

A STUDY OF THE SCHOOL FUNDING FORMULA CREATED BY SB 287 IN  
MISSOURI

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In Partial Fulfillment  
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Doctor of Education

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by  
JAMES L. WELKER  
Dr. Jerry L. Waddle, Dissertation Supervisor

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled:

A STUDY OF THE SCHOOL FUNDING FORMULA CREATED BY SB 287 IN  
MISSOURI

Presented by JAMES L. WELKER

A candidate for the degree of DOCTOR OF EDUCATION

And hereby certify that, in their opinion, it is worthy of acceptance.

---

Dr. Jerry L. Waddle, Major Advisor  
Educational Administration & Counseling

---

Dr. Ruth Ann Roberts  
Educational Administration & Counseling

---

Dr. Lisa A. Bertrand  
Educational Administration & Counseling

---

Dr. Margaret Dalton  
Educational Administration & Counseling

---

Dr. Paul Watkins  
Educational Administration & Counseling

## DEDICATION

The writer dedicates this work to his parents, Stella Marie Welker, beloved deceased mother and Wilbert E. Welker, beloved father. Mom always wanted a doctor in the family and was a strong motivating force in the completion of this dissertation. Dad has always, and still does, teach the value of hard work and how to treat others with care and compassion.



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James L. Welker

Dr. Jerry L. Waddle, Dissertation Advisor

ABSTRACT

The distribution of funds to local school districts creates a challenge for the state of Missouri. This challenge involves the determination of an amount that is adequate and a method of distributing the funds equitably. In 2005, the Missouri legislature devised a plan to address the adequate and equitable distribution of funds to schools through SB 287. This bill utilized the successful schools model to determine an adequate amount of funding per student. This model assumes that there is a relationship between certain measures of school performance and the amount expended per student. In SB 287, data from schools that scored a perfect score on the Annual Performance Report (APR) was used to develop an adequacy target. In addition, adjustments were made for higher than average numbers of free and reduced, special education, and limited English proficient students resulting in a weighted average daily attendance (ADA). Adjustments were also made for variations in the cost of living across the state. Next, local effort was calculated using the assumption that all school districts had an operating levy of \$3.43. The result was deducted from the adequacy target multiplied by the weighted ADA. The bill then distributed the funds based on the weighted ADA in each school district.

The purpose of this study was to investigate the methods of determining adequacy and equity through SB 287. The study examined the assumptions used in the calculation

of adequacy and the extent to which the formula is successful in improving equity over the former formula that was developed by SB 380 in 1993.

The researcher collected data from the Missouri Department of Elementary and Secondary Education. This data was used in correlation analysis to determine relationships between variables used to calculate the adequacy target. Specifically, correlations were performed between expenditure per pupil and APR scores, expenditure per pupil and percent free and reduced, expenditure per pupil and percent special education, and expenditure per pupil and percent limited English proficient. In addition, revenues per ADA under SB 380 were compared to revenues per ADA under SB 287 by calculating the coefficient of variation and the federal range ratio.

Results of the study indicated that there was no positive correlation between expenditure per pupil and school performance as measured by the Annual Performance Report. This seemed to indicate that the successful schools method used in SB 287 to determine adequacy was invalid because it is based on the assumption that these variables are related. The study indicated a small correlation between expenditure per ADA and the percent economically disadvantaged and between expenditure per ADA and the percent in special education. The percent in limited English proficient and expenditure per ADA did not show a significant correlation. In addition, the results of the study indicated that the method of distributing funds decreased the variation in the amount per ADA. As a result, SB 287 seems to improve equity over the SB 380 formula, although perfect equity would not be possible unless certain components of the formula are removed.

## CHAPTER 1

### INTRODUCTION TO THE STUDY

#### *Background*

It has long been recognized that the responsibility to provide for the educational needs of youth rests with the state. Article IX, Section 1(a) of the Missouri Constitution states:

A general diffusion of knowledge and intelligence being essential to the preservation of the rights and liberties of the people, the general assembly shall establish and maintain free public schools for the gratuitous instruction of all persons in this state within ages not in excess of twenty-one years as prescribed by law (State of Missouri, 2005).

Senate Bill 380 (SB 380), commonly referred to as the “Outstanding Schools Act” was passed in 1993 (Missouri Department of Elementary and Secondary Education, 1993). This legislation was enacted in response to a lawsuit initiated by numerous school districts collectively referred to as the Committee for Educational Equality (*Committee for Educational Equality v. Missouri*, 1993). The lawsuit claimed that the formula for distributing funds to schools created an inequity in funding. Senate Bill 380 (SB 380) included a new funding formula which was touted as a solution to providing equitable funding. The SB 380 formula, referred to as the foundation formula, distributed funds to school districts based on the number of pupils enrolled and then adjusted for the local wealth in the district. School districts with high assessed valuations received proportionately less state funding. In addition, those districts with operating levies above \$2.75 were rewarded for local effort by receiving more funding. This benefit was capped at a levy of \$4.60. Those districts that would have received less through the SB 38

formula than what they received under the old formula were classified as “hold harmless”. These schools were guaranteed to receive no less than what they received under the previous formula. Under the SB 380 formula, funding for education continued to increase through the 2002-03 school year. However, as a result of a recession, the elimination or reduction of certain state taxes, and increased competition for state funds, funding for education actually decreased in 2003-04. In response, schools were faced with cutting staff and programs. At the same time increased standards were being implemented through the federal No Child Left Behind legislation, further increasing the need for additional resources for schools (No Child Left Behind Act, 2001). As a result, many school districts faced severe financial shortages.

The Committee for Educational Equality was re-established in 2004 to challenge the equity and adequacy of state funding for schools. Over 250 school districts eventually joined the group which filed a lawsuit against the state of Missouri (*Committee for Educational Equality v. Missouri*, 2004). The lawsuit again challenged the equitable distribution of funds, and in addition, stated that the level of funding provided to schools from the state was inadequate. The difference between the 1993 lawsuit and the 2004 lawsuit was the issue of adequacy. The 2004 lawsuit addressed the question of how much funding is needed per pupil to provide an adequate education.

In the 2005 legislative session, the Missouri Legislature approved a new formula (Appendix A), Senate Bill 287 (SB 287), to distribute funds to schools (Missouri Department of Elementary and Secondary Education, 2006). This formula was described as being based on student needs in contrast to the old formula which was tax rate driven. The SB 287 formula created an adequacy target based on schools that scored 100 on their

Annual Performance Report (APR). This report is prepared by the Missouri Department of Elementary and Secondary Education and summarizes each district's performance on the following: Missouri Assessment Performance tests, ACT scores, advanced courses, vocational courses, college placement, vocational placement, dropout rate, and attendance rate. Scores may range from 0 to 100 and are used to determine accreditation status for each school district. For a K-12 district, a score of 66 to 100 is required to receive the status of "accreditation", 46 to 65 is needed for "provisional accreditation" and if a score falls below 45 the result is an "unaccredited" status (Missouri Department of Elementary and Secondary Education, 2006). Using performance measures as a method of defining adequacy is based on the concept that successful schools should be used as a guide for determining an adequate expenditure per pupil. As a result, it is referred to as the successful schools model (Augenblick and Myers). Adjustments to the adequacy target were provided for higher than average numbers of the following: students who qualified for free or reduced lunch (low socio-economic families), limited English proficient students and special education students.

#### *Conceptual Underpinnings of the Study*

The concept of adequacy addresses how much is needed to educate a child. There appears to be considerable disagreement about what is considered adequate. Depending on the method used, there may be wide variations in the amount required. As previously mentioned, the formula created by the Missouri Legislature in 2005 (SB 287) developed an adequacy target that was based on the expenditures per pupil from schools that scored 100 on their Annual Performance Report. It was assumed by the legislators that these schools were successful and thus whatever they spent per pupil should be used as the

target. This assumption may, or may not be true. The relationship between per pupil expenditure and school performance (APR) was not tested to establish a statistical relationship. It is possible that the amount spent per student is a product of factors other than or in addition to school performance. The formula created by SB 287 also built in adjustments for schools that had a higher percentage of economically disadvantaged, special education, and limited English proficiency students than the average of the schools scoring 100 on the Annual Performance Report. These adjustments are based on the assumption that there are higher costs associated with educating students who are economically disadvantaged, require special education services, and are limited English proficient. If a school district has a higher percentage of students in these categories than the average of the successful schools, the district would receive additional funding based on a multiplier factor. The schools with a higher percentage of economically disadvantaged students would receive an additional funding weight of .25 for each student above the average percentage. Schools with a higher percentage of special education students would receive an additional weight of .75 for each student above the average and schools with a higher percentage of Limited English Proficient students would receive an additional weight of .60 for each student above the average. In order to address this possibility, it is necessary to look at the relationship between cost per pupil and school performance.

Based on the 2003-04 school year, the expenditures per eligible pupil in Missouri ranged from \$4,614.60 to \$13,538.83. Although sometimes intended as an indictment of the spending practices of schools, the question remains, why is there such a difference in the amount that is spent per pupil among school districts in the state? The formula created

by SB 287 uses expenditure per pupil as a basis for determining the target amount for what is adequate. This study will investigate the use of expenditure per pupil to determine adequacy.

The concept of equity is also critical to this study. The challenge is to determine what is meant by equitable funding and then determine if it has changed from SB 380 to SB 287. Equity is a measure of the extent that each student across the state has the same support from financial resources (state and local). The concept of equity provides for each student's needs regardless of which school district they reside. In order to measure any change in equity, the new formula (SB 287) will be compared to the old formula (SB 380).

#### *Statement of the Problem*

The mandate for the state to maintain free public schools results in the problem of how to provide adequate funding and distribute funds equitably. One challenge is to determine what is adequate. If expenditure per pupil is to be used as a guide to determine funding, additional information has to be known about the relationship between expenditure per pupil and school performance. After determining what is adequate, the next logical challenge is how to distribute funding equitably to all schools. Should equity be based on equal funding per penny of tax rate, as with SB 380, or should it be based on equal funding per student, regardless of the tax rate as with SB 287. Senate Bill 287 was developed to improve equity and adequacy of funding to Missouri schools over the previous formula (SB 380). However, the question remains, will SB 287 be effective in improving the equitable and adequate funding of schools in Missouri and are the factors used in the formula based on valid assumptions.

### *Purpose of the Study*

The main focus of the study is on the formula created by SB 287 and its impact on the equitable and adequate distribution of funds to Missouri schools. The purpose of this study is to investigate the validity of the assumptions used in the development of the foundation formula (SB 287). Since expenditure per pupil in schools scoring 100 on the APR is used as a key factor in the formula, this study will first focus on the correlation between expenditure per pupil and school performance as indicated by the annual performance report generated by the Missouri Department of Elementary and Secondary Education. Next the study will test the relationship between expenditure per pupil and the cost of educating students who are economically disadvantaged, special education, and limited English proficiency. Finally, this study will investigate the extent that the new foundation formula created by SB 287 will affect equity in funding school districts in Missouri as compared to the previous formula created by SB 380.

### *Research Questions*

In order to evaluate the funding formula created by SB 287, the following questions will need to be studied:

1. What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?
2. What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?
3. What is the correlation between expenditure per pupil and the percentage of students who receive special education services?

4. What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?
5. Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

### *Research Hypotheses*

This study will utilize data collected by the Missouri Department of Elementary and Secondary Education to test the following hypotheses:

Hypothesis 1: There is no statistical correlation between expenditure per pupil and school performance.

Hypothesis 2: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged.

Hypothesis 3: There is no statistical correlation between expenditure per pupil and the percentage of students who receive special education services.

Hypothesis 4: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient.

Hypothesis 5: The new foundation formula created by SB 287 has no affect on the equitable distribution of funds to Missouri schools as compared to the old formula created by SB 380.

### *Limitations*

The number of factors that may affect cost per pupil and school performance make it difficult to show relationships. In addition, the data available on school performance is limited to the Annual Performance Report (APR) compiled by The

Missouri Department of Elementary and Secondary Education. The APR may not be an accurate measure of how the school is really performing. By focusing the study only on certain factors, results are intended only to show relationships and not to rule out other factors.

The new formula (SB 287) will not be fully implemented for 7 years. This will make comparisons of the old and new formulas difficult because estimates will have to be used for the new formula. These estimates are based on assumptions. One main assumption is that the formula will not be changed before it is fully implemented. Another assumption is that the Missouri Legislature will fully fund the new formula by the 2012-2013 school year. For the purposes of this study, the data used to evaluate the new formula (SB 287) will be based on the assumption that it will be fully implemented in the 2006-2007 school year. It will also be assumed that other revenues and average daily attendance will remain constant at the 2005-2006 levels.

#### *Definition of Key Terms*

The following definitions are listed to provide a better understanding of the content of the study. These definitions are described in the context as they relate to the study.

*Adequacy.* The amount of resources necessary to provide an education.

*Annual Performance Report (APR).* A report prepared by the Missouri Department of Elementary and Secondary Education which summarizes each district's performance on the following: Missouri Assessment Performance tests, ACT scores, advanced courses, vocational courses, college placement, vocational placement, dropout rate, and attendance rate. Scores may range from 0 to 100.

*Assessed Valuation.* The assessed valuation is the total value of property that resides within a school district's boundaries as established by the county assessor.

*Average Daily Attendance (ADA).* The total hours attended in a term by resident pupils divided by the actual number of hours school was in session plus summer school average daily attendance (hours attended divided by 1044).

*Expenditure Per Pupil.* The expenditure per pupil is the total current expenditures of a district divided by the eligible pupil count.

*Economically Disadvantaged.* The students within a district that are eligible for the free and reduced lunch program (their parental income is at or near the poverty index).

*Foundation Formula.* A formula utilized to distribute state funds to school districts throughout Missouri.

*Hold Harmless.* School districts that would receive less funds under the 1993 foundation formula than they received prior to the formula are termed hold-harmless.

*Limited English Proficient (LEP).* Students whose main language is other than English or who may have difficulty in learning due to a lack of ability to speak, read, write or understand the English language.

*Missouri Assessment Program.* A series of evaluations conducted at various grade levels in various subject areas to measure student proficiency.

*Revenue Per Pupil.* The amount of total revenue received by a school district divided by the number of eligible pupils for that district.

*Weighted Average Daily Attendance.* An adjusted average daily attendance based on the following calculation: regular school year average daily attendance plus the

previous summer school average daily attendance plus the number of free and reduced students (only the number above 26.6% multiplied by 25 %) plus the number of special education students (only those above 14.9% multiplied by 75%) plus the number of limited English proficient students (only those above 1.1 % multiplied by 60 %).

### *Summary*

The State of Missouri has the responsibility of providing for the educational needs of Missouri's youth. This responsibility creates challenges in establishing a method of providing adequate funding and distributing it equitably. The Committee for Educational Equality has challenged both the adequacy and equity of funding for Missouri schools (*Committee for Educational Equality v. Missouri*, 2004). In response, the Missouri Legislature passed Senate Bill 287 which created a new funding formula. The SB 287 formula utilizes the Successful Schools model of determining adequacy which assumes that the amount spent by schools that are identified as successful is adequate for all schools.

The amount of expenditure per pupil varies greatly among Missouri schools and if school performance is to be used in the funding formula, then it is important to know the relationship between expenditure per pupil and school performance. One purpose of this study is to test the relationship between these variables. The study will also test the relationship between expenditure per pupil and the percentage of students who are economically disadvantaged, special education, and limited English proficient. And finally, the study will investigate the affect that SB 287 has on the equitable distribution of funds to Missouri schools.

Chapter two will present a review of the literature associated with school funding issues. It addresses issues related to the relationship between resources and outcomes. It also reviews funding methods used by various states and research related to equity and adequacy. Legislation and litigation affecting state funding of schools is also included.

Chapter three provides an explanation of the research design and methodology. It includes an overview of the research problem and purposes along with research questions, hypothesis, population and sample, data collection and instrumentation, and data analysis. Chapter four describes the analysis of data and chapter five will provide findings, conclusions, and implications of the data analysis.

## CHAPTER 2

### REVIEW OF LITERATURE

#### *Introduction*

Many issues surround the debate over funding for schools. The purpose of this study is to investigate several of these issues and their implications. Some issues focus on spending per pupil and how this affects school performance or outcomes. Other issues deal with the affects of outside factors such as demographics, school size, socioeconomic conditions, and rural verses urban. These issues form a framework for understanding factors involved in the development of a state funding mechanism to provide equitable and adequate resources for schools.

#### *Funding Resources and Accountability*

The push for accountability in recent years has created increased interest in the relationship between funding and student outcomes. The use of the economic term, “production function” (Okpala, 2002, p. 886) has been applied to education. Production function assumes that the addition of certain inputs will produce certain outputs (Okpala, 2002). Several studies focused on how factors such as class size and expenditures per pupil are related to student performance. Okpala (2002) found that class size and school size were not significantly related to student performance. The amount spent on instructional supplies was also shown not to be a factor in test scores. The only significant factors found to affect student performance were student demographics. Student performance improved greatly when going from low wealth to high wealth schools. The level of wealth was determined by the percentage of students eligible for

free or reduced lunch programs. Those schools with a free or reduced percentage of 45 percent or less were designated as high wealth schools. Those schools with 45.1 to 65 percent free or reduced were considered middle wealth schools and those schools with greater than 65 percent were considered low wealth schools. High wealth schools had more teachers with ten or more years teaching experience, which also seemed to result in better student performance. A higher percentage of students on free and reduced lunch seemed to have a negative impact on performance (Okpala, 2002).

Some political leaders have proposed a “65% solution”, which would mandate that 65% of the current expenditures of schools be spent on instruction (Standard & Poors, 2005). The problem with this concept is that it is not research based. Standard and Poors, a division of MCGraw-Hill Companies, Inc., researched the 65% issue. They found that in the states considering the 65% solution, higher spending on instructional activities was not linked to higher levels of achievement. Standard & Poors (2005) noted, “Student performance does not noticeably or consistently increase at 65%, or any other percentage spent on instruction” (p. 2). Spending on administration is also blamed for the shortages in funding for instruction. However, as Johnson (2005) noted, “Contrary to widespread opinion, shortages in the amount of school aid that reaches classrooms cannot be blamed on administrative bloat, most educational finance experts say” (p. 16).

Another issue that receives attention is the difference in expenditures between rural and urban Schools. Imazeki and Reschovsky (2003) studied the difference in expenditures between rural and urban schools and found that there were minimal differences in the relationship between cost factors and student performance when

comparing rural and urban schools. However, they also noted that other factors such as school size and poverty rates caused variations in the costs per student.

The level of education of the parents also affected student performance. Students in schools with higher numbers of parents with post-secondary education performed better. Okpala (2002) concluded that factors related to school spending have less to do with student performance than socioeconomic factors that are beyond the school's control.

Several studies have reviewed efficiency factors related to school spending. Bowles and Bosworth (2002) studied the relationship between school size and the amount spent per student. They identified two major problems in looking at cost in public education: (1) "output is difficult to define and measure, and (2) given the lack of competitive markets, expenditures are observed rather than costs" (Bowles and Bosworth, p. 287-288). These issues make it difficult to apply the economic production function to education. The affect of resources on output, which is basically student performance, is difficult to assess because of so many intervening variables. In addition, the amount expended may not reflect true costs and may vary greatly from school to school. As a result of their study, they found that it costs more to educate a student in a small school than it does in a large school. A 10 percent increase in school size resulted in a two percent decrease in costs per student. Bowles and Bosworth suggested that this factor be taken into account when attempting to achieve equity in funding. Fernandez and Rogerson (2001) also conducted a longitudinal study of spending per student. They found that over the years the amount spent per student increased at the same rate as personal

income and that as enrollment increased the amount of expenditures per student went down.

How resources are used seems to be as important as the amount of resources that are available. Cohen, Raudenbush, and Ball (2003) suggested a shift in research from the focus on whether financial resources make a difference to asking which resources make the most difference. This would allow educational leaders to make more informed decisions about how best to utilize limited resources. They suggested, “The value of resources is likely to depend on how they are used” (Cohen, et al., p. 138). As a result, research should focus on how to use resources rather than if resources make a difference. They questioned the validity of conventional research and its ability to make causal inferences between resources and results.

A method of organizing expenditures based on educational strategies was presented by Odden, Archibald, Fermanich, and Gross (2003). They noted the difficulty in using school financial resource data because it was not directly linked to instructional strategies for improvement. The structure they proposed incorporated nine expenditure elements linked to instructional needs. These elements included: core academic teachers, specialist and elective teachers, extra help, professional development, other non-classroom instructional staff, instructional materials and equipment, student support, administration, and, operations and maintenance. They suggested that schools should organize expenditures in these areas as they relate to instructional strategies.

#### *State Funding*

Since education is considered to be a state responsibility, a major portion of the funding comes from the state level. According to Olson (2005), “Nearly \$500 billion in

combined federal, state, and local money is spent on pre-collegiate education in the United States each year, with nearly half of the total coming from state sources” (p. 10). This investment in education has been found to have a major impact on state economies. Hy (2000) used a case study approach to look at cost/benefit analysis of education in Arkansas. Findings indicated there were “. . . positive and immediate effects on the state’s economy” (p. 218). Hy suggested that by increasing spending on education, personal income would rise resulting in more taxes generated which could then be reinvested in state services. Similar findings were found by Owings and Kaplan (2004). They stated:

Education, more than any other social investment, raises the standard of living by increasing employability and spendable income, reduces a community’s social service costs, and thereby increases revenue to support even more education, creating a dynamic synergy. In addition, a good public education system is a major drawing card for local business development and expansion. Education enhances the quality of life, not just for the educated individuals themselves, but for the entire community as well (p. 13).

Owings and Kaplan (2004) suggested that in order to advocate for educational funding, school leaders must make the connection between education and standard of living. They used data to show that individuals with more education have higher incomes, have lower unemployment rates, are less likely to be incarcerated, and less likely to be crime victims.

The methods of distributing funds to schools create many challenges for state governments. Fox, Murray, and Price, (2002) studied the finance formula for distributing funds to Tennessee schools. The Basic Education Formula developed in Tennessee in 1990-91 was designed to link funding more closely to characteristics of the local educational agency. They found that the formula resulted in significant fluctuation in

annual funding to schools and resulted in one third of the schools further away from the average level of funding. They noted that certain goals of the formula may be in conflict with each other and achieving one goal may detract from another.

The state of Michigan replaced the property tax with a state sales tax in 1994. In addition to the elimination of the property tax for education, this change was designed to provide an adequate level of revenue for all schools. The Michigan reforms were successful in eliminating property tax and in increasing the amount of state revenue available for schools. However, other issues such as revenue stability and affects on student performance in urban areas were less positive (Addonizio, 2003).

Several authors identified issues specific to how states fund rural schools. Sielke (2004) noted the difficulty in defining what a rural school is. Using a designation of populations under 2,500 people, Sielke reported that 21% of the American population lived in rural areas. This accounted for about one third of the school districts and about 21% of the students. She also discussed adjustments commonly made by states in funding rural schools. These included an adjustment for small district size, scarcity, transportation, regional cost of living, and incentives for consolidation. The small size and scarcity issues were identified in about half of the 50 states. Sielke noted research from Odden and Picus (2000) that reported consolidation did not produce the expected savings that were intended and may actually have a negative impact on student performance. The issue regarding transportation seemed to be focused more on length of riding time as opposed to funding. Two types of cost adjustments were discussed by Sielke, a cost-of-living adjustment and a cost-of-education adjustment. These adjustments generally assume a higher cost in urban areas although it was noted salary incentives may

be needed to attract qualified teachers into rural areas. The need for funding of facilities was also noted as a issue that faces both rural and urban schools.

### *Legislation and Litigation*

The issues involving school finance have resulted in numerous pieces of legislation and litigation. Crampton (2001) studied the amount of legislative activity over the 1990's with regard to finance. She reported that the amount of legislation in the states increased from 127 in 1994 to 563 in 1999. She suggested that this increase may have been due to favorable economic times resulting in increased revenues. She also noted that the percentage of state revenues directed at education remained at about 1/3 of total revenues. Most of the legislation centered on school infrastructure, technology, charter school funding, special purpose education, employee compensation and personnel issues. Crampton noted that during robust economies it appears that states maintain basic state aid while at the same time have the "luxury of tinkering at the edges of categorical funding" (p. 499). She noted, however, that this "tinkering" tends to result in further eroding of equity in funding and affects how much funding is available to address adequacy issues. Crampton further predicted that "serious policy conflicts" await states in the future (p. 500).

Changes in educational funding have followed certain trends over the years. Walter and Sweetland (2003) studied national trends in school finance reform. They noted that funding structures are "state-specific" and that "litigated outcomes appear to be court-specific" (p. 149). They reported on the types of funding structures that incurred litigation and the resulting court decisions. Although Walter and Sweetland found no funding structure was "superior to avoid legal attack," the foundation base-line was the

structure that most often ended up in court (Walter and Sweetland, p. 149). In almost every case the court ruled that education was a “fundamental right or necessary to ensuring equal educational opportunity” (p. 149). In most cases, this interpretation resulted in decisions requiring states to provide additional funding, but only up to an “adequate level” (p. 149). In Ohio, the court did not identify education as a fundamental right but still pushed for equitable funding up to an adequate level. Walter and Sweetland concluded that “national norms for school finance reform are non-existent” (p. 149). They also noted that funding issues of “constitutionality, equity and adequacy” change continuously due to court interpretations (p. 149-150). As a result, there appears to be no consensus throughout the nation on school finance reform.

Litigation involving rural schools was also prevalent in the literature. Dayton (2003) explained the challenges of rural districts in obtaining additional resources through the state legislatures. He stated, “Compared with relatively wealthy and politically powerful metropolitan areas, rural communities are financially and politically disadvantaged, and political reality dictates that those with greater financial and political power tend to fare much better in battles that define the legislative process” (Dayton, p. 158). Twenty-six court cases involving rural school issues have been heard in state and federal courts since 1971 with a significant increase in the number of cases in recent years. The courts sided with the rural school advocates in 18 of those cases.

The push toward accountability in education extends not only to student performance and standardized tests but also includes funding. Olson (2005) noted that state legislators want to know what they are getting for their money. The question they must answer is, what does it really cost to educate students to meet standards? This is

especially true as the courts have decreed that states have a constitutional mandate to provide funding to meet standards. In 2005, 31 states were debating how to fund schools equitably, 16 states were involved in litigation, and 20 states had recently settled cases in the last 5 years. The question is further complicated by the accounting for the additional costs of economically disadvantaged students, special needs students, and/or limited English speaking.

### *Equity*

The concept that all citizens are entitled to free public education created the challenge of how to distribute funds equitably to all school districts. Olson (2005) noted that much of the inequity resulted because the primary source of funding was local property taxes which tended to vary greatly between districts. This created wide variations in the amount of funds available. In 2005, the average spent per pupil in the District of Columbia was \$11,269. However, Utah spent only \$5,132 per pupil. Missouri averaged \$7,515 per pupil and the national average for the United States was \$7,734 (Olson, p.10).

There is some question as to what constitutes equal funding. Podgursky and Springer (2005) noted the distinction between “horizontal” and “vertical” equity (p. 10). Horizontal equity is achieved, “if real spending per student were identical for all students in the state, regardless of family background, location, or need” (Podgursky and Springer, p. 10). In contrast, vertical equity “takes account of need and seeks to equalize educational opportunity or outcomes given gaps in family incomes” (Podgursky and Springer, p. 10).

The concept of equity has resulted in numerous court cases. Addonizio (2003) provided a summary of key legal challenges against states regarding school funding systems. Addonizio noted that the landmark case of *Serrano v. Priest* (1971) was the first case that focused on the “. . . basic unfairness of spending disparities arising from differences in local wealth . . .” (p. 457). The court’s decision in *Serrano* supported the principle of fiscal neutrality which basically states that a child’s education should not be based on the wealth of the district but rather on the wealth of the state as a whole. After the *Serrano* case, 43 states had suits brought against them prior to 1998, and in 19 of those cases the Supreme Court had ruled that the funding system was unconstitutional. Addonizio further noted that finance reforms failed to address the connection between available resources and student performance.

In some cases, courts have mandated equity. In the New Jersey case, *Abbot v. Burke*, the court “ruled that the state’s poorest districts be allowed to spend as much as the wealthiest districts” (Gewertz, 2005, p. 42). The problem, however, with these decisions is that even if they can determine what amount is needed, states still would have to find enough money to fund it. Craig Stanley, Chairman of the Education Committee in the New Jersey Assembly was quoted as saying, “We look at what we have and divide it up because we lack the political will to look at what we need and find out what it costs” (Gewertz, 2005, p. 47). In 1993, Missouri’s funding system was challenged on the equity issue (*Committee for Educational Equality v. Missouri*, 1993). The result was a new formula which guaranteed equal funding for equal property tax rates (Podgusky & Springer, 2005).

A research study conducted by the Missouri Department of Elementary and Secondary Education (1999) noted that much progress has been made toward a more equitable distribution of funds based on the amount of revenue per pupil. However, there remains a considerable range among school districts and the amount of revenue from state and local sources has increased significantly. In addition, Podgursky and Springer (2005) noted that equity in Missouri's funding system is made more complex because of the high number of school districts with a wide spread of enrollments. According to their data, if schools were ranked according to enrollment, only .5 percent of all students come from the schools in the bottom 10 percent and over half of all students come from the schools that rank in the top 10 percent.

#### *Adequacy*

For a long time courts failed to address how funds were spent or how much it really takes to meet standards. They simply stated whether the funding was adequate and charged the legislature with determining how much it will cost. The concept of adequacy first appeared in *Rose v. Council for Better Education*, (1989). This case declared the state of Kentucky's entire K-12 governance and finance system unconstitutional. As a result, the Kentucky Supreme Court ruled that students were not provided with equal access to educational opportunities and resources as prescribed by the state constitution (Addonizio, 2003). Addonizio (2003) noted that since that case, courts in ten states have ruled their funding systems unconstitutional based on the adequacy issue.

According to Olson (2005), 30 states had adequacy studies conducted in 2005.

Forty-three states use weights to adjust for students with certain characteristics such as poverty, disabilities or limited English proficiency. Twenty-six states adjust funding for at-risk and nine states adjust for differences in cost of living.

The amount required to provide adequacy varies greatly depending on the method utilized. Hoff (2005) noted, “The price tag recommended by studies in Kentucky varied by as much as 40 percent, depending on the researchers’ methods and assumptions” (p. 29). Hoff goes on to say, “School finance experts may have refined their models for determining how much it should cost to adequately educate students, but that doesn’t mean they always agree on the results.” (p. 29). Studies in New York also revealed large variances in the amount required. They varied from 2.5 billion to 8.4 billion more needed per year. Maryland studies differed by 1 billion in what was an adequate level. These variances lead policy makers to question the validity of the methods used.

How to define adequacy is a major challenge. Addonizio (2003) listed four methods of determining adequacy including: statistical modeling, empirical observation, professional judgment, and whole school designs. The statistical modeling approach identifies an acceptable level of student performance and then uses regression analysis to determine the cost of producing those results. This method assumes an educational production function which means that increased resources produce increased student performance. The empirical observation approach identifies schools with acceptable student performance and notes their expenditures. The professional judgment strategy utilizes professionals in the education field to determine the cost involved in an adequate education. It was noted that a problem with this approach is getting professional educators to agree. The whole-school design utilizes a program that is implemented to

promote high achievement for all students. The cost of implementing the program is used to determine adequacy. Many of the models used to determine adequacy utilize cost adjustments for differences in student characteristics such as special needs and geographic differences. Addonizio made the point that cost adjustments are usually based on expenditures rather than costs. This is because they do not directly relate to student performance.

Several solutions to the funding crisis in Missouri have been proposed. Dr. Ed Robb, retired professor from the University of Missouri suggested a simple flat income tax revision and removal of most of the property taxes (Missouri Tax Policy and Education Funding, 2003). A study titled: Calculation of the cost of an Adequate Education in Missouri which was completed by Augenblick & Myers, Inc., (2003) suggested a base amount of funding be provided per student. The amount required to achieve adequacy ranged from \$5,664 to \$7832 depending on the approach used. In addition, over 200 school districts filed a lawsuit against the state for inadequately and inequitably funding education in Missouri (*Committee for Educational Equality v. Missouri*, 2004). Verstegen (2002) uses the term “New Adequacy” to explain the need to reform funding systems to make them provide high quality educational opportunities to children rather than a minimal adequate education (p. 749). She proposed that funding structures be linked to state curriculum and assessment to provide curriculum alignment for high standards. Verstegen also suggested that funding policies create linkages with “. . . services for children and families dealing with health, welfare, juvenile justice, social and rehabilitation, recreation and nutrition services” (p. 780). In addition, she suggested

that equity and adequacy be addressed but in terms of high quality education for all students.

### *Summary*

School finance has been the topic of much debate and research in recent years. Some researchers have focused on factors related to an educational production function which assumes that various factors such as class size and expenditure per pupil are related to outcomes. Much of the research however, has shown that these factors are not primarily responsible for student performance. Demographics and socioeconomic factors tend to have a much greater impact.

Research has started to address the issues of equity and adequacy of funding. Both of these issues are prevalent in the literature and there appears to be a shift from equity to a focus on adequacy in recent years. A problem involving adequacy is defining what is adequate. In some states, legislation has attempted to address these issues. Numerous court cases have been initiated against the states and in many cases decisions have been rendered in favor of local schools.

A considerable amount of research on finance issues related to education has been conducted in recent years. Much of this research has focused on efficiency factors such as class size and the relationship between levels of spending and student performance. In addition, some research has started to address the issues of equity and adequacy of funding.

The literature reviewed in this chapter provides a framework for the design and methodology presented in the next chapter. Chapter 3 provides an overview of the research design and methodology. It includes a discussion of the problem, research

questions and hypotheses along with the population sample, data collection, and data analysis. Chapter four will describe how the data is organized and analyzed and chapter five will provide findings, conclusions, and implications of the data analysis.

## CHAPTER 3

### RESEARCH DESIGN AND METHODOLOGY

#### *Introduction*

Providing an equitable system of educational funding that generates an adequate level of resources is a major challenge. In order to gain a deeper understanding of the issues related to educational funding, we must study the factors that affect the distribution of financial resources to schools. This chapter provides an overview of the problem and purposes of this study along with research questions. The research questions are followed by the research hypotheses, population and sample, data collection and instrumentation, data analysis and summary.

#### *Problem and Purposes Overview*

One basic problem is how to define and determine adequacy with regard to educational funding. Depending on the model used, the answers may vary. The second problem is how to distribute the funds equitably to make sure all students receive the education they are guaranteed by the state constitution.

The 2005 funding formula in Missouri (SB 287) was designed to change the funding system from a tax rate driven formula to a student needs formula. The student needs formula was based on the assumption that school performance is related to educational costs. In the SB 287 formula, the average expenditure per pupil from schools with a perfect score on their annual performance report (APR) was used to determine the adequacy target. The assumption was made that the amount needed to adequately educate

students is related to the performance on the APR. Research question one investigated the relationship between the APR scores and expenditure per pupil.

Adjustments were also made in the new formula (SB 287) to compensate for schools with higher numbers of economically disadvantaged, special education, and limited English proficient students. The formula took the average percentages in each of these categories from the schools that had a perfect score on the APR. It was assumed that the average amount expended by those schools was adequate to educate the corresponding percentages of students in each category. If a school had a higher percentage of students in one of these categories, they would receive additional funding. By making this assumption, the formula suggested that there is a relationship between expenditure per pupil and each of the three categories. Research questions two through four investigated the relationships between expenditure per pupil and these three factors.

The issue of equity of funding was addressed in this study. A comparison was made between the variation in revenue available per pupil under the old formula (SB 380) in the 2005-2006 school year and the variation in revenue per pupil available with new formula (SB 287) in 2006-2007 assuming it were fully implemented and fully funded. Research question five addressed the comparison of the variation of revenue per pupil under these three circumstances in order to measure the differences in equity of funding to Missouri schools.

### *Research Questions*

In order to evaluate the funding formula created by SB 287, the following questions were studied:

1. What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?
2. What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?
3. What is the correlation between expenditure per pupil and the percentage of students who receive special education services?
4. What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?
5. Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

#### *Research Hypotheses*

This study will utilize data collected by the Missouri Department of Elementary and Secondary Education to test the following hypotheses:

Hypothesis 1: There is no statistical correlation between expenditure per pupil and school performance.

Hypothesis 2: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged.

Hypothesis 3: There is no statistical correlation between expenditure per pupil and the percentage of students who receive special education services.

Hypothesis 4: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient.

Hypothesis 5: The new foundation formula created by SB 287 has no affect on the equitable distribution of funds to Missouri schools as compared to the old formula created by SB 380.

### *Population and Sample*

The population in this study included all 524 school districts in the state of Missouri. In order to obtain a more accurate analysis of the data the total population was used as the sample. However, three schools with incomplete data were deleted resulting in a total of 521 schools.

### *Data Collection and Instrumentation*

Data collected on the population was obtained by accessing existing data bases. This data included the current expenditures per pupil, Annual Performance Report scores, revenue per pupil, and the percentages of students who are economically disadvantaged, special education, and limited English proficient. The data was available from the Missouri Department of Elementary and Secondary Education (DESE) in Jefferson City, Missouri. Much of the data was available through the DESE website.

Questions one through four investigated some of the factors used in SB 287 to determine adequacy. The first research question concerned the relationship between current expenditure per pupil and school performance. The current expenditure per pupil was calculated from the Annual Secretary of the Board Report, which each school district submits annually to DESE. The performance data was collected on the Annual Performance Report (APR) which is generated by DESE each year. Scores on the APR can range from 0 to 100.

Research questions two, three and four are similar in that they correlated expenditure per pupil to variables used by SB 287 to calculate weighted average daily attendance. The second research question investigated the relationship between expenditure per pupil and the percentages of students who are economically disadvantaged. The third research question investigated the relationship between expenditure per pupil and the percentages of students who are in special education and the fourth research question investigated the relationship between expenditure per pupil and the percentages of students who are limited English proficient. For each question, the data on current expenditure per pupil from question one was correlated to the percentages of students who make up each group in question.

In order to answer the question regarding equity, a study conducted by the Missouri Department of Elementary and Secondary Education (DESE) was replicated with certain modifications. The study was conducted in 1999 to determine if the foundation formula developed in 1993 had improved revenue equity in Missouri schools between the year prior to implementation of the formula in the 1992-93 school year and the full implementation of the formula in the 1997-98 school year. This study utilized similar procedures to compare the variation of revenues per pupil for the 2005-06 school year to estimated revenues per pupil in the 2006-07 school if the SB 287 formula were fully implemented. The 2006-07 school year was used because it was the first year of implementation for the new formula (SB 287). The SB 287 formula was scheduled to be phased in over 7 years. However, in order to evaluate the affects of the formula on equity it was treated as though it would be fully funded in 2006-07. It should be noted, that the SB 380 formula was not fully funded in 2005-06.

The 1999 DESE study investigated the variation in revenue per pupil to evaluate equity. The revenues from the incidental and teachers funds were added together and divided by the number of pupils as measured by average daily attendance (ADA). Certain state and federal categorical revenues were excluded to control for differences due to these funds. My study utilized the revenue categories identified in the local effort calculation as defined in SB 287 plus the amount of state funding generated by each respective formula. The local effort calculation included local property taxes minus assessor and collector fees. This amount was then added to certain revenues from funds 1 and 2 (intangible taxes, fines and escheats, payments in lieu of taxes, state assessed railroad and utility taxes, merchants and manufacturer's tax, an assessment for federal properties, 50 percent of Proposition C receipts, and any local earnings or income tax).

In order to test equal access to revenue, the 1999 study utilized revenue per pupil per penny of tax rate. Since the new formula was not based on the tax rate, I used revenue per pupil based on average daily attendance (ADA). The actual 2005-06 ADA was used for all formula calculations in order to control for changes in enrollment.

#### *Data Analysis*

Several methods were used to analyze the data. Correlation statistics were used to show the relationship of expenditure per pupil and school performance as measured by the district annual performance report. Correlation statistics were also used to measure the relationship between expenditure per pupil and the percentages of students who are economically disadvantaged, special education, and limited English proficient. As described by Fraenkel and Wallen (2003), "A major purpose of correlational research is to clarify our understanding of important phenomena by identifying relationships among

variables.” (p. 339). The data were analyzed using a “correlation coefficient” (Fraenkel and Wallen, p. 346). This coefficient produced a value between -1.0 and +1.0. Stronger relationships are indicated by coefficients closer to -1 or 1.0. Scores closer to -1.0 indicate that as one variable increases the other variable tends to decrease (a negative correlation). Scores closer to +1.0 indicate that as one variable increases the other variable also tends to increase (a positive correlation) (Fraenkel and Wallen, 2003).

A coefficient of variation, as described in the 1999 School Finance Equity Study conducted by the Missouri Department of Elementary and Secondary Education (DESE, 1999), was calculated to measure equity. This coefficient is equal to the standard deviation divided by the mean and reveals the amount of equity for pupils in districts that are within one standard deviation of the state mean. In addition the federal range ratio, also described in the DESE study (DESE 1999), was also used to measure the difference in revenue per pupil. This ratio measured the difference in revenue between the 95<sup>th</sup> and 5<sup>th</sup> percentiles and then divided the result by the 5<sup>th</sup> percentile rank. A federal range ratio of zero would mean that there is no difference between the 95<sup>th</sup> and 5<sup>th</sup> percentiles resulting in perfect equity. A result of .25 means that the revenue per pupil for the school at the 95 percentile is 25 percent greater than the revenue per pupil at the 5<sup>th</sup> percentile (DESE, 1999). The data was analyzed to determine the variation of revenues per pupil for the 2005-2006 school year as compared to the amount of variation of revenues per pupil projected for the 2006-07 school year. This comparison assumed that other revenues and average daily attendance are held constant and the new formula (SB 287) was fully implemented and fully funded in the 2006-2007 school year.

### *Summary*

In order to conduct a study of funding in Missouri schools, correlation statistics were used to study relationships between student expenditures and school performance. In addition, correlation statistics were used to study the relationship between expenditure per pupil and the cost of educating students who are economically disadvantaged, special education, and limited English proficient. These analyses were important because the new formula for distributing state funding to school districts (SB 287) is based on these relationships.

In order to measure the impact of the formula on equity, portions of a study conducted by the Missouri Department of Elementary and Secondary Education in 1999 were replicated. Statistical data were used to calculate the coefficient of variation and the federal range ratio. The analysis of these data provided an indication of the change in equity from the old formula (SB380) and the new formula (SB 287). Since the new formula will be phased in over the next seven years, a comparison was made between the 2005-2006 school year and the 2006-2007 school year assuming that other revenues and average daily attendance were held constant and the new formula (SB 287) was fully implemented and fully funded. By analyzing this data, the impact of the new formula on providing an equitable level of funding was revealed.

An explanation of how the data analysis is organized along with descriptive characteristics of the sample and further information about the analysis is provided in Chapter four. Chapter five will present the findings, conclusions, and implications of the study.

## CHAPTER 4

### ANALYSIS OF DATA

#### *Introduction*

The purpose of this study was to investigate the affects of SB 287 on the equitable and adequate distribution of funds to Missouri schools. The first part of the study focused on the assumptions used to develop an adequacy target in SB 287. The second part of the study reviewed the extent to which the new formula increased equity in funding.

This chapter provides an explanation of how the data was analyzed. It includes descriptive characteristics of the school districts included in the study along with the research questions and research hypotheses. It also includes an analysis of the data collected. The data for the first four questions are analyzed using Pearson Product-Moment correlations. The data for question five is analyzed using the coefficient of variation and the federal range ratio which is similar to the study conducted by DESE in 1999.

#### *Organization of Data Analysis*

The data collected and analyzed for the first four research questions is based on the relationships of certain variables to current expenditures. These relationships provided the basis used to determine adequacy in SB 287. Each of four variables was correlated to expenditure per ADA separately. The four variables were (a) total score on the Annual Performance Report (APR), (b) percent of students who are economically disadvantaged as measured by participation in the free and reduced lunch program, (c) the percent of students in special education, and (d) the percent of students identified as

Limited English Speaking. The analyses of these relationships were tested utilizing the Pearson Product-Moment correlation.

The data collected for the fifth research question were used to measure changes in equitable distribution of funds before and after implementation of SB 287. Revenues per ADA were used to calculate the coefficient of variation and the federal range ratio. The study used the actual 2005-2006 ADA. Revenues per ADA included both local and state funds placed in the Incidental and Teachers fund in the 2004-2005 school year. Local revenues included current taxes, financial institutional taxes, merchants and manufactures tax, payments in lieu of taxes, fines, state assessed railroad and utility taxes, revenues from federal properties, and half of Proposition C revenues. Current taxes were calculated using the 2004-2005 assessed value multiplied by the 2004-2005 tax rates in the incidental and teachers fund minus county collector's fees. Local funding remained constant for both totals. The state funding total for SB 380 included the 2005-2006 basic formula, at-risk, Exceptional Pupil, Remedial reading, Gifted, Free Textbook, and Fair Share. The state funding total for SB 287 included the state funding required (line 7 on the Annualized Payment Calculation Report, DESE, 2006) plus any amount designated through the small school payment (line 18 on the Annualized Payment Calculation Report, DESE, 2006).

Local funding plus the SB 380 funding was compared to local funding plus the SB 287 funding using the coefficient of variation and the federal range ratio. The coefficient of variation is the standard deviation divided by the mean. The federal range ratio is the revenue per pupil at the 95<sup>th</sup> percentile minus the revenue per pupil at the 5<sup>th</sup> percentile divided by the revenue per pupil at the 5<sup>th</sup> percentile. The analysis of this data

provided an indication of the change in equity from the old formula (SB380) and the new formula (SB 287). Since the new formula will be phased in over the next seven years, a comparison is made assuming that other revenues and average daily attendance are held constant and the new formula (SB 287) is fully implemented and fully funded. By analyzing these data, the impact of the new formula on providing an equitable level of funding is revealed.

#### *Descriptive Characteristics of Schools in the Sample*

All public school districts in the state of Missouri were included in the study with the exception of three schools that were excluded because of missing data (see Table 4.1). There were 74 schools classified as K-8 districts, which includes Kindergarten through grade eight, and 447 school districts classified as K-12, which includes Kindergarten through grade twelve. The average ADA for all schools was 1,595.5. The average operating levy was \$3.4634. There were 301 school districts with an operating levy below the SB 287 performance levy of \$3.43. The average tax levy of schools below \$3.43 was \$2.9998. The average operating levy above \$3.43 was \$4.0976. There were 181 school districts identified as hold-harmless indicating they would not receive less funding under the new formula (SB 287) than the old formula (SB 380). There were 173 school districts that qualified for the small school payment (< 350 students). The average percentage of free and reduced lunch students was 46.58%. The average percentage of Special Education students was 15.3% and the average percentage of Limited English proficient students was 0.88 %.

Table 4.1

*General Information from Sample*

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Total Number of Schools in Sample	521
Number of K-8 Districts	74
Number of K-12 Districts	447
Average ADA (all districts in sample)	1,595.50
Average Assessed Value (all districts in sample)	\$134,374,824.64
Average Tax Levy (all districts in sample)	3.4634
Number of Districts below \$3.43	301
Average Tax Levy (districts below \$3.43)	2.9998
Number of Districts at \$3.43 or above	220
Average Tax Levy (at or above \$3.43)	4.0976
Number of Hold Harmless Schools 2006-2007	181
Number of Small School Districts < 350 students	173
Total Small School District Payment	\$14,658,662.00
Average Percent Free and Reduced	46.58
Average Percent Special Education	15.3
Average Percent LEP	0.88

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### *Research Questions*

In order to evaluate the funding formula created by SB 287, the following questions were studied:

1. What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?
2. What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?
3. What is the correlation between expenditure per pupil and the percentage of students who receive special education services?
4. What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?
5. Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

### *Research Hypotheses*

This study will utilize data collected by the Missouri Department of Elementary and Secondary Education to test the following hypotheses:

Hypothesis 1: There is no statistical correlation between expenditure per pupil and school performance.

Hypothesis 2: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged.

Hypothesis 3: There is no statistical correlation between expenditure per pupil and the percentage of students who receive special education services.

Hypothesis 4: There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient.

Hypothesis 5: The new foundation formula created by SB 287 has no affect on the equitable distribution of funds to Missouri schools as compared to the old formula created by SB 380.

### *Analysis of Data*

The relationships between variables in the first four research questions were analyzed using correlation statistics. A Pearson Product-Moment correlation coefficient ( $r$ ) was used to assess the amount of linear relationship of the two variables included in the first question. The value of the coefficient can range from -1.0 to 1.0. As the score gets closer to 1.0, an increase in one variable corresponds to an increase in the second variable at a constant rate. As the score approaches -1.0, an increase in one variable corresponds to a decrease in the second variable at a constant rate. A value of .10 is considered to be small, .30 is considered to be medium and a value of .50 or greater is considered to be large (Green & Salkind, 2003).

The first four questions investigate the method of determining adequacy in SB 287. This method is based on the successful schools model which assumes that there is a relationship between expenditures and school performance. SB 287 utilized the average expenditures per pupil from schools that obtained a perfect score on the Annual Performance Report (APR) to determine adequacy. The ability to use the total APR score to predict the adequacy target is based on the relationship between the total APR score and expenditure per ADA.

Research Question 1 - What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?

Research question one addressed the correlation between expenditure per pupil and school performance as measured by the district APR. A Pearson Product-Moment correlation coefficient was produced to evaluate each relationship.

Research Hypothesis 1 - There is no statistical correlation between expenditure per pupil and school performance.

School districts that include grades kindergarten through the eighth grade (K-8) have a different maximum point potential on the APR than school districts that contain grades kindergarten through the twelfth grade (K-12). As a result, separate correlations were completed for the two groups. The results of the correlation analysis presented in Table 4.2 revealed that the relationship for K-8 districts is not statistically significant,  $r(74) = -.137, p < .05$ . The results of the correlation analysis for K-12 districts are also presented in Table 4.2. Similar to K-8 districts, the relationship for K-12 districts is not statistically significant,  $r(447) = -.051, p < .05$ . Since the coefficients for both categories of schools are small and negative, the null hypothesis is not rejected.

Table 4.2

*Correlations between Current Expenditures per ADA and Total Score on the APR*

	K-8 Schools	K-12 Schools
Pearson Correlation	-.137	-.051
Sig. (2-tailed)	.245	.285
N	74	447

*p* < .05

In addition to expenditure per pupil and APR scores, three other variables were used to calculate funding levels in SB 287. The relationship analyzed by the second research question addressed the correlation between expenditure per pupil and the percentage of students who are economically disadvantaged.

Research Question 2 - What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?

A Pearson Product-Moment correlation coefficient was produced to evaluate the relationship between expenditure per pupil as measured by the current expenditures per ADA and the percentage of students who are economically disadvantaged as measured by the percent identified in the free and reduced lunch program. K-8 and K-12 schools were combined for this analysis.

Research Hypothesis 2 - There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged.

The results of the correlation analysis presented in Table 4.3 revealed that the relationship is statistically significant,  $r(521) = 0.154, p < .05$ . Although the value is considered small, since the relationship is significant at the  $p < .05$  level, the null hypothesis is rejected.

Table 4.3

*Correlations between Current Expenditures per ADA and Factors used in the Adequacy Target (N=521)*

	Free & Reduced	Special Education	Limited English Proficient
Pearson Correlation	.154**	.265**	.047
Sig. (2-tailed)	.000	.000	.529
N	521	521	183

\*\* $p < .05$

The relationship studied in the third research question addressed the correlation between expenditure per pupil and the percentage of students who are in special education.

Research Question 3 - What is the correlation between expenditure per pupil and the percentage of students receive special education services?

A Pearson Product-Moment correlation coefficient was produced to evaluate the relationship between expenditure per pupil as measured by the current expenditures per ADA and the percentage of students who are enrolled in special education. K-8 and K-12 schools were also combined for this analysis.

Research Hypothesis 3 - There is no statistical correlation between expenditure per pupil and the percentage of students who receive special education services.

The results of the correlation analysis presented in Table 4.3 revealed that the relationship is statistically significant,  $r(521) = 0.265, p < .05$ . Although the value is in the small to medium range, the relationship is statistically significant at the  $p < .05$  level. As a result, the null hypothesis is rejected.

Research Question 4 - What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?

A Pearson Product-Moment correlation coefficient was produced to evaluate the relationship between expenditure per pupil as measured by the current expenditures per ADA and the percentage of students who are identified as limited English proficient. K-8 and K-12 schools were also combined for this analysis.

Research Hypothesis 4 - There is no statistical correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient.

Since many schools did not have students in this category, only the 183 schools that reported students in this category were utilized in the correlation. The results of the correlation analysis presented in Table 4.3 revealed that the relationship was not statistically significant,  $r(183) = .047, p < .05$ . Since the coefficient is small and not significant, the null hypothesis is not rejected.

Research Question 5 - Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

The coefficient of variation and the federal range ratio were used to investigate the extent that the new foundation formula, created by SB 287, affects the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380.

Research Hypothesis 5 - The new foundation formula created by SB 287 has no affect on the equitable distribution of funds to Missouri schools as compared to the old formula created by SB 380.

The results of the analysis presented in table 4.4 revealed that the coefficient of variation decreased from .26 using SB 380 data to .20 using SB 287 data. In addition, the results of the analysis presented in Table 4.5 revealed that the Federal Range Ratio decreased from .82 using SB 380 to .47 using SB 287. As a result of the decrease in both analyses, the null hypothesis is rejected. The decrease in variability as indicated by the two measures indicated that there is more equitable distribution using the SB 287 formula than the SB 380 formula.

Table 4.4

*Coefficient of Variation*

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SB 380 Standard Deviation	1,697.29
SB 380 Mean	6,312.68
SB 380 Coefficient of Variation	.26
SB 287 Standard Deviation	1,443.81
SB 287 Mean	7,188.93
SB 287 Coefficient of Variation	.20

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Table 4.5

*Federal Range Ratio*


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SB 380 (95th percentile)	8,835.73
SB 380 (5th percentile)	4,831.15
Federal Range Ratio for SB 380	0.82
SB 287 (95th percentile)	9,038.79
SB 287 (5th percentile)	6,146.03
Federal Range Ratio for SB 287	0.47

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*Summary*

This chapter provided an overview of the analysis of the data collected to answer the research questions and associated hypothesis. Statistical correlations were used in questions one through four. The statistical correlations analyzed relationships between variables. Analysis of data from the first research question resulted in retention of the null hypothesis. Although the scores were small for research questions two and three, they were significant and resulted in rejection of the null hypothesis. Data for research question five were utilized in calculating the federal range ratio and coefficient of variation. Results of this analysis revealed a decrease in variation indicating an increase in equity. As a result, the null hypothesis from research question five was rejected. Further examination of the findings and conclusions will be presented in chapter five. In addition, chapter five will present implications, suggestion for future research and a summary of the study.

## CHAPTER 5

### FINDINGS, CONCLUSIONS, AND IMPLICATIONS

#### *Introduction*

This chapter provides an explanation of the findings and the conclusions drawn from the data analysis in response to the research questions. In addition, implications for issues raised and suggestions for future research are included. A summary that reviews the purpose of the study along with a review of the findings and conclusions is also provided.

#### *Summary of the Study*

The purpose of the study was to evaluate the method of distributing funds to public schools in Missouri through Senate Bill 287. The two main issues addressed are related to the adequacy and equity of funding. The problem involved the method used to determine what is adequate and the method used to distribute funds equitably to all schools. Data related to the variables used in SB 287 were collected from the Missouri Department of Elementary and Secondary Education (DESE). This data was used to answer the following research questions.

1. What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?
2. What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?
3. What is the correlation between expenditure per pupil and the percentage of students who receive special education services?

4. What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?
5. Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

The review of literature revealed numerous studies involving the relationship between performance and factors related to expenditures. Much of the research however, has shown that these factors are not primarily responsible for student performance. Demographics and socioeconomic factors tend to have a much greater impact.

The issues of equity and adequacy are prevalent in the literature. However, in recent years there appears to be a shift from a focus on equity to a focus on adequacy. In addition, legislation and litigation has attempted to resolve these issues. Numerous court cases have been initiated against states and in many cases decisions have been rendered in favor of the school districts.

The population in this study included 521 of the 524 school districts in the state of Missouri. In order to obtain a more accurate analysis of the data, the total population was used as the sample. However, three schools were deleted due to incomplete data.

### *Findings*

The statistical analysis used to measure the relationships between variables in research questions one through four and the analysis of equity in question five were presented in chapter four. Data collected for question one were categorized based on whether the school district was K-8 or K-12. This was necessary because K-8 schools cannot score points in all areas of the Annual Performance Report (APR).

1. What is the correlation between expenditure per pupil and school performance as measured by the district annual performance report?

The results of the correlation analysis revealed a coefficient of  $-.137$  for K-8 schools (Table 4.2). The results were not significant at the  $p < .05$  level. This coefficient would be considered small and, since it is negative, would represent an inverse relationship.

The results of the analysis for K-12 districts (Table 4.2) revealed a correlation coefficient of  $-.051$ . The results were not significant at the  $p < .05$  level. This is considered very small and, like the K-8 districts, would indicate an inverse relationship since it is negative.

2. What is the correlation between expenditure per pupil and the percentage of students who are identified as economically disadvantaged?

The correlation between expenditure per pupil and the percentage of students who are economically disadvantaged resulted in a score of  $0.154$  (Table 4.3). Although it is small, it is statistically significant at the  $p < .05$  level. There does appear to be some positive relationship between expenditure per pupil and the percentage of students who are economically disadvantaged.

3. What is the correlation between expenditure per pupil and the percentage of students who receive special education services?

The next correlation analyzed the relationship between expenditure per pupil and the percentage of students who are in special education. This correlation resulted in a coefficient of  $.265$  (Table 4.3). The analysis was statistically significant at the  $p < .05$

level, and although this score would be considered small, it does indicate a stronger relationship than the first two correlations.

4. What is the correlation between expenditure per pupil and the percentage of students who are identified as limited English proficient?

The last correlation analyzed the relationship between expenditure per pupil and the percentage of students who are limited English proficient. Only the 183 schools that reported students in this category were included in this correlation. This analysis resulted in a coefficient score of .047 (Table 4.3). This score was not statistically significant at the  $p < .05$  level and was very low. It should be noted that the schools that did not record any students in this category were deleted.

5. Does the new foundation formula created by SB 287 affect the equitable distribution of funding to Missouri schools as compared to the old foundation formula created by SB 380?

The analysis related to question five utilized the federal range ratio and the coefficient of variation to evaluate the equitable distribution of funds to schools. The coefficient of variation for revenue per pupil was .26 using the SB 380 formula (Table 4.4). The coefficient of variation for revenue per pupil was .20 using the SB 287 formula. The federal range ratio for revenue per pupil was .82 using the SB 380 formula (Table 4.5). Using the SB 287 formula, the federal range ratio for revenue per pupil was .47. The changes in the ratio and coefficient indicated that the variation in funding decreased from SB 380 to SB 287.

### *Conclusions*

The purpose of this study was to investigate the funding formula created by SB 287 and the methods used to provide adequate and equitable funding to Missouri schools. The formula created by SB 287 is based on several assumptions. These assumptions imply that there is a relationship between certain variables. One assumption was that the average expenditure per pupil of the schools with a perfect score on the APR should be the target for an adequate amount of funding. Another assumption was that adjustments to the adequacy target were justified by the percentages of students in the categories of economically disadvantaged, special education, and limited English proficient. Research questions one through four analyzed the data that was used in these assumptions to determine if indeed there is a relationship between the variables.

Correlation statistics were utilized in questions one through four to determine the relationship between variables. Question one involved the relationship between expenditure per pupil and school performance as measured by the total score on the APR. The correlation scores of  $-.137$  for K-8 schools and  $-.051$  for K-12 schools indicated a very small negative relationship between the two variables. The negative score indicated an inverse relationship. This means that as one variable goes up the other goes down slightly. The results indicated that there is no positive relationship between expenditure per pupil and school performance as measured by the district annual performance report. These results would therefore bring into question the use of this relationship to predict the adequacy of school funding. The whole concept of the successful schools model is based on this relationship. If there is virtually no positive correlation between expenditure per

pupil and school performance as measured by the APR score, there is no justification for using expenditure per pupil to determine adequacy.

One possible explanation for the lack of correlation between expenditure per pupil and performance on the APR is the affect of available revenues. Using data from question five, the correlation between available revenues and expenditure per pupil is actually very high,  $r(521) = .706, p < .05$ . This correlation was significant at the  $p < .05$  level. As a result, it appeared that expenditure per pupil is much more related to available revenues than performance on the APR. Using this explanation, it appears that SB 287 based the amount of funds needed on the amount of funds provided.

SB 287 also used the assumption that there is a relationship between the expenditure per pupil and the percentage of students who are economically disadvantaged as measured by the percentage on the free and reduced lunch program. This study did not attempt to answer whether the relationship exists, but rather, did this relationship exist in the data that was used in the development of the SB 287 formula. The formula utilized the percentage of students who are economically disadvantaged from the schools with perfect scores on the APR as a base line for determining adequacy. It was assumed that the average expenditure per pupil from these schools was adequate to educate the corresponding average percentage of students identified as economically disadvantaged. As a result, it is assumed that the percentage of students who are economically disadvantaged is related to expenditure per pupil.

Research question two involved the relationship between expenditure per pupil and the percentage of students who are economically disadvantaged as measured by the percentage of students on free and reduced lunches. The correlation score of .154 was

statistically significant at the  $p < .05$  level. Although the correlation was small, it was considered significant indicating that there was a small relationship between the two variables. It may be possible that the reason for any correlation between expenditure per pupil and the percent economically disadvantaged is that additional funds were provided to schools based on the number of students identified as economically disadvantaged. Thus, schools with higher numbers of students in this category would have had more to spend. This seems to be supported by the relationship between available revenues and expenditure per pupil as stated above.

A similar assumption was made for the relationship between expenditure per pupil and the percentage of students in Special Education. Research question three involved the relationship between expenditure per pupil and the percentage of students who are in special education. The correlation score of .265 indicated a small relationship between the two variables that was significant at the  $p < .05$  level. Again, it may be possible that the reason for the correlation is that schools received additional funding for students in special education. Since they have additional funds to spend, their expenditure per pupil would be higher.

Another assumption was made regarding students identified as limited English proficient. Research question four involved the relationship between expenditure per pupil and the percentage of students who are limited English proficient. The correlation score of .047 indicated a very small relationship between the two variables that was not significant.

The issue of equity was addressed by the fifth research question. The coefficient of variation and the federal range ratio were utilized to measure the level of equity in

funding. The coefficient of variation was 0.26 under the SB 380 formula. The coefficient decreased to 0.20 for the SB 287 formula, confirming that the variation in funding decreased under the new formula resulting in increased equity of funding. The score of 0.20 indicates that two-thirds of the students (plus or minus one standard deviation) are within 20 percent of the state average. The federal range ratio using SB 380 revealed a score of .83 which indicated that the revenue per student for the school district serving students at the 95<sup>th</sup> percentile is 83 percent higher than the revenue per student for the school district serving students at the 5<sup>th</sup> percentile. This ratio decreased to .47 using SB 287, meaning that the revenue per student for the school district serving students at the 95<sup>th</sup> percentile is 47 percent higher than the revenue per student for the school district serving students at the 5<sup>th</sup> percentile. As a result, the variation in funding per pupil decreased under the SB 287 formula and thus increased the equitable distribution of funding. In addition, both the federal range ratio and the coefficient of variation confirm the rejection of the null hypothesis that indicated the new foundation formula created by SB287 had no affect on improving the equitable distribution of funds to Missouri schools as compared to the old formula created by SB 380. The results indicated that the variation in the federal range ratio and the coefficient of variation decreased with the new formula as compared to the old formula, indicating that equity increased. It should be noted however, that this study assumed that the formula was fully implemented. In fact, the formula is scheduled to be phased in over a seven year period and not fully enacted until the 2012-13 school year.

It appears that it would be impossible for the formula created by SB 287 to completely erase variation in revenue per student and achieve perfect equity in funding.

This is due to several of the components of the formula including (a) the \$3.43 performance levy, (b) the hold harmless provision, (c) the dollar value modifier used to adjust for differences in the cost of wages, and (d) the additional funding for schools smaller than 350 students.

The SB 287 formula utilized a performance levy of \$3.43. The amount of deduction for local effort was based on a levy of \$3.43 regardless of what the actual levy might have been. As shown in table 4.1, over 300 school districts have a levy below \$3.43. Using the results from research question five, the average revenue per ADA for schools with a levy at \$3.43 or higher was \$7,780.92. The average revenue per ADA for schools with a levy below \$3.43 was \$6,756.24. The difference was \$1,024.68.

The concept behind the performance levy suggests that each school district should contribute a certain level of local support. However, the only way for school districts to raise the operating levy is through a vote of patrons. Many school districts would find this difficult, if not, impossible to accomplish. As a result, districts with a levy less than \$3.43 cannot receive the same amount of revenue per student as a school with a levy of \$3.43 or greater received.

School districts that would receive less state funding per weighted ADA under the SB 287 formula as compared to the state funding under the SB 380 formula are considered hold harmless. The rationale behind hold harmless was to keep school districts from receiving less state funding under the new formula as compared to the old formula. There were 181 schools in the sample that were identified as hold harmless. Using the data from research question five, the average revenue per ADA was \$7,838 for the hold harmless schools. The revenue per ADA for the non-hold harmless schools was

\$6,843.39. The difference was \$994.61. The hold harmless provision of SB 287 appeared to reduce the equitable distribution of funds.

The SB 287 formula also had a provision for differences in the cost of wages across the state. It was assumed that it cost more to educate students in some areas of the state than in others. A dollar value modifier was created to adjust the total amount needed for each school district. The dollar value modifier ranged from 1.0 to 1.1034 (Appendix A). The difference between a school with a dollar value modifier of 1.0 and a school with a dollar value modifier of 1.1034 would be 10.34 percent. It is obvious that the dollar value modifier would add to the variation in revenue across the state and as a result decrease equity.

Another factor that could affect the equitable distribution of funds is the small school payment. SB 287 provided additional funding for schools with 350 students or less. There were 173 school districts with 350 students or less included in the sample. Using the data from research question five, the average revenue per ADA for the small schools was \$7881.45. The average revenue per ADA for the remainder of the schools was \$6,844.65. The difference was \$1,036.8. The small schools provision in SB 287 also appeared to affect equity.

### *Implications*

Several issues were raised by this study. The first issue addressed the successful schools model of determining adequacy. Augenblick and Myers (2003) used the successful schools method and the professional judgment method to develop a base amount per student. They used these methods to determine the cost of educating a student and then added adjustments for the costs of educating students with certain

characteristics, i.e. special education, economically disadvantaged and limited English proficient.

The successful schools model assumes a link between accountability and education funding. However, to use the current spending of successful districts as a guide to determine funding is problematic since the relationship appears non-existent. In reality, spending is more a product of available revenue rather than performance. To base adequacy on current spending is to assume that schools are already receiving adequate funds. In essence, the amount to be provided would be based on the amount available.

The professional judgment model uses a group of professionals to determine the amount needed to educate students with certain characteristics. Resources needed to meet state and federal guidelines are identified and then costs are estimated. Adjustments are then added for students with special characteristics.

Augenblick and Myers (2003) utilized both approaches to determine adequacy. Using the successful schools model, they arrived at a cost per student of \$5,664 for the 2001-02 school year. The professional judgment model yielded an amount of \$7,832. Adjustments for Special Education, at-risk students and limited English proficient students were then added. Augenblick and Myers (2003) suggested that the difference between the two approaches was because only 69.3 percent of the students from the successful schools were actually performing at the nearing proficient or better levels. By making this speculation, they inferred that there is a relationship between the level of spending and the level of performance. They also speculated that the level of adequacy should be tied to the level of expected proficiency required by the No Child Left Behind requirements. They proposed that in 2007-08, if the expectation is to have 84.6 percent

proficiency, an adequacy target of \$7,401 is required assuming an inflationary increase of 11.7 percent (\$7,832 times .846 times 1.117). However, as this study indicated, the relationship between school performance and expenditure per pupil does not justify this proposal.

Similarly to Augenblick and Myers (2003), SB287 determines the adequacy target by identifying schools that achieved a perfect score on the APR. The adequacy target is calculated by averaging the expenditure per pupil of those schools with a perfect score and then multiplying the result by the weighted ADA. The average percentage of students who are identified as economically disadvantaged, special education, and limited English proficient from schools with a perfect APR is used as a baseline for determining the weighted ADA. If a school has a higher percentage of students in these categories, they will receive an additional weight to their ADA. The adjustment for special education was an additional 75 percent. The adjustment for economically disadvantaged students was an additional 25 percent. The adjustment for Limited English proficient was an additional 60 percent. These adjustments were made only for the numbers of students above the average percent of students in these categories from the schools identified as successful. The resulting amounts were added to the regular ADA to arrive at a weighted ADA.

The study conducted by Augenblick and Myers (2003) arrived at similar adjustments based on the professional judgment approach. They found that special education students required an additional 90 to 125 percent adjustment to the base expenditure. At-risk students required an additional 28 to 38 percent adjustment and limited English proficient students required an additional 60 percent adjustment.

If the successful schools model is utilized to establish adequacy, the use of adjustments for economically disadvantaged and special education may be justified. This study revealed that there is a small relationship between the amount spent per student and the percentage of students in these two categories. However, the use of the averages of the successful schools as a base before the adjustments are made was not supported by the results of this study. SB 287 averaged the percentages of economically disadvantaged and special education students from the schools that had a perfect score on the APR. In 2006-07, a school district with 26.5 percent free and reduced, 14.9 percent special education, and 1.1 percent limited English proficient student population would receive the base amount of funding. SB 287 makes the assumption that since these are the percentages for students from the successful schools that the base amount is adequate to provide their education. This would imply that the average amount that these schools spent was enough to provide an adequate education for the average percent of students in these categories. However, since there was little evidence of the relationship between the total score on the APR and expenditure per student, it is illogical to make this assumption. This study does not refute the validity of making an adjustment in adequacy for students in these categories, however, it does challenge the validity of the method used to determine the amount of adjustment. In reality, an adjustment should be made for all students in these categories rather than just those above the average percentages of those schools with a perfect score on the APR. The successful schools method as applied in SB 287 does not provide for a valid adjustment for students in these categories. Since SB 287 utilized the averages of the schools with a perfect score on the APR as a base and since there is no evidence of a relationship between expenditure per pupil and the APR

score, the method used in SB 287 to adjust the adequacy target for these students does not appear to be valid.

The professional judgment model appears to be a more logical approach to determining adequacy. This approach determines the amount of resources that are needed to meet state and federal guidelines and then calculates a cost of these resources. In addition, this approach analyzes the amount required to meet the needs of students with certain characteristics such as special education, economically disadvantaged, and limited English proficiency. Rather than using the amount currently spent per student as the guide for determining adequacy, the professional judgment approach reveals the amount required to provide an adequate education.

The other main issue raised by the study involves equity. The study shows that there is less variation in the distribution of funds with SB 287 than with SB 380. The SB 287 formula is greatly affected by average daily attendance, while the SB 380 formula is greatly affected by tax rate. If equity is measured by revenue per ADA, it is reasonable to accept that equity would improve with SB 287 formula. However, perfect equity using the SB 287 formula would not be attainable because of certain components of the SB 287 formula. The performance levy of \$3.43 portrays each district as receiving at least that much in local funds regardless of their actual operating levy. In order to make additional improvement in equity, either the performance levy of \$3.43 would have to be replaced by the actual levy or the state would have to provide school districts with the authority to raise their operating levies to \$3.43 without a vote of the people. Since the later option would be politically unpopular, using the actual levy to determine local effort appears to be a more acceptable option. In addition, the hold harmless component, the dollar value

modifier and the small schools provision would all add to the variability of available revenues. These components would have to be eliminated in order to achieve total equity.

### *Future Research*

This study identified several areas for future research. The first deals with determining what factors define a successful school. If the successful schools method of determining adequacy is used, more empirical research should be done to study the factors that contribute to success in schools and how they are related to expenditures. In addition, more research needs to be conducted to identify the variables that determine expenditure per pupil such as students who are economically disadvantaged, enrolled in special education, and/or limited English proficient?

If the professional judgment method of determining adequacy is to be used, more research is needed to identify the costs of meeting state and federal guidelines.

### *Summary*

The purpose of this study was to investigate the assumptions that were used in the development of the SB287 funding formula for Missouri schools. More specifically, this study reviewed the methods that the new formula used to achieve adequacy and equity of funding. It should be noted that this study does not intend to assess the actual relationship among variables in the broad sense, but rather to investigate the validity of using the data in the way that it was used in the development of SB287. For example, there may be a relationship between expenditure per pupil and school performance. However, the APR score does not appear to reflect that relationship.

The results of the correlation between expenditure per pupil and school performance as measured by the APR score were not significant for either K-8 or K-12

school districts. As a result, the use of the expenditure per pupil of the schools that had a perfect score on the APR to determine adequacy is not supported. Since the SB 287 formula is based on the relationship between these variables, it could be concluded that the new formula does not accurately determine adequacy. The professional judgment model may be a better approach to determine adequacy since it is based on needs rather than costs.

This study also investigated the use of several adjustments to adequacy utilized in the SB 287 formula. These adjustments were based on the assumptions that it cost more to educate students who were in one or more of the following categories: economically disadvantaged, special education, and percent limited English proficient. This study revealed a small relationship between the expenditure per ADA and percent economically disadvantaged and between expenditure per ADA and percent in special education. These findings may be explained by the high correlation between expenditure per pupil and revenues per pupil. In addition, this study did not find a correlation between percent limited English proficient and expenditure per ADA. This may be due to the small numbers found in this category.

There may be a justification for making adjustments for students who are economically disadvantaged or enrolled in special education, however, these adjustments should be made for all students in these categories not just those above a base percentage as in SB 287. Since there is not a relationship between expenditure per ADA and performance on the APR, it is not appropriate to use the averages for economically disadvantaged, special education and limited English proficient from those schools to determine what is adequate.

The variation in funding as measured by the federal range ratio and coefficient of variation decreased with the use of SB 287. Since the variation in equity decreased under the new formula, it can be concluded that the new formula is successful in improving equity. These results are understandable considering the change of focus from a tax rate driven formula to a formula based on Average Daily Attendance. It appeared that total equity would not be possible under the SB 287 formula because of certain components of the formula including the \$3.43 performance levy, the hold harmless provision, the dollar value modifier, and the small schools provision. It appeared that the formula would be more equitable if these components were eliminated.

The formula created by SB 287 was based on several assumptions. It assumed that there is a relationship between the scores on the Annual Performance Report and expenditure per student. It assumed that there is a relationship between expenditure per pupil and the percentage of students that have certain characteristics, i.e. special education, economically disadvantaged, and limited English proficient. Although there were small correlations between certain variables, the methods of using these assumptions to determine adequacy did not appear to be valid. In addition, the study revealed that the SB 287 formula improved equity in funding per average daily attendance although perfect equity is not possible unless certain components of the formula are removed.

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## The SB 287 Foundation Formula

### **Weighted Average Daily Attendance**

(Regular ADA + most recent summer school + adjustments for Free & Reduced, Special Education, and Limited English Proficient Students)  
(Highest of first preceding year, second preceding year or estimate of current year, but must use most recent summer school, regardless)

X

### **State Adequacy Target**

(Average Expenditures of Schools with a perfect score on the Annual Performance Report, recalculated every two years, \$6,117 for 2006-07 and 2007-08)

X

### **Dollar Value Modifier**

(Index of purchasing power based on Regional Wage Ratio, regional wage per job/state median wage per job,  $1.0 + .15(\text{regional wage ratio} - 1.0)$ , range from 1.0 to 1.1034)

Minus

### **Local Effort**

(2004 Assessed Valuation/100 X \$3.43 (Performance Levy) minus collection fees) +  
(2004-05 revenue in Incidental and Teachers Funds)

Totals

### **State Funding**

(Phased in over 7 years)

(2005-06 funding used as base to be phased-out over 7 years)  
(Other provisions: Hold-harmless districts: districts will not receive less per ADA than the 2005-06 amount, Small Schools Fund: special amount set aside for schools with less than 350 students, Classroom Trust Fund: an amount pulled out of the total funding and identified as Gaming monies)

## VITA

James L. Welker was born May 13, 1956 in Cape Girardeau, Missouri. He graduated from Jackson High School in 1974. He attended Southeast Missouri State University for two years before transferring to the University of Missouri to complete a B. S. in Agricultural Education. He taught Agricultural Education for nine and a half years at Delta R-V schools. During that time, he received a Masters in Agricultural Education from the University of Missouri. Next, he worked as a Supervisor of Agricultural Education for the Department of Elementary and Secondary Education for ten and a half years. During this time, he received a Specialist Degree in Educational Administration from Southeast Missouri State University. Next, he worked for two years as an Adult Education Coordinator at Sikeston Area Career Center. Since that time, he has been employed as Assistant Superintendent of Finance and Support Services for Jackson R-2 Schools. He is in his seventh year at Jackson.

James has received several distinctions and awards. These include the Distinguished Alumni Award from the Department of Agriculture at Southeast Missouri State University, The Outstanding Young Teacher Award and the Distinguished Service Award from the Missouri Vocational Agriculture Teachers Association, the Honorary American Degree from the National FFA Organization, the Honorary State Degree from the Missouri FFA Organization, and Cum Laude Honors Scholar from the University of Missouri.

James belongs to several professional organizations including Missouri Association of School Administrators, Missouri Association of School Business Officials, and Pi Kappa Alpha. James is a member of St. Vincent de Paul parish in Cape

Girardeau. He has been happily married to his wife, Terri, for 27 years and has three children, Matthew, Justin, and Emily.