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**Toward a Contextual Analysis of
School Finance Adequacy Litigation in the U.S.**

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**Toward a Contextual Analysis of
School Finance Adequacy Litigation in the U.S.**

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Dedication

As always, this is for *all* of the children.

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Toward a Contextual Analysis of School Finance Adequacy Litigation in the U.S.

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While early school finance reform efforts focused on the question of equity in school funding, current reformers are concerned with the question of adequacy. Driven by the accountability movement in education policy, the adequacy movement emphasizes the linkage between student performance and school funding. Like the equity movement, the adequacy movement has resulted in numerous legal challenges and decisions by state courts regarding the constitutionality of their states' school finance systems. This study follows the ground-breaking work of other researchers including Karen DeMoss (2001, 2004), Paula Lundberg (2000), and Karen Swenson (2000), who take a contextual approach to analyzing court decisions related to school finance litigation using logistical regression and statistical cluster analysis. The present study employs event history analysis to examine policy adoptions across time in order to identify the conditions and factors that influence the diffusion of adequacy-based school finance policy.

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CHAPTER ONE: INTRODUCTION

While most school finance scholars focus on the features of state funding systems and mechanisms for the distribution of education funds, few examine how those policies are developed. Likewise, there is a similar lack of attention to school finance policy development by political scientists, even though the proportion of states' budgets that is consumed by funding public education makes school finance a significant policy issue in every state. The present research aims to bridge this gap between the school finance and political science literatures by investigating the factors that influence policy development, focusing on the context of state policy development and the spread, or diffusion, of adequacy-based school finance policy across the states. By identifying the conditions and factors that are influential to the diffusion of adequacy-based school finance policy, this effort aims to inform both disciplines on the topic of school finance policy development.

Background of the Problem

State spending on public education typically consumes one-third to one-half of state budgets nationwide, creating significant financial pressure on state revenue systems. Because of the relatively large proportion of state-level resources dedicated to funding public education, school finance is a high profile issue for most policymakers. The financing of public education is a complex and expensive endeavor that requires policymakers to reconcile many social, economic, and political demands when it comes to making decisions about school finance policy. Though the development of school finance policy is widely perceived as a duty of the legislature, the courts have played a prominent role in this policy area, beginning with the U.S. Supreme Court ruling in *Plessy v. Ferguson* (1896) that separate but equal educational facilities were required for

Black students. In 1973, a pivotal ruling by the U.S. Supreme Court in *Rodriguez v. San Antonio Independent School District* directed school finance litigation to state courts. Since that time, state courts have played an important role in shaping the development of school finance policy. While earlier litigation was more likely to focus on claims related to the equity of school funding, policy debate about school finance has shifted in recent years to concerns about adequacy.

The shift from equity to adequacy has also been closely linked to growing interest in accountability and assessment as a driver of education reform. An understanding of the relationship between adequacy and accountability sets the stage for policy discussions on school finance adequacy litigation. The following discussion attempts to illustrate that relationship by describing the linkage between concepts related to school finance adequacy and those related to the accountability movement, followed by a discussion of the role that courts play in school finance policy development.

LINKING ADEQUACY TO ACCOUNTABILITY IN THE CONTEXT OF EDUCATIONAL REFORM

Reform of public education has been a recurrent theme in education policy throughout American history (Spring, 2001; Tyack & Cuban, 1995). In 1983, the publication of *A Nation at Risk* by a task force of the Reagan administration alleged that America's difficulties with economic competition in the global market with countries like Japan and West Germany were the result of a failed system of public schools. Low rates of American productivity were blamed on the allegedly poor quality of America's public schools (Spring, 2001). Concerns with low productivity and poor quality sparked an interest in measuring the performance of schools as a means of holding them accountable to taxpayers and parents for student performance. Since 1989, 49 of 50 states have adopted statewide learning standards (ACCESS, 2004a). These standards are frequently

used to develop accountability systems based on student performance on standardized tests. While some states moved aggressively to implement assessment and accountability programs, adoption and implementation of such programs was fairly uneven until the passage of federal legislation in early 2001.

Almost twenty years after *A Nation at Risk* made its mark on American education policy, the accountability movement received another boost from the federal government with the passage of the *No Child Left Behind Act* [NCLB] of 2001, which launched high-stakes accountability programs to the forefront of education policy. Although the development of accountability systems had been spreading among states, the pace of these initiatives was rapidly accelerated by the passage of NCLB. The NCLB requires that all states implement assessment programs and develop standards for accountability based on those assessments. The legislation establishes performance requirements linked to states' assessment and accountability standards, including a controversial measure referred to as *adequate yearly progress* (AYP). Schools that fail to meet AYP standards must provide their students with intensive remedial interventions and offer students the option to transfer to another school (NCLB, 2001). While its implementation has been controversial, there are no indications that the legislation will be dismantled or that its requirements will be significantly modified. However, the need to meet these standards is becoming a common issue brought up by plaintiffs who are challenging the adequacy of state funding systems.

ROLE OF THE COURTS

Court challenges related to school finance adequacy have paralleled the development of the accountability movement in education policy with its intense focus on student performance. Since 1989, all major school finance litigation has raised concerns related to the adequacy of funding, including litigation that raised concerns with equity as

well. The development of accountability systems has begun to influence school finance policy development as a growing number of states are conducting studies that attempt to link spending with student performance in ways that were not possible prior to the widespread implementation of assessment and accountability systems (ACCESS, 2004b). Previously, courts were reluctant to consider issues of adequacy based on the lack of “justiciable” standards, i.e., legal parameters, for defining an “adequate” education that could be used to ascertain the success or failure of the school finance system in meeting this goal (W. F. Dietz, 1996; Obhof, 2004). Recent legal challenges have successfully used adequacy studies to demonstrate the inability of states’ school finance systems to meet ever-growing demands to educate students to increasingly higher standards of performance set by state and federal accountability systems (Minorini & Sugarman, 1999; Odden & Clune, 1998; Rebell, 2001). These adequacy studies and the related court cases will be described in more detail in Chapter Two.

A review of these cases indicates that not all adequacy claims have led courts to overturn state school finance systems, and adequacy studies in some states have not yet led to litigation. Likewise, legal scholars reviewing school finance litigation have noted that courts do not always reach similar conclusions when faced with similar sets of facts (Lundberg, 2000; Swenson, 2000). The present study traces the evolution of the adequacy movement as it has spread across the states looking for trends that can help explain the differences in the political, social, economic, and educational contexts between states when it comes to state court decisions on school finance adequacy.

Statement of the Problem

Because the educational system in the United States, including its financing, is a state rather than federal responsibility, each state’s school finance system uniquely

reflects the context of its policy development. This variability poses challenges for political scientists and policy analysts who engage in comparative studies of state policies, particularly when faced with the difficulty of finding data that allow for comparisons between states' policies. Most comparative studies of school finance policy face similar challenges related to availability of comparable measures of both inputs, in terms of educational resources, and outputs, in terms of student performance. As a result, traditional analyses of school finance policy typically involve either national studies of school finance policy that provide little explanatory power due to the lack of appropriate data or case studies that are difficult to generalize.

The present study aims to gain a better understanding of the conditions under which a state's lower court is asked to make a decision about issues related to school finance adequacy. In recognition of the limitations imposed by traditional school finance studies, this study takes a new approach to researching questions about the development of school finance policy. The approach taken by the present study was inspired by the work of Karen DeMoss (2001, 2004). DeMoss's approach recognizes the influence of national and regional trends as well as the unique political, social, economic, and educational circumstances that appear to shape public policy within each state.

In her study, DeMoss (2001, 2004) examines court decisions related to school finance equity by first employing a statistical analysis of political, socioeconomic, demographic and educational factors to identify five clusters of states with similar characteristics. Next, DeMoss examines the court decisions related to school finance equity that occurred among the clusters of states to determine which factors were influential in creating differences among court decisions within a cluster. This type of analysis recognizes that context is influential in policy development and attempts to capture the complexity of school finance policymaking. The approach recognizes that a

constellation of factors is more likely to influence policy outcomes than a single characteristic of a state's population, its economic circumstances, its political persuasions, or the students it serves in the public education system.

The present study follows the contextual orientation of DeMoss by developing a model of school finance policy development that integrates consideration of several socioeconomic, political, and education-related factors. This study differs from DeMoss by employing a time-series analytical approach that focuses on the diffusion of adequacy-related school finance policy development across the U.S. Similarly, both studies focus on state court decisions, though the present study is concerned with decisions related to school finance adequacy, while DeMoss was concerned with questions related to school finance equity. The cross-sectional clustering technique used by DeMoss recognized the importance of contextual factors and how they influence school finance policy, but was based on a snapshot of the contextual factors at a single point in time. Given the evolving nature of school finance policy, a time-series approach that recognizes changes in contextual factors occurring over time might provide a more realistic model of policy development, better explaining how such policies develop and diffuse across states.

Purpose of the Study

This study aims to gain a better understanding of how adequacy-based school finance litigation has developed and diffused across the U.S. by identifying the factors and conditions that prompt state lower court decisions related to questions of adequacy and a state's school finance system. By understanding the course and direction of policy development within its context, scholars and policymakers can better understand the critical factors that influence policy adoption related to school finance adequacy. Such an improved understanding can guide policymakers who are interested in achieving school

finance policies based on adequacy. Likewise, a contextual approach can provide school finance scholars with a framework for interpreting the adoption of adequacy-based school finance policies across states, and political scientists with an opportunity to examine the dynamics of policy innovation related to this major policy issue.

The history of school finance policy demonstrates that while legislators author statutory language, courts play a major role in the development of school finance policy due to the power they have to affirm or reject the state school finance systems designed by state legislators. Though school finance policy is shaped by the unique circumstances and conditions of policy development in each state, trends in school finance policy development can be traced to trends in state court rulings on similar cases. Because of the prominent role played by state courts in school finance policy development, it is important to understand the context within which courts are asked to make decisions about school finance adequacy.

The present research targets lower court decisions on school finance policy related to questions of adequacy in an effort to identify contextual similarities and differences among states where lower courts have issued rulings on school finance cases that have adequacy claims. The primary goal is to identify the circumstances under which the citizens of a state decide to bring forward a school finance adequacy claim in the state's judicial system. For the purposes of this study, the state lower court ruling represents a formal acknowledgement that the state is engaged in significant policy discussions on school finance adequacy.

Research Question

The research is aimed at identifying those factors that appear to be most influential in determining whether a state lower court has issued a decision on school

finance adequacy, reflecting citizens' behavior regarding the pursuit of a legal decision on this policy matter. The primary research question in this study investigates whether or not there are similarities among states where citizens have brought forward adequacy-based school finance claims in the state's lower courts. The particular event of interest is the occurrence of a lower court ruling on an adequacy-based school finance lawsuit. The study is designed to explore the conditions in a state when this decision occurs in order to identify trends and influential factors.

Research Question: What are the critical factors that influence citizens to bring forward adequacy-based school finance claims resulting in decisions by state lower courts?

Definitions

In order to discuss the issue of school finance adequacy and its policy development, a few conceptual definitions are needed. This section will provide operational definitions for key concepts described in the paper. An expanded discussion of each concept is included in the literature review that follows in Chapter Two.

EQUITY

When used in the context of school finance litigation, the term equity typically refers to the distribution of funds available for public education. Its focus on resource inputs is related to concepts of distributional fairness and equal opportunity (Berne & Stiefel, 1999; Guthrie & Rothstein, 2001). Early school finance reformers focused on claims related to inequities in state school finance systems and sought remedies to reduce disparities in funding that resulted from a heavy reliance on local property taxes to fund public education across the U.S., except in Hawaii and the District of Columbia (Minorini & Sugarman, 1999). The concept of equity in school finance accommodates two

complementary ideas that are currently reflected in most states' school finance systems – horizontal equity and vertical equity. Horizontal equity encompasses a notion commonly referred to as “one dollar – one scholar,” which rose from theories of equal protection and specifies that equally situated children should be treated equally (Berne & Stiefel, 1999; Minorini & Sugarman, 1999). Vertical equity is based on the notion that differently situated children should be treated differently (Berne & Stiefel, 1999). Put another way, not all students have equal needs, yet each has the equal right to have their needs met (Minorini & Sugarman, 1999). As a result, unequal spending is sometimes necessary to achieve equity in meeting the needs of all children (Berne & Stiefel, 1999; Minorini & Sugarman, 1999). Understanding the concept of equity is important to understanding the current focus on school finance adequacy and how these two concepts differ in terms of their operationalization in school finance policy.

ADEQUACY

In the context of school finance litigation, adequacy refers to a level of funding that is needed to support a specified level of student performance (Guthrie & Rothstein, 1999). Such a view shifts the focus of school finance reform efforts from inputs to the school system, in terms of dollars, to the outputs of school systems, in terms of student academic performance. Berne and Stiefel (1999) propose that adequacy can be defined in a number of ways. One definition is based on “a level of resources that is sufficient to meet defined . . . output standards” (p. 22). Another definition they offer refers to the kinds of outputs that must be achieved and how they will be measured (Berne & Stiefel, 1999). Adequacy in school finance is based on the idea of sufficiency, anchored by the parallel assumptions that a certain level of per-pupil expenditures is necessary to achieve a specific level of student performance and that expenditures at this level are sufficient to produce a specific level of student performance (Guthrie & Rothstein, 1999; Heise, 1995;

Verstegen & Whitney, 1997). This concept of adequacy is strongly linked to the accountability movement and its emphasis on student performance.

POLICY DIFFUSION

Diffusion refers to the process by which innovations spread. Diffusion research has been carried out in a number of disciplines, including anthropology, rural sociology, medicine, and education (Gray, 1973). This concept has been operationalized by political scientists interested in the spread of policy ideas across geographic and political boundaries. Most contemporary studies frame policy diffusion in terms of two primary explanations: 1) internal determinants, i.e., political, economic, and social factors that lead state governments to innovate (Walker, 1969); and 2) regional influences, i.e., the influence of neighboring states on responses to policy problems (Berry & Berry, 1990; 1992). In this study, both possible explanations are explored by including independent variables that were selected to represent the internal determinants and a regional indicator to examine the influence of neighboring states.

Significance of the study

Few studies in the political science literature examine school finance policy development. There is a similar paucity of attention to the politics of policy development in the school finance literature. The present research aims to bridge this gap between the school finance and political science literatures by investigating the diffusion of state policies related to school finance adequacy. By identifying the conditions and factors that are influential to the diffusion of adequacy-based school finance policy, this effort aims to inform both disciplines on the topic of school finance policy development.

The various histories of school finance policy development across the states indicate that litigation plays an important role in the evolution of school finance policy

because of the significant influence of state court decisions. These histories also indicate that school finance policy development involves a complex decision-making process that is influenced by its context. In order to understand and analyze the development of school finance policy, a theoretical approach that recognizes the importance of context is needed. Inspired by previous scholarly work in relatively new theoretical territory that explicitly ties school finance policy development to its context, the present study provides an opportunity to test the theoretical ground charted by DeMoss (2001, 2004) and by others who are concerned with the context of school finance policy development (Lundberg, 2000; Swenson, 2000). While traditional school finance analyses involve econometric studies seeking optimal funding formula parameters or case studies of legal opinions, this study, and those it follows, focuses on linkages between context and school finance policymaking. Unlike those it follows, this study charts new methodological territory in its use of event history analysis to identify influential variables in school finance policy development.

By incorporating knowledge of the school finance literature with the theoretical framework of the political science literature, this contextual approach recognizes that the development of school finance policy reflects a convergence of many factors, including the policy actors and the context within which policy debates take place. A contextual approach can lead to a better understanding of the significant factors and trends related to school finance policy development and provide a framework for understanding related decision making processes. The insight provided by a contextual approach can help bridge the gap between the deep knowledge available from case study research and the keen interest of scholars in understanding national trends in school finance policy (DeMoss, 2001, 2004). The present study aims to contribute to recent scholarly efforts to bridge this gap in policy analysis.

Limitations

History indicates that school finance policy is shaped by a volley of litigation and legislation that occurs primarily at the state level of government. While courts and legislatures both play a vital role in the development and evolution of school finance policy, the present study focuses more on the behavior of courts in response to citizen demands for action. An investigation of legislative behavior in the policy arena of school finance adequacy, and its interaction with court decisions, constitutes an important direction for future research.

The availability of comparable data for each of the 50 states across the 17-year time period significantly limited the dimensions that could be measured in this analysis. This requirement resulted in two significant implications related to the limited sources of data available. The first significant implication is that some of the measures provided less than ideal representations of the contextual dimensions that they were intended to capture. For example, one of the indicators intended to represent educational context in a state is the percentage of residents who indicate that they have at least a high school diploma. Ideally, this measure would reflect the performance of the state's educational system. While this measure may fairly reflect the educational attainment of a state's residents, it is less than ideal for reflecting how well or poorly that state's educational system is performing.

The second significant implication of the limitations posed by study design involves the dimensions that were not measured or included because they were not available for the length of the study period or the available measures lacked variability over the 17-year time period. For example, the model lacks a variable that recognizes the existence of key policy actors or the level of advocacy for an adequacy lawsuit within a

state due to the lack of comparable data for every state for each year of the study period. This lack of attention to key policy actors ignores a significant factor in policy development.

The model also lacks a variable that reflects the political sensitivity of the state's judiciary. An indicator of this sensitivity would reflect whether the state's lower court judiciary are appointed or elected officials. This indicator was originally omitted from the model development due to the static nature of the indicator, i.e., state policies regarding the selection of the judiciary rarely change. Following the preliminary data analyses, an attempt was made to collect judicial selection data for lower courts. While other researchers have used indicators of judicial selection, these efforts have focused on the decisions of state supreme courts. The effort to collect information on state lower courts revealed that there are significant differences in the structure of the judiciary from one state to the next. For example, some states have separate courts for hearing tax cases and other civil matters, and the selection of the judiciary depends upon the type of court. In such a state, it would be necessary to determine which court would hear an adequacy case in those states where an adequacy case has not been heard. Thus the collection of such data would itself involve a significant research effort beyond the scope of the present study.

Organization of the Study

This discussion began by providing background for the issue of school finance adequacy litigation, placing the issue within the greater context of school finance policy development. Chapter One stated the problem, defined the purpose of the present study and described the research question to be explored as well as the limitations imposed by the study design. Chapter Two provides a review of case law and literature related to

school finance adequacy followed by a review of the political science literature related to policy diffusion and its role in state policy development. Following this review, Chapter Three describes the methodological approach using event history analysis as well as the design of the research study. The data analyses, findings and interpretations are reported in Chapter Four. Chapter Five discusses the implications of the findings in terms of the research question, including not only the results of the analyses, but also the implications for the study design and the future of school finance policy development.

CHAPTER TWO: REVIEW OF THE LITERATURE

The development of school finance policy across the U.S. has been shaped over the past three decades by “waves” of litigation involving court rulings followed by corresponding legislative responses to those rulings. While these waves have not spread across states at a uniform pace, the trends clearly indicate that state policymakers take cues from litigation outcomes of their states and others, even in states where no litigation has taken place (Salmon & Alexander, 1990). Each wave of litigation coincides with a different philosophical focus on the part of school finance reformers in their efforts to advocate for increased funding for public education. While the first wave of litigation focused on equal rights protections, the second wave focused on the equity of funding. The third and current wave is focused on the adequacy of funding.

This review of the literature provides an historical overview that traces the history and context of school finance development, leading up to the convergence of the accountability movement with current concerns about school finance adequacy. The discussion begins with a description of the three waves of school finance litigation, focusing on the current wave that is concerned with the adequacy of school funding. Following this description is a discussion of the four approaches commonly used by school finance scholars to determine the cost of an adequate education. After reviewing the adequacy literature, a review of the literature on policy diffusion describes the political science theory that informs the research design of this study on school finance policy development.

History and Context: Three “Waves” in School Finance Litigation

Scholars in the field widely agree that three “waves” of litigation have shaped school finance policy development in the U.S. over the past three decades (Heise, 1995; Verstegen & Whitney, 1997). Each of these waves is defined by its focus on different aspects of this complex issue. All but five states have experienced some type of school finance litigation with the outcomes almost evenly divided between plaintiffs who win and plaintiffs who lose (Hunter, 2004c, 2006). Nonetheless, most states have modified their school finance systems at some time over the past three decades in an effort to make funding more equitable and less reliant on local property taxes (Verstegen & Whitney, 1997). The first wave of school finance litigation is typically associated with claims of constitutional violations related to the equal protection clause of the Fourteenth Amendment of the U.S. Constitution. The second wave of school finance litigation involved claims based on equal protection or education clauses of state constitutions in which plaintiffs primarily sought funding equity. The third and current wave of school finance litigation involves state-level claims in which plaintiffs have turned their attention to questions of whether available funding is adequate. While these waves overlap, and there are some exceptions to this general chronological pattern of school finance litigation, these waves fairly summarize school policy development in recent decades. The following discussion describes each wave of litigation and some of the notable cases typically associated with each wave in the school finance literature.

FIRST WAVE: FEDERAL CONSTITUTIONAL CHALLENGES – IN SEARCH OF EQUAL PROTECTION

The first wave of school finance litigation was concerned with equal protection issues triggered by the civil rights movement and focused its claims on the equal protection clause of the U.S. Constitution (Verstegen & Whitney, 1997). This wave of

equal protection claims included a California case, *Serrano v. Priest* (1971) and a Texas case, *Demetrio Rodriguez v. San Antonio Independent School District [Rodriguez]*, (1973). The federal equal protection wave of court challenges culminated in a landmark decision by the U.S. Supreme Court in *Rodriguez* (1973).

The filing of the precedent-setting *Rodriguez* case in 1968 was prompted by activities related to the civil rights movement (Farr & Trachtenberg, 1999; Ripa, 1997). Parents sued the local school district claiming the rights of their children to equal protection had been violated by the unequal distribution of resources in the Texas school finance system. Plaintiffs complained that their unequal access to education was a result of discrimination, which constituted a violation of the equal protection clause of the Fourteenth Amendment of the U.S. Constitution.

While a federal district court agreed with the plaintiffs and declared the Texas system of school finance unconstitutional, the U.S. Supreme Court later overturned this ruling. In reaching its decision, the U.S. Supreme Court first determined that the case did not call for “strict judicial scrutiny,” a standard that would have placed the burden of proof on the defendants. The standard of strict judicial scrutiny applies only to cases in which plaintiffs demonstrate that they were part of an identifiable class that has suffered harm or that a state action has impinged on a constitutional right or liberty (*Rodriguez*, 1973). The court did not find the plaintiffs in *Rodriguez* to be an identifiable class. More importantly for the course of school finance policy development, they also disagreed with the plaintiffs’ claims that education was a fundamental right guaranteed by the U.S. Constitution.

Using the less stringent “rational relationship” test, the U.S. Supreme Court upheld the Texas system of school finance in a 5-4 ruling because it bore a rational relationship to the legitimate state purpose of financing education (*Rodriguez*, 1973). The

court ruled that the recognized disparities in educational quality did not cause the system to be unconstitutional because the system “assured a basic education for every child in the state . . . [and] bore a rational relationship to legitimate state purpose” (*Rodriguez*, 1973, p. 1280). The 5-4 split among the justices and the scathing dissents issued by Justices Brennan, White, Douglas, and Marshall indicate that there was strong support for an equal protection claim among the dissenters. The *Rodriguez* ruling pointed to state courts as the proper venue for constitutional challenges related to school finance, effectively ending school finance litigation aimed at the federal level and turning the attention of school finance reformers to the state supreme courts (Minorini & Sugarman, 1999; Sparkman, 1990; Versteegen & Whitney, 1997).

Though the *Rodriguez* plaintiffs were ultimately unsuccessful in having the state’s system of school finance thrown out by the court, the Texas legislature responded to the claims and demands raised by the litigation by making adjustments to existing funding formulas during the late 1970s and the early 1980s (B. D. Walker & Casey, 1996). Meanwhile, state level challenges to constitutions were emerging across the country, creating the second wave of school finance litigation.

SECOND WAVE: STATE CONSTITUTIONAL CHALLENGES – IN SEARCH OF EQUITY

Beginning in the 1970s and through the 1980s, interest groups and school districts sought remedies in state courts for the inequitable school funding that resulted from heavy reliance on local property taxes. Court challenges arising during this wave were focused on equity and reducing the disparities in per pupil funding, but they shifted their focus to states’ constitutional provisions (Heise, 1995; Versteegen & Whitney, 1997). This shift inadvertently provided plaintiffs more favorable constitutional language because state constitutions contain clauses that require states to provide education and some state constitutions also include equal protection provisions (Heise, 1995). Second wave claims

pled for equity in funding based on either the education clauses or the equal protection clauses found in states' constitutions, or both (Heise, 1995; Verstegen, 1998). Such school finance litigation brought about mixed results, due in some part to the differences in language between state constitutions and in larger part to the differences in the courts' interpretations of state constitutions' education clauses (Heise, 1995).

An early and influential case in the second wave of school finance litigation was *Serrano vs. Priest*, beginning with its first ruling in 1971 (Heise, 1995; Verstegen & Whitney, 1997). Plaintiffs in this case claimed both that education was a fundamental right under the California Constitution, an education clause claim, and that substantial disparities existed among school districts in the amount of revenue available for education resulting in discrimination against poor children and poor school districts, an equal protection clause claim (Heise, 1995; Verstegen & Whitney, 1997). The California Supreme Court rejected the education clause claim, referring to language in the state's constitution that directed the legislature to provide for a system of common schools. This treatment of the education clause shows up again in later cases (Sparkman, 1990). Conversely, the court upheld the equal protection claim by extending the right to protection against unequal treatment to school districts as well as individuals (Sparkman, 1990). The *Serrano* decision also introduced two important concepts that have significantly influenced school finance policy development. The first concept is known as horizontal equity, which provides that equals should be treated equally (Verstegen & Whitney, 1997). In other words, School District A should have the same amount of money to spend per student as School District B. The other concept introduced by *Serrano* is vertical equity, which recognizes that in some cases, unequal treatment is also necessary to achieve equity (Verstegen & Whitney, 1997). In this case, a child with who has learning disabilities that attends School District A might require more dollars to

achieve the same level of performance as a student who does not have learning disabilities. These concepts have become enduring tenets that continue to influence the development and analysis of school finance policy.

Salmon and Alexander (1990) assessed the influence of the *Serrano* decision on school funding in California. Prior to the *Serrano* decision, the state of California provided 37% of the total state and local revenues for public education (Salmon & Alexander, 1990). After the *Serrano* decision, the school finance system underwent major reform resulting in a 74% to 26% state local split (Salmon & Alexander, 1990). While the state of California contributed a larger percentage of the total cost of education, the overall impact of this reform was to reduce inflation-adjusted education spending per student over time (Sparkman, 1990). Though some analyses indicate that real spending on education typically increases in the years following school finance reform prompted by litigation, the circumstances in California have led to decreased spending on education since the time of the *Serrano* decision (Murray, Evans, & Schwab, 1998).

Another important case, *Robinson v. Cahill*, was decided by the New Jersey Supreme Court in 1973, just thirteen days after the *Rodriguez* decision was handed down by the U.S. Supreme Court (Heise, 1995; Versteegen & Whitney, 1997). In *Robinson*, the New Jersey Supreme Court dismissed both the state and federal equal protection claims and looked instead to the state's education clause (Heise, 1995). The court held that unequal funding among districts violated the state's constitutional requirement to provide for a "thorough and efficient" education (Heise, 1995; Versteegen & Whitney, 1997). This ruling prompted reformers in a number of other states to pursue similar charges that their state's school finance system violated the education clause of the state's constitution (Versteegen & Whitney, 1997).

The *Robinson* ruling also prompted the New Jersey legislature to commence what has become on-going school finance reform, spurred in part by subsequent litigation. Prior to the *Robinson* decision, the state provided 21% of the total state and local revenues for public education. Fifteen years after the *Robinson* decision, the state provided about 45% of total public education revenue (Salmon & Alexander, 1990). About half of all state funding for public education was distributed through power equalizing formulas, which attempt to equalize the tax revenue available to school districts with disparate property tax bases, with the other half being distributed through categorical flat and matching grants (Salmon & Alexander, 1990). The New Jersey legislature also provided state assistance for school facilities (Salmon & Alexander, 1990).

In Texas, school finance reformers pursued a series of court rulings that started at a district court in 1984 as *Edgewood Independent School District v. Bynum* [*Edgewood I*] and culminated in a 1995 ruling by the Texas Supreme Court. The case was filed by a property-poor school district in the San Antonio area against the then-current commissioner of education claiming that the state had failed to provide equitable access to education. After numerous court rulings finding the school finance system unconstitutional and subsequent attempts of the legislature to remedy the situation, a 1995 ruling of the Texas Supreme Court upheld the current system of school finance (*Edgewood v. Kirby* [*Edgewood IV*], 1995). While the ruling indicated that the Texas school finance system, at that time, provided schools with sufficient funds to achieve accreditation, the decision also pointed to weaknesses in the design related to a lack of facilities funding and a heavy reliance on local property taxes (*Edgewood IV*, 1995). The court also expressed concern that the need for local districts to levy property taxes might become so uniform as to constitute a statewide property tax, which is prohibited by the

Texas Constitution. The court predicted that these issues were likely to create problems in the future (*Edgewood IV*, 1995). In response to the court's criticisms about facilities funding, legislators added major facilities components to the foundation school program in 1997 and 1999. While legislative action on facilities funding may have forestalled legal challenges for several years, the heavy reliance on property tax and questions related to the adequacy of the school finance system landed the Texas system back in court in 2001. The recent litigation in Texas will be discussed in the following section describing the third wave of school finance litigation.

Overall, second wave litigation efforts brought about mixed results (Heise, 1995; Verstegen & Whitney, 1997). While plaintiffs prevailed in many states, the Oregon case pointed to inherent problems with the arguments advanced by school finance reformers in second wave litigation (Heise, 1995). In *Olson v. State* (1976), the Oregon Supreme Court looked at evidence of funding disparities in school districts across the state of Oregon caused by heavy reliance on local property taxes and assessed its relationship to the state's constitutional requirement to provide a "uniform and general" system of schools (Heise, 1995). In its opinion, the court pointed out that the plaintiffs sought uniformity only with regard to per pupil spending and not other areas of education, such as facilities, programs, and curricula. The court linked this tolerance for difference to the lack of uniformity in school funding and found that both were permissible because they were rationally related to the state's interest in preserving local control (Heise, 1995). The *Olson* decision pointed out the inherent difficulty in asserting the need for uniformity in one aspect of the educational enterprise while not seeking uniformity in other aspects (Heise, 1995). Such legal conundrums led school finance reformers to seek alternative strategies, resulting in the third wave of school finance litigation focused on the adequacy of school funding (Heise, 1995).

THIRD WAVE: STATE CONSTITUTIONAL CHALLENGES – IN SEARCH OF ADEQUACY

The concept of adequacy goes beyond the notion of equity when it comes to systems of funding public education. Adequacy in school finance is based on the idea of sufficiency, anchored by the parallel assumptions that 1) a certain level of per-pupil expenditures is necessary to achieve a specific level of student performance; and 2) expenditures at this level will produce a specific level of student performance (Guthrie & Rothstein, 1999; Heise, 1995; Verstegen & Whitney, 1997). Such a view shifts the focus of school finance reform efforts from the inputs to school systems, in terms of dollars, to the cost of outputs of school systems, in terms of student academic performance (Guthrie & Rothstein, 1999; Heise, 1995; Verstegen & Whitney, 1997). This concept of adequacy is strongly linked to the accountability movement and its emphasis on student performance. The third, and current, wave of school finance litigation with its focus on adequacy aims to establish the linkage between school funding and student performance.

While many scholars consider the *Pauley v. Kelly* decision in 1979 as the first court decision that addressed questions of adequacy, the 1977 lower court ruling in *Seattle School District No. 1 v. State*, later upheld by the state supreme court in 1978, is frequently overlooked for its pioneering role in considering the question of adequacy in defining the state's role in providing for public education. This case hinged on constitutional requirements to “make ample provision for the education of all children” and to provide a “general and uniform system of public schools.” Plaintiffs successfully linked these provisions to the definition of a basic education, arguing that they were being unconstitutionally required to conduct special excess levy elections in order to fund the requirements of a basic education.

In the absence of an established standard or definition for “basic education,” the trial court employed three standards: 1) a definition supplied by the State Board of

Education and Superintendent of Public Instruction (Board/SPI) in May 1976; 2) existing accreditation standards set by the State Board of Education; and 3) a “collective wisdom” approach (*Seattle School District v. State*, 1977). The Board/SPI approach was based on the present requirements found in state statutes and regulations. The court “costed out” the funds necessary to meet this definition considering teacher qualifications, salaries, instructional requirements, hours of instruction, and other substantive requirements and found that the funding provided by the state fell significantly short of those requirements in the 1975-76 school year. The second approach involved the application of existing accreditation standards for grades 7–12 as if they applied to grades K-12. The court again found the state funding deficient in covering the costs of accreditation. Finally, the collective wisdom approach involved convening local educators, school boards, and parents to identify needed educational resources. Their assessments were based largely on the ratio of certified staff to students and non-salary maintenance and operations costs. The trial court again found existing state resources to fall short of funding the identified needs. The supreme court upheld each of these findings in its ruling the subsequent year, agreeing with both the approach to defining a “basic education” and to the outcomes of each assessment (*Seattle v. State*, 1978).

The legislature responded to the trial court ruling with the Basic Education Act of 1977, which defined full funding of basic education based on pupil-staff ratios. A subsequent court decision in 1983 led to legislation to provide full state funding for bilingual, remedial, and special education programs (Plecki, 2001). The state has not faced a significant school finance challenge in more than 20 years, though momentum is building to challenge the levels of funding currently provided (Mertens & Freund, 2005).

Widely recognized as one of the earliest cases that addressed questions of adequacy is a West Virginia case, *Pauley v. Kelly* decided by the State’s Supreme Court

in 1979 (Guthrie & Rothstein, 1999; Schrag, 2001). In this case, the court ordered the legislature to design a school system that would develop specific competencies in each child as outlined in Figure 2.1 below. In 1983, the court approved the Master Plan for Education developed by the state legislature and state education agency, which included provisions for standards and curricula, improved facilities and a revised school finance plan (Minorini & Sugarman, 1999).

Revisions to the school finance system included a time line and procedure for equalizing teacher salaries, plans to conduct an analysis of the costs to implement each of the new standards, and adoption of features aimed at reducing the disparities in available revenue based on disparities in local property tax bases (Minorini & Sugarman, 1999). However, an evaluation of the school finance system of West Virginia five years after the *Pauley* decision indicated that the allocation formulas were nearly identical to those employed at the time of the ruling, and the state's share of total state and local revenue had increased by only one percent (Salmon & Alexander, 1990). In 1997, the case returned to the West Virginia Supreme Court, which found that the state had failed to fully implement its Master Plan and ordered full implementation by 1998 (Minorini & Sugarman, 1999). The legislature revised the system even more substantially in 2000, leading the presiding Circuit Court judge to dismiss the long-standing *Pauley* case in January 2003 (ACCESS, 2003b).

Although the original ruling in West Virginia pre-dates it by ten years, the 1989 Kentucky Supreme Court ruling is more widely credited for launching the third wave of school finance litigation with its focus on the adequacy of school funding. In *Rose v. Council for Better Education* (1989), the Kentucky Supreme Court found the state's entire educational system unconstitutional, citing the state's low rates of student achievement, high dropout rates, low teacher salaries, and low per-pupil spending

FIGURE 2.1

West Virginia Supreme Court: Definition of an Adequate Education

-
- Literacy
 - Ability to add, subtract, multiply, and divide numbers
 - Knowledge of government sufficient to make informed choices among persons and issues that affect his own governance
 - Self-knowledge and knowledge of the total environment (i.e., knowledge of options) such that child can intelligently choose life work
 - Work and advanced academic training as chosen by the student
 - Recreational pursuits
 - Interest in the fine arts, including music, theater, literature and visual arts
 - Social ethics to facilitate compatibility with fellow members of society.
-

Source: Guthrie & Rothstein, 1999, based on *Pauley v. Kelly*, 255 S.E. 859 (W.V., 1979).

(Guthrie & Rothstein, 1999; Heise, 1995; Schrag, 2003). The court ordered the state to re-structure its educational system in its entirety. The court defined an adequate education in terms of seven capacities to be developed in each child as summarized in Figure 2.2 below.

A concurrent ruling in Montana is also considered to be among the first cases in the third wave of litigation, though its attention to both equity and adequacy have led some to argue that the case belongs in the second wave of school finance litigation (Heise, 1995). In 1989, the Montana Supreme Court determined that the state had failed to adequately fund a system of quality public education for all children (Heise, 1995; Verstegen & Whitney, 1997). Its explicit reference to the issue of adequacy leads most scholars to place this ruling on *Helena Elementary School District No. 1 vs. State* in the third wave of school finance litigation (Heise, 1995; Verstegen & Whitney, 1997).

Although the state revised the school finance system in 1989 and 1993 in response to the 1989 *Helena* ruling and a subsequent lawsuit brought by small and rural districts in 1991, the state's system was challenged again in September 2002 on adequacy grounds in *Columbia Falls v. State*. In April 2004, a Montana District Court declared the state's system unconstitutional because of its failure to provide adequate funding, the system's lack of commitment to American Indian education, and the state's failure to pay its share of the system (ACCESS, 2004d). The state's Supreme Court issued a rare preliminary ruling in November 2004 in order that the other branches of government would have sufficient time to fashion a remedy during the 2005 legislative session (ACCESS, 2004c). The Montana Supreme Court issued a final ruling in March 2005 upholding the findings related to inadequate funding and a failure to preserve American Indian cultural identity as required by the state constitution (ACCESS, 2005). The Montana legislature did

FIGURE 2.2

Kentucky Supreme Court: Definition of an Adequate Education

-
- Oral and written communication skills needed to function in complex and changing society
 - Knowledge of economic, social, and political systems sufficient to enable informed choices
 - Understanding of governmental processes sufficient to enable understanding of issues that affect the community, state and nation
 - Knowledge and awareness of mental and physical wellness
 - Training or preparation for advanced training in academic or vocational fields
 - Academic or vocational skills that allow students to compete favorably for jobs and college placements.
-

Source: Verstegen & Whitney, 1997, based on *Rose v. Council for Better Education*, 790 S.W. 2d 186 (Ky. 1989).

respond with additional funding in 2005, but plaintiffs are back in court claiming that the increase in funding was not sufficient (ACCESS, 2006). While plaintiffs seek a hearing for the spring of 2007, the state argues that recent changes in funding make a continuation of the current case moot.

It is hard to overestimate the influence of these decisions in charting the course for the third wave of school finance litigation. Since 1989, supreme courts in several states based their rulings against school finance systems largely on adequacy grounds first articulated in either the *Helena* or *Rose* cases (Heise, 1995). Not only did the *Rose* decision demonstrate the promise of adequacy theory, it also pointed to the need for other states to identify the basic components of school finance systems required to pass constitutional muster and led the courts in Ohio, Alabama, and Massachusetts to adopt the same adequacy standards (Heise, 1995; Versteegen & Whitney, 1997).

Texas provides another contemporary example of adequacy litigation. Its current school finance litigation involves claims related to the adequacy of the state's school finance system. Originally styled as *West Orange-Cove Consolidated Independent School District v. Jim Nelson [West Orange-Cove]* in 2001, the district court case started with the claim of four property-wealthy school districts that the state's school finance system forced them to levy the maximum maintenance and operations tax allowed by law of \$1.50 per \$100 of assessed valuation, leaving them no meaningful discretion in setting their local tax rates and effectively creating a de facto statewide property tax, which is prohibited by the state's constitution (*West Orange-Cove*, 2003). Such concerns about the capacity of the system and the potential for a de facto statewide property tax were specifically addressed by the majority opinion in the 1995 *Edgewood IV* ruling of the Texas Supreme Court. While the original district court ruling in *West Orange-Cove* dismissed the claims related to \$1.50 tax rate cap without a trial, the pleadings had

evolved by the time they reached the supreme court to include claims related to adequacy in funding and to the linkage of the state's accountability system to its school finance policy (*West Orange – Cove*, 2003).

The Texas Supreme Court remanded the case for trial in May 2003. Moments after closing arguments in the six-week long trial on September 15, 2004, State District Court Judge John Dietz issued a ruling that the current school finance system was unconstitutional based on: 1) its failure to provide adequate funding to meet the state's educational goals; and, 2) its effect of forcing some districts to tax at the \$1.50 tax rate cap resulting in an unconstitutional statewide property tax (Castro, 2004; J. Dietz, 2004). The state appealed and the Texas Supreme Court ruled on the case again in November 2005. The supreme court upheld the district court finding that the lack of meaningful discretion for school districts in setting local property tax rates resulted in an unconstitutional statewide property tax, but reversed the district court on its findings related to the adequacy of public education funding. The supreme court ruling stayed the district court injunction until June 1, 2006. The Texas Legislature passed five major tax bills aimed at reducing local property taxes in May 2006, avoiding the impending court injunction. However, the issue of meaningful discretion in setting local school property taxes along with questions about the adequacy of school funding and its relationship to assessment and accountability are poised to continue to drive school finance policy discussions in the state.

Having surveyed the history of school finance litigation, this review of the literature turns next to the school finance literature that describes methods used by school finance scholars to determine the cost of an adequate education. While some methods have been more commonly employed by researchers than others, their influence on school finance policy has been limited to date. However, recent emphasis on

accountability creates the real potential to upset the status quo with regard to school finance policy and the influence of costing-out studies on state policy development.

Determining the Cost of an “Adequate” Education: Linking Accountability to Adequacy

The adequacy movement has been gaining momentum in recent years as more and more states are subject to litigation on the issue of adequate funding for public education fueled by the adoption of accountability systems. Decisions in many of these cases specifically address the linkage between funding and school performance. In some cases, such as those in West Virginia and Kentucky, the court provided policymakers with detailed instructions on how to proceed with policy development (Guthrie & Rothstein, 1999; Heise, 1995; Verstegen, 1998). In other cases, the court ordered the state legislature to take action to remedy an unconstitutional school finance system, but left the details up to the discretion of lawmakers. While details vary from state to state, they share a common theme of linkage between educational outcomes and school finance policy. As states move to adopt accountability systems that focus on educational outcomes, school finance reformers have capitalized on the linkage between student performance and school funding to bolster their efforts to increase funding for public education.

Adequacy is unlike the traditional school finance concept of equity because it is based on spending what is needed, rather than spending that is equal (Minorini & Sugarman, 1999). In this context, the notion of what is needed is strongly linked to the notion of producing specific outcomes, in terms of student achievement, as prescribed by state and federal accountability systems. According to Odden and Clune (1998), school finance structures that support adequacy focus on “the level of dollars and outcomes” (p.161) rather than a concern with equity in school funding. Based on this linkage

between dollars and outcomes, the adequacy movement reflects a logical outgrowth of the standards-based reform movement (Odden & Clune, 1998). Such notions of adequacy in school finance policy are anchored in the belief that policymakers can clearly define both measurable expectations for student performance and the level of resources needed to produce these levels of student achievement (Guthrie & Rothstein, 2001).

At least 34 states have engaged in studies aimed at determining the cost of an adequate education (Gronberg, Jansen, Taylor, & Booker, 2004; Hunter, 2004a). While some of these studies have been court-ordered, most of them have been initiated by state legislatures, perhaps in anticipation of litigation, or by advocacy groups interested in reforming school finance systems, including those who have used litigation as a policy tool in the past (Hunter, 2004b). Some states have been the subject of multiple studies by different groups, and in these cases, the studies have typically involved different methods (Hunter, 2004c). The discussion turns next to a description of each of the four most commonly used strategies for arriving at the estimated costs for an adequate education.

SUCCESSFUL SCHOOLS APPROACH

One method for determining the cost of an adequate education involves the identification of *successful schools* based on a set of objective criteria, typically linked to student performance on standardized assessments. This approach is based on the underlying assumption that any school should be able to accomplish what another school can accomplish with the same amount of resources (Augenblick, 1997; Augenblick, Myers, & Berk Anderson, 1997; Guthrie & Rothstein, 2001). Assuming adequate controls for non-school resource factors such as family background characteristics have been taken into account, whatever *successful schools* spend is determined to be “adequate” (Guthrie & Rothstein, 1999; Koski & Levin, 2000; Monk & King, 1999; Odden & Clune, 1998).

This method for determining the cost of an adequate education has been used extensively by the consulting team of Augenblick & Myers for several states including Ohio, Illinois, Mississippi, and Louisiana (Education Commission of the States, 2001). Critics of this approach point out that such strategies based upon existing expenditure patterns may reflect unfair and unconstitutional school finance plans, which could potentially lead to over-funding of public education because they rely on data from all districts that produce adequate outcomes, including those who attain those outcomes inefficiently (Guthrie & Rothstein, 1999). There is also the potential for under-funding because this method also suffers from a failure to systematically measure variations in the cost of adequacy due to the characteristics of individual school districts and their students (Reschovsky & Imazeki, 2000).

COST-FUNCTION APPROACH

The *cost-function* method for determining the cost of an adequate education uses statistical inference to link school performance with educational expenditures to determine the appropriate level of resources needed by districts (Guthrie & Rothstein, 1999; Reschovsky & Imazeki, 1999, 2000). This “black box” approach determines the cost of achieving an acceptable level of student achievement based on a correlational method that requires neither the definition of the instructional delivery system nor the need to know the cost of its components (Guthrie & Rothstein, 1999). Instead, it relies on the statistical relationship between student performance and expenditures. Based on statistical inference, this approach uses information about school spending and student performance to derive a unit cost – per classroom or per pupil – that is associated with producing a specific level of student performance. The *cost-function* approach has been applied recently to data for New York, Wisconsin, and Texas (Duncombe & Yinger, 1999; Gronberg et al., 2004; Reschovsky & Imazeki, 1999, 2000). Critics of the

cost-function approach point to its complexity, which not only makes it difficult to explain to policymakers, but also makes it prone to errors created by misspecification of the model and bias created by simultaneous equations (Gronberg et al., 2004). While this method is often perceived as the most objective approach for assessing the cost of an adequate education, all of these methods involve decisions that are prone to political and social influence. With the *cost-function* method, some of those decisions include the selection of the assessment to be used in measuring student performance and the establishment of standards for acceptable performance (Gronberg et al., 2004; Guthrie & Rothstein, 1999).

PROFESSIONAL JUDGMENT

Another method for determining the cost of an adequate education is based on the *professional judgment* of a panel of education experts who conceptually design the ideal educational program to produce adequate student achievement, then others cost out its components (Guthrie & Rothstein, 1999). Reminiscent of the collective wisdom approach used in Washington in 1977, this method was pioneered by Jay Chambers and Thomas Parrish, who referred to their design as a Resource Cost Model in studies conducted for the states of Illinois and Alaska in the early 1990s (Guthrie & Rothstein, 2001). The *professional judgment* approach is favored by James Guthrie and his colleagues at the consulting firm of Management Analysis & Planning Associates because of its transparency to policymakers and the public, as opposed to “black box” models based on statistical or econometric measures of adequacy (Guthrie & Rothstein, 1999). The Guthrie consulting team used the *professional judgment* approach to determine the cost of an adequate education in Wyoming, where the lack of a standardized achievement test made the *professional judgment* method the only viable option (Guthrie & Rothstein, 1999, 2001). The results of this study were used to design a new school finance system

for the state of Wyoming that passed constitutional muster with the state's supreme court in February 2001 (Education Commission of the States, 2001).

The consulting team of Augenblick and Myers used the *professional judgment* model to develop the cost of an adequate education for the South Carolina School Boards Association in 2000, following the passage of the state's Education Accountability Act of 1998 (ECS, 2001). This study determined that the cost to implement the new accountability program would require an additional \$2.9 billion in state aid in 1998-99 dollars. This information was used by the school boards association to inform their lobbying efforts related to the implementation of accountability standards and their school finance policy debates.

Critics point to the possibility of obtaining biased results from the *professional judgment* model based on the inclination of professional educators to think generously toward school districts with presumably less concern for efficiency than a more objective observer might reflect (Gronberg et al., 2004). Guthrie and Rothstein (1999) also acknowledge that this approach, in its effort to eliminate the black box of empirical approaches, may instead introduce a series of black boxes, effectively residing within each participant on the professional judgment panel.

WHOLE-SCHOOL REFORM

Another method used to determine the cost of an adequate education involves *whole-school reform* design, such as Success for All, the Modern Red Schoolhouse, and Accelerated Schools (Guthrie & Rothstein, 1999). Based on this model, the resources specified by the reform are priced and the cost of the resources to implement such a program constitutes the cost of an adequate education at the school level (Clune, 1994; Odden & Clune, 1998).

Critics point out that using this cost information exclusively could significantly underestimate the actual cost of implementation. Early evidence indicates that the costs of the components of a *whole-school reform* may not constitute all of the costs incurred by districts that implement such programs, by failing to recognize some necessary expenditures such as administrative support services (Guthrie & Rothstein, 2001). Implementation of these models is also likely to require some modification to suit local conditions, including community preferences and local budgetary constraints. Another significant criticism of this method is that none of the *whole-school reform* models, some of which are very popular, has been firmly proven to increase student performance (Guthrie & Rothstein, 1999). New Jersey is the only state where the court has ordered the adoption of *whole-school reform* models in some school districts, but implementation is still incomplete and the state has requested flexibility in modifying these programs (ACCESS, 2003a).

THE ROLE OF ADEQUACY STUDIES IN POLICY DEVELOPMENT

This discussion provided brief descriptions of the four primary methods currently used by researchers and policy analysts to determine the cost of an adequate education, pointing out the means by which costs are assessed along with some of the advantages and disadvantages of each method. Studies based on these methods have been used to litigate questions related to adequate funding of public education in at least 27 states and the trend to pursue these questions continues to spread (ACCESS, 2004b). In each state where adequacy studies have taken place or are underway, the decision to engage in these studies has often been the result of political, social, economic, and legal pressures (ACCESS, 2004b). Sometimes the adequacy study prompts new rounds of litigation, and sometimes litigation prompts the studies. Decisions about who will conduct the study, the

methodological approach to be used, and the extent to which the findings will be used to shape school finance policy can also be politically charged (Thompson, 2004).

While there is no single correct approach to measuring the cost of an adequate education, efforts to link student performance and school funding continue to drive school finance policy development in many states, though change is occurring very slowly. A few states have adopted school finance systems based on, or at least informed by, the *successful schools* and *professional judgment* models. One state, New Jersey, has limited experience with the *whole-school reform* model, and the *cost-function* model has yet to influence the adoption of a new or modified school finance system in any state. The concept of adequacy as a standard for school finance policies is undoubtedly spreading across the country. New challenges to states' existing school finance systems are emerging each month, and new court decisions on existing school finance challenges are being delivered with similar frequency.

Though it is too early to conduct a nationwide analysis of the effect of court decisions related to adequacy on state school finance systems, this trend toward adequacy constitutes a policy phenomenon worthy of further investigation. In order to construct a contextual model of school finance policy development, the review of literature turns now from the discussion of case law and school finance adequacy to the political science literature on policy adoption.

Analyzing Policy Adoptions

A significant goal of political science research is to understand how policy actors and their environments interact to produce public policy (Easton, 1965; Lasswell, 1936/1958). Political scientists investigate a wide variety of demographic, economic, and political indicators in an effort to determine what factors explain or significantly

influence the development and adoption of public policy (see Brace & Jewett, 1995 and Gray, 2004 for reviews of the literature). While the fifty states of the U.S. provide an interesting “laboratory” that supports the comparative study of state-level policy development (Mooney, 2001b), political scientists who study the American states have long been faced with theoretical conundrums related to the lack of an overarching theory of state politics (Brace & Jewett, 1995; Jewell, 1982). This lack of a unified theory of state politics is due to the variability in politics and public policy between states combined with the scarcity of comparable data, which confounded early efforts of political scientists to engage in theory-building research (Brace & Jewett, 1995; Jewell, 1982).

In recent decades, the availability of data has grown, and so have the efforts of political scientists to engage in comparative studies of state politics and policy development (Brace & Jewett, 1995; Mooney, 2001b). These efforts reflect a number of comparative approaches. One direction pursued by many political scientists seeks to link the internal characteristics of a state to the types of policies adopted or to the level of spending on specific types of policies. Another direction taken by political scientists seeks to examine the spread, or diffusion, of policy adoptions.

INTERNAL POLICY DETERMINANTS

Early efforts to link internal characteristics to state policies examined political, social, and economic factors and their relationships to policy indicators (Dye, 1979; Elazar, 1966; Sharkansky & Hofferbert, 1969). Elazar (1966) defined the study of political culture with his influential work on political subcultures based on patterns of immigration and settlement across the time and space of American history and geography. Sharkansky and Hofferbert (1969) used factor analysis of 50 variables to examine the influence of state politics on the adoption of relevant state policies. They

found that different social and economic characteristics had relevance for different policies, and that their relevance varied between substantive policy areas. Sharkansky and Hofferbert also found that some features of state political systems were important, even after controlling for socioeconomic variation. Specifically, they posited that electoral and party characteristics of state politics are influential to the nature of the services provided. For example, states that experience high voter participation and high levels of inter-party competition along with high levels of educational attainment and personal wealth tend to provide generous welfare benefits and successful educational services.

Later research efforts focused on policy determinants such as political ideology (W. D. Berry, Ringquist, Fording, & Hanson, 1998; Elazar, 1994; Erikson, McIver, & Wright, 1987; Erikson, Wright, & McIver, 1989, 1993; Lieske, 1993) and political economy (Brace, 1991; Dye, 1979, 1988). Political scientists have developed a variety of indices aimed at measuring political ideology. The research team of Erikson, Wright, and McIver (1987, 1989, 1993) used 122 CBS News/New York Times polls conducted between 1976-1988 to produce several measures of political ideology. The policy liberalism index developed by this research team has been widely used in other political science studies that aim to measure or control for political ideology.

Berry, Ringquist, Fording and Hanson (1998) developed an indicator of political ideology aimed at producing a more contemporary measure than the indices developed by Erikson and colleagues. Berry and colleagues (1998) computed citizens' ideology scores for each state based on interest group ratings of the state's congressional delegation, election returns for congressional races, the party composition of state legislatures, and the party affiliation of governors. Next, they computed institutional ideology scores based on the party affiliations of the state's congressional delegation and the state's governor (Berry et al., 1998).

While one branch of research has focused on political ideology, another has used the field of political economics to frame the analyses of policy adoptions. Dye (1979) argued that both social and economic conditions are important in determining public policy. He later tested this assertion in a study that aimed to demonstrate that state and local government spending on education is heavily constrained by economic resources in the long run (Dye, 1988). Dye's (1979) model correctly predicted the demand for education in 41 states based on per capita income, but the other 9 states appeared to be non-responsive to the model.

Plotnick and Winters (1985) found that income redistribution policies were influenced by the interaction of political and economic factors. They noted that economic factors, such as voter income and urbanization, influenced the willingness of citizens to redistribute income, but this willingness was tempered by political factors, such as party competition and interest group strength (Plotnick & Winters, 1985).

In a 2000 study focused specifically on school finance litigation, Lundberg found that per capita income, the percentage of a state's population located within an urban area, and political ideology were significantly related to the outcome of court decisions.

Overall, research investigating the internal determinants of policy outcomes provides clear indications that social, economic, and political conditions are influential to the development of public policy. However, this same research indicates that the relationship between factors and policy outcomes depends on the policy and internal determinants under investigation. Even when strong relationships between specific factors and policy outcomes are found in some states, they are not always present in all of the states. As a result, success in using internal determinants to predict policy outcomes depends on the thoughtful selection of indicators as well as the use of an analytic technique that suggests the strength of the relationships.

POLICY DIFFUSION

The concept of diffusion, generally defined as the communication of a new idea in a social system over time, has been applied in a variety of disciplines, including anthropology, sociology, medicine, and education (Gray, 1973). In the study of American politics, policy diffusion is concerned with the diffusion of policy adoptions across states (see, for example, Gray, 1973; Mintrom, 1997; Walker, 1969). In general, policy diffusion research focuses on state adoptions of new policies and attempts to identify “the conditions under which state decision makers are most likely to adopt a new program” (Walker, 1969, p. 881). New state policies in this context are those that are new to the state in which they are being adopted, though the policy itself may have been in existence for years (Berry & Berry, 1990, Walker, 1969).

In his seminal work on policy diffusion, Walker (1969) argued that political scientists could not evaluate the relative importance of social, political, and economic determinants of public policy, before they considered “one of the most fundamental policy decisions of all: whether to initiate a program in the first place” (p. 880). Walker’s 1969 study focused on measuring the relative speed with which states adopted new programs, developing an innovation score for each state based on its adoption (or lack of adoption) of 88 different programs. Walker’s analysis determined that those states that permitted full representation of their urban areas in the legislature adopted new ideas more rapidly than states where cities were less fairly represented. Walker (1969) also found that larger, wealthier, and more industrialized states adopted new programs more rapidly than those that were smaller and less well-developed.

A 1973 diffusion study by Gray examined the influence of neighboring states on the adoption of education, welfare and civil rights policies and then developed interaction models for 12 policy innovations. This approach focused on the rate of policy adoptions

and how the number of adopters affected the rate of adoptions over time (Gray, 1973). Gray found that interaction provided significant explanatory power regarding the order of state policy adoptions, but political and economic explanations were more relevant to explaining first adoptions.

Critics of diffusion research have argued that static measures of policy diffusion such as those created by Walker and Gray do not adequately reflect changing times and circumstances related to policy adoption, nor do they reflect the qualitative differences in the policies that are adopted (F. S. Berry & Berry, 1990; Glick & Hays, 1991; Klingman, 1980). Another criticism of diffusion research targets its lack of attention to the contributions of policy entrepreneurs (Mintrom, 1997), though the importance of influential individuals and groups was recognized in the seminal work by Walker (1969). Klingman (1980) argues that without integrating consideration of these two sources of influence, it is impossible to tell whether the diffusion is the result of similar internal causal factors or external pressure created by neighboring adopters. Thus, Klingman (1980) and Berry and Berry (1990, 1992) point out that policy diffusion is arguably the result of both internal determinants of policy and regional influences, though most diffusion research focuses on one type of influence or the other.

While Klingman (1980) proposed a time-series approach that integrated considerations of internal determinants and regional influences, he did not apply this design to actual empirical research. Berry and Berry also advocated for integration, but they took a different methodological approach that they first operationalized in their 1990 study of state lottery adoptions and later replicated in a 1992 study of state tax adoptions. Using event history analysis, the Berry and Berry (1990, 1992) model integrates indicators of internal policy determinants, such as the political, economic, and social characteristics of states, along with an indicator of the regional influences of neighboring

states. This view of policy diffusion recognizes the critical influence of context on policy decisions, an important theme in the present study of school finance policy development.

The policy diffusion literature provides a fitting theoretical framework for approaching the present research question about what drives policy adoptions related to school finance adequacy. Previous studies that attempted to link internal policy determinants to education policy have produced less than satisfying results to date, and very few studies have attempted to link the adoption of education policies to the influence of other states. However, by focusing on the adoption of a particular policy, policy diffusion research can explore the differences and similarities between adopters and non-adopters to learn more about what drives policy decisions within a state. By incorporating indicators of both internal determinants and regional influence, a policy diffusion approach provides a contextual framework that is well-suited to the analysis of a complex public policy issue like school finance.

Conclusion

The review of case law presented here along with current news on litigation provide clear indications that state courts will continue to be faced with questions related to school finance adequacy. The decisions rendered by these courts are likely to influence public policy as the number of states facing challenges to their systems of school finance continues to grow. Further, the literature on policy diffusion indicates that policy adoption by states is influenced by a variety of factors, including characteristics of the states themselves and the decisions of neighboring states.

There are very few studies in the political science literature that examine school finance policy development, and there is a similar lack of attention to the politics of policy development in the school finance literature. The present research aims to bridge

this gap between the school finance and political science literatures by identifying the conditions and factors that are influential to the diffusion of adequacy-based school finance policy.

CHAPTER THREE: METHODOLOGY

Because school finance policy involves a number of dimensions, a contextual approach offers a promising framework for analyzing school finance policy development. A contextual approach to assessing policy adoption can both inform the deliberations of policymakers and guide the investigations of researchers by specifying the political, economic, social, and educational factors that influence policy development. For example, policymakers who seek to initiate the adoption of adequacy-based school finance policies can learn about the circumstances and conditions that are most conducive to their policy goals. Likewise, researchers who wish to evaluate school finance policies and how these policies effect the distribution of funds for education can design meaningful assessments that are sensitive to the context of the policy adoption.

This study employs an event history analysis to explore the context of adequacy-related school finance decisions of state lower courts, aiming to identify the relationships between state characteristics and the emergence of state lower court decisions related to school finance adequacy. State lower court decisions related to school finance adequacy that occurred between 1987 and 2004 are the focus of the study. The chapter begins with a description of the statistical technique to be employed, event history analysis. Next, the design of the statistical model is described. The selection of the variables is discussed, and data sources are identified. The data analysis and findings will be discussed in detail in the following chapter.

Event history analysis

Most early studies of policy diffusion used either indices or factor analysis to analyze the influence of internal determinants within a state or focused on regional

influences to explain the diffusion of policy adoptions (Gray, 1973; J. L. Walker, 1969). In 1990, the research team of Berry and Berry published a ground-breaking study in policy diffusion that employed event history analysis and unified these theories of policy diffusion. This description of event history analysis begins by describing this method of regression analysis and focuses on the application of this approach in overcoming problems inherent with longitudinal studies that employ traditional regression analyses. The Berry and Berry (1990) study and others that have used event history analysis to study policy diffusion are discussed and recent enhancements to the technique are described. Then, the description of the model provides detail on the study design and components.

METHOD

Event history analysis is a form of regression analysis used to estimate the probability that an event will occur during a specific period of time by analyzing the patterns and correlates of events (Berry & Berry, 19990; Yamaguchi, 1991). “Event history” data consists of longitudinal records showing whether an event occurred and when (Allison, 1984; Berry & Berry, 1990). In event history analysis, the goal is to explain qualitative changes in behavior that occur over time.

Box-Steffensmeier and Jones (1997) portray event history analysis in terms of “three elementary concepts: the survivor function, the occurrence of an event, and the hazard rate” (p. 1418). The *survivor function* basically reflects the non-occurrence of an event during a specific period of time (Box-Steffensmeier & Jones, 1997). In the present study, a state that has not experienced a district court decision on school finance adequacy at a specific point in time would be deemed a survivor. The *occurrence of an event* reflects the observation of an actual occurrence during a specific period of time, and this variable is typically the primary focus of attention in the analysis (Box-

Steffensmeier & Jones, 1997). In this study, a decision on school finance adequacy by a state lower court is the dependent variable under investigation. The concept of *hazard rate* is more broadly used in discussions of event history analysis than the survivor function. The hazard rate represents the probability, or the risk, that a given event will occur during a particular time period (Berry & Berry, 1990; Box-Steffensmeier & Jones, 1997). In the present study, the hazard rate represents the likelihood that a state will experience its first lower court decision on school finance adequacy in a given year.

Event history analysis is accomplished by developing pooled cross-sectional time series data that are sorted into *risk sets* (Berry & Berry, 1990). Berry and Berry (1990) point out that “the ‘pooled’ nature of the data allows the dependent variable to be affected by independent variables with the right time property” (p. 399). This feature of event history analysis is especially important in identifying trends related to policy development, particularly as conditions change across states. The risk set is made up of the individuals in the sample who are “at risk” for experiencing an event (Berry & Berry, 1990). The Berry and Berry model of state lotteries assumed that no state is at risk for a particular policy adoption until at least one state has adopted it.

Most event histories include events that are not repeatable, and the size of the risk set decreases over time as individuals in the sample experience the event (Berry & Berry, 1990; Box-Steffensmeier & Jones, 1997). However, there are many examples in actual policy development that can be construed as repeated policy adoptions, including the adoptions of modifications to existing policies. In this study, the risk set includes the states that have not yet had a state lower court ruling on school finance adequacy. The first lower court decision on school finance adequacy can occur only once, though multiple decisions on the topic have occurred in many states. This study is limited to consideration of the first state lower court decision on school finance adequacy in a state,

though examination of subsequent decisions offers an intriguing possibility for future research. Fortunately, event history analysis can handle consideration of multiple occurrences of events, further supporting the use of this technique as a sustainable approach for continuing analyses of school finance policy development.

Once the risk set is established, the next step is to specify how the hazard rate depends on the explanatory variables (Allison, 1984). The use of standard multiple regression procedures poses two significant problems related to severe sample bias and loss of information when data must be censored and time-varying explanatory variables are involved (Allison, 1984; Box-Steffensmeier & Jones, 1997; Yamaguchi, 1991).

Censoring is a problem that occurs in longitudinal studies when incomplete information is available because of the limited observation period (Allison, 1984; Box-Steffensmeier & Jones, 1997; Yamaguchi, 1991). In cases where the event has not occurred, one option is to truncate the observations such that only uncensored observations are included, i.e., only those cases where the event has occurred (Box-Steffensmeier & Jones, 1997; Yamaguchi, 1991). Eliminating cases is problematic not only because it clearly represents a loss in information, but also because it risks introducing bias to the remaining sample of cases (Allison, 1984; Box-Steffensmeier & Jones, 1997; Yamaguchi, 1991). For example, a longitudinal study of school finance policy might eliminate those states where a policy adoption has not occurred. The remaining sample of districts would be prone to introducing bias because only those that adopt the policy would be included in the analysis.

Another technique for dealing with censoring problems is to develop a dichotomous variable indicating whether or not the event has occurred (Allison, 1984; Box-Steffensmeier & Jones, 1997). For example, this study of school finance policy development will include a variable indicating whether or not a state lower court has

ruled on school finance adequacy. A traditional regression analysis that uses a dummy variable from a single point in time cannot discriminate between varying rates of adoption, effectively undermining the time-dependent longitudinal approach that makes sense for the analysis of policy diffusion (Box-Steffensmeier & Jones, 1997).

The issue of explanatory variables that change over time is another problem for traditional regression analysis (Allison, 1984; Box-Steffensmeier & Jones, 1997; Yamaguchi, 1991). For example, this study of school finance policy adoption will include a variable reflecting per pupil expenditures. A traditional regression analysis would include a variable representing a measure from a single point in time – perhaps the beginning of the period, the end of the period, or an average – rather than multiple income measures reflecting changes in income over the period. Such an analysis on a static measure could easily miss or underestimate the influence of per pupil expenditures on school finance policy development.

Event history analysis allows for variations in the hazard rate that are linked to the passage of time or changes in the policy context. Not only can this technique handle situations with multiple outcomes, it is also particularly well-suited to addressing problems related to data censoring or variables that change over time (Berry & Berry, 1990; Box-Steffensmeier & Jones, 1997). Event history analysis incorporates the censored data so that information is not lost and the risk for introducing bias is reduced. The use of event history analysis with its repeated observations also accommodates changes in the dependent variable, in this case, state lower court decisions on school finance adequacy that occur over time. In addition, event history analysis supports the analysis of multiple kinds of events, a feature that could provide unique insight to future policy analyses of states where multiple court decisions have occurred (Allison, 1984).

APPLICATION

Berry and Berry (1990) introduced the use of event history analysis to the political science literature in a study of state lottery adoptions. These authors argued convincingly that neither the internal determinants model nor the regional diffusion model provided “a plausible explanation of state innovation in isolation” (Berry & Berry, 1990, p. 396). Instead, they argued that these models could be “unified theoretically without doing violence to either explanation” (Berry & Berry, 1990, p. 396). Berry and Berry (1990) used event history analysis because it is “suitable for testing a unified theory of state innovation incorporating both internal determinants and regional influences” (p. 398). This approach allows the researcher to control for spurious relationships that might wrongly attribute adoptions caused by internal determinants to those caused by regional influence (Berry & Berry, 1990). Event history analysis also provides a tool that can help explain qualitative changes in behavior that occur over time, a critical factor in a realistic assessment of policy development (Berry & Berry, 1990).

Berry and Berry’s studies (1990, 1992) marked important contributions to the literature that have inspired many of the subsequent investigations of policy diffusion. One important development that has occurred in recent years involves a refinement to the Berry and Berry model related to its measure of regional influence (Mooney, 2001a). Most state politics scholars have presumed that regional influences were positive (Berry & Berry 1990; Walker, 1969), in other words, the adoption of a policy by one state makes its neighboring states more likely to adopt a similar policy (Mooney, 2001a). However, Mooney (2001a) argued that the influence of neighbors could have a negative influence on policy adoption, especially if a policy were perceived as detrimental to a state’s interest. Mooney (2001a) pointed out that Berry and Berry’s (1990) regional influence indicator was constructed in a way that biased their findings about regional influence

(Mooney, 2001a). By replicating the Berry and Berry (1990) study and incorporating an index of regional diffusion based on trends of policy adoption, Mooney (2001a) effectively demonstrated that regional influence can change over time.

DeMoss (2001) deemed event history analysis unsuitable for the analysis of school finance litigation primarily because the qualitative differences between court rulings made it difficult to categorize the decisions in terms of “wins” or “losses” for plaintiffs. Court rulings are frequently ambiguous, providing plaintiffs with some, but not all, of the relief they seek (DeMoss, 2001, 2004). This study is not concerned with the outcome of court decisions. Instead, the focus is on whether a decision has occurred at all. The following section will describe the event history analysis to be conducted for the present study. After describing the model, the elements of the model will be identified along with sources of data to be used.

Description of the model

This study of school finance policy development is focused on state lower court decisions about school finance adequacy. The event of interest is the occurrence of a lower court ruling on an adequacy-based school finance lawsuit, which represents a formal policy discussion on the topic. The study is designed to explore the conditions in a state when this event occurs in order to identify trends and influential factors in this development of adequacy-based school finance policy. Specifically, this study is designed to answer the following research question: 1) what are the critical factors that influence citizens to bring forward adequacy-based school finance claims resulting in decisions by state lower courts?

The statistical analysis involves an event history analysis of state district court decisions that occurred within a 17-year time period beginning with 1987 and ending in

2004. The model will include observations for each state on each variable for each year under investigation. These observations, or cases, in the model are referred to as state-years. The study employs logistic regression analysis to accomplish the event history analysis.

A frequently used model for event history analysis is the logit function, which is used for this study. The logit function takes the following form:

$$\log \left(\frac{\lambda_i}{1 - \lambda_i} \right) \equiv \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki}$$

The logit function specifies the likelihood that an event will occur in terms of a log-odds ratio, which is a ratio comparing the probability that an event will occur to the probability that the event will not occur (Box-Steffensmeir & Jones, 1997). The logit coefficients are interpreted in terms of their relationship to the log-odds of an event occurrence. The model used for this study is described in more detail in the Data Analysis section of Chapter Four.

The selection of variables to be included in this model was informed by recent studies that recognized the influence of context on the outcomes of school finance litigation (DeMoss, 2001, 2004; Lundberg, 2000; Swenson, 2000). These studies incorporated a number of contextual variables to test their influence on the outcomes of school finance litigation. Lundberg (2000) and Swenson (2000) used logistic regression techniques, similar to those employed for the present study. DeMoss (2001, 2004) used statistical clustering to sort the states into five “clusters” based on sociopolitical factors, then further analyzed the outcomes of court decisions in each of these five clusters. Although these studies employ different analytical approaches, they share a number of similarities, particularly the variables under investigation and the goal of understanding what factors influence school finance litigation.

DEPENDENT VARIABLE

This analysis will use a dependent variable that represents the occurrence of the first lower court decision in a state that specifically addresses the issue of school finance adequacy. For each state-year observed, the variable will be coded as “0” where no lower court decision on school finance adequacy took place and “1” in states where a decision took place that year. This dichotomous dependent variable will be used to address the research question regarding similarities among states that have had lower court decisions and those that have not. Once a state has experienced a lower court decision, subsequent state-year observations for that state are removed from the dataset.

COVARIATES (INDEPENDENT VARIABLES)

Drawing on the work of DeMoss (2001, 2004), Lundgren (2000), and Swenson (2000), the present study incorporates variables that describe the political, economic, social, and educational contexts of each state that may be expected to influence court decisions. Unlike the previous studies, this model will consider changes in explanatory variables that occur over time by including repeated observations over a 17-year period. The failure to capture changes within the policy context that occur over time may have confounded the findings of previous studies that lacked this dynamic longitudinal perspective.

Several measures were tested to explore their explanatory power with regard to the dependent variable. Based on these preliminary analyses, five covariates were selected for inclusion in the model. This section includes a description of the measures that were tested and which were retained in the model. The following chapter will describe the model in detail, including the covariates that appear in the model.

Political context

The influence of a state's political context on policymaking has long been recognized by scholars who have attempted to define political ideology and then to seek evidence of its influence on the adoption of public policies and measures of public opinion (W. D. Berry et al., 1998; Brace, Sims-Butler, Arceneaux, & Johnson, 2002; Elazar, 1966; Erikson et al., 1987; Erikson et al., 1989, 1993). While it seems intuitive that political ideology would influence school finance litigation, previous studies have produced contradictory results (DeMoss, 2001, 2004; Lundberg, 2000; Swenson, 2000). However, each investigation used a different set of indicators to measure political ideology, making it difficult to determine whether the observed differences or similarities were based on actual relationships in the data or differences in the sensitivity or accuracy of the political ideology measures.

The present study addresses court decisions that occurred between 1987 and 2004. Though Elazar (1966) has been widely used by political scientists in measuring political ideology, there is good reason to believe that state political ideologies have changed since Elazar's political subcultures were conceived (Berry et al, 1998; Lieske, 1993). The Erikson, Wright, and McIver (1993) indices of state political culture (p. 54) and state policy liberalism (p. 77) based on survey data from 1976 – 1988 are frequently used by political scientists to measure political ideology, though they, too, are arguably somewhat outdated for the purposes of this study. Instead, the indices developed by Berry and colleagues (1988) are particularly well-suited for the present study because they provide annual measures of political ideology for each year of interest in the study. Both the measures for institutional and citizens' ideology were tested in the preliminary analyses. These data were obtained from the Inter-University Consortium for Political and Social Research website at <http://www.icpsr.umich.edu>. During the preliminary analyses of data,

the measure for citizens' ideology provided better explanatory power than the measure for institutional ideology. Only the citizens' ideology measure was retained for the final model.

Economic context

Previous studies have found evidence of a relationship between income and education spending and between income and other policies with redistributive qualities, such as welfare spending (Dye, 1988; Plotnick & Winters, 1985). Lundberg (2000) found a positive relationship between income and court decisions to overturn state school finance systems. While tax effort is sometimes used as an economic measure, problems of comparability and availability arise when measuring tax effort across states and across years.

Another economic factor that may influence school finance policy development is related to the proportion of a state's spending on education that is supported by local revenue. With the exception of Hawaii, where education is fully funded by the state, spending on education involves a combination of state and local funds. Lundberg (2000) and Swenson (2000) hypothesized that a high percentage of local spending would trigger courts to rule in favor of plaintiffs in cases that challenged the school finance system, due largely to the inequities in funding that result from heavy reliance on local revenue. This heavy reliance on local revenue, especially in areas with low property wealth, could also result in inadequate funding.

This analysis tested a measure for per capita personal income and a measure reflecting the percentage of school funding provided by local revenue. Data on personal income were obtained from the website of the Bureau of Economic Analysis, an agency of the U.S. Department of Commerce at <http://www.bea.doc.gov/>. Data on the percentage of local spending were obtained from the National Center for Education Statistics

(NCES). Neither of the economic contextual variables provided significant explanatory power, so they were dropped from the final model. However, preliminary analysis indicated that the measure on per capita income was collinear with a measure reflecting the expenditures per student, and that measure was retained in the final model.

Social context

The social context of a state is certain to influence the demands made on the educational system, by parents, students, and policymakers as well as the responsiveness of the system to those demands (Cover, 2002; Duncombe & Yinger, 1999; Rothstein, 2004). The confluence of these demands is a particularly important feature of the current accountability movement, which is increasingly linked to questions of school funding adequacy (Cover, 2002). Numerous studies have shown that large urban and minority populations present greater challenges to the education system (see, for example, Augenblick & Meyers, 2001; Berne & Stiefel, 1999; Chambers, 1999; Chambers & Parrish, 1982; Reschovsky & Imazeki, 2000; Taylor, 1997).

There is some evidence to indicate that local demographics play a role in the development of local school funding policies. In a 1977 study of millage elections in Michigan, Rubinfeld confirmed that individual voters act in their own self-interest such that voters with children in public school were significantly more likely to support increases in local spending on education than voters who do not have children in school. In addition to the number of children in public school, income and the price of schooling were the most important explanatory variables in determining support for local education spending (Rubinfeld, 1977).

Other studies on revenue and taxation indicate that spending on education decreases as the proportion of the population that is 65 or older increases (Button, 1992; Poterba, 1996). Button (1992) found a negative relationship between the percentage of

the population over 65 in a community and support for local tax proposals, particularly when it came to bond proposals. Poterba (1996) found that the proportion of a state's population that is 65 years old or more may also influence the amount of spending per child. This effect was most pronounced when the elderly voters and the school-aged children were predominantly of different racial groups.

Three indicators were tested to measure the social context of a state, including the percentage of the state's population residing in urban areas, the percentage of non-Anglos in a state's population, and the percentage of residents aged 65 and older. The percentage of the state's population residing in urban areas has been shown to have an influence on school finance decisions (Lundberg, 2000). Data for each of these measures were obtained from various issues of the Statistical Abstract of the U.S. published by the Census Bureau. Though there are data for each state in the study, some statistics are available only for selected years. In constructing the dataset, values from the most recent year available were used in cases where census data were not available. See Appendix I for detailed information on source years for each of these measures in the dataset. Preliminary analyses indicated that of the three social context variables, only the measure reflecting the proportion of non-white residents indicated possible explanatory power. As a result, the measures on urban residents and residents aged 65 and older were not retained for the final model.

Educational context

In order to describe the educational context of a state, the selected measures are intended to reflect the demands on the educational system and the performance of the state's system in providing education to its students. A straightforward indicator of the demand for education is reflected in the proportion of the population that is school-aged. However, measuring the performance of state education systems in serving that

population presents a significant methodological challenge, particularly for the present study that seeks to include observations for each state over a 17-year time period.

The closest proxy to a widely representative measure of student performance is the National Assessment of Educational Progress (NAEP). However, some states began participating in the NAEP as recently as 2003 (Rothstein, 2004), so sufficient data on student achievement from this source are not available for this study.

Performance on college entrance exams is sometimes used by researchers, but the students who take these tests typically are not representative of the overall student population (DeMoss, 2001, 2004; Gronberg et al., 2004; Hanushek, 1994). Thus, some states have very high average SAT scores with lower proportions of their students taking the test, while other states have lower average scores with much higher participation rates. For this study, an SAT index was constructed by combining the average reading and math scores and multiplying the total score by the percentage of test takers to create an SAT index. While the result provides a less than perfect reflection of college readiness of a state's students, it does provide an observation for every state for each year of the study that can be tested.

Another measure of the success of the state's educational system is the graduation rate of students, yet reliable data on graduation rates are even harder to obtain than student performance data. Most states report dropout rates and completion rates to the National Center for Education Statistics, but they do not report comparable data. For example, some states consider students who leave school and earn a GED as a dropout; other states consider them graduates. While not a direct measure of the state's education system, the percentage of the population holding a high school diploma was tested as a measure of the educational context of the state. Although this measure lacks the tight linkage between the state's education system and high school completion, the Census

data on diploma-holders is more comparable across states than reported dropout or completion rates.

Average expenditures per pupil are also frequently used to reflect a state's performance in delivering education. Numerous studies, including recent work by Lundberg (2000) and Swenson (2000), have assumed that low expenditures per pupil would lead courts to overturn state school finance systems. However, the past three decades of school finance policy development also clearly indicate that inequities in funding lead to school finance litigation. Thus, the use of average expenditures poses a noteworthy measurement problem in that expenditures within a state can vary significantly. The average expenditure measure does not reveal variance in the distribution of that spending across districts within a state. As a result, a minority of high spending districts could bring up a statewide average while many of the districts are spending at much lower rates. Such disparities have played an important role in school finance litigation.

Data on the proportion of school-aged population and the percentage of the population that holds a high school diploma were obtained from various issues of the Statistical Abstract of the U.S. published by the Census Bureau. Average total expenditures per pupil were also obtained from the Statistical Abstract of the U.S., which reports on data provided by the National Education Association from its Estimates of School Statistics Database. While other measures of actual per pupil expenditures are available from NCES, they were not available for all years included in the study period. Preliminary analyses eliminated the measures reflecting the school-aged population and the diploma holders due to their lack of potential explanatory power. Only the measure of per pupil expenditures was retained for the final model.

While it is frequently necessary to adjust expenditure measures in a longitudinal study to reflect the changes in spending power caused by inflation, the statistical technique used in this analysis focuses on differences in spending that occur within a three- to four-year interval rather than the entire 17-year span of the study. Because the time intervals are relatively short, no adjustments for inflation were made to the expenditures per pupil or to the measure of per capita personal income.

In summary, this analysis explored a number of political, economic, social, and educational indicators, in an attempt to capture measures that would reflect the context within which state-level policy decisions are made. Event history analysis is well-suited to the exploration of contextual forces that influence policy outcomes. By capturing changes in the policy context that appear to influence policy diffusion, event history analysis offers an opportunity to take a dynamic view of policy development. This analysis began by exploring the measures described above for their potential in describing the contextual forces at work in the development of school finance policy in an effort to identify which are most influential. Of the ten measures tested during model development, five were retained in the final model. Chapter Four continues with a discussion of the data analysis, findings, and interpretations, focusing on those measures that were selected for inclusion in the final model.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS & INTERPRETATIONS

The primary purpose of this study is to identify social, economic, educational and political characteristics of a state that predict the likelihood that the state will experience a lower court decision involving questions of school finance adequacy during a specific time period. The characteristics of the state provide a context for policy development and change. A key feature of the study design is the assumption that changes occur in the characteristics of states over time and that these changes may help predict changes in school finance policy. These event history analyses were constructed using a dataset built from observations for each of the 50 states for each year between 1987 and 2004, a time span covering 17 years. Data were coded into intervals of various lengths, including one-year, two-year, three-year, and five-year intervals. Another dataset was constructed on intervals related to peak adoption periods, resulting in intervals from three to four years long. Analyses were conducted on all the datasets to determine the time intervals that produced the best fitting models. This chapter describes the data analyses, interprets the study findings, and outlines the major conclusions of the study. Implications of these findings will be explored in further detail in Chapter Five.

Data Analysis

Prior to customizing the dataset for the event history analysis, the investigation began with a survey of the statistics for the entire dataset. Next, the data were coded into several datasets, and a series of logistic regression models were explored in an effort to determine the models that best fit the data. This section will describe how the datasets were constructed for those models and how the various analyses led to the selection of the best-fitting models.

CONSTRUCTING THE DATASETS

First, the dichotomous dependent variable representing the existence of a lower court decision was coded “1” if a lower court decision occurred during that year or “0” if no lower court decision occurred. Consistent with event history methodology, the year in which the first lower court decision takes place is the last year for which there are observations for that state in the dataset. Observations for the years following the decision are deleted from the dataset prior to the analysis.

Because the adoption of adequacy-based school finance policy might be affected by time alone, dichotomous dummy variables were used to code time intervals for the event history analysis. The use of these time variables provides the ability to control for maturation effects so that the other time-varying explanatory variables are not influenced by the passage of time (Mintrom, 1997). The dummy variables allow the analysis to calculate the hazard for each risk set, i.e., the states that are at risk for experiencing an adequacy decision, during the time interval defined by the dummy variable (Singer & Willett, 1993).

For example, in the two-year interval dataset, the dummy variable for the years 1987 and 1988 are coded as “1” and dummy variables for all other two-year intervals are coded “0”. The dummy variable for the two-year period covering 1989 and 1990 are coded “1” for observations that occur during 1989 or 1990, and “0” for all other observations, and so on. The one-year interval dataset produced seventeen interval dummy variables. The two-year interval dataset produced nine interval dummy variables. The three-year interval dataset produced six interval dummy variables and the five-year interval dataset produced four. A series of intervals based on peaks in the hazard rate of policy adoptions produced a dataset with five interval dummy variables with interval lengths that ranged from three years to four years long. See Appendices II -

V for complete information on the interval dummy variable coding for the two-year, three-year, five-year, and peak adoption interval datasets.

DEVELOPING THE MODELS

A series of logistic regression models were run on each of the datasets coded for different intervals. First, null models were run for each of the intervals to determine the baseline hazard rates for each interval. Next, full models using all of the covariates for each time interval were regressed to identify the likelihood ratios and statistical significance for each of the covariates. Finally, a series of models were refined using covariates identified by the initial analyses as potentially influential to the outcome variable.

Based on the initial results, the datasets coded for one- and two-year intervals were discarded because they included spells during which no adoptions took place. The lack of adoptions during an interval created a situation in which the dependent variable was perfectly predicted by the interval itself. As a result, the model could not be fitted because the coefficient for one or more of the intervals is effectively negative infinity. The analyses continued with the development and testing of models using the data coded for three-year, five-year, and peak adoption intervals.

After the second stage of analysis, the models for each time interval were compared with the other models developed for the interval, and the most robust model was selected for comparison with the best-fitting models of other time intervals. Based on these comparisons, the models using the five-year interval dataset were discarded as the least explanatory of the remaining models. Models based on the three-year interval dataset and the peak adoption dataset produced the best fitting models.

The same model produced the best fit for both the three-year interval and peak adoption datasets. These models included five of the original ten covariates selected for the study and took the following form:

$$\text{ADOPT}_{i,t} = \text{logit}(b_1\text{POP}_{i,t} + b_2\text{SPENDING}_{i,t} + b_3\% \text{NONWHITE}_{i,t} + b_4\text{CITIDEOLOGY}_{i,t} + b_5\% \text{NEIGHBORS}_{i,t})$$

where the dependent variable $\text{ADOPT}_{i,t}$ is the probability that the state will experience a lower court ruling on a school finance case involving an adequacy claim. $\text{ADOPT}_{i,t}$ is measured with a dummy variable equaling “1” if state i experiences a lower court ruling in year t , “0” if there is no court ruling.

In the equation, POP represents the population (in millions) of state i in year t . The state’s average per pupil expenditure is represented by $\text{SPENDING}_{i,t}$ in state i during year t . The covariate $\% \text{NONWHITE}_{i,t}$ represents the percentage of state i ’s population in that is non-white in year t . The $\text{CITIDEOLOGY}_{i,t}$ is the Berry et. al (1998) citizens’ ideology score in state i during year t . Finally, the $\% \text{NEIGHBORS}_{i,t}$ covariate represents the percentage of states bordering state i that have experienced a lower court adequacy decision prior to year t .

A detailed discussion of findings is provided in the following section.

Findings & Interpretations

This discussion of findings begins with a description of the original dataset collected for the study and includes tables that identify the sources of data and comparisons of the covariates. The results of the two best-fitting models are presented along with possible interpretations for the findings implied by the models’ results.

COMPARING STATES IN THE DATASET

The original dataset constructed for these analyses contained one observation for each state for each year of the study, beginning with 1987 and ending with 2004. Each observation is referred to as a state-year. Each state-year observation reports values for the dependent and independent variables. The list of independent variables and their sources is contained on Table 4.1 below.

A survey of the independent variables indicates considerable variability in the observations across states and across time. Tables 4.2 and 4.3 below provide a description of the variables for 1987 and 2004, respectively. During each year of the 17-year study period, the least populated state was Wyoming, while California was the most populated state. The amount of education funding provided by local revenue in 1987 ranged from a low of less than one percent in Hawaii to a high of more than 90 percent in New Hampshire during that same year. In 2004, Hawaii still had the lowest amount of local revenue at almost 2 percent, but the highest proportion of local revenue had shrunk to about 63 percent in Nevada.

The average expenditures per pupil were lowest in Utah during 1987 at \$2,410 per pupil while expenditures in Alaska that year were highest at \$8,842 per pupil. In 2004, Utah again had the lowest expenditures at \$5,287 per pupil, while Connecticut had the highest expenditures at \$12,014 per pupil.

Measures of the social context included the percentage of a state's population that was school-aged and the percentage of the population that was aged 65 or older. In 1987, the lowest proportion of school-aged children was found in Massachusetts, where just under 16 percent of the population fell into that age category. By contrast, nearly 27 percent of Utah's residents were school-aged that same year. In 2004, the lowest proportion of school-aged children was found in West Virginia, while the highest

TABLE 4.1

List of variables

Variable	Source
Population of state	U.S. Census Bureau ^a
% of local revenue in education spending	U.S. Census Bureau
Amount of average spending per pupil (\$)	U.S. Census Bureau
% of the state's population that is school-aged	U.S. Census Bureau
% of the state's population that is 65 or older	U.S. Census Bureau
% of the state's population that lives in urban areas	U.S. Census Bureau
% of the state's population that is non-white	U.S. Census Bureau
% of the state's population that holds high school diploma	U.S. Census Bureau
SAT index score	U.S. Census Bureau ^b
Institutional and citizens' ideology scores	Berry et. al. ^c
Average per capita income (\$)	U.S. Census Bureau
Regional adoption index	Calculated by author ^d

^aData were reported in various issues of the Statistical Abstract of the United States, published by the U.S. Census Bureau.

^bThe SAT data used to create this index were reported in various issues of the Statistical Abstract of the United States.

^cScores were obtained from the Inter-University Consortium for Political and Social Research website at <http://www.icpsr.umich.edu>.

^dThe regional adoption index indicates the percentage of the neighboring states that have experienced a state district court ruling on school finance adequacy.

TABLE 4.2.

Comparison of independent variables, 1987

Variable	State	Low	State	High
Population (in millions)	Wyoming	0.48	California	27.78
% of local revenue	Hawaii	0.1%	New Hampshire	90.7%
\$spending per pupil	Utah	\$2,410	Alaska	\$8,842
% school-aged	Massachusetts	16.2%	Utah	26.5%
% 65 or older	Alaska	3.6%	Florida	17.8%
% living in urban areas	Idaho	19.6%	New Jersey	100%
% non-white	Vermont	1.9%	Hawaii	72.1%
Institutional ideology score	Arizona	6.9	Massachusetts	93.5
Citizen ideology score	Idaho	26.0	Massachusetts	89.1
Average per capita income	Mississippi	\$10,802	Connecticut	\$21,741

TABLE 4.3

Comparison of independent variables, 2004

Variable	State	Low	State	High
Population (in millions)	Wyoming	0.50	California	35.48
% of local revenue	Hawaii	1.7%	Nevada	62.8%
\$ spending per pupil	Utah	\$5,287	Connecticut	\$12,014
% school-aged	West Virginia	16.0%	Utah	21.8%
% 65 or older	Alaska	6.3%	Florida	17.0%
% living in urban areas	Vermont	27.8%	New Jersey	100% ^a
% non-white	Maine	3.6%	Hawaii	76.5%
Institutional ideology score	Idaho	5.4	Maryland	97.5
Citizen ideology score	Kentucky	8.5	Vermont	95.8
Average per capita income	Mississippi	\$23,343	Connecticut	\$43,292

^a The state of Delaware was also 100% urban in 2004.

proportion was again found in Utah, though school-aged residents had dropped to about 22 percent of the population.

The proportion of citizens who are aged 65 or older was changed very little across the study period. The lowest proportion of citizens who are aged 65 or older was found in Alaska, where senior citizens have made up 3.6 to 6.3 of the population over the study period. Likewise, the highest proportion of senior citizens was found in Florida for each year of the study, ranging from a low of 17 percent in 2002 to a high in 1986 of almost 19 percent.

Other indicators intended to reflect the social context of each state included indicators related to its urbanicity and diversity. The state with the lowest proportion of its citizens in urban areas was Idaho during 1987, when fewer than two percent of its population lived in cities or towns. That same year, 100 percent of the New Jersey population lived in an urban area. While Vermont's non-white population hovered around two percent in 1987, the population of Hawaii was 72.1 percent non-white citizens. On the mainland, half of New Mexico's citizenry was non-white. After 17 years, little had changed in the composition of these states.

Measures of educational attainment also showed variation between states. In 1987, Utah had the lowest proportion of high school diploma holders while Wisconsin reported the highest proportion of diploma holders. Seventeen years later, Tennessee had the lowest proportion of residents with diplomas, while North Dakota had the most. The lowest score on the SAT index constructed for the study in 1987 was found in Mississippi and the highest score that year was observed in Connecticut. In 2004, Mississippi again had the lowest index score, but New Jersey had slipped slightly ahead of second-place Connecticut.

Political ideology scores, particularly those for institutions, showed the widest variance between high and low scores. In 1987, Arizona had the lowest institutional ideology score while Massachusetts had the highest. Seventeen years later in 2004, Idaho ranked lowest on the institutional ideology score while Vermont ranked highest. The widest gap occurred in 1995 when Montana and Utah both had institutional ideology scores of 0.0, while Hawaii's institutional ideology score was 96.9. In 1987, Idaho ranked lowest on the citizens' ideology measure, while Massachusetts ranked highest. In 2004, Kentucky had the lowest citizens' ideology score while Vermont had the highest.

The lowest per capita income in 1987 and 2003 (the last year for which data were available) was observed in Mississippi and the highest per capita income for both years was in Connecticut.

After summarizing and comparing the data, logistical regression analyses were carried out on data sets coded for each of the various time intervals. A comparison of the two best-fitting models is found in Table 4.4 below. While neither of the models produced strongly explanatory results, comparisons of deviance using likelihood ratio tests provided weak evidence that these models are more explanatory than either null or full models for each dataset. Using the 3-year interval data, the comparison of the null model with the full model produced an unimpressive p-score of .64. By contrast, a comparison of the null model to the best fitting model produced a p-score of 0.11, providing weak evidence that the model has some explanatory power.

Using the peak adoption interval data, the comparison of the null model with the full model produced a p-score of 0.53. The comparison of the peak adoption model to the null model indicated an improvement of the p-score to 0.12, providing additional, albeit weak evidence of the model's explanatory power. Though none of the covariates produced strongly significant results, the covariate measuring expenditures per pupil had

TABLE 4.4

Comparison of best-fitting models

Variables	3-year intervals			Peak adoptions		
	Odds-ratios	<i>p</i>	Std Error	Odds-ratios	<i>p</i>	Std Error
Population (per 1,000,000)	1.053	0.13	0.036	1.054	0.12	0.036
Spending/pupil (in \$1,000s)	1.392 *	0.04	0.221	1.401 *	0.04	0.266
% of non-white population	0.043	0.12	0.087	0.048	0.14	0.098
Citizen ideology index	0.777	0.13	0.131	0.757	0.10	0.130
% neighboring adopters	0.191	0.11	0.198	0.228	0.14	0.230
AIC	244.662			246.033		
BIC	294.372			291.225		
Log L	-111.331			-113.017		
Likelihood ratio tests	Model χ^2	<i>p</i>		Model χ^2	<i>p</i>	
Null model vs. full model	636.75	.64		647.84	.53	
Degrees of freedom	11			10		
Null model v. current model	9.00	0.11		8.74	0.12	
Degrees of freedom	5			5		

the only significant p-score ($p < .05$) in the analyses of both datasets. Selection of this covariate was based on the hypothesis that depressed expenditures on education might drive the demand for additional spending on education, and thus the likelihood of a court decision on adequacy. In a completely unexpected finding, these models indicated that for each increase of \$1,000 in per-pupil expenditures, a state is 39 - 40 percent more likely to experience a lower court decision related to questions of adequacy. In other words, as a state spends more on education, it becomes more likely to experience a court decision. The 3-year interval model produced a p-score of 0.043 and the peak adoption model produced a p-score of 0.048. While not a particularly strong finding, it compares well to the p-scores for the other covariates, which range from 0.10 to 0.14.

None of the other covariates in the model produced statistically significant results. Both the 3-year interval and peak adoption models indicated that for every increase in a state's population of one million people, there is about a five percent greater chance that the state will experience a lower court decision on adequacy during one of the spells under observation. Because the findings lack statistical significance, additional analysis would be needed to determine whether growing populations actually influence the adoption of adequacy-based school finance policy.

Model results hint that growth in the non-white population may have a dramatic dampening effect on the likelihood of a lower court decision. In the 3-year interval model, the risk of a lower court decision on adequacy fell by almost 96 percent for each percentage increase in the state's non-white population over the three year period. In the peak adoption model, the risk of a lower court decision on adequacy fell by 95 percent for each percentage increase in the state's non-white population over an interval. While not statistically significant, this finding provides a very intriguing direction for future exploration.

For each ten-point increase in the citizens' ideology score, the risk of a lower court decision on adequacy fell by almost one-quarter. In the peak adoption model, this measure produced a p-score of 0.10, providing very weak evidence that the more liberal the state's citizenry, the less likely there will be an adequacy decision in that state. Conversely, the more conservative the state's citizenry, the more likely there will be an adequacy decision. While this measure lacks strong statistical significance in the present model, this finding indicates an opportunity for further investigation.

Finally, the proportion of neighboring states that have experienced court decisions may have some influence on adoption, but this covariate also produced an unexpected finding. In both models, as the proportion of neighboring states with an adequacy decision grows, the risk of a state experiencing an adequacy decision falls substantially. The finding is unexpected because other adoption models using event history analysis have found that neighboring state adoptions have a positive influence on the likelihood of adoption (Mooney, 2001a; Berry & Berry, 1990). However, Mooney (2001) has also demonstrated that neighboring states can have a negative influence, and this finding might reflect such a dynamic.

Conclusion

The purpose of this research was to determine whether there were common factors among states that experienced adequacy decisions and those that have not, using a method that would account for changes in covariates over time. The event history analysis approach was specifically selected for its ability to account for changes in the state's economic, political, educational, and social contexts over time.

A series of analyses of lower court decisions and contextual data produced two models with weak evidence that they may hold some explanatory power. While the

models used different interval lengths to account for the passage of time, they produced similar estimates, including unexpected results for several of the measures. The only significant finding indicated that the more states spend on education, the more likely they are to experience a lower court decision concerning adequacy. However, the statistical significance of this finding was relatively weak at $p < .05$. None of the other covariates produced statistically significant findings. The following chapter discusses the findings in terms of the research question, then considers the implications for the present study and future research as well as prospective policy development.

CHAPTER FIVE: IMPLICATIONS AND CONCLUSION

Overall, these analyses produced many outcomes that were not expected at the outset of the study. Though unexpected, these outcomes are informative to future research on the development of school finance policy, particularly as it relates to school finance litigation on adequacy. This concluding chapter discusses the implications and conclusions of the current study in terms of the research question it was designed to answer. The chapter begins with a discussion of the critical factors in adequacy-based school finance policy, and continues with suggestions for strategic modifications to the study design. Next, the implications of these findings for school finance policy development are considered before closing remarks contemplate the future of school finance litigation.

Research Question: Identifying Critical Factors

Research Question: What are the critical factors that influence citizens to bring forward adequacy-based school finance claims resulting in decisions by state lower courts?

The study findings identified changes in expenditures per pupil, population, the percentage of a state's non-white population, citizens' ideology, and the percentage of neighboring states that had experienced a lower court decision on school finance adequacy as factors that may influence policy adoptions. While the selection of covariates was intended to identify factors that had a positive effect on policy adoptions, the findings hint that some of the covariates may have a negative effect. The following discussion highlights the findings and offers possible interpretations.

EXPENDITURES PER PUPIL

The only significant and one of the most unexpected findings was the relationship between expenditures per pupil and the likelihood of a lower court adequacy decision. This covariate was expected to reveal that low per pupil expenditures create a demand for a lower court decision, a hypothesis shared by other researchers, including Swenson (2000) and Lundberg (2000). Instead, the results for both models in the current study suggest that for each increase of \$1,000 in per pupil expenditures, a state was 40 percent more likely to experience a lower court adequacy decision ($p < .05$). This unexpected finding raises questions about the relationship between previous court decisions and per pupil expenditures.

One possible explanation for this finding may be the convergence of the established correlation between school finance equity litigation and increased per pupil spending (Murray, Evans & Schwab, 1998; Salmon & Alexander, 1990) combined with the history of school finance policy that has resulted in states experiencing a court decision related to equity prior to a court decision related to adequacy. While higher spending in states that experience adequacy decisions may be an artifact of historical school finance policy development (i.e., the state is likely to have previously experienced equity litigation that increased education spending), another possible explanation may be that adequacy litigation is a reaction to increased spending, particularly if the findings on the citizens' ideology measure that found a positive relationship between conservatism and adequacy litigation are indeed related.

Further investigation of whether high spending is a causal factor in determining whether litigation will develop within a state is an interesting topic for future investigation. Such future investigation might also include a further analysis of the expenditures within a state in order to determine the variance in spending between

districts. Wide disparities between district expenditures within a state have played an important role in school finance litigation, a dynamic that may be confounded by the use of average expenditure data.

POPULATION

The population measure was one of the only variables in the analyses that produced expected outcomes. At least one early study on policy diffusion found that states with larger populations tended to adopt new policies sooner than states with smaller populations (Walker, 1969). This trend also proved true in the current study, which found that for each increase in a state's population of one million residents, the state was five percent more likely to experience a lower court decision on adequacy. While the covariate produced the expected outcome, the finding was not statistically significant.

NON-WHITE POPULATION

Another unexpected finding of this study was the weak evidence that growing proportions of non-white populations in a state might have a strong dampening effect on the likelihood of lower court decisions related to adequacy. Conversely, the inclusion of this covariate was based on the assumption that increases in the non-white population would have a positive influence on the likelihood of a lower court decision related to adequacy, an assumption shared by other researchers including Lundberg (2000) and DeMoss (2001) and supported by the publications of advocates like Peter Schrag (2004). While this perception is commonly held, neither Lundberg nor DeMoss found a significant relationship between the relative size of the non-white population and school finance litigation outcomes. The weak and counterintuitive findings in this study suggest the need for further investigation.

CITIZENS' IDEOLOGY INDEX

A third unexpected finding of this study relates to the citizens' ideology index. While the ideological disposition of a state's populace was expected to have some influence on policy adoptions related to school finance adequacy, the original rationale for including the measure was based on the assumption that the more liberal the citizenry, the more likely they would be to support a lower court adequacy decision, especially one favorable to plaintiffs (DeMoss, 2001; Lundberg, 2000; Swenson, 2000). To the contrary, the results of this study indicate that as the liberalism of the citizenry increases, the likelihood of an adequacy decision decreases. These findings are similar to those of Swenson (2000), who found that traditionalistic political culture was positively associated with court decisions that favored plaintiffs. One possible explanation may be linked to the previous finding on per pupil expenditures. Rather than a liberal bent, adequacy litigation may be driven by a more conservative ideology that seeks to curb increasing expenditures on education. This finding might also suggest that as conservatism grows, some portion of the population feels disenfranchised, and their representatives are compelled to seek relief in court. Future efforts to understand this possible relationship between expenditures, political ideology and court decisions might include an investigation of the pleadings in the adequacy cases that have been decided.

THE INFLUENCE OF NEIGHBORING STATES

The last unexpected finding of this study was the influence of neighboring states on the likelihood of policy adoption. While most policy diffusion studies find that states that have adopted a policy are likely to have a positive influence on their neighboring states that have not yet adopted (Walker, 1969; Berry & Berry, 1990, 1992), this study found that adopting states had a negative influence on their neighbors in terms of policy diffusion. In other words, as more of a state's neighbors experienced a lower court

decision related to school finance adequacy, the less likely that state was to experience a decision of its own. While the dynamics behind this possible trend have yet to be explored, one potential explanation may be related to the struggles to identify remedies for problems raised by adequacy litigation due to the lack of common, clear, justiciable standards for defining an “adequate” education. The citizenry and the courts in non-adopting states may be discouraged from engaging in adequacy litigation because of the struggles experienced by their neighboring states faced with such policy decisions, as Mooney (2001a) observed in his study of regional influences on policy diffusion.

Implications for Study Design

This section first reviews issues related to the overall study design, including changes that would accommodate the introduction of different, perhaps more explanatory, covariates by modifying some of the design requirements. Next, specific covariates are reviewed and alternate indicators are considered before moving to the discussion of the implications for school finance policy development.

While the study was originally designed to accommodate annual changes in the policy context over time, the results suggest that observations of the covariates every year may not be necessary. The implication of this finding points to an important opportunity to modify and potentially improve the overall study design. The development of the datasets for these analyses was significantly limited by the study design, which required the availability of covariate measures for each state during each year of the 17-year study period. The study results suggest that it may be sufficient to collect observations of covariates every three to four years for analyzing the development of this policy adoption. Even more significantly, it is possible that by relaxing the requirement for

annual observations, other variables with greater explanatory power might be included in future study designs.

For example, the measures of educational attainment used in this model were less than ideal in terms of their ability to measure the educational attainment of a state's students. While student scores on assessments and graduation rates would be desirable in terms of measuring educational attainment, there are no widely available comparable data on student assessment or graduation rates for the time period covered by the study. The selection of measures for the current study was driven by their availability on an annual basis across the study period. One of the covariates is a U.S. Census measure of the percentage of the population who indicated that they had a high school diploma. This measure is less than ideal in measuring educational attainment in a state because it is not directly tied to the educational system of the state in which a high school diploma holder resides or the quality of education provided by that system nor does it bear any relationship to the size of the population that has had the opportunity for a high school education within a state.

The other measure of educational attainment used in this study is an index based on SAT scores. The use of SAT scores themselves can be problematic, due in part to the vast differences in participation rates among eligible test takers in different states (Winglee, Marker, Henderson, Young, & Hoffman, 2000).

In an effort to correct for differential participation rates, the index created for this study weights the combined average math and reading scores of each state by the percentage of eligible test takers. Again, the result is not ideal because it does not provide a representative measure of the student population, but it does produce a measure that can be obtained for each state across the 17-year period.

By reducing the need for the annual observations, future research efforts might take advantage of different measures of educational attainment that were not suitable for the current study. One example might include the new graduation rate measures recently developed by researchers in conjunction with the National Center for Education Statistics. They have developed comparable measures of graduation rates for recent years that can be used by other education researchers in cross-state comparisons (Winglee et al, 2000).

Another opportunity to improve the study design involves the introduction of static measures. Because the study design was restricted to measuring covariates that were anticipated to vary across the study time period, no static measures were introduced. The exclusion of static measures may have unnecessarily reduced the explanatory power of the model. For example, many researchers have hypothesized that the way in which judges are selected has an influence on the types of decisions they render (DeMoss, 2001; Lundgren, 2000; Swenson, 2000). However, inclusion of such a measure for state lower courts proved to be a methodological challenge, as described in the Limitations section of Chapter One. As a result, no variables were included to indicate how a state selects its judges. If the selection of judges is influential in the development of policy, the study design might be improved by incorporating a measure reflecting the selection of judges. This measure might also be used to explore further the cyclical adoption periods observed in the current study by testing relationships between adoption and election cycles.

Other static measures that could be used to improve the explanatory power of the model would include measures related to the existence of key policy actors and advocacy groups. Their omission was based largely on the lack of available descriptive measures for the 17-year time period covered by this study. However, a relaxation of the need for dynamic, annual observations might present another opportunity to incorporate one or

more covariates that describe key policy actors and advocacy groups who are involved in school finance litigation. Whether and how the existence and participation of key policy actors and advocacy groups is influential to policy adoptions related to school finance adequacy is another rich topic for future research.

Some of the study findings pointed to specific covariates that merit further exploration to resolve ambiguous findings among various studies or to confirm the unexpected findings. For example, population size appears to have an influence in the development of adequacy-based school finance policy. However, the relatively weak evidence provided by this study indicates that further testing is needed to determine whether population size is clearly related to adequacy-based school finance litigation.

Another unexpected finding worthy of further investigation is related to per pupil expenditures. This finding is particularly interesting because it is not the first study to find an unexpected relationship between per pupil expenditures and school finance litigation. While the existing evidence indicates that high spending may be a causal factor in adequacy-based school finance litigation, additional research is needed to confirm these findings.

The measure reflecting the influence of citizens' political ideology on adequacy-based school finance litigation produced an unexpected finding that also merits further investigation. While many have assumed that adequacy litigation springs from a liberal ideology, the findings of this study indicate that such litigation is more likely to emerge in a conservative environment. Based on the findings of other studies, this finding is best characterized as ambiguous. Likewise, it also seems possible that there may be interaction between citizens' ideology, key actors, and advocacy groups. Exploration of these possible relationships might provide insight into the dynamics at play in policy adoptions related to school finance adequacy.

Finally, the observation of cyclical adoption periods marked by peaks in policy adoptions is somewhat unusual in the literature on policy diffusion, which typically reports on a single peak in adoptions that falls off after a critical mass of states have adopted the policy of interest, continuing at a slower rate until most states have adopted the policy. The observation of multiple peak adoption periods indicates that policy adoptions related to school finance adequacy may follow a different path of policy diffusion than other types of policies. While this dynamic is not problematic for the methodological approach using event history analysis, it does raise some questions about the traditional assumptions of policy diffusion that underlie the study design.

One possible question for future research would refine the study design to investigate whether there may be differences in the dynamics of policy adoptions between those policies that are influenced by the actions of the legislature, which are the topic of most policy diffusion studies, and those that are influenced by actions of the judiciary, which are the topic of the current study. If there are differences in policy diffusion based on the differences in policymaking bodies, there may be a need to incorporate additional measures that describe those policymakers, such as the static measure reflecting the selection of judges described above.

These options to revise the dataset and to incorporate additional measures into the study design hold the potential for improving the explanatory power of the current model. They also offer opportunities to test new theoretical concepts related to policy diffusion, including potential differences in the diffusion of policies that are driven by various types of policymakers and underlying assumptions about adoption cycles.

Implications for School Finance Policy

This research effort was based on assumptions about the drivers of adequacy-based school finance policy development that appear to have been inaccurate either because these assumed drivers were less important than anticipated or the direction of their influence was unexpected. While further research is needed to confirm these findings, the results indicate that adequacy-based school finance policy development may be taking a different path than the development of equity-based school finance policy.

For example, if adequacy-based school finance litigation is driven by a conservative ideology that seeks to cap education spending, the policy outcomes are likely to be different from the outcomes that resulted from equity-based school finance litigation. Rather than increased spending on education, adequacy-based litigation may slow growth in education spending.

While some have perceived adequacy litigation to serve the best interests of minority students, the findings of this study indicate that growth in the minority population reduces the likelihood that adequacy-based school finance litigation will generate a court ruling. This finding raises questions about whether the best interests of minority students will be protected in school finance policy developments related to adequacy concerns.

Finally, the study findings call into question previous assumptions about the diffusion of policy developments across state lines. When it comes to adequacy-based school finance policy development, it appears that the existence of a lower court decision by a neighboring state is more likely to have a dampening effect than to have a positive influence on the development of a state's school finance policy.

Conclusion

Overall, the model provided some evidence that the context of policy adoptions may be influential in determining the likelihood that a state will experience a lower court decision related to school finance adequacy. While the evidence indicates that the overall findings are weak, the results are similar to other research efforts that have attempted to incorporate contextual covariates in analyses of school finance litigation. Other researchers have also assumed that school finance litigation is driven by the presence of minority populations, triggered by low expenditures per pupil, and supported by liberal policymakers (Swenson, 2000; Lundgren, 2000; DeMoss, 2001). Yet their findings, like those of the present study, do not support those assumptions. While other researchers focused on case outcomes and did not limit their selection of cases to those involving adequacy-based claims, they also found similar unexpected empirical relationships between case outcomes and the contextual indicators reflecting the size of the minority population, the influence of liberal policymakers, and expenditures per pupil.

Collectively, these findings suggest that it may be time for researchers who investigate school finance-related policy issues to reconsider, and perhaps revise, some of the expectations and assumptions that underlie their investigations. For example, equity litigation led to an increase in overall education expenditures in most states, particularly in those states experiencing court decisions (Murray, Evans & Schwab, 1998; Salmon & Alexander, 1990). Based on this experience, researchers have tended to assume that low per pupil expenditures are a trigger for school finance litigation, yet recent findings, including those reported in this study, indicate that litigation focusing on adequacy claims may be charting a different course.

Researchers have also tended to assume that school finance litigation is related to advocacy on behalf of minority populations, yet there seems to be some evidence of an inverse relationship between the size of the minority population and the likelihood of school finance litigation. Further exploration of this dynamic is needed to understand this trend. While this finding may indicate that minority populations are less likely to engage in litigation, it might also be a reflection of inequitable access to or representation in the court system by minority populations.

The present event history analysis sought to predict trends in school finance policy development related to considerations of adequacy, an issue of growing interest to school finance scholars, political scientists, policymakers, and to those responsible for the delivery of education at the local level. This growing concern springs from increasing pressure to achieve high student performance driven by the accountability movement and a shift in the focus of school finance reformers from equity to adequacy, a relationship that will continue to influence the development of school finance policy.

This statistical analysis of state lower court decisions attempted to provide a contextual picture of school finance policymaking as it relates to the question of adequacy in school funding. This dynamic, contextual model of school finance policymaking revealed some potentially intriguing relationships between policy contexts and adequacy-based school finance litigation and charted new directions for the further investigation of school finance policy development in an era of accountability and change.

Appendix I: Data Sources

Year	Total population (BEA-Census)	% Urban (Census)	% Non-White (Census)	% Over 65 (Census)	Per capita disposable income (Census)	Inst (Berry & Berry)	Citi (Berry & Berry)
1988	1988	1988	1990	1988	1988	1988	1988
1989	1989	1988	1990	1989	1989	1989	1989
1990	1990	1990	1990	1989	1990	1990	1990
1991	1991	1990	1990	1991	1991	1991	1991
1992	1992	1992	1992	1992	1992	1992	1992
1993	1993	1992	1992	1993	1993	1993	1993
1994	1994	1994	1994	1994	1994	1994	1994
1995	1995	1994	1994	1995	1995	1995	1995
1996	1996	1996	1997	1996	1996	1996	1996
1997	1997	1996	1997	1997	1997	1997	1997
1998	1998	1998	1998	1998	1998	1998	1998
1999	1999	1998	1999	1999	1999	1999	1999
2000	2000	2000	2000	2000	2000	2000	2000
2001	2001	2000	2000	2000	2001	2001	2001
2002	2002	2000	2002	2002	2002	2002	2002
2003	2003	2000	2002	2003	2003	2002	2002
2004	2003	2000	2002	2003	2003	2002	2002

Appendix I: Data Sources - Continued

Year	% Gradrate (NCES - Digest)	% School Age (Census)	SAT (Census)	% HS Grad (Census)	Perpupil\$ (Census)	% Local Revenue (NCES)
1988	1988	1988	1988	1990	1989	1988
1989	1989	1989	1989	1990	1989	1989
1990	1990	1989	1990	1990	1990	1990
1991	1991	1991	1991	1990	1991	1991
1992	1992	1992	1992	1990	1992	1992
1993	1993	1993	1993	1990	1993	1993
1994	1994	1994	1994	1990	1993	1994
1995	1995	1995	1995	1990	1995	1995
1996	1996	1996	1996*	1990	1996	1996
1997	1997	1997	1997	1990	1997	1997
1998	1998	1998	1998	1990	1998	1998
1999	1990	1999	1999*	1990	1999	1999
2000	2000	2000	2000	2000	2000	2000
2001	2001	2000	2001	2000	2001	2001
2002	2002	2002	2002	2000	2002	2002
2003	2003	2003	2003	2002	2003	2003
2004	2003	2003	2003	2002	2003	2003

*Used percent takers from prior year to calculate SATSC; SATSC = Verbal score + math score x % takers

Appendix II: Two-year Interval Dummy Variable Coding

	d1	d2	d3	d4	d5	d6	d7	d8	d9
1987	1	0	0	0	0	0	0	0	0
1988	1	0	0	0	0	0	0	0	0
1989	0	1	0	0	0	0	0	0	0
1990	0	1	0	0	0	0	0	0	0
1991	0	0	1	0	0	0	0	0	0
1992	0	0	1	0	0	0	0	0	0
1993	0	0	0	1	0	0	0	0	0
1994	0	0	0	1	0	0	0	0	0
1995	0	0	0	0	1	0	0	0	0
1996	0	0	0	0	1	0	0	0	0
1997	0	0	0	0	0	1	0	0	0
1998	0	0	0	0	0	1	0	0	0
1999	0	0	0	0	0	0	1	0	0
2000	0	0	0	0	0	0	1	0	0
2001	0	0	0	0	0	0	0	1	0
2002	0	0	0	0	0	0	0	1	0
2003	0	0	0	0	0	0	0	0	1
2004	0	0	0	0	0	0	0	0	1

Appendix III: Three-year Interval Dummy Variable Coding

	d1	d2	d3	d4	d5	d6
1987	1	0	0	0	0	0
1988	1	0	0	0	0	0
1989	1	0	0	0	0	0
1990	0	1	0	0	0	0
1991	0	1	0	0	0	0
1992	0	1	0	0	0	0
1993	0	0	1	0	0	0
1994	0	0	1	0	0	0
1995	0	0	1	0	0	0
1996	0	0	0	1	0	0
1997	0	0	0	1	0	0
1998	0	0	0	1	0	0
1999	0	0	0	0	1	0
2000	0	0	0	0	1	0
2001	0	0	0	0	1	0
2002	0	0	0	0	0	1
2003	0	0	0	0	0	1
2004	0	0	0	0	0	1

Appendix IV: Five-year Interval Dummy Variable Coding

	d1	d2	d3	d4
1987	1	0	0	0
1988	1	0	0	0
1989	1	0	0	0
1990	1	0	0	0
1991	1	0	0	0
1992	0	1	0	0
1993	0	1	0	0
1994	0	1	0	0
1995	0	1	0	0
1996	0	1	0	0
1997	0	0	1	0
1998	0	0	1	0
1999	0	0	1	0
2000	0	0	1	0
2001	0	0	1	0
2002	0	0	0	1
2003	0	0	0	1
2004	0	0	0	1

Appendix V: Peak Adoption Interval Dummy Variable Coding

	d1	d2	d3	d4	d5
1987	1	0	0	0	0
1988	1	0	0	0	0
1989	1	0	0	0	0
1990	0	1	0	0	0
1991	0	1	0	0	0
1992	0	1	0	0	0
1993	0	1	0	0	0
1994	0	1	0	0	0
1995	0	0	1	0	0
1996	0	0	1	0	0
1997	0	0	1	0	0
1998	0	0	1	0	0
1999	0	0	0	1	0
2000	0	0	0	1	0
2001	0	0	0	1	0
2002	0	0	0	0	1
2003	0	0	0	0	1
2004	0	0	0	0	1

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