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MEASURES OF WEALTH IN PENNSYLVANIA

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Abstract

The measure of district wealth used by a state is a critical factor in reducing the potential extremes in available resources that may occur across districts. To be effective, the state definition of wealth should correlate closely with the local tax structure that is available to school districts to raise local revenues. Conversely, if wealth is measured improperly, state aid could be distributed in ways that create or exacerbate disparities in per pupil spending.

The purpose of this study is to identify measures of wealth that are feasible for state school finance systems and examine the impact of alternative definitions of wealth on distribution of state aid to school districts and on the fiscal equity in the school finance system. Pennsylvania and its 500 school districts were used to illustrate the possible measures of wealth and to test their potential application in practice.

Pennsylvania conducted a costing out study that changed the formula that was used to distribute state funding to schools. Equity measures from this study illustrate that the concept of equity based on equal spending is outdated in PA. The objective of the current system of funding in Pennsylvania is to achieve adequacy. The adequacy target established for each district has identified a figure that the state determines to be the amount it takes for districts to achieve similar results. The system does not focus on equalizing spending as much as it is focusing on equalizing outcomes.

Wealth measures used in the MVPI AR now have little impact on funding in PA. The findings of this study indicate that even when relying on the wealth measure that produces the most favorable funding outcome for each district, the change in funding in those simulations were minimal.

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CHAPTER 1

INTRODUCTION

The concept of wealth is a critical one in school finance. It controls or influences school districts' capacity to raise local revenues, as well as many components of state aid that districts receive. It is a concept that is subject to different interpretations in practice and those interpretations can have substantial impact on not only individual school districts, but the equity and adequacy of a state's school finance system as a whole.

The general meaning of wealth in school finance is fiscal capacity or the ability to raise tax revenues (Odden & Picus, 2008). Alexander and Salmon (1995) suggest that wealth can also be defined as capital or net worth. Wealth could be described as a measure that shows an ability to pay (Brimley & Garfield, 2008). In any of these definitions, it becomes clear that wealth can incorporate numerous sources of income, holdings, or possessions.

At the school district level, fiscal capacity represents the magnitude of tax bases that a district has access to raise local revenues. The primary local tax bases are property and income. Other tax bases that are sometimes available to local districts include retail sales, property sales, natural resource extraction, and privilege taxes (Toenjes, 1997).

In all states across this country (except Hawaii which has a single district system), school districts have varying degrees of wealth with unequal distributions of both taxable property and taxable income, as well as other tax bases. This has led to a widespread approach for state aid to school districts called equalized funding. This approach provides more state aid (on a per pupil basis) to districts that have lower fiscal capacity in order to

compensate, in some degree, for their lesser ability to raise local revenues. By defining wealth in terms of fiscal capacity, a state can determine each district's ability to raise local revenues to support education and then distribute state aid inversely to wealth. This provides justification for giving poorer districts a larger portion of state aid than to those districts that are considered to be wealthy. The idea is that the combination of local revenue plus state aid will provide a more equal revenue stream to all districts than just local revenues alone or with unadjusted state aid.

Consequently, the measure of district wealth used by a state is a critical factor in reducing the potential extremes in available resources that may occur across districts. This also means that to be effective, the state definition of wealth should correlate closely with the local tax structure that is available to school districts to raise local revenues. Conversely, if wealth is measured improperly, state aid could be distributed in ways that create or exacerbate disparities in per pupil spending.

Purpose

The purpose of this study is to identify measures of wealth that are feasible for state school finance systems and examine the impact of alternative definitions of wealth on distribution of state aid to school districts and on the fiscal equity in the school finance system. Pennsylvania and its 500 school districts were used to illustrate the possible measures of wealth and to test their potential application in practice.

Research Questions

1. What are alternative measures of school district wealth that can be utilized in state school finance systems?
    a. What are the advantages and disadvantages of each?
2. What measures of wealth are used in Pennsylvania?
3. How are the Pennsylvania measures used in the school finance system?
4. What are feasible alternative measures of wealth for Pennsylvania school districts?
5. What are the fiscal impacts of alternative measures of wealth for school districts?
    a. Distribution of state aid among school districts.
        1. Redistribution of existing state aid
        2. Characteristics of winners and losers.
    b. Changes in fiscal equity among school districts.

The funding of school districts has been a source of interest in the political landscape for some time. Pennsylvania has looked at ways to offset the burden of property taxes. Prior to the 2008-2009 school year, the state's funding formula relied heavily on an aid ratio that favored a district's property measure. Since that time the formula has changed, but still uses this same aid ratio as part of the formula. It is unclear how much these wealth measures impact the funding that a district receives, but the measures used are based on districts' market value and personal income measure. There has been debate over which measure would benefit districts more when used for state

funding, but this study will bring additional light to the impact that these measures have on funding levels in the current formula being used by Pennsylvania.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Looking at alternative measures of wealth in Pennsylvania starts with analyzing measures of wealth that are commonly used throughout the United States. This section defines various measure of wealth used for tax purposes, and how these measures are utilized by states to fund schools. Aid to schools is not generally equal in the sense of specific dollar amounts, but rather they tend to use formulas to satisfy issues of horizontal and vertical equity. Pennsylvania wealth measures were explained and how these wealth measures are used to fund schools were analyzed.

Types of Wealth

Property

Property is defined as something that is "owned or possessed" (Merriam-Webster Online Dictionary, 2008). Property is classified into tangible property and intangible property (Odden & Picus, 2008). Tangible property includes land, improvements to land, residential, commercial, and industrial buildings. It also includes personal property like jewelry, vehicles, household items, and business inventory. Basically, tangible property includes anything that can have a value placed on it. Intangible property has value, but the value is representative. Items like stocks, bonds, and certificates of deposit are considered intangible property.

Non-profit organizations and state and federal government entities that own property can alter district fiscal capacity. Since these organizations are exempt from property tax, the property they own cannot be included in a property wealth measure because it does not create any revenue for the school district through the property tax. If these properties were owned privately, they would generate property tax revenue for the district. So, districts that have a great deal of tax exempt property will have less wealth that they can draw upon for local revenues. Fiscal capacity can also be altered purposely by districts or states by offering tax breaks to industries in order to attract businesses to the area. In these cases industries may receive a reduced tax rate, or have the property tax waived completely for a specific number of years. While this may reduce fiscal capacity with property in the school district, the potential increase in jobs, future property tax (if waived only for a given number of years), and increased economic growth in the district may be an attractive trade-off.

In terms of fiscal capacity, many states utilize property, especially real property (land and improvements) as a wealth component for school districts (Salmon et al., 1988; Alexander & Salmon, 1995; Brimley & Garfield, 2008). As Table 2.1 from the Federation of Tax Administrators (2010) website illustrates, in 2007 the property tax constituted 30% of the total state and local taxes collected in the U.S. This percentage is higher than with any of the other tax sources. The state with the highest percentage of taxes coming from property tax was New Hampshire with 61.4%, while New Mexico had the lowest with 13.5% of their tax revenue coming from property. Pennsylvania's percentage of property tax of total state and local taxes was 29.6%, which ranked 23rd comparatively to other states. In Pennsylvania, property tax also represents the highest

source of revenue for the state than any other tax source. Property tax remains the mainstay of school districts revenues providing 81.9% of total local taxes (Pennsylvania Department of Education, 2010).

Table 2.1

2007 State & Local Tax Collection by Source

(Percentage of Total)

	Property	Sales	Selective Sales	Individual Income	Corporate Income	Other
Alabama	15.6	29.9	17.8	22.7	3.8	10.2
Alaska	20.9	3.6	6.2	n.a.	16.4	n.a.
Arizona	26.7	40.1	8.3	16.1	4.2	4.6
Arkansas	14.7	41.3	12.0	23.6	4.0	4.5
California	24.1	24.2	7.1	30.8	6.5	7.2
Colorado	30.4	27.2	8.2	25.7	2.6	5.9
Connecticut	38.2	14.4	9.2	30.0	3.9	4.3
Delaware	15.6	n.a.	12.8	29.3	8.3	34.1
District of Columbia	29.2	16.1	9.5	25.3	8.0	11.9
Florida	36.8	33.2	15.7	n.a.	3.3	11.0
Georgia	28.7	29.8	8.7	26.5	3.1	3.1
Hawaii	17.3	39.0	12.8	23.8	1.5	5.6

Idaho	23.4	26.9	8.9	29.5	4.0	7.4
Illinois	37.1	16.6	17.2	17.1	5.3	6.7
Indiana	29.1	25.7	11.5	24.7	4.7	4.3
Iowa	33.1	21.2	10.4	25.1	3.0	7.2
Kansas	30.5	26.6	8.9	24.2	4.6	5.3
Kentucky	18.8	20.6	16.5	29.5	8.1	6.5
Louisiana	14.8	40.0	13.0	18.3	4.3	9.5
Maine	36.5	18.7	11.3	24.1	3.3	6.0
Maryland	24.2	12.7	10.7	39.7	2.9	9.8
Massachusetts	34.4	12.7	6.5	35.5	6.6	4.4
Michigan	39.2	21.5	10.5	18.6	4.8	5.3
Minnesota	25.9	19.2	12.6	30.6	5.0	6.8
Mississippi	25.3	36.1	11.8	16.1	4.2	6.6
Missouri	27.4	26.2	11.4	26.9	2.0	6.0
Montana	33.8	n.a.	16.3	25.5	5.5	18.9
Nebraska	33.4	24.3	8.1	23.1	3.0	8.1
Nevada	27.5	33.8	24.4	n.a.	n.a.	14.3
New Hampshire	61.4	n.a.	15.5	2.3	12.6	8.3
New Jersey	41.8	16.7	7.2	22.8	5.6	5.9
New Mexico	13.5	36.1	10.9	15.8	6.2	17.6
New York	28.4	16.4	7.9	31.8	9.3	6.2

North Carolina	22.5	21.9	12.1	32.7	4.8	6.0
North Dakota	26.8	21.9	13.2	12.2	5.2	20.7
Ohio	29.0	20.4	10.8	29.8	2.6	7.3
Oklahoma	16.2	28.5	9.6	23.2	4.7	17.8
Oregon	31.0	n.a.	8.7	44.0	3.6	12.6
Pennsylvania	29.6	17.0	11.6	25.5	4.4	11.9
Rhode Island	41.0	18.3	10.3	22.7	3.7	3.9
South Carolina	31.1	24.3	10.9	23.5	2.3	7.9
South Dakota	34.3	40.5	13.6	n.a.	3.2	8.5
Tennessee	24.2	45.7	11.0	1.4	6.1	11.6
Texas	41.7	30.9	15.9	n.a.	n.a.	11.6
Utah	22.9	28.7	10.4	28.8	4.5	4.8
Vermont	42.1	11.6	17.6	19.9	2.8	6.0
Virginia	30.9	14.5	11.9	31.6	2.7	8.3
Washington	26.8	47.5	14.5	n.a.	n.a.	11.2
West Virginia	18.6	18.5	19.3	22.3	8.8	12.4
Wisconsin	36.0	19.0	8.4	27.1	4.0	5.5
Wyoming	36.9	28.3	4.7	n.a.	n.a.	30.1
United States	30.0	23.5	10.9	22.7	4.7	8.2

Generally, real estate, or land and improvements, constitutes the bulk of a property tax. Other tangible and intangible property can often be included in a property tax, but usually to a lesser degree than actual land and improvements. To determine what real estate is worth, two primary measures are used: market value and assessed value. Market value (also known as true market value or true cash value, (Odden & Picus, 2008)) is defined as the price a willing buyer would pay a willing seller for a property in its present condition with neither buyer nor seller *under pressure to act* (such as career relocation, death of a family member, divorce, etc.). A market value sale also is known as an *arm's length transaction* (NYSORPS, 2009).

The second valuation approach is assessed value. The assessed value is the value assigned to a property for tax purposes. Sometimes, the market value and assessed are the same if assessed value equals 100% of market value, but more usually assessed value is a fraction or percentage of the market value. Use of assessed value has little actual purpose (except perhaps to confuse the property owner and to discourage challenges to valuation placed on property) since the lower assessed values are balanced by higher property tax rates to raise the same level of property tax revenues. If a district has recently done an assessment, and the assessed values are very close to the market value, then on a $100,000 home, 20 mills would produce $2,000 in tax revenue. If assessed value is only 50% of the market value, then the house would be assessed at $50,000 and a rate of 40 mills would be needed to produce the same $2,000 in revenue. A district's property tax base is comprised of the amount of assessed value within its jurisdiction. It is difficult to even make comparisons of assessment practices across states due to the differences in practices that various states use in assessing property, and what sort of property is

included in those assessments. Different jurisdictions can having varying assessed incomes and differing methods, and a simple issue as a recent change in assessors can impact new assessments within a district.

Different types of property are valued by different methods. Residential property uses the most straightforward procedures to determine the market value for a home—comparable sales. In this technique the valuation of residential property is based sales prices of recently sold similar homes, adjusted for different characteristics and locations. The more difficult task is to determine the market value of non-residential commercial and industrial property since these properties are sold much less frequently than homes and are often specialty use or limited use facilities. If the property is an income producing property, comparable sales may be used if there are enough comparable properties that have sold recently. Otherwise, the market values of these types of properties are usually estimated by replacement value of the buildings less depreciation plus the land value or by the income generating potential of the property. So, a new industrial building that cost $200,000 to build, on a piece of land recently assessed at $50,000 could have a market value of $250,000. As the building ages, that assessment may decrease based on depreciation, unless the income generated by the property is factored into the assessment.

Property tax is inelastic (it is not very responsive to economic growth (Mikesell, 1986). Elasticity analyzes the percentage change in tax yield between two points over certain time period, and divided by the change in income over that same period of time. So, a tax is elastic if the yield of the tax grows quicker than the economic growth over the

same time period or inelastic if the yield increases at a slower rate. The formula for elasticity is (King et al., 2003):

$$\text{Elasticity} = \frac{\dfrac{\text{yield } t_2 - \text{yield } t_1}{\text{yield } t_1}}{\dfrac{\text{income } t_2 - \text{income } t_1}{\text{income } t_1}}$$

Historically, the market values of properties have tended to be stable, although this has changed dramatically in recent years. The relative stability in market value leads to the tax being inelastic because as income increases, property values do not tend to increase at the same rate, but rather at a slower rate. However, with the recent housing boom and bust, property values changed much more rapidly than did income. This meant that the elasticity or inelasticity of this tax was also influenced by the rapidity of property reassessments. Also, even with greater stability, differing assessment practices produce inequities in property value determination. Since assessment is often a county responsibility, a lack of qualified assessors in these county positions can reduce the lack of validity in their assessments. Lack of comparable properties and the subjectivity involved in assessment practices only add to inequities in assessed values.

As a measure of wealth, property tax could be progressive in nature if the value of property is generally correlated with the income of the owners (Alexander & Salmon, 1995). This tax becomes regressive in nature when value of property and income of owners are not correlated. Examples of this regressive nature would be senior citizens on fixed incomes whose properties become quite valuable, or farmers whose farm land increases in value at a much faster rate than their income.

The stability of property values does provide a major advantage to school districts through the predictability of revenue that it will produce through taxes (King et al., 2003). When using property as a wealth measure, the predictability it provides is much greater than other, more elastic, wealth measures, which could change more drastically in a short period of time. This predictability is beneficial for schools districts that have to prepare budgets well in advance to their actual implementation. Plus, due to the numerous years that many of these property tax frameworks have been in place, the cost of administering and collecting these taxes tends to be low. However, stability of property values is not guaranteed. Reassessments that produce significantly lower property values and large scale purchases of private property by non-profit organizations can have a significant impact on the revenue brought in by property taxes. In areas where hospitals, universities, or governmental agencies are prevalent, there is always the threat that as those agencies grow, they will begin to buy up private property that are then taken off the tax rolls. A newly developed non-profit agency that moves into a district could potentially have an even greater impact on property tax revenues for districts.

Income

Income is defined as "a gain or recurrent benefit usually measured in money that derives from capital or labor" (Merriam-Webster Online Dictionary, 2008). There are several types of income relevant to measures of school district wealth in school finance systems: earned, unearned, personal, and corporate (King et al., 2003; Odden & Picus, 2008). Earned income refers to wages, net profits, salaries, and commissions earned by taxpayers within a district. Basically, these earnings are compensation from work or a

service that is accomplished. Unearned income includes the interest and dividends that are received through investments, as well as capital gains; these are largely returns from financial investments. Personal income is the total income earned by an individual and is the sum of earned and unearned income. Consequently, personal income provides a much broader picture of the accumulated and taxable wealth brought into the household.

Corporate income is defined as the sales revenue minus deductible expenditures (King et al., 2003; Odden & Picus, 2008). If a corporation has been able to bring in more income that it has had in expenditures, then the business is seen as profitable, and these profits are income that the government can tax. All but four states generate revenue from this type of tax (King et al., 2003). This tax differs from personal income because it taxes profits, not total or earned income.

An income tax is considered elastic; that is, in a given period of time the percentage of income taxes collected changes faster than the percentage change in taxable income (Odden & Picus, 2008). However, the faster change in tax revenues occurs in both directions: as income rises, income taxes increase even faster; but as income falls or the rate of increase slows down, income taxes decrease at a faster rate. It appears that the broader the base of tax payers, the less fluctuation there will be on the yield of the income tax. In other words, the yield from the federal income tax, which uses the income of the entire country as its tax base, will fluctuate less than the yield of an individual state's income tax during changing economic conditions. In the most recent recession, Pennsylvania alone lost over 700 million dollars in personal income tax revenue over one fiscal year from 2008 to 2009 (Pennsylvania Department of Revenue, 2010). This represented a 6.5% decrease in revenue from this tax. Table 2.2 demonstrates that this

was the most significant drop in revenue from personal income taxes over the 10 years recorded in the statistical supplement, with the only other decreases coming in 2002 and 2003 when the revenue from income taxes dropped about 350 million dollars and 30 million dollars respectively. Since districts tend to be small by nature, fluctuation in income across a district can be significant, even noticeable when a single very wealthy individual or large corporation moves out of the district. When using income as a measure of wealth, how wealthy a district appears from year to year will fluctuate based on economic conditions. This variation can greatly affect both the local and state revenues for a district.

Property and income provide interesting comparisons in their strengths and weaknesses as wealth measures. Property is a predictable revenue source because the real estate is always there, yet the accuracy of the value of properties can be questionable due to flawed and inconsistent practices of assessments. Income has almost the opposite characteristics. Measuring income is both relatively easy and more accurate. The measures of a district's income can be determined by the sum of the residents' reported taxes to the Internal Revenue Service (IRS) and state Department of Revenue. These figures would be current, and all districts within a given state would be using the same year's data. The difficulty with using income as a district's wealth measure is instability, especially with a smaller tax base (Odden & Picus, 2008). In a recession, predicted revenue could be inaccurate, and the actual amount of revenue brought into the district could differ greatly from what was expected. For example, from 2004 to 2008 the amount of personal income tax collected in Pennsylvania had increased from the previous years; increasing approximately 3 billion dollars over that time (Pennsylvania

Department of Revenue, 2010). In fact, the largest increase over those years was a 1 billion dollar increase from 2004 to 2005. In addition to the substantial loss in state revenue, the impact was greater for certain individual districts that were affected harder by the recession.

Table 2.2

Personal Income Tax Revenue

Pennsylvania (fiscal years)		Personal Income Tax Revenue ($ thousands)
2000		7,066,013
2001		7,491,462
2002		7,138,688
2003		7,105,885
2004		7,733,804
2005		8,746,792
2006		9,524,139
2007		10,261,618
2008		10,907,741
2009		10,198,646

Another issue in using income as a wealth measure is the loopholes that exist that make it easier for individuals or corporations to shield, hide, or disguise income (King et

al., 2003). This type of tax avoidance can be done for personal taxes by doing things like establishing foundations or trusts to which assets would be transferred. It is the entity that has the gain, not the individual, which may be advantageous depending on the tax laws of the state or jurisdiction. Different kinds of income are taxed at different rates, so, shifting income from one category to another (e.g., capital gains v. dividends) can influence the amount of taxes being paid. Tax avoidance, such as deductions that are allowed by tax code (e.g., dependents, health savings accounts), will reduce taxable income. Evasion or illegally not paying taxes, such as not reporting or misreporting income, can also be a problem as well.

Personal income may be the most accurate measure of a person's ability to pay due to this measurement including both earned and unearned income. No matter what measure is used to determine wealth for a district, all taxes are paid for by an individual's income (King et al., 2003). The capacity to pay taxes from income may come into conflict with taxes based on other measures of wealth. For example, elderly citizens on fixed incomes may struggle with raises in property tax based on highly valued residential homes that they purchased at a time they were employed with higher salaries, which they no longer have in retirement.

Other Measurements of Wealth

Sales taxes, privilege taxes, and natural resource extraction are other types of tax bases that could be used to measure wealth in various areas. Each of these measures represents additional aspects of fiscal capacity beyond income and property.

Sales that occur in a given area are a result of a product being sold or a service provided (Brimley & Garfield, 2008). When this tax is put into place, it is usually at the same percent of the sales level no matter what product or service is purchased. Through sales receipts, the tax revenue generated by sales is easily determined; although unreported sales are not able to be taxed.

The sales tax tends to be regressive, meaning that lower income individuals or families pay a higher percentage of their income for the tax than do higher income individuals or families. Consequently, most states and other jurisdictions using the sales tax will provide exceptions for necessities, such as food, clothing, and clothing (Pennsylvania). However, even with these types of exceptions, designed not to have the tax impact the basic standard of living, the sales tax remains regressive, only less so (Brimley & Garfield, 2008). In other instances, the sales tax may impact consumer choices, particularly on higher priced items, such as automobiles, large appliances, or televisions. Lower income consumers may make different choices on products based on their income (new car vs. used car as an example). However, the advantage of broadening that base of taxable items is that additional revenue will be captured at the same rate.

Utilizing sales as a measure of wealth provides some distinct benefits. Besides the relative ease in administration, sales tax is based on consumption without bias towards individual wealth (King et al., 2003). Everyone pays the same percentage on taxable items, no matter what the income level of the purchaser. Including services, as well as products, as a taxable measure, the sales tax base becomes broadened, which creates more revenue.

A concern with using sales as a measure of wealth for a district is that sales are highly influenced by economic conditions of the moment (Odden & Picus, 2008). Predictability of revenue becomes a serious issue. There are numerous items that are often excluded from sales taxes such as food, medicines necessity items, and sometimes casual transfers (i.e. a transfer in car ownership between two private individuals) (King et al., 2003). Exclusions narrow the tax base and reduce potential revenue, but attempt to make the tax less burdensome to lower income individuals. The sales tax rates are typically the same for all transactions.

Location issues can be very difficult too. A large shopping center, located in one district, but serving many surrounding districts, would only generate local sales tax revenues for the district in which it is physically located, unless some regional sharing arrangement was in place.

Another big issue with sales is the inconsistent manner of dealing with internet sales (Brimley & Garfield, 2008). Many items bought through the internet may not be taxed, or may only be taxed for certain purchasers (i.e. those who live in the same state as the business). Products that are very mobile (meaning items that are easily and inexpensively shipped/mailed) may be bought and sold through this on-line process in avoidance of sales tax. Consumers that live close to state borders in states that have different state sales tax rates may be influenced by the varying tax rates in deciding which state to buy taxable products. These inconsistencies in tax rates and tax avoidance can create limitations to the reliability of revenue that may be generated when sales are used as a wealth measure.

Privilege taxes are levied on both individuals and business for the right of conducting or participating in certain activities (King et al., 2003). These kinds of fees or taxes may also be issued for use of public facilities, to obtain various professional licenses (i.e. teachers' licenses), drivers' licenses, tolls, etc. These fees are justified by the thought of the user receiving a benefit since there is a value tied to the privilege for the user.

Using the privilege tax as a wealth measure has limited application for many districts. Many licensing fees, tolls, park fees, amusement fees are tied to the state, not local governments or schools. Even if the state distributed these monies to schools based on the funds received from each locality, then certain districts, e.g., more populous areas and those with parks and other taxable attractions would stand to receive larger revenues, which may cause an inequitable distribution. District use of privilege taxes could also lead to inequitable funding results, where districts with certain attractions or concentrations of privileged activities could receive substantial benefits not available to the majority of districts. The stability of this measure would also be in question. Economic conditions could have a significant impact on many of these taxes; further, licensing fees are usually only paid once, or once every so many years, so, these tend not to be a consistent source of revenue.

Natural resource extraction, or severance taxes, refers to taxes that are collected based on the removal of natural resources (Brimley & Garfield, 2008). Oil, coal, natural gas, various minerals, timber, and even fish can fall under natural resources that could be subject to a severance tax. By extracting these products from the earth, the extractors pay the state fees for the amount removed or sold.

Again, this kind of revenue, if seen as a wealth measure would be regionally biased. States, or areas, that are rich in resources would be able to produce a great deal more revenue than states with significantly less resources. Within a state, an unequal distribution of natural resources would yield unequal funding opportunities for districts. For example, Marcellus shale in parts of Pennsylvania would represent a larger portion of natural resource wealth than in other parts of the state. A way to equalize the revenue from natural resources would be for the tax to be a state tax. This would allow the state to collect the revenue and establish distribution across the state.

Another issue would be the sustainability of this revenue. Natural resources are a finite resource. When either the quantity or quality of the resource begins to lessen, the revenues derived from their extraction would also be reduced. Further, the market demand for the resource being extracted will affect its value and likely the tax revenues that are obtainable from it.

Composite Measures

Focusing on one wealth measure will tend to emphasize the pros and cons of that measure. The same is true of taxes based on wealth: relying on one kind of tax will provide biases that favor some people while requiring others to pay more than their share. For example, if property were used as the sole wealth measure in a state, then this would make districts with well developed areas look wealthy, even if the constituents in that area had low income.

An alternative would be to use multiple measures of wealth to determine fiscal capacity across the state (King et al., 2003). By tapping into multiple sources of wealth,

the burden is spread across many segments of society instead of focusing on one segment to support government supplied services. Using multiple measures would also take into account a fuller measure of ability to pay. By using a broader definition of wealth, and by including multiple measures in that definition, the disadvantages of each individual measure could be minimized.

A disadvantage of using multiple measures is the increased administrative costs that could go into tracking all of these different measures across the state (Brimley & Garfield, 2008). Obviously by using one measure, then that measure is the only focus that has to be taken into account. Using multiple sources will require assessments in many areas of wealth, and these assessments will have to continually be tracked and updated. There is also the issue of privacy. Tracking every aspect of wealth can be intrusive and difficult. Hiding some sources of wealth may be easier than with others, and getting everyone to report all sources of wealth may be impossible.

Uses of Wealth Measures in School Finance Systems

Though states may greatly differ in many aspects of how they measure wealth, most states use local property as the primary basis to finance their public schools (Odden & Picus, 2008). Historically and currently, significant disparities in property wealth per student exist among school districts in a state. In order to counteract these differences, most states use some sort of funding equalization program. An equalized state aid approach disburses at least some funds in an inverse relationship to district wealth. Consequently, measurement of district wealth is a critical aspect of state funding systems.

Horizontal and Vertical Equity

State equalization funding attempts to improve horizontal and vertical equity (Odden & Picus, 2008). Horizontal equity emphasizes that students or districts that are alike, should be treated alike. Vertical equity recognizes differences among students or districts and justifies unequal treatment based on those differences. For example, two districts that are very similar in size, wealth characteristics, student characteristics, etc., should receive similar funding (horizontal equity). However, two districts that may be the same size, but have differing characteristics (i.e. a much higher special education population, or lower fiscal capacity levels), should receive differing levels of funding in order to address specific needs. Most of the use of wealth measures involves horizontal equity where districts are considered more alike and wealth measures are used to distinguish among districts in fiscal capacity so that general aid formulas can be used to lessen the potential revenue disparities among districts. In the case of vertical equity the disparities among districts tend to reflect differing levels of resources or expenditures needed to compensate for student or geographic differences. Consequently, targeted state subsidies are used often to help improve vertical equity. Examples of this approach are special education, transportation, dual enrollment funds, and education assistance programs.

Tax Effort

Fiscal capacity measures the districts' or states' tax bases to determine the ability to raise funds (Williams, 1993). The tax rates that are implemented reveal the effort that is being put forth by the district to fund schools. By looking at the wealth in the district,

and how the district is taxing that wealth to fund public schools, states can better analyze the effort that the locality is putting forth to provide adequate funding. How district wealth is measured remains an important concern. If district wealth is primarily measured by the value of taxable property in its boundaries, then the gauge of the local tax effort is generally a tax rate that is levied on that property. However, the ability to pay taxes is based on income, not property wealth. When property wealth and income are somewhat correlated, then tax effort measured by property tax rates provides a comparable metric across districts. However, if property wealth and income are not closely related, then the measure of tax effort may be misleading since some types of property may not relate to comparable income levels to pay the tax. For example, if a district has high property wealth per student (e.g., farmland), but the property owners have limited income from that property from which to pay their taxes and the local school board levies lower property taxes in recognition of that situation, then it may appear as if its fiscal capacity is high and effort is low, because the measure of both wealth and tax effort is property wealth.

Measures of Fiscal Equity

Determination of fiscal equity in a state school system traditionally follows the methodology of Berne and Stiefel (1984). Their equity analysis is organized around four questions of who, what, how, and how much. The "who" refers to the group for which school finance should be more equitable; two groups are generally recognized as appropriate: students and taxpayers (Berne & Stiefel, 1984; Williams, 1993). The "what" refers to the resources and services that should be fairly distributed amongst the group.

The "how" refers to the principles that would be used to determine the equitability of the distribution. The "how much" refers to the quantitative measures used to assess equity.

Horizontal equity and fiscal neutrality are used as the "how" of this analysis. Horizontal equity analyzes whether or not all students are treated similarly (Berne & Stiefel, 1984; Williams, 1993). Dispersion measures are utilized to analyze horizontal equity. These measure are used identify the disparity that exists in a distribution. In the case of this study it measures the disparity in spending per student. These measures do allow for a comparison of the data, but regional price differences and decisions made by school boards are examples of other causes of spending differences.

Five dispersion statistics frequently used to analyze horizontal equity are (Berne & Stiefel, 1984; Williams, 1993):

1. Range: the difference between the highest and lowest measure of spending in the distribution.
2. Restricted range: the difference between the measure of spending at the 95^{th} and 5^{th} percentiles of students arranged in ascending order of the measure of spending.
3. Federal range ratio: the restricted range divided by the measure of spending at the 5^{th} percentile of students.
4. Coefficient of variation: the square root of the variance of the measure of spending divided by the mean measure of spending.
5. McLoone index: the ratio of the actual sum of the measure of spending for pupils below the median to the sum of measure of spending that would exist if each pupil below the median were at the median measure of spending.

If the results of these statistical measures show that there is substantial dispersion among districts in spending per student, then the system is inequitable; however, results indicating lower dispersion indicate a greater equity under this definition.

Fiscal neutrality refers to the relationship on spending per student and the measure of wealth (Berne & Stiefel, 1984; Williams, 1993). The idea of fiscal neutrality is that all students should have similar educational opportunity. The wealth of the district should not greatly differ the educational opportunity of the student. In other words, district wealth should not be related to expenditures per student.

The three relationship measures for fiscal neutrality are (Berne & Stiefel, 1984; Williams, 1993):

1. Correlation coefficient: the Pearson Product Moment between the measure of wealth (independent variable) and the measure of spending (dependent variable).
2. Coefficient of determination: measures the fraction of the variation in the measure of spending that could be explained by the measure of wealth.
3. Simple slope: measures the size of the change of the measure of spending associated with a one-unit change in the measure of wealth.

High values of these statistical measures indicate a closer relationship between spending and wealth, which is inequitable under these definitions.

Wealth Measures in Pennsylvania

The primary measure of school district wealth in Pennsylvania is the Market Value/Personal Income Aid Ratio (MV/PI AR). It is a composite measure using both the

market value of taxable property in the district and the amount of personal income of district residents. This overall aid ratio is comprised of two other separate aid ratios: the Market Value Aid Ratio (MV AR), and the Personal Income Aid Ratio (PI AR). The market value aid ratio measures the estimated market value of taxable property per student for the district compared to the state average, and the personal income aid ratio measures the personal income per student of the district compared to the state average. The overall index is a weighted average of two individual aid ratios: 60% of the Market Value Aid Ratio and 40% of the Personal Income Aid Ratio (Act 59, 1977). Thus, the MV/PI AR represents the district's actual market value and actual personal income compared to the state average market value and personal income, all on a per student basis. The result is an inverse index where higher MV/PI Aid Ratios indicate the districts are poorer and lower ratios indicate wealthy districts. This allows the MV/PI AR to be used directly in the state aid formulas as an equalization multiplier since poorer districts with higher ratios would qualify for more state aid in the calculations.

Market Value

The market value is the state's measure of real property (land and improvements) within the district. This measure is determined annually by the State Tax Equalization Board (STEB). STEB was established in 1947 due to the lack of uniformity in the assessment process throughout the state (STEB, 1999). Previously, county assessments determined how state subsidies were distributed, and since there were great variations in the process, STEB was formed to help equalize the distribution of state funding.

As mentioned earlier, market value is the true value, or the price a willing buyer would pay a willing seller for the property in its current condition. Assessed value is a fraction or percentage of the market value, and is the value assigned to the property for tax purposes. STEB calculates the market value of taxable real property in each school district every other year (Williams, 1993) and makes a statistical adjustment in the market values in the off years. While there are many detailed calculations and adjustments', STEB's general methodology is to compare the actual sales price of property to the properties' assessed value. This ratio is then applied to assessed values of other property in the district to estimate a total market value of property of the district.

Counties establish assessed values based on the latest year the county conducted an assessment. However, in Pennsylvania assessments of properties within a county only occur when the county determines to conduct a reassessment and this may be very infrequent due to the negative political implications of reassessment. Consequently, there are some counties in the state which have not had a reassessment on over 50 years. When a home is built after the county's last reassessment, then a county may use the base year approach to determine the taxes. An analysis of the assessed value of the house in the year of the last assessment would determine the taxes that the property owner would pay. This leads to some very problematic assessments when trying to place a 1978 value on a house built in 2008.

Given the infrequent actual assessments, counties often determine assessed value of property as a percentage of market value. For example, using a 100% ratio would approximate market values, while a 50% ratio would yield a substantially lower assessed value. Changing from market value to assessed value has no impact on the amount of

property tax paid by taxpayers. When lower assessed values are used, the tax rate is increased proportionally. The result is substantial variation in the millage rates that are charged from one county to another. The primary purpose of assessed values would seem to be to hide the inexact and out of date property valuations.

This means that neither assessed values for districts can be used to measure wealth across districts nor can individual tax rates based on assessed values be used to compare levels of district taxation. Consequently, distribution of state aid to equalize wealth cannot be based on assessed values since they do not accurately measure district property wealth.

Tax effort is represented by equalized mills (PA Department of Education, 2010). Millage is a measure of taxation where one mill equals one dollar of tax for every one-thousand dollars of property value. Equalizing mills are calculated by summing all of the local taxes, including property plus other non-property local taxes, and dividing by the market value of the property in the district. The use of equalized mills attempts to counteract the differences created by current assessment practices. As a result, equalized mills represent how much total local tax effort the district is making to support education. This allows for tax effort comparisons across district boundaries.

While market value may not be the best measure of property wealth, it is the most feasible one in Pennsylvania. However, the assessment system by counties to determine assessed value is severely flawed. The current system of assessments used by some counties is being challenged in court. In June of 2007, a Common Pleas Court ruled that the legislation allowing for base year assessments was unconstitutional (Clifton v Allegheny Co., 2009). The base year assessments used in the county were considered

arbitrary, and according to the judge they produced unjust results. The decision considered these assessments a violation of the uniformity clause in Pennsylvania's Constitution. The state Supreme Court heard arguments on this case in the beginning of September, 2008, and in April of 2009, upheld the lower court's decision. At this writing, it is unknown what the extent of the impact will be regarding this decision, but it will have a significant impact on many counties in Pennsylvania.

Personal Income

Pennsylvania uses total personal income as the state measure of income wealth. These data are taken from state tax returns, which are identified by school district. Consequently, total personal income is the measure used in the PI AR and MV/PI AR. However, using personal income to measure income wealth is inconsistent with the concept of the wealth measure representing the tax base for raising revenues for school districts. In Pennsylvania, school districts are not allowed to tax total personal income (Pennsylvania School Boards Association, 2006), but are permitted to tax only earned income.

Specifically, in Pennsylvania earned income consists of wages, or net profits (Pennsylvania School Boards Association, 2006), and is levied on such things as wages, salaries, net profits, and commissions. Unlike the state personal income tax, it does not include things like interest and dividends (newPA.com, 2009). The impact of using the earned income tax varies across districts. The ratio of earned income to the total district income ranges from 46% to 95%, with the median being 84% (PA Department of Revenue, 2008). Residents of wealthier districts tend to have a higher proportion of

unearned income from dividends and interest, which are not included in the districts' local earned income tax base.

Weighted Average Daily Membership (WADM)

The student measure used in determination of the aid ratios is weighted average daily membership (WADM), in which different categories of students have different weights: (Pennsylvania School Boards Association, 2006). Rather than the average daily membership (headcount of enrolled students), the aid ratio formula uses the weighted relative weights shown below to derive the number of students in the district:

Half-day kindergarten	0.5
Full-day kindergarten	1.0
Elementary	1.0
Secondary	1.36

The actual numbers of pupils (unweighted) in each category are multiplied by their respective weights and then the individual weighted students are summed to determine the district's WADM. The calculation process is illustrated below.

	Unweighted Pupils		Weight		WADM
Half-day Kindergarten	200	x	0.5	=	100
Elementary	1,100	x	1.0	=	1,100
Secondary	1,800	x	1.36	=	2,448
Total	3,100			=	3,648

The district's WADM is used to determine the market value per WADM and the personal income per WADM for each district and for the state average. The formula and

examples for the ratios are shown below. If the market value of the district totaled $500 million and the personal income totaled $200 million for the district, then the per student amounts would be:

	Example District	State
Market Value	$500,000,000	$620,000,000,000
Personal Income	$200,000,000	$285,000,000,000
WADM	3,648	2,719,650
MV/WADM	$137,061	$227,970
PI/WADM	$54,824	$104,793

These two amounts are used to calculate the market value aid ratio (MVAR), and the personal income aid ratios (PIAR). The formulas are calculated by dividing the district values per WADM by the state's values per WADM, multiplying by 0.5, and subtracting that outcome from 1.0. The calculations for the example district are:

Market Value Aid Ratio (MVAR)

$$MVAR = 1.0 - \left[\frac{\text{District market value/WADM)}}{\text{State market value/WADM)}} \times 0.5\right]$$

$$MVAR = 1.0 - \frac{137{,}061}{227{,}970} \times 0.5$$

$$MVAR = 1.0 - 0.3006$$

$$MVAR = 0.6994$$

Personal Income Aid Ratio (PIAR)

$$PIAR = 1.0 - \left[\frac{\text{District personal income/WADM}}{\text{State personal income/WADM}} \times 0.5\right]$$

$$PIAR = 1.0 - \frac{54{,}824}{104{,}793} \times 0.5$$

$$PIAR = 1.0 - 0.2616$$

$$PIAR = 0.7384$$

The individual MVAR and the PIAR ratios are used to calculate the district's MV/PI AR, which is a composite index, with the MVAR is weighted at 60% of the composite aid ratio, and the PIAR is weighted at 40%. The calculations for the example district would be as follows:

$$\text{MV/PI AR} = (\text{MVAR} \times 0.6) + (\text{PIAR} \times 0.4)$$

$$\text{MV/PI AR} = (0.6994 \times 0.6) + (0.7384 \times 0.4)$$

$$\text{MV/PI AR} = 0.41964 + 0.29536$$

$$\text{MV/PI AR} = 0.7150$$

The construction of the formula results in a reverse index in which poorer districts have higher index values (with average MV/WADM and PI/WADM below state averages); conversely, wealthier districts have lower index values. The original formula was established to yield a MV/PI AR of 0.5000 for a district with per WADM values equal to the state average for these values. Pennsylvania districts' MV/PI ARs range from 0.1500 to around 0.8500. In the example district used above, the district with its relatively high MV/PI AR would be a poorer district. By law, the wealthiest districts are

given an MV/PI AR of 0.1500, even if their calculated MV/PI AR would be lower than that figure, or even negative for very wealthy districts. The lower boundary of 0.1500 was set politically to create a floor so that all school districts would have at least a minimal MV/PI AR (and qualify for state aid). In 2008-2009, twenty-three school districts had a MV/PI AR of 0.1500 due to their wealth in both market values and personal income values. Without the 0.1500 floor those districts that would have had a negative MV/PI AR would pay monies back to the state instead of receiving state aid for certain subsidies. This blatant recapture was avoided through establishing a minimum MV/PI AR for each district, regardless of the actual calculated value.

A primary objective of Pennsylvania's use of a wealth measure is to identify districts that are considered poorer than others with less ability to raise sufficient revenues locally. A second, and political, objective is to provide some level of state aid to all districts and not take locally raised funds away from wealthy districts.

Use of Wealth Measures in Funding in Pennsylvania

In Pennsylvania in 2009-2010, $10.0 billion was appropriated for PreK-12 education by the State Legislature and signed into law by the Governor (PA Department of Education, 2010). Table 2.3 shows the amounts allocated in major subsidies in the budget that were then distributed by the Pennsylvania Department of Education. Some of these subsidies were distributed to school districts based on the wealth of the district and some used other factors. Those districts identified with lower wealth measures received higher aid per student subsidy amounts; those identified as higher wealth districts received a lower aid per student amount.

Table 2.3

2009-2010 PA Education Budget

Category	Direct Use of Wealth Measure	2009-2010 Funding
Total PreK-12	--	$10.0 billion
Basic Education Subsidy	Yes	$5.5 billion
Special Education Subsidy	Yes	$1.0 billion
Pre-K Counts	No	$86.4 million
Science: It's Elementary	No	$13.6 million
Dual Enrollment	No	$8 million
Accountability Block Grant	No	$271.4 million
Project 720 High School Reform	No	$3.7 million
Educational Assistance Program	No	$59.1 million
Charter School Reimbursement	Yes	$226.9 million

The two largest subsidies listed in Table 2.3 - Basic Education and Special Education - have district wealth as a component of their distribution formula (PA Department of Education, 2010). The market value/personal income aid ratio (MV/PI AR) is used in calculating the basic education subsidy, and is used for the base supplement and the inflation index supplement of the special education subsidy. A school district may also qualify for charter school reimbursement funds if it has a MV/PI AR equal to or greater than 0.6000 (and meets two other criteria measures). Many of the other funds (Classrooms for the Future, for example) require local funds as part of the initiative. The ability to raise local funds is tied to local property or income wealth.

For 2008-09, the Pennsylvania Department of Education used a new funding formula to allocate Basic Education Subsidy to school districts. The new formula was based on a Costing Out Study that was done the prior year to determine the expenditure per student that each individual school district would need to have every one of their students reach Proficiency on the state's Pennsylvania System of Student Assessment

(PSSA), which measures districts' progress toward reaching NCLB goals of 100% proficiency for all students. The formula calculates a target spending level for each district, the gap between the district's actual spending and its spending target and then determines a state contribution to close the gap. A six year phase-in is built into the formula. In 2008-09, the new formula was in its first year. This represents a major shift in the funding approach for Pennsylvania.

Previously the basic education funding formula used a hold-harmless approach supplemented by various and annually changing supplements. The supplements only comprised a 2% to 5% annual increase in total funding and many of them used the wealth measure, MV/PI AR as a component of determining district eligibility for the supplement or the amount allocated, or both.

For 2009-2010, the funding formula for the basic education subsidy in Pennsylvania consisted of the following components found on the state's website (PA Department of Education, 2010):

- *Each qualifying school district will receive a state share phase-in allocation. The state funding target will be calculated for each school district as follows:*
- *Calculate an adequacy target for each school district by summing the following:*
    - *Base cost: (a) the base cost per student ($8,698) multiplied by (b) its 2009-2010 modified average daily membership.*
    - *Poverty supplement: (a) the base cost per student multiplied by (b) its number of students eligible for free or reduced price meals under the national school lunch program on October 31, 2007, multiplied by (c) 0.43.*

- *District size supplement: the greater of zero or (a) the base cost per student multiplied by (b) its 2007-2008 adjusted average daily membership multiplied by (c) the sum of 0.483 and the natural logarithm of its 2007-2008 adjusted average daily membership multiplied by -0.05.*
- *English language learner supplement: (a) the base cost per student multiplied by (b) its number of students identified as limited English proficient in the 2007-2008 school year multiplied by (c) the sum of 3.753 and the natural logarithm of its 2007-2008 adjusted average daily membership multiplied by -0.23, provided that such amount shall be no less than 1.48 and no greater than 2.43.*
- *Adjustment for geographic price differences: (a) the greater of 1 or its location cost metric multiplied by (b) the sum of the base cost, poverty supplement, district size supplement, and English language learner supplement minus (c) the sum of the base cost, poverty supplement, district size supplement and English language learner supplement.*

- *The adequacy shortfall is calculated as the greater of zero or its adequacy target minus its actual spending for 2007-2008.*
- *The state funding target equals the adequacy shortfall multiplied by (a) its 2009-2010 market value/personal income aid ratio multiplied by (b) the lesser of 1.00 or its 2007-2008 equalized millage divided by 24.0 (the equalized millage at the 75th percentile).*
- *Each school district whose 2006-2007 equalized millage is equal to or greater than 24.7 (the equalized millage at the 80th percentile) will receive a state share*

phase-in allocation equal to 27.82 percent of its state funding target; each school district whose 2006-2007 equalized millage is less than 24.7 will receive a state share phase-in allocation equal to 21.40 percent of its state funding target.

- *A minimum increase will be provided to each school district, if necessary, so that its total increase including its state share phase-in allocation shall equal a minimum 2.0 percent increase over its 2008-209 Basic Education Funding allocation.*

These components to the new funding formula place more emphasis on adequacy than in previous formulas. Measuring how far districts are from their adequacy targets rather than focusing on equalized funding seems to represent a shift in focus for state funding of public schools.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Introduction

The purpose of this study is to identify measures of wealth that are feasible for state school finance systems and examine the impact of alternative definitions of wealth on distribution of state aid to school districts and on the fiscal equity in the school finance system. This study utilized Pennsylvania and its 500 school districts to illustrate the possible measures of wealth and to test their potential application in practice.

Research Design

This study constructed alternative measures of wealth for Pennsylvania based on the review of literature; these measures were applied to the state funding formulas for education; and the resulting changes in amounts and distribution patterns of state aid to school districts were analyzed to determine the impact of various definitions of wealth on state funding provided to districts. The effects of the changes in funding derived from the alternative definitions of wealth on fiscal equity of the state funding system were also examined. For example, the weights of the market value and personal income value used in the MV/PI AR (currently 60% and 40% respectively) were manipulated to see the effects of more or less emphasis on property and income wealth had on the amount of state funding, and the equity of that funding.

Data Selection

To conduct this study, Pennsylvania's 500 school districts were used as the population group. Financial summaries and data figures were utilized from the Pennsylvania Department of Education's (PDE) website for the most current year available. The most available up-to-date data was selected from STEB's website as it applies to this study. This study also utilized the following data elements: the basic education subsidy, average daily memberships (ADMs), weighted average daily memberships (WADMs), personal income (PI) levels for districts, market values (MV) for districts, the state's market value/personal income aid ratio (MV/PI AR), and the districts' current expenditures.

Data Collection

The 2009-2010 data required for this study was collected from publicly accessible information available on government access websites. PDE's website was the primary source, which contains a variety of financial information, including: definitions of current state subsidies, such as basic education, special education, and charter schools; and data elements used in calculating each state aid subsidy formula, average and weighted average daily membership; the MV/PI AR for each school district, real estate tax rates; and detailed expenditure and revenue data by school district. Consultation with finance staff members in the Pennsylvania Department of Education was necessary to interpret some of the definitions and calculations used in the funding formulas. The spreadsheet available publically through the state did not include the exact formulas, which made the consultation necessary to produce accurate calculations.

The State Tax Equalization Board's website identifies the market values and assessed values of counties and districts. The market values used in the MV/PI AR calculations came from this agency. The Department of Revenue website was utilized to access current income figures for each district.

Data Analysis

Computer spreadsheet models of the state's subsidy formulas for basic education were created to simulate the changes in the MV/PI AR. The models were built to allow for varying the relative weights of property and income used in the wealth measure. These simulations calculated the amount of state funding for each district under each choice of weights for the wealth measures. The results illustrated how the manipulation of the MV/PI AR influenced the distribution of state aid.

The weights that are attached to the MV/PI AR were varied at standard increments to analyze the effect of changing how wealth is measured on state subsidies for school districts. Currently the measures are weighted 60% MV AR and 40% PI AR. The simulation started with 100% MV AR and 0% PI AR. The weights in the simulation were varied inversely by 25% until the MV/PI AR was defined as 0% MV AR and 100% PI AR. At each step, new MV/PI ARs were calculated for each of the 500 school districts. For each of the simulations the revised MV/PI ARs for each district were substituted in state aid formula calculations and a revised state aid amount determined. The changes in state amount for districts in each simulation were determined.

The equity analysis for this study was based on the methodology of Berne and Stiefel (1984). It was organized around four questions of who (the group for which

school finance should be more equitable), what (resources and services that should be fairly distributed amongst the group), how (principles that would be used to determine the equitability of the distribution), and how much (quantitative measures used to assess equity). The students were the "who" of this analysis since they are the focus of the educational process, and were measured by the district and state average daily memberships (ADMs). Any changes to state funding must be judged on the effects on students. The current expenditures per student by the school districts were the "what" of this analysis. The districts' current expenditures divided by their average daily membership (CE/ADM) provided an instructional measure for this analysis.

Horizontal equity and fiscal neutrality were the "how" of this analysis. Horizontal equity analyzes whether or not all students are treated similarly. The question of "how much" was answered by two types of measures. Dispersion measures were utilized to analyze horizontal equity. Fiscal neutrality refers to the relationship on spending per student and the measure of wealth (how do changes in wealth measures impact the CE/student).

The five dispersion statistics reviewed in Chapter 2 were used to analyze horizontal equity: range, restricted range, federal range ratio, coefficient of variation, and the McLoone index (Berne & Stiefel, 1984; Williams, 1993). The three relationship measures from Chapter 2 were used to analyze fiscal neutrality: correlation coefficient, coefficient of determination, and simple slope.

These statistical measures were calculated for the current funding formula, as well as the simulations of state aid that represent 100% reliance on market value, and 0% reliance on market value. They were analyzed to determine if fiscal equity in the state has

been improved or worsened with the revised measures of wealth. Additionally, the gains or losses of state aid by district were calculated for the alternative wealth measures simulations.

The gains or losses from the simulations were added to each district's current expenditures. The new expenditures were then divided by the district's average daily membership to recalculate the current expenditures per student. It is also important to note that the most current data available for CE/student are for 2007-2008. Due to the two year difference, the 2009-10 current expenditures would likely have grown and be greater than they were two years prior. This would render the dollar changes to 2009-10 current expenditures relatively smaller as a proportion than the results of this study which used 2007-08 current expenditures as the base. Also, due to a consolidation of Center Area and Monaca school districts into the Central Valley school district over those two years, those districts were withdrawn from the equity simulations. The equity simulations involved 499 districts, rather than 500 school districts.

Once the simulations were completed, additional analysis attempted to identify common characteristics of districts that gained or lost funding with the alternative measures of wealth. Characteristics such as wealth, size (square miles), number of students, rural/urban/suburban locale, percent of disadvantaged population in students, tax effort as measured by equalized mills, and growth were tested for their relationship with relative increases or decreases in state aid.

Limitations

This study analyzed how Pennsylvania measures wealth to determine the distribution of state aid, and was less concerned with the generalizability toward the precise measures in other states. Many generalizations can be made based on this research, but that was not the intent of the research.

The findings from this study were based on the most current data available, generally 2009-2010. The speed of current technology and the ease in which data can be updated has greatly improved over the years, allowing for current data to be made available in short amounts of time. However, this study does have its limitations.

First, the politics of school funding seems to be changing all the time. Currently the state is analyzing the possibility of redrawing school district lines, decreasing the 500 school districts down to approximately 100. Issues like this would limit the generalizability of the results of this research.

Second, this study did not take into the account the political or practical issues of implementing any level of change to the MV/PI AR. Any change would require legislative action which can be both daunting and tricky. The political implications of changing the aid ratio could be difficult, especially from the viewpoint of those districts most greatly impacted in a perceived negative way. While this research is not calling for a change, it will provide data as to the effect that changes would have on all 500 districts in the Commonwealth.

Third, this study did not look at the impact of implementing other measures into the MV/PI AR. For example, adding sales tax revenue as part of the formula would be intriguing and worthy of study, but that was beyond the scope of this study.

Finally, this study did not attempt to fix the imprecision of STEB. As mentioned earlier, market values and assessed values vary widely amongst counties. Since assessment is often a county responsibility, a lack of qualified assessors in these county positions can reduce the lack of validity in their assessments.

CHAPTER 4

RESEARCH FINDINGS

The purpose of this study is to identify measures of wealth that are feasible for state school finance systems and examine the impact of alternative definitions of wealth on distribution of state aid to school districts and on the fiscal equity in the school finance system. Referring back to the research questions in Chapter 1 of this study, the first three questions have been addressed prior to this chapter. Chapter 2 answered those first three questions by identifying alternative measure of wealth and their advantages and disadvantages, identifying the measure of wealth used in Pennsylvania, and how the measures are used in Pennsylvania's school finance system. This chapter focuses on the final two research questions from Chapter 1 through analyzing simulations that shifted the weighting of the measures used, and the impact that had on state funding of school districts.

Feasible Measures

Income and property are the two measures used in Pennsylvania's aid ratio. These two measures present significant advantages. Property provides a very stable measure, while income has a substantial statewide revenue base and increases (or decreases) along with the economy. Because Pennsylvania has already chosen these measures, and systems are presently in place to administer these systems, the simulations used in this study utilized these two measures for comparison. While the utilization of a sales tax or other measures may broaden districts' tax bases, none of these measures have

data that are identified by school district. The sales tax is also regressive in nature, and difficult to predict. Unless regionalized, a sales tax measure would only benefit those districts that were more commercialized. Therefore, the analysis in the simulations looks at the weighting that the state has presently placed on these measures.

Baseline Data

In order to create a workable spreadsheet to create the simulations, baseline figures had to be developed that replicated the present actual figures. These figures were able to be recreated with the necessary formulas for the simulations within a dollar of the actual figures within each category. The state has an adequacy target (the amount the state has determined would be needed to adequately education the students in a particular district) established, and the difference of that target and the district's actual spending determines the adequacy shortfall of each district (PA Department of Education, 2010). This shortfall is then placed in a formula with the district's MV/PI AR multiplied by the lesser of either 1.0 or their equalized mills divided by 24.0 (the statewide equalized millage at the 75th percentile). This outcome becomes the state funding target. The effect of this calculation is to reduce the state funding target for districts taxing below the 75% level of equalized mills. How much funding a district actually receives is called the State Share Phase-In (hereafter known as SSPI), which is a percentage of the districts state funding target; for 2008-09 the percent of SSPI was 27.82% if a district's equalized millage was greater than or equal to 24.7 (the equalized millage rate at the 80th percentile), or 21.4% if a district's equalized millage rate was below 24.7. Each district was guaranteed to receive a 2% increase over their previous years basic education

funding. Districts that received no SSPI or if their SSPI constituted less than a 2% increase, received a minimum increase amount to bring their allocation up to 2% increase of their prior year's allocation.

There were two measures considered when looking at change in funding for school districts while manipulating the MV/PI AR: the state subsidy and the SSPI. The state subsidy includes the minimum guarantee amount for each district mentioned above. This minimum guarantee was put into the formula in order to ensure that all districts would receive additional funding from the state regardless of their local funding levels. If a district was meeting their adequacy target, then they would still be guaranteed funding through this part of the formula. Ninety-five districts received some sort of minimum increase in the original funding formula. This had the effect of overriding the calculated impact of the MV/PI AR in the state basic aid formula for these districts. Since the minimum guarantee part of the formula hid the effect of changing the wealth measures for these districts and SSPI is the portion of the adequacy shortfall that the state paid before the minimum guarantee formula took effect, the SSPI was the measure used in the simulations in order to analyze wealth measures and their impact on funding. The SSPI was the measure used in the simulations to rank districts, and the change in SSPI was analyzed in the simulations to measure effect of changing the proportions of property wealth and income in the MV/PI AR.

Before any changes in the current weighting took place the districts were ranked based on the dollar amount of SSPI dollars they received using the current weighting (60% MV, 40% PI) as a baseline. Once the districts were ranked from the lowest SSPI to the highest SSPI, a sampling of the districts was taken to analyze the impact of changing

wealth percentage measures more closely. The districts ranked first, fiftieth, and every fiftieth thereafter were placed in the sample group, resulting in a group of eleven districts. These districts in the sample are shown in Table 4.1, along with their SSPI, adequacy targets and shortfalls, and their state funding target. While the simulations were run on every school district, these eleven districts were the focus of the analysis to measure effect on state funding.

Table 4.1

Original State Funding Formula Results

Rank	School District	2009-10 State Share Phase-In	State Funding Target	Adequacy Target	Adequacy Shortfall
1	Allegheny Valley	$0	$0	$12,893,408	$0
50	Turkeyfoot Valley	$32,676	$152,692	$4,438,302	$705,799
100	Oswayo Valley	$173,822	$812,252	$6,382,131	$1,379,269
150	Fort Cherry	$265,843	$1,242,257	$13,277,946	$2,460,286
200	Mid Valley	$373,578	$1,745,693	$19,146,535	$5,882,983
250	Port Allegany	$475,495	$2,221,939	$12,287,329	$3,470,392
300	Littlestown	$608,845	$2,845,072	$23,631,041	$6,673,105
350	Cocalico	$784,434	$3,665,578	$35,993,806	$7,775,659
400	Yough	$967,656	$4,521,759	$26,320,456	$9,429,171
450	Greater Nanticoke	$1,376,369	$6,431,630	$26,541,301	$9,233,684
500	Philadelphia City	$129,039,669	$602,989,108	$2,793,527,677	$1,020,331,027

A brief review at these districts shows the varying funding levels that were provided by the state, and the differences in their adequacy targets. Allegheny Valley

received no SSPI money from the state since they were already spending above their adequacy target and did not have an adequacy shortfall; however, they did get a 2% increase in state funding since the state formula guaranteed a minimum increase this year (PA Department of Education, 2010). The other districts in this sample were all spending less than their adequacy target and received SSPI money.

Table 4.2 identifies some of the demographic features of the districts in the sample. Six of the districts were rural districts, four were suburban, while one of the districts in the sample was considered urban (PA Department of Education, 2010). The districts also represent a mix in wealth as well. Allegheny Valley would be considered the richest district in this sample (with the lowest MV/PI AR of 0.4301), while Port Allegany would be considered the poorest district (with the highest MV/PI AR of 0.7808).

In land size, Allegheny Valley is the smallest at 10.5 square miles, while Port Allegheny is almost 17 times as large at 171.2 square miles (PA Department of Education, 2010). Ironically, these 2 districts are close to the same size in student population with a difference of only about 106 in their ADMs.

The difference in average daily membership (ADM) varies greatly, even if the largest district (Philadelphia) is removed. The smallest district in student population is Turkeyfoot Valley with an average daily membership (ADM) of 374 students, and the largest being Philadelphia with 207,161 students (PA Department of Education, 2010). The median student population in this sample is 1,674 (Mid Valley). The growth column shows the amount of change in the districts' ADM over a 2 year period, with no districts in the sample showing more than a 2.5% increase or a 3.5% decrease. Eight of the school

districts have over a third of their student population identified as economically disadvantaged (qualified for free and reduced lunches).

Table 4.2

Demographics

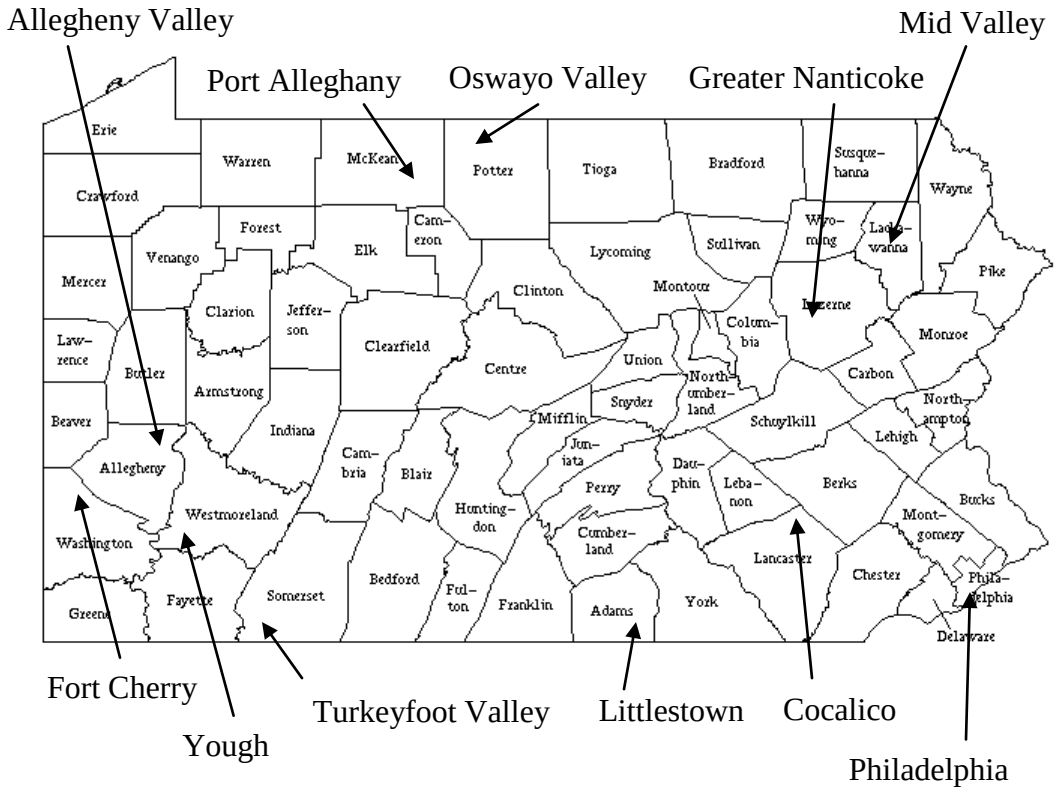
Sample Districts	Type	ADM	Aid Ratio	Square Miles	% Econ. Disadv.	Tax Effort	Growth 07-08 to 09-10
Allegheny Valley	Suburban	1,187	0.4301	10.5	28.26%	28.2	1.34%
Turkeyfoot Valley	Rural	374	0.5847	102.6	43.15%	9.0	2.11%
Oswayo Valley	Rural	538	0.7550	122.8	45.90%	18.9	0.82%
Fort Cherry	Rural	1,196	0.6011	57.9	33.96%	20.3	1.54%
Mid Valley	Rural	1,674	0.4496	15.2	40.61%	16.0	-3.30%
Port Allegany	Rural	1,081	0.7808	171.2	40.59%	19.9	0.66%
Littlestown	Rural	2,267	0.5537	49	21.35%	18.7	2.33%
Cocalico	Suburban	3,462	0.5069	50.9	16.30%	22.4	1.51%
Yough	Suburban	2,433	0.6394	75.3	35.75%	18.0	1.96%
Greater Nanticoke	Suburban	2,327	0.7410	53.1	43.33%	22.6	-3.13%
Philadelphia City	Urban	207,161	0.7207	142.6	65.90%	19.7	-0.31%

Tax effort is represented by equalized mills. With an equalized mill rate of 28.2, Allegheny Valley has the highest rate in the sample, while Turkeyfoot Valley's rate of 9.0 equalized mills represents the lowest. It may be worth pointing out that all but one of the suburban districts in the sample have equalized mill rates above 20.0, while all but one rural districts in the sample have rates below 20.0. The only urban district in the sample has a rate of almost 20.0 (19.7). These differences tend to represent a preference for low taxes over more funds for education for these districts.

These districts also come from varying sections of the state. Figure 4.1 is a map of Pennsylvania that shows the location of the sample districts (Pennsylvania State Data Center, 2010). Two district are from the north central part of the state (Port Alleghany and Oswayo Valley), while 2 are from the south central part of the state (Littlestown and Turkeyfoot Valley). Greater Nanticoke is in east central Pennsylvania, while Allegheny Valley is in the west central part of the state. Cocalico and Philadelphia are located in the southeast, and Fort Cherry and Yough are in the southwest. The final district, Mid Valley is in the north east portion of the state.

Figure 4.1

Location of Sample Districts



Simulation Results

Upon creating a workable spreadsheet that replicated the districts' current funding, the weighting of the MV/PI AR was manipulated in order to analyze the effects that different weighting would have on the districts' SSPI funding levels. The current measures are weighted 60% MV AR and 40% PI AR. The simulation started with 100% MV AR and 0% PI AR. Then the weights in the simulation were varied inversely by 25% until the MV/PI AR was defined as 0% MV AR and 100% PI AR. While this was done for all school districts, the analysis focused on the sample to illustrate the results.

Table 4.3

Simulation Changes in Funding

	100/0	75/25	50/50	25/75	0/100
Allegheny Valley	$0	$0	$0	$0	$0
Turkeyfoot Valley	-$4,448	-$1,671	$1,112	$3,895	$6,684
Oswayo Valley	-$9,508	-$3,592	$2,371	$8,334	$14,297
Fort Cherry	$17,381	$6,545	-$4,290	-$15,125	-$25,961
Mid Valley	-$39,385	-$14,790	$9,888	$34,483	$59,244
Port Allegany	$9,805	$3,654	-$2,436	-$8,526	-$14,616
Littlestown	-$9,237	-$3,519	$2,309	$8,137	$14,075
Cocalico	-$34,045	-$12,844	$8,511	$29,867	$51,377
Yough	$11,956	$4,389	-$2,875	-$10,291	-$17,555
Greater Nanticoke	$82,471	$30,834	-$20,432	-$72,069	-$123,335
Philadelphia City	$1,826,286	$680,381	-$447,619	-$1,575,620	-$2,685,715

As Table 4.3 illustrates, the changes in the weight of the MV/PI AR had varying effects on the districts' SSPI. This table shifts the share from MV to PI from left to right starting with 100% MV and moving to 100% PI. As the share of MV in the wealth measure was reduced (increasing the share of PI), five districts lost funding, five districts gained funding, and Alleghany Valley's funding remained constant at $0.

The sample had an even distribution of the number of districts that gained or lost funds; five districts gained additional funds as the share of market value in the MV/PI AR decreased, five districts lost funding, and one district was unchanged. An examination of the districts' wealth characteristics revealed the reason behind the changes and the cause of whether a district would gain or lose funding in each simulation. In short, the direction of the change was dependent on the relationship between the individual MVAR and PIAR for the district. The state calculates a market value aid ratio (MVAR) and a personal income aid ratio (PIAR) for each district based on their overall market value and personal income value. These two aid ratios are then weighted (MVAR is weighted 60%, PIAR is weighted 40%) and the combination becomes the MVPI AR. The aid ratios for these sample districts are shown in Table 4.4.

What determined the gain or loss for a district in each simulation depended on whether their MVAR was higher or lower than their PIAR. When the simulation was 100% reliant upon market value Fort Cherry, Port Allegany, Yough, Greater Nanticoke, and Philadelphia all gained funding compared to the current formula (60% MV and 40% PI) because their MVARs are higher than their PIARs, meaning they are poorer in market value and received more assistance from the state when the funding formula relied on their lower wealth measure to provide greater equalized state aid. Consequently, as the

simulations shifted to a reliance on personal income, these same districts lost funding the more the aid ratio relied upon their stronger wealth measure. Turkeyfoot Valley, Oswayo Valley, Mid Valley, Littlestown, and Cocalico all benefited from the reliance of the aid ratio simulations on personal income since that is where they are seen as being less wealthy. The differences in MVAR and PIAR and the difference in SSPI funds when shifting from 100% to 0% MV in the aid ration are shown in Table 4.5. Positive numbers indicate that the MV AR is higher and negative numbers indicate the PI AR is higher for each district.

Table 4.4

Aid Ratios

	MVAR	PIAR	MV/PI AR
Allegheny Valley	0.4317	0.4279	0.4301
Turkeyfoot Valley	0.5051	0.7043	0.5847
Oswayo Valley	0.7137	0.8171	0.7550
Fort Cherry	0.6404	0.5424	0.6011
Mid Valley	0.4022	0.5209	0.4496
Port Allegany	0.7969	0.7568	0.7808
Littlestown	0.5453	0.5665	0.5537
Cocalico	0.4849	0.5401	0.5069
Yough	0.6473	0.6278	0.6394
Greater Nanticoke	0.7854	0.6746	0.7410
Philadelphia City	0.7309	0.7057	0.7207

Allegheny Valley's funding didn't change in any simulation. The difference between their MVAR and their PIAR was only 0.0038, meaning their ratios used to make the MV/PI AR were almost identical. But, the real reason Allegheny Valley's funding never changed was because the district had no adequacy shortfall since they were already

spending over their state funding target. So under any simulation they did not qualify for the SSPI funds and only received the state's minimum increase.

Table 4.5

Changes in Aid Ratios and SSPIs

	MV AR - PI AR	Change in SSPI from 100% to 0% MV
Allegheny Valley	0.0038	0.00
Turkeyfoot Valley	-0.1992	11,132.32
Oswayo Valley	-0.1034	23,805.53
Fort Cherry	0.0980	-43,341.58
Mid Valley	-0.1187	98,629.32
Port Allegany	0.0401	-24,420.27
Littlestown	-0.0212	23,311.40
Cocalico	-0.0552	85,422.64
Yough	0.0195	-29,510.95
Greater Nanticoke	0.1108	-205,805.22
Philadelphia City	0.0252	-4,512,001.75

Dispersion measures are utilized to analyze horizontal equity (Berne & Stiefel, 1984; Williams, 1993). The dispersion measures were the range, restricted range, federal range ratio, coefficient of variance, and the McLoone index. Table 4.6 shows the five dispersion statistics for the school districts in the simulations. The table shows these statistics for the current formula, the simulation using 100% MV, and the formula using 0% MV.

There is little difference in the dispersion statistics no matter which simulation is analyzed. While some districts would gain funding while others would lose funding, the simulations do little to impact the horizontal equity of the funding formula.

Fiscal neutrality refers to the relationship between spending per student and the measure of wealth (Berne & Stiefel, 1984; Williams, 1993). The three relationship measures for fiscal neutrality were correlation coefficient, coefficient of determination, and simple slope. Table 4.7 shows the three relationship measures for the school districts in the simulations. As with the dispersion statistics, the table shows these statistics for the current formula, the simulation using 100% MV, and the formula using 0% MV.

Table 4.6

Dispersion Statistics

	Current Formula	100% MV	0% MV
Range	24,076	23,584	23,649
Restricted Range	13,431	13,486	13,480
Federal Range Ratio	1.49	1.44	1.44
Coefficient of Variance	0.191	0.176	0.178
McLoone Index	0.4410	0.4449	0.4448

Table 4.7

Relationship Measures

	Current Formula	100% MV	0% MV
Correlation Coefficient	-0.382	-0.336	-0.305
Coefficient of Determination	0.146	0.113	0.0929
Simple Slope	-476.66	-367.72	-365.62

The relationship measures also show very little change from one simulation to another. Manipulating the aid ratio did little to impact fiscal neutrality. It is interesting to note that with both the dispersion and relationship statistics, the numbers in the two extreme simulations (which would be the simulations that produce the most favorable results based on a district's wealth measure) become more identical than in comparison to the current formula. For example, in simple slope, the change in CE/student in the 100% MV and 0% MV is different by only two dollars and ten cents. But both figures are over a hundred dollars lower than simple slope in the current formula. When all things are considered, however, these changes are not significant.

The simulations analyzed how equity could be impacted. Even when using each districts' most favorable wealth measure (whichever measure gave them the most additional state funding), CE/student was impacted very minimally. With the sample districts, the largest increase per ADM was Greater Nanticoke at only $34 per student. Across all 499 districts in the simulations, the largest increase was $106 per student (Jim Thorpe School District), but even that represented less than a 1% increase (0.93%) in CE/student for the district. In total, only 17 districts had an increase in CE/student over $50 per student and only to 4 districts had an increase of over $70 per student. This is a relatively small amount when differences between district spending per ADM are measured in the thousands. In fact, for all districts, under each district's largest increase simulation, the mean was only $13 per student difference, which would represent approximately a 0.1% increase in CE/student

CHAPTER 5

CONCLUSION

Introduction

The purpose of this study was to identify measures of wealth that are feasible for state school finance systems and examine the impact of alternative definitions of wealth on distribution of state aid to school districts and on the fiscal equity in the school finance system. Pennsylvania and its 500 school districts were used to illustrate the possible measures of wealth and to test their potential application in practice.

This final chapter provides a brief summary of findings for each research question, implications of those findings on current practice of dispersing state aid to public schools, and the chapter concludes with recommendations for future research.

Summary of Research Findings

The first research question looked for alternative measures of wealth that could be utilized in state school finance systems. There are numerous taxes imposed by the state that provide information about the wealth of specific areas. Property and income were identified as the two most prominent measures used by most states in order to measure wealth. While property provides the most stable and predictable source of wealth, it is not always the best indicator of ability to pay. Income provides the best indicator of ability to pay, but can be unstable. There is also the difficulty of which income measure to use: earned income or personal income.

Other wealth measures considered were sales tax revenues and value of natural resources. Currently, there is not a system in place to utilize sales tax as a measure, and the regressive nature of the sales tax may reduce the desire to use it in a funding formula. Commercial areas could create inequities if a sales tax were used, unless there was some sort of regionalizing of the measure. This regionalizing would also have to be in place before a natural resource measure was placed as a measure.

The second and third research questions asked to identify the wealth measures used in Pennsylvania, and how they are used in the school finance system. Pennsylvania uses a composite measure of wealth that consists of property and income. Using the market values and personal income values of each school district, the state calculates an aid ratio to determine the wealth of each school district. The wealth measures are not equally balanced in their contribution; rather property is weighted at 60% while personal income is weighted less at 40% of the overall state aid ratio, MV/PI AR.

The state's MV/PI AR was a greater factor in determining the amount of state general aid prior to changes in the state school finance system made a couple of years ago. Since that time, according to the results of this research, wealth measures have much less impact on allocation of state funds to school districts. The funding system now focuses more on adequacy of funding rather than equity in allocation. It establishes a state funding target for each district to have all of its students reach proficiency and state aid is refocused on assisting districts reach that target. The gap between the state target and the district's actual spending is then analyzed to determine how much the state will supply to help close this gap, the State Share of Phase-In. District wealth plays a slight part in determining the amount of state aid supplied for the SSPI.

The fourth research question examined the use of alternative measures of wealth in the state general aid funding formula and the impact they would have on the amount of state aid that districts received. Simulations were conducted that manipulated the current MV/PI AR to vary the proportions of market value and personal income to see the effect on district funding. The simulations manipulated the current 60/40 split in market value and personal income. Starting at 100% MV and 0% PI, simulations were run at 25% intervals with the last simulation being 0% MV and 100% PI. These simulations produced little impact on the amount of state funding a district received. Districts that were not at their adequacy target received a SSPI amount in order to get them closer to the state adequacy target, and all states were guaranteed at least a 2% increase.

Research question five looked at the impact that varying wealth measures from one extreme to another had on fiscal equity. The results of these simulations were unexpected, yet provided great insight to how little impact wealth measures now have on changing Pennsylvania's state funding to districts. Some districts would receive greater funding with market value emphasized, while others benefited from greater reliance of personal income in the composite definition of wealth used in the funding formula. However, the greatest change in state aid across the range of wealth measure modifications was only $106 per ADM and most districts had changes in their state aid of less than $13 per ADM. The determination of which wealth measure had the greater impact on a district was the measure in which the formula calculated them as being poorer, which qualified them for greater state aid. For example, if a district had a higher aid ratio in personal income (meaning they were seen as being richer in property than in personal income), then the simulation that was weighted most heavily on personal

income provided the greatest amount of state aid. Ultimately, state aid relied on how close districts were to their adequacy target, not wealth.

There were districts that did not have a change in state aid in any simulation. One way for this to happen is that the districts' PI AR and MV AR had to be identical or very close to equal. However, due to the change in the state's funding system, the ultimate reason that some districts aid did not change (they were $0 in every simulation) was because those districts were already at the state's funding target and qualified for no state aid beyond the minimum guarantee.

The equity statistics that were utilized really brought the insignificance of the wealth measures to light. Even when using the most favorable simulation for each individual district, the mean change in funding for districts was only $13 per student. The lowest district in current expenditures per student started at over $8,000 per student, and the median is well over $10,000 per student, so $13 per student represents little more than a tenth of one percent to the median district.

Implications on Current Practice

What the equity measures illustrate is that the concept of equity based on equal spending is outdated in PA. The objective of the current system of funding in Pennsylvania is to achieve adequacy. The adequacy target established for each district has identified a figure that the state determines to be the amount it takes for districts to achieve similar results. The system does not focus on equalizing spending as much as it is focusing on equalizing outcomes.

Wealth measures used in the MVPI AR now have little impact on funding. The findings of this study indicate that even when relying on the wealth measure that produces the most favorable funding outcome for each district, the change in funding in those simulations were minimal.

Whether the impact of wealth measures being diminished is a positive outcome or not is debatable, but the impacts of initial wealth measures still play a part in the current funding measures. When the state changed the funding formula, the initial base was still impacted by previous years' funding practices of heavier reliance on the MVPI AR. The political move on the part of the legislature was to ensure an increase regardless of the formula of adequacy, which may impact equity more than the current funding formula that diminishes the impact of wealth. Though there has been a shift towards adequacy, how does the state overcome the years of previous funding that has helped provide significant differences in CE/student?

The winners (those that seem to gain the most funding) are those districts that are farthest from the adequacy target. While the state has made sure that numerous measures play a part in the total allocation a district receives (so not to rely on one part of the formula too heavily), the formula still focuses heavily on the adequacy issue. The state will provide a portion of the adequacy shortfall, so the farther districts are from the target, the more they may stand to gain. However, if a district is far from their adequacy target, there will be a higher portion to be made up by the district in order to reach that target as well. In this case, the district benefits from by gaining funding from the state, but also must deal with the issue of still being well below their adequacy target.

Recommendations for Future Research

This study focused on the current funding practices under a formula implemented in the past couple of years. As mentioned earlier, the base numbers for the start of this formula were impacted by a different system that was in place for numerous years prior. The impact that measures of wealth had on the funding received by districts may have been much greater under the previous formula. Equity in that funding may have been impacted to a greater extent as well. By researching the impact of those previous years, equity of the base figures used in funding schools under the current formula could be brought to light.

Another area of interest would be the impact the guaranteed increase has on fiscal equity. While this was undoubtedly a political move that provided some funding for every districts, why are districts guaranteed an increase if they are already at the adequacy target? The 2% guarantee in the current funding formula seems to contradict the concept of having an adequacy target.

There is also still much to consider in the aspect of assessed values for property. Though this research shows little impact in the current funding formula, the impact at the local levels could be much greater. Local school boards still raise funds primarily through property tax, and assessment practices from one jurisdiction to another still varies greatly. Current court decisions mentioned earlier in this study indicate that assessment practices may end up being required to be done more frequently, but the cost may be high and implementation may take time. This will not likely solve the differences in assessment practices by the assessors themselves either (or improve the lacking ability of some of the assessors).

If the goal of the legislature was to focus on outcomes with a new funding formula regardless of wealth, then they have taken a step in that direction. But politics is still evident in the current formula under the disguise of a minimum increase guarantee. Also, does wealth play too little of a part in the current formula? Do districts that are considered poor get the funding needed to meet their adequacy targets completely while districts that are at their adequacy targets get guaranteed increases? If not, then is the current formula robbing the poor to pay the rich?

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