-.070	-4.561	.000***
Equalized mills	.028	1.791	.073	.065	3.253	.001**
BEF per ADM	.001	.042	.967	.035	1.005	.315
Revenue per ADM	-.034	-.896	.385	-.127	-2.724	.007**
Spending						
Avg. inst. exp per ADM	-.071	-2.296	.022*	-.004	-.171	.864
Avg. reg exp per ADM	.078	3.029	-002**	.035	1.733	.083
Avg. SPED exp per ADM	-.056	-2.723	.007**	-.065	-3.310	.001**
Savings						
Fund balance per ADM	.032	2.222	.026*	.048	3.724	.001**
Debt						
Debt per ADM	.019	1.357	.125	.019	1.402	.161
Student						
enrollment	.027	1.728	.084	.022	1.421	.155
Truancy	-.043	-2.604	.009**	-.043	-2.596	.009**
infractions	-.005	-.336	.714	-.005	-.365	.715
Teacher						
staff size				.019	1.247	.212
Avg. teach ed.				.074	4.172	.001**
Avg. teach exp.				.036	2.518	.012*
R²	.538			.543		
Δ in R²	.002			.005		

*p < .05, **p < .01, ***p < .001

Table 5 presents the results of the multiple regression models for the PSSA

tanking and all economic and noneconomic indicators.   Model 1 includes the

dependent variable of the PSSA rank and the economic independent variable subset

titled district wealth. This subset includes the economic indicators of socioeconomic

disadvantage rate and MV/PI ratio. Model 2 includes the dependent variable of the

PSSA rank and the economic independent variable subset of district wealth, adding

the subset of district revenue. This subset includes the economic independent

variables of the adjusted Act 1 index, equalized millage, basic education funding per

ADM, and revenue per ADM. Model 3 includes the dependent variable of the PSSA

rank and the economic independent variables within the subsets of district wealth,

district revenue, and a third subset, district spending. District spending includes the

economic independent variables of average instructional expenditures per ADM,

average regular education expenditures per ADM, and average special education

expenditures per ADM. Model 4 includes the dependent variable of the PSSA rank

and the economic independent variable subsets of district wealth, district revenue,

and district spending, and adding the subset district savings. This subset includes

the economic independent variable of fund balance per ADM. Model 5 includes the

dependent variable of the PSSA rank and the economic independent variable

subsets of district wealth variables, district revenue, district spending, and district

savings, adding the subset district debt, which includes the economic independent

variable of debt per ADM. Model 6 contains the dependent variable of the PSSA rank

and the economic independent variable subsets of district wealth variables, district

revenue, district spending, district savings, and district debt. This model introduces

the noneconomic independent variable subset that is student related, which includes district enrollment, truancy rate, and discipline infractions. Model 7 contains the dependent variable of the PSSA rank and the economic independent variable subsets of district wealth variables, district revenue, district spending, district savings, district debt, and the noneconomic independent variable subset that is student related. This model adds the new subset of teacher-related variables, which include teaching staff size, average teacher education level, and average teaching experience. Each model will display the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 establishes the economic independent variables included in district wealth: socioeconomic disadvantage rate ($\beta = -.570$) and MV/PI ratio ($\beta = -.198$). These explained 53% of the variance in the dependent variable PSSA ranking. Both of these variables have a negative β, which indicates a drop in PSSA ranking.

Model 2 adds the economic independent variable subset of district revenue. District revenue includes the adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. These variables increase the R^2 from .52% to .53%. In particular, the variables that are predictive in this model include socioeconomic disadvantage rate ($\beta = -.575$) and MV/PI ratio ($\beta = -.245$), which maintain their predictiveness, and include adjusted Act 1 index ($\beta = -.084$) and revenue per ADM ($\beta = .028$) as well. Socioeconomic disadvantage rates, MV/PI ratio, and Act 1 index all have negative β, which indicate a poorer PSSA ranking. Revenue per ADM has a positive β, which signifies a better PSSA ranking.

Model 3 includes the economic independent variable subset district spending.   Average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM are included within this subset. These variables increased R^2 slightly to 54%. The predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.548$), MV/PI ratio ($\beta = -.199$), and adjusted Act 1 index ($\beta = -.080$), and they remain negative predictors. These indicators also show a decrease in PSSA rank. Average regular education expenditures per ADM ($\beta = .033$) and average special education expenditures per ADM ($\beta = -.088$) are also predictive within this model. As with the previous models, a negative β indicates a drop in PSSA rank, a positive β indicating the reverse. The impact of revenue per ADM diminishes and is no longer predictive within this model.

Model 4 introduces the economic independent variable subset of district savings, which includes fund balance per ADM. The R^2 remains exactly the same within this model at 53%. The independent variables of socioeconomic disadvantage rate ($\beta = -.541$), MV/PI ratio ($\beta = -.219$), adjusted Act 1 index ($\beta = -.074$), and average special education expenditures per ADM ($\beta = -.069$) continue to be negative predictors within the model.   These variables suggest a drop in PSSA rank. The fund balance per ADM ($\beta = .040$) is found to be predictive within Model 4. This positive β identifies a positive impact on PSSA ranking. Average regular education expenditure loses its predictiveness within the model.

94

Model 5 presents the economic independent variable subset of district debt represented by debt per ADM. This model explains 54% of the variance on the PSSA ranking. The model introduces debt per ADM, but this variable is not predictive. The independent variables of socioeconomic disadvantage rate ($\beta = -.541$), MV/PI ratio ($\beta = -.219$), adjusted Act 1 index ($\beta = -.074$), average special education expenditures per ADM ($\beta = -.069$), and fund balance per ADM ($\beta = .040$) are the independent variables within the model that remain predictive. Again, a negative β indicates a drop in PSSA rank, resulting in a decrease in student achievement. Inversely, a positive β indicates an increase in PSSA rank, which would result in an increase in student achievement.

Model 6 included the noneconomic independent variables that are student related: enrollment, truancy rate, and discipline infractions. This model increased the R^2 to about 54% of the variance. The predictive variables are socioeconomic disadvantage rate ($\beta = -.529$), MV/PI ratio ($\beta = -.212$), adjusted Act 1 index ($\beta = -.082$), the average special education expenditures per ADM ($\beta = -.056$), and average instructional expenditures per ADM ($\beta = -.071$). Truancy rate ($\beta = -.043$) was the only student-related noneconomic indicator that showed predictability. These variables all have a negative β and indicate a drop in PSSA rank. Fund balance per ADM ($\beta = .032$) and average regular education instructional expenditures per ADM ($\beta = -078$) have a positive β, indicating that an increase will improve PSSA rank.

In Model 7 the subset of teacher-related variables was introduced. The teacher-related variables include staff size, average teacher education level, and average teaching experience. The independent variables of socioeconomic disadvantage rate ($\beta = -.508$), MV/PI ratio ($\beta = -.302$), adjusted Act 1 index ($\beta = -.070$), average special education expenditures Per ADM ($\beta = -.065$), and revenue per ADM ($\beta = -.127$) were negative predictors in the model. Conversely, the fund balance per ADM ($\beta = .048$) and equalized millage ($\beta = .065$) were positive predictors. The noneconomic indicators of truancy rate ($\beta = -.043$), average teacher education level ($\beta = .074$), and average teaching experience ($\beta = .012$) also gained predictability within this model. As in all previous models, a negative β indicates a drop in PSSA rank, resulting in a decrease in student achievement. Inversely, a positive β indicates a better PSSA rank, which would result in an increase in student achievement. In this model R^2 increased from 53% to 54%. The average instructional expenditures per ADM and average regular education instructional expenditures per ADM lost predictability within the model.

SAT Findings

The SAT data, which reported an average score for each district, was collected through the Pennsylvania Department of Education Database. The SAT assessment is typically administered to students in high school, partly in grades 11 and 12.   The range of assessment scores is from 600 to 2400.

Pearson Correlations for average SAT score and all Indicators

Table 6
Pearson Correlation Among Average SAT Score and Economic Indicators

	SAT	SED rate	MV/PI ratio	Adjusted Act 1	Eq mills	BEF per ADM	Revenue per ADM	Avg. inst. exp per ADM	Avg. reg exp per ADM	Avg. SPED exp per ADM	Fund bal per ADM	Debt per ADM
SAT	1											
SED rate	-.534**	1										
MV/PI ratio	-.462**	.729**	1									
Adjusted Act 1	-.139**	.105**	.281**	1								
Equalized mills	-.093**	.081**	.013	.005	1							
BEF per ADM	-.412**	.676**	.846**	.229**	-.242**	1						
Revenue per ADM	.372**	-.582**	-.880**	-.335**	.300**	-.820**	1					
Avg. inst. exp per ADM	.098**	-.147**	-.468**	-.388**	.249**	-.254**	.678**	1				
Avg. reg exp per ADM	.080**	-.088**	-.397**	-.262**	.243**	-.171**	.594**	.838**	1			
Avg. SPED exp per ADM	-.049*	.083**	-.284**	-.218**	.315**	-.191**	.511**	.686**	.575**	1		
Fund bal per ADM	.056**	.033	.048*	-.175**	-.228**	.257**	-.021	.124**	.099**	-.025	1	
Debt per ADM	.009	.013	-.020	-.124**	.001	.036	.040*	.093**	.073**	.025	.096**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 6 shows the Pearson correlations coefficients between the average SAT scores and all economic indicators. Significant correlations were found for socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized millage rate, basic education funding per ADM, revenue per ADM, average instructional expenditures per ADM, average regular education expenditures per ADM, average special education expenditures per ADM, and fund balance per ADM. There was no significant correlation between debt per ADM and SAT scores.

Significant negative correlations were demonstrated by the average SAT score and socioeconomic disadvantage rate, r (2463) = -.534, $p < .01$, and MV/PI ratio, r (2463) = -.462, $p < .01$. This signifies that as a school district's socioeconomic disadvantage rate and MV/PI ratio increase, their average SAT score will decrease. Other economic indicators with a negative correlation are adjusted Act 1 index, r (2458) = -.139, $p < .01$; equalized millage rate, r (2463) = -.093, $p < .01$; basic education funding per ADM, r (2463) = -.412, $p < .01$; and average special education expenditures per ADM, r (2463) = -.049, $p < .05$. An increase in any of the six negatively correlated variables will have a negative impact on average PSSA scores for a school district.

A significant positive correlation was indicated between three economic indicators. These indicators are revenue per ADM, r (2463) = .372, $p < .01$; average instructional expenditures per ADM, r (2463) = .098, $p < .01$; average regular education expenditures per ADM, r (2463) = .080, $p < .01$; and fund balance per ADM, r (2459) = .056, $p < .01$. An increase in these variables indicates an increase in average SAT score.

Table 7
Pearson Correlation Among Average SAT Score and Noneconomic Indicators

	SAT	Enrollment	Truancy	Infractions	Staff size	Avg. teach ed.	Avg. teach exp.
SAT	1						
Enrollment	-.024	1					
Truancy	-.321**	.194**	1				
Infractions	-.102**	.710**	.277**	1			
Staff size	-.025	.997**	.198**	.720**	1		
Avg. teach ed.	.267**	.005	-.135**	-.077**	.007	1	
Avg. teach exp.	.115**	-.084**	-.171**	-.067**	-.085**	.093**	1

**Correlation is significant at the 0.01 level (2-tailed)
 *Correlation is significant at the 0.05 level (2-tailed)

Table 7 shows the Pearson correlation coefficients between the average SAT score and all noneconomic indicators. Significant correlations were found between truancy rate, reportable disciplinary infractions, average teaching education level, and average teaching experience. There was no a significant correlation between the SAT exam scores, and enrollment size and teaching staff size.

 Significant negative correlations were demonstrated among the Average SAT score and truancy rate, r (2463) = -.321, $p < .01$, and disciplinary infractions, r (2452) = -.102, $p < .01$. This signifies that as truancy and disciplinary infractions increase, the average SAT score will decrease.

A significant positive correlation was indicated by average teaching education level, r (2463) = .267, $p < .01$, and average teaching experience, r (2463) = .115, $p < .01$. These noneconomic independent variables have a positive correlation, and suggest an increase in the average SAT score.

Table 8

Hierarchical Multiple Regression Models for Average SAT Score and Economic Indicators

Independent Variables	Model 1 Dependent Variable PSSA			Model 2 Dependent Variable PSSA			Model 3 Dependent Variable PSSA			Model 4 Dependent Variable PSSA			Model 5 Dependent Variable PSSA		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	-.420	-17.006	.000***	-.418	-16.624	.000***	-.374	-13.514	.000***	-.372	-13.468	.000***	-.372	-13.468	.000***
MV/PI ratio	-.156	-6.335	.000***	-.140	-5.383	.000***	-.195	-6.633	.000***	-.203	-6.883	.000***	-.203	-6.883	.000***
Revenue															
Adjusted Act 1				-.056	-3.127	.002**	-.064	-3.585	.000***	-.050	-2.724	.006**	-.050	-2.724	.006**
Equalized mills				-.054	-3.170	.002**	-.034	-1.870	.062	-.019	-1.023	.306	-.019	-1.023	.306
Basic education funding per ADM				-.48	-1.298	.194	.019	.604	.546	-.038	-1.069	.285	-.038	-1.069	.285
Revenue per ADM				.018	.361	.718	.031	.704	.481	.024	.556	.578	.024	.556	.578
Spending															
Avg. instructional expense per ADM							-.031	-1.197	.231	-.051	-1.909	.056	-.051	-1.909	.056
Avg. regular expense per ADM							.004	.162	.871	-.008	-.367	.714	-.008	-.367	.714
Avg. special expense per ADM							-.087	-4.377	.000***	-.084	-4.257	.000***	-.084	-4.257	.000***
Savings															
Fund balance per ADM										.064	3.739	.000***	.064	3.739	.000***
Debt															
Debt per ADM													-.003	-.185	.854
R^2	.296			.299			.302			.305			.305		
Δ in R^2				.003			.003			.003			.000		

*p < .05, **p < .01, ***p < .001

Hierarchical Multiple Regression Models for Average SAT Score and Economic,

Noneconomic, and All Indicators

Table 8 presents the results of the multiple regression models for the

average SAT score and economic indicators. Each of the five models includes the

dependent variable of average SAT score and then independent variables as follows:

Model 1 includes the economic independent variable subset titled district wealth.

This subset includes the economic indicators of socioeconomic disadvantage rate

and MV/PI ratio. To district wealth, Model 2 adds the subset of district revenue,

which includes the economic independent variables of adjusted Act 1 index,

equalized millage, basic education funding per ADM, and revenue per ADM. Model 3

adds the subset of district spending to subsets district wealth and district revenue.

District spending includes the economic independent variables of average

instructional expenditures per ADM, average regular education expenditures per

ADM, and average special education expenditures per ADM. Model 4 adds the

economic independent variable subset district savings to district wealth, district

revenue, and district spending. The district savings subset includes the economic

independent variable of fund balance per ADM. To all of these existing subsets,

Model 5 adds the final subset, district debt, which includes the economic

independent variable of debt per ADM. Each model displays the R^2 and the change

(Δ)in R^2 at the bottom. The significance level was set a $p < .05$.

Model 1 establishes the district wealth economic independent variables of

socioeconomic disadvantage rate ($\beta = -.420$) and MV/PI ratio ($\beta = -.156$) as

explaining 29% of the variance in the dependent variable average SAT score. Both

of these variables have a negative β, which indicates a drop in average SAT score.

In Model 2 the added economic independent variable subset of district

revenue includes the adjusted Act 1 index, equalized millage, basic education

funding Per ADM, and Revenue Per ADM. These variables increase the R^2 to 30%. In

particular, the predictive variables in this model include socioeconomic

disadvantage rate (β = −.418) and MV/PI ratio (β = −.440), and they maintain their

predictiveness. The adjusted Act 1 index (β = −.056) and basic education funding

per ADM (β = −.054) are also predictive. The socioeconomic disadvantage rate,

MV/PI ratio, Act 1, index, and basic education funding per ADM all have a negative β,

which indicate a lower average SAT score.

The added subset in Model 3 of district spending includes average

instructional expenditures per ADM, average regular education expenditures per

ADM, and average special education expenditures per ADM. These variables

increased R^2 slightly, but it remains at 30%. The predictive variables in this model

are socioeconomic disadvantage rate (β = −.548), MV/PI ratio (β = −.199), and

adjusted Act 1 index (β = −.080), and they remain negative predictors. Average

special education expenditures per ADM (β = −.087) is also introduced as predictive

within this model. As with the previous models, a negative β indicates a drop in

average SAT score. The impact of basic education funding per ADM diminishes and

is no longer predictive within this model.

The district savings subset introduced in Model 4 includes fund balance per

ADM. The R^2 increases slightly within this model to 31%. The independent variables

of socioeconomic disadvantage rate ($\beta = -.372$), MV/PI ratio ($\beta = -.203$), adjusted Act 1 index ($\beta = -.050$), and average special education expenditures per ADM ($\beta = -.084$) continue to be negative predictors within the model, suggesting a drop in average SAT score. The fund balance per ADM ($\beta = .064$) is found to be predictive within Model 4. This positive β identifies a positive impact on average SAT score.

Model 5 presents the economic independent variable subset of district debt represented by debt per ADM. This model explains 31% of the variance on the average SAT score, but the variable debt per ADM is not predictive. The socioeconomic disadvantage rate ($\beta = -.372$), MV/PI ratio ($\beta = -.203$), adjusted Act 1 index ($\beta = -.006$), average special education expenditures per ADM ($\beta = -.084$), and fund balance per ADM ($\beta = .064$) are the independent variables within the model to remain predictive. As indicated in previous models, a negative β indicates a drop in average SAT score, resulting in a decrease in student achievement. Inversely, a positive β indicates an increase in average SAT score, which would result in an increase in student achievement.

Table 9

Hierarchical Multiple Regression Models for Average SAT Score and Noneconomic Indicators

Independent Variables	Model 1 Dependent Variable SAT			Model 2 Dependent Variable SAT		
	β	t	Sig	β	t	Sig
Student						
enrollment	.096	3.541	.000***	.036	1.906	.057
Truancy	-.318	-16.032	.000***	-.285	-15.014	.000***
Infractions	-.082	-2.976	.003**	-.003	-.157	.875
Teacher						
Staff size				.036	1.899	.058
Avg. teach ed.				.225	11.975	.000***
Avg. teach exp.				.046	2.446	.015*
R²	.109			.157		
Δ in R²				.048		

*p < .05, **p < .01, ***p < .001

Table 9 presents the results of the multiple regression models for the average SAT score and noneconomic indicators. Model 1 includes the dependent variable of average SAT score and the noneconomic independent variable subset that is student related. This subset includes district enrollment, truancy rate, and discipline infractions. To these, Model 2 adds a new subset of teacher-related variables: teaching staff size, average teacher education level, and average teaching experience. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 indicates that all student-related variables are predictive, accounting for 11% of the variance in the dependent variable of average SAT score. The predictive variables are district enrollment (β = .096), truancy rate (β = −.318), and disciplinary infractions (β = −.082). Within this model, district enrollment has a positive β, indicating a positive effect on average SAT score. Truancy rate and

disciplinary infractions are negative, denoting a negative effect on the average SAT score.

In Model 2, the teacher related variables include staff size, average teacher education level, and average teaching experience. Truancy rate ($\beta = -.309$), average teacher education level ($\beta = .225$), and average teaching experience ($\beta = .046$) are the only variables that show predictiveness. Truancy rate has a negative β, which indicates a drop in the average SAT score. Average teacher education level and average teaching experience have a positive β that indicates an increase in the average SAT score. These variables indicate about 16% of the variance on the average SAT score.

Table 10

Hierarchical Multiple Regression Models for average SAT score and All Indicators

Independent Variables	Model 1 Dependent Variable PSSA			Model 2 Dependent Variable PSSA			Model 3 Dependent Variable PSSA			Model 4 Dependent Variable PSSA			Model 5 Dependent Variable PSSA		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	-.420	-17.006	.000***	-.418	-16.624	.000***	-.374	-13.514	.000***	-.372	-13.468	.000***	-.372	-13.468	.000***
MV/PI ratio	-.156	-6.335	.000***	-.140	-5.383	.000***	-.195	-6.633	.000***	-.203	-6.883	.000***	-.203	-6.883	.000***
Revenue															
Adjusted Act 1				-.056	-3.127	.002**	-.064	-3.585	.000***	-.050	-2.724	.006**	-.050	-2.724	.006**
Equalized mills				-.054	-3.170	.002**	-.034	-1.870	.062	-.019	-1.023	.306	-.019	-1.023	.306
Basic education funding per ADM				-.48	-1.298	.194	.019	.604	.546	-.038	-1.069	.285	-.038	-1.069	.285
Revenue per ADM				.018	.361	.718	.031	.704	.481	.024	.556	.578	.024	.556	.578
Spending															
Avg. instructional expense per ADM							-.031	-1.197	.231	-.051	-1.909	.056	-.051	-1.909	.056
Avg. regular expense per ADM							.004	.162	.871	-.008	-.367	.714	-.008	-.367	.714
Avg. special expense per ADM							-.087	-4.377	.000***	-.084	-4.257	.000***	-.084	-4.257	.000***
Savings															
Fund balance per ADM										.064	3.739	.000***	.064	3.739	.000***
Debt															
Debt per ADM													-.003	-.185	.854
R²	.296			.299			.302			.305			.305		
Δ in R²				.003			.003			.003			.000		

*p < .05, **p < .01, ***p < .001

Table 10

Hierarchical Multiple Regression Models for Average SAT Score and All Indicators cont.

Independent Variables	Model 6 Dependent Variable SAT			Model 7 Dependent Variable SAT		
	β	t	Sig	β	t	Sig
Wealth						
SED rate	-.354	-12.002	.000***	-.352	-11.938	.000***
MV/PI ratio	-.170	-5.527	.000***	-.168	-5.479	.000***
Revenue						
Adjusted Act 1	-.050	-2.724	.006**	-.049	-2.717	.007**
Equalized mills	-.008	-.429	.668	.001	.027	.979
BEF per ADM	-.024	-.667	.505	-.048	-1.281	.200
Revenue per ADM	.036	.826	.409	.051	1.150	.250
Spending						
Avg. inst. exp per ADM	-.037	-1.361	.171	-.007	-.327	.744
Avg. Reg exp per ADM	.003	.140	.889			
Avg. SPED exp per ADM	-.070	-3.492	.000***	-.071	-3.542	.000***
Savings						
Fund balance per ADM	.064	3.607	.000***	.060	3.3374	.001**
Debt						
Debt per ADM	.001	.040	.968	.003	.156	.876
Student						
enrollment	.066	3.524	.000***	.072	3.821	.000***
Truancy	-.081	-4.051	.000***	-.075	-3.763	.000***
Infractions	-.002	-.111	.911	-.005	-.200	.790
Teacher						
Staff size				.111	1.169	.242
Avg. teach ed.				.025	1.151	.250
Avg. teach exp.				.048	2.778	.006**
R^2	.313			.315		
Δ in R^2	..008			.002		

*p < .05, **p < .01, ***p < .001

Table 10 presents the results of the multiple regression models for the average SAT score and all economic and noneconomic indicators. All models include the dependent variable of average SAT score, with economic independent variable subsets being added as follows: Model 1 includes subset of district wealth, which includes the economic indicators of socioeconomic disadvantage rate and MV/PI ratio. Model 2 includes the district wealth subset and adds that of district revenue, which includes the economic independent variables of adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. To these subsets, Model 3 adds district spending, which includes the economic independent variables of average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. Model 4 adds the subset district savings; this subset includes the economic independent variable of fund balance per ADM. To all of these subsets, Model 5 adds the subset district debt, which includes the economic independent variable of debt per ADM. Model 6 contains all of the variables included in the foregoing five models and introduces the noneconomic independent variable subset that is student related; this subset includes district enrollment, truancy rate, and discipline infractions. Model 7 is the same as Model 6 but adds the new subset of teacher-related variables, which include teaching staff size, average teacher education level, and average teaching experience. Each model displays the R^2 and the change (Δ)in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variables of socioeconomic disadvantage rate ($\beta = -.420$) and MV/PI ratio ($\beta = -.156$) explain

29% of the variance in the dependent variable PSSA ranking.   Both of these variables have a negative β, which indicates a drop in average SAT score.

The economic independent variable subset of district revenue added in Model 2 includes the adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. These variables increase the R^2 to 30%. In particular, the variables that are predictive in this model include socioeconomic disadvantage rate (β = −.418) and MV/PI ratio (β = −.440), and they maintain their predictiveness. The adjusted Act 1 index (β = −.056) and basic education funding per ADM (β = −.054) are also predictive. Socioeconomic disadvantage rates, MV/PI ratio, Act 1, index, and basic education funding per ADM all have a negative β, which indicate a lower average SAT score.

Subset district spending, added in Model 3, includes average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. These variables increased R^2 slightly, but it remains at 30%. The predictive variables in this model are socioeconomic disadvantage rate (β = −.548), MV/PI ratio (β = −.199), and adjusted Act 1 index (β = −.080), and they remain negative predictors. Average special education expenditures per ADM (β = −.087) is also introduced as predictive within this model. As with the previous models, a negative β indicates a drop in average SAT score. The impact of basic education funding per ADM diminishes and is no longer predictive within this model.

With the added subset of district savings in Model 4, which includes fund balance per ADM, the R^2 increases slightly to 31%. The independent variables of

socioeconomic disadvantage rate (β = −.372), MV/PI ratio (β = −.203), adjusted Act 1

index (β = −.050), and average special education expenditures per ADM

(β = −.084) continue to be negative predictors within the model.   These variables

suggest a drop in average SAT score. The fund balance per ADM (β = .064) is also

found to be predictive within Model 4. This positive β indicates a positive impact on

average SAT score.

Model 5 presents the economic independent variable subset of district debt

represented by debt per ADM. This model explains 31% of the variance on the

average SAT score, but the debt per ADM variable is not predictive. Socioeconomic

disadvantage rate (β = −.372), MV/PI ratio (β = −.203), adjusted Act 1 index

(β = −.006), average special education expenditures per ADM (β = −.084), and fund

balance per ADM (β = .064) are the independent variables within the model to

remain predictive. As indicated in previous models, a negative β indicates a drop in

average SAT score resulting in a decrease in student achievement. Inversely, a

positive β indicates an increase in average SAT score, which would result in an

increase in student achievement.

Model 6, as already noted, includes the student-related noneconomic

independent variables: enrollment, truancy rate, and discipline infractions. This

model increased the R^2 slightly, but it still explains about 31% of the variance. The

negative predictive variables are socioeconomic disadvantage rate (β = −.354),

MV/PI ratio (β = −.170), adjusted Act 1 index (β = −.050), and average special

education expenditures per ADM (β = −.070). Truancy rate (β = −.043) is the only

student related noneconomic indicator to show negative predictability. These variables all have a negative β and indicate a drop in average SAT score. Fund balance per ADM (β = .064) and district enrollment (β = .066) have a positive β, indicating that an increase will improve the average SAT score.

The subset of teacher-related variables introduced in Model 7 includes staff size, average teacher education level, and average teaching experience. The independent variable of socioeconomic disadvantage rate (β = −.352), MV/PI ratio (β = −.168), adjusted Act 1 index (β = -.049), and the average special education expenditures per ADM (β = −.071) were negative predictors in the model. Fund balance per ADM (β = .048) was a positive predictor within the model. The noneconomic indicators of truancy rate (β = −.075), district enrollment (β = .072), and average teaching experience (β = .048) also gained predictiveness within this model. As in all previous models, a negative β indicates a drop in average SAT score, resulting in a decrease in student achievement. Inversely, a positive β indicates a growth in the average SAT score, which would result in an increase in student achievement. In this model R^2 increased from 31% to about 32%.

Graduation Rate Findings

Graduation rate data, which is reported by average percent for each district, was collected through the Pennsylvania Department of Education Database.

Pearson Correlations for Graduation Rate and all Indicators

Table 11
Pearson Correlation Among Graduation Rates and Economic Indicators

	Graduation rate	SED rate	MV/PI ratio	Adjusted Act 1	Eq mills	BEF per ADM	Revenue per ADM	Avg. inst. exp per ADM	Avg. reg exp per ADM	Avg. SPED exp per ADM	Fund bal per ADM	Debt per ADM
Graduation rate	1											
SED rate	-.440**	1										
MV/PI ratio	-.305**	.729**	1									
Adjusted Act 1	-.070**	.105**	.281**	1								
Equalized mills	-.103**	.081**	.013	.005	1							
BEF per ADM	-.223**	.676**	.846**	.229**	-.242**	1						
Revenue per ADM	.229**	-.582**	-.880**	-.335**	.300**	-.820**	1					
Avg. inst. exp per ADM	.086**	-.147**	-.468**	-.388**	.249**	-.254**	.678**	1				
Avg. reg exp per ADM	.058**	-.088**	-.397**	-.262**	.243**	-.171**	.594**	.838**	1			
Avg. SPED exp per ADM	-.045*	.083**	-.284**	-.218**	.315**	-.191**	.511**	.686**	.575**	1		
Fund bal per ADM	.067**	.033	.048*	-.175**	-.228**	.257**	-.021	.124**	.099**	-.025	1	
Debt per ADM	.034	.013	-.020	-.124**	.001	.036	.040*	.093**	.073**	.025	.096**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 11 shows the Pearson correlation coefficients between the graduation rate and all economic indicators. There was no significant correlation between debt per ADM and graduation rate.

Significant negative correlations were demonstrated between graduation rate and socioeconomic disadvantage rate, r (2483) = -.440, $p < .01$; MV/PI ratio, r (2483) = -.305, $p < .01$; adjusted Act 1 index, r (2483) = -.070, $p < .01$; equalized millage rate, r (2483) = -.103, $p < .01$; basic education funding per ADM, r (2483) = -.223, $p < .01$; and average special education expenditures per ADM, r (2463) = -.045, $p < .05$. An increase in any of the six negatively correlated variables will have a negative impact on the graduation rate for the school district.

A significant positive correlation was indicated between four economic indicators. These indicators are revenue per ADM, r (2483) = .229, $p < .01$; average instructional expenditures per ADM, r (2483) = .086, $p < .01$; average regular education expenditures per ADM, r (2483) = .058, $p < .01$; and fund balance per ADM, r (2459) = .067, $p < .01$. An increase in these variables indicates an increase in graduation rate.

Table 12

Pearson Correlation Among Graduation Rates and Noneconomic Indicators

	Graduation rate	Enrollment	Truancy	Infractions	Staff size	Avg. teach ed.	Avg. teach exp.
Graduation rate	1						
Enrollment	-.182**	1					
Truancy	-.306**	.194**	1				
Infractions	-.220**	.710**	.277**	1			
Staff size	-.181**	.997**	.198**	.720**	1		
Avg. teach ed.	.158**	.005	-.135**	-.077**	.007	1	
Avg. teach exp.	.060**	-.084**	-.171**	-.067**	-.085**	.093**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 12 shows the Pearson correlation coefficients between graduation rate and all noneconomic indicators. Significant negative correlations were demonstrated between the graduation rate and district enrollment, r (2483) = -.182, p < .01; truancy rate, r (2483) = -.306, p < .01; disciplinary infractions, r (2472) = -.102, p < .01; and teaching staff size, r (2483) = -.181, p < .01. These results signify these indicators have a negative impact on graduation rate.

A significant positive correlation was indicated by average teaching education level, r (2483) = .158, p < .01, and average teaching experience, r (2483) = .060, p < .01. These noneconomic independent variables have a positive correlation, and suggest an increase in the graduation rate.

Table 13

Hierarchical Multiple Regression Models for Graduation Rate and Economic Indicators

Independent Variables	Model 1 Dependent Variable Grad. Rate			Model 2 Dependent Variable Grad. Rate			Model 3 Dependent Variable Grad. Rate			Model 4 Dependent Variable Grad. Rate			Model 5 Dependent Variable Grad. Rate		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socio economic disadvantage rate	-.440	-24.426	.000***	-.480	-18.046	.000***	-.480	-18.046	.000***	-.482	-18.126	.000***	-.482	-18.126	.000***
MV/PI ratio	.033	1.244	.214	-.143	-3.906	.000***	-.143	-3.906	.000***	-.144	-3.918	.000***	-.144	-3.918	.000***
Revenue															
Adjusted Act 1				-.034	-1.786	.074	-.034	-1.786	.074	-.036	-1.896	.058	-.036	-1.896	.058
Equalized mills				-.011	-.531	.596	-.011	-.531	.596	-.013	-.620	.535	-.013	-.620	.535
Basic education funding per ADM				.224	6.550	.000***	.224	6.550	.000***	.225	6.589	.000***	.225	6.589	.000***
Revenue per ADM				.027	.648	.517	.027	.648	.517	.027	.670	.503	.027	-670	.503
Spending															
Avg. instructional expense per ADM							.008	.344	.731	.007	.321	.749	.007	.321	.749
Avg. regular expense per ADM							.001	.039	.969	.001	.050	.960	.001	.050	.960
Avg. special expense per ADM							-.004	-.185	.853	-.004	-.209	.835	-.004	-.209	.835
Savings															
Fund balance per ADM										.031	1.580	.114	.031	1.580	.114
Debt															
Debt per ADM													.028	1.541	.124
R²	.194			.202			.202			.202			.203		
Δ in R²				.008			.000			.000			.001		

*p < .05, **p < .01, ***p < .001

Hierarchical Multiple Regression Models for Graduation Rate and Economic,

Noneconomic, and All Indicators

Table 13 presents the results of the multiple regression models for

graduation rate and economic indicators. All models include the dependent variable

of graduation rate. Model 1 includes the economic independent variable subset of

district wealth. This subset includes the economic indicators of socioeconomic

disadvantage rate and MV/PI ratio. To this, Model 2 adds the subset of district

revenue, which includes the economic independent variables of the adjusted Act 1

index, equalized millage, basic education funding per ADM, and revenue per ADM.

Model 3 includes the subsets of district wealth and district revenue, adding a third

subset of district spending. This subset includes the economic independent

variables of average instructional expenditures per ADM, average regular education

expenditures per ADM, and average special education expenditures per ADM. To

these subsets, Model 4 adds the subset district savings, which includes the

economic independent variable of fund balance per ADM. Finally, Model 5 adds

district debt; this subset includes the economic independent variable of debt per

ADM. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The

significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variable

of socioeconomic disadvantage rate ($\beta = -.440$) explains 19% of the variance in the

dependent variable graduation rate.   This variable has a negative β, which indicates

a drop in average graduation rate.

The variables in the district revenue subset added in Model 2 increase the R^2 to 20%. The predictive variables in this model include socioeconomic disadvantage rate ($\beta = -.480$), MV/PI ratio ($\beta = -.143$), and basic education funding per ADM ($\beta = .224$). Socioeconomic disadvantage rates, MV/PI ratio and Act 1 all have a negative β, which indicates a lower graduation rate. Basic education funding, however, has a positive β, which suggests a higher graduation rate.

With the district spending subset in Model 3, the R^2 remained exactly the same at 20%. The predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.480$), MV/PI ratio ($\beta = -.143$), and basic education funding per ADM ($\beta = .224$). The subset of district spending had no predictive variables. As with the previous models, a negative β indicates a drop in graduation rate. Inversely, a positive β indicates an increase in the graduation rate, which would result in an increase in student achievement.

Model 4 introduces the economic independent variable subset of district savings, which includes fund balance per ADM. The R^2 does not change, remaining at 20%. The independent variables of socioeconomic disadvantage rate ($\beta = -.482$), MV/PI ratio ($\beta = -.144$), and basic education funding per ADM ($\beta = .225$) continue to be predictors within the model.

Model 5 presents the economic independent variable subset of district debt represented by debt per ADM. This model continues to explain 20% of the variance in the graduation rate. The final variable introduced, debt per ADM, is variable is not predictive. The independent variables of socioeconomic disadvantage rate ($\beta = -.482$), MV/PI ratio, ($\beta = -.144$), and basic education funding per ADM

117

(β = .225) are the independent variables within the model that remain predictive.

As indicated in previous models, a negative β indicates a drop in graduation rate

resulting in a decrease in student achievement. A positive β indicates an increase in

graduation rate, which would result in an increase in student achievement.

Table 14
Hierarchical Multiple Regression Models for Graduation Rate and Noneconomic Indicators

Independent Variables	Model 1 Dependent Variable Graduation Rate			Model 2 Dependent Variable Graduation Rate		
	B	t	Sig	B	t	Sig
Student						
Enrollment	-.054	-1.993	.046*	-.067	-2.517	.012*
Truancy	-.268	-13.629	.000***	-.254	-12.907	.000***
Infractions	-.108	-3.926	.000***	-.093	-3.395	.001**
Teacher						
Staff size				.306	1.279	.201
Avg. teach ed.				.118	6.181	.000***
Avg. teach exp.				-.004	-.216	.829
R²	.116			.130		
Δ in R²				.014		

*p < .05, **p < .01, ***p < .001

Table 14 presents the results of the multiple regression models for the

graduation rate and noneconomic indicators.   All of the models include the

dependent variable of average graduation rate. Model 1 includes the noneconomic

independent variable subset that is student related, which encompasses district

enrollment, truancy rate, and discipline infractions. To the subset in Model 1, Model

2 adds the new subset of teacher-related variables, which include teaching staff

size, average teacher education level, and average teaching experience. Each model

displays the *R²* and the change (Δ) in *R²* at the bottom. The significance level was set

at *p* < .05.

Model 1 indicates that all student-related variables are predictive, accounting for 11% of the variance in average graduation rate. The predictive variables are district enrollment ($\beta = -.054$), truancy rate ($\beta = -.268$), and disciplinary infractions ($\beta = -.108$). All of these variables have a negative β and denote a negative effect on the graduation rate.

In Model 2 the teacher-related variables include staff size, average teacher education level, and average teaching experience. The predictive variables are district enrollment ($\beta = -.067$), truancy rate ($\beta = -.254$), disciplinary infractions ($\beta = -.093$), and average teacher education level ($\beta = .118$). District enrollment, truancy rate, and disciplinary infractions, all have a negative β, indicating a drop in the graduation rate. Average teacher education level has a positive β that indicates an increase in the graduation rate. These variables indicate about 13% of the variance in the average graduation rate.

Table 15

Hierarchical Multiple Regression Models for Graduation Rate and All Indicators

Independent Variables	Model 1 Dependent Variable Grad. Rate			Model 2 Dependent Variable Grad. Rate			Model 3 Dependent Variable Grad. Rate			Model 4 Dependent Variable Grade Rate			Model 5 Dependent Variable Grad. Rate		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socio economic disadvantage rate	-.440	-24.426	.000***	-.480	-18.046	.000***	-.480	-18.046	.000***	-.482	-18.126	.000***	-.482	-18.126	.000***
MV/PI ratio	.033	1.244	.214	-.143	-3.906	.000***	-.143	-3.906	.000***	-.144	-3.918	.000***	-.144	-3.918	.000***
Revenue															
Adjusted Act 1				-.034	-1.786	.074	-.034	-1.786	.074	-.036	-1.896	.058	-.036	-1.896	.058
Equalized mills				-.011	-.531	.596	-.011	-.531	.596	-.013	-.620	.535	-.013	-.620	.535
Basic education funding per ADM				.224	6.550	.000***	.224	6.550	.000***	.225	6.589	.000***	.225	6.589	.000***
Revenue per ADM				.027	.648	.517	.027	.648	.517	.027	.670	.503	.027	-670	.503
Spending															
Avg. instructional expense per ADM							.008	.344	.731	.007	.321	.749	.007	.321	.749
Avg. regular expense per ADM							.001	.039	.969	.001	.050	.960	.001	.050	.960
Avg. special expense per ADM							-.004	-.185	.853	-.004	-.209	.835	-.004	-.209	.835
Savings															
Fund balance per ADM										.031	1.580	.114	.031	1.580	.114
Debt															
Debt per ADM													.028	1.541	.124
R²	.194			.202			.202			.202			.203		
Δ in R²				.008			.000			.000			.001		

*p < .05, **p < .01, ***p < .001

Table 15

Hierarchical Multiple Regression Models for Graduation Rate and All Indicators cont.

Independent Variables	Model 6 Dependent Variable Grad Rate			Model 7 Dependent Variable Grad Rate		
	β	t	Sig	β	t	Sig
Wealth						
SED rate	-.398	-19.385	.000***	-.399	-19.468	.000***
MV/PI ratio	-.040	-1.252	.221	-.035	-1.084	.279
Revenue						
Adjusted Act 1	-.023	-1.253	.210	-.022	-1.199	.231
Equalized mills	-.039	-2.013	.044	-.047	-2.393	.017*
BEF per ADM	.013	.439	.661	.020	.671	.502
Revenue per ADM	.015	.448	.654	.007	.209	.834
Spending						
Avg. inst. exp per ADM	.025	.769	.442	.024	.716	.474
Avg. reg exp per ADM	.062	3.359	.001**	.070	3.722	.000***
Avg. SPED exp per ADM	.032	1.380	.168	.030	1.298	.194
Savings						
Fund balance per ADM	.015	.781	.435	.016	.821	.412
Debt						
Debt per ADM	.023	1.310	.190	.022	1.211	.226
Student						
Enrollment	-.145	-7.969	.000***	-.150	-8.171	.000***
Truancy	-.094	-4.422	.000***	-.098	-4.580	.000***
Infractions	-.013	-.602	.547	-.011	-.510	.610
Teacher						
Staff size				.147	1.457	.145
Avg. teach ed.				-.003	-.134	.893
Avg. teach exp.				-.040	-2.109	.035*
R²	.225.			.227		
Δ in R²	.022			.002		

*p < .05, **p < .01, ***p < .001

Table 15 presents the results of multiple regression models for graduation rate and all economic and noneconomic indicators. All models include the dependent variable of graduation rate, with subsets for the independent variables added as follows: Model 1 includes the economic independent variable subset of district wealth, which includes the economic indicators of socioeconomic disadvantage rate and MV/PI ratio. To this, Model 2 adds the district revenue subset, which includes the economic independent variables of adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. Model 3 adds district spending, which includes the economic independent variables of average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. Model 4 adds the district savings subset, which contains fund balance per ADM, and Model 5 adds district debt, which includes the economic independent variable of debt per ADM. Model 6 introduces the student-related noneconomic independent variable subset: district enrollment, truancy rate, and discipline infractions, whereas Model 7 adds the new subset of teacher-related variables, which include teaching staff size, average teacher education level, and average teaching experience. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variable of socioeconomic disadvantage rate ($\beta = -.440$) explains 19% of the variance in the graduation rate. This variable has a negative β, which indicates a drop in average graduation rate.

Model 2 shows that the variables included in district revenue increase the R^2 to 20%. The predictive variables in this model include socioeconomic disadvantage rate ($\beta = -.480$), MV/PI ratio ($\beta = -.143$), and basic education funding per ADM ($\beta = .224$). Socioeconomic disadvantage rates, MV/PI ratio, and Act 1 have a negative β, indicating a lower graduation rate. Basic education funding has a positive β, which suggests a higher graduation rate.

In Model 3, with the district spending subset, the R^2 remained exactly the same at 20%. The predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.480$), MV/PI ratio ($\beta = -.143$), and basic education funding per ADM ($\beta = .224$), the subset of district spending having no predictive variables. As with the previous models, a negative β indicates a drop in graduation rate. Inversely, a positive β indicates an increase in the graduation rate, which would result in an increase in student achievement.

In Model 4, which introduces the subset of district savings, the R^2 does not change, remaining at 20%. The independent variables of socioeconomic disadvantage rate ($\beta = -.482$), MV/PI ratio ($\beta = -.144$), and basic education funding per ADM ($\beta = .225$) continue to be predictors within the model. Model 5 continues to explain 20% of the variance in graduate rate with the addition of district debt as represented by debt per ADM; this variable is not predictive. The socioeconomic disadvantage rate ($\beta = -.482$), MV/PI ratio, ($\beta = -.144$), and basic education funding per ADM ($\beta = .225$) are the independent variables within the model that remain predictive. As indicated in previous models, a negative β indicates a drop in

graduation rate, resulting in a decrease in student achievement. A positive β indicates an increase in graduation rate, which would result in an increase in student achievement.

Model 6, which introduced the noneconomic student-related variables, increased the R^2 to explain about 22% of the variance. The socioeconomic disadvantage rate (β = −.398), average regular education expenditures per ADM (β = .062), district enrollment (β = −.145) and truancy rate (β = −.094) all showed predictiveness within this model. Socioeconomic disadvantage rate, district enrollment, and truancy rate have a negative impact on graduation rate. Average regular education expenditures per ADM is the only positive indicator, showing an increase graduation rates. The impact of MV/PI ratio diminishes and is no longer predictive within this model.

Finally, in Model 7 with the introduction of teacher-related variables, the R^2 increased from 22% to about 23%. The socioeconomic disadvantage rate (β = −.399), average regular education expenditures per ADM (β = .070), district enrollment (β = .150), truancy rate (β = −.098), and average teaching experience (β = −.040) are all predictive within this model. As in all previous models, a negative β indicates a drop in graduation rates resulting in a decrease in student achievement. Inversely, a positive β indicates a growth in graduation rate, which would result in an increase in student achievement.

Dropout Rate Findings

The dropout rate data were collected through the Pennsylvania Department of Education Database and reported by average percent for each district. The average percent range is from 1 to 100, as usual.

Pearson Correlations for Dropout Rate and all Indicators

Table 16

Pearson Correlation Among Dropout Rate and Economic Indicators

	Dropout rate	SED rate	MV/PI ratio	Adjusted Act 1	Eq mills	BEF per ADM	Revenue per ADM	Avg. inst. exp per ADM	Avg. reg exp per ADM	Avg. SPED exp per ADM	Fund bal per ADM	Debt per ADM
Dropout rate	1											
SED rate	.442**	1										
MV/PI ratio	.304**	.729**	1									
Adjusted Act 1	.061**	.105**	.281**	1								
Equalized mills	.100**	.081**	.013	.005	1							
BEF per ADM	.225**	.676**	.846**	.229**	-.242**	1						
Revenue per ADM	-.228**	-.582**	-.880**	-.335**	.300**	-.820**	1					
Avg. inst. exp per ADM	-.081**	-.147**	-.468**	-.388**	.249**	-.254**	.678**	1				
Avg. reg exp per ADM	-.055**	-.088**	-.397**	-.262**	.243**	-.171**	.594**	.838**	1			
Avg. SPED exp per ADM	.048*	.083**	-.284**	-.218**	.315**	-.191**	.511**	.686**	.575**	1		
Fund bal per ADM	-.064**	.033	.048*	-.175**	-.228**	.257**	-.021	.124**	.099**	-.025	1	
Debt per ADM	-.038	.013	-.020	-.124**	.001	.036	.040*	.093**	.073**	.025	.096**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 16 shows the Pearson correlation coefficients between the dropout rate and all economic indicators. The significant correlations found are as follows: significant negative correlations were demonstrated between dropout rate and revenue per ADM, r (2467) = -.228, $p < .01$; average instructional expenditures per ADM, r (2467) = -.081, $p < .01$; average regular education expenditures per ADM, r (2467) = -.055, $p < .01$; and fund balance per ADM, r (2467) = -.064, $p < .01$. An increase in these variables indicates a decrease in dropout rates. A low dropout rate is a characteristic of high student achievement.

A significant positive correlation was indicated with six economic indicators: that is, an increase in these variables would indicate an increase in dropout rate: socioeconomic disadvantage rate, r (2467) = .442, $p < .01$; MV/PI ratio, r (2467) = .304, $p < .01$; adjusted Act 1 index, r (2462) = .061, $p < .01$; equalized millage rate, r (2467) = .100, $p < .01$; basic education funding per ADM, r (2467) = .225, $p < .01$; and average special education expenditures per ADM, r (2467) = .048, $p < .05$. An increase in any of the six positively correlated variables will increase the dropout rate for the school district. High dropout rates represent poor student achievement.

Table 17

Pearson Correlation Among Dropout Rate and Noneconomic Indicators

	Dropout rate	Enrollment	Truancy	Infractions	Staff size	Avg. teach ed.	Avg. teach exp.
Dropout rate	1						
Enrollment	.181**	1					
Truancy	.305**	.194**	1				
Infractions	.220**	.710**	.277**	1			
Staff size	.181**	.997**	.198**	.720**	1		
Avg. teach ed.	-.156**	.005	-.135**	-.077**	.007	1	
Avg. teach exp.	-.065**	-.084**	-.171**	-.067**	-.085**	.093**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

Table 17 shows the Pearson correlation coefficients between dropout rate and all noneconomic indicators. Significant negative correlations were demonstrated between the dropout rate and average teaching education level, r (2467) = -.156, $p < .01$, and average teaching experience r (2467) = .065, $p < .01$. These variables indicate a negative impact on dropout rates, a high dropout rate being illustrative of poor student achievement.

A significant positive correlation was indicated by district enrollment, r (2467) = .181, $p < .01$; truancy rate, r (2467) = .305, $p < .01$; disciplinary infractions, r (2456) = .220, $p < .01$; and teaching staff size, r (2467) = .181, $p < .01$. These noneconomic independent variables have a positive correlation and suggest an improvement on graduation rate and, hence, a lowered dropout rate. A low dropout rate represents high student achievement.

Table 18

Hierarchical Multiple Regression Models for Dropout Rate and Economic Indicators

Independent Variables	Model 1 Dependent Variable Dropout Rate			Model 2 Dependent Variable Dropout Rate			Model 3 Dependent Variable Dropout Rate			Model 4 Dependent Variable Dropout Rate			Model 5 Dependent Variable Dropout Rate		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	.442	24.493	.000***	.485	18.199	.000***	.485	18.199	.000***	.487	18.280	.000***	.489	18.336	.000***
MV/PI ratio	-.039	-1.461	.144	.133	3.603	.000***	.133	3.603	.000***	.133	3.615	.000***	.126	3.407	.001**
Revenue															
Adjusted Act 1				.026	1.348	.178	.026	1.348	.178	.028	1.458	.145	.023	1.229	.219
Equalized mills				.009	.447	.655	.009	.447	.655	.011	.537	.591	.013	.634	.526
Basic education Funding per ADM				-.217	-6.327	.000***	-.217	-6.327	.000***	-.218	-6.367	.000***	-.212	-6.154	.000***
Revenue per ADM				-.026	-.623	.533	-.026	-.623	.533	-.026	-.645	.519	-.020	-.498	.619
Spending															
Avg. instructional expense per ADM							-.005	-.238	.812	-.005	-.214	.830	-.002	-.090	.928
Avg. regular expense per ADM							-.002	-.108	.914	-.003	-.118	.906	-.001	-.051	.960
Avg. special expense per ADM							.003	.137	.891	.003	.161	.872	.003	.160	.873
Savings															
Fund balance per ADM										-.029	-1.491	.136	-.027	-1.363	.173
Debt															
Debt per ADM													-.036	-1.963	.050
R²	.196			.203			.203			.204			.206		
Δ in R²				.007			.000			.001			.002		

*p < .05, **p < .01, ***p < .001

Hierarchical Multiple Regression Models for Dropout Rate and Economic,

Noneconomic, and All Indicators

Table 18 presents the results of multiple regression models of dropout rate

and economic indicators.   All of the models include the dependent variable of the

drop rate. Model 1 includes economic independent variable subset titled district

wealth. This subset includes the economic indicators of socioeconomic disadvantage

rate and MV/PI ratio. Model 2 adds the district revenue subset to the district wealth

subset. The district revenue subset includes the economic independent variables of

adjusted Act 1 index, equalized millage, basic education funding per ADM, and

revenue per ADM. Model 3 adds a third subset, district spending, which includes

the economic independent variables of average instructional expenditures per ADM,

average regular education expenditures per ADM, and average special education

expenditures per ADM. To all of these, Model 4 adds the subset district savings; this

subset includes the economic independent variable of fund balance per ADM. Model

5 adds the final subset, district debt, which includes the economic independent

variable of debt per ADM.   Each model will display the R^2 and the change (Δ) in R^2 at

the bottom. The significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variable

of socioeconomic disadvantage rate ($\beta = .442$) explains 19% of the variance in the

dependent variable graduation rate.   This variable has a positive β, which indicates

an increase in the dropout rate.

Model 2 adds the economic independent variable subset of district revenue,

whose variables increase the R^2 to 20%. The predictive variables in this model

include socioeconomic disadvantage rate (β = .485), MV/PI ratio (β = .133), and

basic education funding per ADM (β = −.217). Basic education funding has a negative

β, which suggests a fall in the dropout rate. The socioeconomic disadvantage rates,

MV/PI ratio, and Act 1 index have a positive β, which indicates a higher dropout

rate.

  With the district spending subset added in to Model 3, the R^2 remained

exactly the same at 20%. The predictive variables in this model are socioeconomic

disadvantage rate (β = .485), MV/PI ratio (β = .133), and basic education funding

per ADM (β = −.217). The district spending subset had no predictive variables. As

with all previous models, a negative β indicates a fall in dropout rate, which

indicates greater student achievement. Inversely, a positive β indicates an increase

in the dropout rate, which would result in a decrease in student achievement.

  Model 4 introduces the economic independent variable subset of district

savings, which includes fund balance per ADM. The R^2 does not change and remains

20%. The independent variables of socioeconomic disadvantage rate (β = .487),

MV/PI ratio (β = −.133), and basic education funding per ADM (β = −.218) continue

to be predictors within the model.

  With the introduction of the district debt subset in Model 5, the variance in

the graduation rate remains steady at 20%. The debt per ADM variable is not

predictive. The independent variables of socioeconomic disadvantage rate

(β = .489), MV/PI ratio, (β = .126), and basic education funding per ADM

(β = −.212) are the independent variables within the model that remain predictive.

As indicated in previous models, a negative β indicates a fall in the dropout rate,

resulting in an increase in student achievement. A positive β indicates an increase in

dropout rate, which would result in an increase in student achievement.

Table 19
Hierarchical Multiple Regression Models for Dropout Rate and Noneconomic Indicators

Independent Variables	Model 1 Dependent Variable Dropout Rate			Model 2 Dependent Variable Dropout Rate		
	β	t	Sig	β	t	Sig
Student						
Enrollment	.052	1.935	.053	.066	2.443	.015**
Truancy	.268	13.557	.000***	.254	12.866	.000***
Infractions	.146	7.368	.000***	.094	3.427	.001**
Teacher						
Staff size				-.316	-1.315	.189
Avg. teach ed.				-.115	-6.035	.000***
Avg. teach exp.				-.001	-.073	.942
R²	.115			.129		
Δ in R²				.014		

*p<.05, **p<.01, ***p<.001

Table 19 presents the results of multiple regression models for the dropout

rate and noneconomic indicators. All models include the dependent variable of the

average dropout rate, with Model 1 adding the noneconomic independent variable

subset that is student related. This subset includes district enrollment, truancy rate,

and discipline infractions. Model 2 then adds the new subset of teacher-related

variables, which include teaching staff size, average teacher education level, and

average teaching experience. Each model displays the R^2 and the change (Δ) in R^2 at

the bottom. The significance level was set at $p < .05$.

Model 1 indicates that the student-related variables are predictive, accounting for 11% of the variance in the dependent variable of average dropout rate. The predictive variables are truancy rate ($\beta = .268$) and disciplinary infractions ($\beta = .146$). All of these variables have a positive β, denoting an increase in the dropout rate.

Model 2 introduced the subset of teacher-related variables in addition to the variables presented in Model 1. These teacher-related variables include staff size, average teacher education level, and average teaching experience. The predictive variables are district enrollment ($\beta = .066$), truancy rate ($\beta = .254$), disciplinary infractions ($\beta = .094$), and average teacher education level ($\beta = -.115$). District enrollment, truancy rate, and disciplinary infractions all have a positive β, which indicates an increase in the dropout rate. Average teacher education level has a negative β that indicates a drop in the graduation rate. These variables account for about 13% of the variance in the dropout rate.

Table 20

Hierarchical Multiple Regression Models for Dropout Rate and All Indicators

Independent Variables	Model 1 Dependent Variable Dropout Rate			Model 2 Dependent Variable Dropout Rate			Model 3 Dependent Variable Dropout Rate			Model 4 Dependent Variable Dropout Rate			Model 5 Dependent Variable Dropout Rate		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	.442	24.493	.000***	.485	18.199	.000***	.485	18.199	.000***	.487	18.280	.000***	.489	18.336	.000***
MV/PI ratio	-.039	-1.461	.144	.133	3.603	.000***	.133	3.603	.000***	.133	3.615	.000***	.126	3.407	.001**
Revenue															
Adjusted Act 1				.026	1.348	.178	.026	1.348	.178	.028	1.458	.145	.023	1.229	.219
Equalized mills				.009	.447	.655	.009	.447	.655	.011	.537	.591	.013	.634	.526
Basic education Funding per ADM				-.217	-6.327	.000***	-.217	-6.327	.000***	-.218	-6.367	.000***	-.212	-6.154	.000***
Revenue per ADM				-.026	-.623	.533	-.026	-.623	.533	-.026	-.645	.519	-.020	-.498	.619
Spending															
Avg. instructional expense per ADM							-.005	-.238	.812	-.005	-.214	.830	-.002	-.090	.928
Avg. regular expense per ADM							-.002	-.108	.914	-.003	-.118	.906	-.001	-.051	.960
Avg. special expense per ADM							.003	.137	.891	.003	.161	.872	.003	.160	.873
Savings															
Fund balance per ADM										-.029	-1.491	.136	-.027	-1.363	.173
Debt															
Debt per ADM													-.036	-1.963	.050
R²	.196			.203			.203			.204			.206		
Δ in R²				.007			.000			.001			.002		

*p < .05, **p < .01, ***p < .001

Table 20

Hierarchical Multiple Regression Models for Dropout Rate and All Indicators cont.

Independent Variables	Model 6 Dependent Variable Dropout Rate			Model 7 Dependent Variable Dropout Rate		
	β	t	Sig	β	t	Sig
Wealth						
SED rate	.399	19.401	.000***	.399	19.401	.000***
MV/PI ratio	.040	1.244	.213	.040	1.244	.213
Revenue						
Adjusted Act 1	.017	.923	.356	.017	.923	.356
Equalized mills	.036	1.852	.064	.036	1.852	.064
BEF per ADM	-.033	1.192	.234	-.033	1.192	.234
Revenue per ADM	.013	.400	.689	.013	.400	.689
Spending						
Avg. inst. exp per ADM	-.010	-.312	.755	-.010	-.312	.755
Avg. reg exp per ADM	-.052	-2.878	.004**	-.052	-2.878	.004**
Avg. SPED exp per ADM	-.023	-1.028	.304	-.023	-1.028	.304
Savings						
Fund balance per ADM	-.020	-1.062	.288	-.020	-1.062	.288
Debt						
Debt per ADM	-.030	-1.684	.091	-.030	-1.684	.091
Student						
Enrollment	.145	7.995	.000***	.145	7.995	.000***
Truancy	.104	5.038	.000***	.104	5.038	.000***
Infractions	.012	.587	.557	.012	.587	.557
Teacher						
Staff size				-.151	-1.488	1.37
Avg. teach ed.				.011	.487	.627
Avg. teach exp.				.024	1.279	.201
R²	.224			.224		
Δ in R²	.018			.000		

*p < .05, **p < .01, ***p < .001

Table 20 presents the results of multiple regression models of dropout rate and all economic and noneconomic indicators.   All of the models include the dependent variable of the dropout rate. Model 1 includes the economic independent variable subset district wealth. This subset includes the economic indicators of socioeconomic disadvantage rate and MV/PI ratio. Model 2 adds the subset of district revenue, which includes the economic independent variables of adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. Model 3 adds a third subset titled district spending; this subset includes the economic independent variables of average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. To these subsets, Model 4 adds district savings, which includes the economic independent variable of fund balance per ADM, and Model 5 adds district debt, a subset that includes the economic independent variable of debt per ADM. Model 6 contains everything included in the first five models and introduces the student-related noneconomic independent variable subset, which includes district enrollment, truancy rate, and discipline infractions. Model 7, finally, adds the new subset of teacher-related variables, which include teaching staff size, average teacher education level, and average teaching experience. Each model will display the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variable of socioeconomic disadvantage rate ($\beta = .442$) explains 19% of the variance in the

136

dependent variable graduation rate.   This variable has a positive β, which indicates an increase in the dropout rate.

In Model 2 the added the economic independent variables in the subset of district revenue increase the R^2 to 20%. The predictive variables in this model include socioeconomic disadvantage rate (β = .485), MV/PI ratio (β = .133), and basic education funding per ADM (β = −.217). Basic education funding has a negative β, which suggests a fall in the dropout rate. Socioeconomic disadvantage rates, MV/PI ratio, and Act 1 index have a positive β, which indicates a higher dropout rate.

With the addition of the district spending variables in Model 3, the R^2 remained exactly the same at 20%. The predictive variables in this model are socioeconomic disadvantage rate (β = .485), MV/PI ratio (β = .133), and basic education funding per ADM (β = −.217). The subset of district spending had no predictive variables. As with all previous models, a negative β indicates a fall in dropout rate, which indicates greater student achievement. Inversely, a positive β indicates an increase in the dropout rate, which indicates a decrease in student achievement.

In Model 4 with the introduction of the district savings subset, the R^2 does not change, remaining at 20%. The independent variables of socioeconomic disadvantage rate (β = .487), MV/PI ratio (β = −.133), and basic education funding per ADM (β = −.218) continue to be predictors within the model.

Model 5 presents the economic independent variable subset of district debt but continues to explain 20% of the variance on the graduation rate. This final

137

model introduces debt per ADM, but his variable is not predictive. The independent variables of socioeconomic disadvantage rate (β = .489), MV/PI ratio, (β = .126), and basic education funding per ADM ($\beta = -.212$) are the independent variables within the model that remain predictive. Like previous models, a negative β indicates a fall in the dropout rate resulting in a increase in student achievement. A positive β indicates an increase in dropout rate, which suggests an increase in student achievement.

The student-related noneconomic independent variables in Model 6 are enrollment, truancy rate, and discipline infractions. This model increased the R^2 to explain about 22% of the variance. The socioeconomic disadvantage rate (β = .399), average regular education expenditures per ADM ($\beta = -.052$), district enrollment (β = .145), and truancy rate (β = .104) all showed predictability within this model. The socioeconomic disadvantage rate, district enrollment, and truancy rate have a positive β and increase the dropout rate.   Average regular education expenditures per ADM is the only negative indicator and it indicates a decrease in dropout rates. The impact of MV/PI ratio and fund balance diminishes and is no longer predictive within this model.

In Model 7 the subset of teacher related variables introduced are staff size, average teacher education level, and average teaching experience. The socioeconomic disadvantage rate (β = .399), the average regular education expenditures per ADM ($\beta = -.052$), district enrollment (β = .145), and truancy rate (β = .104) are all predictive within this model. The teacher-related variables have no predictable indicators within the model. As in all previous models, a negative β

indicates a drop in dropout rates and has a positive influence on student achievement. Inversely, a positive β indicates a growth in dropout rate, which would result in a decrease in student achievement. The R^2 in this model remains the same at 22%.

Post-Secondary-Bound Findings

The post-secondary-bound data were collected through the Pennsylvania Department of Education Database. The data were reported as average scores for each district. The higher the percentage rate of post-secondary-bound students, the greater the student achievement, and vice versa.

Pearson Correlations for Post-Secondary-Bound Rate and all Indicators

Table 21

Pearson Correlation Among Post Secondary Bound and Economic Indicators

	Post sec	SED rate	MV/PI ratio	Adjusted Act 1	Eq mills	BEF per ADM	Revenue per ADM	Avg. inst. exp per ADM	Avg. reg exp per ADM	Avg. SPED exp per ADM	Fund bal per ADM	Debt per ADM
Post sec. bound	1											
SED rate	-.405**	1										
MV/PI ratio	-.360**	.729**	1									
Adjusted Act 1	-.019	.105**	.281**	1								
Equalized mills	.106**	.081**	.013	.005	1							
BEF per ADM	-.361**	.676**	.846**	.229**	-.242**	1						
Revenue per ADM	.337**	-.582**	-.880**	-.335**	.300**	-.820**	1					
Avg. inst. exp per ADM	.124**	-.147**	-.468**	-.388**	.249**	-.254**	.678**	1				
Avg. reg exp per ADM	.100**	-.088**	-.397**	-.262**	.243**	-.171**	.594**	.838**	1			
Avg. SPED exp per ADM	.081**	.083**	-.284**	-.218**	.315**	-.191**	.511**	.686**	.575**	1		
Fund bal per ADM	-.067**	.033	.048*	-.175**	-.228**	.257**	-.021	.124**	.099**	-.025	1	
Debt per ADM	-.011	.013	-.020	-.124**	.001	.036	.040*	.093**	.073**	.025	.096**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

147

Table 21 shows the Pearson correlation coefficients between the post-secondary-bound average and all economic indicators. There was no significant correlation for the adjusted Act 1 index and debt per ADM. Significant negative correlations were demonstrated between the post-secondary-bound rate and socioeconomic disadvantage rate, r (2474) = -.405, $p < .01$, and MV/PI ratio, r (2474) = -.360, $p < .01$. This signifies that as a school district's socioeconomic disadvantage rate and MV/PI ratio increase, their post–secondary-bound rate will decrease. Other economic indicators with a negative correlation are equalized millage rate, r (2474) = -.106, $p < .01$, and basic education funding per ADM, r (2743) = -.361, $p < .01$. An increase in any of the negatively-correlated variables will have a negative impact, on average, on the post-secondary-bound rate for a school district.

A significant positive correlation was indicated between three economic indicators. These indicators are equalized millage rate, r (2474) = .106, $p < .01$; revenue per ADM, r (2474) = .337, $p < .01$; average instructional expenditures per ADM, r (2474) = .124, $p < .01$; and average regular education expenditures per ADM, r (2474) = .100, $p < .01$. An increase in these variables indicates an increase in post-secondary-bound rates.

Table 22

Pearson Correlation Among Post-Secondary-Bound Noneconomic Indicators

	Post sec	Enrollment	Truancy	Infractions	Staff size	Avg. teach ed.	Avg. teach exp.
Post sec bound	1						
Enrollment	-.016	1					
Truancy	-.120**	.194**	1				
Infractions	-.083**	.710**	.277**	1			
Staff size	-.018	.997**	.198**	.720**	1		
Avg. teach ed.	.259**	.005	-.135**	-.077**	.007	1	
Avg. teach exp.	.001	-.084**	-.171**	-.067**	-.085**	.093**	1

**Correlation is significant at the 0.01 level (2-tailed)
 *Correlation is significant at the 0.05 level (2-tailed)

Table 22 shows the Pearson correlation coefficients between the post-secondary-bound rate and all noneconomic indicators. Significant negative correlations were demonstrated between the post-secondary-bound rate and truancy rate, r (2474) = -.120, p < .01; disciplinary infractions, r (2474) = -.083, p < .01; and teaching education level, r (2483) = .259, p < .01. The noneconomic independent variables with a negative correlation indicate a decrease in post-secondary-bound students, and a positive correlation suggests an increase in the post-secondary-bound rate.

Table 23

Hierarchical Multiple Regression Models for Post Secondary Bound and Economic Indicators

Independent Variables	Model 1 Dependent Variable Post Sec. Bound			Model 2 Dependent Variable Post Sec. Bound			Model 3 Dependent Variable Post Sec. Bound			Model 4 Dependent Variable Post Sec. Bound			Model 5 Dependent Variable Post Sec. Bound		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage Rate	-.304	-11.399	.000***	-.308	-11.434	.000***	-.334	-11.298	.000***	-.336	-11.349	.000***	-.336	-11.349	.000***
MV/PI ratio	-.139	-5.189	.000***	-.154	-5.525	.000***	-.135	-4.149	.000***	-.135	-4.147	.000***	-.135	-4.147	.000***
Revenue															
Adjusted Act 1				.057	2.959	.003**	.050	2.510	.012*	.049	2.442	.015*	.049	2.442	.015*
Equalized mills				.136	7.455	.000***	.126	6.496	.000***	.124	6.422	.000***	.124	6.422	.000***
Basic education Funding per ADM				-.019	-.470	.638	-.006	-.136	.891	-.005	-.098	.922	-.005	-.098	.922
Revenue per ADM				.014	.260	.795	-.009	-.141	.888	-.007	-.104	.917	-.007	-.104	.917
Spending															
Avg. instructional expense per ADM							-.056	-1.961	.050*	-.057	-1.995	.046*	-.057	-1.995	.046*
Avg. regular expense per ADM							.002	.059	.953	.006	.163	.870	.006	.163	.870
Avg. special expense per ADM							.081	3.000	.003**	.081	2.988	.003**	.081	2.988	.003**
Savings															
Fund balance per ADM										-.008	-.413	.680	-.008	-.413	.680
Debt															
Debt per ADM													-.003	-.164	.870
R²	.173			.192			.195			.196			.196		
Δ in R²				.019			.003			.001			.000		

*p < .05, **p < .01, ***p < .001

Hierarchical Multiple Regression Models for Post-Secondary-Bound Rate and

Economic, Noneconomic, and All Indicators

Table 23 presents the results of multiple regression models of the post-secondary-bound rate and economic indicators. All models include the dependent variable of the post-secondary-bound rate. Model 1 adds the economic independent variables subset district wealth. This subset includes the economic indicators of socioeconomic disadvantage rate and MV/PI ratio. Model 2 adds the subset of district revenue, which includes the economic independent variables of adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. Model 3 adds a third subset, district spending, which includes the economic independent variables of average instructional expenditures per ADM, average regular education expenditures per ADM, and average special education expenditures per ADM. Model 4 adds the district savings subset, which includes the economic independent variable of fund balance per ADM. Model 5 includes the final subset, district debt, which contains the economic independent variable of debt per ADM. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 establishes that the district wealth economic independent variables of socioeconomic disadvantage rate ($\beta = -.304$) and MV/PI ratio ($\beta = -.139$) explain 17% of the variance in the post-secondary-bound rate. Both of these variables have a negative β, which indicates a drop in the post-secondary-bound rate.

In Model 2 the variables in the added district revenue subset increase the R^2 around 19%. The predictive variables in this model include socioeconomic

disadvantage rate ($\beta = -.308$) and MV/PI ratio ($\beta = -.154$), which maintain their predictiveness. The adjusted Act 1 index ($\beta = .057$) and equalized millage ($\beta = .136$) are also predictive. The socioeconomic disadvantage rate and MV/PI ratio have a negative β, which indicate a lower post-secondary-bound rate. The adjusted Act 1 index and equalized millage have a positive β, which indicate an increase in the post-secondary-bound rate.

The variables in the district spending added subset in Model 3 increased R^2 slightly, but it remains at 19%. The predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.334$), MV/PI ratio ($\beta = -.135$), adjusted Act 1 index ($\beta = .050$), and equalized millage ($\beta = .126$). Average instructional expenditures per ADM ($\beta = -.056$) and average special education expenditures per ADM ($\beta = .081$) are also introduced as predictive within this model. As with the previous models, a negative β indicates a drop in the post-secondary-bound rate, and a positive β represents an increase in the post-secondary-bound rate.

In Model 4 the variable fund balance per ADM in the district savings subset increases the R^2 slightly to 20%. The socioeconomic disadvantage rate ($\beta = -.336$), MV/PI ratio ($\beta = -.135$), average instructional expenditures per ADM ($\beta = -.057$), and average special education expenditures per ADM ($\beta = -.081$) continue to be negative predictors within the model. These variables suggest a drop in the average post-secondary-bound rate. The adjusted act 1 index ($\beta = .049$) and equalized millage ($\beta = .124$) are also predictive in this model. These

variables have a positive β, identifying as a positive impact on post-secondary-bound rate.

The added variable in the district debt subset, debt per ADM, in Model 5 explains 19% of the variance in the post-secondary-bound rate, but this variable is not predictive. The socioeconomic disadvantage rate (β = −.336), MV/PI ratio (β = −.135), adjusted Act 1 index (β = .049), equalized millage (β = −.124), average instruction expenditures per ADM (β = −.57), and average special education expenditures per ADM (β = .081), are the independent variables within the model that remain predictive. As indicated in previous models, a negative β indicates a drop in post-secondary-bound rate and a decrease in student achievement. Inversely, a positive β indicates an increase in the post-secondary-bound rate, which would mean an increase in student achievement.

Table 24

Hierarchical Multiple Regression Models for Post Secondary Bound and Noneconomic Indicators

Independent Variables	Model 1 Dependent Variable Post Secondary Bound			Model 2 Dependent Variable Post Secondary Bound		
	β	t	Sig	β	t	Sig
Student						
Enrollment	.085	2.982	.003**	.057	2.049	.041*
Truancy	-.105	-5.045	.000***	-.075	-3.714	.000***
Infractions	-.114	-3.926	.000***	-.083	-.2949	.003**
Teacher						
Staff size				-.219	-.887	.375
Avg. teach ed.				.241	12.264	.000***
Avg. teach exp.				-.036	-1.841	.066
R^2	.021			.077		
Δ in R^2				.056		

*p < .05, **p < .01, ***p < .001

Table 24 presents the results from the multiple regression models for the post-secondary-bound rate and noneconomic indicators.   Both models include the dependent variable of the post-secondary-bound rate. Model 1 includes the noneconomic independent variable subset that is student related, which contains includes district enrollment, truancy rate, and discipline infractions, and Model 2 adds the new subset of teacher-related variables. These include teaching staff size, average teacher education level, and average teaching experience. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

Model 1 indicates that the student-related variables predict 2% of the variance in the dependent variable of post-secondary-bound rate. The predictive variables are district enrollment ($\beta = .085$), truancy rate ($\beta = -.105$), and disciplinary infractions ($\beta = -.114$). District enrollment has a positive β, denoting an increase in the post-secondary-bound rate. Truancy rate and disciplinary infractions have a negative β, indicating a fall in the post-secondary-bound rate.

Model 2 adds the subset of teacher-related variables, which include staff size, average teacher education level, and average teaching experience. The predictive variables are district enrollment ($\beta = .057$), truancy rate ($\beta = -.075$), disciplinary infractions ($\beta = -.083$), and average teacher education level ($\beta = .241$). District enrollment, truancy rate, and disciplinary infractions, all have a negative β, which indicates a decrease in the post-secondary-bound rate. District enrollment and average teacher education level have a positive β, suggesting an

increase in the post-secondary-bound rate. These variables indicate about 8% of

variance in the post-secondary-bound rate.

Table 25

Hierarchical Multiple Regression Models for Post Secondary Bound and All Indicators

Independent Variables	Model 1 Dependent Variable Post Sec. Bound			Model 2 Dependent Variable Post Sec. Bound			Model 3 Dependent Variable Post Sec. Bound			Model 4 Dependent Variable Post Sec. Bound			Model 5 Dependent Variable Post Sec. Bound		
	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig	β	t	Sig
Wealth															
Socioeconomic disadvantage rate	-.304	-11.399	.000***	-.308	-11.434	.000***	-.334	-11.298	.000***	-.336	-11.349	.000***	-.336	-11.349	.000***
MV/PI ratio	-.139	-5.189	.000***	-.154	-5.525	.000***	-.135	-4.149	.000***	-.135	-4.147	.000***	-.135	-4.147	.000***
Revenue															
Adjusted Act 1				.057	2.959	.003**	.050	2.510	.012*	.049	2.442	.015*	.049	2.442	.015*
Equalized mills				.136	7.455	.000***	.126	6.496	.000***	.124	6.422	.000***	.124	6.422	.000***
Basic education Funding per ADM				-.019	-.470	.638	-.006	-.136	.891	-.005	-.098	.922	-.005	-.098	.922
Revenue per ADM				.014	.260	.795	-.009	-.141	.888	-.007	-.104	.917	-.007	-.104	.917
Spending															
Avg. instructional expense per ADM							-.056	-1.961	.050*	-.057	-1.995	.046*	-.057	-1.995	.046*
Avg. regular expense per ADM							.002	.059	.953	.006	.163	.870	.006	.163	.870
Avg. special expense per ADM							.081	3.000	.003**	.081	2.988	.003**	.081	2.988	.003**
Savings															
Fund balance per ADM										-.008	-.413	.680	-.008	-.413	.680
Debt															
Debt per ADM													-.003	-.164	.870
R^2	.173			.192			.195			.196			.196		
Δ in R^2				.019			.003			.001			.000		

*p < .05, **p < .01, ***p < .001

149

Table 25

Hierarchical Multiple Regression Models for Post Secondary Bound and All Indicators cont.

Independent Variables	Model 6 Dependent Variable Dropout Rate			Model 7 Dependent Variable Dropout Rate		
	β	t	Sig	β	t	Sig
Wealth						
SED rate	-.336	-11.320	.000***	-.332	-11.278	.000***
MV/PI ratio	-.135	-4.128	.000***	-.107	-3.544	.000***
Revenue						
Adjusted Act 1	.049	2.438	.015*	.069	3.553	.000***
Equalized mills	.125	6.423	.000***	.112	5.783	.000***
BEF per ADM	-.006	-.121	.903	-.008	-.198	.843
Revenue per ADM	-.006	-.089	.929	-.020	-.370	.711
Spending						
Avg. inst. exp per ADM	-.057	-1.999	.046*	-.025	-1.061	.298
Avg. reg exp per ADM	.005	.149	.882	-.025	-1.142	.253
Avg. SPED exp per ADM	.081	2.975	.003**	.029	1.262	.207
Savings						
Fund balance per ADM	-.007	-.382	.703	-.006	-.316	.752
Debt						
Debt per ADM	-.003	-.160	.873	-.005	-293	.770
Student						
Enrollment	.020	.986	.324	.019	.957	.339
Truancy	.034	1.563	.118	.043	1.995	.040*
Infractions	-.012	-.657	.511	-.014	-.747	.455
Teacher						
Staff size				.011	.552	.581
Avg. teach ed.				.080	3.528	.000***
Avg. teach exp.				-.020	-1.043	.297
R²	.196			.198		
Δ in R²	.000			.002		

*p < .05, **p < .01, ***p < .001

Table 25 presents the results of the multiple regression models for the post-secondary-bound rate and economic indicators. All models include the dependent variable of the post-secondary-bound rate, with Model 1 first including the economic independent variables subset of district wealth. This subset includes the economic indicators of socioeconomic disadvantage rate and MV/PI ratio. Model 2 district revenue subset, which contains the adjusted Act 1 index, equalized millage, basic education funding per ADM, and revenue per ADM. Model 3 adds district spending, which includes average instructional expenditures per ADM, average regular education expenditures per ADM and average special education expenditures per ADM. The district savings subset is added to Model 4; it includes one independent variable, fund balance per ADM. Model 5 adds the final subset of district debt, with its one independent variable of debt per ADM.   Model 6 contains all the variable subsets in the first five models and introduces the student-related noneconomic independent variable subset, which includes district enrollment, truancy rate, and discipline infractions. Model 7, finally, adds the subset of teacher-related variables, which include teaching staff size, average teacher education level, and average teaching experience. Each model displays the R^2 and the change (Δ) in R^2 at the bottom. The significance level was set at $p < .05$.

   Model 1 establishes that the district wealth economic independent variables of socioeconomic disadvantage rate ($\beta = -.304$) and MV/PI ratio ($\beta = -.139$) explained 17% of the variance in the dependent post-secondary-bound rate.   Both of these variables have a negative β, which indicates a drop in the post-secondary-bound rate.

151

In Model 2, the variables within district revenue increase the R^2 to around 19%. The predictive variables in this model include socioeconomic disadvantage rate ($\beta = -.308$) and MV/PI ratio ($\beta = -.154$), and they maintain their predictiveness. The adjusted Act 1 index ($\beta = .057$) and equalized millage ($\beta = .136$) are also predictive. Socioeconomic disadvantage rates and MV/PI ratio have a negative β, which indicate a lower post-secondary-bound rate. The adjusted Act 1 index and equalized millage have a positive β, which suggests an increase in the post-secondary-bound rate.

In Model 3, the independent variables contained within district spending increased the R^2 slightly, but it remains at 19%. The predictive variables in this model are socioeconomic disadvantage rate ($\beta = -.334$), MV/PI ratio ($\beta = -.135$), adjusted Act 1 index ($\beta = .050$), and equalized millage ($\beta = .126$). Average instructional expenditures per ADM ($\beta = -.056$) and average special education expenditures per ADM ($\beta = .081$) are also introduced as predictive within this model. As with the previous models, a negative β indicates a drop in the post-secondary-bound rate, whereas a positive β suggests the reverse.

With the variable fund balance per ADM introduced in Model 4, the R^2 increases slightly to 20%. The independent variables of socioeconomic disadvantage rate ($\beta = -.336$), MV/PI ratio ($\beta = -.135$), average instructional expenditures per ADM ($\beta = -.057$), and average special education expenditures per ADM ($\beta = -.081$) continue to be negative predictors within the model. These variables suggest a drop in the average post-secondary-bound rate. The adjusted Act 1 index

($\beta = .049$) and equalized millage ($\beta = .124$) are also predictive in this model. These variables have a positive β, identifying a positive impact on the post-secondary-bound rate.

Model 5 explains 19% of the variance on the post-secondary-bound rate. This model introduces debt per ADM in the district debt subset, but this variable is not predictive. The socioeconomic disadvantage rate ($\beta = -.336$), MV/PI ratio ($\beta = -.135$), adjusted Act 1 index ($\beta = .049$), equalized millage ($\beta = .124$), average instruction expenditures per ADM ($\beta = -.57$), and average special education expenditures per ADM ($\beta = .081$) are the independent variables within this model that remain predictive. As indicated in previous models, a negative β indicates a drop in the post-secondary-bound rate and a decrease in student achievement. Inversely, a positive β indicates an increase in the post-secondary-bound rate, which suggests an increase in student achievement.

Model 6 introduces the student-related noneconomic independent variables—enrollment, truancy rate, and discipline infractions—which are not predictive within this model. The R^2 increased slightly, explaining about 20% of the variance. The socioeconomic disadvantage rate ($\beta = -.336$), MV/PI ratio ($\beta = -.135$), adjusted Act 1 index ($\beta = .049$), equalized mills ($\beta = .125$), average instructional expenditures per ADM ($\beta = -.057$), and average special education expenditures per ADM ($\beta = .081$) all showed predictability within this model. The socioeconomic disadvantage rate, MV/PI ratio, and average instructional expenditures per ADM, have a negative β, indicating a decrease in the post-secondary-bound rate. The

153

adjusted Act 1 index, equalized mills, and average special education expenditures per ADM are positive indicators, suggesting an increase in the post-secondary-bound rate. The impact of MV/PI ratio and fund balance diminishes and is no longer predictive within this model.

Model 7 introduces the teacher-related variables, which include staff size, average teacher education level, and average teaching experience. The socioeconomic disadvantage rate ($\beta = -.332$), MV/Pi ratio ($\beta = -.107$), equalized mills ($\beta = .125$), truancy rate ($\beta = .043$), and average teacher education level ($\beta = .080$) are all predictive within this model. As in all previous models, a negative β indicates a drop in post-secondary-bound rate, having a negative influence on student achievement. Inversely, a positive β indicates a growth in the post-secondary-bound rate, which would result in an increase in student achievement. The R^2 in this model increased slightly but remains the same at 20%.

Qualitative Data and Findings

Superintendents and business manager teams were selected to be interviewed for Phase 2 of the study. The selection criteria were that the participants have at least 5 years of experience in their jobs and have at least 3 years of experience working together as a team. Using the quantitative findings, the school districts throughout Pennsylvania were sorted and ranked into thirds. Then, at least two school district teams from each third were selected for the interview process. A total of seven team interviews with 14 participants took place throughout Pennsylvania to obtain a variety of data. Interview numbers 3 and 7 were selected

from the upper third, interview numbers 1 and 6 were from the middle third, and interviews 2 and 4 were from the bottom third. Interview 5 took place with the Executive Directors of PASA and PASBO.

Individual contact was made with each eligible interview participant team with an e-mailed letter of invitation. Interviews took place during the summer of 2015.   The qualitative data were analyzed and interpreted according to a six-step process (Creswell, 2012): 1) preparing and organizing the data for analysis, 2) transcribing the data by hand, 3) distributing the transcriptions to the interviewees for validation of accuracy, 4) coding the results to find the themes 5) developing descriptions and revealing interconnections in the data (Cresswell, 2012), and 6) interpreting and reporting the findings. The format chosen here for reporting the data is to provide and discuss the answers given by the participants to each question of the interview protocol.

Question 1

In your experience, which economic indicators have the greatest impact on student achievement?

> a. *Why are these economic indicators most impactful regarding student achievement?*
>
> b. *How do you think these economic indicators can be addressed to increase student achievement?*

The superintendent from Interview 1 indicated that socioeconomic disadvantage rate is the number one indicator on student achievement. "I would

think it might be the only one…. Socioeconomic disadvantage rates, I think, are everything when it comes to student achievement." The superintendent noted that the school district has around a 45% socioeconomic disadvantage rate. "That means a lot: access to pre-school, less expensive housing here, we are more spread out. We have a lot of low income, or trailers, and those kind of things…. There's not a lot of high-quality pre-schools around here. There's not a lot of money being spent on pre-school enrichment experiences."

The superintendent stated that another problem of the high socioeconomic disadvantage rate is that "college is not on the table, and it's an issue we have here. For a lot of kids in middle school, even, that's not even an option. It's not on the table. The parents don't know how to approach that or there's a bias against it." The superintendent indicated that he regards this as a major side effect of high poverty.

> If you have students going into high school that don't have an end goal, or a very specific target, they are just kind of aimless, then the functionality of school has less of an impact. If you're a farmer here, at some point finishing your high school education may conflict with you working on the farm. If you are doing both, it's very difficult to labor on a dairy farm and then go to school all day, and then perform at a high level.

A neighboring district has about a 7% socioeconomic disadvantage rate. The superintendent stated that the houses are very nice and that those who can afford their house probably are college-educated and very successful. Consequently, the parents emphasize their values with their children, so the test scores at school are

higher. Because the test scores at school are higher, the property values are higher, and it's a snowball effect. The superintendent concluded,

> If you look at the overall mission of a district like ours, [it] is likely to
> improve the socioeconomic status of our students, whereas in some students,
> it might be to replicate the socio-economic status of the students. In a
> wealthy district, it is about replicating social class, where a district like ours,
> or an urban district, you want your children to have a better life than you
> have.

He also stated it is more difficult for in a rural environment to make major changes.

The business manager from Interview 1 agreed with the superintendent. "I think I would agree that the largest factor is the socioeconomic disadvantaged area." The business manager has worked within the district for many years. He noted, " our district has some relatively poor families, poor children, and sometimes they don't even know they're poor. They're at lower levels of income in the county, but they're actually really bright kids."

The business manager observed that the students need "a shot and that chance in the classroom, and then that's where you have your basic education funding in there." Over the past few years, he said, the district has been harmed by funding formulas within Pennsylvania. He stated that the only way to make up money is at the local level and this is extremely difficult with a disadvantaged tax base.

> The laws almost said, "If you don't tax at the district level, then we're going to
> penalize you with state money," but yet we had public policy that told us we

are a rural, clean and green, farming, open space community. We don't want

you to tax the farmers…. You have one public policy telling us not to tax. You

have the funding policy which was telling us to tax harder, or we won't give

you money.

The business manager concluded by saying that the school board simply kept pace and did not tax any more. This hurt the district with regard to the programs they could offer to students.

The business manager also believes basic education funding to be an indicator of concern. "In terms of the indicator, if your basic education funding got locked in a low level, I think that could truly kind of stick out a little bit as an indicator." He said that several districts in his area have reached a cap in their area, where they really just can't raise their tax rates anymore. "The basic education funding is low, and staying low, and not changing. School districts are really kind of maxed out their local side. This impacts programs, because they have no choice. The cuts have to come from the program side." He gave an example of a school district that experienced a large charter school expense growth that was higher then what they could generate from taxes and state subsidies. "They were basically cutting programs to the students who were left behind, to pay for students who were leaving, to go to the charter schools, et cetera. It's had a huge impact." He said that changes at the state level are necessary to make any impact with the economic set of indicators.

The superintendent from Interview 2 selected basic education funding, ability to tax, and socioeconomic disadvantage rate as the most influential factors.

I would say probably the most impactful is the basic education funding. As a

school district, that's something that over the last couple years we have not

received as much as we should have, and that's what we use to really

purchase materials and educational things to help the students learn. I would

look at that as being the most impactful.... I think our second impact is our

ability to raise taxes. A good example would be this year, we just raised taxes

4.094 or 4.044 mills, so we raised the amount we were allowed and then

went up to the millage exception; it was around $54 a household. We still

had to take a million dollars out of our fund balance.... The state going

through and looking at the formula and coming up with a plan for the

formula is going to be helpful for us as a school district. Less helpful for

districts that have already been getting a lot of money. Looking at the

formula and redistributing things the proper way—when you're a state that's

one of the only states without a formula, it's a problem. I think that that's one

of the ways to address at least the basic education funding piece of things.

[Another method to address the economic issues would be to] raise taxes

every year just a little bit. We've had to raise them a lot based on a couple

years ago, they gave back some money, so we've had to raise more than we

probably should have. The rule of thumb is you raise taxes a little bit every

year and that builds upon itself to help recuperate those funds. That would

be probably the second thing that would help with those economic

indicators."

At the end of his answer, the superintendent discussed the third indicator of socioeconomic disadvantage rates.

Our socioeconomic disadvantaged rate ranges from 35 to 50%, about. We're 35% at the high school level, and then probably our one elementary at 50%. There's a big range there. Probably at the high school level, if we pushed the issue, we'd be closer to 45 or 50% socioeconomic disadvantage. I don't know how you change that. I don't know how you change that factor. That's probably a factor that can't really be changed but has a huge impact.

The business manager in interview 2 agreed with the superintendent:

I would agree with ability to raise taxes. I think the reason it's impactful is that it precludes us from doing some things that we would like to do. Obviously if we could renovate some of our older buildings, we'd have better facilities for the students and I think that lends to better achievement. The economics is impactful. We have to do things a lot smarter than other districts because of those factors.

The business manager also stated the pension plan is also hurting the district.

When I started here 5 years ago, our pension obligation was $500,000. Today it's well over $2.7 million, and that's just in 5 years. What's happening is that we're taking away that $2 million we could be using for new curriculum, new whatever, to benefit the students, and we're having to put it towards that, as well as some other things. All districts are experiencing that. It's more impactful to a district like ours, where we don't have the ability to raise a

160

significant amount of tax revenue. Now we're raising these taxes to pay for your pension, your health care, your other obligations.

In interview 3, the superintendent did not hesitate in identifying socioeconomic as the primary economic indicator to affect student achievement:

When I first started in this district 19 years ago, our free and reduced lunch rate was more in the 3–6% range. We're now up to 14 –18%, based on different indicators that we've been given different measures. What I've noticed in our scores is that our low socioeconomic group are under-performing students for the most part. I think that's probably the biggest issue for us.

The superintendent spoke about how to address this indicator. They noted that the district had applied for a Pre-K Counts grant, which helps families with preschoolers who wouldn't ordinarily be able to send their children to preschools. This superintended believes that adding resources could help the problem:

The other thing that could probably help to appease some of those risk factors for our low socioeconomic kids would be to push in resources, speech, academic support, instructional support at different levels. The SAP programs that we have in place and so forth…. We're currently considering a kindergarten center, and if we're able to do that, we'll be able to have flexible grouping with kindergartners pushing all the speech and language, all the instructional support, every aspect of social workers and everything into that kindergarten center. Provide our typical half-day program for typical kids. Kids who show indicators of that risk or non-readiness for kindergarten or

first grade can participate in the full-day program with supports. We're hoping that also helps to address it.

For the business manager in Interview 3, any money factor is important; he noted that the basis of what he worries about is funding and money:

Honestly, I've worked at mostly all poor school districts. The amount of materials and benefits in this district is not the richest school in the world, but it is compared to what I've worked at. The difference is staggering. The amount of money spent on children and the things that they have available to them here rather than the schools that I was at for the first 15 years of my career. The money here provided opportunities for underprivileged students unlike in his former districts. This gives students a greater opportunity for academic success.

Superintendent number 4 began, "When I look at other districts and compare other districts, what we see is there's an absolute trend that the districts with the lower free and reduced lunches certainly have the highest achievement." Thus, he indicated a direct tie to the socioeconomic disadvantage rate, but added a somewhat different perspective. Rather than looking at such areas as necessarily where wealthy and educated people choose to live, "you can also look at it that you live in a community that values education, values the work of the schools, teaches their children they're going to have to have that productive career in their lives." This superintendent said that when there is success in the home, the kids can produce at school, which will result in the school being "a little bit more attractive to others." He believes that to fix the problem, a cultural change is necessary.

"Students and parents must value education. When this happens the whole school

district improves." The superintendent did acknowledge that "some of the

economic formulas must be adjusted to help all of the districts in the state."

The business manager in Interview 4 began by saying,

Money always dictates most things, so I do believe that this district is above

average, household income wise. It keeps us a little bit above average with

our scores and such, but as superintendent said, there has been an influx of

lower income families that have entered the district over the last 20 years,

probably. I think the district wealth drives most of this. I think how money is

spent affects districts, very much so. If you have wise administrators that run

it properly, I think you're fine, within reason, but some districts really don't

have a chance because it's a downward spiral if people start moving out, keep

raising socioeconomic disadvantage rates and decreasing district wealth. it

reflects on scores.

The business manager also agreed with the superintendent that the "culture of the

district and the funding formulas need to have a positive change to have an impact

of student success."

In Interview 5, the Executive Director 1 observed first that

"[s]ocioeconomic status and district wealth (MV/PI ratio) are most

important. I've worked for a long time trying to focus on closing

achievement gaps, particularly for poor students, because that's the biggest

problem that we face in the state: the gaps between poor students and other

students is some of the widest of any state in the country, and I believe that

much of that problem has to do with the inequitable funding resources that school districts have to work with those students, and generally, … concentrations of low income students in districts contribute greatly to that challenge, and generally, those districts that tend to be more under resourced than other higher achieving districts that have wider gaps in achievement between their non-disadvantaged and disadvantaged students.

The Executive Director 1 observed that these problems present tough issues because of concerns about going "beyond just teaching the core subjects and making sure that the students achieve in those subjects, versus addressing all their other needs." Some of these include drugs in their communities, parents that are substance abusers, or the semi-transient status of students because of frequent moves from one household to another. These he characterized as "barriers that children from low income families face, concluding that "[s]chools can do [only] so much, and it takes a lot more to address those to allow those students to achieve at the same levels or beyond, of what other students are achieving." He also stated that major changes to state laws and funding formulas are need for improvement.

The Executive Director 2 in Interview 5 agreed with the superintendent, identifying the same two economic indicators, the students' socioeconomic state and district wealth, as key. However, this Executive Director 2 also added "the ability to generate revenue at a local level," noting that these factors cannot be isolated nor can they be entirely characterized as predictive and absolutely indicative what a student will achieve. He also pointed out problems with some of the indicators, observing that they have been used for decades and that some, such as aid ratio and

weighted average daily membership, are seriously flawed, even to the point that

they "distort economic circumstances in certain districts." He expressed approval of

the face that "the Basic Education Funding Commission is looking at alternative

indicators to measure district wealth."

Executive Director 2 suggested that local revenue is also an important factor.

Noting that it is important whether the district has a tax base, he cited the fact that

some of the "larger urban areas" have "some remnants of a downtown business

district that gives them some commercial and industrial tax base," which can help in

offsetting certain cost factors associated with students' education.

Executive Director 2 concluded by offering further conclusions on what

causes the financial problems and what might be done about it:

> In terms of what we do about them, I think, clearly the haves and have nots in
>
> Pennsylvania are separated by assessed values. The haves have growing
>
> assessed values in the suburbs, at least traditionally. The have nots have a
>
> static, or declining, tax base, and when your assessed value is sort of gone
>
> nowhere, you're sort of forced to do that tax increase, just to maintain where
>
> you are, in relationship to the increased cost every year of school personnel
>
> and facilities, and transportation, et cetera, and I think that's the dividing
>
> line. Somehow we've got to look at what happens in districts that don't have
>
> a tax base, and that needs to be a factor in how we fund, as opposed to just
>
> letting them sit out there and try to maintain an effort that is headed in not a
>
> good direction. We need a state solution, to trying to help, more significantly,
>
> meet the needs of socioeconomic disadvantaged students."

In Interview 6 the superintendent also stated that the indicators most affecting student achievement were economic, citing district wealth because of how important it is to have stability in the school programs. The superintendent believes that adequate funding would lead to higher achievement. "I know they got the anomaly schools of Pittsburgh, Harrisburg, Philadelphia. There's a lot of districts that are trying to do something they just can't achieve because they don't have the resources to do it."

The superintendent identified the next biggest economic indicator as poverty because it "separates a lot of family supports." In his school district, 28% of the population qualify for free and reduced lunches, which might be surprising because "most people consider us to be a very nice suburban district from the outside." About 450 of the kids are from families who are on food stamps, 18 of the students are homeless students, and, as of the previous year, the food bank was "providing direct support to 150 families in our community." The superintendent spoke of how difficult it is for student to achieve when the family is struggling with poverty. He also noted that the problem isn't that people aren't working: "What we're finding is, blue collar people who used to have middle-class paying jobs are now doing two or three part-time jobs, and they still don't have near the wages they used to." The extra work has a negative impact because parents are not able to be with their children and "that's driving a lot more stress within the family." He also noted that because "social services are set for urban districts," his district does not have access to the "social service net," which places more responsibility on the schools. The superintendent concluded,

I think we have an expense issue. The legislators have tied our hands. We can't negotiate down. We can only negotiate up. All the collective bargaining things are stacked in the union's favor, which is fine if that's the belief system of the commonwealth, but then don't limit our ability to pay. You can't have it both ways. If you want us to take on and have tough negotiations with labor and bring down costs, then you have to give us the capacity to negotiate them later. Right now, we don't have either.

The business manager in Interview 6 also cited financial problems, noting that the "Act 1 limitation is placed on school districts. The state is required now to limit our ability to raise taxes only to the Index." This limitation raises a particular problem for this district, because the index max is not enough to fund even the pension for the coming school year. The business manager raised the obvious question: "where would we get the additional funding to support the educational objectives of the school district?" The manager noted that this situation places more responsibility on local taxpayers. "Basic Ed has cut back, so more of the percentage has come to the local residents and taxpayers for real estate taxes impact."

In terms of addressing the problem, the manager suggested that because of the impact of pension increases, a reassessment in the community may be needed. Perhaps, he said, some "changes to the pension program and more equitable resources are the key."

The superintendent in Interview 7 stated that average daily membership is one problem. "If the students are in the seats, aren't in the school, it has a big impact, obviously, on their learning." The superintendent continued,

For a district like ours, with the relative wealth of the district, the basic

education funding is not as big as an impact as it is, maybe, in some of the

more, we'll call them poorer districts. I came from Central PA where we

really relied on that basic education funding, more so, for a majority of our

budget. That does have an impact, then, as far as what we can do as far as

staffing, supplies, facilities, etc. By looking at it based on ADM is probably the

biggest thing as far as impact.

The superintendent indicated that "the socioeconomic disadvantages rate also has a

major impact." Its effect is not major in his current district, he said, "but in my

previous districts it was critical."

The business manager in Interview identified the socioeconomic factor as the

most influential because the students coming from more "disadvantaged homes

tend to struggle the most." Students from homes higher on the socioeconomic scale

usually do better, perhaps because the parents are more involved or have advanced

degrees.

We had a study done years ago with the SAT, and they came and told us that

the reason that we would never catch a neighboring district in SAT scores is

because SAT scores was most impacted by the mother's educational

background.

The business manager observed that a great deal of the money coming to the

district from businesses relieves families of the burden, noting that their district

gets an enormous amount of money from these businesses because the district has a

higher millage generated from commercial properties.

Question 1 Summary and Common Themes

In each interview both the superintendent and business manager identified socioeconomic status as an economic indicator for student achievement, with challenges arising from dealing with students who come from a low income family. During multiple interviews, the superintendents and business managers revealed that it is difficult to find students from low-income families who are healthy and ready for school. Proper health care and nutrition is a significant obstacle to student success.

Another indicator identified in multiple interviews district wealth, which is calculated through the MV/PI ratio. The business managers tended to speak of this indicator more often, but superintendents agreed about its importance. District wealth indicates how much revenue is generated through local taxes. The money at the disposal of each district varied in each interview. Many of the superintendents and business managers indicated that with more money, they can provide extra programing for students. These programs could be advanced placement courses, preschool programs, and tutoring programs. District wealth was also an indicator of how much taxes can be raised to generate money for the district.

The culture of the school district was frequently spoken of as a significant indicator. Many of the superintendents and business managers indicated that the communities', parents', and teachers' beliefs on education affect student achievement. During the interviews, differences emerged in each district in terms of the value of education. High achieving school districts with low socioeconomic disadvantage rates expected student success. In school districts within farming

communities, family support for the school district was characterized as high, but students are also expected to work on the farm. Superintendents and business managers characterized low achieving school districts with high socioeconomic disadvantage rates as having cultural challenges to overcome.

When asked how the problem should be addressed, many of the superintendents and business managers said that a change is needed in state law to allow for economic resources, observing that Act 1 limits the ability to generate local revenue. Along with more revenue, they also suggested that cultural change must be made, observing that a high achieving culture usually continues to achieve at a high rate. According to the participants, low achieving school districts tend to achieve at a lower rate because they do not have a model for success or do not know what success looks like within an academic setting.

Question 2

In your experience, which noneconomic indicators have the greatest impact regarding student achievement?

       a. Why are these noneconomic indicators most impactful regarding student achievement?

       b. How do you think these noneconomic indicators can be addressed to increase student achievement?

The superintendent from Interview 1 stated that truancy rates and discipline infractions are the most impactful noneconomic indicators. "If you have a lot of truancy, if you have a lot of disciplinary infractions, those are symptomatic of a poor academic culture or lack of value in education, or real problems in the community as

well." The superintendent identified urban areas themselves as the problem, not urban schools, per se, and he applied this idea also to his own community: "We are dealing some with some pretty significant community issues, quality of life issues, that impact everything."

The superintendent noted that to have a more academic culture, "schools need to have a lower truancy rate. You have fewer reportable disciplinary infractions, all of those things, but they're reflective of some things that are happening in the community." Dysfunctionality in the home is hard to overcome, but programs can be put into place to increase school attendance.

Conversation about dealing with disciplinary infractions focused on the students at the high school. The superintendent said, "Very few juniors and seniors ever get suspended, because they've dropped out. They've either changed, or they've dropped out." He observed that too many "reportable disciplinary infractions" is a symptom of "erosion or just a poor academic culture in your building. These infractions bring everything down, which affects student achievement, it absolutely does. Truancy rates are the same thing." The superintendent identified quality of life issues, in terms of truancy rates and disciplinary infractions, as having the greatest impact on student achievement.

The business manager from Interview 1 again agreed with the superintendent. "From where I sit, the superintendent has to work through the truancy stuff and the discipline, and everything that happens on that student side". He discussed a scenario wherein half of the high school seniors go to the career and technical center for hands-on type learning in construction industries, trucking and

diesel mechanics, heavy earth-moving equipment and HVAC, or auto repair, which are all pretty high-end skill sets. "This is the stuff that gets our kids excited for school," the business manager stated, because they know that they might have "an $85,000-a-year job in HVAC when they get out, or a $70,000-a-year job driving a truck when they finish. That is what keeps them in school and out our trouble."

When kids are excited about school and come every day, they are successful. The business manager stated,

> We just had a speaker at graduation that went to Cornell and went to Harvard. Our district basically has a really wide gamut of what we're providing for our students. We have students who will go to all of the four major military academies. We have jet fighter pilots, we have submariners. We have kids being really successful. We have kids running 1,000-acre, 500-cow farms, major businesses, generating 2.5 million dollars a year. The trick is getting them excited and coming to school.

The superintendent from Interview 2 began, "I think the noneconomic indicators that are most impactful would be truancy and disciplinary infractions and class size." He said that truancy and discipline infractions are almost the same, observing that "when kids are in trouble they're not in school so that becomes an absentee issue."   The superintendent thinks staff size is important because "I think the class student to teacher ratio makes a difference of how kids perform. We're fortunate right now: our teacher-to-student ratio is medium to low so that helps with our student achievement part of things." However, the superintendent continued,

As the budget gets tighter, less teachers we're going to have, class sizes are going to go up and the student achievement is going to go down. I mean, I can predict right now in 5 years if the budget and the funding doesn't change our class sizes are going to be 30 or more and student achievement is going to go down because there's less individualized attention.

The business manager in Interview 2 agreed with class size as an important noneconomic indicator, largely because as teachers retire, they are not all replaced because of budget constraints. He said that very few replace every teacher who retires. He also noted that because the school district where he works is rural, outside of the percentage of students who stay in the district to farm, no one stays and works in the district because "there's nowhere to work. We have a couple places, we have like a large sporting goods store and some smaller businesses but that's it." As a matter of interest, he noted that a lot of the kids from the district go into engineering after they graduate, more so than any other place he has been employed.

The superintendent from Interview 3 believes that truancy is the most impactful and that

> [p]robably one of the most impactful things that we see on truancy and even behavior issues is the dynamic of the family. Social and emotional health of the student and the family. Socioeconomics. If a kid doesn't feel that he fits in the school system, or with his peers. Can't keep up financially with the cool clothes or whatever. Those are usually issues that are related to that. A divorce occurs, destruction in the family unit, a death in the family. That

usually sends a kid spiraling and then we get attendance issues, discipline

issues, even in some cases, dropout issues. Believe or not, even in our

district we've had homelessness on occasion.

The superintendent also stated, "The method to fix the problems is similar to those

actions taken in the first question."

The business manager in Interview 3 agreed:

The biggest noneconomic would be truancy. I think our kids come to school

most of the time. That's a huge difference between smaller schools that kids

don't show up for school. You don't show up for school, you're not going to

learn. You can read a book all you want, you're not going to learn if you don't

come to class. In other districts truancy becomes a more serious indicator of

many problems within the household. These problems are difficult for a

school to address without outside services.

The superintendent in interview 4 began, "I would have to say truancy rates

would have a huge impact on student success. You have to have the students here to

be successful and teach them. I think you'll see our attendance rates are really very

good here." The superintendent attributed good attendance to the many programs

in the district to make kids comfortable and give them a good education. He believes

they are not bullied and that they are happy. Another factor the superintendent

discussed is the teacher. "I think the number one thing that determines if a district's

going to be successful are the teachers in the classroom." The superintendent said

that when hiring takes place in the district, the school board is directed to

hire the best. I can't tell you, as a superintendent, that's the best thing that

could be said. Our teachers sometimes compete against each other.

Somebody has a new bulletin board. Somebody else wants to have a better

bulletin board. Even though that sometimes causes good friction a little bit in

the building, boy, it works wonderfully.

The superintendent observed further that the teachers are very competitive in

terms of publishing, even if only locally, or getting grants. "If you're hiring the best,

that's what you're going to get. You're going to get people who are competitive…. I

think, truly, those two are the things that I think can most affect how we do this."

The business manager in interview 4 stated, "The biggest non-economic

factor I think is the personnel. Teachers and people in charge of the teachers." He

agreed with the superintendent about the quality of the teachers, observing that

"the new teachers coming in have been molded, shaped, and basically it's a great

place to work, and everybody's taught that. They work hard." The business manager

concluded, "This is also a great situation because the new teachers are generally less

expensive."

In Interview 5 the Executive Directors addressed this question together as a

team for a joint response. The Executive Director 1 spoke first, saying, "Truancy

rates and disciplinary infractions are most important." The Executive Director 2

agreed: "My sense is that, when you have high truancy rates, when you have high

discipline issues, a number of discipline issues, that generally, they're in more

challenged communities, lower wealth communities." Executive Director 1

continued,

Enrollment levels, particularly in the low enrollment, large geographic area, sparsely populated areas, have very limited opportunities, so that's going to affect student achievement levels. We have a very large number of very small school districts, in terms of enrollment in the state. Last count that I took was, we have 77 school districts with under 1,000 students. We have in the neighborhood of 160 districts under 1,500. Then we have several districts under 500. Just scalability to deliver a comprehensive educational program is very limited in those districts.

Executive Director 2 interjected, "It is very hard to generate revenue in those districts to prove a comprehensive curriculum and extracurricular programs." The superintendent agreed, observing that in many of the districts he had just spoken of, which tend to be rural, the post-secondary enrollment rates would be low, simply because the opportunities are fewer, and the classes will be less focused on college prep.

Executive Director 2 concluded, too, that

[e]ducation level will be important. I just saw something that said the entire school district of Philadelphia—I think they have 9,000 teachers—[and] only four teachers have doctorates. You go up the road to Central Bucks, I would bet 10% to 20% of the teachers have doctorates, because the pay scale there, top of the scale, is $115,000 right now. That drives people and provides better education for students.

Both Executive Directors suggested these factors are difficult if not impossible to change.

Superintendent 6 said, "I think some really powerful non-economic data comes out of the census data. There's a strong correlation between the education level of the parents and the achievement level of their kids, particularly that of the mother in the house." The superintendent observed that though people cannot change their mother's education level, current students can be encouraged and pushed to go further and achieve a higher level than their parents did. The superintendent continued, "The culture is huge: do you really believe kids can learn or not? That has been our strongest battle in the school district over the last 5 years." The superintendent said with some shock, "I was pretty much point-blank told when I arrived, our kids do what they're supposed to. We're not our neighbors. You're expecting too much. That's stunning to people here that people have that belief system because we hear the mantra, 'All people can learn.'" The superintendent said the culture dictates the student achievement in the school district. He said that discipline and truancy are important but that they also "...fit into the culture aspect."

The business manager in Interview 6 observed that because of the ways the family unit has changed—single parents raising children, grandparents raising children—disciplinary action has changed within the school, too. Further, it may cost more to educate the kids because they do not have two parents to provide for them. Safety is important to the business manager as well. The school has had to address safety issues because the parents are now thinking about it. "Parents are asking, 'What are you doing for safety? How safe is my kid in this?' Not anything about education." The business manager concluded, "We're spending dollars that I

think could have been moved to instruction to address the changing non-economics within our community. People don't realize what that's costing us at times."

In Interview 7 the superintendent focused mostly on teacher experience and education level, along with class size as the most significant noneconomic factors.

Here, we offer twenty-seven AP courses. Where I came from, in my district, we had one. Only because that's what we could afford and we could hire the extra teacher.... You tie that into your teacher experience and your staff size. Obviously, you'll attract better teachers with higher salaries. The majority of our teachers, better than 50%, have master's degrees. That has an impact, obviously, on the direct instruction in the classroom which then, again, elevates our students to a different level.

The superintendent also identified class size as a factor that makes a

big difference. I left a rural district where we had class sizes in elementary of 30 to 35. Our limit, here, for our fourth and fifth grade is 26. In the kindergarten through second, we're looking at class sizes of 19 to 22, at the most. That does have a big impact as far as the individual instruction and how much feedback they get from the teacher. That has a big impact on, obviously, student achievement. Total enrollment is not bad because we're spread out pretty good within our classes and our buildings. And truancy rates are very low.

The business manager in Interview 7 said, "Enrollment is a big one. Before the economic collapse in 2008 our enrollment was actually going up. We were projected to be close to 4,600 – 4,700 kids. Right now, we're barely at 4,000 because

it flattened." The business manager agreed that truancy rates are very low: "If kids are here, they're here. I'm sure our test scores reflect that compared to somebody who might have a high truancy rate."

Question 2 Summary and Common Themes

Truancy rates and disciplinary infractions were most often identified as the most important indicators during the interviews. One superintendent pointed out the link between the two, showing that they are almost the same in the sense that if students are in trouble, often they will not come to school. These two indicators were also identified as symptoms of a culture problem. In the high achieving districts, the superintendents and business manager did identify the problem, but they also indicated that their rates of occurrence are relatively low compared to those in other school districts. The superintendents and business managers in the rural settings indicated that they see high truancy rates because of the farm needs within the household. They pointed out that in the lower achieving school districts, there is a culture of not valuing the school system and this leads to disciplinary referrals and higher truancy rates. They all agreed that when students are in school, achievement rates increase.

Another main indicator identified was enrollment and class size. Enrollment is a large factor because it can lead to an increase in class size, and if the class size becomes large, the staff size may increase. Most of the superintendents wanted smaller class sizes, so enrollment was a factor they examined often during the school year. Several people mentioned that smaller class sizes result in more

individual attention for students. The superintendents believe that these smaller

class sizes will result in higher student achievement.

Throughout the interviews, the superintendents and business managers

were asked to offer solutions for truancy, disciplinary infractions, and total

enrollment. Most of the superintendents stated that they have programs in place to

prevent the problem for truancy. Both superintendents and business managers

agreed that having students actually in school is the most important factor. They

suggested that they need to find a way to make sure the students fit in and want to

come to school. Both the superintendents and business managers did not think

enrollment was a problem that can be solved entirely. Rather, they said, it is

something that should be watched carefully to ensure that proper resources are

allocated where they are needed within the school district.

Question 3

Which has a greater impact on student achievement in your district, the economic

indicators or noneconomic indicators?

> a. *Why do you believe this group of indicators has the greatest impact*
>
>   *regarding student achievement?*
>
> b. *How do you believe this entire group of indicators can be addressed to*
>
>   *increase student achievement?*

In Interview 1 the superintendent had a difficult time with this question. "It's

tough to answer, because I guess I get frustrated in education, because I see a lack of

substance." As he began to think his way toward an answer, he said, "There's good

cultural work being done to try to change the socioeconomic status of students in

districts. If you have smart people in those districts, it's cultural work to try to do that." The superintendent acknowledged that economic indicators have challenges, noting that "[t]he noneconomic indicators are symptoms of a culture, because valedictorians are not truant and do not get suspended."   He then spoke about the influence of poverty in students' academic performance: "There's some interesting research out there about poverty rates, and how people who live in poverty have an us-versus-them mentality in life. I'm generalizing significantly, but I do not get calls about academic issues." He does not receive calls, he said, from parents who are mad that their child is not being challenged academically. "It's all behavioral issues, or disciplinary issues. Those are the areas, and if you have this us/them kind of mentality through life, that becomes very difficult." He finally concluded, "It's all cultural work, so the economic indicators are key. The noneconomic indicators, I think, are more symptomatic. It goes back to that socioeconomic status."

The business manager from Interview 1 stated, "Our rural poor are generally culturally very different from the urban poor. It's two different things, yet they're going to test the same in the socioeconomic test." The business manager tended to believe that budgetary economic indicators have the greatest impact.

> Probably 70% of our wage earners are self-employed when you throw in the farmers, all with a tremendous work ethic. This is important because they know what they need to do, and then that translates to the superintendent's side of the wheelhouse in terms of, they didn't need a college education, so then therefore that translates to the kid. The kid's going along in the truck, to

learn HVAC and learn plumbing and learn block-laying and brick-laying.

We're a trades-based area.

He agreed that the economic indicators have a tremendous impact on education. He stated, "We have so many of our people who leave this district, so on that socioeconomic side, even though they're not earning the big three-figure stuff that you'll see in a local school district up north, they have a good living." But he also stated that the tax base is hard working and does not want tax increases for schools. "Their view of the education system, and what that's bringing to their student, is different." Even as he indicated that the socioeconomic indicator is important, he noted that the district tended to have different socioeconomic measures than other districts and that such would translate into different types of cultures also. "We definitely are addressing a different culture than some of our neighboring school districts." The business manager concluded, "All the other socioeconomic indicators are in alignment with the other districts in the county; however, our culture is just entirely different compared to [them]."

In Interview 2 the superintendent and business manager both said that economic factors have a greater impact. The superintendent qualified his statement somewhat by observing that their school was doing better academically than some that were "giving out those one-on-one devices," by which me meant technological devices. "It's not just that technology that brings the scores up; it's how you're implementing that technology I think that makes the difference."

The business manager admitted that he would say

…economic because it's something that you can actually deal with. The non-

economic is kind of difficult. As we discussed, it kind of puts schools like ours,

districts like ours at a disadvantage because there's some schools that can

provide iPads to every student. We're not at that point. We're trying to get

there, we're trying to do whatever we can do. I think its impact is definitely

more economic.

The superintendent in Interview 3 indicated that noneconomic have the

greatest impact.

We work within the budget that we're given. I think we provide a pretty solid

education for kids for the funds that we receive. We use them pretty

responsibly. We have a pretty strict board in terms of being conservative.

The non-economic indicators are things that are more difficult for us to wrap

our hands around as a community because our community is shifting. In the

'60s we had class sizes in the 800s, 900s. At one point, the school district was

so big that they had to split half-day programs for certain grade levels,

certain parts of the alphabet, because they couldn't fit them all in the schools.

There was a huge boom here in the '50s and '60s. A lot of the housing that we

have here was built during that time. As a result, there are a lot of small

ranch split-entry type homes that are considered starter homes and now

would be considered more of a low-income homes were built. The young up-

and-coming families are moving into three or four or $500,000 homes. The

houses here, as they're flipping from those senior citizens, are going to young

families who can afford $100,000-, $150,000-home. That's changing our economic base it gives us a different class of problems to work with. We're dealing with single parent homes. We're dealing with more drug and alcohol issues in the home. That translates to more drug and alcohol issues among students as well. For us to address those issues, we need to keep students engaged, whether it's pulling them in academically, artistically, athletically, activities."

The business manager in Interview 3 believed that all the indicators are closely related. "I don't think the noneconomic indicators are really fully noneconomic, to be honest with you." He explained that he thought that truancy and discipline issues, and everything that goes along with them, will be found more in the poorer districts than in the affluent districts, and he concluded, "I think economics drives 99% of the issues and the successes of school districts. "

The superintendent from Interview 4 expressed his belief that economics in the community is more important than anything else that affects the students. Money enables the district to train the staff in any intervention they might need to use with the kids; they can add extra classes or run summer camps. "With money, we can change our instruction. We can add more Title 1 people. We add do more volunteers. There are things we can do to impact." The superintendent concluded by saying, "As a district we must help every child succeed, but this is difficult if we do not have the economic means to provide the best education possible."

The business manager in Interview 4 said he believes the noneconomic indicators have a greater impact. He acknowledge that this belief would probably

sound strange coming from someone who deals primarily with the economic side of things, but he stated his belief that a great part of making a program work is effort on the part of the people who are carrying it out. If people don't produce the effort, the program will fail, even though many programs are good. "All the money in the world, that doesn't buy kids happiness. It's that same theory. It plays a big part, but I think [its] the effort of personnel."

Executive Director 1 in Interview 5 answered this question, "They are totally integrated, so you can't distinguish one from the other." He continued,

I think schools can have students achieve at high levels. It takes extra

resources to get there. It isn't one or the other, it's often tandem, and you've

got to really address both, because, you know, a student comes to school

hungry, and doesn't have adequate meal, or is sick, because they're not

getting adequate medical treatment, or they're coming from a household

where there's abuse taking place, whatever the issue is that they're coming to

school with, that is external to the student's ability to learn, those have to be

addressed before that student can achieve at high levels.

Executive Director 1 concluded by noting that it has to be either the school or the community who deals with such student issues, and if the student doesn't get it from one place or the other, achievement will suffer.

Executive Director 2 essentially agreed, noting that economic indicators often predict the noneconomic indicators. He said that the district's resources combined with effort would largely "predict whether you end up with discipline infractions and a high truancy, and low teacher experience and education

credentials." Executive Director 2 concluded, "I would have to say, it's the economic indicators, because they're predictive of non-economic indicators."

In Interview 6, the superintendent indicated that economic factors would be the most significant for an underfunded district. He noted that there are certain tipping points at which a certain amount of funding dictates the culture. "There is a tipping point that more economic support ... You could give us 10 million dollars tomorrow and I'm not sure it's going to make a difference in this district on achievement." Most principals would say that they'd do great things with the money, but the superintendent believes it would "yield marginal results compared to when you have the resources to get the job done. I think there are districts that can't entertain a conversation on culture because they don't have time to." The superintendent thinks that "a fair funding formula is probably the starting place" to begin to correct the problem. But he said,

> I do believe our principal and superintendent certification and training programs have lost sight of teaching leaders how to create vision. If we ever get funding solved, there's going to be an issue on how do we culture change because I don't think many of our leaders are equipped to handle that conversation.

The business manager in Interview 6 indicated his views on the importance of economic factors when he said,

> I think we need to look at the districts from the economic indicators of their strengths. What's their fund balances? How much money do they have available for them as they move forward in the future? The debt. How large is

their debt? Where is their debt heading in the future? We might have to get

in there and start negotiating differently with their contracts. We may have

to restructure their debt. We may have to look at our programs and see if we

could, okay, scale back on some of the offerings that we have because we're

being asked to do more with the community.

The business manager believes that tighter connections to the community should

fostered, along with more openness; the schools can provide tutoring and summer

programs, but such cost initiatives need to be monitored for their impact on the

district's financial stability. "If you're not watching that, the next thing you know

you're on the downhill side and then you have some issues." He noted that "districts

need to have some stability in their organizational structure. You can't have

superintendents leave every two years and get a thing to change. You don't have

that core stability." The business manager concluded by stating that the economic

structure of the state needed to be examined and changed.

The superintendent in Interview 7 began by observing that he thinks the

noneconomic indicators are most important, but he wanted to take it over a level to

the "home life. The parenting. The education level of the parents, especially the

mother. Those are big things that we can't control." The superintendent indicated

that many students in preschool and kindergarten are "coming in ready to learn

already at a higher level than you'll see at a more rural area or a poorer area or an

urban area because of the fact that they can afford to do some of those things."   This,

he said, is because "the students and parents value the education. That makes a big

difference. … The hardest part for us is to take them from that level and go higher. That's the biggest thing in what we can do."

The business manager in Interview 7 stated, "I think it is the noneconomic indicators that really impact our district the most. We do have a couple of examples of economic indicators, or economics, dealing with it." The business manager did not elaborate any further for this question.

Question 3 Summary and Common Themes

The themes identified within this question varied, but most of the respondents found the indicators hard to separate, believing that the economic and noneconomic indicators are dependent on each other. Some felt the economic indicators are key and the noneconomic indicators are suggestive of the economic problems. Some suggested that with more local resources a school district could provide more academic opportunities to their students. Some believed that economic indicators can be the most influential in underfunded school districts. It was also believed that economics can be identical in two different communities, but the culture can make a dramatic difference.

The superintendents and business managers believed that structural changes need to be made at the state level before dramatic change can happen for individual school districts. It was suggested that cultural work also needed to be completed within the school community to improve achievement.

Question 4

Data collected from the 2008 – 2009 school year through the 2012 – 2013 school year have indicated that the socioeconomic disadvantage rate, MV/PI aide ratio, and truancy and teacher education level have the most impact on student achievement. What are your beliefs regarding these results?

In answering this question, the superintendent in the first interview began with a small story about an elementary school.

> We have an elementary school that has 220 students, K to 5, so it has two classes of 20 in each grade. They are 70 square miles, which would make that about the fifth largest district in the county itself. It's not our largest elementary attendance area, and they are twice a blue ribbon school and there are times we have had the highest math and the highest reading achievement in the county. [But] we had something unique. We had a husband and wife team teaching fifth grade—have no kids and devoted themselves solely to the teaching of children. They are an anomaly. That is a school that had 100 percent proficiency, a number of years, during that time period.

> You would go to our middle schools. In our middle schools, there were a couple years where we had the highest reading achievement in the county. For a number of years, we were in the top quintile in PVAAS math growth, at both middle schools. There are only three seventh-grade schools that hit the top quintile in PVAAS growth, and we had two of them.

The superintendent went on to discuss how elementary schools and middle and secondary schools differ. "When you look at the 90/90/90 schools, it's elementary school, elementary school, elementary school, and then you find a few rare middle schools, like Tinton Falls, New Jersey. You really have to really dig deep." The superintendent noted that it is hard to find high-performing high schools.

When PVAAS was first coming out, and they were telling me that PVAAS is not related to demographics. Achievement is related to demographics, but growth is not related to demographics. I buy that. I understand that, at the elementary level. I somewhat understand that at the middle school level. I completely don't understand that when I look at the high school results.

In conclusion, the superintendent stated,

If you're talking about cultural change, the family background, in my opinion, matters greatly, the older the kids get. Most districts can do elementary really well. Middle schools, if you have your act together, you can do well. Your background knowledge, and the culture, and everything matters even more at the high school level. That's when it gets exposed. That's when there's a separation. Socioeconomic status and student achievement, but I put the qualifier in there about the high school is where it becomes most relevant.

The business manager in Interview 1 pointed out that the economic indicators over the time period presented in the question indicate a kind of "pivot point" in change. He noted that the economic indicators were related to things that couldn't be taxed. He also expressed some doubt about the validity of the statistics:

"I think you'll have to look at them with a little bit of a skepticism in terms of that turbulent era. You would have crossed over the Tom Corbett/Rendell switchover."

In Interview 2 the superintendent agreed that district wealth and socioeconomic disadvantage rates have a great impact on student achievement, nor did he disagree with the idea that they were predictive. The superintendent was a surprised about teacher education level.

Teacher education? You can purposefully hire teachers with more education. I think you have a better chance of impacting the non-economic than you do the economic factors because really other than taxes the state decides what you get. It's out of your hands. I can't disagree with those results. They definitely are impactful.

The business manager in Interview 2 identified district wealth as especially important because of the likely family environment and home culture in a rich school district: "District wealth in my opinion is really a predictor." He also noted his belief that the home is more important than anything.

In Interview 3, the superintendent expressed his belief that average community income is important.

What parents can afford for their children. The business manager spoke of poorer school districts families where survival is their main concern. They're not worried about getting their kids involved in Boy Scouts, athletics, reading clubs, summer library camp. They don't have cars to get them there. They're worried about do I have enough food stamps to feed you all this month? Here it's rare when kids aren't in two or three activities at a time. Ballet,

191

sports, science club. They're partner members at the local science program. Our families are connected to the resources of the city by proximity that also they can afford to access them where a lot of families can't. It's so hard for me to look at the wealth of a district and separate that from the community and the families that are here. I think that has more of an impact. Even a family that's poor that says to their child, did you get your homework done, let's go to the library and borrow a book, is at a better advantage than the family that's just so worried about putting that meal on the table or there's a drug issue in the home. That's going to make a big difference in the student achievement rate. Somebody believing in that kid is somebody, developing resiliency in that child.

The business manager also agreed with the findings laid out in the question.

I agree with that totally, to be honest with you. I think the economic factors and the student-teacher factors are also economic to me. I think we can afford more teachers. The parents who have little kids who are successful, the parents are successful, want to bring their children to a better school district where the money is where even if they have to pay a lot more taxes the kids are probably getting a better education and there's a lot more available to their kids than in the smaller districts. I think the number of students we have has to do with economics as well, and so does the number of teachers we have and the quality of teachers that we have. Our teachers make starting out what a teachers in other counties make after fifteen years. We can take the cream of the crop.

The superintendent in Interview 4 agreed with the finding, noting that the economic factors were the two he would pick immediately. "Unfortunately sometimes, with noneconomic factors, though, teachers can get burnt out. I mean this is a tough job, it really is." The education of the teacher is a main factor: "They bring in a whole different energy, possibly. Their technology use is just so advanced." The superintendent stated that the younger teachers like to "teach the older teachers how to use the new technology. It is part of our culture."

The business manager in Interview 4 agreed with the findings, but did not elaborate on his reason. He simply stated, "When I look at the factors they are the ones I would believe that would have the most impact."

Executive Director 1 in Interview 5 also noted the time frame, characterizing it as a "significant period of change, given funding cuts that took place in 2011. My recollection is, student achievement levels didn't start to really drop, I mean they did drop a few percentage points, until probably 13 or 14. Obviously, there's a lag...." The superintendent believed that "...cuts were to things like tutoring programs, programs that were really targeted at the most struggling students"; therefore, he thought that pulling the plugs on those would eventually have enough of an effect to drop struggling students down a level in their proficiency. Executive Director 1 continued,

> I think this is a difficult time period, because of just the larger trends in state
> funding and federal funding that took place, and that's a direct correlation on
> district wealth. I think if you had started to look at more widely, and broke up
> the group, the 500 school districts, you'd probably see the ones that are less

dependent on state and federal funding, they probably held their own,

probably just a blip on the radar screen. Everything pretty much remained

the same, but those that suffered the biggest cuts, the most disadvantaged

school districts, the ones that most depended on state and federal dollars,

probably saw a pretty big dramatic change in their outcomes.

Executive Director 1 concluded, "I think all those thing together, the district wealth,

the economic indicators, student factors, and teacher factors are all major factors.

Executive Director 2 in Interview 5 also described the time as an "interesting

period, which I would best describe as tumultuous, because we would have been, in

2008 -2009 been the year of the most significant BEF funding increases of the three

years of the costing-out study." He remembered the increase as being close to

$300,000,000, perhaps the largest BEF increase in history. Things were good, and

"then, we hit 11, 12, and started the year of cuts. You've got the two ends of very

different economic circumstances and state budget circumstances in

Pennsylvania…." In sum, during the period of time in question, there was a lot of

money in the system and then not very much. Executive Director 2 thus thought that

any factors examined during that time would show as overwhelming and influential,

simply because of the anomaly of the financial situation.

In Interview 6, the superintendent and the business manager had relatively

short responses to this question. The superintendent stated that it didn't surprise

him and that he found it to be a reasonable hypothesis. The business manager

concurred, stated that "these indicators address the basic needs to the core. If

students are not coming to school with some basic needs, they're not learning. How

do you address that? How do you fund that? How do you get that need to that student?"

In Interview 7 the superintendent agreed: "I feel that, in this district, definitely." He spoke of the groups that emerge when one tracks student achievement ultimately concluding that "you can see there is a difference based on socioeconomic status and what they do in the classroom." He concluded, "Your findings are exactly what I and what most others would expect."

The business manager in Interview 7 stated, "Not too much more I can add to that, other than our district wealth and, I think, our parent involvement kept us going in those early years." The business manager continued, "We had some school boards that wanted to cut things that we weren't really looking to cut. [Then] the school board was attacked by some of these parents who said, 'Are you nuts?'" The business manager concluded, "The indicators you identified are what I think impact student achievement in a district. I think culture also plays a major role."

Question 4 Summary and Common Themes

For interview question number 4, everyone agreed with the findings that socioeconomic disadvantage rates, district wealth, truancy, and teacher experience are the crucial factors when addressing student achievement. One common theme across all interviews was that resources decreased during this time period and that this was a time period with a great deal of change. Every person interviewed had some decrease of resources in their district. Most said they decreased staff size, cut programs, or did not fill retirements. They claimed that if the indicators are predictive during this time period, they are influential at any time.

Along with agreeing with the finding, many of the responses alluded to culture. The superintendents and business managers still feel that the culture is important. Culture also came up in the answers to questions 1, 2, and 3. The superintendents and business managers believe that culture has a large influence on student achievement. They all agreed that the culture of their school district had either a positive impact or made the state budget cuts more challenging during this time period.

Question 5

Are their any other economic or noneconomic indicators you believe affect student achievement?

Superintendent 1 identified the "culture of work" as "key when you're trying to improve social class. Some non-economic factors may be parent education level, parent structure or family structure. We currently have 39 students with parents imprisoned." He identified custody issues as a problem, emphasizing that family structure is important He also stated that special education issues are a factor and recommending looking into the correlation between the amount "spent on special education litigation versus student achievement; the higher the number of special education litigation, the better the student achievement. Because that's indicative of a culture ... more than anything."

The business manager in Interview 1 noted that "the number 1 economic indicator I have is just total spending per student. That's going to lead you to the spending." In terms of noneconomic indicators, the business manager regarded a culture that values school as the most important, as well as one that values hands-on

work and success. He noted that in their rural community, success is defined in terms of what a person contributes to society "and carrying your own weight and making a living." The other noneconomic indicator the business manager thought to be important was programming. "What kind of programs? How would you define a program at different levels? Sports, extra-curricular, variations of AP math and AP classes; how many of them do they offer? That's going to directly correlate to the student achievement."

In interview 2 the superintendent stated that culture is important. "We were 15 years behind other districts when I came here. The culture here is different. Parents do value education here [; they're] involved…. It's almost like they haven't quite reached the 21st century yet and it's nice." He also stated, however, that drugs are a problem. "The second thing that impacts, and this goes to the cultural aspect of things, and we talked about this a lot, is the issue of drugs and alcohol in the county; in our community here it's huge." The superintendent noted that the problem is getting worse even with education. 'That's the part that concerns me. Kids are thinking nothing of heroin, nothing of marijuana, nothing of drinking alcohol. I mean, they're just not, and that I would say impacts our student achievement."

The business manager in Interview 2 said that he thinks leadership is important.

> One of the things that has really done a tremendous amount of good in this district is leadership and it's pretty evident here compared to what was here when I first started. There wasn't teacher engagement. There was a lot of

conflict but when you have good, strong leadership from everybody things change. Things have changed here dramatically. That's really important. Leadership is especially important with just getting everybody on the same page because that wasn't even remotely what was here before. That's really important.

The superintendent in Interview 3 stated that racial tensions can be a problem at times. "We have a small minority of black students and a small minority of Hispanic students and, I want to say, an almost equal Asian population." He also indicated that students' family cultures are important, as well as the culture of the schools: "Do kids feel welcome when they walk in the door? Are we building safety nets around kids, or are we being judgmental? One of biggest complaints that we had at one of our elementary schools … was that our minority families didn't feel welcome."

The business manager from Interview 3 added that the culture is an indicator. "It's all about money and what you can afford. We're lucky we can afford a lot more than a lot of other schools. I think it's obvious that our kids are going to excel." The business manager stated, "You might find one or two kids in 10 or 20 years that are going to go to Harvard or Princeton or things like that in my former districts. … It has to do with their parents being successful and the culture of success from the school and home."

The superintendent in Interview 4 continued the theme of culture, referring to his response about culture to an earlier question: "The culture of your school, is it acceptable to be achieving, high achieving, be a National Merit Scholar? … I think

we're fine here, but I've seen districts where it's just not cool. It's not cool to be smart or to do well." The superintendent thinks that it helps that the students have to pass the Keystone Exam to graduate because it places some of the responsibility for accountability back on the kids. He acknowledged that their system is not perfect, but he still felt it would help with "those kids who just quit and aren't willing to achieve. I think that's a good move for education, to give those kids a little bit of accountability."

The business manager in Interview 4 concurred about the culture: "The culture thing's big, because truly, if the athletes are your smart kids, and that's cool, then that's good. Once it turns the other way though, that can really degenerate quickly." The business manager stated that he thinks another factor is having "proper buildings, equipment; you know, it doesn't have to be the fanciest, but it has to be adequate, and I think that's very big with student achievement."

Executive Director 1 in Interview 5 began by referring to the important of stable leadership, noting that stability is extremely important and referring to the fact that there was a lot of turnover and program and staffing reductions during the period in question. He also added that an important noneconomic factor is state and federal policies.

> We've seen, over the last 15 years, major change in state and federal policy, to the point now where, we use the term "policy whiplash" being imposed on school districts. Imposing a policy this year, two years later, doing something entirely different, and schools have to drop everything and change direction.

Losing attention, meanwhile, on focusing on what their primary business,

improving instruction, and supporting students.

Executive Director 2 also began with leadership. He spoke of changes he had

seen through his career at the district level, noting one district in particular without

naming it that had declined and attributing it to leaderships and governance

changes. The business manager also added that culture is important.

Whether or not you have a success model that can set a culture in place, that

has some high attribution to student achievement. For instance, if you have a

district, you know, landlocked, no growth, and everybody is exactly the same,

in terms of the student population, and there's no model of success to show,

either through parental educational quality, or inspired leadership, then

there's really nothing there that says, well this is how we can be successful. If

a district doesn't have an advantage of being able to model what educational

success looks like, then everybody thinks it looks like just what they're used

to, and you don't get anyplace, you don't get any success.

The superintendent in Interview 6 began, "I guess you could wrap it in the

culture to a certain extent, but it revolves around, does the district have a clear plan

where they want to go? That's probably not culture, it's probably management

culture versus student culture." He also spoke about schools' coming up with a good

way to measure their own efficiency in terms of money management; this, he said,

was something schools should do on their own, without a state mandate.

The business manager in Interview 6 brought up wellness programs as

something that would be good for the students. He said that "cyber learning" needed

to be addressed because it is providing competition to the traditional classroom. He addressed changes in technology, noting that a district's equipment affects it, as well as the maintenance of buildings and transportation.

The superintendent in Interview 7, like many of the others, started by talking about the culture of the community as a whole. "[A]ctually, since I've been here we've tried to push changes in the culture in our special education department and at the lower level. Unfortunately, our staff, and this happens a lot of times in highly successful districts, they're going to be paying attention to the better students. Which is the majority." Another indicator the superintendent identified was the sports team's performance.

> When I was at small single-A school, our budget was only 12 million dollars and we had a population of about 1500 students. Our test scores, especially on the male side of the district, our test scores were low. Very little college rates. We were only sending 30-something percent of our kids to school because they were staying local. When our football team started to become successful, there was a direct correlation to student achievement, college accessibility. We went from a team that was zero and 27—at one point they were going to cut the whole football program—to where they went to the state championship 13 straight years. Our SAT scores went up. Our college acceptance rates went up. I mean the whole economic or the whole academic feeling just totally went up.

The superintendent concluded, "It was a change in culture within them. It's funny, because when you start looking at noneconomic factors, they tie to the programs.

When you start talking about arts and you start talking about athletics and music and things like that."

The business manager said that the only thing he could think of was the board members. He related an incident from 2009 when the school board was really nasty, but in less than two years it had turned over. "Boards are funny sometimes and can be game changers."

Question 5 Summary and Common Themes

Two common themes identified in interview question 5 were leadership and cultural influence. The superintendents and business managers believe that the quality of the leadership team can have a positive influence on student achievement. They noted that the leaders' ability to make sure everyone is working together is important. The responses indicated that an effective leadership team can help change the learning culture within the district, which was also identified multiple times as important. The responses indicated that the culture in the teaching staff, management staff, student body, and community all have an impact on student achievement. One interview response indicated that having the staff truly believe all students can achieve is a difficult concept for teaching staffs and communities as a whole. A superintendent observed that sometimes the culture around the school community is that our students can achieve only so much. During various points in the interview questions, the respondents indicated that the mother's education level has an impact on education because of its effect on the home culture. They cited a research study that they believed indicated the value of education at home.

Table 26

Frequency Table of Interview Themes

Interview Team Number Achievement Third	Team 1 Middle	Team 2 Lower	Team 3 Upper	Team 4 Lower	Team 5 Exec Dir.	Team 6 Middle	Team 7 Upper
Interview Question 1							
Socioeconomic Disadvantage Rate	X	X	X	X	X	X	X
Equalized Mill	X						
Basic Education Funding	X	X			X	X	
Culture	X	X		X			
Ability to Generate Funds		X			X		X
Act 1 Index		X			X	X	
Pension Plan		X					
MV/PI ratio			X	X	X	X	
ADM							X
Interview Question 2							
Truancy	X	X	X	X	X		X
Discipline	X	X			X	X	
Enrollment					X		X
Class Size		X					X
Teacher Characteristics				X	X		X
Culture						X	
Interview Question 3							
Economic		X		X		X	X
Noneconomic			X	X			
Both	X	X	X		X		X
Culture	X		X				
Interview Question 4							
Declining resources	X						
Culture			X		X		
Socioeconomic Disadvantage Rate	X	X	X	X	X	X	X
MV/PI	X	X	X	X	X	X	X
Truancy	X	X	X	X	X	X	X
Teacher Education	X		X	X	X	X	X
Interview Question 5							
Culture	X	X	X	X	X	X	X
Athletics							X
Leadership		X			X		
Mother Education Level	X						
Spending per pupil	X						
Spending on Litigation	X						
Pension		X					
Racial Tensions		X	X				
School Boards							X
Proper equipped Buildings				X		X	
Policies					X		
Cyber Programs						X	
Wellness Programs						X	

Table 26 presents a frequency table of common themes presented during

interviews. Data collected through this table was utilized to code the interviews and

discover common themes.

CHAPTER 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

The purpose of this study was to explore the relationship between economic and noneconomic indicators and on student achievement in Pennsylvania. The secondary purpose was to discover perceived barriers to student achievement and to provide recommendations from experts about methods to improve student success by overcoming both economic and noneconomic factors. The economic indicators included in this study are as follows: basic education funding, district wealth (MV/PI), average daily membership (ADM), weighted average daily membership (WADM), total local revenue, local mill value, adjusted Act 1 index, expenditures, fund balance, debt, and socioeconomic disadvantage rates. The noneconomic indicators are total enrollment, truancy rates, reportable discipline infractions, staff size, and teacher experience and education levels. Student achievement is represented by graduation rates, dropout rates, post-secondary education rate, and high-stakes test scores, such as the PSSA and SAT scores.

It is important to understand the rationale supporting the perceived success or failure of school systems by examining economic and noneconomic indicators relating to student success because these indicators have a dramatic impact on a school district's academic reputation. This study used a sequential explanatory, mixed-method design that employed both empirical and interpretive data to examine the possible influence of economic and noneconomic indicators on student achievement.

The theoretical framework was provided by two researchers, Hanushek (1986, 1989, 1994) and Bruce Baker (2012), as described in Chapter 1. Chapter 2 discussed the existing literature on economic resources and student achievement. Chapter 2 also provided a history of legislation that details all economic indicators, noneconomic indicators, and student achievement. The data sources were identified and the methodology explained in Chapter 3. Chapter 4 demonstrates the results of the data analyses. The outputs included Pearson correlations, hierarchical multiple regression models, and interview findings. Chapter 5, finally, summarizes both the quantitative and qualitative research findings. This chapter also provides implications for educational policy and research while identifying recommendations for future study.

Summary of Research Question Findings

This study consisted of four research questions. Questions 1 and 2 were quantitative in nature; for these, data were collected from and through various links on the Pennsylvania Department of Education website. These links detail the economic and noneconomic variables for all the public school districts in Pennsylvania. All of the quantitative data were collected for 5 school years, from 2008 - 2009 through the 2012- 2013. Research questions 3 and 4 required use of the qualitative method, for which interviews of school district superintendent and business manager teams were conducted. The interviewees selected were required to have at least 5 years of experience in their positions, and the superintendent and business manager teams that were interviewed from the same district must also have been working together as a team for at least 3 years. A total of seven

interviews involving 14 people occurred throughout Pennsylvania.   The interview

subjects were selected using purposeful sampling. Data obtained through the

quantitative analysis was used to separate school districts across the state into three

categories, and school district teams were identified and interviewed from each of

the three categories.

Research question 1. Is there a relationship between economic and

noneconomic indicators and student achievement?

Relationship between economic and noneconomic indicators and PSSA ranking.

Significant correlations can be identified for the economic indicators of

socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized

millage rate, basic education funding per ADM, revenue per ADM, average

instructional expenditures per ADM, average regular education expenditures per

ADM, and average special education expenditures per ADM. Significant negative

correlations were demonstrated by the PSSA ranking score and socioeconomic

disadvantage rate, r (2473) = -.714, p < .01; MV/PI ratio, r (2473) = -.612, p < .01;

adjusted Act 1 index, r (2468) = -.182, p < .01; equalized millage rate, r (2473) = -

.064, p < .01; basic education funding per ADM, r (2473) = -.538, p < .01; and average

special education expenditures per ADM, r (2473) = -.041, p < .05. The data suggest

that an increase in any of the six negatively correlated variables will have a negative

impact on PSSA rank, which signifies lower student achievement. A significant

positive correlation was indicated between three economic indicators: revenue per

ADM, r (2473) = .491, p < .01; average instructional expenditures per ADM, r (2473)

= .164, p < .01; and average regular education expenditures per ADM, r (2473) =

.137, *p* < .01. These data suggest that an increase in these positive indicators will have a positive impact on PSSA rank, implying increased student achievement. These findings support the work of Baker (2012) and Wenglinsky (1997), which suggest a positive relationship between student achievement gains and financial inputs. They also reject suggestions by Coleman (1970) and Hanushek (1986, 1989, 1994) that spending large amounts of money will not necessary lead to increased student achievement.

Significant correlations can be observed between student achievement and the noneconomic indicators of truancy rate, reportable disciplinary infractions, average teaching education level, and average teaching experience. Significant negative correlations were demonstrated in the PSSA ranking score and truancy rate, *r* (2473) = -.371, *p* < .01, and disciplinary infractions, *r* (2462) = -.151, *p* < .01. These findings imply that as truancy and disciplinary infractions increase, the PSSA ranking will increase and student achievement will drop. These findings were also supported through the interviews conducted for the qualitative portion of this study. A significant positive correlation was indicated in the average teaching education level, *r* (2473) = .376, *p* < .01, and average teaching experience, *r* (2473) = .122, *p* < .01. These data suggest an increase in student achievement. Therefore, these findings lead to rejecting the null hypothesis that there is no relationship between economic and noneconomic indicators and student achievement in PSSA rank.

Relationship between economic and noneconomic indicators and average SAT Score. Significant correlations can be identified for the economic indicators of

208

socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized millage rate, basic education funding per ADM, revenue per ADM, average instructional expenditures per ADM, average regular education expenditures per ADM, average special education expenditures per ADM, and fund balance per ADM. Significant negative correlations were demonstrated by the average SAT score and socioeconomic disadvantage rate, r (2463) = -.534, $p < .01$; MV/PI ratio, r (2463) = -.462, $p < .01$; Act 1 index, r (2458) = -.139, $p < .01$; equalized millage rate, r (2463) = -.093, $p < .01$; basic education funding per ADM, r (2463) = -.412, $p < .01$; and average special education expenditures per ADM, r (2463) = -.049, $p < .05$.

The data from this study suggest that an increase in any of the six negatively correlated variables will have a negative impact on average SAT scores for a school district, which would indicate a decrease student achievement.

A significant positive correlation was indicated between student achievement and four of the economic indicators: revenue per ADM, r (2463) = .372, $p < .01$; average instructional expenditures per ADM, r (2463) = .098, $p < .01$; average regular education expenditures per ADM, r (2463) = .080, $p < .01$, and fund balance per ADM, r (2459) = .056, $p < .01$. An increase in these variables indicates an increase in the average SAT score. These findings challenge suggestions by Coleman (1970) and Hanushek (1986, 1989, 1994) that spending large amounts of money will not necessary lead to increased student achievement. These findings, again, support the work of Baker (2012) and Wenglinsky (1997) which suggest a positive relationship between student achievement gains and financial inputs.

Significant correlations were found with the noneconomic indicators of truancy rate, reportable disciplinary infractions, average teaching education level, and average teaching experience. Significant negative correlations were demonstrated for the average SAT score and truancy rate, r (2463) = -.321, p < .01, and disciplinary infractions, r (2452) = -.102, p < .01. This signifies that as truancy and disciplinary infractions increase, the average SAT score will decrease. These correlations were confirmed though interviews. A significant positive correlation was indicated by the average teaching education level, r (2463) = .267, p < .01, and average teaching experience, r (2463) = .115, p < .01. These noneconomic independent variables have a positive correlation, suggesting an increase in the average SAT score. These findings indicate that the null hypothesis should be rejected which states that there is no relationship between economic and noneconomic indicators and student achievement on average SAT score.

Relationship between economic and noneconomic indicators and graduation rate. Significant correlations can be identified for the economic indicators of socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized millage rate, basic education funding per ADM, revenue per ADM, average instructional expenditures per ADM, average regular education expenditures per ADM, average special education expenditures per ADM, and fund balance per ADM. Significant negative correlations were demonstrated between graduation rates and the socioeconomic disadvantage rate, r (2483) = -.440, p < .01; MV/PI ratio, r (2483) = -.305, p < .01; adjusted Act 1 index, r (2483) = -.070, p < .01; equalized millage rate. r (2483) = -.103, p < .01; basic education funding per ADM, r (2483) = -

.223, $p < .01$; and average special education expenditures per ADM, r (2463) = -.045, $p < .05$. Data from this study suggest that an increase in any of the six negatively correlated variables will have a negative impact on graduation rates for school districts. A significant positive correlation was indicated with revenue per ADM, r (2483) = .229, $p < .01$; average instructional expenditures per ADM, r (2483) = .086, $p < .01$; average regular education expenditures per ADM, r (2483) = .058, $p < .01$; and fund balance per ADM, r (2459) = .067, $p < .01$. This data imply that an increase in these variables indicates an increase in the graduation rate. These findings reject the suggestions by Coleman (1970) and Hanushek (1986, 1989, 1994) that spending large amounts of money will not necessary lead to increased student achievement. The works of Baker (2012) and Wenglinsky (1997), which suggest a positive relationship between student achievement gains and financial inputs, are supported by these findings.

Significant correlations were found for the noneconomic indicators of district enrollment, truancy rate, reportable disciplinary infractions, teaching staff size, average teaching education level, and the average teaching experience. Significant negative correlations were demonstrated between the graduation rate and district enrollment, r (2483) = -.182, $p < .01$; truancy rate, r (2483) = -.306, $p < .01$; disciplinary infractions, r (2472) = -.102, $p < .01$; and teaching staff size, r (2483) = -.181, $p < .01$. The data suggest that these indicators have a negative impact on graduation rates. A significant positive correlation was indicated with average teaching education level, r (2483) = .158, $p < .01$, and average teaching experience, r (2483) = .060, $p < .01$. These noneconomic independent variables have a positive

correlation, and suggest an increase in the graduation rates. These findings lead to rejecting the null hypothesis that there is no relationship between economic and noneconomic indicators and graduation rates.

Relationship between economic and noneconomic indicators and dropout rate. Significant correlations can be identified for the economic indicators of socioeconomic disadvantage rate, MV/PI ration, adjusted Act 1 index, equalized millage rate, basic education funding per ADM, revenue per ADM, average instructional expenditures per ADM, average regular education expenditures per ADM, average special education expenditures per ADM, and fund balance per ADM. Significant negative correlations were demonstrated between dropout rate and revenue per ADM, r (2467) = -.228, $p < .01$; average instructional expenditures per ADM, r (2467) = -.081, $p < .01$; average regular education expenditures per ADM, r (2467) = -.055, $p < .01$; and fund balance per ADM, r (2467) = -.064, $p < .01$. The data suggest that an increase in these variables indicates a decrease in dropout rates, and a low dropout rate is a characteristic of high student achievement. A significant positive correlation was indicated in dropout rates and the socioeconomic disadvantage rate, r (2467) = .442, $p < .01$; MV/PI ratio, r (2467) = .304, $p < .01$; adjusted Act 1 index, r (2462) = .061, $p < .01$; equalized millage rate, r (2467) = .100, $p < .01$; basic education funding per ADM, r (2467) = .225, $p < .01$; and average special education expenditures per ADM, r (2467) = .048, $p < .05$. The data imply that an increase in any of the six negatively correlated variables point to an increase in the dropout rates for school districts. High dropout rates are characteristic of low student achievement. These findings support the work of

Baker (2012) and of Wenglinsky (1997), who suggest a positive relationship between student achievement gains and financial inputs. These findings also reject suggestions by Coleman (1970) and Hanushek (1986, 1989, 1994) that spending large amounts of money will not necessary lead to increased student achievement.

Significant correlations exist between the graduation rate and the noneconomic indicators of district enrollment, truancy rate, reportable disciplinary infractions, teaching staff size, average teaching education level, and average teaching experience.   Significant negative correlations were demonstrated between dropout rates and average teaching education level, r (2467) = -.156, p < .01, and average teaching experience, r (2467) = .065, p < .01. These variables indicate a lower dropout rate, which represents high student achievement. A significant positive correlation was indicated for district enrollment, r (2467) = .181, p < .01; truancy rate, r (2467) = .305, p < .01; disciplinary infractions, r (2456) = .220, p < .01; and teaching staff size, r (2467) = .181, p < .01.   These findings support the study by Sutton, Muller, and Langenkamp (2013) which showed a relationship between truancy and school dropout. These indicators were also supported in all interviews during the qualitative phase of this study. These noneconomic independent variables have a positive correlation and suggest a decrease in dropout rates, which generally accompany high student achievement. These findings have rejected the null hypothesis stating there is no relationship between economic and noneconomic indicators and dropout rates.

Relationship between economic and noneconomic indicators and students who attend post-secondary education. Significant correlations can be identified for the

economic indicators of socioeconomic disadvantage rate, MV/PI ration, equalized

millage rate, basic education funding per ADM, revenue per ADM, average

instructional expenditures per ADM, average regular education expenditures per

ADM, average special education expenditures per ADM, and fund balance per ADM.

Significant negative correlations were demonstrated between post-secondary-

bound rates and the socioeconomic disadvantage rate, r (2474) = -.405, $p < .01$, and

the MV/PI ratio, r (2474) = -.360, $p < .01$. Such correlations signify that as a school

district's socioeconomic disadvantage rate and MV/PI ratio increase, their post-

secondary-bound rates will decrease. Other economic indicators with a negative

correlation are equalized millage rate, r (2474) = -.106, $p < .01$, and basic education

funding per ADM, r (2743) = -.361, $p < .01$. An increase in any of the negatively

correlated variables suggests a negative impact, on average, on post-secondary-

bound rates in a school district.

A significant positive correlation was indicated for five economic indicators.

These indicators are equalized millage rate, r (2474) = .106, $p < .01$; revenue per

ADM, r (2474) = .337, $p < .01$; average instructional expenditures per ADM, r (2474)

= .124, $p < .01$; and the average regular education expenditures per ADM, r (2474) =

.100, $p < .01$. An increase in these variables indicates an increase in post-secondary-

bound rates. Finally, these findings support those of Baker (2012) and Wenglinsky

(1997), which suggest a positive relationship between student achievement gains

and financial inputs. Suggestions by Coleman (1970) and Hanushek (1986, 1989,

1994) that spending large amounts of money will not necessary lead to increased

student achievement are also rejected.

Significant correlations can be found with the noneconomic indicators of

district enrollment, truancy rate, reportable disciplinary infractions, teaching staff

size, average teaching education level, and the average teaching experience.

Significant negative correlations were demonstrated between the post-secondary-

bound rate and the truancy rate, r (2474) = -.120, p < .01; disciplinary infractions, r

(2474) = -.083, p < .01; and teaching education level, r (2483) = .259, p < .01. The

noneconomic independent variables with a negative correlation indicate a decrease

in post-secondary-bound students. A positive correlation suggests an increase in

the post-secondary-bound rates. With these findings, the null hypothesis can be

rejected which states that there is no relationship between economic and

noneconomic indicators and post-secondary-bound rates as an aspect of student

achievement.

Research question 2. Is there a strength and rank in the relationship of

these indicators with student achievement?

Economic indicators and student achievement. The multiple regression

models using the economic indicators and PSSA rankings, SAT, graduation rate,

dropout rate, and post-secondary-bound rate have demonstrated that only two

economic variables have predictiveness among all the dependent variables. The

economic independent variable subsets of district wealth, district revenue, district

spending, district savings, and subset district debt were all examined within the

models. The first predictive variable was the socioeconomic disadvantage rate, as

follows: PSSA ranking and socioeconomic disadvantage rate ($\beta = -.541$), SAT score

and socioeconomic disadvantage rate ($\beta = -.372$), graduation rate and

215

socioeconomic disadvantage rate ($\beta = -.482$), dropout rate and socioeconomic disadvantage rate ($\beta = .489$), and post-secondary-bound rate and socioeconomic disadvantage rate ($\beta = -.336$). The data suggest that the socioeconomic disadvantage rate has a negative impact on all of the dependent variables, leading to lower student achievement. The β is positive for the dropout rate, which means that the dropout rate increases as the socioeconomic disadvantage rate increases. These findings support Coleman et al.'s (1966, p. 22) beliefs that socioeconomics have a very strong impact on student achievement.

The second predictive variable within the five dependent variables is the MV/PI ratio: PSSA ranking and MV/PI ratio ($\beta = -.219$), SAT score and MV/PI ratio ($\beta = -.203$), graduation rate and MV/PI ratio, ($\beta = -.144$), dropout rate and MV/PI ratio, ($\beta = .126$), and post-secondary-bound rate and MV/PI ratio ($\beta = -.135$). The β is positive for the dropout rate, which means that the dropout rate increases as the MV/PI ratio increases. The MV/PI ratio has a negative impact on all of the dependent variables, leading to lower student achievement. These findings lead to rejecting the null hypothesis which states there is no strength or rank in the relationship between any indicators and any aspect of student achievement.

Noneconomic indicators and student achievement. The multiple regression models of the noneconomic indicators and PSSA ranking, SAT, graduation rate, dropout rate, and post-secondary-bound rate have displayed two noneconomic variables that have predictability among all the dependent variables. The first of these variables is the truancy rate, as follows: PSSA rankings and truancy rate ($\beta = -.309$), SAT score and truancy rate ($\beta = -.309$), graduation rate and truancy rate (β

216

= −.254), drop out rate and truancy rate (β = .254), and post secondary bound rate and truancy rate (β = −.075) all display that the truancy rate has a negative impact on student achievement. The β is positive for the dropout rate, which suggests that the dropout rate increases as the truancy rate increases.   The data suggest that truancy rate has a negative impact on all of the dependent variables, leading to lower student achievement.

The second predictive noneconomic variable is the average teacher education level. The average teacher education level is the only independent variable that is a positive predictor of student achievement. The PSSA ranking and average teacher education level (β = .318), SAT score and average teacher education level (β = .225), graduation rate and average teacher education level (β = .118), post-secondary-bound rate and average teacher education level (β = .241) all have a positive β which indicates student achievement. The dropout rate and average teacher education level (β = -.115) has a negative β, which implies a fall in the dropout rate and implies a positive effect on student achievement. These findings reject the null hypothesis that stating there is no strength or rank in the relationship between any indicators relating to any aspect of student achievement.

Economic and noneconomic indicators and student achievement. There is only one independent variable that is predictive among all the dependent variables. Socioeconomic disadvantage rate is the only independent variable that is predictive for all the economic independent variable subsets of district wealth variables, district revenue, district spending, district savings, district debt, and the noneconomic independent variable subsets that are student and teacher related.

PSSA ranking and socioeconomic disadvantage rate ($\beta = -.508$), SAT ranking and socioeconomic disadvantage rate ($\beta = -.352$), graduation rate and socioeconomic disadvantage rate ($\beta = .399$), and post-secondary-bound rate and socioeconomic disadvantage rate ($\beta = -.332$) all demonstrate that a higher socioeconomic disadvantage rate is a negative predictor of student achievement. The socioeconomic disadvantage rate and dropout rate ($\beta = .399$) shows a positive β, suggesting an increase in dropout rate, which translates into negative student achievement among all independent variables within the study. This economic indicator is also addressed by Coleman (1970), Hanushek (1986, 1989, 1994) and Baker (2012) and is found to be a predictor and influential within all models. These findings reject the null hypothesis stating that there is no strength or rank in the relationship between any indicators and any aspect of student achievement?

Research question 3. What economic and noneconomic indicators do superintendents and business managers perceive as barriers that impede student achievement?

The economic indicator that was addressed in every interview by both the superintendent and businesses manager was the socioeconomic disadvantage rate. This indicator is perceived to have an enormous impact on student achievement among all the dependent variables. The school districts with low socioeconomic disadvantage rates indicated that this variable is a contributing factor to high student success. The school districts with high levels of socioeconomic disadvantage rates claimed this is one of the reasons they do not achieve at the same levels as those districts with lower rates. Officials of both low and high

218

socioeconomic disadvantaged schools stated that programming is affected by the socioeconomic disadvantage rate.

The second economic indicator identified by superintendents and business managers was the MV/PI aid ratio, also known as district wealth. This indicator was usually cited because it directly governs the amount of financial resources each school district has available to spend. It also affects the amount of money a school district can generate at the local level. Districts with high wealth identified this indicator as enabling valuable programming resources within the district, which then contributes to a high student success rate. Inversely, school districts with low district wealth were unable to provide the same programming as their wealthier peers. This finding supports Bruce Baker's (2012) findings that money has an impact on student achievement. The MV/PI aid ratio also directly affects the basic education funding each district receives from the state. This is important because school districts with high wealth are typically given less money, while low wealth districts receive more money from the state. However, at times, the formula does not work as intended, and it was criticized on many occasions for being unfair.

Truancy rates and disciplinary infractions were mentioned in most interviews as the noneconomic indicators that affect student achievement. These indicators were usually identified together. The superintendents and business managers stated that they are usually linked because if there are discipline problems, there are usually truancy problems. School districts that were identified as typically high achieving stated that their reportable disciplinary infractions and truancy rates were low. However, in some of the rural communities they claimed to

have a higher truancy rate owing to the students' need to work on the farm. It was more typical for the lower achieving school districts to have a higher rate of both truancy and disciplinary infractions.

In every interview both the superintendent and business managers included district culture as having a major impact on student achievement. The officials for high achieving districts asserted that the culture in their school district promotes and expects high student achievement. The authorities in lower achieving school districts claimed that trying to overcome local culture is a major battle when addressing student achievement. These findings directly support Hanushek's (1994) findings stating that student performance would improve if more parents motivated their children to do better in school and if more parents took an active interest in their children's schooling.

Research question 4. How do superintendents and business managers believe the perceived economic and noneconomic barriers can be addressed to improve student achievement?

The superintendents and business managers who were interviewed noted that the ability to generate and receive funding would have a great impact on student achievement. This goes against Hanushek's (1989) statement that "we have little reason to believe that an increase in funding of current school programs will lead to a noticeable improvement in performance of schools" (p. 48). The interviewees indicated their opinion that Act 1 index, the MV/PI aid ratio, and basic education funding formulas need to be adjusted to promote student achievement. This supports Baker's (2012) overall findings that money does matter in schooling

220

and that it must be spent wisely to yield benefits. On balance, in direct tests of the relationship between financial resources and student outcomes, money matters (Baker, 2012).

Superintendents and business managers also expressed their conviction that money would not completely solve the problem of low student achievement. They all indicated that the school and community culture must be addressed in order to have lasting positive student achievement change in the school district. These findings support Coleman, Hoffer, and Kilgore's (1982a, 1982b) belief that a student's socioeconomic status and family background would establish the ability to achieve within the public school setting (Cooper & Valentine, 2013). The school officials interviewed believe that school culture has a major influence on student achievement. They think that a teacher can make a tremendous impact on the achievement of every student and that the culture of the community affects student achievement to the extent that if the community supports the school, then high student achievement will follow. They also believe that school districts need examples of a positive culture. Excellence in academic achievement must be identified and promoted as a model for both the school and the community culture to have lasting results.

Recommendations for Policy Makers

A school district's ability to generate and spend money is directly correlated to student achievement. The MV/PI aid ratio, Act 1 index, equalized millage rate, basic education funding, and socioeconomic disadvantage rates are negatively correlated economic indicators of student achievement: that is, decreases in any of

these indicators will result in decreased achievement. The socioeconomic disadvantage rates and MV/PI aid ratio are also predictive indicators of student achievement. District revenue, instructional expenditures, and regular education expenditures are economic indicators that have a positive correlation with student achievement, meaning that these indicators will increase student achievement. It can be summarized in simple terms. If a school district has the ability to generate local revenue and if it receives adequate funding from the state's basic education funding from the state, the students will achieve at a high rate. Inversely, school districts with limited ability to generate local revenue and which are not obtaining adequate basic education funding from the state will not achieve at the same level as their wealthier peers. Policy makers must objectively examine methods for redesigning Pennsylvania funding formulas in order achieve proper distribution of state funding. One of the most important formulas to examine is the distribution of basic education funding monies. Because this formula is outdated, it does not promote fair distribution of state money, especially to school districts that are unable to generate money through local resources.

The noneconomic indicators of high truancy rates and reportable disciplinary infractions are negatively correlated with student achievement, indicating a decrease therein. This study has also indicated that the truancy rate is a predictor of student achievement. These indicators are connected and were mentioned as barriers to student achievement in all the interviews. Policy makers must ensure that each school district is implementing truancy prevention programs. Policy makers must also ensure that students who are truant are identified and are

222

given proper supports. This must be enforced at the local community and school district levels. Again, in this situation, school districts need sufficient funds to help these students.

The teacher education level was a predictive noneconomic indicator of student achievement. Teachers with advanced degrees have been proven to increase student achievement. Thus, policy makers need to find methods of providing graduate degree opportunities, at affordable prices, for all educational professionals.

The socioeconomic disadvantage rate was the only predictive indicator spanning both the economic and noneconomic indicators. Overcoming high socioeconomic disadvantage rates takes a tremendous amount of resources and money. Typically, school districts with high socioeconomic disadvantage rates have limited ability to raise local revenue. They also are not, in most cases, receiving adequate basic education funding to provide the necessary programing designed to improve student achievement. School districts with high socioeconomic disadvantage rates are attempting to provide education to the most needy students in the state. Policy makers need to explore methods for providing the most funding to those school districts that serve the most needy students.

Recommendations for Further Study

This study explored the multiple economic and noneconomic indicators that exist throughout Pennsylvania, as well as their influence and impact on student achievement. A mixed methods approach was used to identify both quantitative and qualitative data that affect student achievement. This study concluded that a school

district's ability to generate local revenue combined with funding received from the state will determine the students' achievement rate.

All of the quantitative data were collected for 5 school years, from 2008 - 2009 through the 2012- 2013. The findings of this study are a snapshot during this time period and conclusions are based upon the data collected. The findings should not be interpreted as simplistic assertion that money matters in education. The findings should invite future researcher to conduct further studies on various aspects of the conclusions. One major area for further examination is to explore the relationship between regular education expenditures as well as special education expenditures and their impact on student achievement. Another area for further study would include the impact of the Pennsylvania School District retirement plan on school district budgets and its impact on student achievement. Finally, the quantitative data suggest research pertaining to professional development for teachers and that impact on student achievement.

Student achievement, for this study, was determined by using the PSSA and SAT exams, graduation and dropout rates, and number of students who are post-secondary bound. The Keystone Exam was not used in this study owing to the inconsistencies in its administration and results. Pennsylvania has also transitioned to the Common Core curriculum, and the PSSA exam has been modified to reflect these new standards. These standardized assessment changes also affect student achievement. Future studies need to explore and determine if these indicators are consistent with these new exams.

This study focused mostly on quantitative data. The differences among districts throughout the state are vast, however, so a limited number of interviews were carried out to determine the validity of the findings and the beliefs of experts in the field. Using the quantitative data results from this study, a deeper qualitative analysis could be completed to determine if a more comprehensive view can be obtained at the school district leader level.

A final area for further exploration would include a school district and community culture analysis. During the qualitative portion of this study, community and school district culture was identified as having a great influence on student achievement. The focus of this study was to determine the impact of economic and noneconomic indicators of student achievement. School districts with simultaneously high achievement and high socioeconomic disadvantage rates can be identified; thus, it would be useful to explore their local culture in order to determine its influence on student achievement.

Conclusion

Every school district in the Commonwealth of Pennsylvania is operating in the hope of providing the best possible education to ensure student achievement. This study has determined that several economic and noneconomic indicators may affect a school district's ability to ensure student achievement.

The economic indicators that have a negative impact on student achievement are the socioeconomic disadvantage rate, MV/PI ratio, adjusted Act 1 index, equalized millage rate, basic education funding, and average special education instruction expenditures. The economic indicators having a positive impact on

student achievement are local revenue, average instructional expenditures, and average regular education expenditures. The noneconomic indicators having a negative affect on student achievement are the truancy rate and reportable disciplinary infractions. Finally, a teacher's education level and experience are noneconomic indicators that may have a positive influence on student achievement.

The main conclusion of this study, which used quantitative data collected from each of the 5 school years from 2008–2009 through 2012–2013, suggests that student achievement rate is determined by a school district's ability to generate local revenue and state funding. It has also been determined, by examining data from every public school district in Pennsylvania, that the socioeconomic disadvantage rate within a school district is the greatest predictive indicator of student achievement. Interviews conducted for this study have also validated the quantitative findings of the study. The interviews also indicated that changes in school district funding policies at the state level are needed to help provide a more fair and equitable distribution of state funds to the school districts that are serving the students with the most need.

This study's conclusions are based on both empirical and interpretive data, which have enabled a comprehensive examination of the relationship of economic and noneconomic indicators to student achievement.

References

Abrams, L. M., & Madaus, G. F. (2003). The lessons of high-stakes testing.

Educational Leadership, 61(3), 31-35.

Act 59. Amending the Public School Code of 1949, Pub. L. No. 199, 67 Stat. (1977).

Amsterdam, C. (2006). Adequacy in the South African context: A concept analysis.

Perspectives in Education, 24(2), 25-34.

ASCD. (1997, 2015) *A lexicon of learning: What educators mean when they say…*

Retrieved from http://www.ascd.org/Publications/Lexicon-of-

Learning/H.aspx

Badgett, K., Decman, J., & Carman, C. (2013). National implications: The impact of

teacher graduate degrees on student math assessments. *National Forum of

Teacher Education Journal, 23*(3), 1-18.

Badgett, K., Decman, J., & Carman, C. (2014). The influence of teacher graduate

degrees on student reading achievement. *AASA Journal of Scholarship &

Practice, 11*(1), 4-25.

Baker, B. D. (2012). *Revisiting the age-old question: Does money matter in education?*

Albert Shanker Institute. Retrieved from

http://files.eric.ed.gov/fulltext/ED528632.pdf

Baker, M., & Johnston, P. (2010). The impact of socioeconomic status on high stakes

testing reexamined. *Journal of Instructional Psychology, 37*(3), 193-199.

Bao, D. H., Romeo, G. C., & Harvey, R. (2010). School socioeconomic classification,

funding, and the New Jersey High School Proficiency Assessment (HSPA).

Education and Urban Society, 42(3), 335-351.

Barclay, A. C. (2012). *Measuring teacher immediacy and communication competence on student achievement in calculus: A sequential explanatory mixed method design.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3551589)

Bissett, J., & Hillman, A. (2013). *The history of school funding in Pennsylvania 1682 - 2013.* Retrieved from http://www.parss.org/wp-content/uploads/2010/12/PARSS-HistoryofSchoolFunding.pdf

Bushaw, W. J., & Lopez, S. J. (2012). Public education in the United States: A nation divided. *Phi Delta Kappan, 94*(1), 9-25.

Bushaw, W. J., & Lopez, S. J. (2013). Which way do we go? *Phi Delta Kappan, 95*(1), 9-25.

Cadima, J., Peixoto, C., & Leal, T. (2014). Observed classroom quality in first grade: associations with teacher, classroom, and school characteristics. *European Journal of Psychology of Education - EJPE, 29*(1), 139-158. doi: 10.1007/s10212-013-0191-4

CCSSO - . (2012). Common core state standards initiative: Preparing American students for college and career.   Retrieved from http://www.corestandards.org/

Coleman, A. L. (1998). Excellence and equity in education: High standards for high-stakes tests. *Virginia Journal of Social Policy & the Law, 6*(1), 81-113.

Coleman, J. (1970). Reply to Cain and Watts. *American Sociological Review, 35*(2), 242-249.

Coleman, J. (1978). Parents, teachers and children: Prospects for choice in American

    education. *Teachers College Record, 80*, 381-385.

Coleman, J., Hoffer, T., & Kilgore, S. (1982a). Achievement and segregation in

    secondary schools: A further look at public and private school differences.

    Sociology of Education, 55, 162-182.

Coleman, J., Hoffer, T., & Kilgore, S. (1982b). *High school achievement: Public,*

    Catholic, and private schools compared. New York, NY: Basic Books.

Coleman, J. (1977). *Parents, teachers, and children: Prospects for choice in American*

    education. San Francisco, CA: Institute for Contemporary Studies.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F.

    D., & York, R. L. (1966). *Equality of educational opportunity*. Washington, DC:

    US Government Printing Office.

Condron, D. J., & Roscigno, V. J. (2003). Disparities within: Unequal spending and

    achievement in an urban school district. *Sociology of Education, 76*(1), 18-36.

Cooper, B., & Valentine, T. (2013). *James S. Coleman (1926–1995): Career,*

    contributions and controversies, redefining American education, contribution

    to education. Retrieved from

    http://education.stateuniversity.com/pages/1841/Coleman-James-S-1926-

    1995.html

Cowell, R. (2014). *Testimony to Basic Education Funding Commission* (Press release).

    Retrieved from http://www.eplc.org/wp-content/uploads/2014/10/Ron-

    Cowell-Testimony-to-Basic-Education-Funding-Commission-Clarion-

    09.30.14.pdf

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative reasearch* (4th ed.). Boston, MA: Pearson Education, Inc.

Dady, K. J., Jr. (2010). *Measures of wealth in Pennsylvania.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3436060)

De Witte, K., & Csillag, M. (2014). Does anybody notice? On the impact of improved truancy reporting on school dropout. *Education Economics, 22*(6), 549-568. doi: 10.1080/09645292.2012.672555

Dessoye, L. K. (2007). PSSA panic and paranoia: Effects on student teachers entering our profession. *Academic Leadership (15337812), 5*(3), 8-8.

Dingchu, W., Xiaoxue, L., & Junhua, W. (2009). Goal orientation and process orientation of Chinese educational equity practice. *Journal of Education Research, 2*(4), 409-414.

Editorial Projects in Education Research Center. (2011, June 20). Issues A-Z: School Finance. *Education Week.* Retrieved from http://www.edweek.org/ew/issues/school-finance/

Elmore, R. F., & Rothman, R. (Eds.). (1999). *Testing, teaching, and learning: A guide for states and school districts*. Washington, DC: National Academy Press.

ETS - Educational Testing Service. (2004). Equity and adequacy: Americans speak on public school funding. Retrieved from https://www.ets.org/Media/Education_Topics/pdf/2004report.pdf

Fleming, J. (2002). Who will succeed in college? When the SAT predicts Black

    students' performance. *Review of Higher Education: Journal of the Association*

    for the Study of Higher Education, 25(3), 281-296.

    doi:10.1353/rhe.2002.0010

Georgia Partnership for Excellence in Education. (2013). *The education policy*

    toolbox. Retrieved from http://toolbox.gpee.org/Student-

    Achievement.242.0.html

Good, C. J. (2010). A nation at risk. *American Educational History Journal, 37*(1/2),

    367-386.

Hannon, B. (2012). Test anxiety and performance-avoidance goals explain gender

    differences in SAT-V, SAT-M, and overall SAT scores. *Personality & Individual*

    Differences, 53(7), 816-820. doi: 10.1016/j.paid.2012.06.003

Hanushek, E. A. (1986). The economics of schooling: Production and efficiency in

    public schools. *Journal of Economic Literature, 24*(3), 1141.

Hanushek, E. A. (1989). Expenditures, efficiency, and equity in education: The

    federal government's role. *American Economic Review, 79*(2), 46.

Hanushek, E. A. (1994). *Making schools work*. Washington, DC: Brooking Institution.

Hanushek, E. A., & Haycock, K. (2010). An effective teacher in every classroom

    Education Next, 10(3), 46-52.

Hill, A. T. (2003). *A panel study of the effects of teacher education, class size, and time-*

    on-task on student achievement: Evidence from NELS:88. (Doctoral

    dissertation). Available from ProQuest Dissertations & Theses database.

    (UMI No. 3085467)

Himes, J. (2011). *Elimination of Act 1 referendum exceptions*. Harrisburg, PA:

    Pennsylvania Association of School Business Officials.

Hoover Institution. (2011). *Eric Hanushek*. Retrieved from

    http://www.hoover.org/fellows/10150

Huang, F. L., & Moon, T. R. (2009). Is experience the best teacher? A multilevel

    analysis of teacher characteristics and student achievement in low

    performing schools. *Educational Assessment, Evaluation and Accountability,*

    21(3), 209-234. doi: 10.1007/s11092-009-9074-2

Jacob, A. (2012). Examining the relationship between student achievement and

    observable teacher characteristics: Implications for school leaders.

    International Journal of Educational Leadership Preparation, 7(3).

Jones, G. M., Jones, B. D., & Hargrove, T. (2003). *The unintended consequences of high*

    stakes testing. Lanham, MD: Rowman and Littlefield Publishers, Inc.

Keagy, D. R., & Piper, D. M. (2010). *Pennsylvania school business: A guide for*

    educational administrators (2nd ed.). Harrisburg, PA: Pennsylvania

    Association of School Business Officials.

Kepler, B. C. (2006). *A correlational analysis of intermediate level reading*

    assessments and the Pennsylvania System of School Assessment for students

    (Doctoral dissertation). Available from ProQuest Dissertations & Theses

    database. (UMI No. 3239889)

Kiviat, B. (2000). *The social side of schooling*. Retrieved from

    http://www.jhu.edu/~jhumag/0400web/18.html

Koniewski, M. (2013). Estimating the effect of class size on academic achievement

    by ex post facto experiment. *EDUKACJA Quarterly*(6), 41-58.

Larson, R., & Barton, R. (2013). Lessons on leading for equity. *Principal Leadership,*

    13(8), 18-24.

Lipscomb, S., Chiang, H., & Gill, B. (2012). Value-added estimates for phase 1 of the

    Pennsylvania Teacher and Principal Evaluation Pilot: Full report. Cambridge,

    MA: Mathematica Policy Research.

Lott, E. (2014). Questions, answers about the Western Pennsylvania school guide.

    Retrieved from http://www.bizjournals.com/pittsburgh/print-

    edition/2014/04/11/questions-answers-about-the-western-

    pennsylvania.html?page=all

Madaus, G., Russell, M., & Higgins, J. (2009). *The paradoxes of high stakes testing:*

    How they affect students, their parents, teachers, principals, schools, and

    society. Charlotte, NC: Information Age Publishing.

Marchant, G. J., Paulson, S. E., & Shunk, A. (2006). Relationships between high-stakes

    testing policies and student achievement after controlling for demographic

    factors in aggregated data. *Education Policy Analysis Archives, 14*(30), 1-31.

Marion, S. F., & Sheinker, A. (1999). *Issues and consequences for state-level minimum*

    competency testing programs (Wyoming Report 1). Minneapolis, MN:

    National Center on Educational Outcomes.

McColskey, W., & McMunn, N. (2000). Strategies for dealing with high-stakes state

    tests. *Phi Delta Kappan, 82*(2), 115-120.

McFadden, L. (2009). Miami's "zone" teaches lessons about low-performing schools. *Phi Delta Kappan, 90*(8), 557-562.

Mims, S. U., Scott-Little, C., Lower, J. K., Cassidy, D. J., & Hestenes, L. L. (2008). Education level and stability as it relates to early childhood classroom quality: A survey of early childhood program directors and teachers. *Journal of Research in Childhood Education, 23*(2), 227.

"More Blacks are taking SAT II achievement tests, yet the racial scoring gap is widening." (2009). *Journal of Blacks in Higher Education,* 63, 22-24.

Mwere, B. (2010). *Equity and adequacy in the financing of public school education in Canada: Issues and concerns.* (Master's thesis). Available from ProQuest Dissertations & Theses database. (UMI No. MR80863)

Nagle, R. J., Gresham, F. M., & Johnson, G. D. (1979). Truancy intervention among secondary special education students. *School Psychology Digest*, *8*, 464-468.

Nankervis, B. (2011, Fall). Gender inequities in university admission due to the differential validity of the SAT. *Journal of College Admission, 213*, 24-30.

NCES – National Center for Education Statistics. (2010). *Identification of rural locales.* Retrieved from http://nces.ed.gov/ccd/rural_locales.asp

NEA – National Education Association. (2012). *How public education is structured and funded*. Washington, DC: National Education Association.

Nolan, J. R., Cole, T., Wroughton, J., Clayton-Code, K. P., & Riffe, H. A. (2013). Assessment of risk factors for truancy of children in grades K-12 using survival analysis. *Journal of At-Risk Issues, 17*(2), 23-30.

Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using SPSS 4th edition* (4th ed.). Crows Nest, Australia: Allen & Unwin.

PARSS - Pennsylvania Association for Rural and Small Schools. (2010). *A blueprint for equity.* Retrieved from http://www.parss.org/?page_id=337

PASA – Pennsylvania Association of School Adminstrators & PASBO – Pennsylvania Association of School Business Officials. (2012). *Student learning opportunities slashed across the state as financial condition of school districts deteriorates.* Retrieved from

http://archive.pasbo.org/2012FinalBudgetSurveyReport.pdf

Pash, L. L. (2010). *An analysis of the instructional methods successful school districts use to prepare elementary students for the reading portion of the Pennsylvania State System of Assessment.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI NO. 3525548)

PDE. (2012). Fast facts: Pennsylvania accountability system. Retrieved June 19, 2013, from

http://www.portal.state.pa.us/portal/http;//www.portal.state.pa.us;80/portal/server.pt/gateway/PTARGS_0_123531_1304679_0_0_18/Fast%20Facts%20%20Pennsylvania%20Accountability%20System%20(PAS).pdf

PDE – Pennsylvania Department of Education. (2013a). *Act 1 Index.* Retrieved from http://www.portal.state.pa.us/portal/server.pt?open=514&objID=510332&mode=2

PDE. (2013b). *AFR data: Summary level.* Retrieved from

  http://www.portal.state.pa.us/portal/server.pt/community/summaries_of_a

  nnual_financial_report_data/7673/afr_excel_data_files/509047

PDE. (2013c). *Enrollment data and statistics.* Retrieved from

  http://www.education.state.pa.us/portal/server.pt/community/enrollment

  /7407

PDE. (2013d). *Financial data elements.* Retrieved from

  http://www.education.state.pa.us/portal/server.pt/community/financial_da

  ta_elements/7672

PDE. (2013e). *Financial terms.* Retrieved from

  http://www.education.state.pa.us/portal/server.pt/gateway/PTARGS_6_2_5

  2431_7673_509030_43/

PDE. (2013f). Pennsylvania's general performance level descriptors for the

  Pennsylvania System of School Assessment (PSSA). Retrieved from

  http://www.portal.state.pa.us/portal/http;//www.portal.state.pa.us;80/por

  tal/server.pt/gateway/PTARGS_0_123031_1243577_0_0_18/PSSA_General_P

  erformance_Level_Descriptors.pdf

PDE. (2013g). *State assessment performance level descriptors and cut scores.*

  Retrieved from

  http://www.portal.state.pa.us/portal/server.pt/community/state_assessme

  nt_system/20965/p/1329706

PDE. (2014a). *Office for safe schools.* Retrieved from

http://www.education.state.pa.us/portal/server.pt/community/office_of_ele

mentary_secondary_education/7209/office_for_safe_schools/1152067

PDE. (2014b). *Pennsylvania truancy toolkit.* Retrieved from

http://www.patruancytoolkit.info/index.cfm?pageid=2605#whatistruancy

PDE. (2015a). *Keystone Exam.* Retrieved from

http://www.portal.state.pa.us/portal/server.pt/community/state_assessme

nt_system/20965/keystone_exams/1190529

PDE. (2015b). *School performance profile.* Retrieved from

http://www.portal.state.pa.us/portal/server.pt/community/pennsylvania_d

epartment_of_education/7237/p/1604316

PDE. (2015c). *Pennsylvania school performance profile: Frequently asked questions.*

Retrieved from http://paschoolperformance.org/FAQ

Pennsylvania State Board of Education. (2011). *Implementing the Common Core*

standards in Pennsylvania: Reflections from the field. Retrieved from

http://www.stateboard.education.pa.gov/Documents/Research%20Reports

%20and%20Studies/Common%20Core%20White%20Paper.pdf

Peters, S., & Oliver, L. (2009). Achieving quality and equity through inclusive

education in an era of high-stakes testing. *Prospects, 39*(3), 265-279. doi:

10.1007/s11125-009-9116-z

Pittsburgh Business Times. (2012). Pittsburgh Business Times' *guide to Western*

Pennsylvania schools.

Pregot, M. (2012). An analysis of school funding in eight countries. *School Business Affairs, 78,* 32 - 34.

Rauch, M. E. A. (2008). *Possible predictive factors for the Greater Johnstown school district's Pennsylvania System of School Assessment reading results.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3303558)

Ryan, T. G., & Goodram, B. (2013). The impact of exclusionary discipline on students. *International Journal of Progressive Education, 9*(3), 169-177.

SAT. (2014a). *The history of the SAT.* Retrieved from http://sat.collegeboard.org/about-tests/history-of-the-tests

SAT. (2014b). *What does the SAT test?* Retrieved from http://sat.collegeboard.org/why-sat/topic/sat/what-the-sat-tests

SAT. (2014c). *What is the SAT?* Retrieved from http://sat.collegeboard.org/about-tests/sat

Scheuneman, J. D., & Oakland, T. (1998). *Test interpretation and diversity: achieving equity in assessment.* Washington, DC: American Psychological Assn.

Shin, Y. (2012). Do Black children benefit more from small classes? Multivariate instrumental variable estimators with ignorable missing data. *Journal of Educational and Behavioral Statistics, 37*(4), 543-574. doi: 10.3102/1076998611431083

Shin, Y., & Raudenbush, S. W. (2011). The causal effect of class size on academic achievement: Multivariate instrumental variable estimators with data

missing at random. *Journal of Educational and Behavioral Statistics, 36*(2), 154-185. doi: 10.3102/1076998610388632

Stecher, B., & Hamilton, L. (2002). Test-based accountability: Making it work better. *Education Week, 21*(23), 48-32.

Stedman, J. B., & Riddle, W. C. (1998). *Goals 2000: Educate America Act implementation status and issues*. Washington, DC: Library of Congress Congressional Research Service.

Supovitz, J. (2009). Can high stakes testing leverage educational improvement? Prospects from the last decade of testing and accountability reform. *Journal of Educational Change, 10*(2/3), 211-227. doi: 10.1007/s10833-009-9105-2

Sutton, A., Muller, C., & Langenkamp, A. G. (2013). High school transfer students and the transition to college: Timing and the structure of the school year. *Sociology of Education, 86*(1), 63-82. doi:10.1177/0038040712452889

Swan, B. A. (2006). *Middle school mathematics teacher certification, degree level, and experience, and the effects on teacher attrition and student mathematics achievement in a large urban district.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3233679)

Tingey, R. A. (2009). *High-stakes testing under the No Child Left Behind Act: How has it impacted school culture?* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No 3401427)

Togut, T. D. (2004). *High-stakes testing: Educational barometer for success, or false prognosticator for failure.* Retrieved from http://www.harborhouselaw.com/articles/highstakes.togut.htm#1

Toldson, I. A., & McGee, T. (2014). What the ACT and SAT mean for Black students' higher education prospects. *Journal of Negro Education, 83*(1), 1-3.

Webb, C. E. (2003). *The effects of a class size reduction on elementary student reading achievement in a Midwestern urban school district.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3401427)

Wenglinsky, H. (1997). How money matters: The effect of school district spending on academic achievement. *Sociology of Education, 70*(3), 221-237.

Whitehouse.gov. (2013). *Redesigning and reforming no child left behind*. Retrieved from https://www.whitehouse.gov/issues/education/k-12/reforming-no-child-left-behind

Wu, D., Liu, X., & Wu, J. (2009). Goal orientation and process orientation of Chinese educational equity practice. *Journal of Education Research, 2*(4), 409-414.

Zhang, D. (2008). *The effect of teacher education level, teaching experience, and teaching behaviors on student science achievement.* (Doctoral dissertation). Available from ProQuest Dissertations & Theses database. (UMI No. 3330757)

Zhou, L., & Johnson, F. (2010). *Revenues and expenditures for public elementary and secondary education: School year 2007-08*. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubs2010/2010326.pdf

Appendix A

Interview Invitation

Dear [Interviewee Name):

My name is Michael Sable, and I am doctoral student at Indiana University of Pennsylvania. I am writing to invite you and your business manager to participate in a team interview for my study. You have been selected because you have at least five years of experience as a superintendent and have been working with your business manager for at least three years. The purpose of my study is to explore the multiple economic and noneconomic indicators that exist throughout Pennsylvania and their influence on student achievement. Participation in this study will require approximately one hour of your time to answer interview questions pertaining to economic and noneconomic indicators and their influence on student achievement and possible methods to address solutions. The interviews will be recorded digitally and interviewees will be provided with digital copies of the final transcripts. All interviewees retain the right to review and edit their interview transcript.

I sincerely hope that you will consider participating in my study. The potential benefits from your participation in this study include identifying specific economic and noneconomic indicators that influence student achievement within Pennsylvania. This study may help school districts and lawmakers become more aware of precise areas of funding need to improve educational achievement for Pennsylvania students. It can also provide potential solutions to these problems from experts in the field.

I will be contacting you via telephone in the near future to confirm your interest in being interviewed. Please feel free to contact me as specified below with any questions.

Sincerely,

Michael E. Sable

Email:
  KPLS@iup.edu
Mailing address:
  225 Pointer Drive
  Jefferson Hills, PA 15025
Telephone:
  412-715-5914
Dissertation Chairperson:
  Dr. David Piper
Dissertation Chairperson Email:
  dpiper@iup.edu
Dissertation Chairperson Mailing Address:
  Keith Hall, Room 3-E   390 Pratt Drive
  Indiana, PA 157-5
Dissertation Chairperson Telephone:
  724-357-4471
This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

Appendix B

Interview Protocol

Economic Indicators - Financial elements related to student achievement. For the purposes of this study economic indicators will include: Basic Education Funding, District Wealth (MV/PI), Average Daily Membership (ADM), Weighted Average Daily Membership (WADM), total local revenue, local mill value, Adjusted Act 1 Index, expenditures, fund balance, debt, and socioeconomic disadvantage rates.
Noneconomic Indicators – Non-financial elements related to student achievement. For the purposes of this study economic indicators will include: demographic status *r*ural, Suburban, Urban), total enrollment, truancy rates, reportable discipline infractions, staff size, and teacher experience and education credentials.
Student Achievement – A group of elements utilized to measure student success. For the purposes of this study student achievement will be measured by PSSA, SAT, high school graduation and dropout rates, and percentage of students who attend post- secondary education.

1. In your experience, which economic indicators have the greatest impact on student achievement?
   a. Why are these economic indicators most impactful regarding student achievement?
   b. How do you think these economic indicators can be addressed to increase student achievement?

2. In your experience, which noneconomic indicators have the greatest impact regarding student achievement?
   a. Why are these noneconomic indicators most impactful regarding student achievement?
   b. How do you think these noneconomic indicators can be addressed to increase student achievement?

3. Which has a greater impact on student achievement in your district the Economic Indicators or Noneconomic Indicators?
   a. Why do you believe this group of indicators has the greatest impact regarding student achievement?
   b. How do you believe this entire group of indicators can be addressed to increase student achievement?

4. Data collected from the 2008 – 2009 school year through the 2012 – 2013 school year have indicated [economic indicator) and [noneconomic indicator) have the most impact on student achievement. What are your beliefs regarding these results?

5. Are their any other economic or noneconomic indicators you believe impact student achievement?

Appendix C

Informed Consent

Printed on IUP letterhead
Mixed Methods Investigation of Student Achievement Indicators
Informed Consent Form

You are invited to participate in this research study. The following information is provided in order to help you to make an informed decision whether or not to participate. If you have any questions please do not hesitate to ask. You are eligible to participate because you are a superintendent or business manager of a public school district in Pennsylvania.

The purpose of this study is to explore the multiple economic and noneconomic indicators that exist throughout Pennsylvania and their influence on student achievement. Participation in this study will require approximately one hour of your time to answer interview questions pertaining to economic and noneconomic indicators and their influence on student achievement and possible methods to address solutions. There may be questions that may not apply and you may decline to answer any specific question or questions. The interviews will be recorded digitally and interviewees will be provided with digital copies of the final transcripts. All interviewees retain the right to review and edit their interview transcript. Information from the interview will be verified with you at a later time if you are willing through email or postal mail.

There are no known risks or discomforts associated with this research. The interview will be scheduled at a time and location to be determined in advance.

The potential benefits from this study include identifying specific economic and noneconomic indicators that influence student achievement within Pennsylvania. This study may help school districts and lawmakers become aware of precise areas of funding needed to improve educational achievement for Pennsylvania students.

Your participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigator or IUP. Your decision will not result in any loss of benefits to which you are otherwise entitled. If you choose to participate, you may withdraw at any time by notifying the Project Director or informing the interviewer. Upon your request to withdraw, all information pertaining to you will be destroyed. If you choose to participate, all information will be held in strict confidence.

The information obtained in the study may be published in educational journals or presented at educational meetings but your identity will be kept strictly confidential.

If you are willing to participate in this study, please sign the statement below and return in the stamped, self-addressed envelope to the researcher. The extra copy is for you to keep.

Project Director: Dr. David Piper
Rank/Position: Professor
Department Affiliation: Department of Employment and Labor Relations
Campus Address: Keith Hall, Room 3-E 390 Pratt Drive, Indiana, PA 15705
Phone: 724-357-3928

Researcher: Michael E. Sable
Rank: Graduate student at Indiana University of Pennsylvania
Home Address: 225 Pointer Drive, Jefferson Hills, PA 15025
Phone: 412-715-5915
This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

VOLUNTARY CONSENT FORM:
I have read and understand the information on the form and I consent to volunteer to be a subject in this study. I understand that my responses are completely confidential.

I have received an unsigned copy of this informed Consent Form to keep in my possession.
(PLEASE PRINT)
Name

Signature

Date

Phone number where you can be reached

Best days and times to reach you

VOLUNTARY CONSENT TO PARTICIPATE IN THE RESEARCH STUDY TO INVESTIGATE ECONOMIC AND NONECONOMIC INDICATORS ON STUDENT ACHIEVEMENT IN PENNSYLVANIA.

_____

Participant Signature/Date

I certify that I have explained to the above individual the nature and purpose, the potential benefits, and possible risks associated with participating in this research study, have answered any questions that have been raised, and have witnessed the above signature.

_____

Investigator's Signature/Date