Analysis of Fiscal Equity in Virginia: 2004 – 2020

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ABSTRACT

The following research completes several statistical analyses of per pupil expenditure data in the Commonwealth of Virginia to assess the degree of fiscal equity in the statewide finance model for public elementary and secondary education. Five years, between 2004 and 2020, were selected for analysis to examine whether trends noted in a 2005 study of fiscal equity in Virginia[1] have remained constant or whether the degree of equity has increased or decreased. A historical overview of the funding of public schools in Virginia and revisions to the Virginia Constitution and its Education Articles provide information about the development of public education in Virginia. This commentary is followed by an explanation of the current funding model, Standards of Quality formula, and legislative criticism of the design elements thereof. School finance reform litigation from across the nation is then reviewed to demonstrate how the constitutionality of state public school finance models has been challenged in both federal and state courts over time. The school finance litigation discussion begins with the broad topic of equal protection guarantees in the federal Constitution and how those guarantees shaped early equity lawsuits. A survey of school finance reform cases is presented to show a progression from equity suits to adequacy suits. The litigation commentary concludes with a discussion of the most recent school finance case in Virginia, *Scott v. Commonwealth* (1994). After establishing the precedents for the analysis of state funding models, a series of dispersion statistics are calculated based on per pupil expenditures for each of the 132 school divisions in Virginia. These statistics include Range, Restricted Range, Coefficient of Variation, Gini Coefficient, and McLoone Index. The findings of the 2004-2020 analyses are compared to the findings of the 2005 study of fiscal equity in Virginia. The noted results of the analyses have implications for policy makers in the Commonwealth.

[1] Arbogast, II, T. (2005). *An historical analysis on fiscal equity in Virginia: 1974 – 2003*

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GENERAL AUDIENCE ABSTRACT

The following research completes statistical analyses of educational spending data to assess equity in the statewide finance model for public elementary and secondary school in the Commonwealth of Virginia. Five years—2004, 2008, 2012, 2016, and 2020—were selected for analysis to examine whether trends noted in a 2005 study of fiscal equity in Virginia have continued or whether the degree of equity has increased or decreased. A historical overview of the funding of public schools in Virginia and revisions to the Virginia Constitution and its Education Articles provide information about the development of public education in Virginia. This commentary is followed by an explanation of the current funding model (the Standards of Quality formula), legislative criticism of the formula, and an overview of school finance reform litigation from across the nation. The school finance litigation discussion begins with equal protection guarantees and develops to show a progression from cases that challenge equity in funding to cases that challenge the adequacy of funding. The litigation commentary concludes with a discussion of the most recent school finance case in Virginia, *Scott v. Commonwealth* (1994). After establishing the precedents for the analysis of state funding models, a series of statistics are calculated based on per pupil expenditures for each of the 132 school divisions in Virginia. The findings of the 2004-2020 analyses are compared to the findings of the 2005 study of fiscal equity in Virginia. The noted results of the analyses have implications for policy makers in the Commonwealth.

Dedication

To my wife Renee', for her love, encouragement, support, and sacrifices along the way; to our children—Ryan, Andrew, Zoey, and Evan—for understanding the times when I had to work and for pulling me away from the work when I needed to be pulled away; and to my parents Dennis and Barbara, for a lifetime of encouragement and love. I dedicate my dissertation to each of you, with love and gratitude.

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Chapter One

Overview of Study

In 2005, Arbogast conducted a study measuring the fiscal equity in public school finance for the Commonwealth of Virginia. At the time of publication, the analysis of fiscal equity spanned the full existence of the Standards of Quality[2] (SOQ) funding formula, which is still the funding structure for Virginia's public elementary and secondary schools. Arbogast provided historical prospective on the arguments used in litigation throughout the United States when plaintiffs brought suits against states for failure to provide an equitable distribution of funds or failure to fund the minimum educational program at an adequate level (2005). In public school finance reform lawsuits, the terms equity and adequacy are closely related and are often used in connection with each other (Arbogast, 2005; *Helena Elementary School Dist. No. 1 v. State*, 1989; *Rose v. Council for Better Educ., Inc., 1989)*. Conceptually, equity refers to the degree to which the state share of educational expenditures is equalized within its funding system, and adequacy refers to whether the funding system substantially provides for a basic education for all students (Thro, 1994).

In the Arbogast study (2005), the statistics commonly used in school finance equity lawsuit were applied to expenditure data from all school divisions[3] in the Commonwealth of Virginia (Verstegen, 1996). The equity statistics—Range, Restricted Range, Coefficient of Variation, Gini Coefficient, McLoone Index, Theil Index, and a host of similar statistics—have been used in state and federal court systems to assess the fairness of funding formulae (Arbogast, 2005; Vertegen, 1996). The purpose of Arbogast's study was to determine, statistically, whether Virginia's SOQ formula had achieved fairness, or equity, in the statewide distribution of funds. Other statistical analyses, namely relationship statistics, examined how the fiscal capacity of localities had bearing on the per pupil expenditures of those localities when compared to other localities within the Commonwealth. Five years, from what had been the nearly thirty-year history[4] of the SOQ formula, were selected for analysis: fiscal years (FY) 1975, 1989, 1994, 1998, and 2003. Analyses of the expenditure data in these five years demonstrated that the SOQ formula used to fund public education in Virginia had not achieved equity since its inception in 1975 (Arbogast, 2005).

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[2] The Standards of Quality were included for the first time in the 1971 Virginia Constitution. The funding formula referred to throughout as the SOQ formula was implemented in 1975.
[3] The Commonwealth of Virginia uses the term "school division" instead of "school district"
[4] The Standards of Quality formula was first implemented in FY 1975 school year, and the Arbogast study included FY 2003 as its last selected year.

Arbogast noted that, by some measures, e. g. range, equity in spending decreased, as indicated by a growing gap between the lowest and highest per pupil expenditure levels throughout the state. More complex statistical measures—the Gini Coefficient and the Theil Index—however, indicated that equity had initially increased and later plateaued. Overall, the variance in per pupil expenditures below the median level decreased over the selected years (FY 1975 – FY 2003), and the divisions with higher fiscal capacities appeared to have drifted further away from the median (Arbogast, 2005).

A selection of equity statistics used to measure Virginia's funding model between FY 1975 and FY 2003 will be applied in the present analysis of the data for FYs 2004, 2008, 2012, 2016, and 2020. The relationship statistics to explore fiscal capacity and a locality's per pupil expenditures in the selected years will also be replicated to the greatest extent possible:[5] fiscal capacity will be represented by the Local Composite Index[6] (LCI) for each locality; per pupil expenditures will be determined by dividing reported expenditures[7] by the number of students in the school division.[8] Therefore, the present statistical analysis will examine whether the funding formula has resulted in a higher or lower degree of fiscal equity in Virginia in the intervening years by comparing per pupil expenditures and local ability to pay.

Additionally, the review of school finance court cases in Chapter 2 summarizes the approaches to litigation that have transpired in federal and state courts across the country since the 1960s. Up to 2005, at the time the Arbogast research was completed, school funding litigation had explored contentions that inequitable funding violated the federal equal protection clause, state equal protection clauses, and state education articles (Heise, 1995; Thro, 1994; U. S. Const. amend XIV). The court cases that mark these three waves of litigation are reviewed in Chapter 2 (*Robinson v. Cahill, 1973*; *Rose v. Council for Better Education, Inc., 1989*; *San Antonio v. Rodriguez, 1973*; Thro, 1994). Additionally, a survey of more recent school finance reform litigation is provided as supplemental material for the discussion of the Virginia public school finance system, which includes the Virginia equity case *Scott v. Commonwealth* (1994).

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[5] The treatment of raw data for the selected years and the application of each statistic is detailed in Chapter 3.
[6] Local Composite Index is a measure of wealth used by the Virginia Department of Education. This index is explained in Chapter 2, beginning on page ____
[7] Expenditure data reflect the recorded expenditures for each school division by source of funding, as listed in the Superintendents Annual Reports available at www.doe.virginia.gov
[8] The method for calculating adjusted current expenditures is introduced on pages 4 and 5 and is explained at length in Chapter 3.

Research Design

In earlier studies of fiscal equity in the Commonwealth of Virginia, researchers[9] found the most complete historical records of funding and expenditure data were not those that had been collected by the Virginia Department of Education (VDOE). For instance, the studies conducted by Verstegen and Salmon (2001), as well as the Arbogast (2005) study, relied on data collected by the Virginia Education Association (VEA), which analyzed data on fiscal and resource equity. However, Virginia funding and expenditure data pertaining to the prescribed time period for the current analysis (FY 2004 – FY 2020) have been collected by the VDOE and represent the official record of the data. Therefore, data collected by and available through the VDOE has been used for analysis. The data have been obtained from the Superintendent's Annual Reports available at the VDOE website.[10]

The aforementioned analysis of fiscal equity in Virginia compared data taken from five years during the first thirty years of the SOQ funding formula's lifetime (Arbogast, 2005). Fiscal year 1975 was selected as the starting point because that year marked the first time the Standards of Quality formula was used by the General Assembly to allocate funding to the public schools.[11] The analysis also used FY 1989 because that was the implementation year for recommendations from the Joint Legislative Audit and Review Commission (JLARC) to restructure the SOQ formula (Arbogast, 2005; JLARC, 1988). The remaining three years of the study—FYs 1994, 1998, 2003—were picked with a degree of convenience in terms of the availability of data[12] (Arbogast, 2005). Arbogast recommended for future studies in this area the use of predetermined intervals. To that end, the current analysis of fiscal equity in Virginia begins with FY 2004 and uses data at four-year intervals such that the subsequent years are FYs 2008, 2012, 2016, and 2020. These years are each also the first year of a biennium budget. While the former analysis was able to show trend data through each of the five selected years, the current analysis will standardize the time between each selected year to remove subjectivity from the data points.

Data pertaining to expenditures for each of Virginia's 132 school divisions[13] for each selected year are available as Microsoft Excel ("Excel") spreadsheets on the VDOE website.

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[9] e. g., Richard Salmon and Deborah Verstegen co-authored multiple papers on fiscal equity in Virginia
[10] www.doe.virginia.gov
[11] The SOQ formula was adopted in the 1971 Virginia Constitution but was not implemented until 1975.
[12] Arbogast indicated that FY 2004 was to have been included in the analysis but data for that year was not yet available, so FY 2003 was selected by default. The other selected years—FYs 1994 and 1998—were selected as "regular points in time."
[13] At the time of Arbogast's study in 2005, Virginia had 135 school divisions. An explanation of this reduction is offered in Chapter 3 in the discussion of data collection and arrangement.

These spreadsheets were copied and pasted into new workbooks so they could be sorted, filtered, and statistically analyzed in Excel. The data for each observation year is contained in Table 15 of the Superintendent's Annual Report. The VDOE reports furnish expenditure data by source of funding, including expenditures supported by local funds, state funds, state retail sales and use tax funds, and federal funds. In the interest of comparing state and local contributions, the expenditures funded by federal sources were not included in the calculations.

For each source of funding, the related expenditure data were has presented as per pupil amounts, which divide the total expenditures by funding source for each school division by the number of students in the average daily membership (ADM) for each school division. Throughout the discussion of the statistics, the inclusion of "PPE" ("per pupil expenditures") accompanies references that have been calculated by dividing total expenditure amounts by the number of students in ADM. Converting total expenditures to a per pupil amount will allow school divisions with large pupil enrollment to be compared to school divisions of a much smaller scale.[14] This mathematical procedure will allow for an *apples to apples* comparison where all expenditures are related to mathematically equivalent, singular students. The calculated PPE by funding source and other relevant data for all school divisions for each selected year are listed in Appendices A – E.

The first calculations of the school finance data will be descriptive statistics, namely the mean, median, standard deviation and minimum and maximum values, for total (aggregate) expenditures and PPE in each of the selected years. Next, the equity or dispersion statistics will be calculated. These statistics will be reported in the following order: range, restricted range, Coefficient of Variation, Gini Coefficient, and McLoone Index. The final calculations—Pearson Product-Moment Correlation and regression—will be completed to correlate fiscal capacity of school divisions (independent variable) and their respective per pupil expenditures (dependent variable).

Throughout the data collection and analyses, Excel will be used to process the data and calculate the various statistics. As some of the statistics will require several steps to calculate in Excel, descriptions of the procedures used to carry out the calculations will accompany the discussion of each statistic in Chapter 3.

The statistical analyses of expenditure data will be conducted in an effort to: (1)

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[14] In the Membership Report collected in the Superintendents' Annual Report for 2019-2020, Fairfax County reported 184,716 students in fall membership compared to the 210 students Highland County counted in fall membership. (www.doe.virginia.gov)

determine the degree to which state funding levels per division have been maintained or seen increases during the lifespan of the SOQ funding formula; (2) examine the degree of equity that has been reached; and (3) assess whether the current funding formula has achieved fiscal neutrality.

Purpose and Significance of the Study

As was evident in the research of others in this field, the SOQ formula is not without its critics, and there have been multiple attempts to address funding disparities and unresolved issues of equity throughout the forty-five year existence of the formula (JLARC, 2002; Salmon, 2010; Verstegen, 1996). As litigation throughout the nation has resulted in revisions to funding models in other states (*Rose v. Council for Better Education, Inc.,* 1989), Virginia's funding model has not gone unaddressed by the court system[15] (*Scott v. Commonwealth*, 1994). The most recent and prominent legal challenge to the Virginia funding system was *Scott v. Commonwealth* (1994), in which the Virginia Supreme Court ruled that the funding system was not a constitutional but a legislative matter. Unlike other school finance litigation at the time of *Scott*, the Virginia court was confronted with questions about the equity achieved by the model rather than the adequacy of the education provided by the model (*Rose v. Council for Better Education, Inc.,* 1989; *Scott v. Commonwealth,* 1994).

The purpose of this research is to add to the analysis of data pertaining to the school financing model for public schools in the Commonwealth of Virginia. To that end, common equity statistics will be run to assess, analyze, and provide further commentary on how the financing model has performed, in terms of providing an equitable distribution of funds, since FY 2004.

By adding another sixteen years to the original findings, this analysis seeks to determine whether the trends established up to 2003 have remained true or whether the SOQ model has, through adjustments to its components, provided more fiscal neutrality over time. An interesting note pertaining to the collection period of data is that during the current span of years, the state and nation endured an economic downturn rivaled only by the Great Depression of the 1930s (Salmon & Alexander, 2018). In 2007 the United States entered the Great Recession and began to recover in 2009. The economic strife felt throughout the nation had a perceptible impact on

[15] While the court system has not initiated adjustments to the formula, several adjustments have been made by Virginia's General Assembly.

the funding of public education, and the literature reviewed herein shows how the recession had an effect on funding equity.

Limitations and Delimitations

To provide a historical context for the findings, a number of sources were examined to gain insight on the development of the public school financing model used in the Commonwealth of Virginia. Detailed histories of early attempts to establish free public education[16] and of the Virginia Literary Fund[17] provided insight on how social and economic pressures have acted upon school finance in Virginia from the Colonial Period through the 1900s. The work of Salmon and Alexander (2018)[18] has also detailed the changes in the mechanics of Virginia's funding model. Accordingly, material here is designed to show how school finance in Virginia has developed over time, how pressures within and beyond the Commonwealth have imparted changes on the funding model, and how effectively the model has been able to maintain or achieve fiscal neutrality. In other words, the research undertaken here questions whether Virginia's funding model has been adjusted appropriately to maintain a commendable degree of equity since the inception of the model. Therefore, a limitation of this study is that its findings are not generalizable to other states, even where those states may have similar constitutional provisions for the distribution of funds.

There are national collections of data to show Virginia's ranking among the states in terms of wealth, teacher pay, and per pupil expenditures. According to a five-year survey of the U. S. Census Bureau (2014-2018), Virginia ranked 9th in average household income when compared to the other 49 states, the District of Columbia, and Puerto Rico. Virginia's average household income for this period was $71,564, and the average for all entries during this period was $59,843. Based on the U. S. Census Bureau of median household income data from 2017, Virginia ranked 9th overall with an average household income of $73,535. Despite the limitations of only looking at this particular measure of wealth to rank the states and U.S. Territories, one can fairly judge Virginia's fiscal capacity to be in the top ten in the nation.

This has not, however, had a direct correlation to the amount of dollars that are spent on education annually in Virginia. According to the National Education Association (NEA), the current per pupil expenditures (in fall enrollment) for Virginia were $12,197 in FY 2018 and

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[16] R. A. Meade (1941). *A history of constitutional provisions for education in Virginia*.
[17] F. G. Mullins (2001). *A history of the Literary Fund as a funding source for free public education in the Commonwealth of Virginia*.
[18] R. G. Salmon, M. D. Alexander (2018). *Taking the mystery out of Virginia school finance.*

$12,118 in FY 2019, which ranked 23rd and 25th in the nation respectively (2020). Virginia has consistently ranked in the second quartile for average state-wide per pupil expenditures when compared to the other 49 states and the District of Columbia between the years 2004 and 2016 (National Science Foundation, 2020). In 2008, Virginia ranked 17th in the nation by this measure with $10,664 in expenditures per pupil compared to a national average of $10,249. This was the highest ranking for the Commonwealth in the selected years. In the same time period (2004-2016), Virginia twice ranked 24th among the rest of the states and the District of Columbia. In terms of the percentage of school divisions in Virginia that have per pupil expenditures at or above the national average, only 70.3% of Virginia school divisions met this mark, which ranked 15th in the nation (Quality Counts, 2020).

The NEA data regarding average teacher salaries shows Virginia ranked 28th in 2017-2018 and 33rd in 2018-2019 with average salaries of $53,091 and $53,267 compared to the national averages of $60,768 and $62,304 in the same two years (NEA, 2020). Although the argument can be made that teachers' salaries have decreased in constant dollars since FY 2000 across the nation—the NEA reported a 1.6% decrease nationally from FY 2000 to FY 2017—Virginia's teachers have seen a decrease of 8.1% in that time (Snyder, deBrey, & Dillow, 2019).

This analysis of school funding equity did not, however, set out to compare Virginia's current expenditures or teachers' salaries to other states in the nation. Instead, the intention of this research is to focus on the distribution of educational funding throughout the Commonwealth. Through the application of selected equity statistics, this approach to school finance in Virginia has built upon earlier findings related to fiscal equity and does not argue whether the SOQ formula provides for adequate levels of funding throughout the Commonwealth.

Organization of the Study

The remainder of the study will be comprised of four chapters, a list of references, and appendices. Chapter 2 contains an Introduction, a two-part Review of Literature, and a Summary. The Part One of the Review of Literature provides historical perspective on the legislative development of public education and its funding in the Commonwealth of Virginia. Part Two reviews school finance reform court cases to show how litigation in these matters has evolved over time and has imparted changes on state finance models for public education. The discussion of the school finance reform litigation follows the three waves approach advanced by Thro (1994). Chapter 3 describes the methodology and provides explanations of the dispersion

and relationship statistics that are used in the analysis school expenditures. Chapter 4 will share the results of the statistical calculations accompanied charts that isolate various statistical summaries. The final chapter will provide an explanation of what the findings indicate and draw comparisons to the findings of the 2005 study. Chapter 5 will also discuss policy recommendations based on the statistical results and recommendations for future studies in fiscal equity. Data appearing in Appendices A – E includes the expenditure data for the all school divisions (separated by funding source) and other relevant data for the selected years. Appendix F includes a survey of litigation in school finance reform.

Chapter Two

Review of Literature

Over the past sixty years, Virginia and almost all other states[19] have faced legal challenges regarding the funding structures for their public schools (Escue, Thro, & Wood, 2011). Efforts to address flawed public school finance models look both at funding circumstances in a particular state and at constitutional provisions in that state and in others. This Review of Literature develops in two parts. Part One will provide background information pertaining to the development of public schools in Virginia, the funding model that supports the system of education, and commentary on the Standards of Quality (SOQ) funding model. Part Two will discuss the relationship between the federal and state constitutions and school funding in terms of equal protection guarantees and claims that states have fallen short of meeting the educational requirements in their own constitutions. Part Two will survey equity suits and adequacy suits, highlighting certain cases that are representative of the three waves of litigation that have focused on school finance reform and concluding with a discussion of *Scott v. Commonwealth* (1994), the significant equity suit in Virginia.

Part One – History of School Finance and Constitutional Provisions in Virginia

Literature regarding the first public schools in Virginia has been reviewed to establish a starting place for understanding how both funding and legislation in the Commonwealth have transformed education in the past two and a half centuries. The funding history has been summarized to highlight the legislative actions that have left indelible impressions on what is now the current funding model, the Standards of Quality (SOQ) model. The overview pertaining to the development of the SOQ model also gained perspective from quantitative analyses of the public school allocations and disbursements at various times in the past fifty years. These analyses have been used to provide commentary on the relative success of the SOQ model to provide equitable funding for public schools since its inception in the early 1970s.

Education Funding in Virginia Prior to the Standards of Quality Formula

The history of free public education in Virginia began to take shape with the 1784 bill entitled “General Diffusion of Knowledge” (Meade, 1941). This bill proposed that education should be available not only to the wealthy landowners but also to the common, or the poor,

[19] According to SchoolFunding.Info, there have been no court decisions on this matter in Delaware, Hawaii, Iowa, Nevada, and Utah. (www.schoolfunding.info) Retrieved December 2020.

residents of Virginia. Thomas Jefferson's plan for funding free public schools, as expressed in the bill, would have shared the burden to fund "common" schools among all people in a locality. Twelve years later, an act was passed to establish public schools.[20] The act did not, however, create a mandate for free public schools—as Jefferson had urged—but instead made free public schools permissible, such that the magistrates of county courts could decide whether to establish schools in their counties. Jefferson opined that leaving the decision for schools in hands of the local courts would all but guarantee that there would be no free public education (Meade). Jefferson further stated that the "wealthy members of counties" would see local taxation as a "plan to educate the poor at the expense of the rich" (as quoted in Meade, 1941).

In the early 1800s, as the need for common schools became more popular, a succession of governors including Monroe, Cabell, and Tyler each tried to rally legislative support for state funding to aid public schools (Mullins, 2001). Governor Tyler eventually succeeded in getting the Virginia General Assembly to create the Virginia Literary Fund in 1810 (Mullins, 2001; Salmon & Alexander, 2018). Prior to the establishment of this fund, there was virtually no appropriation of state funds to localities for education (Mullins, 2001; Salmon & Alexander, 2018). The Virginia Literary Fund and other revenue sources, such as private lotteries, endowments, and various taxes, were generally unable to provide sufficient funding for a growing educational system and ultimately rendered education an opportunity afforded to some but not all Virginians (Meade, 1941; Mullins, 2001).

During the first half of the 1800s, the concept of free schools led further away from Jefferson's urging to leave control of schools to the localities. The District Free Schools Act of 1829, for instance, gave more power and control to state officials but lacked local taxation, which left the state funding inadequate to support the education system (Meade, 1941; Mullins, 2001). Therefore, the act did not succeed at establishing a mandatory system of schools because it still relied on uncooperative localities to levy local taxes. Henry Ruffner outlined a system of county schools monitored by a state superintendent of public instruction (Meade, 1941). The proposed system would require sufficient local taxes to be paired with revenue from the Literary Fund to support the cost of educating all, the rich and the poor. Ruffner's proposal and several others failed to pass in the legislature, and localities were still not compelled to levy taxes to support the common schools (Meade, 1941; Mullins, 2001).

[20] "An Act to establish public schools" was passed by the General Assembly on December 22, 1976

Between 1842 and the Civil War, there were attempts to create county and district systems of education, but each of these attempts still contained provisions that counties would need to put to a vote whether to subscribe to a plan for electing a county superintendent and establishing local taxes to supplement the revenue from the Literary Fund (Meade, 1941). In essence, these attempts fell short of creating a mandatory system of education in the commonwealth. The constitutional convention that followed the end of the Civil War, however, did result in the creation of a mandatory system of education (Virginia Constitution, 1869). The question of how to fund free public education was debated throughout the convention and eventually came to rely on investments from the Literary Fund, a capitation tax, and a statewide property tax (Meade, 1941; Mullins, 2001; Salmon & Alexander, 2018). For the next thirty years, this model resulted in funds for public education to be provided at nearly even amounts shared between the state and the localities, with the state level of funding exceeding local funding (Salmon & Alexander, 2018). However, post-war debts that had to be paid had a crippling effect on the funding of public schools (Mullins, 2001).

The system of funding public free education in the early 1900s could not keep pace with the increase in the population, and the Literary Fund was repurposed and became a fund for building schools (Mullins, 2001; Salmon & Alexander, 2018). The General Assembly gave local governing bodies the ability to increase the taxes levied upon residents and sought to increase the proportion of property taxes that could be dedicated to the purpose of the statewide system of schools (Meade, 1941; Mullins, 2001). While up to this point, the state's contribution had been slightly greater than the fiscal support generated through local taxation on a statewide scale, the state's share in the cost of education began to represent a smaller percentage of the total after the turn of the century (Salmon, 2010). By the 1920s, the state contribution was approximately 25% of the total cost and remained there into the 1930s. As there was no federal funding available at this point, the balance of the cost had to be funded through local taxation. Just as is the case today, so was true in the middle of the twentieth century: low levels of contributions from state funding and high levels of contributions of local funding resulted in widespread disparity according to the fiscal capacity of each locality. In other words, localities with higher property values had greater taxes bases and therefore had the ability to generate more revenue for the operation of their local school systems.

In response to this inequity, Virginia, like many states, instituted a fixed foundation funding model in the 1930s, based on the Strayer-Haig model for equalization in funding (Alexander, Salmon, & Alexander, 2015; Hickrod & Hubbard, 1968; Salmon & Alexander,

2018). The fixed foundation model essentially determines the minimum cost per pupil as one factor in the minimum cost of education and multiplies that factor by the number of students in a school district. This amount is then adjusted by a qualifying tax rate and assessed valuation of property. In Virginia, this became the basis for the Basic State School Fund (Salmon & Alexander, 2018). The remainder of the minimum cost becomes the share for which the locality is responsible, known as Local Required Effort (LRE).

The minimum foundation program, in various shapes and forms, still survives in many states across the nation (Alexander, Salmon, & Alexander, 2015). The application of the minimum foundation program resulted in an increase in the percentage of state contributions towards the total cost of education but failed to eliminated the disparity that resulted from high fiscal capacity localities' ability to fund their schools well-above the state minimum cost of education (Salmon, 2010). In general, minimum foundation programs are able to equalize the state distribution of funds, but variance in localities' ability to voluntarily supplement the funding of minimum standards allows property-rich divisions to spend a great deal more per pupil than their property-poor counterparts (Delja, 2004; Thro, 1989).

With the implementation of the minimum foundation program, the Basic State School Fund, there was an appreciable increase in the percentage of total funding that came from state generated revenue (Salmon & Alexander, 2018). Reports of expenditure data collected by the Virginia Department of Education for the first year of each decade between 1920 and 1970 show that state funding increased from approximately 25% of the total in 1920-21 to between 33% and 36% of the total cost in the years between 1940 and 1960 (as cited in Salmon & Alexander, 2018).

When the Virginia Constitution was revised again in 1971, the matter of funding was addressed in section 2 of the Education Article. It is in this section that the Standards of Quality (SOQ) began to appear as way of implementing the educational clause in section 1. The SOQ formula is the current model for funding public schools in Virginia, and a more detailed discussion of that formula is found in a later section in Part One of this chapter.

With the implementation of the SOQ formula, the level of equity in state funding improved for nearly twenty years, between 1975 and 1994, and then the improvement seemed to trail off heading into the early 2000s (Driscoll & Salmon, 2008). Along the way, however, there has been demand for the General Assembly to fully fund the SOQs (JLARC, 2002). In the current model, the state share of the statewide cost of funding the minimum educational program is set at 55% and localities pay the remaining 45% (JLARC, 2002; Salmon & Alexander, 2018).

The cost of the minimal program does not take into account capital costs that school divisions incur. When these costs are added to the operational costs, the state share of the total cost drops to 40% (JLARC, 2002).

Through the first two decades of the 2000s, Virginia has seen periods of economic decline and growth. The most notable decline was felt during the Great Recession, which began in 2007. Even though the economy has made a full recovery, several taxes that were reduced during the economic recovery have prevented needed revenue from flowing back into Virginia's public schools (Salmon & Alexander, 2018). Furthermore, recession-era reductions in the number of non-instructional support positions and the elimination of other operational expenses funded through the SOQ have resulted in a funding model that does not truly reflect the reality of cost of education (Duncombe & Cassidy, 2016).

Constitutional Conventions and Revisions to the Virginia Constitution

Prior to the Virginia Constitution of 1868, various pieces of legislation had attempted to enact a system of free public schools (Meade, 1941; Mullins, 2001). Legislation of this type was permissive of schools but did not mandate their establishment (Meade). The Virginia Constitution of 1868, however, did call for a uniform system of public free schools (Meade). This section will provide a background of the constitutional conventions and changes to public education in Virginia, beginning with the convention that produced the constitution of 1868 and ending with the current constitution, adopted in 1971.

After the Civil War, a constitutional convention began in Richmond in 1867 and was dominated by the opinions of the Radical Republicans who sought to extend equal political rights to all men and establish a system of common schools (Meade, 1941). In the 1868 Virginia Constitution, the General Assembly enacted an article to provide for the first time a mandatory and universal free public education. Specifically, Article VIII of that constitution provided as follows:

> The general assembly shall provide by law, at its first session under this constitution, a uniform system of public free schools, and for its gradual, equal, and full introduction in all the counties of the state by the year eighteen hundred and seventy-six, or as much earlier as practicable. (Virginia Constitution, 1868)

The Radical Republicans seemed to be a driving force during the convention, making a free system of education a foregone conclusion from the outset of the convention; however, this sentiment had long been felt in Virginia even prior to the Civil War (Meade, 1941).

In 1902, the Virginia Constitution was revised and adopted education article section 129 (Moore, 1971). This section, continuing the intention of the 1868 convention, stated that "[t]he General Assembly shall establish and maintain an efficient system of public free schools throughout the State" (Virginia Constitution, 1902). One of the more notable changes was a prohibition of "mixed schools," or schools where black and white children were educated together, which, unfortunately, was indicative of the state of the politics at time. Virginia public schools were not fully compelled to integrate until the 1971 Virginia Constitution (Delja, 2004; Virginia Constitution).[21]

To this point, in a period of approximately 130 years dating back to Thomas Jefferson's proposals for a General Diffusion of Knowledge, Virginia had gone from being a commonwealth where only the wealthy were educated, at their own expense, with no system of free education for the poor and certainly no provision for the education of non-white children to one where the state was constitutionally required to fund some aspect of a mandatory free and uniform public education for all citizens, with no distinction of color. The education article of the constitution had established limits for statewide property taxes to be spent on education, but there was no articulation of what the state had to contribute to free public schools across the state.

The constitution of 1971 gave great attention to the Education Articles that had been in existence since the 1868 convention. Section 1 of these Articles, as revised in 1971, reads as follows:

> The General Assembly shall provide for a system of free public elementary and secondary schools for all children of school age throughout the Commonwealth, and shall seek to ensure that an educational program of high quality is established and continually maintained. (Virginia Constitution).

This provision had previously been situated in section 129 of the 1902 constitution, which stated "[t]he General Assembly shall establish and maintain an efficient system of public free schools throughout the State" (Moore, 1971; Virginia Constitution, 1902). The difference in the language between the 1971 and the 1902 Constitutions shows a change from the establishment and maintenance of an "efficient system" of schools to ensuring the establishment and maintenance of "an educational program of high quality."

Much debate had ensued regarding section 129—whether it compelled localities to fund a portion of the cost of education, and what was meant by an "efficient" system of schools in the

[21] The Virginia Constitution, prior to 1971, had not required the operation of schools in all localities, thereby allowing localities to close, rather than integrate, public schools.

1960s (*Burruss v. Wilkerson*, 1968; Moore, 1971). These matters were to be addressed in the 1971 Virginia Constitution, which was written with an awareness of court rulings in public education such as in *Serrano v. Priest* (1971) in California and *Burruss v. Wilkerson* (1968) in Virginia (Delja, 2004; Moore, 1971; Salmon & Alexander, 2018). In particular, the words "seek to" were added to section 1 of the proposal that had been furnished by the Commission on Constitutional Revision (the "Commission") (Delja, 2004; Moore, 1971; Salmon & Alexander, 2018; Virginia Constitution, 1971). In its proposed language, the Commission had stated that the General Assembly "shall ensure that an educational program of high quality is established and maintained" (as quoted in Moore, 1971). Governor Mills Godwin, however, insisted that the Education Article read that the General Assembly "shall *seek to* ensure that an educational program of high quality is established and maintained" (emphasis added), and the added words were approved by both the House and Senate Education Committees (Delja, 2004; Moore, 1971; Salmon & Alexander, 2018). The effect of the addition of "seek to" has lessened the commitment required of the General Assembly and provided the article its own defense from lawsuits that would challenge the constitutionality of Virginia's funding system (Delja, 2004; Moore, 1971; Salmon & Alexander, 2018; *Scott v. Commonwealth*, 1994). Additionally, assigning the responsibility to establish and maintain high quality educational programs to the General Assembly left practically no room for any judiciary body to impose its own conditions upon education in the Commonwealth or to impose upon the General Assembly any definition of "high quality" (Moore, 1971; *Scott v. Commonwealth*, 1994).

The 1971 Virginia Constitution is the current state constitution. It requires, in Article VIII, section 1, the Board of Education to establish and maintain a system of high quality education. In section 2, the Board of Education is given authority to determine the Standards of Quality (SOQ), and the General Assembly is given the authority to determine the "manner in which funds are to be provided" for the high quality educational program (Virginia Constitution, article VIII, sections 1 and 2). The actual standards that address instructional programs, personnel, accreditation and evaluation, student achievement and graduation requirements, teacher quality and educational leadership, planning and public involvement, and school board policies are found in the Code of Virginia, §22.1-253.13:1-13:9.

Funding through the Standards of Quality

The responsibility for funding the standards was addressed in Article VIII, Education, section 2. It is in this section that the SOQ began to appear as way of implementing the clause in section 1. Section 2 states:

> Standards of quality for the several divisions shall be determined and prescribed from time to time by the Board of Education, subject to revision only by the General Assembly. The General Assembly shall determine the manner in which funds are to be provided for the cost of maintaining an educational program meeting the prescribed standards of quality, and shall provide for the apportionment of the cost of such program between the Commonwealth and the local units of government comprising such school divisions. Each unit of local government shall provide its portion of such cost by local taxes or from other available funds. (Virginia Constitution, article VIII, section 2).

The "manner in which funds are to be provided" referred to the development of the Standards of Quality (SOQ) funding formula (Virginia Constitution, 1971). Funding for public elementary and secondary school divisions in Virginia comes from a combination of federal, state, and local sources of revenue. Of these, the federal funds are the smallest contribution, generally accounting for only 6.4% – 10.4% of the total funding[22] (Commonwealth Institute, 2019; Salmon & Alexander, 2018). The remaining state and local funding components can be separated into three categories: state flat grants, mandatory state and local funding (foundation program), and voluntary local funding, or local leeway. This section will expand upon the state and local funding components of the funding model, calling attention to what is required by the SOQ and what mechanisms are in place to equalize the cost to localities, namely the Local Composite Index (LCI).

State flat grants provide categorical aid to school divisions for a number of programs and needs including special education, vocational education, gifted and talented, alternative education programs, homebound instruction, and others. These programs target needs of student populations and represent costs beyond the SOQ requirements (Salmon & Alexander, 2018).

Other funding is provided through the foundation program, which with the Virginia Constitution of 1971 transformed from the Basic State School Fund into Basic State Aid (Salmon & Alexander, 2018; Virginia Constitution). The foundation program is equalized through a

[22] Salmon and Alexander present a table of selected years between 2007 and 2017 and indicate that the percentage of federal sources of revenue/expenditure fluctuates between a low of 6.4% in 2009 and a high of 10.4% in 2011. The Commonwealth Institute indicates the federal share of funding for 2017-2018 was 6.9%.

measure of local ability to pay called the local composite index (LCI). The index is used to determine what portion of the total cost of the SOQ is the responsibility of the State and what is the Local Required Effort (LRE), or the responsibility of the locality. An over-reliance on property valuation had been criticized in *Burruss v. Wilkerson* (1968) (Salmon & Alexander, 2018). The LCI is a three-part measure of wealth that merges True Valuation of Real and Public Service Corporations (TV); Adjusted Gross Income (AGI); and Taxable Retail Sales Receipts (TRS); therefore, the statewide measure of wealth no longer relies as heavily on property valuation (Salmon & Alexander, 2018). The components of the LCI are represented as a formula in Figure 1. Weights are applied to each of the three measures of wealth: True Valuation of Real and Public Service Corporations (TV); Adjusted Gross Income (AGI); and Taxable Retail Sales Receipts (TRS) (Salmon & Alexander, 2018). These calculations are completed twice, once for the ADM component and once for the state population component (as shown in Figure 1). The two components are then weighted—66.67% for the ADM component and 33.33% for the population component—and added together. The sum of these weighted components is then multiplied by .4500, which mathematically sets the average statewide contribution of local expenditures for SOQ programs at 45%. As the indices differ according to input data for each locality, the output LCI calculations vary from school division to school division and represent differences in local ability to pay. Localities with low fiscal capacities have LCIs hovering close to .2000, which means the local share of the cost, or Local Required Effort (LRE) of the SOQ is 20% and the state share of the cost is 80%. Localities at the other end of the spectrum with high fiscal capacities have LCIs calculated above 1.000. However, to ensure that the state provides some level of funding to all school divisions and thereby retain some level of political support from the most affluent communities, the upper-end LCIs are capped at .8000, which compels the state to pay 20% of the cost of the SOQ for these school divisions.

The LCI is an attempt to equalize the cost of the foundation program, providing low-fiscal capacity school divisions with a higher percentage of state aid and vice versa. The General Assembly appropriates the state funds to school divisions after applying LCI to the total amount, withholding the Sales Tax revenue (Salmon & Alexander, 2018).

Figure 1

Local Composite Index (LCI)

ADM Component

$$.5\left[\frac{\text{Local True Values / Division ADM}}{\text{State True Values / State ADM}}\right] + .4\left[\frac{\text{Local Adjusted Gross Income / Division ADM}}{\text{State Adjusted Gross Income / State ADM}}\right] + .1\left[\frac{\text{Local Taxable Retail Sales / Division ADM}}{\text{State Taxable Retail Sales / State ADM}}\right]$$

Population Component

$$.5\left[\frac{\text{Local True Values / Local Population}}{\text{State True Values / State Population}}\right] + .4\left[\frac{\text{Local Adjusted Gross Income / Local Population}}{\text{State Adjusted Gross Income / State Population}}\right] + .1\left[\frac{\text{Local Taxable Retail Sales / Local Population}}{\text{State Taxable Retail Sales / State Population}}\right]$$

LCI = ((0.6667 x ADM Component + (0.3333 x Population Component)) x 0.4500)

Adapted from "*Overview of K-12 Education Funding in Virginia (Direct Aid to Public Education Budget)" by K. Dickey, 2013. VDOE.*

To determine the cost of funding the SOQ, the General Assembly has set staffing requirements to meet the minimum educational program established for the state. The SOQ formula was designed to calculate a cost for instructional personnel per 1,000 students in a school division's average daily attendance[23] (ADA). In 1972, the Instructional Cost Commission recommended a change from the use of ADA to the use of average daily membership[24] (ADM). The intention behind this change in calculation was to increase the state portion of the shared cost of funding the SOQ and thereby reduce the burden on localities (Instructional Cost Commission, 1972). At the time of its implementation, the SOQ calculated that a minimum educational program required 59.5 instructional positions per 1,000 pupils in a school division's ADM[25] (Code of Virginia; JARC, 1986) Because local school divisions had control over the salaries that could be offered and there was wide variance in these salaries across the state, there was considerable difficulty determining a fair projection of the cost for each school division to

[23] Average Daily Attendance (ADA) is defined as the aggregate number of days of attendance of all students in a school year divided by the total number of instructional days

[24] Average Daily Membership (ADM) is defined as the aggregate number of days of membership of all student in a school year divided by the total number of instructional days

[25] For 1,000 students, the SOQ requires 57 instructional positions and 2.5 additional positions for remedial education and gifted and talented education.

meet the staffing standards.

The SOQ staffing requirements for administrative and non-instructional support personnel are established in the Code of Virginia (§22.1-253.13:1-13:9). For these positions and the cost associated with them, the General Assembly uses a calculation of prevailing costs to determine how much funding to provide a given school division, based on the number of students in membership at each school in the division (Salmon & Alexander, 2018).

In its current form, the SOQ programs include funds for several accounts, the largest being Basic State Aid (Salmon & Alexander, 2018). The General Assembly authorizes the disbursement of funds for Basic State Aid, textbooks, vocational and gifted education, and Special Education as well as several other accounts. The total amount of these accounts distributed to a school division is based on a per pupil cost and multiplied by the number of students in the school division's ADM. The retail sales and use tax revenue is then added back into the SOQ Programs account. Other programs—Incentive Programs, Categorical Programs, Lottery-Funded Programs, and State Grants—are included in the total funding from the State, and some of the programs also require local effort in an amount determined by the LCI.

After the provision of state flat grants based on the needs of student populations and the provision of state aid through a foundation program (equalized by the LCI), there is one remaining part of the funding equation that allows disparate levels of funding to practically obliterate the equity safeguarded through the flat grants and state equalization program. This remaining element is local leeway, which is the ability of a locality to supply additional funding for their schools beyond what is required by the SOQ (Salmon & Alexander, 2018). As is seen in a number of equity suits in Part Two of this chapter, the fiscal capacity of localities determines how much local revenue is generated and available for school expenditures. When there is great variance in fiscal capacity or local effort from one locality to another, disparate levels of funding will exist (*Burruss v. Wilkerson*, 1968; Delja, 2004; *San Antonio Independent School District v. Rodriguez*, 1973; *Scott v. Commonwealth*, 1994; Thro, 1989). Evidence of this disparity can be seen in the per pupil expenditure amounts throughout the state.[26]

Joint Legislative Review and Audit Commission Reports

In Virginia between the mid-1980s and the early 2000s, the Joint Legislative Audit and Review Commission (JLARC) submitted three reports to the governor and General Assembly

[26] Appendices A – E list the Virginia school divisions local, state, and total per pupil expenditures and local composite indices for reference.

regarding the SOQ funding formula. By the time of the first report, the SOQ had been in place for more than a decade, and the data showed the State's share of total expenditures for elementary and secondary education had increased from 35.3% in the mid-1970s to over 44% in the mid-1980s (Superintendents' Annual Reports as cited in Salmon & Alexander, 2018). However, the JLARC reports indicated that the Virginia General Assembly was still unable to fund the SOQ sufficiently. The first report,[27] in 1986, estimated that an additional $161.4 million was needed in general fund appropriations to sufficiently fund the SOQ in the 1986-1988 biennium budget.

For this reason, the JLARC report also suggested the use of the "prevailing cost" to determine the cost of fully funding the SOQ. Prevailing cost used the expenditure levels for instructional salaries around which most school divisions tended to cluster when all salaries for all divisions were compiled (JLARC, 1986; Salmon & Alexander, 2018). Then a linear weighted average was used to determine the prevailing salaries throughout the state. Data from this exercise showed that the State provided 64.5% of what was needed to meet the SOQ (JLARC, 1986).

The second JLARC report,[28] in 1988, discussed among its primary concerns pupil equity and tax equity. These concerns were reflective of the court cases being litigated elsewhere in the nation in the 1970s and early 1980s, such as *Robinson v. Cahill* (1973) and *Pauley v. Bailey* (1979). Regarding tax equity, the report advanced the position that the Commonwealth should strive to ensure that differences in tax efforts and general resources required to pay the cost of education should not vary greatly across the Commonwealth. In other words, the Commonwealth should be sensitive to varying abilities to pay and should equalize this cost. To this end, the joint commission sought to answer whether the calculations for the cost of the SOQ and the apportionment of state funds could be more sensitive to local conditions and if the Commonwealth was able to compensate for such disparities in local ability-to-pay (JLARC, 1988). The joint commission concluded that Virginia's funding system, when properly calculating the multiple wealth indicators, does in fact provide for an equitable distribution of state funding. However, the commission also concluded that the General Assembly could do more to equalize the disparities being felt across the state (JLARC, 1988).

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[27] JLARC (1986). *Funding the Standards of Quality – Part 1: Assessing SOQ Costs*. Richmond, VA: Commonwealth of Virginia.
[28] JLARC (1988). *Funding the Standards of Quality – Part 2: SOQ Costs and Distribution*. Richmond, VA: Commonwealth of Virginia.

Research in the field of fiscal equity in Virginia[29] has demonstrated a conclusion similar to what was reported in the third JLARC report on funding the SOQ in 2002:[30] The Commonwealth is funding only 40% (instead of the 55% indicated by policy since 1993) of the cost of the SOQ, leaving localities to question whether the State is an equal partner in education (JLARC, 2002). This imbalance in funding indicated two concerns: one, the method for estimating the cost of SOQ programs required revision; and two, escalating local cost for programs beyond the minimum educational program prescribed by the state indicates a need for additional state funding. In order to fund the SOQ at the 55% level at the time of the JLARC report, the state would have needed to add over $480 million to the education budget in FY 2003 and $580 million in FY 2004.

The 2002 report furnished seven findings, several of which urged the General Assembly to assess whether the methodology used to determine staffing needs and funding levels in the 1980s and 1990s continued to be a good fit in the 2000s (JLARC, 2002). The report roundly criticized the state for failing to adjust the funding model through the years and noted that the state's failure to fund the SOQ sufficiently was perpetuating the disparities that result from local effort when local ability-to-pay varies widely across the Commonwealth (JLARC, 2002). The commission also included recommendations to continue to equalize state funding through the LCI but to consider changes to the index that would more appropriately adjust for population density and the weight given to each measure of wealth (JLARC, 2002). According to Salmon and Alexander (2018), the report fell on deaf ears. Beginning with the 2003 Session, JLARC has furnished annual reports on state spending. These reports are a fraction of the size of the 2002 report and generally present spending data without recommendations for increasing funding levels.

Part Two – Litigation of School Finance

Since the late 1960s, public school finance reform challenges have argued the constitutionality of state funding models in the courts with varying outcomes (Escue, Thro, & Wood, 2011). These challenges have created an extensive body of litigation that has been characterized as having come in three waves based upon the constitutional provisions that have been at the center of the claims (Thro, 1994). Cases in the first wave were equality suits, arguing

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[29] L. G. Driscoll and R. G. Salmon, *An Analysis of the Fiscal Equity Achieved by the Virginia System for Financing Public Elementary and Secondary Education, Selected Fiscal Years, 1975 to 2003* (Richmond: Virginia Education Association, 2005)

[30] JLARC (2002). *Review of Elementary and Secondary School Funding* (Richmond, VA: Commonwealth of Virginia)

the disparity in funding created by school finance models violated federal equal protection clauses of the U. S. Constitution (*San Antonio Independent School Dist*rict *v. Rodriguez*, 1973; *Serrano v. Priest*, 1971; Thro, 1994; Verstegen & Whitney, 1997). In a similar manner, the cases that marked the second wave of litigation challenged equality clauses of state constitutions and the education articles of state constitutions (*Horton v. Meskill*, 1977; *Pauley v. Bailey*, 1979; *Robinson v. Cahill*, 1973; *Washakie County School Dist. No. 1 v. Herschler*, 1980). Cases in the third wave have argued that state funding models have failed to fund adequately the minimum standards set forth in education articles of state constitutions (*Edgewood Indep. Sch. Dist. v. Kirby*, 1989; *Gannon v. State*, 2014; *Montoy v. State*, 2005; *Rose v. Council for Better Educ., Inc*., 1989; Thro, 1994). The second part of this Review of Literature will discuss equal protection in both the federal and state constitutions and then follow with an overview of the litigation that represents the three waves of school finance reform efforts in the nation.

Equal Protection and Education

Equal protection claims, or equality suits, in school finance reform court cases comprise the first wave of litigation, which was argued in federal courts. This section will discuss legal strategies behind these challenges and their basis in the equal protection guarantees of the U. S. Constitution. The purpose of this section is to illustrate the broad topic of equal protection as a means for school finance reformers to argue against the constitutionality of school funding models. The discussion will also briefly explain the judicial standard of review for federal equal protection in the context of education.

The United States Constitution and the United States Supreme Court have had an undeniable effect on the present state of public school funding litigation as a result of rulings at the nexus of the equal protection clause of the Fourteenth Amendment and education. This effect has been like that of a bell rung loudly at two key moments—in the Court's decision in *Brown v. Board of Education of Topeka* (1954) and in *San Antonio Independent School District v. Rodriguez* (1973).[31] Several commentators on public school law have noted the federal Constitution makes no mention of education (Alexander & Alexander, 2012; Salmon & Alexander, 2018; U. S. Const.). As provided by the Tenth Amendment, the matter of education has been left to the states and to the people (U. S. Const. amend. X). Or, more in keeping with the wording of the Tenth Amendment, the matter of education has not been delegated to the federal government by the federal Constitution and therefore, the authority to legislate education

[31] *San Antonio Independent School District v. Rodriguez* (1973) is reviewed in the next section of this chapter.

inherently belongs to the states and to the people (Alexander & Alexander, 2012). The Tenth Amendment provides that "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the People" (U. S. Const. amend. X). That is, unless there is a claim that the policy or regulation in question violates the U. S. Constitution, litigation of education-related challenges must be directed at the state constitution. The current position of the Supreme Court, in this respect, has been to refrain from ruling on matters of education that belong to the states unless there is a claim that truly conflicts with the federal Constitution (Alexander & Alexander, 2012; *Brown v. Board of Education of Topeka*, 1954; *San Antonio Independent School District v. Rodriguez*, 1973).

In some of the cases reviewed for this study, plaintiffs have argued that state models for funding public education have violated certain guarantees of the Fourteenth Amendment, specifically those included in the equal protection clause. The Fourteenth Amendment, in section 1, guarantees that the state cannot make or enforce laws that abridge the rights afforded to citizens of the United States. The whole section is printed here:

> All persons born or naturalized in the United States and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws. (U. S. Const. amend. XIV)

The equal protection clause guards individuals and groups from discriminatory actions designed by the government (U. S. Const. amend. XIV). In the course of determining whether the government or state's actions have been discriminatory under the Fourteenth Amendment, a court must consider whether the actions denied a fundamental right or were inherently discriminatory against a suspect class (Alexander & Alexander, 2012). When the state action, or law, denies a fundamental right or discriminates against a suspect classification, the state must show a compelling reason for the law to be deemed constitutional. This is considered to be a heightened level of judicial scrutiny of the state's actions. If, however, no fundamental right is denied or there is no discriminatory effect on a suspect classification, the state needs only to demonstrate a rational basis for the law.

The holding of the U. S. Supreme Court in *Brown v. Board of Education of Topeka* (1954) served to define the High Court's position on the aspect of suspect classifications in education equal protection cases. In *Brown*, plaintiffs challenged the segregation of students in

public education and the doctrine of separate-but-equal that had been rationalized in the ruling of *Plessy v. Ferguson* (1896) (*Brown v. Board of Education of Topeka,* 1954*)*. In *Plessy*, a case concerning the comfort of passengers on train cars, the U. S. Supreme Court had found the "equal but separate" accommodations of passengers a reasonable measure by the state to ensure peace and order (*Plessy v. Ferguson,* 1896*)*. In the U. S. Supreme Court opinion on *Brown v. Board of Education*, however, Chief Justice Warren declared that the segregation of students on the basis of race does "deprive the children of the minority group of equal educational opportunities" (*Brown v. Board of Education of Topeka, 1954*). The Court's ruling indicated that segregation was a discriminatory act against a suspect classification for which there did not exist a compelling interest on the state's part. Therefore, segregation was found to be unconstitutional under the Fourteenth Amendment.

One of the widely acclaimed passages in Chief Justice Warren's opinion for the majority in *Brown* called attention to educational rights (*Brown v. Board of Education of Topeka*, 1954). The significance or prominence of a right has bearing on which level of judicial scrutiny is applied by the court. Warren's opinion stated:

> Today, education is perhaps the most important function of state and local governments. Compulsory school attendance laws and the great expenditures for education both demonstrate our recognition of the importance of education to our democratic society. It is required in the performance of our most basic public responsibilities, even service in the armed forces. It is the very foundation of good citizenship. Today it is a principal instrument in awakening the child to cultural values, in preparing him for later professional training, and in helping him to adjust normally to his environment. In these days, it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity, where the state has undertaken to provide it, is a right which must be made available to all on equal terms. (*Brown v. Board of Education of Topeka, 1954)*.

In the words of the Chief Justice, education was a "right." However, the emphasis given to education as a right in Warren's opinion is a matter that will resurface in the decades following this decision (Alexander & Alexander, 2012).

The First Wave: Federal Equal Protection Cases

The purpose of this section is to illustrate how the concept of fiscal equity has been addressed in various courts. This section builds upon the U. S. Supreme Court's equal protection

ruling in *Brown v. Board of Education of Topeka* (1954) by adding to it the decision in *San Antonio Independent School District v. Rodriguez* (1973) (Delja, 2004; Escue, Thro, & Wood, 2011; Heiss, 1995; Thro, 1994). While the ruling in *Brown* demonstrated how the Supreme Court reviews discrimination in education lawsuits, the Court's decision in *San Antonio* set the precedent for equality cases that argued the fundamental right aspect of equal protection in federal courts (*Brown v. Board of Education of Topeka*, 1954; *San Antonio v. Rodriguez*, 1973; Thro, 1989).

In the first wave of school finance equality cases, litigants sought relief under the equal protection clause of the U. S. Constitution. For instance, in *Burruss v. Wilkerson* (1968), a case in Virginia, plaintiffs brought suit against the state believing the model for the distribution of funds for public schools violated the federal equal protection clause. In particular, the plaintiffs alleged the state's funding scheme, which in part relied on a valuation of real property, created disparities in how school divisions were funded across the state (*Burruss v. Wilkerson*, 1968). The plaintiffs, from a low fiscal capacity locality, argued that the state distribution of funds to their locality did not afford the resident children the same educational opportunities that were available elsewhere, particularly in localities with higher real property valuations (*Burruss v. Wilkerson*, 1968). The court dismissed the case on the basis that inadequate local funding, not inadequate state funding, had rendered the schools in question in woeful need of repair (*Burruss v. Wilkerson*, 1968). In dismissing the case, the court also declared that the state funding model, insomuch as it followed a uniform plan for the distribution of state funds and did not discriminate against poorer localities, did in fact meet the constitutional requirement in the Commonwealth of Virginia (*Burruss v. Wilkerson*, 1968). An insufficient source of tax revenue at a local level was unfortunate but also beyond the purview of the court (*Burruss v. Wilkerson*, 1968). Therefore, in this case, uniform distribution of funds was not discriminatory, and the court did not opine on the matter of educational rights or suspect classes (*Burruss v. Wilkerson*, 1968).

Soon after *Burruss* (1968), the funding scheme used in California's system of public schools was challenged in *Serrano v. Priest* (1971). The suit brought against the state alleged that a school finance system based on local property tax created substantial disparities that discriminated against the poorest citizens (*Serrano v. Priest*, 1971). While the case was dismissed initially,[32] the plaintiffs successfully appealed the matter to the State Supreme Court. The State Supreme Court cited the "uniformity of operation" provision in California's state

[32] *Serrano v. Priest*, 10 Cal. App. 3d 1110, 89 Cal. Rptr. 345 (1970)

constitution, which is its equivalent to the Equal Protection clause of the Fourteenth Amendment (*Serrano v. Priest*, 1971). The Court opinion in this case declared that education is a fundamental interest that cannot be conditioned on wealth (*Serrano v. Priest*, 1971). In so doing, the court recognized that the funding system did discriminate against the poor and was violative of the equal protection clause of the Fourteenth Amendment. The court concluded that the funding system based on local property taxes was not narrowly tailored to achieve the compelling state interest, and therefore, the ruling was made in favor of the plaintiffs (Alexander & Alexander, 2012; *Serrano v. Priest*, 1971).

Two years later, the U. S. Supreme Court handed down an equal protection ruling in the equity suit *San Antonio Independent School District v. Rodriguez* (1973). In this case residents of low property value school districts alleged that the state funding method discriminated based on wealth because the more affluent school districts, or school districts with higher fiscal capacities, were able to offer education of a higher quality than school districts that were not as fiscally able (*Rodriguez v. San Antonio Independent School District*, 1971). This disparity, the plaintiffs alleged, denied the less fiscally able school districts equal protection under the Fourteenth Amendment and further violated the Texas state constitution's provision regarding a minimum foundation program (*Rodriguez v. San Antonio Independent School District*, 1971).

The revenue that was to be generated to fund the local share of the cost relied on a locality's ability to collect ad valorem property taxes. Consequently, school districts in communities with low property valuations were forced to increase tax rates in order to meet their local effort. Meanwhile, school districts with higher property valuations could keep tax rates low and still generate sufficient tax revenue. With this rationale, the plaintiff school districts argued that the state funding model was discriminatory based on the relative wealth of school districts (*Rodriguez v. San Antonio Independent School District*, 1971).

Because the identified group in the original trial[33] did not represent any definable class of "poor" people, the U. S. Supreme Court, upon appeal by the state, determined the state only had to show a rational relationship to a legitimate state purpose instead of a compelling relationship (*San Antonio Independent School District v. Rodriguez*, 1973). The U. S. Supreme Court declared that the funding system in Texas, although not without its flaws, did not violate the equal protection guarantee of the U. S. Constitution because the system neither discriminated

[33] *Rodriguez v. San Antonio Indep. Sch. Dist.*, 337 F. Supp. 280 (W.D. Tex. 1971)

against a suspect class nor denied a fundamental right (Alexander & Alexander, 2012; *San Antonio Independent School District v. Rodriguez*, 1973).

There were multiple takeaways from the U. S. Supreme Court's decision in *Rodriguez* (1973). For one, the ruling indicated a rational relationship existed between the funding system and the state's purpose, and that an imperfect funding system that was rationally based was not unconstitutional (*San Antonio Independent School District v. Rodriguez*, 1973). Additionally, the U. S. Supreme Court found that wealth did not define a suspect classification (*San Antonio Independent School District v. Rodriguez*, 1973).

The most significant takeaway was that the Court's decision in *Rodriguez* (1973) closed the door on state funding issues that were being tried under the equal protection guarantee of the Fourteenth Amendment (Thro, 1989). In the ruling handed down the Court definitively pronounced that education was not a fundamental right under the federal Constitution. Writing for the majority, Justice Powell stated the following:

> Nothing this Court holds today in any way detracts from our historical dedication to public education. We are in complete agreement with the conclusion of the three-judge panel below that 'the grave significance of education both to the individual and to our society' cannot be doubted. But the importance of a service performed by the State does not determine whether it must be regarded as fundamental for purposes of examination under the Equal Protection Clause. (*San Antonio v. Rodriguez*, 1973)

Powell further stated:

> It is not the province of this Court to create substantive constitutional rights in the name of guaranteeing equal protection of the laws. Thus, the key to discovering whether education is 'fundamental' is not to be found in comparisons of the relative societal significance of education as opposed to subsistence or housing. Nor is it to be found by weighing whether education is as important as the right to travel. Rather, the answer lies in assessing whether there is a right to education explicitly or implicitly guaranteed by the Constitution. (*San Antonio v. Rodriguez, 1973)*

When education, as important as it is believed to be, still fell short of the Constitutional protection of being considered a fundamental right, the prospect of more cases being tried under the federal equal protection clause became bleak (Thro, 1989). Therefore, funding equity claims under the Fourteenth Amendment almost uniformly went away (Alexander & Alexander, 2012; Thro, 1994). The effect of taking this argument off the table was to cause most future court cases

involving school funding to be tried in state courts rather than federal courts (Alexander & Alexander, 2012).

The Second Wave: State Equal Protection and State Education Articles Cases

Since education was not considered to be a fundamental right under the federal Constitution, plaintiffs sought relief next primarily under the equality provisions in state constitutions and somewhat secondarily under the state education articles (Delja, 2004; Heise, 1995; Thro, 1994). The second wave cases argued for equity in educational opportunities regardless of how the revenue was generated or was distributed (Thro, 1989; Verstegen & Whitney, 1997). The reformers in these cases acknowledged but were able to tolerate disparities in expenditures if there was still an equally available, adequate minimum educational opportunity for all children (*Robinson v. Cahill*, 1973; Verstegen & Whitney, 1997). The outcome of the cases in the second wave tended not to favor plaintiffs and depended largely, but not exclusively, on whether the state constitution recognized education as a fundamental right (Thro, 1994; Verstegen & Whitney, 1997).

Shortly after U. S. Supreme Court ruling in *San Antonio v. Rodriguez*,[34] the requirement to provide equal educational opportunities that were "thorough and efficient" under the New Jersey Constitution was the basis of the challenge in *Robinson v. Cahill* (1973), which marked the start of the second wave cases (*Horton v. Meskill*, 1977; *Pauley v. Bailey*, 1979; *Robinson v. Cahill*, 1973; Thro, 1989; *Washakie County School Dist. No. 1 v. Herschler*, 1980). The state supreme court, in light of the wording of the constitution, held that any shortcoming in the funding scheme that resulted in a locality's inability to provide a thorough and efficient education was the state's problem to rectify (*Robinson v. Cahill*, 1973). The court recognized, too, that the prospect of relying on local taxation to meet the various needs of education throughout the state may not be realistic, and that there is no denying that the input of dollars has a direct effect on the quality of the education offered (*Robinson v. Cahill*, 1973).

In *Washakie County School Dist. No. 1 v. Herschler* (1980), the plaintiffs, school districts and residents of poorer localities in terms of property valuation, challenged the property tax-based funding system, believing that it violated the equal protection clause of the Wyoming state constitution. In the instant case, the requirement for the state to provide for the "uniform operation" of all laws caused the court to hold that the funding system was unconstitutional

[34] The decision in *San Antonio v. Rodriguez* was announced on March 21, 1973, and the decision in *Robinson v. Cahill* was handed down on April 3, 1973.

(*Washakie County School Dist. No. 1 v. Herschler*, 1980). Education was considered to be a fundamental interest in Wyoming and could not, therefore, be conditioned upon wealth, which was considered to be a suspect class (Verstegen & Whitney, 1997; *Washakie County School Dist. No. 1 v. Herschler*, 1980). The remedy was for revenue collected from ad valorem taxes in localities to be dispersed evenly throughout the state (*Washakie County School Dist. No. 1 v. Herschler*, 1980).

As demonstrated by *Robinson* (1973) and *Washakie* (1980), the state constitutions offered something attractive to school finance reformers that the federal Constitution did not offer: a direct pronouncement of a state's duties for providing education (Heise, 1995). The U. S. Constitution, comparatively, only indirectly addresses the states' duties (Heise, 1995; Thro, 1989). The spelling out of a more specific duty in equal protection guarantees and educational clauses of state constitutions appeared to have made the prospect of prevailing more likely for finance reformers (Heise, 1995). Furthermore, state constitutions could determine that individuals had a fundamental right to an education under the state constitution, whereas the federal Constitution provides no such right (Thro, 1989). Therefore, a focus on state constitutions' educational clauses became a new avenue of redress for school finance reformers.

The Third Wave: State Education Articles Cases

In 1989, new cases began to usher in the third wave of school finance reform litigation in the state court systems (*Edgewood Indep. Sch. Dist. v. Kirby*, 1989; *Gannon v. State*, 2014; *Montoy v. State*, 2005; *Rose v. Council for Better Educ., Inc*., 1989). As states either began to design wealth indices that reduced reliance on local property taxes—or at least became more adept at offsetting the disparities felt in property-poor school divisions—litigants departed from challenging equity in funding and instead began to challenge equity of opportunity or adequacy of programming (Arbogast, 2005; Verstegen & Whitney, 1997). That is, instead of seeking to reduce the disparity between the low fiscal capacity districts and the high fiscal capacity districts (equity suits), third wave cases (quality suits) seek to increase the state share of the cost of an adequate educational system because some districts lack the financial resources to meet the minimum standards of quality (Escue, Thro, & Wood, 2011).

In *Rose v. Council for Better Education, Inc.,* (1989), plaintiffs challenged the constitutionality of the state funding system under the education article of the state constitution, specifically the mandate to "provide an efficient system of common schools throughout the state" (*Rose v. Council for Better Education, Inc.*,1989). Evidence in the case demonstrated the

quality of schools throughout Kentucky to be deplorably low and the funding system to have had a history of failing to fund its schools equitably (*Rose v. Council for Better Education, Inc.,*1989). The variations in funding resources had caused great disparities in the quality of education available to students, and even the best-off districts were underperforming national averages by far (*Rose v. Council for Better Education, Inc.,*1989). The court ruled that the legislature, despite making substantial efforts to provide an efficient system of education, had fallen short of its mark (*Rose v. Council for Better Education, Inc.,*1989). Therefore, the court declared that the lack of uniformity throughout the state and the "unequal educational opportunity" available to students violated the state constitution (*Rose v. Council for Better Education, Inc.,* 1989). The court required a complete overhaul of the education system and school finance system. The mandate to provide an efficient system of schools led to the drafting of seven competency standards that were later adopted not only in Kentucky but also in Ohio, Alabama, and Massachusetts (Alexander, 1991; Verstegen & Whitney, 1997). This case has been heralded as the seminal case for the adequacy strategy in school finance reform litigation (Heise, 1995; Thro, 1994). It also demonstrated that judicial intervention is sometimes needed to assist the legislature in its pursuit to uphold constitutional obligations (Alexander, 1991).

Since the ruling on *Rose v. Council for Better Education, Inc.,* (1989), several other court decisions have followed the same path in similar adequacy suits (*Brigham v. State*, 1997; *Campbell County School Dist. v. State*, 1995; *Edgewood Indep. Sch. Dist. v. Kirby*, 1989; *Gannon v. State*, 2014; *Montoy v. State*, 2005). Whether reformers have challenged state education articles that are to provide for "thorough and efficient" systems of schools, as in *Campbell County School Dist. v. State* (1995), or the "minimally adequate education" of students, as in *Abbeville County School District v. State* (1997) and *Brigham v. State* (1997), courts have had to interpret the quality standards required in their state constitutions (Thro, 1994).

Challenges of the quality standards in state education articles, the third wave, continues to the current day.[35] The pendulum has begun to swing in the favor of plaintiffs, particularly once their strategy shifted from pre-*Rose* equity claims to post-*Rose* adequacy claims (Rebell, 2017). Arguments for litigants and school finance reformers continue to focus more squarely on output measures, such as educational opportunities and student achievement as the third wave continues. To this effect, the general migration of schools towards standards-based performance

[35] A survey of adequacy litigation is provided in Appendix F.

measures is also proving to be advantageous for plaintiffs that want to make connections between funding disparities and educational outputs (Rebell, 2017).

Equity Litigation in the Commonwealth of Virginia

Despite the third wave trend towards adequacy cases in other states since 1989, the most recent school funding case in Virginia was an equity suit much more in the mold of the second wave cases. An attempt to challenge the notion of "substantial equality" was tried in Virginia[36] in the early 1990s (*Scott v. Commonwealth*, 1994). The plaintiffs argued that the Virginia Constitution called for substantially equal educational opportunities and that a system that tolerates such wide disparity is evidence that the Commonwealth has failed to create an educational system that is uniform in its provision of educational opportunities (Delja, 2004; *Scott v. Commonwealth*, 1992). The state funding formula, hereafter the Standards of Quality (SOQ) formula, provided for cost sharing between the state and localities to meet minimum requirements of the educational system, but the ability of wealthy localities to supply discretionary funding above and beyond required levels was creating significant gaps between per pupil expenditures in the low fiscal capacity school divisions and per pupil expenditures in the high fiscal capacity school divisions (Delja, 2004).

The Supreme Court of Virginia heard the case upon appeal (*Scott v. Commonwealth*, 1994). In its ruling, the Supreme Court noted that education is a fundamental right under the Virginia Constitution and that the constitutional requirement placed upon the General Assembly to "seek to ensure that an educational program of high quality is established and continually maintained" in no way required that there had to be equity in spending or equality of educational opportunities (*Scott v. Commonwealth*, 1994). The Supreme Court of Virginia concluded that eliminating the disparities felt between the wealthy school divisions and the poor school divisions is not required of the General Assembly by the constitution and therefore affirmed the trial court's ruling (*Scott v. Commonwealth*, 1994).

While the plaintiffs in *Scott* had a strong equity case that was ultimately doomed by the politics at play, an argument can be made that the lawsuit would have had a greater chance to succeed had the plaintiffs pursued an adequacy suit instead of an equity suit (Delja, 2004). The judge in the trial court, in fact, gave the plaintiffs this opportunity, noting the difference between the strategy used in the *Scott* case and the strategy used in the *Rose* (1989) case (Delja, 2004).

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[36] See Delja (2004) for a thorough review of the Virginia equity case.

Summary

The relationship between the equal protection guarantees of the Fourteenth Amendment and similar equality provisions in state constitutions has influenced the way that plaintiffs attempt to challenge matters of funding equity and adequacy in state public school finance schemes. The litigation reviewed for this chapter demonstrates an evolution both in how plaintiffs challenged funding systems and how the courts have interpreted both federal and state legislation. The question of whether citizens have a protected right to an education is central to the discussion of equity suits. It is also a question that has met different fates depending on how the argument has been approached in court and which court has provided the answer. Those who advocate for school finance reform have worked dutifully to create fairness and equity where it had been missing. Intricate funding models that take into account the various resources available to tax bases and therefore distribute the cost of education equitably are also examples great fairness and equity.

In Virginia, the concept of public free education for all children has been an elusive ideal for centuries, for it encompasses two major issues: the funding of the educational system and universal access to educational opportunities. From a funding standpoint, education had been a privilege of the wealthy landowners and was not to be extended to the common or poor residents at the expense of the rich. The funding of public education had lacked a consistent vision for a sustainable source of revenue. Through time, the funding scheme has become more sophisticated, and the legislature has made efforts to equalize state funding. These efforts have provided some relief from the disparities created by a wide range of variance in property valuation and needs of learners throughout the state. Nevertheless, wealth disparities continue to curb the spirit of the language in the Virginia Constitution and its Education Article.

From a universal access to educational opportunities standpoint, public education in Virginia has had a checkered past. The earliest provision for schools sought to educate the common students, but these schools were left to local choice and were clearly intended to be racially segregated. The Civil War era continued to bring into focus the hard truths about racial divides and what seemed to be statewide resistance to the notion of equal suffrage rights for minorities. The years following the Civil War, however, began to restore the Commonwealth to the nation and progress to the vision of education as a right of all people.

The two major concepts— the historical evolution of school finance in Virginia and litigation related to challenges of funding equity in state funding models—have been brought together to demonstrate the relevance of the statistical analyses of expenditures in Virginia's

public schools at four-year intervals during the past 16 years. The remaining mathematical portion of this research attempts to demonstrate whether Virginia's SOQ formula fits the funding needs of the state as well as it was designed to nearly fifty years ago. The analyses of current expenditures are presented in Chapter 4, and the findings are discussed in Chapter 5.

Chapter Three

Methodology

The following chapter develops in three parts to discuss the selection of statistics and the steps taken to calculate each for the analysis of fiscal equity in Virginia's public elementary and secondary schools. The first section of this chapter categorizes the statistics and briefly describes what each statistic measures. The discussion then engages how the data has been imported and arranged for the calculations and what was considered when rejecting certain elements of available date. The third and final section of the chapter discusses the steps that were undertaken to run each statistic.

Statistics Used in the Study

The following discusses the descriptive statistics, dispersion statistics, and relationship statistics used to analyze the school division expenditure data that is available via the Virginia Department of Education's website.[37] The descriptive statistics include mean, median, standard deviation, and minimum and maximum values for aggregate and per pupil expenditure data in Virginia. Because this study not only questions whether equity has been achieved but also calls attention to the root of the inequitable resources, the expenditure data has been analyzed by source of funding, i.e., expenditures that are supported with state funds, local funds, or the combination of state, local, and retail sales and use tax receipts. These statistics will be presented in Chapter 4.

The dispersion, or equity statistics, are those statistics that are commonly used to analyze equity in school finance reform cases (Salmon, Alexander, & Salmon, 2015; Verstegen, 1996; Verstegen, 2015). The list[38] below summarizes the equity statistics that have been used in this analysis of Virginia's fiscal equity.

1. *Range:* the difference between the highest per pupil funding levels and the lowest.
2. *Restricted Range*: the difference between per pupil funding at the 95th percentile and the 5th percentile.
3. *Coefficient of Variation (CV)*: the standard deviation of the mean of per pupil expenditures, multiplied by 100 (to express as a percentage).

[37] Expenditure data tables for the fiscal years 2000 – 2020 are available online at www.doe.virginia.gov as of April 2021.

[38] Adapted from Verstegen (1996) Table 1, "Univariate Statistic Employed to Assess Equity" and Verstegen (2015) Table 3, "Measures of Fiscal Equity and Target Values"

4. *The Gini Index*: a measure of the proportionality of the distribution of per pupil funding values based on cumulative percentages of population and per pupil funding.
5. *The McLoone Index*: a measure of equity in the lower half of the distribution. This is expressed as a ratio of actual per pupil funding values below the median compared to amount of funding needed to increase those values to the mean per pupil funding in the state.

There are other statistics commonly used in the analysis of school funding equity, such as the Theil Index, the Atkinson Index and the Verstegen Index. These have not been selected for use because of their similarity to the Gini Index and the McLoone Index. The aforementioned statistics are similar to the McLoone Index (Alexander, Salmon, & Alexander, 2015).

The final statistics that have been calculated for this analysis are relationship statistics (Alexander, Salmon, & Alexander, 2015; Verstegen, 2015). These statistics measure the relationship between a locality's ability to pay, or fiscal capacity, and the per pupil expenditures for each school division. For these comparisons, ability to pay will be based on the locality's wealth, as represented through the Local Composite Index (LCI). The following relationship statistics will be presented in Chapter 4:

1. *Pearson's Correlation Coefficient (r)*: a measure of the relationship between per pupil expenditures and Local Composite Index (LCI)
2. *Regression (r^2):* a measure of how much of the variance between per pupil expenditure values can be explained by the LCI.

Collection and Arrangement of Data

For each of the selected years in the study, two tables from the Virginia Department of Education (VDOE) were downloaded into a central workbook in Microsoft Excel ("Excel") where the calculations could be completed. Specifically, these data pertain to the listings of the Local Composite Index (LCI) for each school division as well as Table 15 from the Superintendents' Annual Reports on the VDOE webpage.

The process that is described below uses FY 2004 as an example. The same steps will be carried out for FYs 2008, 2012, 2016, and 2020.

Data Import

The workbook used to calculate the equity and relationship statistics for each fiscal year was developed by importing and combining separate data sources from VDOE. These sources

are available at the VDOE website under the "School Finance" heading on the homepage and the "Superintendent's Annual Report" subheading on the School Finance page.[39]

The files needed for FY 2004 are available by selecting the link for "2003 – 2004"; for the subsequent fiscal years in the study, the fiscal year corresponds to the second year listed within a link. For each year, the VDOE has a collection of 19 tables. This study used Table 15 ("Sources of Financial Support for Expenditures, Total Expenditures for Operations and Total Per Pupil Expenditures for Operations") and Table 16 ("Composite Index") for the then-current Local Composite Index (LCI) of each school division. Data pertaining to Average Daily Membership (ADM), which is necessary for calculating per pupil expenditures, was included in Table 15. ADM in Table 15 represents the March 31 ADM calculation for each school division.

The VDOE data related to school division expenditures by source of financial support is found in Table 15 of the Superintendent's Annual Reports, and so this table was used as a starting place for the construction of the Excel workbook where all data were combined. In Table 15, data in columns A – I were selected. This selection included for all counties, cities, and towns: Division number; Division Name; End-of-Year Average Daily Membership (ADM); and total and per pupil expenditure amounts for three funding sources. The funding sources are local funds, state funds, and state retail sales and use tax funds. The VDOE table includes data for expenditures supported by federal funding, but these data have been excluded so as to focus strictly on state and local expenditures. The selected cells were pasted into a new workbook where the data could be sorted, filtered, and otherwise manipulated.[40]

The second table imported from the Superintendent's Annual Report is Table 16. The cells for Local Composite Index (LCI) were copied and pasted into the workbook in proper alignment with the school divisions.

Workbook Arrangement

The workbook, after merging VDOE data from Tables 15 and 16, required some rows to be combined to recognize four instances where two school divisions operate as one. The data for the following divisions were merged, resulting in a total of 132 school divisions:

- Williamsburg includes James City County (Williamsburg is the fiscal agent)
- Fairfax County includes Fairfax (Fairfax County is the fiscal agent)
- Greensville County includes Emporia (Greensville County is the fiscal agent)

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[39] The direct URL for the Superintendent's Annual Report is https://www.doe.virginia.gov/statistics_reports/supts_annual_report/index.shtml

[40] Tables available for download from VDOE are password protected.

- Bedford County includes Bedford (Bedford no longer operates a school division)

Once this alignment had been achieved, duplicate columns, i.e. Division Name, were removed. Likewise blank columns were used for the calculation of total expenditures and total per pupil expenditures. The columns and column headers for each workbook were then assigned according to the following, where the letter represents the column order:

A. Division Number
B. Division Name
C. Local Composite Index (LCI)
D. Average Daily Membership (ADM)
E. Locally Supported Total Expenditures for Operations
F. Local Per Pupil Expenditures (Local PPE)
G. State Supported Total Expenditures for Operations
H. State Per Pupil Expenditures (State PPE)
I. Retail Sales and Use Tax Supported Expenditures for Operations
J. Sales and Use Tax Per Pupil Expenditures (Sales and Use PPE)
K. Total State and Local Expenditures[41]
L. Total State and Local Per Pupil Expenditures (Total PPE)

Total State and Local Expenditures (Column K) represents the sum of expenditures supported by state funds (Column G), local funds (Column E), and retail sales and use tax funds (Column I). Total State and Local Expenditures does not include any expenditures supported by federal funding.

The per pupil expenditures (PPE) columns (Columns F, H, and J) have been calculated by dividing the corresponding total by the average daily membership (ADM) for each school division. Therefore, Local PPE is the quotient of Total Local Expenditures (Column E) divided by ADM (Column D). The PPE calculation will be used in other calculations to analyze equity.

Calculation of Statistics

To calculate the descriptive statistics, the following basic functions of Excel (listed with the equation syntax) were applied to the data in the per pupil funding columns for each source—state, local, and total including retail sales tax, where the data set begins on Row 2 and ends on Row 133:[42]

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[41] Total State and Local Expenditures includes state funding, local funding, and sales and use tax funds and excludes all federal funding.
[42] The row numbers, and therefore the arrays of cells, correspond to the FY 2004 data, which is used as an example.

Mean	=AVERAGE(L2:L133)
Median	=MEDIAN(L2:L133)
Standard Deviation	=STDEVA(L2:L133)
Minimum Value	=MIN(L2:L133)
Maximum Value	=MAX(L2:L133)

Calculation of Equity Statistics

To find the range, or the difference between the highest per pupil expenditures (PPE) in the state and the lowest, the minimum value for PPE for each expenditure type was subtracted from the maximum value of the corresponding type. As the range decreases, equity increases (Salmon, Alexander, & Salmon, 2015; Verstegen, 1996).

The restricted range requires the additional step of determining which values represent the 95th percentile and 5th percentile of a set. The 95th and 5th percentiles were calculated in Excel by selecting the data and applying the equations:[43]

=PERCENTILE.INC(___:___,0.95)

=PERCENTILE.INC(___:___,0.05)

The restricted range is the difference between the value at the 95th percentile and the value at the 5th percentile. As with the range, when the restricted range increases, equity decreases (Salmon, Alexander, & Salmon, 2015; Vertegen, 1996).

The Coefficient of Variation (CV) measures the amount of variability that can be observed when comparing individual per pupil expenditure values to the mean for each funding source. CV was calculated by dividing standard deviation of PPE values by the mean and multiplying by 100, which expresses the statistic as a percentage. As the CV decreases, equity increases (Salmon, Alexander, & Salmon, 2015; Verstegen, 1996).

Calculation of Gini Index

The Gini Index is a statistic that is used to show wealth inequality. In terms of school finance, it is used as an indication of the proportional distribution of per pupil expenditures. It provides a statistic to measure what can be graphically represented by the Lorenz Curve, which displays, on the *y*-axis, the cumulative percentage of total per pupil expenditures, and, on the *x*-axis, the cumulative percentage of total student population (in ADM) (Salmon, Alexander, & Salmon, 2015).

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[43] The representation of the Excel syntax as (___:___) is to be interpreted as the array of cells within a selection, where the first-appearing cell is separated from the last-appearing cell by a colon, all enclosed within a parenthesis.

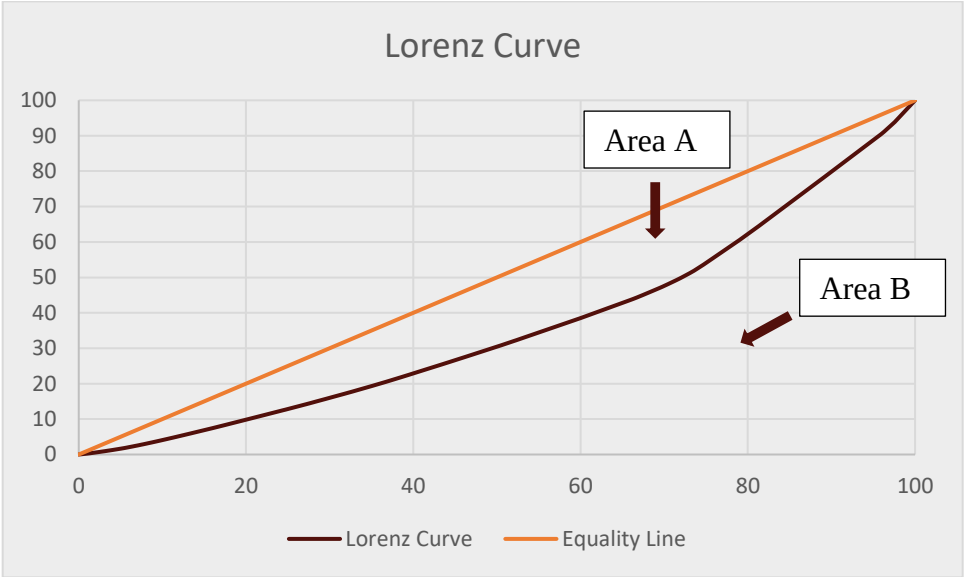
The following steps were taken to complete the calculation of the Gini Index. First, the Division Number, ADM, and total expenditure columns[44] were copied and pasted into a new sheet in the Excel workbook in columns A, B, and C. Totals for ADM and total expenditures were calculated below the raw data in columns B and C, respectively. Column D was designated for the Percentage of Total Population, and Column E was designated for Percentage of Total Expenditures. To calculate Percentage of Total Population, each ADM value listed in Column B was divided by the sum total of the population. To calculate Percentage of Total Expenditures, each expenditure value in Column C was divided by the sum total of expenditures.

With the percentages of Total Population and Total Expenditures calculated, the next step created a ratio between the two. Column F divided the Percentage of Total Expenditures for each row by the Percentage of Total Population, creating an expenditure-to-population ratio. After this calculation, the expenditure-to-population ratio (Column F) was sorted from smallest to largest with the selection area expanded to include adjacent columns. This step put the school divisions in order from lowest fiscal capacity to highest fiscal capacity per pupil. The next two columns, G and H, were designated for Cumulative Percentage of Population and Cumulative Percentage of Expenditures. A zero value was added to Column G, and then the percentages in Column D (Population) were pasted into Column G with an equation that added each successive value to the previous total, creating a cumulative total. The same method was applied to create a cumulative percentage of expenditures in Column G. All values for cumulative percentages of population and funds were selected and used to create a Lorenz Curve, as shown in the Figure 2.

[44] For each iteration of this process, different expenditure data were used. For instance, the entire calculation process was repeated for each source—state, local, and total (excluding federal funding).

Figure 2

Lorenz Curve



The total area of the Lorenz Curve chart is equal to 100. The area under the Lorenz Curve (Area B) has been calculated as

$$\text{Area B} = (C_{EXP,x} + C_{EXP,x+1}) / 2 * (C_{POP,x+1} - C_{POP,x})/100$$

where C_{EXPx} represents the cumulative percentage of expenditures of any school division, C_{EXPx+1} represents the next highest school division expenditure value in order, C_{POPx} is the cumulative percentage of the population that corresponds with C_{EXPx}, and C_{POPx+1} is the cumulative percentage of the population that corresponds with C_{EXPx+1}.

This equation was applied to each cell in the entire column, and then a sum of the area calculations were computed. An equality line was created where $y=x$. The total area below the equality line is equal to 50, as the line effectively cuts the total area in half. The region between the equality line and the Lorenz Curve is commonly referred to as Area A. The calculation of Area A is the difference between 50 and the sum of the area below the Lorenz Curve. The Gini Index is calculated as Area A divided by 50. The range for this measure is from 0 to 1. As the measure decreases, equity increases (Salmon, Alexander, & Salmon, 2015; Verstegen, 1996).

Calculation of McLoone Index

The calculation of the McLoone Index value is described the sum of all observations at or below the median divided by the product of the number of observations at or below the median level and the value of the median level.

$$\frac{\text{Sum of observations at or below the median}}{}$$

(Median) x (Number of observations at or below median)

To complete this calculation in Excel, the per pupil expenditure values for each funding source were selected and sorted from largest to smallest with each source in its own column and treated as a separate calculation. The median PPE value for each source was determined, and the 66 values at or below the median were summed. The sum total of the values at or below the median were then divided by the product of the number of observations below the median—66—and the median value. This statistic ranges from 0.0 to 1.0. As the McLoone Index approaches 1.0, levels of equity increase (Salmon, Alexander, & Salmon, 2015; Verstegen, 1996).

Calculation of Relationship Statistics

Pearson's Correlation Coefficient (r) has been used to analyze the relationship between local ability to pay and per pupil funding by source. The calculation of Pearson's Correlation Coefficient in Excel was simply a matter of selecting the appropriate data and applying an equation. In the present context, the LCI will be set as the *x* (independent) variable and PPE will be set as the *y* (dependent) variable. These values are arrayed in two columns. The following equation was used to calculate the Pearson Correlation Coefficient in Excel:

=PEARSON(___:___,____:____)

Inside the parenthesis, the first array of cells listed the first and last LCI values in the column, separated by a colon. The second array contained the first and last per pupil funding values[45] listed in the column, separated by a colon. The result of the Pearson equation is listed as being equal to "r". The range for this measure is from -1 to 1, with values approaching zero indicating less of a relationship than values approaching -1 and 1 (Salmon, Alexander, & Salmon, 2015; Verstegen, 2015).

The regression (r^2) indicates how much of the variance between PPE values can be explained by the LCI. The range for r^2 is from 0 to 1. A value closer to 1 indicates more of the variance in the per pupil expenditures compared to the mean can be attributed to LCI, and a value closer to zero indicates that LCI explains a lesser degree of the variation from the mean (Salmon, Alexander, & Salmon, 2015; Verstegen, 2015).

[45] This process was completed separately for each funding source—state, local, and total—for each fiscal year in the study.

Chapter Four

Results

In the following chapter, the results of the statistical calculations are presented in three sections: Descriptive Statistics, Equity Statistics, and Relationship Statistics. While the descriptive data are limited to totals, mean values, and minimum and maximum values, they allow for some observations about general trends in the increases and decreases of expenditures in Virginia's public elementary and secondary schools. The equity statistics are presented after the descriptive statistics. The equity statistics include range, restricted range, Coefficient of Variation (CV), the Gini Index, and the McLoone Index. These statistics investigate the distribution of expenditures throughout the Commonwealth. The final set of statistics to be presented in this chapter are the relationship statistics, which compare the school divisions' fiscal capacity to the actual per pupil expenditures recorded for each division in the selected years.

The data are presented in terms of

1. expenditures funded by the state,
2. expenditures funded by the locality, and
3. total expenditures, which combines the state and local contributions with the retail sales and use tax component of funding and which excludes federal funding

Descriptive Statistics

The descriptive statistics for years FY 2004 to FY 2020 have been arrayed in Table 1. The aggregate totals for state, local, and total expenditures represent the sum of all expenditures, separated by source of funding, for the 132 public school divisions in Virginia. The sum of state-funded expenditures for all school divisions in FY 2004 was $3,237,740,485. This amount rose

Table 1

Descriptive Statistics Applied to Aggregate State and Local Expenditures for Selected Years for each School Division[a]

	Aggregate State-Funded Expenditures				
Descriptive Statistic	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Total	3,237,740,485	4,607,479,400	4,284,134,807	4,876,808,082	5,729,381,568.20
Mean	24,528,337	34,905,147	32,455,567	36,945,516	43,404,405.82
Median	10,895,060	17,009,440	15,107,759	17,041,458	20,008,907.70
Minimum	962,151	1,309,847	1,063,245	1,043,451	1,226,789.28
Maximum	219,184,475	302,875,593	328,706,355	414,972,703	508,343,476.49
	Aggregate Locally Funded Expenditures				
Total	5,072,426,848	6,591,291,977	6,950,958,330	7,782,624,249	8,740,047,836.46
Mean	38,427,476	49,934,030	52,658,775	58,959,275	66,212,483.61
Median	9,964,593	11,498,850	12,700,039	14,128,593	14,029,194.17
Minimum	1,147,394	1,757,578	1,742,845	1,420,669	1,895,105.82
Maximum	1,314,730,267	1,675,671,675	1,755,448,359	1,953,468,131	2,256,902,714.48

(a) n = 132

significantly in FY 2008 to $4,607,479,400, which represented an increase of 42.3% in the span of four years (10.6% annual average). Between FY 2008 and FY 2016, however, the aggregate total of state-funded expenditures increased only 5.9% after an overall decrease in FY 2012. By FY 2020, the state-funded expenditures had increased by $2,491,641,083 over the FY 2004, an increase of 77% over that time span. However, most of this increase in value took place prior to FY 2008. Between FY 2008 and FY 2020, the aggregate state funding for expenditures experienced a 24.4% increase (2.03% annually). This was aided by an increase of 17.5% between the FY 2016 and FY 2020 observations.

During the same span of years, FY 2004 to FY 2020, the aggregate totals for locally funded expenditures followed a slightly different trend, increasing in each observation year. In FY 2004, the sum of locally funded expenditures for all school divisions was $5,072,426,848, which was more than $1.8 billion above the state-funded expenditure mark. The local expenditures increased to $6,591,291,977 in FY 2008, which represented an increase of 29.94%. That is an average increase of 7.5% per year, which was slightly under the state expenditure growth rate in the same years. Aggregate local expenditures increased again in FY 2012 to $6,950,958,330. In FY 2016, the sum of locally funded expenditures was $7,782,624,249,

marking an increase of 12% over FY 2012 and an increase of 53.43% over the FY 2004 amount. Compared to the state-supported expenditure amount, local dollars outstripped state dollars in FY 2016 by $2.9 billion, excluding the retail sales and use tax contributions. Compared to the state-funded expenditures percentage of growth between FY 2008 and FY 2016, which was 5.85%, the percentage increase of locally funded expenditures was 18.07%. By FY 2020, the aggregate locally funded expenditures topped $8.7 billion, and the difference between aggregate local expenditures and state-funded expenditures exceeded $3 billion. Locally funded expenditures experienced an overall increase of 72.3% (4.5% annually) over the FY 2004 amount. When compared strictly to locally funded expenditures, the FY 2020 state-funded expenditures represented 39.60% of spending and locally funded expenditures represented 60.40% of spending.

The state-funded mean expenditure level per school division in FY 2004 was $24,528,337 while the local mean expenditure level per school division was $38,427,376. Both the state mean and the local mean increased in FY 2008, with the state increasing by 42% and the local increasing 30%. In FY 2012, however, the state-funded mean expenditure level decreased by nearly $2.5 million and the local mean expenditure level increased by $2.7 million. The state and local mean expenditure levels both increased again in FY 2016 and in FY 2020, with the state mean increasing to $43.4 million per school division in FY 2020 and the local mean increasing to $66.2 million per school division. These mean expenditure level represent percentage increases of 77% for state-funded expenditures and 72% for locally funded expenditures over the study period (FY 2004 to FY 2020).

For each school division, the amount of state-supported expenditures, locally supported expenditures, and total expenditures[46] were divided by the number of students in the school division's year-end average daily membership (ADM) to calculate a per pupil expenditure (PPE) amount for state and for local expenditures. Table 2 arrays this data for each source of funding.

The mean expenditure level for state-funded per pupil expenditures, or the state PPE, in FY 2004 was $3,234. The state PPE mean then increased 37.5% ($1,211) from FY 2004 to FY 2008. It decreased by 14% in FY 2012 before increasing in each of the next two observation years (FYs 2016 and 2020) for a total increase of $1,933 (59.8%) during the study period. Comparatively, the local PPE mean values (Table 2) increased from the FY 2004 level in each successive observation year. The slightest increase between any two observation years occurred

[46] Total expenditures represent the combination of three, non-federal sources of funding: state funds, local funds, and funds generated by the state retail sales and use tax.

between FY 2008 and FY 2016 when locally funded expenditures increased by only $85 per pupil. The greatest increase occurred between FY 2004 and FY 2008, with the expenditure level increasing $806 per pupil in this span of four years. Overall, locally funded per pupil expenditures increased 50.6%, or $1,797 per pupil, between FY 2004 and FY 2020.

The comparison between state PPE and local PPE mean values shows the balance favored local spending. The state PPE in FY 2004 was $321.47 less than the local PPE. This means that, when disbursed throughout the whole state, more local dollars were spent per pupil than were state dollars. This remained true in FYs 2012, when there was a $533.40 difference in favor of local dollars; 2016, when there was a $484.30 difference in favor of the local dollars; and 2020, when the mean expenditure level for local PPE was $186 higher than the mean for state PPE. In FY 2008, however, the mean expenditure level for local PPE was $82.95 lower than the state PPE.

When state and local funding sources were combined with the state retail sales and use tax funding and divided by the total number of students in average daily membership, the mean for total PPE increased by $4,211 during the study period (see Table 2). This represents a percentage increase of 56% during this time despite a decrease in the total PPE mean value at the FY 2012 observation.

Table 2

Descriptive Statistics Applied to State, Local, and Total Per Pupil Expenditures (PPE) for Selected Years for each School Division[a]

	State-Funded Per Pupil Expenditures				
Descriptive Statistics	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Mean	3,234	4,445	3,914	4,418	5,166
Median	3,289	4,625	4,011	4,599	5,268
Standard Deviation	831	1,155	1,057	1,165	1,360
Minimum	1,103	1,409	1,273	1,386	1,638
Maximum	4,967	6,787	6,127	7,543	7,648
	Locally Funded Per Pupil Expenditures				
Descriptive Statistics	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Mean	3,555	4,362	4,447	4,903	5,353
Median	3,054	3,645	3,814	4,188	4,393
Standard Deviation	2,033	2,687	2,552	2,794	3,136
Minimum	1,079	1,683	1,435	1,430	1,629
Maximum	13,258	17,050	15,780	16,619	17,088
	Total (Non-federal) Per Pupil Expenditures[b]				
Descriptive Statistics	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Mean	7,515	9,759	9,306	10,388	11,727
Median	7,116	9,153	8,826	9,865	11,000
Standard Deviation	1,454	1,941	1,882	2,037	2,188
Minimum	5,993	7,753	7,189	8,075	8,966
Maximum	15,236	19,618	18,089	18,998	19,997

(a) n = 132
(b) The Total (Non-federal) Per Pupil Expenditures funding source combines state-funded and locally funded expenditures with the expenditure amounts supported by the state retail sales and use tax, all divided by average daily membership (ADM).

Equity Statistics

The next statistics further analyze the per pupil expenditures by moving beyond aggregate and mean values. These statistics—range, restricted range, Coefficient of Variation, the Gini Index, and the McLoone Index—begin to analyze the distribution of expenditures across the spectrum of school divisions and therefore begin to inform the discussion of fiscal equity in

the Commonwealth. The equity statistics are presented in the Table 3 (state-funded), Table 4 (locally funded), and Table 5 (total funding), and each statistic is detailed in the charts to follow.

Table 3

Equity Statistics Applied to State-funded Per Pupil Expenditures in Selected Years

Equity Statistics	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Range	3,864	5,378	4,854	6,157	6,010
Restricted Range	3,016	3,984	3,662	3,997	4,728
Coefficient of Variation	25.69	25.98	27.01	26.36	26.33
Gini Index	0.1800	0.1747	0.1644	0.1595	0.1618
McLoone Index	0.7876	0.7683	0.7694	0.7681	0.7818

Table 4

Equity Statistics Applied to Locally Funded Per Pupil Expenditures in Selected Years

Equity Statistics	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Range	12,179	15,367	14,345	15,189	15,459
Restricted Range	6,197	8,026	7,532	8,066	9,828
Coefficient of Variation	57.19	61.59	57.38	57.00	58.58
Gini Index	0.2868	0.2937	0.2762	0.2664	0.2809
McLoone Index	0.7467	0.7409	0.7380	0.7466	0.7570

Table 5

Equity Statistics Applied to Total (Non-federal) Funding Per Pupil Expenditures in Selected Years

	FY 2004	FY 2008	FY 2012	FY 2016	FY 2020
Range	9,243	11,865	10,900	10,924	11,031
Restricted Range	4,109	5,279	5,526	6,424	6,921
Coefficient of Variation	19.35	19.89	20.23	19.61	18.66
Gini Index	0.1072	0.1041	0.1082	0.1027	0.1070
McLoone Index	0.9360	0.9428	0.9246	0.9269	0.9410

Range and Restricted Range

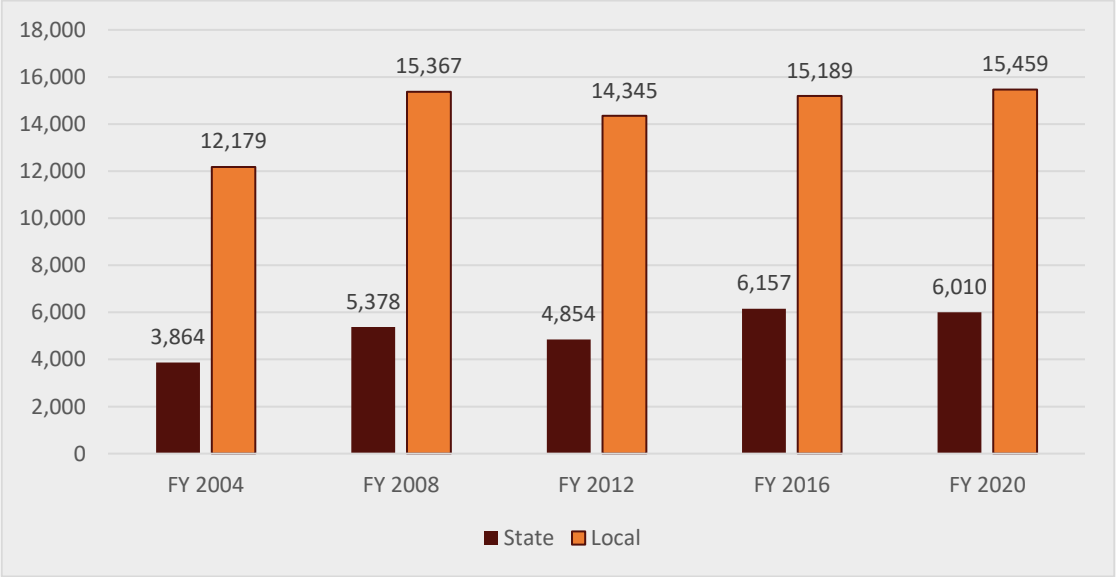
The first two statistics to be reviewed are Range and Restricted Range. Range, or the difference between the highest value and the lowest value for per pupil expenditures, is an indication of disparity. The greater the range, or the wider the gap between the highest value and

the lowest value, the more disparity there is in distribution of funds. Restricted range is a similar analysis of the distribution but removes the values above the 95th percentile and below the 5th percentile from the equation.

An examination of the range and restricted range for state PPE and local PPE shows that the expenditure levels behaved in nearly the same manner regardless of funding source through FY 2016 (see Chart 1). Both state PPE and local PPE had an increase in range between FY 2004 and FY 2008, both decreased between FY 2008 and FY 2012, and both increased between FY 2012 and FY 2016. Additionally, the difference between the school division that had the highest level of expenditures per pupil and the school division with the lowest was growing in three of the four spans between the selected years of the study. The range for state PPE in FY 2004 was $3,864. The range increased by $1,514 in FY 2008 and decreased by $524 in FY 2012. The range increased again in FY 2016 before another decrease in FY 2020. The FY 2020 range was $6,010, which represents an overall increase of $2,146 since the FY 2004 observation. The school division receiving the lowest state-funded PPE level in FY 2020 was Falls Church,[47] which recorded $1,638 in state-funded PPE. Scott County[48] recorded $7,648 in state-funded PPE in FY 2020.

Chart 1

Range for State-funded and Locally Funded Per Pupil Expenditures



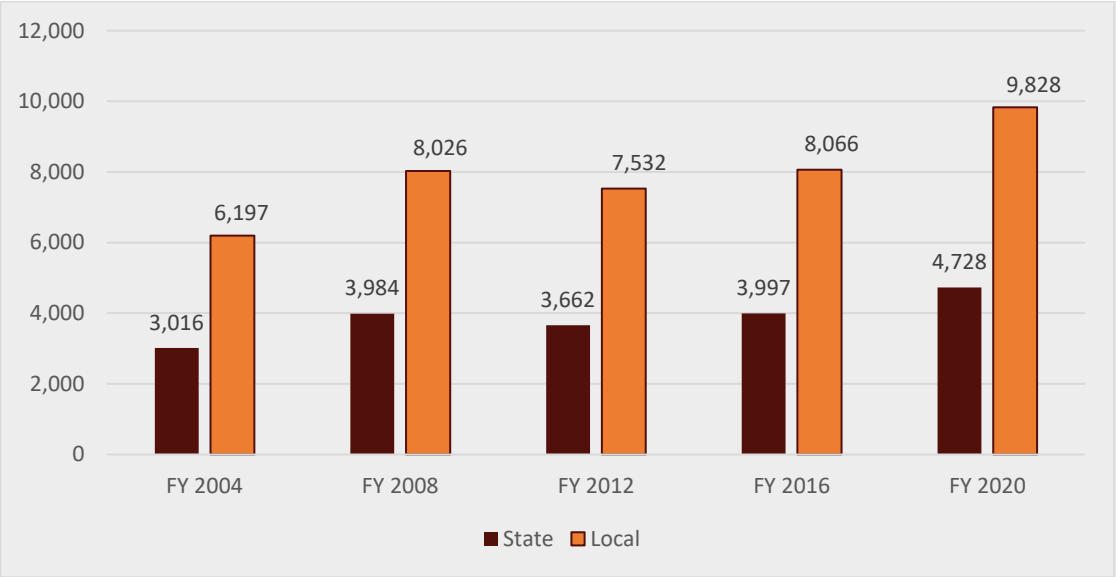
[47] The LCI for Falls Church in FY 2020 was .8000
[48] The LCI for Scott County in FY 2020 was .1917

By comparison, the range for locally funded PPE (see Chart 1) increased from $12,179 in FY 2004 to $15,459 in FY 2020. This was an overall percentage increase of 26.9% over the duration of the study period, marked by an increase of 26.2% at the FY 2008 observation year and moderate fluctuation beyond that. The difference between the state PPE range and the local PPE range was greatest in FY 2008, when the local PPE range was $9,989 higher than the state PPE range. In FY 2020, the local PPE range was $9,449 higher than the state PPE range, with Arlington recording the highest level of local PPE ($17,087 per pupil) and Scott County recording the lowest level ($1,629 per pupil).

The restricted range, which attempts to eliminate outliers at both ends of the distribution, showed moderate fluctuation in terms of state PPE, as shown in Chart 2. The greatest

Chart 2

Restricted Range for State-funded and Locally Funded Per Pupil Expenditures



increase in the state PPE restricted range calculation occurred between FY 2004 and FY 2008 when the value increased by $967.73 from $3,016 (FY 2004) to $3,984 (FY 2008). This increase is $546 less than the change noted in the range calculation for the same years. In FY 2012, the restricted range value decreased by $322. The restricted range value then increased by $335 in FY 2016 and increased again by $732 in FY 2020. In total the restricted range showed an increase of $1,712 compared to the $2,146 shown in the range calculation.

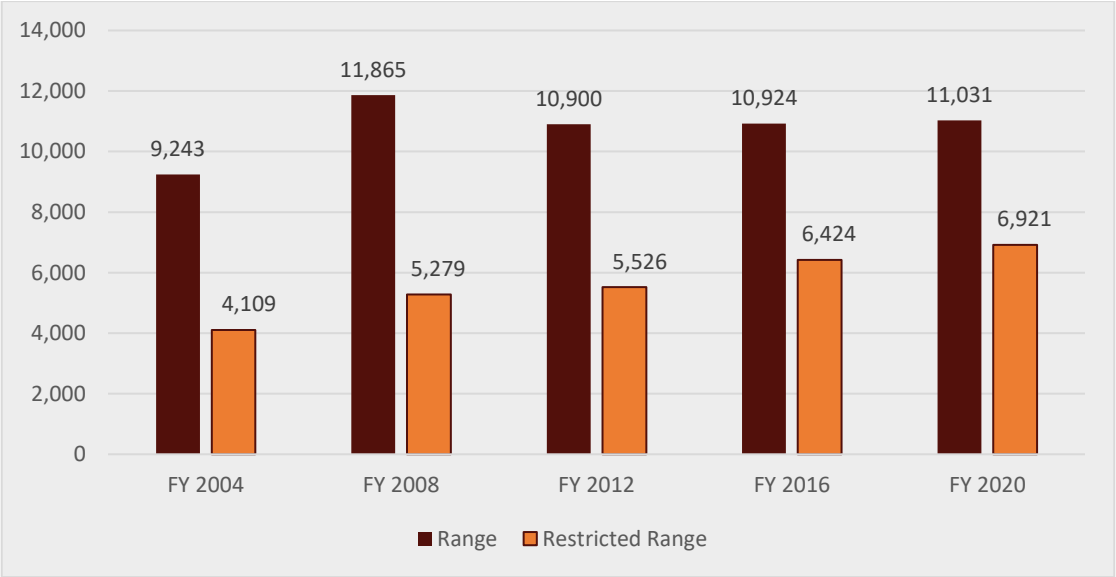
The restricted range for locally funded PPE increased in each observation year after FY 2004 except for FY 2012. The FY 2008 restricted range was $1,830 higher than in FY 2004, and the value increased by $1,761 between FY 2016 and FY 2020. Overall, the restricted range for

locally funded PPE increased by $3,631, which is a percentage increase of 58.6%. Compared to the range for local PPE, the restricted range increased $351 more than the range. Even when the restricted range for state PPE and local PPE appear to behave or fluctuate in the same manner, the values for local PPE restricted range are approximately two times higher than the state expenditures at each interval of the study.

When the range and restricted range were calculated for total PPE (see Chart 3), the restricted range showed increases in each observation year after FY 2004. The range, however, showed a sharp increase of $2,622 at the FY 2008 observation followed by a decrease of $924 in FY 2012.

Chart 3

Range and Restricted Range for Total Per Pupil Expenditures



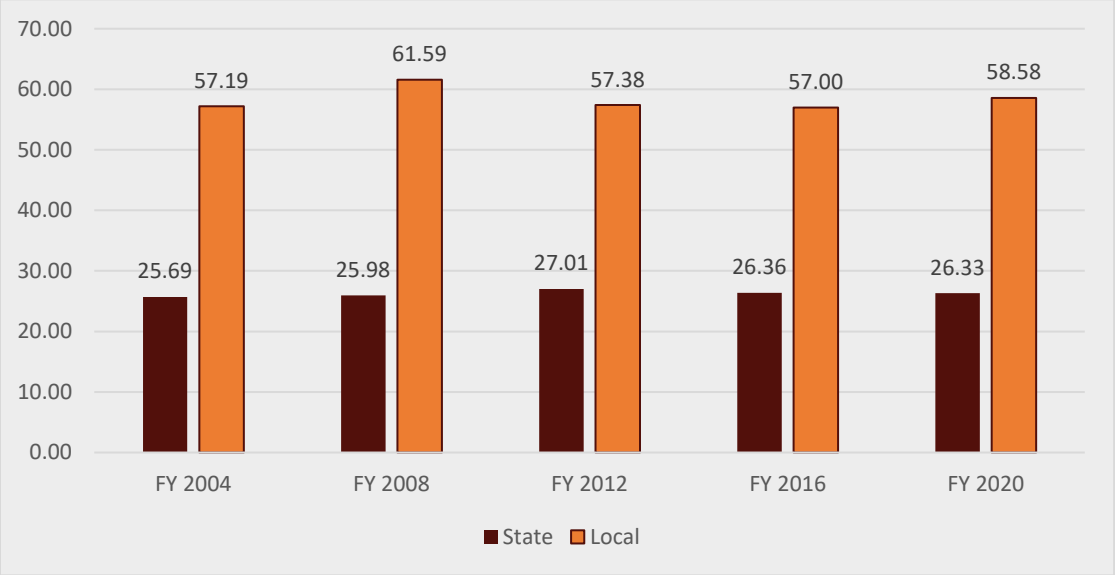
The difference between the total PPE range and the restricted was greatest in FY 2008, with the range $6,586 higher than the restricted range. In FY 2020, these values had grown closer, showing a difference of $4,110 in that year. For the study period, the range for total PPE had increased by $1,788, and the restricted range had increased by $2,812.

Coefficient of Variation

The next statistic, coefficient of variation (CV), was used to compare individual PPE values by funding source to the mean PPE values for the same funding source. The CV values for state PPE and local PPE are displayed in Chart 4. At the five intervals for the study, the CV for local PPE has an average of 58.35% compared to the state's 26.27%.

Chart 4

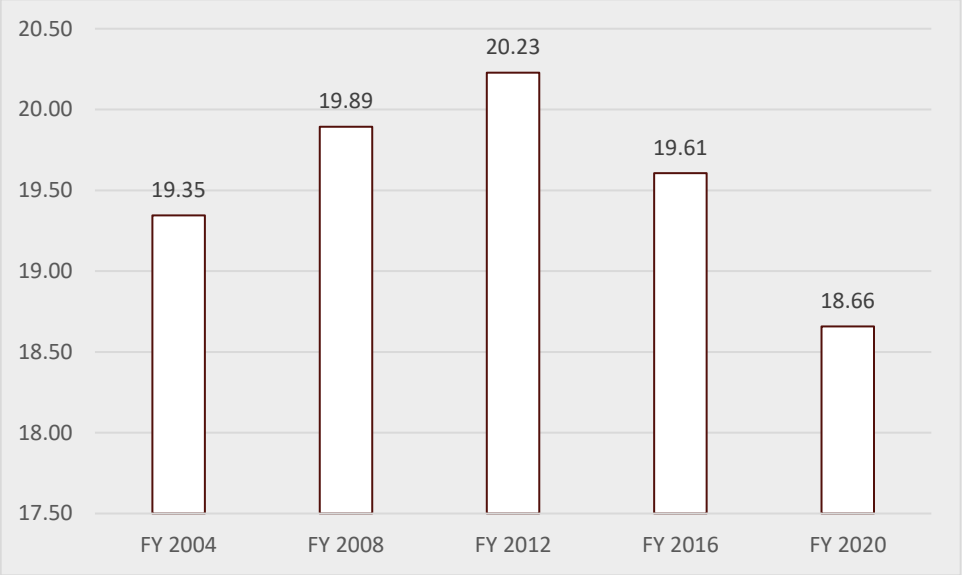
Coefficient of Variation for State-funded and Locally Funded Per Pupil Expenditures



The state CV value was lowest in FY 2004 (25.69%), reached its highest level of variability in FY 2012 (27.01), and had an average value of 26.27% during the selected years of the study. Between FY 2004 and FY 2020, the CV fluctuated within a range of 1.32%. The local PPE CV values (see Chart 4) peaked in FY 2008 at 61.58% and had an average value of 58.35%. The CV for local PPE fluctuated within a range of 4.59%. Additionally, the local PPE CV was twice the size of the state PPE CV in each of the years of the study.

Chart 5

Coefficient of Variation for Total [(a)] Per Pupil Expenditures



(a) Total per pupil expenditures includes state-funded expenditures, locally funded expenditures, and expenditures funded by the state retail sales and use tax. Federal funds are excluded from the total.

The CV values for total PPE (Chart 5) indicate increases in FYs 2008 and 2012 followed by decreases in FY 2016 and FY 2020. The CV values peaked in FY 2012 (20.23%) and averaged at 19.55% over the course of the study years. The values fluctuated within a range of 1.57% between FY 2004 and FY 2020. The total PPE CV values are more aligned with the state PPE than the local PPE values for the same statistic.

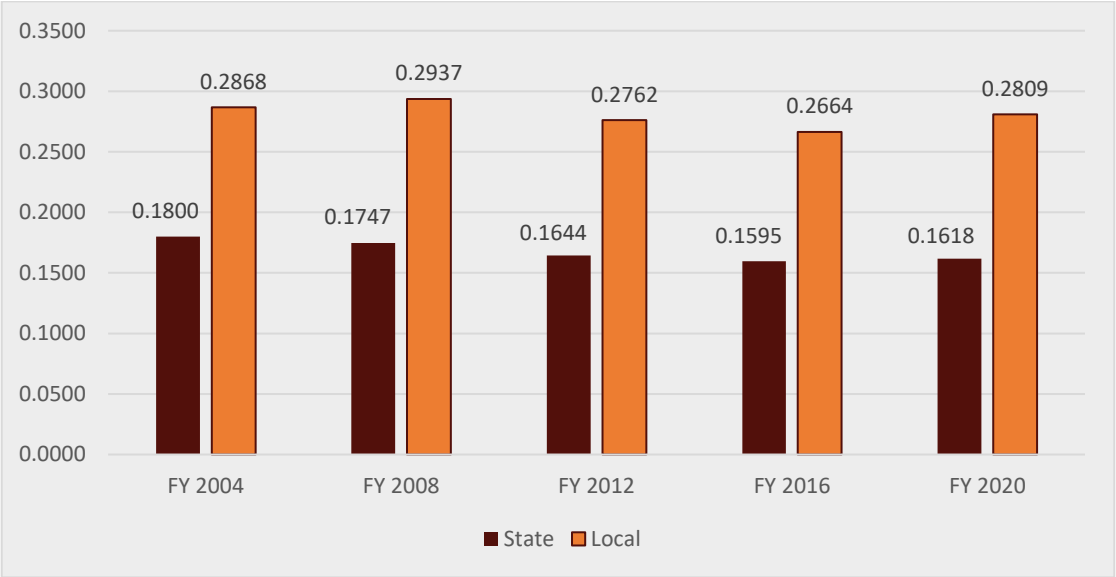
Gini Index

The Gini Index calculated the distribution of total expenditures across the total population by creating a ratio of expenditure share of the total to population share of the total.[49] Gini Index values for state and local expenditures are displayed in Chart 6.

[49] See pages 51-54 for an explanation of the calculation of the Gini Index.

Chart 6

Gini Index Values for State-funded and Locally Funded Per Pupil Expenditures



When the Gini Index was calculated for the state-funded expenditures, the values showed a consistent reduction in the selected fiscal years until a slight uptick in FY 2020. Beginning in FY 2004 at .1800, the Gini decreased by a total of .0205 by FY 2016 and had its lowest value of .1595 in the same year. The aforementioned uptick in FY 2020 represented a change of .0023 from FY 2016 and brought the overall average during the study period to .1681.

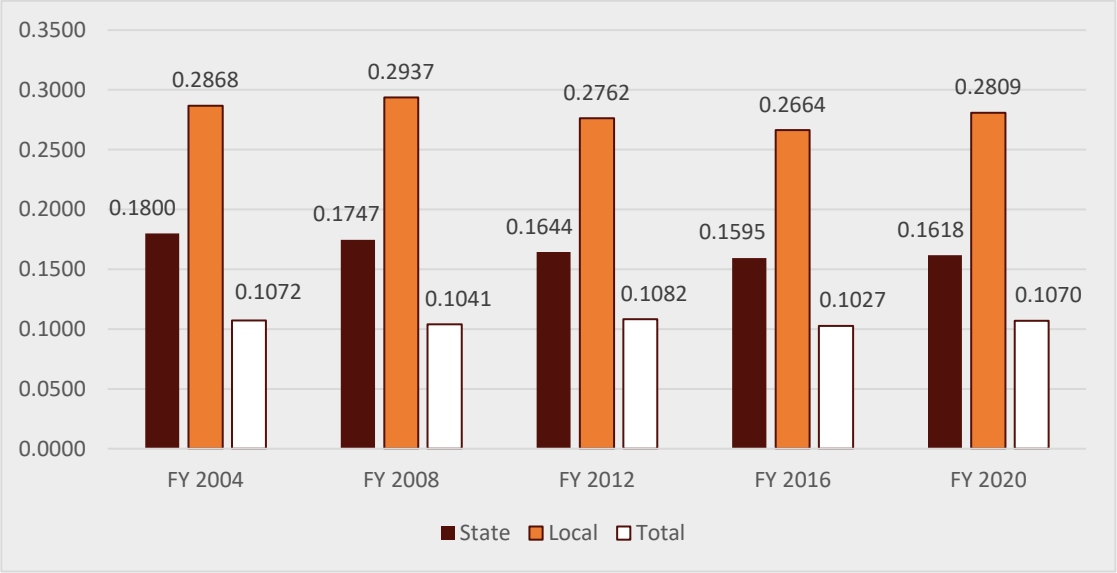
The Gini Index calculations for local expenditures also appear in Chart 6. For the local expenditures, the Gini values decreased between FY 2004 and FY 2016 by .0203, nearly the identical amount as the state values over the same years.[50] In FY 2020, the Gini value increased by .0145 over the FY 2016 mark. This increase in the final observation year nearly nullified the decreases that had come previously, and the net change over the study period was a decrease of .0058. There are some examples of localities where the local spending is virtually proportionate with the size of the student population. For instance, in FY 2012, Shenandoah County Schools had an average daily membership of 6,152.75 students, which represented .4912% of the total student population in the state. The $33,722,806 of local expenditures represented .4852% of the total local expenditures in the state for FY 2012. However, when the school divisions are arrayed from lowest fiscal capacity per pupil to highest fiscal capacity per pupil, the lowest 10% of the population accounts for only 4% of the local expenditure total in the state. The 50% of the population with less local support accounts for only 31% of the local expenditures in the state. At

[50] The Gini Index value for state-funded PPE decreased by .0205 between FY 2004 and FY 2016.

the other end of the spectrum, Fairfax County Schools typically account for 13-14% of the total population and 25% of the local expenditures.

Chart 7

Gini Index Values for State-funded, Locally Funded, and Total Per Pupil Expenditures



The total expenditures (see Chart 7) for the selected years of the study had Gini Index values that ranged from .1027 in FY 2016 to .1082 in FY 2012. This represented a total range in the value of .0055, which showed the least fluctuation of the three expenditure types. As with the values for state PPE and local PPE, the Gini values for total PPE also increased in the final observation year. In FY 2020, the value increase by .0043 to .1070, which represented a .0002 increase from its FY 2004 level.

Much the same as with the local expenditures, there are examples of school divisions that make up a far greater share of the total expenditures than the size of those school divisions would suggest. In other words, their share of the expenditures is not proportionate to their size. For instance, Arlington represented 1.57% of the student population and 3.02% of the expenditures in FY 2004; Loudon County represented 4.47% of the student population and 5.67% of the expenditures in FY 2008; and Fairfax County annually accounts for 13-14% of the population and approximately 17-18% of the total expenditures.

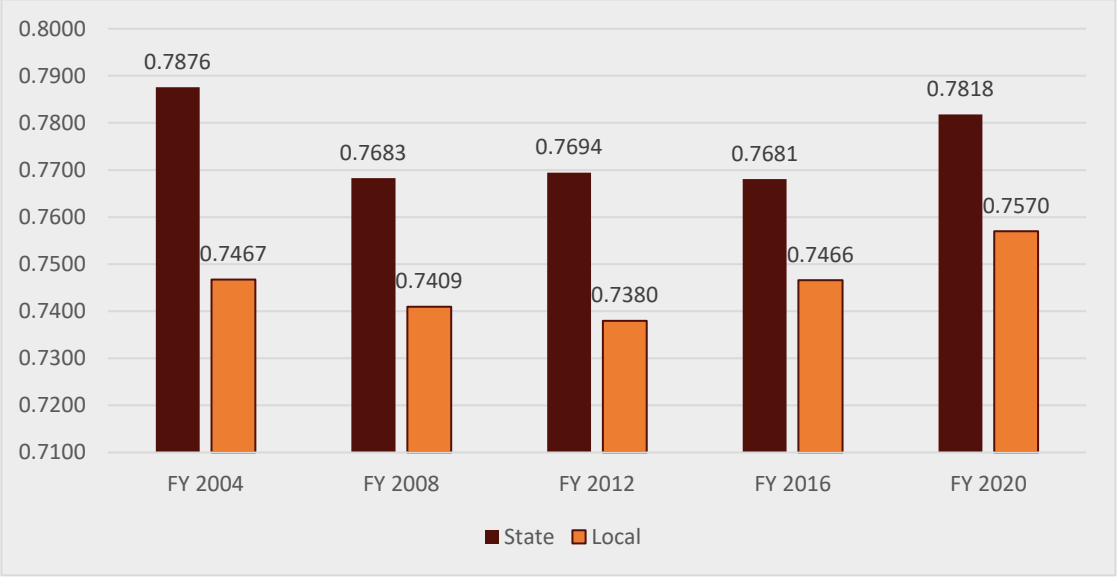
McLoone Index

While the Gini Index took into account the full distribution of expenditures and total population, the McLoone Index focused on the lower half of the distribution. For this statistic, the median per pupil expenditure level for all school division was determined for state, local, and

total expenditures. Because there are 132 school divisions in the calculations, sixty-six school divisions were at or below the median expenditure level. The sum of the per pupil expenditures for all school divisions below the median was divided by the product of the median value and sixty-six, the number of school divisions at or below the median. The results of these calculations for state-funded and locally funded per pupil expenditures appear in Chart 8.

Chart 8

McLoone Index Values for State-funded and Locally Funded Per Pupil Expenditures



The McLoone Index values for state PPE ranged from .7876 (FY 2004) to .7681 (FY 2016), which represents fluctuation within a range of .0195. While there was an overall decrease of .0058 in this value from FY 2004 to FY 2020, a more drastic decrease in the McLoone value occurred between FY 2004 and FY 2008. The McLoone Index value decreased .0193 in this span of four years. This change in value was virtually masked by the .0137 increase in FY 2020.

Comparatively, the values associated with the local PPE (see Chart 8) stayed practically level between FY 2004 and FY 2016 before increasing in FY 2020. The index had perceptible decreases from FY 2004 to FY 2008 and from FY 2008 to FY 2012; however, the value increased by a total of .0190 in the final two observation years and was .0103 higher in FY 2020 than it was in FY 2004.

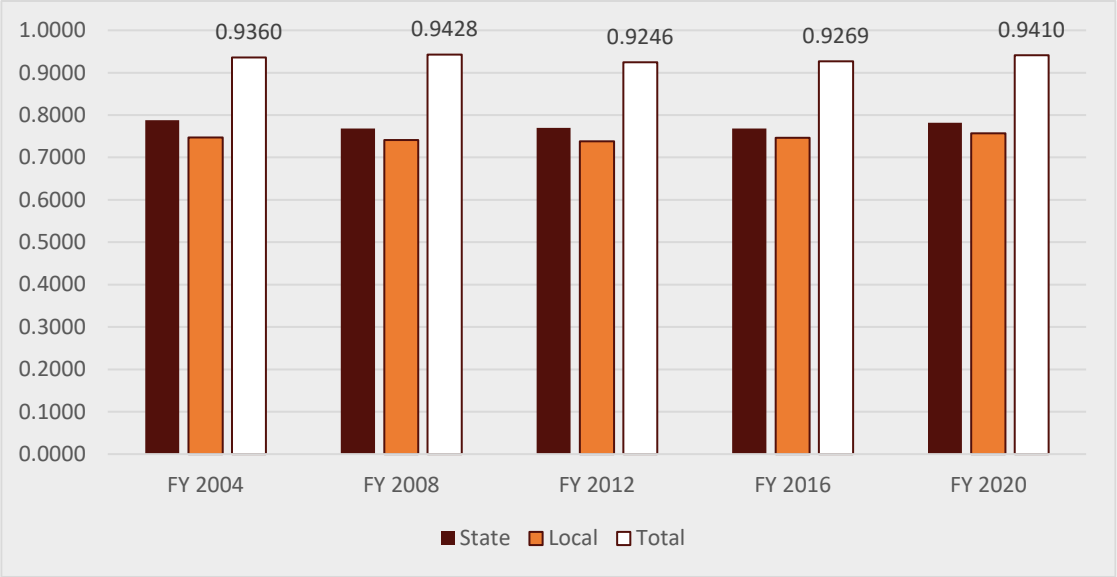
The McLoone Index values for total PPE, as shown in Chart 9[51] trended much higher than the state and local values. Over the sixteen-year period of the study, the index values

[51] Chart 9 includes labels for McLoone Index values for Total Per Pupil Expenditures; the McLoone Index values for state and local Per Pupil Expenditures are included in Chart 8.

fluctuated within a range of .0182 with a high value of .9428 (FY 2008) and a low of .9246 (FY 2012). The .0141 increase from FY 2016 to FY 2020 brought the McLoone Index value for total PPE to .0018 from its high mark in FY 2008.

Chart 9

McLoone Index Values for State, Local, and Total Per Pupil Expenditures



Relationship Statistics

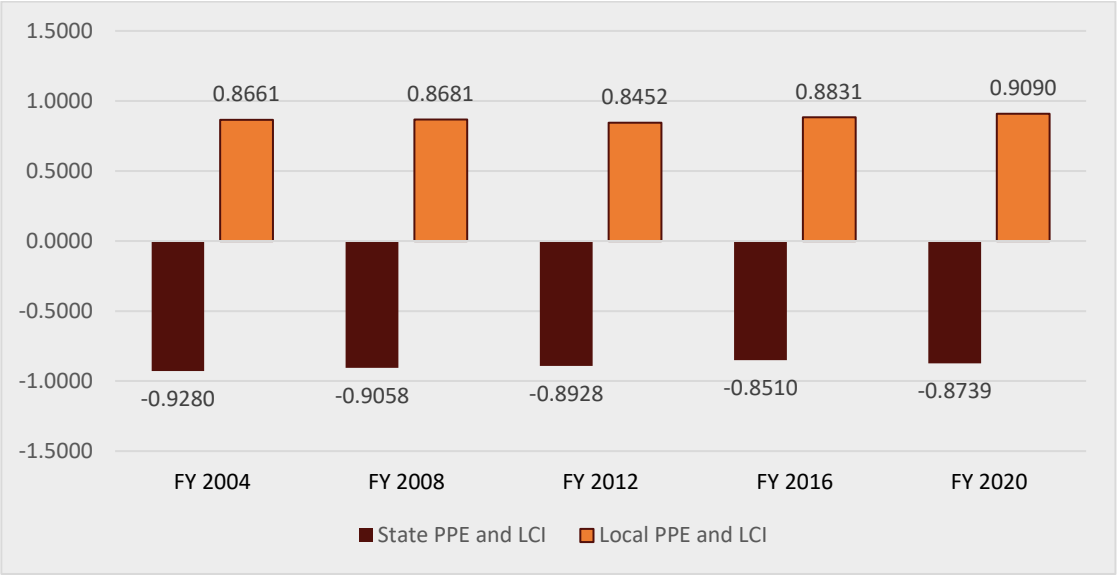
For the statistics presented so far, the calculations have centered on either aggregate expenditures or per pupil expenditures and a population factor, such as average daily membership. For the two relationship statistics, Pearson's Correlation Coefficient and Regression, the statistics will compare per pupil expenditures and fiscal capacity, as represented by the Local Composite Index (LCI).

Pearson's Correlation Coefficient

The first relationship statistic reviewed is Pearson's Correlation Coefficient, which measures the relationship between each division's per pupil expenditures, by source of funding, and the Local Composite Index (LCI) for each division.

Chart 10

Correlation between Per Pupil Expenditures and Local Composite Index for State and Local Funding Sources

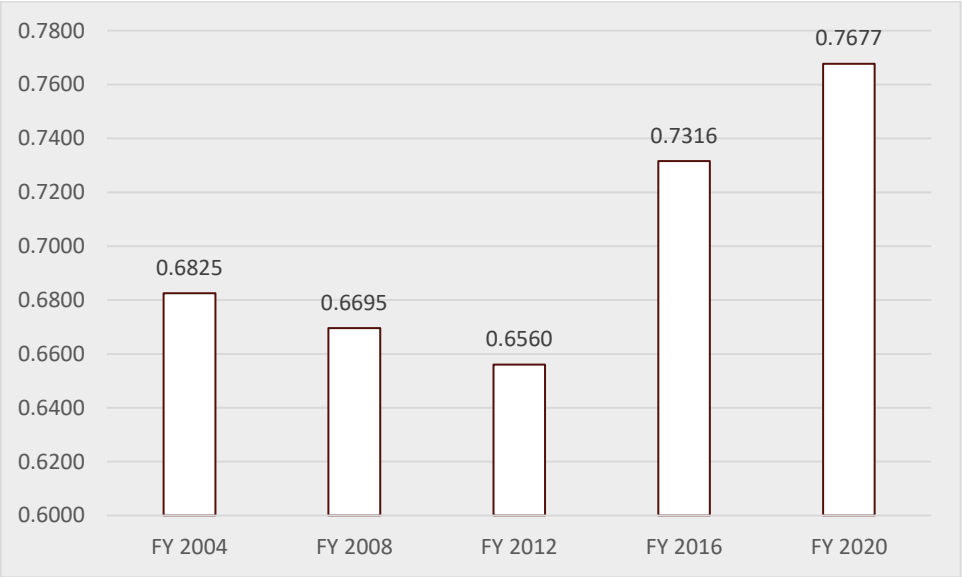


As shown in Chart 10, the state PPE and the LCI have a strong negative correlation, which shows that as the LCI goes up, the amount of state-funded per pupil expenditures decreases. Conversely, the local PPE and the LCI have a strong positive correlation: As LCI goes up, indicating a greater fiscal capacity, the amount of locally funded per pupil expenditures also increases. The relationship between state PPE and LCI is technically getting weaker over the course of the presented fiscal years, moving from -.9280 to -.8739, which is a total change of .0541. The correlation between local PPE and LCI (see Chart 10), on the other hand, shows some fluctuation at the FY 2012 observation but ultimately increases in FY 2016 and FY 2020. From FY 2004 to FY 2020, the r value for local PPE increased by .0429.

The relationship between total PPE and LCI (as shown in Chart 11) is not as well defined as were the relationships between state and local PPE and LCI. For the total PPE calculation, in FYs 2004, 2008, and 2012, the average value of the coefficient was .6694. In FY 2016, this value increased sharply to .7316, showing a much more pronounced relationship between the variables. The increase in the r value continued in FY 2020, increasing an additional .0361 to .7677. This ultimately shows a trend towards a stronger positive correlation between total PPE and LCI.

Chart 11

Pearson's Correlation Coefficient (r) for Total Per Pupil Expenditures



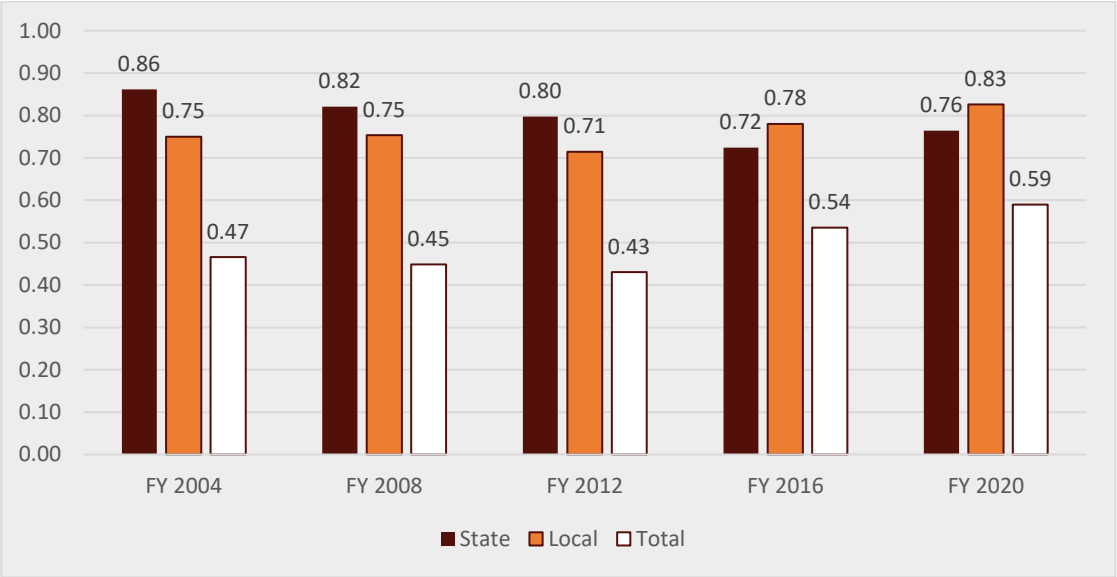
Regression

Defined as r^2, or the square of the value for Pearson's Correlation Coefficient, regression shows the how much of the relationship in a correlation can be attributed to or explained by a certain factor. For this study, regression was calculated to determine how much of the variance between school divisions' per pupil expenditures can be explained by LCI. Chart 12 shows the r^2 values for state, local, and total PPE.

An examination of the r^2 values for the calculation of regression for state PPE and LCI shows that the LCI explained less of the variance in state PPE values among the school divisions over time. The value decreased from explaining 86% of the variance in FY 2004 to explaining 76% of the variance in FY 2020. The r^2 values for the relationship between local PPE and LCI experienced some fluctuation over the course of the study but more or less held true. In FYs 2004 and 2008, the LCI explained 75% of the variance in local PPE. For the duration of the study, despite a decrease in FY 2012 and an increase in FY 2016 and FY 2020, the LCI explained 76% of the variance in local PPE from school division to school division.

Chart 12

Regression (r^2) Values for State, Local, and Total Per Pupil Expenditures



The r^2 values for the relationship between total PPE and LCI somewhat resemble the sharp increase noted in the calculation of the correlation coefficient. For FYs 2004, 2008, and 2012, the r^2 values for total PPE and LCI showed a steady but minor decrease, from explaining 47% of the variance in total PPE to 43% of the variance. In FY 2016, however, the r^2 value had a sharp increase and explained 54% of the variance in total PPE among school divisions. The r^2 value for FY 2020 also increased, to 59%, which resulted in a sixteen year average of 49% of the variance in total PPE being explained by LCI.

Chapter Five

Findings and Recommendations

This chapter is divided into two sections. In the first, the statistics presented in Chapter 4 are reviewed and interpreted. The second section of the chapter will discuss recommendations for policy makers.

Review of Statistics

The descriptive statistics presented in Chapter 4 provide context for the larger discussion of fiscal equity in Virginia's public elementary and secondary schools. In FY 2020, three school divisions[52] expended more than a billion dollars in state and local funds, while nine school divisions[53] expended less than $10 million. Grouping school divisions by enrollment sizes shows that the composition of state's school divisions varies greatly.[54] In FY 2020, there were 14 school divisions with fewer than 1,000 students in ADM, 70 school divisions with between 1,000 and 5,000 students in ADM, 20 school divisions with between 5,000 and 10,000 students in ADM, and 28 school divisions with more than 10,000 students in ADM.

Because the difference in scale among the school divisions also presents differences in fiscal capacities and the tax bases that support educational operations in Virginia's school divisions, equity studies compare school divisions' expenditures on per pupil bases.[55] Comparisons at the per pupil level show that expenditures supported by local funds in FY 2020 ranged from $1,629 per pupil to $17,088 per pupil, which is a range of $15,459. There were 20 school divisions that expended less than $3,000 per pupil in local funds, and 12 school divisions that expended more than $10,000 per pupil in local funds. These comparisons acknowledge that high fiscal capacity localities are able to support educational operations in a way that lower fiscal capacity localities cannot. The role of the SOQ funding formula, however, is to create fiscal neutrality, or to render the differences in local ability less apparent by directing more state funding to the localities that are most in need of support.

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[52] Fairfax County, Loudon County, and Prince William County. Of these divisions, only Prince William County was below the state mean for total per pupil expenditures at $11,646 per pupil compared to the state mean of $11,727.
[53] The following school divisions had less than $10 million in total (non-federal) expenditures: Bath, Bland, Charles City, Craig, Highland, Buena Vista, Norton, Lexington, and Colonial Beach. Of the nine, only Bath, Charles City, and Highland had total (non-federal) per pupil expenditures above the state mean.
[54] Highland County had the fewest students in ADM with 214.55, and Fairfax County had the most with 187,993.73.
[55] See Alexander K., Salmon, R. G., and Alexander, F. K. (2015). *Financing public schools: Theory, policy, and practice*. Pages 354 – 364.

Previous analyses of fiscal equity in Virginia's public schools[56] have calculated similar dispersion statistics[57] to examine whether the SOQ had reached or maintained a substantial degree of equity. The results of Arbogast's study (2005) showed that, between FY 1975 and FY 2003, several statistics[58] provided evidence of an increase in equity in adjusted current expenditures. The Coefficient of Variation (CV) had decreased from 26.33% (FY 1975) to 19.39% (FY 2003), meaning that the per pupil expenditures from one school division to the next showed less variation when compared to the mean expenditure level over time (Arbogast, 2005). The Gini Index had decreased from .1378 (FY 1975) to .0956 (FY 2003), which was indication that the total amount of expenditures was more evenly spread over the total student population in the state over time (Arbogast, 2005). The McLoone Index had increased from .8707 (FY 1975) to .9351 (FY 2003), which was an indication that the amount of dollars that would be needed to be added to the expenditure levels of school divisions below the median to bring them up to the median had decreased between FY 1975 and FY 2003 (Arbogast, 2005).

As encouraging as those statistics were for the changing profile of Virginia's funding system, Arbogast (2005) also noted that progress towards fiscal neutrality had plateaued approaching the year 2000. There was an "an extraordinarily strong" positive relationship shown to exist between fiscal capacity and adjusted expenditures (Arbogast, 2005). From FY 1975 to the FY 2003, the Pearson Correlation Coefficient measuring the relationship between fiscal capacity and adjusted current expenditures increased from .8259 in FY 1975 to .8689 in FY 2003. This was an indication that the SOQ formula was not achieving fiscal neutrality. Therefore, Arbogast concluded that the quality of education available to students across commonwealth was "directly affected" by the fiscal capacity localities rather than Virginia's overall wealth (2005).

Analysis of fiscal equity statistics for Virginia's public elementary and secondary schools for FYs 2005 and 2011 indicated a reversal of the trends observed in the 2005 study (Driscoll & Salmon, 2013). The CV for adjusted state and local expenditures per pupil had increased to 21.04% in FY 2005 and increased again in FY 2011 to 21.46% (Driscoll & Salmon, 2013). The

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[56] Specifically, T. Arbogast, II (2005) and L. G. Driscoll and R. G. Salmon (2013)

[57] The referenced studies based dispersion calculations on adjusted state and local expenditures per pupil. The expenditure totals did not include expenditures related to pupil transportation or child nutrition but did factor in Federal Impact Aid receipts. Therefore, the state PPE and local PPE statistics calculated in the present study are not comparable to the results from Arbogast and Driscoll and Salmon. However, comparisons between the equity statistics calculated for total PPE and the results of previous studies are still reasonably close.

[58] In the Arbogast study, the restricted range ratio, Federal range ratio, Coefficient of Variation, Gini Coefficient, Thiel Index, and McLoone Index all showed increases in equity while the range and restricted range showed a decrease in equity.

Gini Index also increased from its FY 2003 value of .0956 to .1073 in FY 2011. The McLoone Index had decreased by .0233 since FY 2003, when it was .9351, to .9118 in FY 2011. These three statistics indicated for Driscoll and Salmon (2013) a "significant deterioration" in the level of equity that had been present in the analysis of these statistics for FY 2003. Selected equity statistics from the findings of the Arbogast (2005) study and the Driscoll and Salmon (2013) are presented in Table 6.

Table 6

Equity Statistics Presented in Previous Studies[a] of Fiscal Equity in Virginia's Public School Divisions[b] for Selected Years[c] between FY 1975 and FY 2011 based on Adjusted State and Local Expenditures per Pupil[d]

Equity Statistics	FY 1975	FY 1989	FY 1994	FY 1998	FY 2003	FY 2005	FY 2011
Range	1,199	4,133	4,238	5,755	6,959	9,598	10,638
Restricted Range	466	1,556	2,210	2,550	2,821	3,993	4,270
Coefficient of Variation	26.33	22.97	19.77	19.63	19.39	21.04	21.46
Gini Index	0.1378	0.1183	0.1043	0.1005	0.0956	0.1030	0.1073
McLoone Index	0.8707	0.8999	0.9143	0.9174	0.9351	0.9380	0.9118

(a) T. Arbogast (2005) and L. G. Driscoll and R. G. Salmon (2013)
(b) For FYs 1975, 1989, 1994, and 1998, n = 135; for FYs 2003, 2005, and 2011, n = 132
(c) Data for FY 1975 through FY 1998 are cited from T. Arbogast (2005); data for FYs 2003, 2005, and 2011 are cited from L. G. Driscoll and R. G. Salmon (2013)
(d) Adjusted current expenditures in the aforementioned studies do not include expenditures for pupil transportation or child nutrition. Both studies did, however, include Federal Impact Aid receipt.

State and School Division Expenditure Levels

The overall increase in aggregate state-funded expenditures, which increased by $2.49 billion (real dollars) from FY 2004 to FY 2020, provides evidence of increased funding for regular school operations.[59] The effects of the recession that began in 2007 are also reflected in a decrease in state-funded expenditures after FY 2008, which decreased by $323,344,593 by FY 2012. According to Driscoll and Salmon (2013), Virginia's direct aid payments showed reductions of $81.9 million between FY 2007 and FY 2011, with a drastic 13.7% decrease in state funding in FY 2011. Decreases in state-funded expenditures in FY 2012 have continued until FY 2020 and can be seen in total expenditures (down 7%), mean expenditure levels (down almost $2.5 million), the median funding level (down 11%), and minimum funding level (down approximately 9%). By FY 2016, all measures of had rebounded, as some had predicted, and

[59] This represents approximately $1.82 billion in 2004 constant dollars, according to cpiinflationcalculator.com

surpassed the FY 2008 levels (Driscoll & Salmon, 2013). Therefore, the overall growth during the entire sixteen-year period (77%) is primarily the result of the growth between FY 2004 and FY 2008 (42%) and secondarily the growth between FY 2016 and FY 2020 (17.5%).

Like aggregate state expenditures, locally funded aggregate expenditures increased by $1.5 billion between FY 2004 and FY 2008. During the economic downturn, however, locally-funded expenditures increased $359,666,352 while the state-funded expenditures decreased.[60] This indicates that local effort accounted for more of the total expenditures than did the state effort. This was a direct result of the state's 36% reduction in the funding of support positions after the onset of the recession (Duncombe & Cassidy, 2016).

These data demonstrate that there is an imbalance between the state share and the local share of the cost of education. When the aggregate state expenditures are combined with aggregate local expenditures in FY 2004, the state dollars represent 38.96% of the total compared to the local dollars' 61.04% of the total. Between FY 2004 and FY 2020, the state expenditures total increased by 76.96%, and the local expenditures total increased by 72.31%. Despite the greater overall percentage increase in state expenditures, in FY 2020 the state share of total expenditures accounted for 39.6% of the total compared to the local share of 60.4% of the total. Therefore, the increased state effort has resulted in less than a 1% change in the ratio of state-to-local expenditures on a statewide comparison level.

Equity in Per Pupil Expenditures

The analysis of equity in Virginia's public school divisions begins with several statistics—mean expenditure levels, range and restricted range, Coefficient of Variation, the Gini Index, and the McLoone Index—that are based on per pupil expenditure calculations. For these statistics, the expenditures for each school division were separated into three categories: state-funded expenditures; locally funded expenditures; and expenditures supported through the combination of state funds, local funds, and retail sales and use tax funds. Each expenditure total by source was then divided by the number of students in ADM for each school division.

Mean Values for Per Pupil Expenditures

As indicated by the mean expenditure levels[61] at the height of the pre-recession economy, the state was able to fund schools more substantially than it was able to in the years following the

[60] Locally funded expenditures increased by 5.4% while state-funded expenditures decreased by 7% between FY 2008 and FY 2012.
[61] See Table 2, p.60

recession. In FY 2008, for instance, the mean for state PPE was $83 higher than the mean for local PPE, with state PPE amount at $4,445 and the local PPE amount at $4,362. In the selected years after FY 2008, the mean for local PPE was greater than the mean for state PPE. Additionally, whereas the mean for state PPE decreased between FY 2008 and FY 2012, the mean for local expenditures continued to increase. This is particularly evident in FY 2012, as the economy and state funding levels were still in the process of recovering from the recession: The mean for local PPE increased from $4,362 (FY 2008) to $4,447 (FY 2012) while the McLoone value[62] for local PPE decreased from .7409 (FY 2008) to .7380 (FY 2020), which indicates that the increases in the local PPE were occurring above the median. Increases in local PPE above the median indicate that the more affluent school divisions were able to increase funding when less fiscally able divisions could not. In FY 2020, the difference between the mean for state PPE and the mean for local PPE decreased from $484 in FY 2016 to $186 in FY 2020. This represents the narrowest margin between these two measures since FY 2008 and can be seen as an increase in the degree of equity created by the state funding model. However, that the mean for local PPE is still higher than the mean for state PPE is an indication that the state expenditure levels are not adequate.

Range and Restricted Range

As stated in the previous chapter, the increases and decreases in the range and restricted range for state PPE and local PPE resemble each other through FY 2016,[63] as the range and restricted range for both state PPE and local PPE increased from FY 2004 to FY 2008, decreased from FY 2008 to FY 2012, and then increased again from FY 2012 to FY 2016. However, in FY 2020, the local PPE restricted range increased by nearly 22%, growing $1,761 since FY 2016. Comparatively, the range for local PPE increased nearly 2% between FY 2016 and FY 2020. The increase in the restricted range for local PPE further indicates that the distribution of local PPE is vastly different above and below the median as the high-capacity school divisions are able to put more local funding towards education than their low-capacity counterparts. Furthermore, when the increase is noted in the restricted range, rather than in the range, there is an indication that the disparity in local funding is not simply the result of the outlier, wealthiest school divisions skewing the data.

[62] See Table 4, p.62
[63] See Chart 1, p.63, and Chart 2, p. 64.

The range indicates that there has been a decrease in equity between FY 2004 and FY 2020. For a brief time, between FY 2008 and FY 2012, in an economy recovering from the recession, the reductions in the state PPE range (a decrease of $524) and in the local PPE range (a decrease of $1,270) indicated an increase in equity. This, however, was short-lived, as the ranges continued to increase after FY 2012. In FY 2016, the state PPE range increased by 26.84% ($1,303), and the local PPE range increased by 5.88% ($844). This increase in range is an indication of increasing disparity in per pupil expenditures, a decrease in the degree of equity. The decrease in equity as measured by range held true in the FY 2020 observation. The local PPE increase in range is indicative of the variance in expenditure levels among the 12 school divisions that spend more than $10,000 per pupil.[64] For instance, in FY 2020, Loudon County, which expended $11,161 per pupil in locally supported expenditures, has an LCI of .5383. Arlington expended $17,088 per pupil and has an LCI of .8000. A difference of $5,927 between these two school divisions, illustrates the variance in local effort among the Commonwealth's most fiscally-able school divisions.

The same can be seen in the restricted range: Despite the state PPE and local PPE decreases in FY 2012, the local PPE restricted range ($9,828) more than doubled the state PPE restricted range ($4,728). This is an indication that, when the values at and above the 95th percentile and the values at or below the 5th percentile are removed from consideration, the amount of local expenditures per student are still considerably skewed towards the school divisions with a higher fiscal capacity and a lower reliance on state funding for per pupil expenditures. It also means there is more disparity in local funding, and state funding is exhibiting more disparity, by virtue of an increase in range.

Coefficient of Variation

Coefficient of Variation (CV) values measure the variability of the data in a set. Greater variability is an indication of inequity. When considering the CV for total PPE, the CV was highest in FY 2012 (20.23%) and decreased in FY 2016 (19.61%) and FY 2020 (18.66%), which shows an increase in equity overall. The CV values for state PPE and local PPE, however, show that the local PPE value is higher than the state value. The CV for local PPE was higher than the state PPE CV by the following values: 31.50% (FY 2004), 35.61% (FY 2008), 30.37% (FY 2012), 30.64% (FY 2016), and 32.25% (FY 2020). The sizeable difference between these values

[64] Of the 12 school divisions that had locally funded expenditures over $10,000 per pupil, Loudon County had the lowest local PPE and Arlington had the highest. The mean local per pupil expenditure level for this group was $13,324 per pupil in FY 2020.

shows that more variability exists in the local PPE values for each of the selected years and that the local PPE values are not grouped closely to the mean values. Therefore, analysis of the CV indicates more a higher degree of equity in the state PPE and more disparity in the local PPE.

The argument that locally funded expenditures create disparity is furthered by looking at standard deviation (SD) values[65] for the school divisions that have a Local Composite Index (LCI) higher than .5000. The SD values for local PPE in the group of school divisions having an LCI higher than .5000 ranges from 2,631.54 (FY 2004) to 3,427.16 (FY 2008). The SD for local PPE for the group of school divisions with an LCI below .3000 ranges from 620.47 (FY 2004) to 980.87 (FY 2016). The SD comparison here illustrates that the various amounts of local PPE in the group of low-LCI school divisions are more concentrated around than mean while the various amounts of local PPE in the group of high-LCI school divisions are comparatively dispersed from the mean.

Gini Index

As a measure of the distribution of wealth across populations, the Gini Index provides a statistical value for how equitable or inequitable the distribution is. This statistic differs from the previous statistics in that it is not directly comparing per pupil expenditures. When applied to educational expenditures, the Gini Index analyzes a school division's percentage of the total expenditures in the state to the school division's percentage of the total student population in the state. If a system were able to be absolutely equalized in the distribution of expenditures, ten percent of the population would account for ten percent of the expenditures; fifty percent of the population would account for fifty percent of the expenditures; and so on to one-hundred percent of the population and expenditures. The equal distribution of population and expenditures would result in a Gini Index value of 0.0, and the consolidation of all expenditures into a single entity of the total population (a single school division) would result in a Gini Index value of 1.0. Therefore, values closer to zero represent equitable systems and values closer to 1.0 represent inequitable systems.

The Gini values for state expenditures in FYs 2004, 2008, 2012, and 2016 consistently decreased, which indicates an increase in equity. The FY 2020 Gini value, however, increased by .0023, which is relatively minor. By this measure, the distribution of state funds throughout the Commonwealth became steadily more equitable between FY 2004 and FY 2016 but perhaps stalled in the most recent observation year (FY 2020). The Gini values for local expenditures,

[65] Standard deviation is a factor in the calculation of the Coefficient of Variation

however, show a greater departure from absolute equality in expenditures. At an average of .2808 at the four-year intervals between FY 2004 and FY 2020, the Gini values for local expenditures indicate the consolidation a high percentage of the expenditures in a small percentage of the total population.

When the Gini Index calculations were run for the total expenditures in the state, the Gini values averaged .1058 over the selected years. While the index did fluctuate from interval to interval, the overall average for the Gini Index between FY 2004 and FY 2020 is lower than the state Gini value (.1681) and local Gini value (.2808) by themselves. This means that the state's effort to equalize funding through the local composite index was able to offset approximately 62% of the disproportionality in the share of total expenditures created by local leeway funds.

McLoone Index

Whereas CV and the Gini Index analyzed the whole distribution of expenditures in the state, the McLoone index isolates the expenditures that are below the median value. In this statistic perhaps more than in others, the impact of adding state dollars to the local dollars is statistically apparent. The McLoone Index values for local PPE fluctuated within a .0190 range from .7380 (FY 2012) to .7570 (FY 2020). These values are indicative of severe inequity and show that the lower half of the distribution does not compare well to the median value. When the state expenditures, local expenditures, and sales and use tax expenditures are all taken into account, however, the McLoone Index exhibited a much higher degree of equity. For the observation years, the average value for the McLoone Index was .9343. This value suggests that the state funding addresses the inequity in the lower half of the distribution.

Pearson's Correlation Coefficient

The strong negative relationships between state PPE and LCI and the strong positive relationship between local PPE and LCI are to be anticipated in a funding model such as Virginia's Standards of Quality (SOQ) model, which uses a foundation program to equalize the disbursement of state funds according to fiscal capacity. The strong negative relationship between state PPE and LCI is an indication that more state funding is being directed to the school divisions with lower fiscal capacities, which is the basic concept of the local composite index.

When the school divisions are arranged in rank order according to LCI, with the lowest LCIs first, there should be a relatively consistent pattern that emerges when looking at the state PPE and local PPE: As the LCI value increases, the state PPE should decrease and local PPE

should increase. Such a pattern should exist based upon the concept of the LCI (a measure of wealth). For the first three selected years of the study (FYs 2004, 2008, and 2012), Lee County had the lowest LCI in the state and had the highest state-funded PPE in the state. In the fourth year (FY 2016), however, Lee County had the second-lowest LCI[66] and ranked 9th in state-funded PPE. There are bound to be anomalies, and statistically, this is confirmed by the Pearson values ranging between - .9280 and - .8510. However, Wise County had the second-lowest LCI in FY 2004 and ranked 19th in state-funded PPE; had the third-lowest LCI FY 2008 and ranked 30th in state-funded PPE; and had the third-lowest LCI in FY 2012 and ranked 33rd in state-funded PPE.

The statistical relationship between total PPE and LCI shows the weakest relationship, compared to state PPE and local PPE. If the SOQ funding system absolutely equalized local ability with state funding—that is, increasing the state share for low-fiscal capacity localities and decreasing the state share for high fiscal capacity localities such that fiscal neutrality was achieved—the relationship between total per pupil expenditures and LCI would be statistically irrelevant. This would mean that state funding would be sufficient to offset funding disparities created by local effort. This is not the case in Virginia. The data suggests that local funding of expenditures directly affects the overall relationship between total PPE and LCI enough to create a discernible positive relationship that is getting stronger with time: .6825 (FY 2004), .6695 (FY 2008), .6560 (FY 2012), .7316 (FY 2016), .7677 (FY 2020). This means that the inverse relationship between state contributions and LCI—as LCI increases, state support decreases—is no longer apparent once state and local dollars are counted together. Therefore, fiscal neutrality has not been achieved in the current SOQ funding model.

Conclusions and Recommendations

This section of the study of fiscal equity in Virginia's public elementary and secondary schools attempts to reassemble the statistics that have been pulled apart and isolated over the previous chapters and answer questions regarding whether Virginia's SOQ funding formula has increased the level of equity during the years of the study. According to some statistics,[67] namely the Coefficient of Variation and the McLoone Index, there is reason to believe that state's SOQ model has increased the level of fiscal equity among the school divisions in the Commonwealth;

[66] In FY 2016, Buena Vista had a composite index of .1756 and Lee County had a composite index of .1886.
[67] In this context, the funding source under consideration is the total (non-federal) source

however, there are other statistics—range, restricted range, and Pearson's Correlation Coefficient—that demonstrate the elusiveness of fiscal equity.

The first statistic revisited in this section is the McLoone Index because it provides an excellent starting place for demonstrating how state funding has, in part, achieved a higher level of equity in educational expenditures. This statistic had showed a trend towards equity in the study that spanned from FY 1975 to FY 2003 and was leveling off in the early 2000's (Arbogast, 2005). In more recent years (FY 2004 – FY 2020), the McLoone Index values for total PPE were between .92 and .95 for each observation year despite the inequity evident in the values for the local PPE. The total PPE values are evidence that the state's method of funding through the LCI does a great deal to offset what may be lacking in terms of local effort.

The same holds true, statistically, when analyzing the Gini Index. The change in the Gini Index between FY 1975 and FY 2003 showed a decrease in the value (increase in equity) from .1378 to .0956 (Arbogast, 2005). Between FY 2004 and FY 2020, the Gini Index for total per pupil expenditures fluctuated with a range of .0043 and had an average value of .1058. With the Gini Index, there is evidence that an unquestionable amount of inequity exists when isolating the local expenditures. However, when the state dollars are added together with the local dollars, the Gini Index results look quite different. Whereas the Gini values for local expenditures between FY 2004 and FY 2020 were between .2664 (FY 2016) and .2937 (FY 2008), the values for total expenditures were between .1027 (FY 2016) and .1082 (FY 2012). Therefore, the state-funded expenditures have helped to create more of a level playing field in terms of total expenditures.

Another analysis of the basic per pupil expenditure calculations furthers this point. When the school divisions with LCI values above .5000[68] are isolated, the *group* means for state PPE are $1,857 in FY 2004; $2,449 in FY 2008; $2,358 in FY 2012; $2,521 in FY 2016; and $2,995 in FY 2020. These are all considerably lower than the *statewide* means for state PPE in each year.[69] However, when the group means for local PPE are added to the state retail sales and use tax funding per pupil calculations for this group, the per pupil totals exceed the mean values of total PPE for the school divisions with LCI values below .3000. That is to say, *without any state-funded expenditures*, the schools divisions with LCI values above .5000 exceed the mean of *total* per pupil expenditure levels for the school divisions having LCI values below .3000.

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[68] The grouping of school divisions with LCI values above .5000 contains a varying amount of school divisions in each observation year: 23 in FY 2004; 21 in FY 2008; 27 in FY 2012; and 22 in FY 2016.
[69] See Table 2, page 60.

In summary, the SOQ formula has proven to overcome some of the disparity created by fiscal capacity, but ultimately, fiscal inequity will continue to persist where the state does not take more aggressive measures to offset the imbalance of local funds above the median of total expenditures. At this point in time, however, the LCI is too strong of a predictor for total expenditures. School divisions in resource-poor and low fiscal capacity localities do not receive enough in equalization aid from the state to offer the advantages that may be available in school divisions with more wealth.

Recommendations to Policy Makers

Despite the complexity of the SOQ formula to take into account several wealth and fiscal capacity variables to achieve a fair and equitable distribution of funds, the formula is unable to respond to local leeway spending, or that portion of local spending that exceeds the local required effort. From a litigation standpoint, the prospect of successfully arguing that the formula fails to distribute funds equitably seems bleak. The outcome of *Scott v. Commonwealth of Virginia* (1994) has already answered the legal question, as interpreted by the Virginia Supreme Court, of whether the state system of schools is required to have substantial equity in funding, declaring that the aspirational language of the state constitution does not require such equity. Therefore, arguments seeking to address the distribution of state funds in the name of equity may not gain much traction.

The disparities that are evident in the current system, however, still warrant further discussion and action. As seen in litigation elsewhere in the nation following *Rose v. Council for Better Educ., Inc* (1989), an argument for more adequate funding for the lowest capacity schools may be a more promising path forward. If the SOQ formula promotes equity below the median per pupil values, as seen in the McLoone Index, and if the rampant disparity from local leeway[70] funding naturally occurs further and further above the median per pupil amounts, then policy makers could reason that any adjustments made above the median, or at the highest composite index values, should not further disadvantage the school divisions below the median or at the lowest composite index values. Furthermore, any adjustments should not discourage high fiscal capacity localities from funding beyond required levels.

A proposed legislative adjustment may look closely at restructuring the impact of the retail sales and use tax on total funding throughout the Commonwealth.[71] The *Code of Virginia*

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[70] Local leeway funds are the local funds in excess of the required local effort

[71] The per pupil expenditures supported by the retail sales and use tax for each selected year are included in Appendixes A – E.

provides that the sales tax is apportioned and distributed to localities according to the latest available population projects developed by the Weldon Cooper Center for Public Service for the University of Virginia (§58.1-638(D)). The sales tax is a funding source that is technically local revenue but is also separate from local required effort and has virtually no relationship to the LCI, as evidenced by the Pearson Correlation Coefficient for this source.[72] Hypothetically, a legislative change to §58.1-638(D) could create a method to redirect this revenue from the school divisions with composite indices higher than .5000 to school divisions with composite indices below .3000 (*Code of Virginia)*. This would have the effect of creating three tiers among the school divisions: the "non-recipient" school divisions with LCIs higher than .5000; "recipient" school divisions with LCIs lower than .3000; and "unadjusted" school divisions with LCIs between .3000 and .5000. The revenue collected for distribution among the school divisions with the highest fiscal capacities (LCI above .5000) would be appropriated instead to the school divisions with the lowest fiscal capacities (LCI below .3000). Then, using ADM as a proxy for total population of school-aged children, the re-appropriated sales tax revenue would be distributed to the low fiscal capacity localities as sales tax "add-on" funds for the purposes named in §58.1-638(D) of the *Code of Virginia*: "maintenance, operation, capital outlays, debt and interest payments, or other expenses incurred in the operation of public schools." The "non-recipient" school divisions would not receive the sales tax revenue, and the "unadjusted" school divisions would receive the sales tax revenue that has traditionally been apportioned and distributed to them. A redistribution of this sort would have resulted in additional per pupil funding (sales tax "add-on") in the following amounts for the students at the recipient school divisions: $1,021 in FY 2004; $1,190 in FY 2008; $1,682 in FY 2012; $2,131 in FY 2016; and $2,234 in FY 2020.[73] This measure would not completely nullify the disparity in local funding. It would, however, bring the expenditure levels in the lower half of the statewide distribution closer to the mean (increase in equity) and reduce the range in per pupil expenditures (increase in equity).

An additional recommendation to policy makers, whether they are legislators, school board members, superintendents, or advocacy groups, relates to advocating for less restrictive language in the SOQ staffing requirements (*Code of Virginia,* §22.1-253.13:2). When school

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[72] For selected years, the Retail Sales and Use Tax correlates to Local Composite Index as follows: FY 2004, r = .0317; FY 2008, r = .1287; FY 2012, r = .2040; and FY 2016, r = .1198

[73] For this calculation, the mean value for sales and use tax per pupil for school divisions with composite indices higher than .5000 was multiplied by the number of students in the ADM for those school division. This dollar amount was then divided by the number of students in the ADM of the school division with composite indices below .3000 to determine the per pupil amount.

divisions develop operational budgets with limited resources, as in lower fiscal capacity localities, the SOQ staffing requirements may provide necessary funding but do not give school divisions enough leeway in staffing decisions to meet the unique needs of the locality. For instance, §22.1-253.13:2(H.3) mandates the employment two full-time librarians when a high school has 1,000 in membership (*Code of Virginia*). With the advent of online resources, increased access to technology in classrooms, and a general advocacy for research to be an integral part of classroom instruction, the mandate for an additional librarian in a high school when enrollment eclipses 1,000 students does not seem reflective of the instructional needs of the school. In this sense, the staffing requirements become restrictive without meeting the local needs, which ultimately puts more strain on local support to fund positions not allocated through the SOQ staffing requirements.

As the SOQ staffing requirements relate to school counselors, legislative changes effective in 2021-2022 will set the student-to-counselor ratio at 325:1 throughout an entire school division (*Code of Virginia,* §22.1-253.13:2 (H.4.b)). While the adjustment in the ratio is responsive to growing concerns for the social-emotional well-being of students, the 2021-2022 ratio will present a challenge for school divisions that traditionally have difficulty staffing school counselor positions at the previous ratios. The deficiency is one of legislating a uniform treatment without taking into account the variability of needs throughout the state and the varying ability of school divisions to recruit highly qualified personnel to low fiscal capacity localities. To that point, a legislative effort to re-benchmark the SOQ staffing requirements would provide an opportunity for the Commonwealth to support, through the SOQ formula, staffing at school divisions that more accurately reflects the staffing that the school divisions have deemed is necessary to provide high quality instruction. In the absence of re-benchmarking the SOQ staffing requirements, authorizing school boards to exercise more discretion over the use of state funds may achieve a similar purpose.

Recommendations for Future Studies

Section 1 of the Education Articles of the Virginia Constitution states the General Assembly “shall seek to ensure that an educational program of high quality is established and continually maintained.” The mandate for the continual maintenance of the educational program seems to imply that Standards of Quality, and therefore the Commonwealth’s constitutional obligation to fund the Standards of Quality, must also be maintained. If this is case, an analysis of the cost of meeting the needs of all school divisions should be undertaken. The current

analysis of school division expenditures between FY 2004 and FY 2020 did not investigate the comparison between Local Required Effort—a locality's share of the cost of funding the Standards of Quality—and Total Local Effort—the total dollar amount contributed by a locality for all expenditures associated with the operation of a local, public school division, which includes Local Leeway, or discretionary funding. A recommendation for further study would be to assess the extent to which localities support educational expenditures with local funding beyond what is required by the SOQ formula. For a study of this sort, the research would investigate average base costs of education[74] and would likely identify common costs among school divisions that should be state-funded rather than locally funded. Such a study may identify a more accurate funding target for the General Assembly and may be foundational in demonstrating that the SOQ formula fails to maintain or adequately fund a high quality educational program in each locality of the Commonwealth.

[74] See Alexander K., Salmon, R. G., and Alexander, F. K. (2015). *Financing public schools: Theory, policy, and practice*, pages 364 – 371.

References

Abbeville County School District v. State, 335 S.C. 58, 515 S.E.2d 535, 135 Ed. Law Rep. 833 (South Carolina 1999)

Alexander, K. (1991). *The common school ideal and the limits of legislative authority: The Kentucky case*. 28 Harv. J. on Legis. 341

Alexander, K., & Alexander, M. D. (2012). *American public school law*. (8th Ed.) Belmont, CA: Wadsworth.

Alexander K., Salmon, R. G., & Alexander, F. K. (2015). *Financing public schools: Theory, policy, and practice*. Routledge: Taylor & Francis Group.

Arbogast, II, T. (2005). *An historical analysis on fiscal equity in Virginia: 1974 – 2003*. (Publication No. 305411856) [Doctoral dissertation, Virginia Polytechnic Institute and State University]. ProQuest Dissertations & Theses Global.

Brigham v. State, 166 Vt. 246, 692 A.2d 384, 117 Ed. Law Rep. 667 (Vermont 1997)

Brown v. Board of Education of Topeka, 347 U. S. 483, 74 S.Ct. 686 (1954)

Burruss v. Wilkerson, 301 F. Supp. 1237 (W.D. Va. 1968)

Campbell County School District, State of Wyoming, et al v. State of Wyoming, 907 P.2d 1238 (Wy. 1995)

Delja, A. M. (2004). *Across four Aprils: School finance litigation in Virginia*. 2004 B.Y.U. Educ. & L. J. 191

Dickey, K. (2013). Overview of K-12 education funding in Virginia: Direct aid to public education budget. *Virginia Department of Education*. Retrieved from https://www.nvic.org/cmstemplates/nvic/pdf/state-legislature/soq-funding-presentation-3.pdf

Driscoll, L. G., & Salmon, R. G. (2008). How increased state equalization aid resulted in greater disparities: An unexpected consequence for the Commonwealth of Virginia. *Journal of Education Finance, 33*(3).

Driscoll, L. G., & Salmon, R. G. (2013). Challenges confronting public elementary and secondary education in the Commonwealth of Virginia. *Journal of Education Finance. 38*(3).

Duncombe, C., & Cassidy, M. (2016, January). Virginia's eroding standards of quality: How the state slashed support for Virginia's school since the recession. *The Commonwealth Institute*. Retrieved from https://www.thecommonwealthinstitute.org/2016/01/06/ virginias-eroding-standards-of-quality/

Edgewood Indep. Sch. Dist. v. Kirby, 777 S.W.2d 391, 56 Ed.Law Rep. 663 (Tex. 1989)

Escue, C. P., Thro, W. E., & Wood, R. C. (2011). *Some perspectives on recent school finance litigation*. 268 Ed. Law Rep. 601

Gannon v. State, 319 P.3d 1196, 302 Ed. Law Rep. 377 (Kan. 2014)

Helena Elementary Sch. Dist. No. 1 v. State, 236 Mont. 44, 769 P.2d 684 (1989)

Heise, M. (1995). *State constitutions, school finance litigation, and the "third wave": From equity to adequacy*. 68 Temp. L. Rev. 1151, 1152.

Hickrod, G. A, & Hubbard, B. C. (1968). *Alternatives in educational expenditure policy for the state of Illinois.* Illinois State Univ. Retrieved from https://files.eric.ed.gov/fulltext/ED024147

Horton v. Meskill, 376 A.2d 359 (Conn. 1977)

Instructional Costs Commission. (1972). *Report to the governor and the general assembly of Virginia*. Richmond, VA: Commonwealth of Virginia.

Joint Legislative Audit and Review Commission (JLARC). (1986). *Funding the standards of quality – part 1: Assessing SOQ costs (JLARC I)*. Richmond, VA: Commonwealth of Virginia.

Joint Legislative Audit and Review Commission (JLARC). (1988). *Funding the standards of quality – part 2: SOQ costs and distribution (JLARC II)*. Richmond, VA: Commonwealth of Virginia.

Joint Legislative Audit and Review Commission (JLARC). (2002). *Review of elementary and secondary school funding*. Richmond, VA: Commonwealth of Virginia.

Lujan v. Colorado State Bd. of Educ., 649 P.2d 1005, 1034 (Colo. 1982)

McDaniel v. Thomas, 248 Ga. 632, 285 S.E.2d 156 (1981)

Meade, R. (1941). *A history of constitutional provisions for education in Virginia.* (Publication No. DP15051) [Doctoral dissertation, University of Virginia]. ProQuest Dissertations & Theses Global.

Montoy v. State, 120 P.3d 306, 202 Ed. Law Rep. 319 (Kan. 2005)

Moore, H. W. (1971). *In aid of public education: An analysis of the Education Article of the Virginia Constitution of 1971*. 5 U. Rich. L. Rev. 263.

Mullins, F. (2001). *A history of the Literary Fund as a funding source for free public education in the Commonwealth of Virginia.* (Publication No. 3073109) [Doctoral dissertation, Virginia Polytechnic Institute and State University). ProQuest Dissertations & Theses Global.

National Education Association (NEA). (2020). Rankings of the state 2019 and estimates of school statistics 2020. *NEA Research*. Retrieved from www.nea.org

National Science Foundation (2020). Expenditures per Pupil for Elementary and Secondary Public Schools. *Science and Engineering Indicators: State Indicators*. Alexandria, VA: National Science Foundation. Retrieved from https://ncses.nsf.gov/indicators/states/indicator/public-school-per-pupil-expenditures

Pauley v. Bailey, 255 S.E. 2d 859 (W.Va. 1979)

Plessy v. Ferguson, 163 U.S. 537, 538, 16 S. Ct. 1138, 1138, 41 L. Ed. 256 (1896)

Quality Counts 2020: School Finance. (2020, December 10). Retrieved January 08, 2021, from https://www.edweek.org/policy-politics/quality-counts-2020-school-finance

Rebell, M. A. (2017). Courts & kids: Pursuing educational equity through state courts. [Supplement]. Retrieved from www.schoolfunding.info

Robinson v. Cahill, 62 N.J. 473, 303A 2d 273 (1973)

Rodriguez v. San Antonio Indep. Sch. Dist., 337 F. Supp. 280 (W.D. Tex. 1971)

Rose v. Council for Better Educ., Inc., 790 S.W.2d 186 (Ky. 1989)

Salmon, R. G. (2010). The evolution of Virginia public school finance: From the beginnings to today's difficulties. *Journal of Education Finance*, *36*(2).

Salmon, R. G., & Alexander, M. D. (2018). *Taking the mystery out of Virginia school finance: Financing public elementary and secondary education in the Commonwealth of Virginia*. (2nd ed). Ypsilanti, MI: NCPEA Publications.

San Antonio Indep. Sch. Dist. v. Rodriguez, 411 U.S. 1, 93 S. Ct. 1278, 36 L. Ed. 2d 16 (1973)

SchoolFunding.Info. (2019, December 05). Retrieved January 08, 2021, from https://www.schoolfunding.info/about-us/

Scott v. Commonwealth of Virginia, 443 S.E.2d 138 (1994)

Serrano v. Priest, 5 Cal. 3d 584, 487 P.2d 1241 (1971)

Snyder, T.D., de Brey, C., & Dillow, S.A. (2019). *Digest of Education Statistics 2017* (NCES 2018-070). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Thro, W. E. (1989). *To render them safe: The analysis of state constitutional provisions in public school finance reform litigation*. 75 Va. L. Rev. 1639

Thro, W. E. (1994). *Judicial analysis during the third wave of school finance litigation: The Massachusetts decision as a model*. 35 B.C. L. Rev. 597

United States Census Bureau. (2019). *2014 – 2018 American community survey 5-year estimates*. Retrieved from www.census.gov

U. S. Const. amend. X, XIV

U. S. Const. art. VI

Va. Code Ann. §22.1-253.13:1-13:3

Verstegen, D. (1996). Concepts and measures of fiscal inequality: A new approach and effects for five states. *Journal of Educational Finance*, *22*(2).

Verstegen, D. (2015). On doing an analysis of equity and closing the opportunity gap. *Education Policy Analysis Archives*, *23*(41). http://dx.doi.org/10.14507/epaa.v23.1809

Verstegen, D., & Salmon, R. (2001). Virginia education finance reform: Have excellence and equity been achieved? *Journal of Education Finance*, *14*(2).

Verstegen, D., & Whitney, T. (1997). From courthouses to schoolhouses: Emerging judicial theories of adequacy and equity. *Educational Policy*, *11*(3).

Virginia Constitution. (1868, 1902, 1970). Richmond, VA: Commonwealth of Virginia.

Virginia Department of Education (VDOE). (2002 – 2020). *Superintendents' Annual Report*. Retrieved from https://www.doe.virginia.gov/statistics_reports/supts_annual_report/index.shtml

Washakie Cty. Sch. Dist. No. One v. Herschler, 606 P.2d 310 (Wyo. 1980)

Appendix A

Per Pupil Expenditure Data by Funding Source for FY 2004

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
001	Accomack	.2929	5,149.31	3,117.29	3,859.02	891.35	7,867.66
002	Albemarle	.6220	12,271.95	6,374.28	1,848.28	735.06	8,957.62
003	Alleghany	.2975	2,874.96	3,208.49	3,948.93	678.01	7,835.43
004	Amelia	.3360	1,663.01	1,961.83	3,758.16	757.11	6,477.11
005	Amherst	.3034	4,512.09	2,249.81	3,634.24	762.04	6,646.09
006	Appomattox	.2899	2,272.02	1,721.65	3,905.04	702.80	6,329.50
007	Arlington	.8000	18,178.70	13,258.00	1,244.79	733.35	15,236.14
008	Augusta	.3532	10,680.85	2,587.50	3,173.53	733.99	6,495.02
009	Bath	.8000	786.96	8,424.26	1,330.77	689.13	10,444.16
010	Bedford	.3943	9,836.05	2,577.07	2,830.94	678.88	6,086.89
011	Bland	.3019	912.36	1,929.61	4,437.85	678.15	7,045.62
012	Botetourt	.4256	4,745.39	3,573.47	2,946.68	757.17	7,277.32
013	Brunswick	.2702	2,276.81	2,164.70	4,343.65	803.72	7,312.07
014	Buchanan	.2452	3,621.43	1,977.40	4,469.92	654.53	7,101.84
015	Buckingham	.2709	2,177.16	1,545.08	4,389.42	750.81	6,685.31
016	Campbell	.2837	8,619.54	2,37h 68.91	3,433.88	711.64	6,524.43
017	Caroline	.3104	3,509.36	2,755.24	3,400.40	706.10	6,861.74
018	Carroll	.3123	4,011.56	2,406.44	3,842.52	729.45	6,978.41
019	Charles City	.4370	868.34	6,536.31	3,095.36	775.68	10,407.36
020	Charlotte	.2392	2,186.58	1,535.78	4,378.58	656.16	6,570.52
021	Chesterfield	.3882	54,814.52	3,336.15	2,778.53	657.13	6,771.81
022	Clarke	.5297	2,033.02	4,832.40	2,239.49	710.40	7,782.29
023	Craig	.3410	701.87	2,367.24	3,855.93	822.39	7,045.56
024	Culpeper	.3849	6,162.94	3,408.70	2,936.61	709.92	7,055.23
025	Cumberland	.3203	1,336.75	2,055.17	3,932.17	909.16	6,896.50
026	Dickenson	.2624	2,583.45	2,247.56	4,206.98	684.01	7,138.55
027	Dinwiddie	.2877	4,449.20	2,419.55	3,550.70	635.16	6,605.41
028	Essex	.4122	1,606.87	3,088.05	3,078.95	763.04	6,930.04
029	Fairfax	.7518	158,483.22	8,295.71	1,261.15	762.23	10,319.08
030	Fauquier	.5848	10,312.26	5,420.02	2,064.91	745.24	8,230.16
031	Floyd	.3470	2,092.97	2,533.74	3,550.67	688.89	6,773.31
032	Fluvanna	.3721	3,483.94	3,073.28	3,059.91	578.34	6,711.53
033	Franklin	.3874	7,143.90	2,831.91	3,134.64	709.46	6,676.01
034	Frederick	.3756	11,296.16	4,298.85	3,008.30	664.55	7,971.69
035	Giles	.3140	2,534.67	2,633.38	3,303.78	737.77	6,674.93
036	Gloucester	.3132	6,133.20	2,863.85	3,343.29	746.98	6,954.12
037	Goochland	.8000	2,087.66	6,250.47	1,102.90	708.78	8,062.15
038	Grayson	.2912	2,221.80	2,040.30	4,241.37	707.24	6,988.91
039	Greene	.3183	2,626.38	2,999.47	3,724.56	711.73	7,435.75
040	Greensville	.2196	1,549.47	1,771.31	4,507.89	723.66	7,002.86
041	Halifax	.2380	5,876.85	2,541.25	4,448.07	729.58	7,718.90

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
042	Hanover	.4756	17,919.32	3,613.97	2,380.84	660.72	6,655.53
043	Henrico	.5113	44,762.45	3,797.73	2,250.60	705.10	6,753.43
044	Henry	.2930	8,099.62	2,001.31	3,761.54	790.01	6,552.86
045	Highland	.6224	293.88	4,369.34	3,273.98	786.85	8,430.17
046	Isle of Wight	.3632	5,010.88	3,448.52	2,945.72	787.69	7,181.93
048	King George	.3514	3,155.45	3,127.77	3,013.44	656.16	6,797.38
049	King & Queen	.3658	840.74	4,214.73	3,994.83	773.77	8,983.33
050	King William	.3459	1,859.83	3,192.46	3,636.32	691.30	7,520.08
051	Lancaster	.6258	1,368.73	4,942.67	1,988.52	752.68	7,683.87
052	Lee	.1859	3,691.81	1,079.42	4,966.88	744.25	6,790.56
053	Loudoun	.6851	40,438.44	7,821.92	1,579.64	671.33	10,072.90
054	Louisa	.6086	4,241.58	4,447.11	1,961.59	775.58	7,184.28
055	Lunenburg	.2481	1,697.84	2,076.75	4,491.96	802.89	7,371.60
056	Madison	.4150	1,853.67	3,138.21	3,305.99	770.17	7,214.38
057	Mathews	.4786	1,286.66	3,034.72	2,961.42	709.68	6,705.82
058	Mecklenburg	.3346	4,768.09	2,281.42	3,807.68	677.72	6,766.82
059	Middlesex	.5572	1,298.00	3,785.47	2,508.33	760.44	7,054.23
060	Montgomery	.3875	9,306.69	3,295.05	3,123.18	792.80	7,211.02
062	Nelson	.4831	2,001.01	4,106.98	2,821.79	801.31	7,730.07
063	New Kent	.4219	2,518.41	3,217.99	2,903.86	733.61	6,855.46
065	Northampton	.3407	1,997.46	2,506.40	3,999.79	790.82	7,297.00
066	Northumberland	.5972	1,444.64	4,124.59	2,282.21	723.30	7,130.10
067	Nottoway	.2451	2,313.49	1,291.10	4,078.42	782.23	6,151.75
068	Orange	.4221	4,087.19	3,387.57	2,960.11	736.79	7,084.47
069	Page	.2959	3,504.15	2,232.50	3,540.77	681.50	6,454.77
070	Patrick	.2813	2,599.95	2,060.63	3,892.93	684.45	6,638.01
071	Pittsylvania	.2793	9,067.25	1,654.97	3,683.74	745.64	6,084.34
072	Powhatan	.3956	4,001.42	3,826.65	2,896.71	690.66	7,414.02
073	Prince Edward	.3108	2,739.30	2,152.95	3,755.88	781.54	6,690.37
074	Prince George	.2596	6,005.21	1,926.68	3,671.70	677.14	6,275.52
075	Prince William	.3895	62,645.95	4,055.56	3,155.23	671.52	7,882.31
077	Pulaski	.3263	4,877.26	2,370.90	3,358.56	749.85	6,479.32
078	Rappahannock	.7170	1,027.02	5,879.13	1,746.46	859.16	8,484.75
079	Richmond	.3455	1,218.68	2,997.14	3,225.67	651.73	6,874.54
080	Roanoke	.4177	14,381.96	3,816.15	2,868.91	734.67	7,419.72
081	Rockbridge	.4271	2,765.11	3,882.73	3,056.10	735.75	7,674.58
082	Rockingham	.3516	10,851.90	3,425.33	3,033.49	808.75	7,267.57
083	Russell	.2548	4,080.07	1,383.18	3,843.49	766.49	5,993.16
084	Scott	.2286	3,719.14	1,276.75	4,284.17	682.97	6,243.89
085	Shenandoah	.3825	5,780.30	2,941.11	3,017.69	705.86	6,664.65
086	Smyth	.2498	4,932.24	1,505.98	3,900.67	753.24	6,159.90
087	Southampton	.2919	2,793.13	2,676.26	3,910.16	839.10	7,425.52
088	Spotsylvania	.3548	21,889.98	3,313.78	2,920.40	702.49	6,936.67

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
089	Stafford	.3296	24,646.96	2,937.49	3,081.16	668.86	6,687.51
090	Surry	.8000	1,080.73	9,183.39	1,334.65	638.06	11,156.10
091	Sussex	.3003	1,354.02	5,518.89	4,047.04	647.30	10,213.23
092	Tazewell	.2678	6,933.64	1,535.63	3,983.18	712.21	6,231.02
093	Warren	.3781	5,077.86	2,828.72	3,027.28	722.44	6,578.44
094	Washington	.3484	7,176.43	2,410.81	3,307.90	619.55	6,338.26
095	Westmoreland	.3719	1,923.16	2,565.61	3,138.41	790.35	6,494.37
096	Wise	.2146	6,624.78	1,778.30	3,921.11	711.49	6,410.90
097	Wythe	.3125	4,245.22	2,270.27	3,666.67	723.57	6,660.51
098	York	.3792	12,388.86	3,077.19	2,781.81	640.91	6,499.91
101	Alexandria	.8000	10,797.96	11,634.41	1,211.94	764.80	13,611.15
102	Bristol	.3748	2,321.50	3,399.02	3,221.56	722.01	7,342.58
103	Buena Vista	.2373	1,080.52	2,844.16	4,086.00	703.32	7,633.47
104	Charlottesville	.5710	4,239.93	7,668.80	2,428.25	933.01	11,030.05
106	Colonial Heights	.4755	2,789.27	5,079.59	2,533.84	702.87	8,316.29
107	Covington	.3407	884.17	4,879.82	3,711.72	676.85	9,268.39
108	Danville	.2927	7,106.50	2,715.89	3,152.82	853.75	6,722.46
109	Falls Church	.8000	1,863.33	11,700.06	1,161.78	716.88	13,578.71
110	Fredericksburg	.7011	2,381.67	6,184.47	1,691.68	658.96	8,535.11
111	Galax	.3378	1,328.40	2,464.25	3,368.98	545.81	6,379.04
112	Hampton	.2613	22,748.30	2,686.15	3,722.56	809.95	7,218.66
113	Harrisonburg	.5286	4,050.94	5,388.57	2,330.23	695.94	8,414.74
114	Hopewell	.2496	3,840.82	2,584.04	3,992.47	723.66	7,300.17
115	Lynchburg	.3833	8,665.65	3,166.59	3,185.68	899.08	7,251.35
116	Martinsville	.2990	2,537.91	2,810.91	3,761.19	812.56	7,384.67
117	Newport News	.2675	30,705.38	2,470.86	3,620.35	865.81	6,957.02
118	Norfolk	.2655	34,039.89	2,685.59	3,783.33	804.92	7,273.84
119	Norton	.3435	681.08	2,371.88	4,186.39	735.48	7,293.75
120	Petersburg	.2196	5,210.23	1,953.10	4,367.19	642.68	6,962.97
121	Portsmouth	.2164	15,548.67	1,832.04	4,285.23	687.87	6,805.15
122	Radford	.3232	1,519.53	2,975.12	3,467.69	627.00	7,069.80
123	Richmond	.4456	23,822.40	5,524.96	3,069.62	881.87	9,476.46
124	Roanoke	.3949	12,860.88	3,523.89	3,429.11	739.98	7,692.97
126	Staunton	.3959	2,672.54	3,711.21	3,207.56	880.73	7,799.50
127	Suffolk	.3018	12,977.98	2,310.45	3,530.83	760.01	6,601.29
128	Virginia Beach	.3394	75,354.91	3,572.86	2,908.70	734.37	7,215.92
130	Waynesboro	.3651	2,932.61	3,411.41	2,996.57	729.01	7,136.99
131	Williamsburg	.8000	817.30	5,861.45	1,394.16	684.09	7,939.70
132	Winchester	.5587	3,564.05	6,158.69	2,465.72	700.74	9,325.15
135	Franklin	.3173	1,398.05	3,077.74	4,116.02	661.18	7,854.94
136	Chesapeake	.3344	39,633.85	3,263.80	3,167.00	745.78	7,176.58
137	Lexington	.4544	635.18	3,503.90	2,749.83	535.61	6,789.34
139	Salem	.4166	3,903.18	4,337.08	2,658.49	699.71	7,695.27

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
142	Poquoson	.3294	2,505.43	2,942.13	3,019.24	642.99	6,604.36
143	Manassas	.4109	6,689.95	5,011.74	3,024.71	728.96	8,765.40
144	Manassas Park	.3200	2,257.36	4,134.77	3,772.82	654.86	8,562.45
202	Colonial Beach	.2921	574.22	1,998.16	3,671.15	586.02	6,255.33
207	West Point	.2823	770.68	4,084.57	3,763.75	541.77	8,390.10
	TOTAL		1,154,985.30				
	MEAN		8,749.89	3,555.33	3,233.86	726.18	7,515.37
	MEDIAN		3,592.74	3,054.00	3,288.88	723.44	7,115.97
	STANDARD DEV		17,712.01	2,033.31	830.76	71.10	1,453.86
	RANGE		158,189.34	12,178.57	3,863.98	397.40	9,242.98
	RES. RANGE		35,753.53	6,196.81	3,016.08	230.67	4,108.62
	CV		202.43	57.19	25.69	9.79	19.35
	GINI			.2868	.1800	–	.1072
	MCLOONE			.7467	.7876	–	.9360
	PEARSON			0.8661	-0.9280	0.0317	0.6825
	REGRESSION			0.7500	0.8612	0.0010	0.4658

Appendix B

Per Pupil Expenditure Data by Funding Source for FY 2008

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
001	Accomack	.3255	4,951.73	2,952.05	5,347.31	1,008.51	9,307.86
002	Albemarle	.6095	12,477.47	8,424.69	2,613.91	949.98	11,988.58
003	Alleghany	.2423	2,881.70	3,739.55	5,705.55	832.30	10,277.40
004	Amelia	.3431	1,847.30	2,621.66	4,806.02	866.40	8,294.08
005	Amherst	.2870	4,627.25	2,499.45	5,075.02	922.31	8,496.78
006	Appomattox	.2696	2,201.69	2,066.07	5,322.56	914.30	8,302.93
007	Arlington	.8000	17,940.00	17,050.30	1,626.54	941.10	19,617.94
008	Augusta	.3320	10,790.21	3,076.86	4,619.33	1,004.80	8,701.00
009	Bath	.8000	715.48	10,277.50	1,830.72	1,014.84	13,123.05
010	Bedford County	.3632	10,761.63	3,082.01	4,162.66	903.84	8,148.51
011	Bland	.3059	903.81	2,277.41	5,484.91	859.79	8,622.11
012	Botetourt	.3957	4,937.00	4,075.10	4,088.21	976.25	9,139.55
013	Brunswick	.2540	2,143.25	2,307.11	6,118.17	1,066.59	9,491.87
014	Buchanan	.3205	3,341.29	3,048.91	5,595.59	901.61	9,546.11
015	Buckingham	.2591	2,000.19	2,892.62	5,781.81	1,097.16	9,771.59
016	Campbell	.2612	8,545.02	2,262.56	4,879.90	977.55	8,120.01
017	Caroline	.3495	4,051.35	3,148.14	4,341.51	1,116.34	8,605.98
018	Carroll	.2842	3,962.98	2,645.10	4,838.19	966.98	8,450.27
019	Charles City	.4128	862.64	5,887.04	5,203.56	907.75	11,998.35
020	Charlotte	.2234	2,101.01	1,808.78	6,035.31	877.59	8,721.68
021	Chesterfield	.3616	58,162.87	4,198.70	3,895.76	858.04	8,952.49
022	Clarke	.5580	2,149.69	5,081.90	2,961.89	927.94	8,971.73
023	Craig	.3184	730.35	2,502.91	5,025.70	1,006.87	8,535.48
024	Culpeper	.4062	7,263.16	4,069.95	4,012.67	835.81	8,918.43
025	Cumberland	.2859	1,446.08	3,461.84	5,238.07	973.25	9,673.16
026	Dickenson	.2344	2,462.39	2,733.50	5,525.26	808.40	9,067.15
027	Dinwiddie	.2669	4,662.78	2,690.57	5,025.37	817.93	8,533.86
028	Essex	.4019	1,616.46	3,787.01	4,281.29	941.35	9,009.66
029	Fairfax County	.7456	163,134.28	10,271.73	1,850.00	967.77	13,089.50
030	Fauquier	.6443	11,135.83	7,089.65	2,457.30	1,010.75	10,557.70
031	Floyd	.3212	2,039.88	2,763.41	4,740.60	966.37	8,470.38
032	Fluvanna	.3749	3,662.65	3,828.99	4,129.95	827.77	8,786.71
033	Franklin	.3950	7,269.17	3,587.20	4,251.65	992.18	8,831.03
034	Frederick	.3925	12,789.47	4,851.94	4,183.76	843.13	9,878.83
035	Giles	.2755	2,529.53	2,566.64	5,086.65	947.18	8,600.48
036	Gloucester	.3323	5,927.27	3,930.66	4,321.65	1,012.90	9,265.21
037	Goochland	.8000	2,366.90	7,836.72	1,409.45	884.34	10,130.51
038	Grayson	.2780	2,059.89	2,461.75	5,526.88	1,047.35	9,035.99
039	Greene	.3334	2,744.99	3,608.79	4,699.48	909.51	9,217.78
040	Greensville	.2199	2,536.20	2,372.80	5,759.85	918.27	9,050.92
041	Halifax	.2380	5,762.01	2,750.13	5,777.37	983.72	9,511.22

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
042	Hanover	.4352	18,755.95	4,376.34	3,549.42	913.39	8,839.16
043	Henrico	.4604	47,725.18	3,949.57	3,483.30	947.26	8,380.13
044	Henry	.2553	7,373.83	1,994.56	5,280.77	1,112.45	8,387.78
045	Highland	.6380	269.62	6,898.05	5,798.64	1,054.29	13,750.99
046	Isle of Wight	.3753	5,316.79	4,504.50	4,021.07	1,026.29	9,551.86
048	King George	.4034	3,888.11	2,940.27	4,053.18	759.91	7,753.36
049	King & Queen	.4073	786.48	6,156.08	5,489.29	1,107.68	12,753.05
050	King William	.3267	2,117.74	3,353.07	4,786.98	868.81	9,008.87
051	Lancaster	.6844	1,333.89	6,910.47	2,378.15	995.05	10,283.67
052	Lee	.1769	3,448.56	2,672.67	6,787.25	1,049.84	10,509.77
053	Loudoun	.6895	53,478.89	10,014.98	2,216.69	860.37	13,092.04
054	Louisa	.5542	4,581.64	5,270.00	2,923.86	956.13	9,150.00
055	Lunenburg	.2399	1,620.69	2,040.04	5,846.48	1,071.43	8,957.96
056	Madison	.4362	1,845.59	4,149.69	4,059.80	1,004.91	9,214.40
057	Mathews	.4701	1,277.98	4,384.42	3,757.62	852.84	8,994.88
058	Mecklenburg	.3056	4,658.19	2,344.11	5,008.27	848.20	8,200.58
059	Middlesex	.5923	1,255.35	5,401.25	2,861.68	983.90	9,246.83
060	Montgomery	.3737	9,589.12	3,799.31	4,281.26	1,046.64	9,127.22
062	Nelson	.4874	2,044.92	5,157.66	3,892.05	1,042.14	10,091.84
063	New Kent	.4044	2,718.21	3,963.11	3,902.63	952.94	8,818.68
065	Northampton	.3925	1,805.28	4,307.52	5,313.22	988.84	10,609.58
066	Northumberland	.6517	1,433.91	5,655.99	2,635.15	996.39	9,287.52
067	Nottoway	.2429	2,222.59	2,131.14	5,574.24	988.76	8,694.14
068	Orange	.4323	5,045.79	3,529.02	4,005.28	848.23	8,382.53
069	Page	.2882	3,567.10	2,760.58	5,592.02	865.54	9,218.13
070	Patrick	.2592	2,564.41	2,265.38	5,509.61	936.18	8,711.17
071	Pittsylvania	.2573	9,082.11	1,908.21	4,925.15	951.72	7,785.09
072	Powhatan	.3722	4,348.41	4,607.75	4,042.22	886.14	9,536.10
073	Prince Edward	.2776	2,532.69	2,974.47	5,461.36	1,168.72	9,604.55
074	Prince George	.2304	6,152.97	1,930.32	5,083.63	908.67	7,922.61
075	Prince William	.4287	71,321.34	5,100.80	4,246.63	883.30	10,230.73
077	Pulaski	.2995	4,786.82	2,555.39	4,778.37	956.76	8,290.53
078	Rappahannock	.7463	944.38	8,610.94	1,925.51	1,168.01	11,704.46
079	Richmond	.3593	1,207.89	3,681.41	4,652.31	854.37	9,188.09
080	Roanoke	.3757	14,871.44	4,049.93	4,033.27	964.45	9,047.65
081	Rockbridge	.4546	2,800.84	4,332.01	3,525.42	966.92	8,824.35
082	Rockingham	.3299	11,431.17	3,686.66	4,312.96	1,013.09	9,012.71
083	Russell	.2292	4,131.34	1,729.23	5,346.74	943.84	8,019.81
084	Scott	.1962	3,826.23	1,683.27	6,211.77	862.03	8,757.08
085	Shenandoah	.3419	6,138.92	4,088.46	4,331.40	896.49	9,316.35
086	Smyth	.2184	4,870.88	1,985.54	5,722.83	852.55	8,560.92
087	Southampton	.2671	2,804.41	2,921.79	5,232.38	1,129.58	9,283.74
088	Spotsylvania	.3455	23,898.20	4,337.94	4,137.47	917.28	9,392.69

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
089	Stafford	.3503	26,142.31	3,860.80	4,112.06	935.98	8,908.85
090	Surry	.7842	992.48	11,040.26	1,882.36	1,028.13	13,950.74
091	Sussex	.2912	1,286.79	7,026.50	5,864.23	1,015.82	13,906.55
092	Tazewell	.2500	6,664.76	1,840.35	5,139.51	975.99	7,955.86
093	Warren	.3956	5,262.21	3,466.45	4,020.70	991.41	8,478.55
094	Washington	.3351	7,314.77	3,080.59	4,442.59	905.21	8,428.38
095	Westmoreland	.4076	1,727.12	3,287.82	4,565.08	983.30	8,836.20
096	Wise	.2036	6,556.69	2,232.11	5,211.79	916.56	8,360.46
097	Wythe	.3086	4,270.97	2,492.59	4,722.71	916.60	8,131.90
098	York	.3749	12,756.40	3,530.03	3,918.59	857.38	8,306.00
101	Alexandria	.8000	10,488.87	15,056.62	1,682.29	1,021.52	17,760.43
102	Bristol	.3366	2,275.06	2,771.75	5,068.07	991.86	8,831.68
103	Buena Vista	.2172	1,152.76	2,275.45	5,467.78	814.82	8,558.04
104	Charlottesville	.6061	3,904.91	10,010.02	2,957.43	1,259.28	14,226.74
106	Colonial Heights	.4565	2,884.67	6,457.91	3,606.22	913.52	10,977.65
107	Covington	.2918	873.44	4,720.17	5,709.28	670.35	11,099.80
108	Danville	.2655	6,480.90	2,940.98	5,019.06	1,042.78	9,002.81
109	Falls Church	.8000	1,919.18	16,018.18	1,511.15	930.05	18,459.38
110	Fredericksburg	.7538	2,572.87	9,489.94	1,856.35	935.14	12,281.43
111	Galax	.2944	1,317.52	2,531.13	4,629.99	762.76	7,923.88
112	Hampton	.2410	21,394.53	3,200.19	5,179.91	1,066.83	9,446.93
113	Harrisonburg	.4361	4,361.60	5,692.75	4,134.19	831.14	10,658.08
114	Hopewell	.2515	3,878.03	2,805.61	5,439.30	856.84	9,101.75
115	Lynchburg	.3500	8,330.29	4,247.47	4,488.72	1,066.46	9,802.64
116	Martinsville	.2470	2,416.23	2,914.22	5,167.73	1,074.16	9,156.11
117	Newport News	.2577	29,604.23	3,121.91	5,053.78	1,096.92	9,272.61
118	Norfolk	.2693	32,312.29	3,169.56	5,120.16	1,084.17	9,373.89
119	Norton	.3299	776.99	2,262.04	5,075.68	838.07	8,175.79
120	Petersburg	.2188	4,600.02	1,985.99	6,186.09	900.97	9,073.04
121	Portsmouth	.2185	14,334.54	2,671.23	5,826.32	860.41	9,357.96
122	Radford	.2947	1,519.11	3,565.16	4,786.22	779.00	9,130.38
123	Richmond	.4329	22,317.84	5,903.63	4,382.72	1,200.91	11,487.25
124	Roanoke	.3763	12,285.72	3,875.35	4,804.05	991.39	9,670.78
126	Staunton	.3925	2,641.52	4,248.65	4,069.07	1,357.14	9,674.86
127	Suffolk	.3014	13,557.74	3,407.29	4,550.23	1,051.75	9,009.27
128	Virginia Beach	.3492	70,690.42	4,848.03	4,049.07	1,031.33	9,928.43
130	Waynesboro	.3160	3,002.42	3,733.31	4,312.91	1,036.06	9,082.28
131	Williamsburg	.8000	10,111.52	6,881.51	2,847.42	924.82	10,653.75
132	Winchester	.5602	3,669.87	7,435.41	3,200.18	935.18	11,570.76
135	Franklin	.2728	1,268.14	3,924.83	6,118.41	918.40	10,961.64
136	Chesapeake	.3186	39,209.92	4,573.11	4,457.81	1,036.29	10,067.22
137	Lexington	.3982	611.26	3,785.06	4,540.13	839.93	9,165.13
139	Salem	.3768	3,936.39	4,805.02	3,892.16	829.78	9,526.96

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
142	Poquoson	.3299	2,458.74	3,215.36	4,169.46	888.77	8,273.60
143	Manassas	.4335	6,260.62	7,892.69	3,242.92	1,072.15	12,207.76
144	Manassas Park	.3650	2,413.84	5,767.55	4,962.99	811.64	11,542.18
202	Colonial Beach	.3131	592.36	3,576.38	5,351.36	693.63	9,621.37
207	West Point	.2683	805.27	4,482.73	5,363.61	715.44	10,561.77
	TOTAL		1,196,576.86				
	MEAN		9,064.98	4,362.31	4,445.26	951.87	9,759.45
	MEDIAN		3,852.13	3,645.10	4,624.66	947.22	9,153.05
	STANDARD DEV		18,378.75	2,686.57	1,154.84	106.90	1,941.42
	RANGE		162,864.65	15,367.03	5,377.81	686.79	11,864.58
	RES. RANGE		34,619.40	8,026.47	3,983.81	304.01	5,279.08
	CV		202.74	61.59	25.98	11.23	19.89
	GINI			.2937	.1747	–	.1041
	MCLOONE			.7409	.7694	–	.9428
	PEARSON			0.8681	-0.9058	0.1287	0.6695
	REGRESSION			0.7536	0.8205	0.0166	0.4483

Appendix C

Per Pupil Expenditure Data by Funding Source for FY 2012

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
001	Accomack	.3753	5,041.09	3,307.47	3,640.21	1,122.99	8,070.66
002	Albemarle	.6872	13,075.96	8,364.49	1,929.54	1,056.49	11,350.52
003	Alleghany	.2151	2,704.61	3,675.80	5,009.17	945.83	9,630.80
004	Amelia	.3472	1,816.83	2,930.43	4,308.22	896.00	8,134.65
005	Amherst	.2664	4,544.52	2,730.57	4,676.87	1,059.99	8,467.43
006	Appomattox	.2732	2,294.35	2,126.87	4,803.84	865.72	7,796.44
007	Arlington	.8000	21,816.54	15,779.90	1,490.82	818.30	18,089.02
008	Augusta	.3416	10,681.27	3,350.52	3,736.09	1,024.08	8,110.69
009	Bath	.8000	674.90	9,589.85	1,657.78	883.16	12,130.80
010	Bedford County	.4076	10,483.90	3,089.07	3,485.77	940.01	7,514.86
011	Bland	.2723	863.57	2,514.87	4,768.35	909.36	8,192.58
012	Botetourt	.3682	5,040.96	4,284.80	3,655.20	1,018.66	8,958.65
013	Brunswick	.2728	2,015.62	3,091.22	5,386.15	1,076.03	9,553.41
014	Buchanan	.2849	3,302.47	3,389.24	4,835.51	898.55	9,123.30
015	Buckingham	.2738	2,034.91	3,190.46	5,194.67	982.94	9,368.06
016	Campbell	.2490	8,350.06	2,635.27	4,118.87	995.68	7,749.82
017	Caroline	.3580	4,299.43	2,721.29	3,927.83	1,039.14	7,688.26
018	Carroll	.2573	4,321.57	3,319.15	4,663.19	799.85	8,782.19
019	Charles City	.4203	812.49	5,755.25	4,442.46	1,019.65	11,217.35
020	Charlotte	.2288	2,096.00	1,939.13	5,850.08	860.16	8,649.37
021	Chesterfield	.3551	58,863.63	3,555.52	3,630.59	858.99	8,045.10
022	Clarke	.5346	2,067.69	5,302.65	2,729.06	956.56	8,988.27
023	Craig	.2903	703.82	2,476.27	4,850.33	1,016.96	8,343.55
024	Culpeper	.4167	7,776.07	3,832.59	3,467.78	914.27	8,214.64
025	Cumberland	.2805	1,459.29	2,765.45	4,767.97	1,005.57	8,538.99
026	Dickenson	.1940	2,440.75	3,692.74	4,848.07	861.19	9,402.00
027	Dinwiddie	.2631	4,416.78	2,735.30	4,643.27	1,008.37	8,386.93
028	Essex	.4868	1,628.15	3,979.63	3,598.18	881.92	8,459.73
029	Fairfax County	.7126	177,226.28	9,905.12	1,854.73	908.70	12,668.55
030	Fauquier	.6097	11,195.12	7,160.30	2,331.60	1,056.52	10,548.41
031	Floyd	.3470	2,034.12	2,569.00	4,293.90	947.54	7,810.44
032	Fluvanna	.3867	3,802.41	4,029.26	3,547.16	850.90	8,427.32
033	Franklin	.4011	7,443.18	3,839.34	3,817.93	990.50	8,647.77
034	Frederick	.3816	13,058.70	4,469.28	3,695.83	968.70	9,133.80
035	Giles	.2649	2,436.94	2,300.91	4,866.75	992.00	8,159.66
036	Gloucester	.3703	5,773.73	3,795.44	3,573.76	1,010.36	8,379.56
037	Goochland	.8000	2,359.27	7,120.48	1,272.93	1,152.86	9,546.28
038	Grayson	.3178	1,873.68	2,428.59	4,854.47	1,091.38	8,374.44
039	Greene	.3500	3,009.27	3,817.80	4,251.22	941.72	9,010.74
040	Greensville	.1998	2,590.39	1,891.10	5,226.14	887.01	8,004.25
041	Halifax	.2748	5,764.39	2,506.23	4,727.77	969.40	8,203.40

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
042	Hanover	.4195	18,548.23	4,299.55	3,250.45	942.72	8,492.71
043	Henrico	.4370	49,768.72	3,882.53	3,338.80	930.04	8,151.36
044	Henry	.2315	7,431.74	2,213.58	4,893.75	986.47	8,093.80
045	Highland	.7846	216.18	9,350.81	4,918.33	1,297.26	15,566.40
046	Isle of Wight	.3926	5,507.15	4,332.58	3,607.34	1,056.59	8,996.51
048	King George	.3875	4,169.99	3,013.87	3,567.72	908.77	7,490.35
049	King & Queen	.4404	759.93	5,251.39	4,466.18	1,180.99	10,898.57
050	King William	.3291	2,227.90	4,008.41	3,922.95	937.52	8,868.89
051	Lancaster	.8000	1,288.69	8,050.05	1,490.85	1,033.50	10,574.40
052	Lee	.1692	3,567.26	1,651.24	6,127.15	966.21	8,744.60
053	Loudoun	.5854	65,940.40	8,757.28	2,263.28	847.70	11,868.26
054	Louisa	.5392	4,687.26	6,476.98	2,878.40	977.90	10,333.29
055	Lunenburg	.2308	1,597.32	2,171.35	5,351.02	1,003.57	8,525.94
056	Madison	.5204	1,874.36	4,366.77	3,057.06	1,016.32	8,440.15
057	Mathews	.5882	1,172.28	5,340.96	2,768.98	1,035.19	9,145.14
058	Mecklenburg	.3315	4,701.11	2,351.12	4,550.87	868.89	7,770.88
059	Middlesex	.7430	1,198.48	6,356.21	2,040.48	990.19	9,386.88
060	Montgomery	.3549	9,594.80	4,189.86	3,852.91	1,101.55	9,144.32
062	Nelson	.5734	1,976.59	6,739.94	2,854.02	1,034.62	10,628.59
063	New Kent	.4312	2,937.43	4,119.26	3,225.89	924.20	8,269.35
065	Northampton	.5109	1,772.32	4,098.53	3,917.86	968.96	8,985.36
066	Northumberland	.8000	1,494.64	6,023.68	1,483.05	938.65	8,445.37
067	Nottoway	.2547	2,341.41	2,038.03	4,996.53	939.35	7,973.91
068	Orange	.4257	5,217.46	3,197.92	3,230.41	883.21	7,311.55
069	Page	.3181	3,663.39	2,755.52	4,378.99	840.21	7,974.72
070	Patrick	.2439	2,554.61	2,058.16	4,922.10	981.33	7,961.58
071	Pittsylvania	.2401	9,170.71	1,825.80	4,924.52	952.34	7,702.65
072	Powhatan	.3969	4,391.86	4,609.24	3,492.41	971.89	9,073.54
073	Prince Edward	.3043	2,376.42	3,485.21	4,720.03	1,166.02	9,371.26
074	Prince George	.2344	6,384.93	2,230.37	4,516.95	880.00	7,627.32
075	Prince William	.4036	81,692.20	4,812.12	3,999.09	813.73	9,624.94
077	Pulaski	.2870	4,559.94	3,040.28	4,466.09	943.23	8,449.60
078	Rappahannock	.8000	895.29	8,840.57	1,803.84	1,090.13	11,734.54
079	Richmond	.3562	1,167.69	4,168.48	4,257.27	929.13	9,354.87
080	Roanoke	.3460	14,413.17	4,293.20	3,607.28	1,069.85	8,970.33
081	Rockbridge	.5050	2,546.19	5,040.69	3,145.12	1,084.87	9,270.68
082	Rockingham	.3489	11,708.58	4,195.50	3,717.12	993.70	8,906.31
083	Russell	.2113	4,375.46	1,733.17	5,027.45	764.11	7,524.72
084	Scott	.1821	3,930.64	1,435.09	5,296.67	849.21	7,580.97
085	Shenandoah	.4029	6,152.75	5,480.93	3,608.55	907.08	9,996.56
086	Smyth	.2100	4,807.68	1,752.01	5,288.85	909.48	7,950.34
087	Southampton	.2896	2,877.19	3,626.57	4,815.26	909.12	9,350.94
088	Spotsylvania	.3593	23,654.93	3,978.60	3,664.36	982.73	8,625.69

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
089	Stafford	.3362	27,294.12	4,330.70	3,750.00	868.69	8,949.38
090	Surry	.6955	920.39	12,536.03	1,783.90	1,043.39	15,363.32
091	Sussex	.3213	1,156.25	7,223.97	5,439.60	1,035.41	13,698.98
092	Tazewell	.2487	6,503.46	1,937.66	4,556.32	820.16	7,314.14
093	Warren	.4204	5,411.97	3,487.25	3,245.44	1,015.60	7,748.29
094	Washington	.3165	7,339.56	3,220.12	4,015.67	921.57	8,157.36
095	Westmoreland	.5020	1,718.52	4,607.55	3,372.40	905.05	8,884.99
096	Wise	.1885	6,185.58	2,932.54	4,625.41	975.69	8,533.63
097	Wythe	.3142	4,362.44	2,982.89	4,116.52	899.51	7,998.92
098	York	.3727	12,577.83	3,995.75	3,442.22	975.72	8,413.70
101	Alexandria	.8000	12,314.44	14,533.20	1,597.51	838.07	16,968.78
102	Bristol	.3132	2,383.77	2,807.73	4,477.97	945.04	8,230.74
103	Buena Vista	.1932	1,197.94	1,912.18	5,381.63	684.62	7,978.44
104	Charlottesville	.6560	4,117.42	10,745.49	2,400.58	992.34	14,138.41
106	Colonial Heights	.4428	2,862.64	6,523.92	3,429.32	923.67	10,876.90
107	Covington	.2597	926.37	5,432.39	4,488.72	702.00	10,623.11
108	Danville	.2470	6,274.45	3,193.51	4,910.93	1,038.16	9,142.60
109	Falls Church	.8000	2,178.94	13,807.96	1,348.20	960.28	16,116.44
110	Fredericksburg	.7763	3,238.50	8,015.87	1,554.24	821.34	10,391.45
111	Galax	.2695	1,328.45	2,684.89	4,461.92	762.33	7,909.14
112	Hampton	.2690	21,405.56	3,464.05	4,305.58	953.83	8,723.47
113	Harrisonburg	.4133	5,044.72	5,059.82	3,991.27	868.71	9,919.80
114	Hopewell	.2285	4,193.98	3,286.03	4,971.75	753.77	9,011.54
115	Lynchburg	.3643	8,719.43	3,809.51	3,810.91	1,028.94	8,649.35
116	Martinsville	.2263	2,278.34	2,813.06	4,797.55	1,157.71	8,768.32
117	Newport News	.2778	29,664.20	3,679.38	4,379.19	1,023.44	9,082.01
118	Norfolk	.3004	32,999.97	3,391.87	4,152.82	918.50	8,463.20
119	Norton	.3042	907.52	2,136.22	4,247.30	805.14	7,188.65
120	Petersburg	.2255	4,504.25	2,126.57	5,202.76	894.89	8,224.22
121	Portsmouth	.2497	15,191.97	3,854.83	4,808.02	913.83	9,576.69
122	Radford	.3251	1,574.27	3,183.81	4,112.03	755.84	8,051.69
123	Richmond	.4945	23,126.77	6,113.72	3,641.02	1,152.86	10,907.60
124	Roanoke	.3582	13,005.78	4,062.01	4,152.63	943.37	9,158.02
126	Staunton	.4024	2,673.14	4,641.42	3,555.34	1,005.72	9,202.49
127	Suffolk	.3432	14,397.42	3,406.85	4,007.25	1,007.33	8,421.43
128	Virginia Beach	.4060	69,856.43	5,171.95	3,489.22	1,034.50	9,695.67
130	Waynesboro	.3609	3,250.54	3,937.37	3,467.88	920.35	8,325.61
131	Williamsburg	.8000	10,941.54	6,913.88	2,499.95	944.85	10,358.68
132	Winchester	.5124	4,049.84	6,224.44	3,230.73	896.90	10,352.07
135	Franklin	.3047	1,269.62	3,614.73	5,104.37	995.54	9,714.64
136	Chesapeake	.3465	39,525.30	4,730.16	3,890.40	998.59	9,619.14
137	Lexington	.4601	666.51	3,472.50	4,321.22	664.22	8,457.95
139	Salem	.3516	3,898.42	5,065.67	3,711.99	861.42	9,639.08

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
142	Poquoson	.3524	2,234.50	4,192.59	3,659.93	929.89	8,782.41
143	Manassas	.4005	7,141.22	5,935.95	4,233.69	859.65	11,029.29
144	Manassas Park	.3311	3,014.17	3,363.31	4,897.26	721.85	8,982.42
202	Colonial Beach	.3785	598.32	3,535.68	4,803.04	605.28	8,944.00
207	West Point	.2667	753.43	5,293.37	4,606.15	768.35	10,667.86
	TOTAL		1,252,690.19				
	MEAN		9,490.08	4,446.93	3,913.53	945.50	9,305.96
	MEDIAN		3,990.24	3,813.65	4,011.46	944.95	8,825.65
	STANDARD DEV		19,872.96	2,551.67	1,057.07	108.06	1,882.40
	RANGE		177,010.10	14,344.82	4,854.22	691.98	10,900.37
	RES. RANGE		35,147.53	7,532.18	3,661.71	351.79	5,525.78
	CV		209.41	57.38	27.01	11.43	20.23
	GINI			.2762	.1644	–	.1082
	MCLOONE			.7380	.7694	–	.9246
	PEARSON			0.8452	-0.8928	0.2040	0.6560
	REGRESSION			0.7143	0.7971	0.0416	0.4304

Appendix D

Per Pupil Expenditure Data by Funding Source for FY 2016

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
001	Accomack	.3555	5,261.60	3,400.97	4,877.71	929.47	9,208.14
002	Albemarle	.6506	13,709.34	9,064.12	2,129.84	1,152.37	12,346.33
003	Alleghany	.2423	2,203.95	4,272.16	5,460.36	1,084.05	10,816.57
004	Amelia	.3309	1,811.55	2,811.87	4,738.80	1,080.75	8,631.43
005	Amherst	.3079	4,185.89	3,775.84	5,006.84	1,166.32	9,949.01
006	Appomattox	.3080	2,267.83	2,479.13	4,870.26	1,050.68	8,400.07
007	Arlington	.8000	25,509.87	16,288.38	1,588.95	905.30	18,782.62
008	Augusta	.3545	10,372.30	4,082.19	4,138.75	1,097.42	9,318.36
009	Bath	.8000	579.94	14,121.07	1,799.24	1,058.23	16,978.54
010	Bedford County	.3132	9,822.32	3,736.47	4,254.98	1,359.84	9,351.29
011	Bland	.3254	800.59	3,910.19	4,853.24	1,107.17	9,870.60
012	Botetourt	.3720	4,730.54	5,401.58	4,003.67	1,161.57	10,566.82
013	Brunswick	.2985	1,728.87	3,236.27	6,250.57	1,363.11	10,849.95
014	Buchanan	.3572	2,991.22	3,775.60	4,991.67	1,053.56	9,820.83
015	Buckingham	.3347	2,025.33	3,617.46	5,157.39	1,148.24	9,923.09
016	Campbell	.2760	7,957.26	3,469.79	4,277.57	1,093.73	8,841.09
017	Caroline	.3272	4,302.81	2,861.14	4,709.44	1,107.18	8,677.76
018	Carroll	.2696	3,893.98	3,331.74	5,149.65	1,123.12	9,604.51
019	Charles City	.4432	703.66	6,995.10	4,807.85	1,348.39	13,151.34
020	Charlotte	.2505	1,918.86	2,192.76	7,543.23	1,065.93	10,801.92
021	Chesterfield	.3496	59,645.52	3,931.48	4,087.07	1,016.68	9,035.22
022	Clarke	.5153	2,005.55	6,339.35	3,277.44	1,147.28	10,764.07
023	Craig	.3157	616.60	3,065.27	5,632.94	1,297.72	9,995.94
024	Culpeper	.3445	8,090.36	3,680.66	4,291.06	1,079.48	9,051.20
025	Cumberland	.2781	1,373.37	2,631.69	6,018.91	1,146.04	9,796.64
026	Dickenson	.2711	2,292.19	3,397.67	5,386.78	1,026.88	9,811.33
027	Dinwiddie	.2882	4,350.47	3,409.41	5,017.84	1,057.24	9,484.49
028	Essex	.4023	1,464.76	4,854.91	4,620.72	1,164.02	10,639.65
029	Fairfax County	.6807	185,581.97	10,526.17	2,236.06	1,030.93	13,793.17
030	Fauquier	.5586	11,059.78	7,794.26	3,090.46	1,097.00	11,981.71
031	Floyd	.3470	2,063.27	3,306.55	4,573.83	1,175.52	9,055.90
032	Fluvanna	.3836	3,528.85	4,750.94	4,024.48	1,172.68	9,948.10
033	Franklin	.4138	7,283.69	4,359.47	4,121.68	1,140.27	9,621.42
034	Frederick	.3719	13,157.37	5,606.62	4,173.40	1,089.74	10,869.76
035	Giles	.2867	2,383.54	3,094.80	5,220.79	1,140.74	9,456.32
036	Gloucester	.3661	5,558.27	4,325.32	4,043.40	1,044.54	9,413.26
037	Goochland	.8000	2,556.33	8,035.29	1,463.34	1,270.11	10,768.73
038	Grayson	.3461	1,669.64	3,739.57	4,933.35	1,259.42	9,932.34
039	Greene	.3568	3,173.03	3,507.91	4,577.98	1,044.78	9,130.68
040	Greensville	.2259	2,555.42	2,176.45	5,727.28	997.17	8,900.90
041	Halifax	.3011	5,316.56	2,980.98	5,329.70	1,078.73	9,389.41

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
042	Hanover	.4070	18,076.21	4,512.13	3,792.96	1,033.00	9,338.09
043	Henrico	.4059	51,455.04	4,934.49	3,114.17	1,039.16	9,087.83
044	Henry	.2408	7,402.80	1,929.78	5,579.20	1,065.06	8,574.04
045	Highland	.8000	209.11	10,027.43	6,326.52	1,116.29	17,470.24
046	Isle of Wight	.4195	5,441.62	4,691.59	3,957.36	1,084.36	9,733.32
048	King George	.3774	4,315.32	3,377.78	3,981.32	1,072.64	8,431.74
049	King & Queen	.4338	848.40	4,639.46	4,594.05	1,251.50	10,485.01
050	King William	.3196	2,221.34	4,003.55	4,865.55	958.91	9,828.00
051	Lancaster	.7792	1,221.11	8,288.87	1,934.76	1,062.52	11,286.15
052	Lee	.1886	3,275.78	2,346.16	5,871.86	1,089.80	9,307.82
053	Loudoun	.5618	76,870.07	9,437.36	2,887.96	943.57	13,268.89
054	Louisa	.5644	4,832.60	6,592.86	3,079.39	1,055.88	10,728.13
055	Lunenburg	.2502	1,548.33	2,382.94	5,966.39	1,132.24	9,481.57
056	Madison	.4471	1,809.63	5,085.54	3,940.81	1,177.37	10,203.72
057	Mathews	.5437	1,107.15	6,471.48	3,515.32	1,078.38	11,065.18
058	Mecklenburg	.3609	4,469.34	3,245.12	4,702.28	1,026.63	8,974.02
059	Middlesex	.7449	1,242.35	6,892.03	1,913.17	1,028.85	9,834.05
060	Montgomery	.3866	9,747.79	4,751.55	4,098.39	1,107.32	9,957.27
062	Nelson	.5689	1,943.34	7,638.13	3,375.64	1,066.59	12,080.36
063	New Kent	.4298	3,043.05	4,494.03	3,447.32	1,065.10	9,006.45
065	Northampton	.4840	1,654.09	4,693.85	4,531.22	998.00	10,223.07
066	Northumberland	.7431	1,351.52	8,012.33	1,940.62	1,062.23	11,015.17
067	Nottoway	.2478	2,244.72	2,234.46	5,603.83	967.01	8,805.30
068	Orange	.3618	5,117.94	4,109.38	4,079.71	1,066.48	9,255.57
069	Page	.2985	3,471.23	2,958.37	4,869.24	1,058.97	8,886.58
070	Patrick	.2726	2,874.37	2,214.60	5,597.71	908.24	8,720.54
071	Pittsylvania	.2507	9,143.83	1,991.39	5,347.97	1,053.97	8,393.34
072	Powhatan	.3913	4,257.52	5,169.52	3,924.78	1,079.73	10,174.03
073	Prince Edward	.3274	2,086.05	4,030.37	4,979.41	1,375.19	10,384.97
074	Prince George	.2430	6,354.74	2,649.96	5,225.15	891.58	8,766.69
075	Prince William	.3822	87,925.48	4,910.80	4,316.25	969.22	10,196.27
077	Pulaski	.3113	4,314.83	3,354.10	4,883.31	1,089.96	9,327.37
078	Rappahannock	.7916	893.93	9,729.28	1,938.82	1,213.05	12,881.16
079	Richmond	.3364	1,283.71	4,184.10	5,297.73	896.96	10,378.78
080	Roanoke	.3704	14,268.53	4,531.32	4,009.74	1,044.39	9,585.46
081	Rockbridge	.4740	2,608.05	5,049.06	4,032.53	1,169.21	10,250.79
082	Rockingham	.3702	11,799.72	5,174.57	4,068.29	1,113.52	10,356.38
083	Russell	.2486	4,047.74	2,056.01	5,344.38	1,012.73	8,413.12
084	Scott	.1940	3,799.90	1,554.59	5,954.07	846.46	8,355.11
085	Shenandoah	.3653	6,063.12	4,382.16	4,251.80	1,108.64	9,742.61
086	Smyth	.2252	4,562.25	2,307.54	5,553.51	1,055.80	8,916.85
087	Southampton	.2878	2,797.28	5,073.35	5,260.62	999.65	11,333.62
088	Spotsylvania	.3555	23,498.64	4,778.18	4,141.74	1,045.43	9,965.35

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
089	Stafford	.3412	27,962.20	4,443.52	4,123.76	995.30	9,562.58
090	Surry	.8000	833.95	14,689.15	1,443.14	1,206.02	17,338.31
091	Sussex	.3585	1,063.78	7,820.61	5,757.49	1,308.86	14,886.95
092	Tazewell	.2756	6,044.77	2,326.90	5,071.86	1,080.44	8,479.21
093	Warren	.3871	5,406.89	3,880.54	3,928.53	1,195.83	9,004.91
094	Washington	.3813	7,323.32	3,948.58	4,097.01	1,070.27	9,115.86
095	Westmoreland	.4633	1,663.76	4,192.17	4,872.97	1,138.52	10,203.65
096	Wise	.2538	5,929.24	2,008.81	5,072.30	993.44	8,074.55
097	Wythe	.3183	4,213.19	3,171.16	4,739.20	1,050.21	8,960.57
098	York	.4026	12,711.78	3,892.62	3,755.87	990.76	8,639.25
101	Alexandria	.8000	14,921.51	13,482.54	1,694.05	1,027.36	16,203.95
102	Bristol	.3085	2,299.57	2,911.82	5,057.25	1,170.36	9,139.43
103	Buena Vista	.1756	993.18	1,430.42	6,105.06	1,044.08	8,579.56
104	Charlottesville	.6683	4,370.62	11,226.58	2,731.01	1,034.51	14,992.10
106	Colonial Heights	.4323	2,824.96	6,926.54	3,779.48	977.26	11,683.28
107	Covington	.2818	997.34	3,993.29	5,347.26	982.34	10,322.89
108	Danville	.2649	6,198.51	2,731.97	5,501.88	1,032.62	9,266.47
109	Falls Church	.8000	2,489.76	16,619.28	1,386.05	993.02	18,998.34
110	Fredericksburg	.6135	3,478.76	8,150.40	2,891.62	1,011.93	12,053.95
111	Galax	.2738	1,371.85	2,614.49	5,393.83	831.21	8,839.54
112	Hampton	.2878	20,488.99	3,661.98	4,892.62	1,046.16	9,600.76
113	Harrisonburg	.4009	5,891.27	5,312.96	4,603.78	919.56	10,836.31
114	Hopewell	.2298	4,311.50	2,442.29	5,308.63	913.59	8,664.51
115	Lynchburg	.3680	8,515.43	5,186.67	4,397.84	1,204.09	10,788.60
116	Martinsville	.2222	2,191.79	3,440.08	5,799.53	926.17	10,165.78
117	Newport News	.2908	28,880.52	3,823.19	5,021.75	1,014.26	9,859.20
118	Norfolk	.3123	31,858.84	3,860.63	4,801.90	1,017.00	9,679.53
119	Norton	.3102	829.41	2,525.45	5,209.89	800.67	8,536.01
120	Petersburg	.2475	4,273.69	2,628.37	5,878.38	1,039.54	9,546.29
121	Portsmouth	.2678	14,749.20	3,630.51	5,087.01	1,020.15	9,737.67
122	Radford	.2675	1,647.03	2,987.41	5,046.54	948.73	8,982.68
123	Richmond	.4636	23,679.44	6,187.44	4,288.06	1,048.87	11,524.38
124	Roanoke	.3592	13,583.14	4,956.80	4,936.15	1,059.46	10,952.41
126	Staunton	.3923	2,639.63	4,505.25	4,307.69	1,241.21	10,054.14
127	Suffolk	.3490	14,368.86	4,126.41	4,319.27	1,114.22	9,559.90
128	Virginia Beach	.4034	68,879.80	5,450.01	3,835.06	1,050.85	10,335.92
130	Waynesboro	.3493	3,231.67	4,486.61	4,172.46	1,043.59	9,702.66
131	Williamsburg	.8000	11,606.88	6,912.19	2,819.00	1,059.96	10,791.16
132	Winchester	.4376	4,407.65	6,567.34	4,138.71	951.68	11,657.73
135	Franklin	.2978	1,141.39	5,235.25	5,763.32	1,280.80	12,279.38
136	Chesapeake	.3610	39,913.11	4,698.23	4,310.03	1,062.42	10,070.69
137	Lexington	.4510	657.36	4,707.85	3,596.88	875.16	9,179.89
139	Salem	.3695	3,783.05	5,079.24	4,179.09	985.14	10,243.47

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
142	Poquoson	.3895	2,092.57	5,027.64	3,919.73	1,095.34	10,042.70
143	Manassas	.3662	7,586.30	6,124.90	5,187.92	988.22	12,301.04
144	Manassas Park	.2683	3,462.61	3,794.66	5,895.07	817.62	10,507.36
202	Colonial Beach	.3520	602.28	4,489.21	5,285.95	852.75	10,627.92
207	West Point	.2581	769.03	5,619.02	4,924.52	870.95	11,414.49
	TOTAL		1,279,145.20				
	MEAN		9,690.49	4,902.72	4,418.42	1,066.65	10,387.79
	MEDIAN		3,846.94	4,188.13	4,598.91	1,059.21	9,864.90
	STANDARD DEV		20,885.29	2,794.47	1,164.81	110.64	2,036.59
	RANGE		185,372.86	15,188.85	6,157.18	574.52	10,923.79
	RES. RANGE		34,696.87	8,066.44	3,996.58	390.73	6,423.82
	CV		215.52	57.00	26.36	10.37	19.61
	GINI			.2664	.1595	–	.1027
	MCLOONE			.7466	.7681	–	.9269
	PEARSON			0.8831	-0.8510	0.1198	0.7316
	REGRESSION			0.7800	0.7243	0.0144	0.5352

Appendix E

Per Pupil Expenditure Data by Funding Source for FY 2020

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
001	Accomack	.3506	5,107.23	3,496.74	5,857.12	1,063.34	10,417.20
002	Albemarle	.6780	14,297.30	10,206.43	2,277.38	1,263.36	13,747.17
003	Alleghany	.2899	1,992.35	5,022.51	6,072.96	1,304.20	12,399.67
004	Amelia	.3231	1,710.64	3,377.10	5,458.23	1,301.76	10,137.09
005	Amherst	.3073	4,079.27	3,731.17	5,972.33	1,297.44	11,000.94
006	Appomattox	.2950	2,257.02	2,579.94	5,882.28	1,233.49	9,695.71
007	Arlington	.8000	28,152.20	17,087.62	1,799.97	1,089.95	19,977.54
008	Augusta	.3602	10,256.66	4,435.57	4,799.57	1,199.25	10,434.38
009	Bath	.8000	529.71	14,357.61	2,315.96	1,106.61	17,780.19
010	Bedford County	.3132	9,473.28	4,168.08	5,031.62	1,436.09	10,635.79
011	Bland	.3070	689.33	4,291.61	5,556.38	1,279.62	11,127.61
012	Botetourt	.3856	4,667.54	5,123.60	4,607.06	1,219.11	10,949.77
013	Brunswick	.3537	1,522.77	4,249.41	6,971.31	1,569.01	12,789.73
014	Buchanan	.3078	2,664.94	4,567.23	5,435.69	1,240.78	11,243.69
015	Buckingham	.3485	2,084.53	3,099.88	5,937.83	1,239.15	10,276.85
016	Campbell	.2851	7,888.67	3,564.11	5,134.85	1,187.02	9,885.98
017	Caroline	.3446	4,213.78	3,495.82	5,253.85	1,305.56	10,055.23
018	Carroll	.2727	3,660.86	3,182.43	6,414.71	1,261.67	10,858.81
019	Charles City	.5175	613.35	9,444.25	4,429.78	1,548.27	15,422.30
020	Charlotte	.2439	1,758.24	2,901.48	7,143.45	1,228.51	11,273.44
021	Chesterfield	.3522	62,132.69	4,070.09	4,808.26	1,092.31	9,970.66
022	Clarke	.5506	1,916.62	7,333.13	3,459.85	1,271.48	12,064.46
023	Craig	.3235	581.28	3,260.23	6,356.13	1,382.89	10,999.24
024	Culpeper	.3573	8,472.14	3,791.03	4,868.65	1,189.39	9,849.07
025	Cumberland	.2810	1,296.56	2,977.98	7,345.44	1,254.75	11,578.17
026	Dickenson	.2470	2,047.03	3,278.51	6,723.21	1,187.09	11,188.82
027	Dinwiddie	.2783	4,325.39	3,638.80	6,148.19	1,133.52	10,920.52
028	Essex	.4298	1,305.21	5,376.62	5,281.26	1,309.10	11,966.98
029	Fairfax County	.6754	187,993.73	12,005.20	2,704.04	1,171.89	15,881.14
030	Fauquier	.6114	11,125.05	8,609.52	3,150.09	1,245.40	13,005.01
031	Floyd	.3337	1,908.01	4,111.95	5,391.07	1,399.54	10,902.56
032	Fluvanna	.3912	3,548.01	4,915.91	4,493.74	1,293.84	10,703.48
033	Franklin	.3954	6,795.48	4,893.77	5,007.88	1,335.14	11,236.80
034	Frederick	.3898	13,832.88	6,463.40	4,878.85	1,190.70	12,532.94
035	Giles	.2779	2,370.89	3,809.85	5,229.68	1,244.57	10,284.10
036	Gloucester	.3821	5,271.36	5,443.64	4,834.41	1,198.72	11,476.77
037	Goochland	.8000	2,618.82	9,046.20	1,713.76	1,372.47	12,132.42
038	Grayson	.3462	1,668.00	3,736.27	5,706.38	1,352.02	10,794.66
039	Greene	.3321	2,964.42	4,402.55	5,305.17	1,369.08	11,076.81
040	Greensville	.2189	2,205.18	3,187.32	6,587.88	1,095.84	10,871.04
041	Halifax	.3000	4,830.26	2,560.24	6,338.63	1,237.55	10,136.41

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
042	Hanover	.4468	17,514.12	5,123.51	4,142.70	1,184.19	10,450.39
043	Henrico	.4183	51,590.02	5,173.77	3,743.12	1,167.89	10,084.77
044	Henry	.2253	7,352.91	1,734.07	6,866.69	1,179.74	9,780.50
045	Highland	.8000	214.55	10,331.79	6,449.13	1,139.54	17,920.46
046	Isle of Wight	.3968	5,622.30	4,821.64	4,672.95	1,180.86	10,675.45
048	King George	.3721	4,467.70	3,896.04	4,832.23	1,187.52	9,915.79
049	King & Queen	.3945	812.22	5,529.55	6,010.60	1,308.11	12,848.26
050	King William	.3283	2,175.72	4,375.61	5,778.44	1,092.92	11,246.97
051	Lancaster	.7718	1,067.32	11,040.09	2,093.47	1,292.76	14,426.32
052	Lee	.1754	3,173.55	1,974.27	7,527.05	1,223.03	10,724.35
053	Loudoun	.5383	84,080.89	11,160.51	3,494.72	1,087.01	15,742.24
054	Louisa	.5474	4,947.47	7,420.45	3,628.29	1,119.71	12,168.46
055	Lunenburg	.2525	1,579.71	2,189.73	6,844.34	1,203.21	10,237.27
056	Madison	.4608	1,697.35	6,032.23	4,406.39	1,327.06	11,765.68
057	Mathews	.5060	996.48	9,030.77	4,637.27	1,245.08	14,913.12
058	Mecklenburg	.3767	4,148.04	7,837.54	5,162.66	1,181.51	14,181.72
059	Middlesex	.6160	1,200.43	8,099.78	3,377.04	1,183.92	12,660.74
060	Montgomery	.3920	10,019.75	5,367.14	4,676.27	1,247.80	11,291.22
062	Nelson	.5356	1,684.27	8,848.07	4,007.89	1,406.99	14,262.95
063	New Kent	.4172	3,342.51	4,232.78	4,340.92	1,128.59	9,702.29
065	Northampton	.4746	1,503.09	5,498.54	4,918.80	1,306.53	11,723.87
066	Northumberland	.7187	1,290.29	9,537.53	2,577.46	1,200.20	13,315.19
067	Nottoway	.2385	1,981.69	2,487.30	7,073.23	1,264.46	10,824.99
068	Orange	.4025	5,039.93	4,363.40	4,540.72	1,209.51	10,113.64
069	Page	.3007	3,341.73	3,124.67	5,524.87	1,165.91	9,815.45
070	Patrick	.2396	2,506.78	2,148.15	6,557.52	1,110.30	9,815.97
071	Pittsylvania	.2443	8,637.36	2,276.65	6,043.95	1,207.11	9,527.70
072	Powhatan	.4302	4,325.82	5,252.18	4,300.43	1,110.19	10,662.80
073	Prince Edward	.3598	2,028.47	3,419.49	5,640.51	1,486.38	10,546.38
074	Prince George	.2391	6,302.62	2,570.26	5,814.57	1,051.59	9,436.42
075	Prince William	.3783	91,905.15	5,501.84	5,064.39	1,079.67	11,645.90
077	Pulaski	.3192	4,124.10	3,845.28	5,658.62	1,226.35	10,730.26
078	Rappahannock	.7672	776.97	12,202.52	2,298.00	1,398.10	15,898.62
079	Richmond	.3100	1,301.30	3,636.11	6,181.14	999.53	10,816.78
080	Roanoke	.3620	13,901.72	4,973.58	4,790.26	1,176.63	10,940.47
081	Rockbridge	.4498	2,590.34	5,636.21	4,944.28	1,275.65	11,856.14
082	Rockingham	.3682	11,869.42	5,359.71	4,662.32	1,260.79	11,282.83
083	Russell	.2322	3,713.24	1,970.40	6,720.59	1,175.32	9,866.32
084	Scott	.1917	3,513.67	1,628.90	7,648.12	1,013.39	10,290.41
085	Shenandoah	.3821	5,937.19	5,084.50	5,107.64	1,266.01	11,458.16
086	Smyth	.2174	4,232.96	2,514.63	6,566.43	1,195.20	10,276.26
087	Southampton	.2963	2,762.91	4,236.78	6,075.43	1,069.32	11,381.53
088	Spotsylvania	.3627	23,759.47	4,568.62	5,090.27	1,155.85	10,814.73

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
089	Stafford	.3462	30,024.95	4,382.93	4,739.59	1,094.06	10,216.59
090	Surry	.8000	716.71	16,688.07	1,928.64	1,380.10	19,996.81
091	Sussex	.3482	1,082.67	7,983.26	6,897.55	1,292.79	16,173.60
092	Tazewell	.2624	5,568.11	2,394.26	5,339.50	1,232.52	8,966.28
093	Warren	.4333	5,355.72	4,910.69	4,323.76	1,329.22	10,563.68
094	Washington	.3434	6,997.25	3,814.84	5,024.85	1,211.70	10,051.39
095	Westmoreland	.4743	1,571.76	5,881.91	6,767.01	1,327.93	13,976.85
096	Wise	.2474	5,587.46	2,253.54	6,176.30	1,133.48	9,563.31
097	Wythe	.3146	3,980.72	3,340.45	5,471.95	1,202.17	10,014.56
098	York	.3822	13,034.31	4,364.74	4,500.99	1,076.56	9,942.29
101	Alexandria	.8000	16,002.91	14,487.94	1,876.38	1,211.91	17,576.23
102	Bristol	.2922	2,246.68	2,729.39	6,115.80	1,309.59	10,154.78
103	Buena Vista	.1849	875.81	2,732.90	7,149.10	1,287.37	11,169.37
104	Charlottesville	.6772	4,496.84	13,285.78	2,740.61	1,241.76	17,268.15
106	Colonial Heights	.4179	2,866.50	7,440.57	4,765.39	1,140.41	13,346.36
107	Covington	.2981	1,007.02	3,172.55	6,135.09	996.72	10,304.35
108	Danville	.2546	5,655.94	4,144.27	6,437.22	1,263.42	11,844.91
109	Falls Church	.8000	2,640.07	17,039.82	1,638.38	1,118.62	19,796.82
110	Fredericksburg	.6210	3,686.97	8,193.09	3,195.96	1,165.52	12,554.57
111	Galax	.2587	1,332.15	3,152.85	6,593.57	960.23	10,706.65
112	Hampton	.2741	19,526.23	4,000.87	5,633.69	1,167.26	10,801.82
113	Harrisonburg	.3645	6,515.70	5,098.90	5,703.97	1,034.35	11,837.22
114	Hopewell	.2032	4,198.82	3,100.09	6,900.49	1,093.30	11,093.88
115	Lynchburg	.3700	8,143.18	4,665.10	5,333.20	1,448.11	11,446.41
116	Martinsville	.2135	1,911.62	3,366.14	6,712.17	1,196.82	11,275.12
117	Newport News	.2781	28,379.78	4,056.15	6,075.96	1,112.18	11,244.29
118	Norfolk	.2958	29,634.25	3,860.29	5,663.85	1,186.31	10,710.45
119	Norton	.2870	809.20	2,403.02	6,007.24	938.42	9,348.68
120	Petersburg	.2430	4,116.66	2,322.74	7,131.77	1,187.52	10,642.04
121	Portsmouth	.2462	13,910.42	3,686.76	5,886.25	1,187.17	10,760.18
122	Radford	.2429	1,639.41	3,804.21	5,955.84	1,060.66	10,820.71
123	Richmond	.4925	25,017.46	6,771.60	4,277.86	1,142.43	12,191.89
124	Roanoke	.3416	13,844.91	4,715.04	5,860.10	1,226.22	11,801.35
126	Staunton	.3867	2,710.08	4,345.62	4,909.97	1,343.59	10,599.18
127	Suffolk	.3420	14,346.88	4,195.79	5,053.21	1,254.28	10,503.28
128	Virginia Beach	.4046	68,588.33	5,812.69	4,387.06	1,160.71	11,360.46
130	Waynesboro	.3578	2,926.20	4,785.58	5,005.77	1,358.99	11,150.35
131	Williamsburg	.7703	11,736.78	7,624.30	3,084.01	1,231.99	11,940.31
132	Winchester	.4244	4,363.82	6,858.89	4,989.53	1,145.87	12,994.29
135	Franklin	.2952	1,081.83	4,850.12	6,380.14	1,476.99	12,707.25
136	Chesapeake	.3476	41,472.72	5,031.80	5,144.95	1,163.87	11,340.61
137	Lexington	.4172	664.45	4,985.16	4,542.27	1,004.19	10,531.62
139	Salem	.3715	3,917.78	5,029.33	4,716.84	1,064.98	10,811.15

DIV	School Division	LCI	ADM	Locally Funded PPE	State Funded PPE	Sales and Use Tax PPE	Total (Non-federal) PPE
142	Poquoson	.3742	2,134.85	5,000.06	4,633.26	1,142.00	10,775.33
143	Manassas	.3557	7,732.66	5,873.53	5,813.32	1,096.30	12,783.15
144	Manassas Park	.2675	3,625.63	3,402.45	6,670.98	917.55	10,990.98
202	Colonial Beach	.3600	637.85	3,258.78	6,397.13	907.69	10,563.60
207	West Point	.2554	805.49	5,915.64	6,108.04	969.03	12,992.72
	TOTAL		1,290,985.75				
	MEAN		9,780.20	5,352.77	5,166.46	1,207.48	11,726.72
	MEDIAN		3,700.11	4,392.74	5,267.56	1,199.72	11,000.09
	STANDARD DEV		21,434.64	3,135.80	1,360.46	121.51	2,187.94
	RANGE		187,779.18	15,458.72	6,009.74	661.32	11,030.53
	RES. RANGE		34,472.06	9,827.74	4,728.45	400.80	6,920.84
	CV		219.16	58.58	26.33	10.06	18.66
	GINI			.2809	.1618	–	.1070
	MCLOONE			.7570	.7818	–	.9410
	PEARSON			0.9090	-0.8739	0.1518	0.7677
	REGRESSION			0.8262	0.7638	0.0231	0.5894

Appendix F

Recent Litigation in School Finance Reform: 2000 – 2019

Below is a listing of the most recent school finance reform cases for each state between the years of 2000 and 2019. The following states have not had school finance reform cases during this timeframe: Delaware, Hawaii, Maine, Maryland, Nevada, New Mexico, North Dakota, Utah, Vermont, and Virginia.

State	Year	Court Case Name and Citation
Alabama	2014	*I.L. v. Ala.*, 739 F.3d 1273, 300 Ed.Law Rep. 749 (11th Cir. 2014)
Alaska	2007	*Moore v. State*, No. 04-9756 (Alaska Super. Ct. 2007)
Arizona	2003	*Roosevelt Elementary Sch. Dist. v. State*, 74 P.3d 258, 179 Ed.Law Rep. 900 (Ariz. Ct. App. 2003)
Arkansas	2007	*Lakeview Sch. Dist. No. 25 v. Huckabee*, 220 S.W.3d 645, 220 Ed.Law Rep. 383 (Ark. 2007)
California	2019	*Cal. Sch. Bds. Ass'n v. State*, 454 P.3d 962 (Cal. 2019)
Colorado	2013	*Lobato v. State*, 304 P.3d 1132 (Colo. 2013)
Connecticut	2018	*Conn. Coalition for Justice in Educ. Funding v. Rell*, 176 A.3d 28, 351 Ed.Law Rep. 391 (Conn. 2018)
Florida	2019	*Citizens for Strong Sch., Inc. v. Fla. State Bd. of Educ.*, 262 So.3d 127, 362 Ed.Law Rep. 1104 (Fla. 2019)
Georgia	2008	*Consortium for Adequate Sch. Funding in Ga. v. State*, 2008 WL 8238595 (Ga. Super. Ct. Fulton Cty., Aug. 11, 2008)
Idaho	2017	*Joki v. State*, 394 P.3d 48, 343 Ed.Law Rep. 589 (Idaho 2017)
Illinois	2011	*Carr v. Koch*, 960 N.E.2d 640, 275 Ed. Law Rep. 971 (Ill. Ct. App. 2011)
Indiana	2009	*Bonner v. Daniels*, 907 N.E.2d 516, 245 Ed.Law Rep. 512 (Ind. 2009)
Iowa	2012	*King v. State*, 818 N.W.2d 1, 283 Ed.Law Rep. 390 (Iowa 2012)
Kansas	2017	*Gannon v. State*, 402 P.3d 1186, 96 Ed. Law Rep. 258 (Kan. 2017)
Kentucky	2007	*Young v. Williams*, No. 03-00055/01152 (Cir. Ct., Div. II, Feb. 13, 2007)
Louisiana	2006	*Jones v. State Bd. of Elementary & Secondary Educ.*, 927 So.2d 426, 208 Ed.Law Rep. 959 (La. Ct. App. 2006)
Massachusetts	2005	*Hancock v. Comm'r*, 822 N.E.2d 1134, 195 Ed.Law Rep. 591 (Mass. 2005)
Michigan	2002	*Durant v. State*, 650 N.W.2d 380, 169 Ed.Law Rep. 389 (Mich. Ct. App. 2002)
Minnesota	2017	*Cruz-Guzman v. State*, 916 N.W.2d 1, 357 Ed.Law Rep. 302 (Minn. 2018)
Mississippi	2017	*Clarksdale Mun. Sch. Dist. v. State*, 233 So.3d 299, 351 Ed.Law Rep. 670 (Miss. 2017)

Missouri	2009	*Comm. for Educ. Opportunity v. State*, 294 S.W.3d 477, 249 Ed.Law Rep. 926 (Mo. 2009)
Montana	2005	*Columbia Falls Elementary Sch. Dist. No. 6 v. State*, 109 P.3d 257, 196 Ed.Law Rep. 958 (Mont. 2005)
Nebraska	2007	*Citizens of Decatur for Equal Educ. v. Lyons--Decatur Sch. Dist.*, 739 N.W.2d 742, 224 Ed.Law Rep. 938 (Neb. 2007)
New Hampshire	2008	*Londonderry Sch. Dist. SUA No. 12 v. State*, 958 A.2d 930, 238 Ed.Law Rep. 307 (N.H. 2008)
New Jersey	2011	*Abbott v. Burke*, 20 A.3d 1018, 268 Ed. Law Rep. 328 (N.J. 2011)
		Perry A. Zirkel, Ph.D., J.D., LL.M., An Updated Tabular Overview of the School Finance Litigation, 379 Ed. Law Rep. 453, 460 (2020)
New York	2017	*Maisto v. State*, 64 N.Y.S.3d 139, 349 Ed.Law Rep. 163 (App. Div. 2017)
		Aristy-Farer v. State, 58 N.Y.S.3d 877 (2017)
North Carolina	2004	*Hoke Cty. Bd. of Educ. v. State*, 599 S.E.2d 365, 190 Ed.Law Rep. 661 (N.C. 2004)
Ohio	2002	*DeRolph v. Ohio*, 780 N.E.2d 529 (Ohio 2002)
Oklahoma	2007	*Okla. Educ. Ass'n. v. Okla. Legislature*, 158 P.3d 1058, 220 Ed.Law Rep. 360 (Okla. 2007)
Oregon	2009	*Pendleton Sch. Dist. v. State*, 200 P.3d 133, 241 Ed.Law Rep. 423 (Or. 2009)
Pennsylvania	2017	*William Penn Sch. Dist. v. Pa. Dep't of Educ.*, 170 A.3d 414, 348 Ed.Law Rep. 271 (Pa. 2017)
Rhode Island	2014	*Woonsocket Sch. Comm. v. Chaffee*, 89 A.3d 778, 303 Ed.Law Rep. 924 (R.I. 2014)
South Carolina	2014	*Abbeville Cty. Sch. Dist. v. State*, 767 S.E.2d 157, 312 Ed.Law Rep. 917 (S.C. 2014)
South Dakota	2011	*Olson v. Guindon*, 771 N.W.2d 318, 247 Ed.Law Rep. 961 (S.D. 2009)
Tennessee	2002	*Tenn. Small Sch. Sys. v. McWherter*, 91 S.W.3d 232, 172 Ed.Law rep. 1044 (Tenn. 2002)
Texas	2016	*Morath v. Tex. Taxpayer Student Fairness Coalition*, 490 S.W.3d 826, 332 Ed.Law Rep. 1117 (Tex. 2016)
Washington	2012	*McCleary v. State*, 269 P.3d 227, 276 Ed.Law Rep. 1101 (Wash. 2012)
West Virginia	2006	*Bd. of Educ. of Cty. of Kanawha v. W. Va. Bd. of Educ.*, 639 S.E.3d 893, 215 Ed. Law Rep. 1154 (W. Va. 2006)
Wisconsin	2000	*Vincent v. Voight*, 614 N.W.2d 388, 146 Ed.Law Rep. 422 (Wis. 2000)
Wyoming	2008	*Campbell Cty. Sch. Dist. v. State*, 181 P.3d 43, 232 Ed.Law Rep. 394 (Wyo. 2008)

Source: Zirkel, P. A. (2020) *An Updated Tabular Overview of the School Finance Litigation*. 379 Ed. Law Rep. 453

Appendix G

IRB Approval

VIRGINIA TECH.

Division of Scholarly Integrity and
Research Compliance
Institutional Review Board
North End Center, Suite 4120 (MC 0497)
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Blacksburg, Virginia 24061
540/231-3732
irb@vt.edu
http://www.research.vt.edu/sponsp/irb/hrpp

MEMORANDUM

DATE: March 8, 2021

TO: M. David Alexander, David Dennis Scott

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires October 29, 2024)

PROTOCOL TITLE: Analysis of Fiscal Equity for Public Schools in Virginia: 2004 - 2020

IRB NUMBER: **21-228**

Based on the submitted project description and items listed in the Special Instructions section found on Page 2, the Virginia Tech Human Research Protection Program (HRPP) has determined that the proposed activity is not research involving human subjects as defined by HHS and FDA regulations.

Further review and approval by the Virginia Tech Human Research Protection Program (HRPP) is not required because this is not human research. This determination applies only to the activities described in the submitted project description and does not apply should any changes be made. If changes are made you must immediately submit an Amendment to the HRPP for a new determination. Your amendment must include a description of the changes and you must upload all revised documents. At that time, the HRPP will review the submission activities to confirm the original "Not Human Subjects Research" decision or to advise if a new application must be made.

If there are additional undisclosed components that you feel merit a change in this initial determination, please contact our office for a consultation.

Please be aware that receiving a "Not Human Subjects Research" Determination is not the same as IRB review and approval of the activity. You are NOT to use IRB consent forms or templates for these activities. If you have any questions, please contact the Virginia Tech HRPP office at 540-231-3732 or irb@vt.edu.

PROTOCOL INFORMATION:

Determined As:	**Not Human Subjects Research**
Protocol Determination Date:	**March 8, 2021**

ASSOCIATED FUNDING:

The table on the following page indicates whether grant proposals are related to this protocol, and which of the listed proposals, if any, have been compared to this protocol, if required.

SPECIAL INSTRUCTIONS:

This activity does not meet the definition of human subjects research, as defined within the Federal Policy for the Protections of Human Subjects. The primary goal is to analyze funding and disbursement data in Virginia's public elementary and secondary school divisions to determine whether the state funding model creates or achieves equity in the level of state funding provided to the public school divisions in Virginia. The activity involves analyzing the schools' fiscal data collected and reported by the Virginia Department of Education (VDOE). This activity meets the federal definition of research, but does not meet the federal definition of human subjects research, since information analyzed is previously collected, fiscal data.

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this protocol is to cover any other grant proposals, please contact the HRPP office (irb@vt.edu) immediately.