WHY PERFORMANCE PAY?
AN ANALYSIS OF THE PREDICTORS
OF STATE PERFORMANCE-PAY POLICY ADOPTION
by
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Why Performance Pay? An Analysis of the Predictors of State Performance-Pay Policy Adoption

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ABSTRACT

This study employed binary logistic regression and the methodological approach of adoption and innovation research to explore predicting factors in the adoption of performance-pay policy throughout the United States. Less than half the state education departments in the United States have adopted performance-pay policies. What influences the statewide adoption of performance pay? Policymakers argue that performance-pay programs encourage the recruitment and retention of the best employees, and programs such as the Race to the Top and other policy initiatives are intended to encourage the adoption of performance-pay programs. Interestingly, despite these federal financial incentives, many states choose not to adopt pay for performance. This study focuses on the external diffusion-related factors, such as the influence of federal incentives and similar policy adoption by neighboring states, as well as the internal determinants, such as the political and economic environment, the degree of need, the strength of the teachers union within the state, and the innovative tendencies of the state. Of the seven tested variables, the only statistically significant predictor affecting the model is teachers unions, which revealed a decrease in the likelihood of adoption by 17%. This study fills the research gap by identifying and exploring possible explanations for performance-pay policy adoptions by state education programs. The implications of the results are discussed based on these seven potential variables.
DEDICATION

For Julian, Gennessee, and Dellany.

My greatest heroes. Your strength and character inspire me every minute of every day.

Remain forever true to our family compass:

Faith, Humanity, Humility, and Integrity.
ACKNOWLEDGEMENTS

I cannot even begin to give credit where credit is truly due for the completion of this dissertation. The journey was not without strife, struggle, change, and doubt—but I am thankful to my Julian, Gennessee, and Dellany, who stood by and encouraged me, even when I was less than deserving. Seeing them overcome their own struggles and challenges in order to keep their dreams in focus renewed the drive and ambition I needed to attain my own.

Much gratitude to Eliani, who has been a pillar of strength emotionally and intellectually—she is such an inspiration in every way. Thanks to my incredible siblings, who wanted this for me even more than I wanted it for myself at times. They never ceased believing in me and continuously remind me of my true potential. Thank you to my incredible mentor, Steven, who was there for me personally and intellectually—and truly believes that I have something incredible to offer the world of education.

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CHAPTER 1

INTRODUCTION

Society is calling for change in public organizations, and schools are no exception. Consequently, there is great pressure on politicians and public organizations at all levels to initiate and secure measures that will reinstate public confidence by means of accomplishing public goals. An emphasis on results is necessary to regain the confidence of the public in the nation’s education system (Julnes & Holzer, 2001), and performance pay is one policy believed to solve the issue of providing results that meet many of these system goals. Performance pay, also commonly called “merit pay,” is a financial reward given to employees according to an organization’s perception of the individual employee’s merit (Chamberlain, Wragg, Haynes, & Wragg, 2002) and is structured to identify and reward teachers who lead to significant gains in student achievement (Balch & Springer, 2015; Goldhaber, 2009; Podgursky & Springer, 2007). Although economists draw a distinction between “performance-related pay” and “merit pay” insofar as how funds are distributed (merit pay commonly refers to compensation in professional occupations, and performance pay commonly refers to compensation for manual work), in the education field, professionals have used both terms to describe the same concept (Chamberlain et al., 2002). For the purposes of this study, the terms performance pay, merit pay, incentive pay, and pay-for-performance (PFP) are synonymous.

President Barack Obama’s Secretary of Education, Arne Duncan, made his advocacy for performance-pay policy evident in his 2009 address to the National Education Association (NEA):
School systems pay teachers billions of dollars more each year for earning PD [professional development] credentials that do very little to improve the quality of teaching. At the same time, many schools give nothing at all to the teachers who go the extra mile and make all the difference in students’ lives. (Duncan, 2009, para. 33-34)

It was Duncan’s aim to extend performance-pay policy adoption throughout the nation during his time as education secretary, as apparent in the allocation of federal education monies through the competitive Race to the Top (RttT) program and his frequent public declarations advocating for performance pay during his time in office. Furthermore, many fellow proponents who were likewise ardent about performance pay as a means to improve education policy backed his stance, including the National Center on Teacher Quality (NCTQ). In its annual state yearbook, the NCTQ includes state performance-pay policies as an element of the overall state grade given to each state based on the health of the state’s education system (Jacobs et al., 2015). However, as passionately as Duncan advocated for the adoption of performance-pay policy, the opposition was equally committed. According to NEA’s Director of Collective Bargaining and Member Advocacy, Bill Raabe (2009), performance pay is not a viable option for education reform. Raabe argued that paying teachers based on student test scores, subjective evaluations, or hard-to-staff subjects does little to improve the practice of teaching or student learning and is not an effective method of teacher compensation. These polarized views of the policy demonstrate the intense political and economic debate about teacher compensation and education reform.
Within this contentious framework, performance pay was and continues to be a hotly debated topic among education policymakers at the federal, state, and even district levels. Although the nature and history of that debate is fascinating and relevant, this study does not advocate a position, nor does it focus upon the implementation, outcomes, or maintenance of performance pay. Rather, it looks at the factors that may influence a state to adopt statewide performance-pay policies as indicative of trends and the likelihood of its fate. Performance-pay policy adoption has experienced uneven success rates due to nonadoption or abandonment soon after adoption, and understanding the cycles within education reform around this issue is essential to effective future policy implementation. Regardless of the varying views about performance pay to incentivize teachers, in order for the policy to reach a maintenance stage of implementation, policymakers would do well to understand the factors contributing to any state’s decision making about it.

**Teacher Compensation Practices in America**

Three major shifts in teacher compensation have occurred since the establishment of American formal schools in the 1800s. The first form of teacher pay, “boarded ‘round,” involved the teacher taking turns boarding at each of the pupils’ homes in lieu of pay (Protsik, 1995). This practice was very common during the early to mid-1800s and served the purpose of providing compensation for rural teachers as well as holding the teachers (virtually all women) to a high level of moral accountability, which constituted a large portion of their job responsibility.

As communities expanded and the need for larger schools arose, schools began merging to create larger districts with more centralized administrations and standardized
curricula. This growth led to a formalization of the teaching profession, after which official certification became a requirement in most schools (Protsik, 1995). Along with the certifications came more official and consistent salary schedules. Early salary schedules, which included salaries determined by gender, years of experience, race, grade level taught, and the superintendent’s subjective value of merit, were referred to as “grade-based” (Protsik, 1995).

The opinions and perceptions held by the highest level of administration influenced the beginning of the first official performance pay. Consequently, significant discrepancies existed among male and female teachers and teachers of color, despite the more formal salary schedule that provided for a consistent wage (Protsik, 1995). Ultimately, the exploitation of African Americans and women in the profession led to the single-salary schedules used by over 95% of school districts at the start of the 21st century (Podgursky & Springer, 2007). Since the middle of the 19th century, performance-pay salary programs have challenged single-salary schedules, with some of the former officially implemented as early as 1918 (Murnane & Cohen, 1986).

In the 20th century, American schooling was often invoked as the best solution to social and economic ills (Tyack & Cuban, 1995). On one hand, putting so much faith in the power of education has led to the most comprehensive public-school system in the world, and on the other hand, caused disillusionment with and generated blame toward schools when they did not reach the unobtainable (Tyack & Cuban, 1995). The consequence of these unrealistic expectations, which have evolved over time, has been perpetual education policy reform.
Historically, there have been two approaches to education reform: The first claims that education reform is evolving and ongoing, with changes most often contributing to progress (yet sometimes resulting in regress). The other approach embraces the idea that education reform is a repetitious process in which policies simply cycle in and out of trend (Tyack & Cuban, 1995). Both approaches are evident in the research regarding policy adoption, but what is certain is the persistent belief that states ought to adopt federally suggested or proposed education initiatives in response to voters’ demands as a way to meet the educational needs of generations of children. Whereas shaping and funding education were once specifically local concerns, an era of accountability and cycles of politically motivated reform have taken control out of the hands of localities and placed it into the hands of the state and federal government (McLendon & Cohen-Vogel, 2008).

The federal government spurs these types of adoption measures primarily through financial incentives that are often too appealing for states to pass up. For instance, states that were willing to commit to federally supported initiatives were eligible to receive funding through the 2009 RttT Fund. However, some researchers and education reform activists have expressed concern that states are adopting such policies for budgetary reasons and not for the betterment of schools (LaVenia, Cohen-Vogel, & Lang, 2015). This skepticism about policy adoption within a district can influence the fidelity of the program’s implementation. It seems apparent that federal inducements in the form of incentives play a role in policy adoption, but if those were the only contributing predictors, then all states would readily adopt federal programs, which is not the case.
Podgursky and Springer (2011) have argued, “An efficient teacher compensation structure is one that is designed to recruit, retain, and motivate the highest quality workforce for any given level of expenditure” (p. 166). Therefore, compensation reform, in particular, has sparked interest in federal programs that define measured goals, as evidenced by the 28 points on the RttT application dedicated solely to the terms of performance-pay compensation programs. Notably, in the 2009 to 2010 applicant pool, all the winning state applicants for RttT funds, except for Illinois, include some type of performance-pay language (U.S. Department of Education, 2009) and in the second round, all 36 applicants included some form of PFP language (Raabe, 2009).

In contrast to the standardized pay scale, proponents of merit-based pay argue that it offers more encouragement for study and personal advancement, spurs the most efficient to rise, retains the best teachers, and gives school managers better returns on their fiscal investments (Chamberlain et al., 2002; Johnson, 1984; Yuan et al., 2012). Traditional uniform salary scales do not provide a financial reward for superior performance, nor do they have a financial penalty for inferior performance (Murnane & Cohen, 1986; Podgursky & Springer, 2011). Opponents argue that performance pay encourages cheating or teaching to the test (Baker, 2002; Fryer, 2013), causes dissension between teachers and administrators (Murnane & Cohen, 1986), decreases a teacher’s intrinsic motivation, and leads to harmful competition (Fryer, 2013; Yuan et al., 2012). Despite the conflicting arguments for and against performance pay, the policy continues to resurface in education reform debates and is therefore worthy of analysis.

Evidence of a troubled education system prompted the Regan Administration’s landmark 1983 publication, A Nation at Risk, states:
We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. (Gardner, 1983, pp. 5)

The report claimed that 13% to 40% of all 17-year-olds at the time were functionally illiterate, scores from the Scholastic Aptitude Test (SAT) were on a 15-year decline, and American students were significantly lagging the scores of students from other industrialized nations on international achievement tests. As a part of the report, the Department of the Navy claimed that at least 25% of its recruits were unable to read and understand written safety instruction without remedial work (Gardner, 1983). Those statistics, among many others, prompted more federal control in once state-dominated education policy-making and consequently set states and districts on a path to adopting a variety of policies to meet significant demands. This reorganization led to a merging of education control between the local, state, and federal governments, with more focus on the federal level than ever before, apparent in the adoption of the Bush Administration’s No Child Left Behind Act (NCLB) of 2001, the Obama Administration’s 2009 Race to the Top (part of the American Reinvestment and Recovery Act), and the 2015 replacement of NCLB, Every Student Succeeds Act.

Due to ever-increasing pressure to improve achievement test scores through policies, states and school districts around the nation have scrambled to recruit and retain the best educators in the profession, based on the premise that teacher quality is the single best predictor of student success (Goldhaber, 2002; Hanushek, 2002; Stronge,
Ward, Tucker, & Hindman, 2008). According to Stronge et al. (2008), teacher quality encompasses behaviors that fall within four domains: instruction, student assessment, classroom management, and personal qualities. Although once difficult to determine, Stronge, Ward, and Grant (2011) identified specific classroom practices that characterize high-quality teachers. Recruiting and retaining high-quality teachers is challenging at a time when the supply of teachers is constrained by a decline in enrollment in teacher-education programs, with adequate wages becoming more crucial for attracting and retaining teachers (Allegretto & Mishel, 2016).

This trend has resulted in widespread support of federal education incentives that seek to recruit and motivate high-performance teachers. For example, the 1999 Teacher Advancement Program was expanded in 2006 under the Teacher Incentive Fund and renewed in 2009 under the American Recovery and Reinvestment Act, all focusing on teacher recruitment and retention. In addition, in 2012 the government invested $4.3 billion in performance pay as part of the RttT legislation, which has expanded through 2016, with over $70 million designated for “human capital incentives” in education (U.S. Department of Education, 2016).

In business and industry, a model for attracting and retaining the best and the brightest has been to pay employees based on their performance rather than using salary schedules. Following this pattern, some states, like Florida and South Carolina, have implemented entire statewide education performance-pay programs, while other states, like Indiana and Arizona, have state laws that support performance-pay programs but allow each district to decide whether they want to implement the policy. Despite these
conflicting stances on performance pay, there is no shortage of support for such policies at the national and, in many cases, state levels.

Although some districts have adopted performance-pay policy independently of state incentives or preferences, Goldhaber (2010) revealed in the Center for American Progress report that states are more likely to experience successful implementation of performance-pay policies than are smaller districts. The report further argues that states have a greater capacity than do smaller districts to implement the data systems necessary to conduct large-scale evaluations of teacher performance and a corresponding compensation system to ensure program success. Despite this argument for total statewide adoption and the substantial federal financial incentives it could bring, many states have yet to adopt statewide performance-pay policies (see Figure 1).

As Figure 1 indicates, as of 2015 half of the states in the U.S. have some form of performance-pay initiative, and half do not (Washington, DC is the 26th “state”). Although not all states have sustained their programs and performance pay is distributed in different ways, it is worth understanding why some states adopt performance-pay policy while others do not. Although a body of conflicting research has emerged within the literature about the effect of performance pay, there is a notable lack of research studying the predictors of its adoption state by state. These data could have a valuable impact on the nature of future deliberations. The purpose of this study is to examine what motivates a state to adopt performance-pay policies by determining the predictor variables in relation to performance-pay policy adoption.

**Statement of the Problem**

As national education policy continues to shift in the context of changing presidential administrations, international competition, the demands of the workplace, and shifting societal norms and values, states and school districts are clamoring to keep up with the cycles of changing expectations. Those outside influences force districts to engage in constant change to adapt to both new legal standards and the ebb and flow of social beliefs. Performance-pay policy is one aspect of the changing education landscape, with interest in it renewed in the past decade. The empirical research regarding the effectiveness of performance pay adoption continues to expand. For example, a great deal of attention has been devoted to studying the effects of performance pay on student achievement (Figlio & Kenny, 2007; Goodman & Turner, 2010; Lazear, 2003; Richards & Sheu, 1992), teacher retention and recruiting (Clotfelter, Glennie, Ladd & Vigdor, 2008; Hanushek, Kain, & Rivkin, 1999), and on teacher attitudes and job
satisfaction (Lavy, 2009; Marsden & Richardson, 1994; Tomlinson, 2000). This study intends to add to that body of literature through a quantitative analysis of the factors influencing performance-pay policy adoption to shed light upon relationships between factors and adoption.

**Purpose of the Study**

The primary purpose of this study is to reveal predictors of the much-debated adoption of performance-pay policy. Research suggests that teacher quality is the strongest indicator of higher student achievement (Darling-Hammond, 2000; Goldhaber, 2010; Rivkin, Hanushek, & Kain, 2005; Rockhoff, 2004), and the Center for American Progress maintains that compensation is powerful for attracting and retaining the best professionals (Kowal, Hassel, & Hassel, 2008). Interestingly, teacher quality is not clearly defined in the literature except for value-added measures or increases in student achievement scores (Goldhaber, 2015); however, as stated prior, Stronge et al. (2008) identified four domains of instructional behaviors and practices that proved promising in identifying teacher quality, including criteria such as higher-level questioning and fewer incidences of off-task behavior. Furthermore, the link between teacher experience and education credentials and student achievement is weak (Shaker, 2010; Springer, 2009). Therefore, performance pay, a compensation model based on measurable objectives rather than years of experience and level of education, seems like a logical solution to some of the challenges that school districts face today. This study will examine performance-pay policy adoption by assessing seven variables in an effort to isolate the factors most likely to predict the adoption of performance-pay policy at the state level.
Examining the political, economic, and social influences (federal and state) as predictors of performance-pay policy can shed light on the disparities across state adoption of performance-for-pay, revealing the elements contributing to adoption or non-adoption of the policy. That following question guides this study:

- What forces (internal and external) are associated with the statewide adoption of performance-pay policy?

Under what conditions do state departments of education adopt new policies, and what organizational, economic, and political forces influence their decisions? For some, the adoption of performance-pay policy offers a market-based solution to rewarding teacher performance, improving retention, and inspiring quality through competition. This research explores not only diffusion factors, including vertical diffusion from the federal to state level governments and the adoption of similar policy by regional neighbors, but also the influence of the political composition of state governments, the degree of need for policy adoption, the role of interest group influences, the inclination to adopt new policy, and the role of economic factors. Table 1 shows the seven potential predicting variables used in this study to determine the relationship between determinants and the adoption of performance-pay policy.
Table 1

*Table of Variables, Model Questions, and Determinants*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model Question</th>
<th>Determinant</th>
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<tbody>
<tr>
<td>Race to the Top Aspiration</td>
<td>Are states aspiring for the Race to the Top funds more likely to adopt PFP?</td>
<td>Vertical Diffusion</td>
</tr>
<tr>
<td><em>(rttt)</em></td>
<td></td>
<td>Influence</td>
</tr>
<tr>
<td>Regional Adoption <em>(regad)</em></td>
<td>Are states whose regional neighbors have already adopted PFP more likely to adopt it?</td>
<td>Diffusion Influence</td>
</tr>
<tr>
<td>Innovation Score <em>(inn)</em></td>
<td>Are states with a history of higher rates of innovation more likely to adopt PFP?</td>
<td>Innovation Inclination</td>
</tr>
<tr>
<td>Chance for Success Index <em>(success)</em></td>
<td>Does a state’s Chance for Success score have an impact on its inclination to adopt PFP?</td>
<td>Problem Severity</td>
</tr>
<tr>
<td>Republican Party Control <em>(rep)</em></td>
<td>Is the likelihood of adoption affected when the dominant political party in control is the Republican party?</td>
<td>Political Climate</td>
</tr>
<tr>
<td>Education Expenditure <em>(eduex)</em></td>
<td>Does the percentage of a state’s total revenue spent on education have a relationship with adoption of PFP?</td>
<td>Economic Conditions</td>
</tr>
<tr>
<td>Teacher Union Strength Score <em>(tchun)</em></td>
<td>Is the strength of a state’s teachers union associated with the adoption of PFP?</td>
<td>Interest Group</td>
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</table>

This research fills a gap in adoption studies and exposes factors within state education systems for use by federal and state policymakers. It identifies the predictors and the likelihood of performance-pay policy adoption as a solution to the challenges faced by stakeholders at all levels, and it provides a new perspective on what inspires states to embrace federal education reforms. By understanding the variables that influence state governments to adopt federal initiatives voluntarily, policymakers can
approach policy adoption, implementation, and maintenance more effectively, and better understand how to implement change within bureaucracies (Pincus, 1973).

**Research Framework**

The past two decades have led to an expansion in methods and theories about the influences of public policy adoption, methods and theories that have helped to shape this study. Unfortunately, most educational policy studies focus solely on the innovative qualities of the policy rather than examining the factors that predict the likelihood of its acceptance. Studying these factors has potential to expand our understanding of the current education environment and provide insight about the cycle of legislative attempts intent upon improving American schools.

This study used a combined internal determinant framework and diffusion framework, based on the work of LaVenia et al.’s 2015 Common Core State Standards policy-adoption study and Berry and Berry’s 1990 state-lottery-adoption study. The combination of these frameworks explains what leads governments to innovate and adopt something new and encompasses both internal determinants (political, economic, and social environments that provide favorable conditions for adopting certain new policies) or diffusion explanations (policy adoption as attributed to the adoption of states in close proximity or diffusion of ideas between levels of government). Traditional state innovation literature often leaves out either internal determinants or diffusion determinants; however, Berry and Berry (1990) argued that separating the two models ignores the merger of diffusion and internal determinants as possible explanations for policy adoption. It is improbable that a state would adopt a policy simply because its regional neighbors have done so, without considering the political and economic
environment of its own state. Equally, the authors argued, it is highly unlikely that a state would adopt a policy without any influence from regional neighbors or diffusion-related factors.

First published in the middle of the 20th century, the Diffusion of Innovations (DOI) model is based on the premise that adopters of any new idea are categorized into innovators, early adopters, early majority, late majority, and laggards distributed on a bell curve (Rogers, 1983). Furthermore, each adopter’s ability to implement a new policy depends on five components: awareness, interest, evaluation, trial, and adoption. Rogers’ theory has been adapted and adjusted to apply to a variety of studies in the social sciences, medicine, and other public policy fields. DOI proposes a process that begins with increasing adopters’ knowledge of the innovation and ending with a measurement of the decision to adopt or reject. In contrast, the Internal Determinants (ID) theory suggests that the inclination to innovate is determined by the political, economic, and social characteristics that are specific to a context (Berry & Berry, 1990). Taken together, implementation of the DOI model and an analysis of ID can paint a more thorough picture of a state’s inclination to adopt policy. To present a conclusive picture of state policy adoption, the variables reflecting external and internal determinants were chosen selectively.

This study, based on similar work by Berry and Berry (1990), Feiock and West (1983), and LaVenia et al. (2015) was conducted using these two theories of analysis. To encompass both frameworks, this analysis utilizes predictor variables including the influence of federal incentives, regional diffusion, innovative status, problem severity, political factors, economic conditions, and interest groups.
Overview of Methods

Like many classification studies, this study uses binary logistic regression to determine membership of the dichotomous dependent variable PFP adoption. Logistic regression is best suited for this study because time is not a relevant consideration regarding the sensitivity of when and how the policy adoption occurred, and the approach offers flexibility when assessing predicting variables that are not all normally distributed, linearly related, or possessed of equal variance. Essentially, the logistic regression will ask, “Does an independent variable increase the log likelihood of the adoption of performance-pay policy?”

To look at a state’s inclination to adopt PFP policy, the dependent variable data included a merger of two biennial data sets from all 50 states from 2009 to 2011. Each set of biennial data was merged to isolate the states that adopted statewide PFP as of 2011. Presently, 17 states have adopted strong statewide PFP policies, and an additional eight support and encourage the use of PFP among school districts, for a total of 25 states with PFP policy versus only 11 states that had adopted performance-pay policies in 2007 (NCTQ, 2015). Although performance-pay policies in the U.S. education system have been around since the early 1900s, this study will focus on the conditions of the past decade’s education systems and limits the data to the years states were eligible to apply for Congressional allotment of $4.3 billion for RttT, 2009 to 2011.

Assumptions, Limitations, and Threats

Assumptions

This study assumes that performance pay is neither a positive nor a negative solution to the problems faced by state education systems, but rather one possible solution of many to addressing education reform. The aim is not to validate or discredit
the use of the policy but instead to help identify possible casual relationships and predicting variables of policy adoption. The study is subject to selection bias, as the dataset was manually compiled from a variety of sources that were readily accessible. Furthermore, all data were gathered from various individual organizations that utilized their own method of collecting data, which is also subject to bias. Efforts to minimize bias include using data from well-known and credible sources and checking the dataset for accuracy during collection and analysis. Chapter 3 provides a detailed explanation of the dataset.

**Limitations**

Because this study focuses on the predicting factors of performance-pay policy adoption at the state level, the sample excluded school districts that adopted the policy individually. Their sovereign decision-making made them ineligible to be included in the sample because this study focused on the changes to state policy only.

Due to the complexities in a state’s policy-adoption process, omitted variable bias was present. Furthermore, the regional grouping of states is subjective and may result in spurious estimates; however, to help alleviate the risk, the study referenced prior research utilizing similar accepted regional groupings.

This study used reports from 2009 and 2011 presenting data compiled by the National Council on Teacher Quality funded by non-government organizations. Therefore, the results of this study are applicable only to compensation policy changes during this time period, and no larger generalizations about previous or future policy changes are warranted. A larger study inclusive of more data would present a complete picture of performance pay in the United States. Furthermore, at the time of this writing,
numerous states are still considering the adoption and rejection of performance-pay policy, demonstrating a need for further research regarding the issue.

**Definition of Key Terms**

Following are definitions for terms used in this study related to performance pay:

- **Adoption.** The enactment of a new policy.
- **Determinants.** Characteristics influencing the adoption of public policy.
- **Diffusion.** The spread of policy ideas.
- **Innovation.** The creation of new policy ideas or agendas.
- **Merit pay.** Another term used to reference performance-related pay. Through performance-pay systems, bonuses (most often monetary, but also in the form of time off, professional development opportunities, or other incentives) are provided for workers who perform their jobs at an acceptable level as measured by specific criteria, or in acknowledgment of outperforming fellow employees on specific criteria.
- **Performance pay.** Performance pay is extra pay added to a base salary, sometimes linked to student outcomes or a set of predefined measurable criteria. Alternative names include merit pay, incentive pay, pay for performance, or alternate compensation.
- **Traditional salary schedule.** A salary schedule based on longevity (years of service) and level of education received; sometimes referred to as a single-salary schedule.
- **PFP.** “Pay-for-performance,” an abbreviation referring to either merit pay or performance pay.
Organization of Study

The organization for the remainder of the study is as follows: Chapter 2 presents an extensive literature review to establish a foundation for this research. The review includes wide-ranging opinions regarding performance pay. Chapter 2 also includes a description and discussion of the theoretical framework guiding this study, Diffusion of Innovation and Internal Determinants frameworks, a history of school reform, the history and effects of performance pay, and, lastly, an analysis of policy studies and literature related to variable selection.

Chapter 3 explains the methodological approach to the study, specifically the application of logistic regression, as well as provides a description of the variables, data sources, and the empirical approach to the analysis. Chapter 4 presents the results from the empirical model, and Chapter 5 includes a summary of the results, with suggestions for future research.
CHAPTER 2
LITERATURE REVIEW

This chapter begins by describing the value of applying the DOI theory in conjunction with the ID theory to present a broad understanding of performance pay adoption. It then sets forth an overview of compensation reform, a review of performance-pay research and performance-pay programs. Lastly, this review provides research and justification with regard to the predicting variables used for analyzing the predictors of state policy adoption.

Diffusion of Innovation and Internal Determinants

Diffusion of Innovation (DOI) theory is a well-known lens for studying public policy adoption (Berry & Berry, 1990; Rogers, 1983; Rogers, 1995). Between 1962 and 1974, empirical diffusion research reports nearly doubled (Rogers, 1983), and the use of the DOI framework for policy-adoption studies continues to remain a standard. Diffusion is defined as the spread of new knowledge, including ideas, practices, or objects (Rohrbach, Graham, & Hansen, 1993) or “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995, p. 5). In social science research, the DOI framework explains what leads governments to innovate or adopt something new (LaVenia et al., 2015).

According to Rohrbach et al. (1993), DOI in a state’s school-policy adoption has four distinct stages:

1. *Dissemination*—a state becomes aware of programs and is encouraged to adopt them.

2. *Adoption*—a state makes a commitment to initiate the program.
3. **Implementation**—teachers or other appropriate personnel deliver the program.

4. **Maintenance**—education organizations are encouraged to continue the use of the program.

This study focuses on the two first stages of the DOI framework, paying particular attention to the actors in the dissemination of the idea, as well as other relevant factors that play into the adoption stage of the framework.

One aspect of the diffusion model is that it attributes policy adoption to the adoption of similar policy by geographically neighboring governments or the diffusion of policy between levels of government (Berry & Berry, 1990). The relationship between adoptions by states and previous adoptions by neighboring states has been assessed by regional influence in many traditional policy-innovation studies (Berry, 1994; Daley & Garand, 2005; Karch, 2007). The evidence supporting the diffusion of policies between states that share borders or within common regions is mixed. Some have found that regional neighbors influence policy adoption (Berry & Berry, 1990; Daley & Garand, 2005), while others (Karch, 2007; LaVenia et al., 2015), discovered no significant relationship. One problem with focusing solely on the proximity of agents with regard to the adoption of policy is that 20th-century communication and transportation technologies have changed and lessened the influence of proximity (Karch, 2007). Berry (1994) argued that the diffusion explanation alone is not adequate to explain the reasoning behind a government’s decision to implement a new policy, as research discovered that single-model explanations—when only the ID model or regional diffusion model were used—produced incorrect results. Diffusion of Innovation studies
have often left out the importance of internal factors that may also influence policy adoption (Berry & Berry, 1990).

Based on Mohr’s (1969) analysis of organizational innovation, regional diffusion cannot be the only explanation for policy adoption and must include economic, social, and political factors. These factors or “internal determinants” include explanations for why state governments innovate in connection to the state’s political, economic, and social environments. Together, application of DOI and ID frameworks can shed light upon the predictors of policy adoption. Figure 2 shows the diffusion determinants related to the DOI framework expanded by the internal determinants related to the ID framework. Chapter 3 provides details regarding all determinants.

*Figure 2. Diffusion of Innovation (DOI) and Internal Determinant (ID) Models Combined*
This study utilizes both models to examine the predictors of performance-pay policy adoption as modeled by Berry and Berry’s (1990) study on state-lottery adoptions, Feiock and West’s (1993) study on the adoption of solid-waste recycling programs, LaVenia et al.’s (2015) study on the adoption of the Common Core Standards, and Mintrom and Vergari’s (1998) analysis of policy networks and innovation diffusion.

**Compensation Reform**

The need for education reform has been a topic of political debate for years, and stakeholders, including legislators, educators, parents, and even students, recognize and feel the strains of the education system. Some of the strains relevant to staffing in education systems include recruiting and retaining quality educators (especially for hard-to-fill positions), increasing standardized test scores, teacher evaluations, tenure, and salaries (Buddin, McCaffrey, Kirby, & Xia, 2007). Additionally, compensation reform has resurfaced as a strategy to enhance academic outcomes (Kolbe & Strunk, 2012; Springer, 2009). Cassidy (2013) stated that hourly wages of teachers and their feelings about work predicted classroom quality and the overall emotional well-being of the classroom, which suggests that compensation is an issue worthy of consideration.

However, compounding the challenge of budgets, student achievement, and teacher hiring and retention, districts are faced with the influence of state and federal mandates in their attempt to address the crisis in American education (McLendon & Cohen-Vogel, 2008).

Although solutions are seemingly difficult to ascertain, one solution that could address some of these staffing concerns is performance pay. Performance pay, long used to motivate employees in the corporate world, has shown promise in the private sector
(Houston, 2000; Ingraham, 1993; Lazear, 2003), as well as in education in places like Kenya, India, Israel, and the United Kingdom (Kingdon & Teal, 2007; Muralidharan & Sundararaman, 2009). It is one solution proposed by U.S. policymakers as a potential answer to school district staffing issues (Duncan, 2009; Johnson, 1984). However, the challenge with any reform measure is that education is a complex system with multiple stakeholders, unequal and poorly observable goals, multitask jobs, and team production, which requires creative policy-making to achieve the vast goals faced by schools (Buddin et al., 2007; Eberts, Hollenbeck, & Stone, 2002). Coupled with the demand for improved test scores is the constraint of limited budgets, which public schools continuously confront. When tackling complicated directives such as these, district administrations apply the best and most fiscally responsible hiring practices, among other measures.

In 1996, the National Commission on Teaching and America’s Future (NCATF) reported that a key to reform teaching would include “developing a career continuum for teaching linked to assessment and compensation systems that reward knowledge and skill” (p. 94). President Clinton affirmed in his 1997 State of the Union address that securing certification from the National Board for Professional Teaching and paying effective teachers a reward is one way to hire and retain the very best teachers (Ballou & Podgursky, 1997). In 2002, the Bush Administration’s No Child Left Behind Act advocated rewarding teachers based on performance, and in 2008, President Obama Administration’s Great Teachers and Great Leaders report recommended that performance pay based on outcomes is the key to improving the U.S. education system (Shaker, 2010). Since the 1980s, there has been a surge of support for performance-pay programs (Cornett & Gaines, 1994; Duncan, 2009).
The Rationale for Performance Pay

Teacher-compensation reform is a longstanding policy issue, and its intent is to improve the quality and performance of the teaching workforce (Buddin et al., 2007; Duncan 2009). Performance pay rewards effective teachers, as opposed to the alternative traditional pay scale (based on level of education and number of years teaching) and are essentially “contests” against predetermined performance standards, where teachers receive awards if their measured performance meets or exceed a certain target (Neal, 2011, p. 2). The rationale behind performance pay is simple—pay teachers competitively, and they will work harder (Atkinson et al., 2009; Booth & Frank, 1999; Chamberlain et al., 2002; Fryer, 2013; Glewwe, Ilias, & Kremer, 2008; Johnson, 1984; Podgursky & Springer, 2007; Woessmann, 2011). The justification for performance pay is that it provides teachers with a direct financial incentive to increase effort, therefore, improving specified student outcomes.

Performance pay creates a sorting effect upon the profession because teachers with greater abilities are attracted to and remain in their positions (Buddin et al., 2007; Lazear, 2003) and helps district employees focus on organization goals or targets (Wragg, Haynes, Chamberlin & Wragg, 2003). It is also valuable for recruiting for hard-to-fill positions and schools (Atkinson et al., 2009; Booth & Frank, 1999; Figlio & Kenny, 2007; Fryer, 2013; Podgursky & Springer, 2011; Woessmann, 2011) and improves job satisfaction (Belfield & Heywood, 2008).

Studies have consistently shown that teacher quality and student success are directly correlated (Darling-Hammond, 2000; Stronge et al., 2008); therefore, districts have compelling incentives to secure and retain the best and the brightest educators,
which in turn forces innovative hiring and retention policies. Because of the strong association between contented teachers and student achievement, this study specifically examines the challenge of compensation—specifically, the relationship between performance-pay policy adoption in the context of external and internal forces influencing school and district practices.

Multiple studies have demonstrated the correlation between the quality of the teacher in the classroom as a predictor of student achievement (Fryer, 2013; Goldhaber, 2002; Rivkin et al., 2005; Stronge et al., 2011). In fact, Rivkin et al. (2005) suggested that compared with teachers at the bottom of the scale, high-quality teachers may achieve an entire year’s worth of additional learning with their students. For example, teacher quality raised math achievement by 0.15 to 0.24 standard deviations per year, and reading by 0.15 to 0.20 per year.

The research suggests that quality teachers improve learning, but it does not show a correlation between years of experience and teacher quality. Nor is the number of educational credits held by a teacher tied to outcomes, though both are rewarded through traditional pay scales. Separate from teacher quality, there is no evidence that teacher experience improves student achievement (Podgursky & Springer 2011; Rivkin et al., 2005; Rockoff, 2004; Shaker, 2010). In Podgursky and Springer’s 2007 report, 10 of 41 studies actually found a statistically significant negative relationship, and not a single study comparing advanced degrees to student achievement demonstrated statistical significance. Yet despite this lack of evidence supporting traditional pay scales, nearly 100% of traditional public-school teachers are in school districts using salary schedules based on years of experience and education level (Podgursky & Springer, 2007). With a
lack of evidence to support any link between traditional pay scales and student outcomes, many policymakers find adoption of performance-pay policy an appealing argument.

**A History of Performance Pay in American Education**

The notion of performance pay is not new. In fact, in the beginning of organized public schools in the United States, some manner of performance pay was the standard. Prior to the 1920s, close to half of all U.S. school districts used some form of performance pay (Cohen & Murnane, 1985). However, in 1918, the percent of U.S. school districts using performance pay fell from 48% to 33% and would repeatedly fluctuate during the decades that followed (Cohen & Murnane, 1985).

In the 1920s, when the business world embraced the scientific management philosophy, performance pay was a frequently used option because it was believed to offer more impetus for study and personal advancement, which would provide more opportunities to boost and thereby retain the best teachers (Springer, 2009). Performance pay also gave school managers better returns on their fiscal investments (Johnson, 1984). Despite all these advantages, performance pay still lost popularity during the 1920s and decreased to 18% by 1928 (Cohen & Murnane, 1985).

Between 1939 and 1953, school systems that used performance pay in cities with populations of more than 30,000 fell from 20% to 4% (Cohen & Murnane, 1985). However, the cyclical trend continued when teacher demands for higher salaries, labor shortages, low-quality education, and excessive expenditures spurred reform. Then with the launch of Sputnik, an entirely new drive for performance pay surged in a climate of heightened awareness of competition with Russia. By the end of 1960, the practice of merit compensation rose to 10% in U.S. school districts as part of an effort to keep up
with the rising national pressure on schools (Johnson, 1984). Between 1960 and 1970, the growth of performance-pay plans did not stall with approximately 20% of U.S. school districts having this reward system in place. However, as in the past, these policies did not persist, and the percentage fell to 5.5% in 1972, nearly in line with the levels 40 years earlier (Cohen & Murnane, 1985).

During the Reagan Administration in the 1980s, performance pay found its way back to the table and gained popularity yet again. A combination of political and social factors, including the perception that teaching standards were poor and contributing to low educational attainment (Tomlinson, 2000), led to an explosion of interest in performance-related pay plans in the mid-1980s (Cornett & Gaines, 1994). The decline in American productivity in relation to Japan and other industrialized countries inspired another resurgence of performance pay (Johnson, 1984). President Reagan stated, “Teachers should be paid and promoted on the basis of their merit and competence. Hard-earned tax dollars should encourage the best. They have no business rewarding incompetence and mediocrity” (Johnson, 1984, p. 175). The earliest incentive programs in the 1980s were deployed in response to the perception that superior teachers were not being rewarded, and education needed to reward the best. Thus by 1985, over half of U.S. states had adopted or approved various performance-pay initiatives (Cornett & Gaines, 1994; Dee & Keys, 2004). Yet despite the push for performance pay in the 1980s, 75% of performance-pay programs that existed in 1983 were no longer operational 10 years later (Eberts et al., 2002).

Today, the adoption of performance pay has once again gathered steam in U.S. education policy. President Obama promoted performance pay in his early 2009 address
to the Hispanic Chamber of Commerce (The White House, 2009). Then Secretary of Education Arne Duncan affirmed that performance pay was his “highest priority,” and in 2009, the Obama Administration allocated $4.3 billion in RttT funding, encouraging states to implement performance-pay systems for teachers (Lavy, 2015). Of the 500 possible points on the RttT application, 58 were reserved for initiatives to improve teacher and principal effectiveness based on performance, and 28 points were specifically for performance-pay policy initiatives (U.S. Department of Education, 2009).

It is clear what direction the federal government level wants to take in the matter of compensation reform; however, the empirical research does not provide a strong case for the success of performance-pay policy programs.

**Pay-for-Performance Research**

**Pay for Performance in the Private Sector**

Performance-pay policies are utilized regularly in the private sector because they are perceived as fairer: pay follows quality, and usually profitable, work performance (Barro & Beaulieu, 2003), and the flexibility in compensation practices allows for greater overall cost effectiveness (Podgursky & Springer, 2011). In 1989, more than 90% of private sector firms operated with some form of performance-pay system (Ingraham, 1993), and research conducted by Milkovich and Newman (2005) and Podgursky and Springer (2011) revealed that over three-fourths of non-hourly employees in large firms at the time were covered by performance-pay systems.

Performance-pay empirical research has shown promise in fields outside education. The Safelite Glass Corporation experienced a 44% gain in productivity after switching to piece-rate pay (Lazear, 2000), and when applied to the medical field, it
resulted in a sorting effect, thereby improving the practice. Poorly performing doctors chose to leave the practice, productive doctors were induced to join, and those who were under a performance-pay plan were, in fact, more profitable (Barro & Beaulieu, 2003). With the success of performance-pay policy in the private sector, it makes sense that performance-pay legislation would be encouraged for state education reform.

**Performance-Pay Policy Internationally**

The allure of performance-pay policy in solving the education crisis is not limited to education systems in the United States. In 2011, Woessmann conducted a comprehensive study of performance-related pay policies around the globe to understand if student achievement is indeed improved through performance-pay policies. The author noted that after controlling for student, school, and country background measures, student achievement in math, reading, and science was significantly higher in countries that used performance pay versus those that did not.

In India, a study by Muralidharan and Sundararaman (2009) showed that performance-pay bonuses resulted in meaningful gains on student test scores and were significantly more cost-effective with no adverse consequences to the program. The study also revealed that adding school inputs (supplies, more resources, etc.) also increased test scores; however, the cost-benefit analysis was not comparable to teacher incentive programs, which raised test scores three times as much. It is worth noting that Muralidharan and Sundararman’s (2009) study also found that the more educated and better trained the teachers, the better they responded to the incentives. Both group and individual rewards accompanied increased achievement in the first year, although only individual rewards were effective the second year. Another study by Kingdon and Teal
also detected a positive relationship between student achievement and teacher’s pay in India. A study in Kenya further demonstrated distinct gains in student achievement linked to performance pay (Glewwe et al., 2008). Both India and Kenya showed increases of .20 standard deviations when teachers received an additional 2% to 3% percent beyond their yearly salaries (Fryer, 2013; Glewwe et al., 2008).

India established performance pay not only to improve student achievement but also to increase teacher attendance rates. In rural areas of developing countries, excessive teacher absence is a widespread problem, and a particularly onerous one in rural India (Duflo & Hanna, 2005). However, through the induction of performance-pay bonus systems for attendance, this study observed an immediate decline in teacher absence, and the program had a substantial positive effect upon child achievement levels (Duflo & Hanna, 2005).

However, while incentive pay reduced absenteeism and improved student achievement in India and Kenya in the short term, the enhanced student outcomes did not endure (Fryer, 2013). According to Glewwe et al. (2008), students attending schools with teacher incentives researched in Kenya scored higher on the exams. But the authors argued that the teachers focused their efforts raising test scores in the short run rather than on increasing long-term learning outcomes. Many of the changed instructional behaviors in Kenya involved conducting test preparation, reducing the rate of blank responses on standardized tests, and getting students to complete the exam (Glewwe et al., 2008). The students in those schools did not show a reduced dropout rate, higher attendance rates, or long-term understanding or achievement. Because of conflicting
results, the authors argued that these data cast doubt on the effectiveness of teacher-incentive programs, despite the contextual evidence of success (Glewwe et al., 2008).

In Israel, Lavy (2002) discovered that the teachers’ performance-based incentive program was more financially efficient in increasing student achievement versus investing in other school resources. Lavy (2009) advocated for performance-pay policy, claiming that it could align the interests of teachers and the school without necessarily causing behavior distortions such as test-score manipulations or teaching-to-the-test. He argued that it could increase more students to take the exam, as well as increase the pass rate and mean test score. In 2015, Lavy took his initial performance-pay research to a new level to determine its long-term effects on students’ future success. The research determined that the students who participated in the study experienced sizable gains in schooling attained, increased annual earnings in their 20s and 30s, and had significantly reduced dependence on welfare benefits.

The adoption of performance-pay policies did not show the same hopeful results in England, however. All United Kingdom schools were expected to implement new management and teacher-performance policies by September 2000 (Tomlinson, 2000). The government took a serious interest in performance-related pay schemes through tax-exempt profits of up to 20% of total pay in an effort to increase labor market flexibility and generate higher productivity or employment (Booth & Frank, 1999). The Atkinson et al. (2009) study shows that the pay-for-performance scheme in England did improve test scores and resulted in value-added averages per pupil relative to teachers ineligible to receive the reward. In short, the study found that teachers do respond to direct financial incentives and the effect is increased student performance on test scores. Nevertheless,
another study of the program in England showed unintended consequences that have made the policy questionable. Wragg et al. (2003) conducted a three-year study of the Teachers’ Incentive Pay Project (TIPP) in schools in England, which looked at the effects the policies had on teachers. They found that head teachers felt poorly trained and prepared for assessing teachers, the program was full of contradictory implementation policies and communication, burdensome and time-consuming paperwork was involved, and teachers distrusted the head teachers as decision makers. Ultimately, 60% of all head teachers were against it, with only 40% in support of continuing the program. Although England’s policy appeared beneficial to student achievement overall, it had negative associations for educators.

**Pay for Performance in American Private and Charter Schools**

Another model of pay for performance exists in private and charter schools throughout the United States. Unlike public schools, in most instances charter schools have variable salary schedules that allow more flexibility and overall effectiveness (Podgursky & Springer, 2011). It is suggested that the regulatory freedom, small size of wage-setting units, and a competitive market allow greater freedom to engage and retain effective teachers and even result in recruiting teachers with better academic credentials than do traditional public schools (Podgursky, 2006). Schools in states that legalized charter schools between 1991 and 1993 are two-thirds more likely than schools in the rest of the United States to have teacher incentives (Figlio & Kenny, 2007), and teachers in the private and charter education sector understandably express much more support for performance-based compensation. According to Ballou and Podgursky (1993), teaching is harder in public schools than in private schools, given public school bureaucracy.
(documenting instruction, etc.). This can make performance pay more difficult to implement. Regardless of the divergent attitudes toward performance pay by public and private/charter educators, policymakers contend that performance pay is a viable option in public education because of its success at improving productivity in industry and increasing test scores in charter schools.

**Public-School Performance-Pay Outcomes in the United States**

In the United States, the overall perception of the effectiveness of performance-pay programs in the public-school sector is mixed. Case-study research about the issue produces widely divergent results nationally: significant gains, no gains, and even negative gains. Further, mixed empirical evidence is mixed regarding PFP’s relationship to attendance, course completion, and dropout rates. The conflicting outcomes of performance-pay programs in relation to student achievement make the viability of such policies unclear, as the purpose of those programs is essentially to modify teacher behavior with the goal of positively affecting student outcomes.

There is selective state evidence suggesting that students with performance-pay teachers have higher testing gains (Dee & Keys, 2004; Figlio & Kenny, 2007; Fryer, 2013). For example, Clotfelter et al. (2008) showed that salary differentials proved to be an effective strategy for improving the quality of education in high-poverty schools and made a higher impact on math teachers overall. In addition, in Little Rock, Arkansas, the National Center on Performance Incentives reported that students whose teachers were eligible for performance pay made substantially greater test score gains in math, reading, and language arts than did students taught by ineligible teachers (Winters, Greene, Ritter, & Marsh, 2008). Dee’s and Keys’ (2004) study of Tennessee’s career-ladder system
showed that the program was at least partially successful in rewarding teachers who had some success with promoting student achievement. Specifically, the study indicated that a teacher certified by the career-ladder evaluations contributed to large gains in students’ mathematics scores. The Texas Reach program also showed links to improved student test scores (Balch & Springer, 2015). The Austin Independent School District Reach program experienced some success with its performance-pay initiatives, as student test-score gains were evident in math and reading, and that growth was even maintained the second year; however, there was no evidence of additional growth after the third year (Balch & Springer, 2015). Additionally, in North Carolina, the accountability bonus program increased math achievement on national and state exams and reading on state-level exams (Vigdor, 2008).

Conversely, some researchers have argued that there is minimal evidence supporting the positive effects of performance pay on student achievement in the United States (Eberts et al., 2002). Fryer (2013) found that there were actually negative gains in both elementary and middle school, the middle school level being statistically significant; furthermore, there was also no evidence that teacher incentives had a positive effect on achievement in high school. New York City schools implemented a $75 million performance-pay initiative; however, the program did not produce meaningful growth on student achievement, and in some cases exhibited negative gains; and in Tennessee, where the average teacher incentives totaled 8% of the teachers’ salaries, incentives had no effect on student achievement (Fryer, 2013). In the Payson, Arizona, Project on Incentives in Teaching (POINT) program, 80% of teachers believed that the program had not affected their work, as they were already working as effectively as they could
Overall, the results did not show a meaningful difference between students whose teachers were assigned to the treatment group and those assigned to the control group. POINT intervention did not lead to overall large, lasting change in student achievement, nor did it induce teachers to make substantial changes to their instructional practices or their level of effort (Springer et al., 2011).

Performance pay policies have also been used for goals other than student achievement, such as attendance patterns and graduation rates. Multiple studies have associated performance pay with a decrease in dropout rates (Eberts et al., 2002; Ladd, 1999). In comparison to a similar school using a traditional compensation schedule, Eberts et al. (2002) discovered that merit pay awarded in part for the number of students who complete a course resulted in an increase in course completion from 40% to 75%; however, the study also showed an overall decrease in GPA for both the control and experiment schools. There is sparse evidence supporting both increased achievement coupled with decreased dropout rates or improved course completion, but rather, PFP policies appear only to influence behaviors of which the teacher has control: their own.

**Performance Pay and Teacher Behavior**

Theoretically, incentive pay could have one of three effects on teacher behavior. It may motivate teachers to increase effort, it can spur cheating and teaching-to-the-test (or focusing on specific objectives at the expense of other learning), or it can decrease a teacher’s intrinsic motivation and lead to harmful competition (Fryer, 2013).

Firestone and Pennell (1993) suggested that competition is the cornerstone of incentive pay, the assumption being teachers will work harder when they earn salaries based on performance. According to Booth and Frank (1999), employees in
performance-related pay positions in the United Kingdom labor market showed a 20% increase in productivity and 9.6% increase in earnings, and the individuals under performance-pay compensation plans had higher earnings (all other conditions remaining the same) because they were self-selected and driven to supply greater effort. Neal (2011) asserted that there is strong evidence suggesting local teacher effort rose following the implementation of performance pay, and Lavy (2009) found that treatment-group teachers reported greater use of individualized instruction, more tracking the classroom by ability, and longer instructional time than did control-group teachers.

On the other hand, some studies have shown negative reactions to incentive-pay programs, suggesting that they actually decrease productivity, or at the very least, that it remains unchanged (Fryer, 2013; Glewe et al., 2010; Lavy, 2009; Marsden & Richardson, 1994). Furthermore, individual-incentive plans can work against the kind of team effort required to develop and sustain a productive organizational climate (Cohen & Murnane, 1985; Goodman & Turner, 2010; Richards & Sheu, 1992).

In group situations, performance pay can impede collegiality and collaboration, reduce morale, and make it difficult to identify high-performing teachers (Cohen & Murnane, 1985). Moreover, economic approaches to the issue suggest that group-performance pay (collective outcomes) can lead to a free-rider program (Vigdor, 2008), and although Belfield and Heywood (2008) claimed that cooperative working arrangements increase the probability of receiving performance pay, the performance criterion was shown to increase total compensation but not job satisfaction.

Incentive-pay programs also come with risks. As Baker (2002) noted, incentives can sometimes cause distortion by rewarding the wrong behavior. In the case of
education-related pay for performance, teachers tend to game the system by teaching for the test, not for lifelong learning (Besley & Ghatak, 2006; Liang & Akiba, 2013). The emphasis on improved test scores then becomes an incentive for teachers to minimize the time they spend with children whose test scores they believe will not respond to an increase in teacher attention (Cohen & Murnane, 1985). In a study by Eberts et al. (2002), teachers had an incentive to diminish academic rigor and make their classes more entertaining, consequently decreasing achievement scores since student retention rates and evaluations determined the teacher bonuses. Furthermore, the commitment to the teacher’s professional ambitions were counterproductive to nurturing the warm and supportive climate that decreases dropout rates (Firestone and Pennell, 1993). Additional unintended consequences of performance-pay policy include teachers shifting focus from extracurricular activities to mere contract obligations (Adnett, 2003; Burgess & Ratto, 2003) and denying students opportunities for critical thinking and building mastery (Neal, 2011). Unintended negative consequences such as cheating, teaching-to-the-test, and, ironically, focusing on defined test objectives rather than general learning, have been shown to bear a negative impact on student performance (Fryer, 2013).

**Performance Pay and Teacher Attitudes**

Another issue related to pay for performance is the emotional and mental effect it has upon teachers. Teacher incentive programs are complex, and teachers cannot always understand how their efforts will translate into rewards. Consequently, performance-pay programs can have a destructive influence on intrinsic motivation, self-esteem, teamwork, and creativity (Beer et al., 2004), and lead to decreased job satisfaction (Belfield & Haywood, 2008; Glazerman, McKie, & Carey, 2009). Examining the factors
that motivate teachers, Houston (2000) conducted a study directly measuring public-service motivation. Notably, the findings from the study showed that public-service motivation does exist and that individuals employed in public organizations have different motives from those employed in the private sector, motives that conflict with the philosophy of performance-pay policies. This difference explains why teachers dislike performance-pay plans more than any other incentive plan—the competition it generates undermines teacher commitment (Firestone & Pennell, 1993).

Firestone and Pennell (1993) suggested that competition is the cornerstone of incentive pay, yet competition can be damaging to the culture of a school. Sixty-three percent of teachers surveyed in the Leigh study believed that performance pay would more likely lead to competition than to improvement (Leigh, 2013). Competitiveness among teachers under performance pay can cause dissension among staff members, with questions such as, “Why does worker x get merit pay and I don’t?” and “What can I do to get merit pay?” (Murnane & Cohen, 1986, p. 15). Questions like these reflect a decline in intrinsic motivation or contribute to harmful competition (Fryer, 2013), and old-time performance pay has been shown to cause dissension between teachers and administrators (Cohen & Murnane, 1985).

Job stress is another concern of performance-pay participants, as evidenced among teachers in Kentucky after the implementation of performance-related pay policies (Kelley, 1999). Too often, the performance standards are set too high, such that no price level would induce sufficient effort to make them attainable (Neal, 2011), and Yuan et al. (2012) found that teachers had doubts about their control over student achievement due to the external factors in play (for example, family environment). The same study revealed
that teachers did not consider their programs motivational and were concerned about using student test scores to measure teaching performance and about the fairness of the program; therefore, they did not judge the opportunity worthy of making changes to their behavior (Yuan et al., 2012). Although some teachers believe in the philosophy of performance-pay programs, most struggle embracing the “fairness” of such policies. Consequently, teachers resist pay-for-performance policy because of the questionable fairness of performance assessments, the negative effect on relationships with other teachers, the potentially lower level of base pay, and lack of valuing teachers’ experience (Ballou & Podgursky, 1993).

**Performance-Pay Program Longevity**

Sustaining performance-pay policies has proven to be a challenge, with a long list of failed performance-pay programs from around the nation. With conflicting findings about the success of performance-pay programs, researchers have sought to explain what makes a program ineffective or effective. Policymakers would benefit from understanding the factors that influence both the compensation scheme’s efficacy and the likelihood of its implementation.

Hatry and Greiner (1994) found that 75% of performance-pay programs that existed in 1983 were no longer running in 1993. Many factors influence the sustainability of performance-pay programs in education, which differ in important ways from analogous programs in the private sector. Murnane and Cohen (1986) stated that the primary differences between private and public performance pay is the type of work teachers do and the nature of their workplace. Given ever-changing student populations, societal needs, education policy, and leadership turnover, consistent goals are difficult to
strive for and assess meaningfully. State leadership changes often mean that programs move away from their original intent, never become implemented as intended, or are not given enough time to work (Cornett & Gaines, 1994). The consequence is failed policy intended to address the vitally important problem of struggling schools and lackluster student achievement. For example, in Mississippi, the piloted 2013 Governor’s Education Works Initiative stalled out in 2016 due to changing tests and standards (Jackson, 2016). The program did not last even three years before it was abandoned, owing to a shift in factors affecting the purpose and outcomes of the initiative.

One source of failure for teacher-performance-pay plans is the negligible progress in truly bringing about change in teacher behavior (Cornett & Gaines, 1994). In numerous cases, performance criteria are low so that more teachers can qualify for awards, and in even more instances, teacher opposition is a fundamental reason for the failure of performance-pay plans (Ballou & Podgursky, 1993). Additionally, to protect their relationships with teachers, principals often deem their teachers “good” or “excellent” and in 2000, most Florida teachers were identified as worthy of receiving state-funded performance pay (Figlio & Kenny, 2007). Ultimately, performance pay can become illusionary and ineffective when all participants get the same reward (Glewwe et al., 2008).

**Complexity of Programs**

Yet another source of failure for performance-pay plans is the complexity of the programs and the implementation plan. Fryer (2013) argued that the incentive schemes are far too complex and that there is no clarity about how much effort a teacher should exert or how that effort influences student achievement. Teachers respond to simple,
individualized incentives by modifying behaviors in desirable ways. However, performance-pay implementations are complex. They include the need to disentangle individual contributions, focus on quality over quantity, and avoid inadvertently teaching-to-the-test at the expense of long-term learning (Fryer, 2013). Implementations expose great difficulty in judging teachers’ performance and applying the criteria fairly, challenges inherent in addressing teacher and union opposition (Johnson, 1984). Administrators must be prepared to manage failing morale and increased division among staff. They must work hard to distinguish between merit rewards and favoritism, address failures to meet plan objectives, and bring about changes in school leadership or philosophy (Wragg et al., 2007). Lastly, executing performance-pay policy is also costly to a district and at the same time perceived as inconsistent, with most employees disliking fluctuations in monthly income (Buddin et al., 2007; Johnson, 1984; Wragg et al., 2003).

**Evaluations**

One of the most pressing struggles with performance-pay policy implementation is the role of evaluations to identify which teachers are eligible for the compensatory reward and which teachers are not. The difficulty lies in identifying the most effective teachers, as value-added measures are not strongly correlated with observable teacher characteristics (Beer et al., 2004; Fryer, 2013). Teachers also view pay for performance programs as unfair and resent being forced to participate in such programs, and this often leads to program elimination (Cornett & Gaines, 1994).

One case study analyzed the failure of Florida’s Special Teachers Are Rewarded (STAR) program and revealed a negative belief that the legislation was a substantial intervention by the state into domains that once belonged to the district (Buddin et al.,
The report was critical of the state’s prescribing how districts should monitor teacher performance, and many educators expressed a belief that the emphasis on student achievement gains was misplaced because of the program. Teachers also considered the tool utilized to determine teacher quality unreliable and the notion of shared awards artificial. In addition, the report criticized the failure to recognize contributions made by teams of teachers (Buddin et al., 2007). In short, the results of this study showed that using standardized test scores to measure teacher performance is questionable. Single-year measures are highly volatile, and student classroom assignments influence overall grade level success, compromising the viability of performance-pay programs (Buddin et al., 2007).

Most important is the sense of unfairness and objectivity around evaluations (Ballou, 2001). Performance-pay plans in the 1980s and 1990s came up short in terms of developing teacher evaluations that were valid, fair, and reliable (Buddin et al., 2007). Problems with evaluations include the belief that they are not likely to be consistent across evaluators, and accuracy of evaluations is hard to assess. Evaluations are also subject to influence by personalities and demographic similarities. Performance evaluation is further influenced by real or imagined favoritism, which may inspire workplace animosity (Buddin et al., 2007). In some cases, subordinates are encouraged to curry favor with supervisors in ways that do not necessarily further organization objectives; at other times, supervisors may be hesitant to differentiate between good and poor performance because of their personal proximity (Buddin et al., 2007).

Despite the chaos that is a part of designing effective evaluation practices, quality evaluations are nonetheless necessary and essential to a successful performance-pay
program, and it is only through analysis of successful programs that policymakers can find best practices for implementation. Firestone and Pennell (1993) have noted that observations by evaluators are subject to bias and favoritism, while inadequate observations are not representative of the hours spent in the classroom throughout a school year. The inherent difficulty of evaluative practices contributes to a sense of distrust and doubt about the validity of performance-pay policy.

**Best Practices**

For all the dismal examples of unsuccessful programs, Beer et al. (2004) found that performance pay was not a total failure. The authors posited that performance-pay policies, when established and implemented using best practices, can show some positive returns. However, they also argue that investing in effective leadership, clear objectives, and coaching or training proves to be a better investment during and after implementation.

Despite the bulk of research that cast doubt on the effectiveness of performance-pay policy, several programs lend insight into best practices. Successful performance-pay systems are intended to incentivize teacher behavior. They must encourage teacher collaboration, promote a strong link between schooling outcomes and teacher rewards, avoid high-stakes test manipulation, and lead teachers away from dysfunctional behaviors (Buddin et al., 2007).

The first key in programs that have succeeded over time is in states, districts, and schools where there is strong leadership at the school and government levels (Cornett & Gaines, 1994). The biggest challenge is setting performance standards that strike the right balance of paying out enough to make the incentives motivational without paying
out too much (Beer et al., 2004). Cohen and Murnane (1985) have identified the characteristics of districts that have sustained performance-pay programs. First, they argued that performance pay works best where there are clearly measurable outcomes and the program centers on a base salary schedule to which performance pay is added and is above average for its geographical context. The high salaries allow the districts to be selective when choosing candidates and thereby engender effectiveness to the performance-pay plan. They also concluded that the program should not penalize or dismiss ineffective teachers, nor should incompetent teachers be protected; rather, the program design and implementation should reward teachers who show measurable progress within the goals of that program.

Another key to long-term performance-related pay programs, according to Murnane and Cohen (1986), is that the working conditions must be clear. The essential common attributes of successful performance-pay plans include clear explanations of why some teachers receive the bonus and others do not, as well as what a teacher can do to earn performance pay. Successful programs aim to make everyone feel special and rewarded for extra work, and the amount of the incentive pay matters (Podgursky & Springer, 2011). To ensure best practices, all teachers must be included in the program’s design and implementation (Ballou & Podgursky, 1993). According to Seltz and Heneman (2004), successful performance-pay programs comprise nine important components:

1. Reward employees for achieving results and exhibiting behaviors aligned with organization goals.
2. Provide rewards commensurate with contribution.
3. Can be communicated to stakeholders and participants easily.
4. Are understood easily by stakeholders and participants.
5. Recognize the organization’s ability to deliver pay increases.
6. Administered logically.
7. Conform to legal requirements.
8. Use a credible means of evaluating performance.
9. Conform to management philosophy.

Awareness that performance-pay policy has found success in industry, charter schools, international settings, and even some states over long periods gives policymakers evidence that education reform focused upon compensation can provide an answer to some of the shortcomings of American public education. To expand this awareness, this study proposes that analysis of the leading factors that contribute to a state’s adoption of performance-pay policy can inform decisions on national, state, and local levels about its future likelihood to result in positive outcomes overall.

Empirical research detailing state-by-state implementation of performance-pay policy is abundant and easily accessed; however, research is lacking the prediction of policy dissemination, adoption, and maintenance. This study aims to start the conversation about the adoption of performance pay and fill the research lacunae.

**State Determinants and Diffusion of Policy**

Berry and Berry (1990) established a foundation for many current policy adoption and innovation studies through the merger of DOI and ID frameworks. The merger between the two frameworks provides a more conclusive explanation for policy adoption, including the fiscal, political, and social needs of the state.
The influence of regional neighbors adopting policy has been suggested as a strong indicator of a state’s inclination to adopt the same policy (Glick & Friedland, 2014; Lutz, 1987; Walker, 1969), and early literature on state policy innovation often includes explanations of policy adoption through the transfer of ideas by means of an interstate and regional exchange (Walker, 1969). As an example of how diffusion could occur between regional neighbors, Glick and Friedland (2014) looked at state policy briefings written for and presented to legislators to determine the frequency with which these briefs referenced regional neighbors as evidence of the impact of diffusion, finding a strong correlation between policy adoption and geographic diffusion. Their study identified not only the importance of policy diffusion, but also the pathway across which the diffusion took place. Although much of the methodology of policy diffusion studies has changed, the interstate influence on policy adoption has remained constant in the empirical research (Berry & Berry, 1990; McLendon & Cohen-Vogel, 2008).

The perspective of vertical influence suggests that the federal government shapes policy adoption (Feiock & West, 1993). Between 1980 and 2001, a paradigm shift restructured the political landscape around education reform and led to a major policy transformation, allotting more education governance to the federal government (Mehta, 2013), and the decade following the enactment of the No Child Left Behind Act led to greater federalized education policy (McGovern, 2011). The federal government attempts to persuade states to adopt policy through a combination of monitoring, coercion, and incentives to influence the behavior of agents (states), and although not the same as interstate diffusion, policy diffusion from the federal level is an external
determinant that plays a significant role in policy adoption at the state level (LaVenia, et al., 2014).

For example, LaVenia et al.’s 2014 study on state adoption of the Common Core Standards showed a statistically significant correlation between states that received RttT funds and the adoption of the Common Core standards. The fiscal incentives offered by the federal government facilitated the diffusion of such policy. Wong and Langevin’s (2005) exploration of vertical influence demonstrated that the federal government’s influence on state education governance using incentives has flourished since the Reagan-era publication of A Nation at Risk. As effectively as diffusion-related determinants appear to influence policy adoption, internal influences of policy adoption, including political and economic determinants, are also important.

The internal political characteristics of a state also influence policy outputs (Boehmer, Luke, Haire-Joshu, Bates, & Brownson, 2008; McLendon, Hearn, & Deaton, 2006). Political party dominance or control over both the legislative and executive branches of state government has been shown to alter the kinds of policies proposed, as well as the ability of states to adopt specific policies (Schneider, Jacoby & Lewis, 2015; McLendon et al., 2006). Literature on school reform policy finds that states with a liberal government are more inclined to adopt public school policy through existing internal systems and processes while conservative governments tend to reform public schools through nontraditional external means (Mintrom & Vergari, 1998; Wong & Langevin, 2005). The role of politics continues to permeate the era of education reform.

Not only does party control play a significant role in policy adoption, but so too would a state’s track record of innovative policy adoption as demonstrated through years
of evidence. Some states are inclined to adopt innovative policy more eagerly than are others. First noted by Walker (1969), who expanded his understanding of Rogers’ 1962 explanation of innovation and hypothesized that levels of innovation depended not only on regional differences as suggested by Rogers but also included various political and demographic variables. The limitations of Walker’s (1969) work, however, was that his raw innovation score did not explain “the distinct roles of internal policy innovation and external diffusion forces” (p. 2). Expanding on Walker’s work, Boehmke and Skinner (2012) utilized an Event History Analysis approach to generate innovation scores that eliminate the adoption data of various effects and more accurately reflect differences across states’ internal innovativeness. The result was a scale to identify the most to least innovative states, or “faster to adopt policy than other states” (p. 1). They analyzed policy adoption data from all 50 states from 1959 through 2009 to derive a score to represent a state’s propensity to adopt innovative policies, which revealed systematic regional, demographic, and political differences in innovativeness across states. This score, representative of the innovative climate of a particular state, could be an internal determinant of the willingness to adopt innovative policy, such as performance pay.

Equally, at the organization level, the simplest explanation for policy adoption is a response to a need (Feiock & West, 1993). In the education field, those needs involve achievement scores, graduation rates, adult literacy rates, higher education attendance rates, and many other factors regarding the health of the education system known to influence policy adoption (Boehmer, et al., 2008). An example of performance-pay policy adoption in response to need was the adoption of the South Carolina School Incentive Reward Program (SIRP). Widespread dissatisfaction with the quality of
education in the state led to the establishment of SIRP, and the legislation received bipartisan support in an effort to improve the quality of education in South Carolina (Richards & Sheu, 1992). The education system has far-reaching outcomes on society, including higher income levels and broad economic growth; therefore, improvement in public education has led policymakers and researchers to focus on increasing teacher effectiveness (Lavy, 2007).

Some of the literature has suggested that the higher the spending on education, the greater the likelihood of policies adopted to improve it (Boehmer et al., 2008). Other influences on policy adoption are implied by the economic model that posits that the more affluent a community, the greater the extent of policy development (Boehmke & Skinner, 2012; Feiock & West, 1993; Mohr, 1969). In the case of public education institutions, Pincus (1973) has shown that per-capita school spending was related to a district’s inclination to adopt new policy, and Grissmer (2001) confirmed that additional spending on education makes a positive difference, especially among disadvantaged student populations. Conversely, Hanushek, Peterson, and Ludger (2012) found that increasing per-pupil expenditures is not significantly correlated to learning gains. As Hedges et al. (2016) have indicated, the inconsistency in how studies have been conducted prevents solid conclusions about the true impact of education expenditures on student outcomes. Yet economics still plays an important role in policy adoption. Feiock and West (1993) demonstrated that when communities do not have the requisite finances, they are unable to adopt policy. Arizona’s Proposition 301 came to fruition only after the state experienced economic prosperity and increased education funding in the 1990s (White & Heneman, 2002). This condition is important to note for states regarding
policy adoption, as no matter how great the need or influence of diffusion, the fiscal realities may prevent the adoption of new policy.

Although generally considered external entities in the education realm, interest groups are an internal determinant in policy adoption. Teachers unions play an important role in policy adoption, and in education; teachers unions are a very powerful force. Hartney and Flavin (2011) concluded that teachers unions serve as one of the most important actors in education policymaking, and Julnes and Holzer (2001) have argued that the effect of unions can be positive or negative depending on the circumstances, claiming also that unions feel justified in opposing change when it may bring with it negative consequences for its members. Goldhaber et al. (2008) discovered that collective bargaining agreements have a negative effect on the likelihood of a district’s use of performance pay. Accordingly, interest groups have been a dominant force in the policy-making process, which suggests that the presence of a strong union would influence the adoption or nonadoption of a policy (Ballou, 2001; Feiock & West, 1993; Fryer, 2013).

**Summary**

This chapter has presented a conceptual approach to the study of performance-pay policy adoption through the lens of DOI and the theory of ID as well as an overview of performance-pay research.

The conflicting outcomes of performance-pay policy create a muddled comprehension of the effectiveness of the policy. As the literature demonstrates, the results of performance-pay programs run the gamut from contributing to negative outcomes to successfully achieving long-term, sustained goals. In the face of such
widely divergent effects, it is difficult to determine what would compel a state to adopt such a sweeping policy that bears no guarantee of desirable results. Through an analysis of prior policy studies, this review shows that there are varieties of determinants that influence policy adoption, including factors both internal and external to the organization.
CHAPTER 3

METHODS

This chapter describes the methodological approach used in the study. It provides an explanation of the conceptual framework, presents the project’s research question, and details the research methodology, including operative variables, data coding and sources, and analytic methods. The final section of this chapter discusses the limitations of the study.

Purpose and Research Questions

State education policy-making is a complex process involving a variety of determinants and factors; and understanding this process may provide valuable insights for policy development (Chor, Wisdom, Olin, Hoagwood, & Horowitz, 2014). The purpose of this study was to identify the factors that contribute to a state’s adoption of performance-pay policies, including the influence of federal incentives, regional diffusion, innovative status, problem severity, political factors, economic conditions, and interest groups. Understanding the factors that influence performance-pay policy adoption by states can provide an information framework for future educational reform measures developed by policymakers at the federal and state levels. The biennial data for the dependent variable, adoption of performance-pay policy, encompass three years, were collected twice, once in 2009 and again in 2011, and merged into one dataset indicating which states had adopted PFP policy during the timeframe. The following question guided analysis of the data.

• What forces (internal and external) are associated with the statewide adoption of performance-pay policy?
Methods

Many policy adoption studies (e.g., Berry & Berry, 1990; LaVenia et al., 2015) have used event history analysis to explain the qualitative change (the “event” or adoption of the policy) at a particular point in time. A problem with this kind of analysis is that it assumes the event (adoption of the policy) will happen only one time; that is, if a state adopts the policy once, it cannot adopt the policy again. However, that presumption is not applicable to performance-pay policies, as in some cases states have adopted performance pay only to abandon it for a period and then readopt the practice later. Therefore, time is not a relevant factor in the same way as it is in event history analysis studies, an alternate method was used.

Because this study has a dichotomous outcome variable, this study used binary logistic regression for determining associations between independent variables and performance-pay policy adoption. Traditionally, dichotomous-outcome studies use either ordinary least squares (OLS) or linear discriminant function analysis, both of which have been found less than ideal due to their strict statistical assumptions, such as linearity, normality, and continuity for OLS regression or multivariate normality with equal variances and covariances for discriminant analysis (Peng, Lee, & Ingersoll, 2002). Thus, logistic regression is better suited to understand performance-pay policy adoption than either multiple regression or discriminant analysis because the predicting variables are not all normally distributed, linearly related, or of equal variance, which ultimately makes logistic regression much more flexible (Mertler & Vannatta, 2010).

Other advantages of logistic regression are that all probability variables are reported as positive values within a regression model, and it has the ability to produce
nonlinear models, which is ideal for this particular study (Mertler & Vannatta, 2010). Furthermore, logistical regression has increased in educational research since its inclusion in statistical packages in the 1980s (Peng et al., 2002). Effectively, in this study, the logistic regression will reveal the following: Does the independent variable increase the likelihood of a state adopting of performance-pay policy?

**Dependent Variable (Outcome Variable)**

The dependent variable examined in the study is the adoption by individual states within the United States of performance-pay policy, which is a popular compensation alternative to the traditional pay scale based on years of experience and education level. This variable is coded as 0 if the state has not demonstrated formal support for adopting statewide performance-pay initiatives, or 1 if the state supports the adoption of performance-pay policies, even if the decision to implement is left at the district’s discretion. The data spanned three years between 2009 and 2011 and were aggregated to represent each independent variable in the dataset.

**Independent Variables (Predictor Variables)**

The seven independent variables chosen for this study were carefully selected to avoid multicollinearity while at the same time providing a precise measurement to predict membership in the adoption of performance-pay policy category or not. Each variable represents a political, socioeconomic, need-based, influence-based, or diffusion-related association with policy adoption. Furthermore, including both regional and internal influences in this model prevents mistaking a spurious relationship between a state’s adoption and that of its neighbors (Berry & Berry, 1990). The independent variables, fully described below, are as follows:
1. Race to the Top application status
2. Regional influences
3. Innovative status
4. Chance for Success score
5. Partisan control
6. State education expenditure
7. State teachers union strength

**Variable 1: Race to the Top (RttT) application status.** To study the topic of performance-pay policy adoption, it is imperative that this variable measuring vertical influence be included due to the monetary incentives offered at the federal level. The 2009 RttT legislation provided $4.3 billion for awarded states willing to adopt any number of recommended federal programs, including performance pay. And just as in LaVenia et al.’s (2015) study of state adoption of the Common Core Standards, this study seeks to understand whether states adopt federally incentivized policies because of outside pressure rather than self-determined interests. Of the 36 states (35 excluding District of Columbia) that applied for round II funding, all included a performance-pay initiative and a stated commitment to implement upon receipt of RttT funds (Rose, 2010). Equally, the LaVenia et al. (2015) study discovered that RttT aspiration had a statistically significant predication on state adoption of Common Core standards, which could show similar results in a study of performance-pay predicting variables. States are not compelled to adopt performance-pay policies through federal mandates, but, rather, may or may not respond to incentives. Further, some states have adopted performance pay in the absence of federal incentives. This disparity means that RttT policy may or may not have a significant effect on the inclination to adopt performance-pay policy.

The RttT variable was included as a means to evaluate the vertical influence of federal government initiatives in the adoption of performance-pay policy by state. To
measure this variable, data were collected from the National Department of Education’s RttT website to determine which states aspired for RttT funds and, for information purposes, whether it included implementation of performance-pay policy during the time studied. After determining which states were aspiring for RttT funds during each phase of the RttT application process, each RttT application was individually reviewed to determine if it included language in support of statewide adoption of pay-for-performance policy. Interestingly, although 40 states participated in the first round of applicants in 2009, only one state, Illinois, had a winning RttT application, but did not include language in support of performance pay; in the second round, all 36 applicants included some language supporting performance pay, which suggests that the RttT program did incentivize support for PFP. Although intriguing, for the purposes of this study, this variable was intended only to identify which states aspired for RttT funding and which states did not; therefore, the variable is nominal and is coded as follows: \( 0 = \) did not apply and \( 1 = \) applied in the timeframe of the RttT applicant window, 2009 to 2011.

Variable 2: Regional influences. Regional influences can also influence an organization’s propensity to adopt policy as reflected in the DOI framework described in Chapter 2. The influence of regional neighbors’ adopting policy is a strong indicator of a state’s inclination to adopt the same policy (Lutz, 1987; Walker, 1969). The idea that neighboring states would mimic one another is in alignment with Rogers’s DOI (1995) framework. Additionally, Boehmke and Skinner (2012), Lutz (1987), and Walker (1969) all found detectable regional patterns in policy adoption. Furthermore, Glick and
Friedland (2014) discovered that policy researchers frequently report on the policies of other states when preparing research briefs for legislators.

The regional influence data were collected from the National Council on Teacher Quality (NCTQ), using the prior year data to determine if a regional neighbor was a prior adopter of performance-pay policy. As depicted in Figure 3, the U.S. Department of Educational Regional Laboratories (USDERL) region map guided the collection of regional data.

![Figure 3. Department of Educational Regional Laboratories (USDERL) Region Map.](https://ies.ed.gov/ncee/edLabs/regions/)

Because each region has an inconsistent number of regional neighbors, a continuous variable does not proportionately depict regional neighbor adoption; therefore, the regional influence variable is coded as 0 if no regional neighbor adopted PFP during prior years of the study, 1 if less than half of the regional neighbors adopted PFP policy during prior years of the study, 2 if more than half of the regional neighbors
adopted PFP policy during prior years of the study, or 3 if all regional neighbors adopted PFP policy during prior years of the study.

Variable 3: Innovative status. Boehmke and Skinner (2012) conducted a study focusing on the exploration of a state’s propensity for innovation or willingness to adopt new policies relative to other states. Building on Walker’s (1969) innovation scores, Boehmke and Skinner (2012) created a study utilizing event history analysis to solve many of the deficiencies in Walker’s original study, such as right censoring (when a subject of the study has already experienced the outcome before entering the study). They analyzed policies from all 50 states over the course of the last four decades to derive a score to represent a state’s tendency to adopt innovative policies. Through the extensive study, they determined a state’s inclination to be innovative after an analysis of policies spanning the 40 years, 1959-2009. Berry and Berry (1990) noted that innovative status is one factor that helps explain states’ adoption of specific policies, and LaVenia et al. (2015) discovered that prior education policy adoption (inclination to adopt innovative policies) did have a statistically significant prediction on state adoption of Common Core standards.

Boehmke and Skinner’s (2012) mean rate innovation score was assigned to each state included in this study. This variable score is coded as a ratio scale, with lower numbers representing a lower level of innovation and higher numbers representing a higher level of innovation.

Variable 4: Chance for Success score. In the context of teacher salaries, performance pay is intended to offer incentives to increase teacher retention and improve student achievement scores, ideally resulting in a better state education system (Atkinson
et al., 2009; Booth & Frank, 1999; Chamberlain et al., 2002). Several published studies that have used problem severity as a predictor for policy adoption detected significant effects (Daley & Garand, 2005; Sapat, 2004). This variable attempts to capture the overall need for improved education health by looking at a variety of factors encompassed in the Education Research Center’s *Chance for Success Index* (CFSI), mostly focused on the student achievement aspect of the problem severity determinant. The index also provides information that could target the efforts of public education systems in ways that serve students of all ages more effectively (Editorial Projects in Education, 2008). To test the need-based model, the “Chance for Success” index, which evaluates 13 different factors—including socioeconomic status, achievement scores, opportunities, and education outcomes—was assigned to each corresponding state. According to Raymond (2010), the Chance for Success score includes the following elements:

1. Family Income: Percent of children in families with incomes at least 200% of poverty level.
2. Parent Education: Percent of children with at least one parent with a postsecondary degree.
4. Linguistic Integration: Percent of children whose parents are fluent English-speakers.
7. 4th Grade Reading: Percent of 4th grade public school students “proficient” on NAEP.
8. 8th Grade Mathematics: Percent of 8th grade public school students “proficient” on NAEP.
9. High School Graduation: Percent of public high school students who graduate with a diploma.
10. Young-Adult Education: Percent of young adults (18–24) enrolled in postsecondary education or with a degree.
11. Adult Educational Attainment: Percent of adults (25–64) with income at or above national median.
12. Annual Income: Percent of adults (25–64) with income at or above national median.

This variable, collected manually from the EPE Research Center, is coded as a ratio scale, again, with lower numbers representing a lower level of education health (representing a greater need) and higher numbers representing a higher level of education health (representing a lesser need). To account for the three years within the study, data were collected from 2008, 2009, and 2010 and averaged. The lag year data were used with the assumption that a poor score of health would indicate a need to policymakers, thereby inspiring policymakers to seek policy-driven solutions.

Variable 5: Partisan control. Dominant political party of state legislature during the period of adoption can influence a state’s willingness to adopt or reject a policy (Boehmer et al., 2008). McLendon et al. (2006) found that legislative party strength does drive policy adoption, particularly when connected to performance funding. This variable, also an internal determinant, analyzed a relationship between political party dominance in a state during the period studied and the state’s likelihood of adopting performance-pay policy. These data were collected from MultiState Associates, Inc., and reveal which political party had dominant control of the state in the year of performance-pay policy adoption or which political party had dominant control for the majority of the timeframe if no policy was adopted during the time period. To preserve statistical power, this variable was reduced to solely Republican dominated ($\theta = \text{not a Republican dominated government}$, $I = \text{Republican dominated government}$) in alignment with Ecks’ 2016 study on the adoption of compulsory education laws and Rock and Howard’s study
(2008) that suggest conservative political stances most influence education finance reform.

**Variable 6: State education expenditure.** According to Boehmer et al. (2008), the higher the spending on education, the greater the likelihood that policies intended to improve education are adopted. Another influence on policy adoption is the economic model that suggests that the more affluent a community, the more it will expand policy development compared to communities of lesser means (Feiock & West, 1993). In addition, multiple studies indicate that wealth or availability of resources are among the strongest predictors of innovation (Mohr, 1969). Due to the cost of policy implementation and adoption, some communities do not have the fiscal capacity to adopt innovative policy (Feiock & West, 1993). Pincus (1973) argued that with the absence of a marketplace to test the value of an innovation, school organizations are more apt to adopt a cost-raising innovation provided it is acceptable to taxpayers. At the same time, a body of research suggests that increased spending in education does not equate to increased student achievement (Hanushek et al., 2012; Hedges et al., 2016).

This variable uses the percentage of a state’s total expenditures on education as a predictor of performance-pay policy adoption. Data on the annual statewide expenditures and annual expenses were collected from the U.S. Census, which were then used to calculate the percentage of total revenue spent on education expenses. This variable is identified as the average percentage of total annual state revenue; therefore, the data did not have to be normed for inflation. Again, the mean for each state for the duration of the study was used.
Variable 7: Overall statewide teacher’s union strength. According to Figlio and Kenny (2007), nonunionized schools were more than twice as likely as unionized schools to offer teacher incentive programs, and several researchers pointed out that teachers’ unions are among the strongest opponents of PFP (Ballou & Podgursky, 1993: Lavy, 2007). Performance-pay policies were thwarted due to union opposition in 2005-2006 in Massachusetts and again in 2000 in Philadelphia, when the local teachers’ union realized the plan was short-budgeted by $180 million (Buck & Greene, 2011). Similar union opposition repelled performance-pay policies in local districts, even when statewide programs offered substantial financial incentives (Buck & Greene, 2011). Goldhaber (2009) noted that 6% of districts with a collective bargaining agreement have performance pay versus 11% for those without. Even the editors for the National Education Association (NEA) website declared that “Such a move [implementing performance-pay programs] comes with serious, potential pitfalls...such plans can pit employee against employee, especially when there’s a quota for merit increases” (Rosales, 2010, para. 5). Union strength varies from state to state, from district to district, and unions discourage bonuses that directly reward improved student test scores (West & Mykerezi, 2011).

The Fordham Institute conducted a study on the strength of teacher unions in each state and assigned them a score based on 37 variables across five broad areas: resources and membership, involvement in politics, scope of bargaining, state policies, and perceived influence (Winkler, Scull, & Zeehandelaar, 2012). Although the Fordham Institute’s findings were published in 2012, the strength of a state’s teachers union is predictably consistent over the course of the years of the study, and the data remain
useful for examining predictors of policy adoption for the timeframe of the study. One category of the teachers union variable included state expenditures on education. To avoid a collinear relationship, the index was recalculated to remove that portion of the ranking. This variable is coded as a continuous ranking scale, the higher the state rank (1 being the highest and 50 the lowest), the stronger the teachers union.

Sample

This study includes two sets of biennial state-level data spanning three years from 2009 to 2011. The sample intentionally begins the year of the reinstatement of 2009 Americans Reinvestment Act when the Obama Administration earmarked federal funds in the RttT program and specifically encouraged statewide performance-pay policy adoption.

The state-level policy studies in this logistic regression encompass all 50 states, but exclude the District of Columbia because of the limited data from that location, which made comparable analysis impractical. The regional influence variable excludes Hawaii because it does not have neighboring states in its defined region. In addition, eleven states had already adopted performance pay prior to the beginning of the timeframe of this study; however, their inclusion in the study had minimal impact on the results, and the determinants representing each state are valuable and worthy of inclusion.

Procedure

The goal of the logistic regression is to accurately predict outcomes for the adoption of performance-pay policy for each independent variable. An effort was made to reduce the number of predictors in order to achieve parsimony, while maintaining a strong level of prediction (Mertler & Vannatta, 2010). Because the aim of this study is to
determine a state’s status insofar as the adoption of performance-pay policy. Table 2 presents the independent variables and measures in the data set compiled for this study.

The outcome of a logistic regression analysis comparing these seven variables reasonably predicts the probability of a state’s status in performance-pay adoption (pfp)—either (0) indicating the state has not made a formal effort to support adoption of performance-pay initiatives or (1) the state supports performance-pay policies, even if the decision to do so is left to district discretion.

Table 2

Table of Variables and Measurement Explanation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>rttt</td>
<td>Are states aspiring for the Race for the Top funds more likely to adopt PFP?</td>
</tr>
<tr>
<td>regad</td>
<td>Are states whose regional neighbors have already adopted PFP more likely to adopt it?</td>
</tr>
<tr>
<td>inn</td>
<td>Are states with a history of higher levels of innovation more likely to adopt PFP?</td>
</tr>
<tr>
<td>success</td>
<td>Does a state’s Chance for Success score have an impact on its inclination to adopt PFP?</td>
</tr>
<tr>
<td>ptycl</td>
<td>Does a Republican-controlled government influence whether a state adopts PFP?</td>
</tr>
<tr>
<td>eduex</td>
<td>Does the percentage of a state’s total revenue spent on education influence the adoption of PFP?</td>
</tr>
<tr>
<td>tchun</td>
<td>Is the strength of a state’s teachers associated with the adoption of PFP?</td>
</tr>
</tbody>
</table>

The logistic regression is based on probabilities, odds, and the logarithm of the odds (Mertler & Vannatta, 2010). The odds are defined as the ratio of the probability that an event will occur divided by the probability it will not occur.
Odds = \frac{p(X)}{1-p(X)} \quad (1)

Where \( p(X) \) is the probability of the adoption of performance pay \( X \) occurring, and \( 1 - p(X) \) is the probability of event \( X \) not occurring. The ultimate outcome of a logistic regression is a nonlinear function, and \( \hat{Y} \) is the probability of having one outcome or another based on a nonlinear model, resulting from the best linear combination of predictors. This can be represented as

\[ \hat{Y}_i = \frac{e^u}{1+e^u} \quad (2) \]

Where \( \hat{Y}_i \) is the estimated probability that the \( i^{th} \) case is in one of the categories of the DV, and \( e \) is a constant raised to the power of \( u \), where \( u \) is the linear regression equation

\[ u = B_0 + B_1X_1 + B_2X_2 + \cdots B_kX_k \]

which is then the natural log of the probability of having adopted performance-pay policy divided by the probability of not having adopted performance-pay policy (Mertler & Vannatta, 2010). The linear regression equation creates the logit or log of the odds:

\[ \ln \left( \frac{\hat{Y}}{1-\hat{Y}} \right) = B_0 + B_1X_1 + B_2X_2 + \cdots B_kX_k \quad (3) \]

The effect of an independent variable is usually represented by an odds ratio, \( \text{Exp}(B) \), which is defined as a ratio of the odds of being classified in one of the two categories. The odds ratio is simply the exponentiated B coefficient.

In the SPSS software package, the logistic regression sum includes three parts: statistics for overall model fit, classification table, and summary of model variables (Mertler & Vannatta, 2010). The goodness-of-fit shows the results of chi-square, which will demonstrate the value of the significance of each independent variable. Significant values are those greater than .05.
The second component of a logistic regression is the classification table for the dependent variable. The classification table compares the predicted values for the adoption of performance-pay policy, based on the logistic regression model. If the calculated probability is less than .50, the case is classified as not having adopted performance-pay policy (coded 0).

The final component interpreted is the table of coefficients for variables included in the model. The significance of each measure is tested with a measure known as the Wald Statistic and the associated significance value. The Wald test (Wald Chi-Squared Test) is a way to determine whether the explanatory variables add something to the model.

**Assumptions and Limitations**

Because this particular study is limited to only 50 cases (the 50 U.S. states), the issue of the number predictor variables relative to the number of cases can pose a potential problem with large parameter estimates and standard errors, especially in situations where combinations of discrete variables result in too many cells with no cases (Mertler & Vannatta, 2010). Second, the goodness-of-fit test may have frequencies that are too small ($f_e < 5$), meaning the analysis may therefore have too little power.

Another potential limitation with logistic regression is the sensitivity to high correlation among predictor variables. This results in multicollinearity. To avoid this concern, each chosen variable was specifically selected to address a particular arena of predictors of performance-pay policy adoption to avoid redundancy among the variables. Lastly, extreme values can distort the results of a logistic regression, as logistic regressions are sensitive to outliers. To prevent extreme values, the standardized
residuals were examined in order to detect outliers, and any cases with z-score values
greater than |3| were deleted from the sample.

Despite the limitations, this study explores the association between the varying conditions of state-wide education systems and the adoption of performance-pay policies in a way that demonstrates the directional relationships between potential predictors and the adoption of PFP.
CHAPTER 4
RESULTS

The analytical plan of this study was formulated to address the goal, to identify the factors associated with a state’s adoption of performance-pay policies, including the influence of federal incentives, regional diffusion, innovative status, problem severity, political factors, economic conditions, and interest groups. The conceptual framework of the study incorporated both DOI and ID, leading to the following research question:

- What forces (internal and external) are associated with statewide support of performance pay policies?

The dependent variable of this study was “pay-for-performance (PFP) policy adoption” which has two binary outcomes, if a state did not adopt PFP, coded as 0, and if a state did adopt PFP, coded as 1. Both primary and secondary data were used for a combination of nominal and continuous variables covering a range of potential determinants of policy adoption. The data were manually entered and quality checked into an Excel spreadsheet, then imported into IBM SPSS Statistics Subscription, which was used for both preparing the data as well as the analysis. Because this study looked at state-level policy, the data included all 50 states, from 2009 to 2011, the window in which states could apply for RttT funds.

The goal of the study was to understand the relationship between theoretically derived factors that could predict whether the states support the adoption of PFP policies; therefore, the analysis plan was correlational in nature. To complete the study, the data were averaged for scale variables and aggregated across the years of study for all nominal variables. Descriptive statistics analysis was used to show frequency distribution, and
binary logistic regression model was used to assess and identify the influence of variables on state adoption of performance pay. Consistent with the effort to avoid collinearity, a collinearity diagnostics test was executed through SPSS, and the variable inflation factor (VIF) for all covariates was under 3, which is well below the threshold of 10, and the tolerance for all variables exceeded .1; therefore, multicollinearity was not a problem (Mertler & Vannatta, 2010). The following section begins with descriptive statistics for the variables used in the study, followed by an explanation of the results of the binary logistic regression.

**Descriptive Statistics**

The data were representative of all 50 states spanning three years, 2009 to 2011. The nominal data were merged into one dataset (RttT aspiration, PFP adoption, and Republican Party control during year of adoption, and regional adoption). Continuous data (annual Chance for Success Index and annual percentage of state revenue spent on education) were combined and averaged to create one dataset of 50 cases (one for each state).

**Dependent Variable**

At the end of 2011, the final year in which states could apply for RttT funds, 24 states had officially adopted some form of state-level performance-pay policy, which was represented as 0 if the state did not adopt PFP policies or 1 if the state did adopt PFP policy. It is important to note that some states had adopted PFP prior to the dates of this study, two of which dropped PFP the first year of the study, and others adopted PFP during the years of study, only to discard the policy shortly thereafter. The duration of policy implementation or causes for policy abandonment are not relevant to this study,
but rather, the focus is on the predictors of policy adoption. Table 3 shows which states held statewide performance-pay policies in 2011.

Table 3

*States with State-wide Performance in 2011*

<table>
<thead>
<tr>
<th>Arizona</th>
<th>Indiana</th>
<th>Nebraska</th>
<th>South Carolina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>Kentucky</td>
<td>Nevada</td>
<td>South Dakota</td>
</tr>
<tr>
<td>California</td>
<td>Louisiana</td>
<td>Mississippi</td>
<td>Tennessee</td>
</tr>
<tr>
<td>Florida</td>
<td>Maine</td>
<td>Missouri</td>
<td>Texas</td>
</tr>
<tr>
<td>Georgia</td>
<td>Michigan</td>
<td>Oklahoma</td>
<td>Utah</td>
</tr>
<tr>
<td>Idaho</td>
<td>Minnesota</td>
<td>Oregon</td>
<td>Virginia</td>
</tr>
</tbody>
</table>

**Diffusion-Related Variables**

**Regional neighbors.** Regional diffusion can influence adoption of like policies between regional neighbors (Boehmke & Skinner, 2012; Glick & Friedland, 2014; Lutz, 1987; Walker, 1969). Utilizing the U.S. Department of Educational Regional Laboratories region map, each state’s regional neighbors were reviewed the year prior to analysis to identify the ratio of states that had already adopted PFP and data were compiled to evaluate the relationship between regional neighbor adoption and state adoption of PFP. Table 4 shows the frequencies of regional influence during the timeframe of the study. Interestingly, only one state adopted PFP policies without having a regional neighbor do so previously, 24 states were in regions with neighboring states that had already adopted, and 13 states had some regional neighbors that had adopted, yet they did not.
**Table 4**

*Regional Neighbor Adoption of PFP*

<table>
<thead>
<tr>
<th>Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No regional neighbors adopted PFP prior and state did not adopt.</td>
<td>12</td>
</tr>
<tr>
<td>No regional neighbors adopted PFP prior and state did adopt.</td>
<td>1</td>
</tr>
<tr>
<td>Some, but less than half of regional neighbors adopted PFP prior and state did not adopt.</td>
<td>9</td>
</tr>
<tr>
<td>Some, but less than half of regional neighbors adopted PFP prior and state did adopt.</td>
<td>16</td>
</tr>
<tr>
<td>Half or more, but not all, regional neighbors adopted PFP prior and state did not adopt.</td>
<td>4</td>
</tr>
<tr>
<td>Half or more, but not all, regional neighbors adopted PFP prior and state did adopt.</td>
<td>8</td>
</tr>
</tbody>
</table>

*N = 50 cases*

**RttT aspiration.** Race to the Top aspiration is an example of vertical diffusion, or diffusion between levels of government. Just as in LaVenia et al.’s 2015 study on state adoption of the Common Core Standards, the association of the RttT legislation to the adoption of PFP was included in this study. Per Table 5, 46 of the 50 states applied for RttT funds during the study, and only one state that adopted PFP did not apply for RttT funds (Texas). Of the 46 states that applied for RttT funds, almost half (52%) formally adopted PFP policies, and approximately half did not (48%). Annually, the data reveal a strong story. The first phase of RttT applications were accepted in 2009, the second in 2010, and the final phase of applications occurred in 2011. Only 10 states did not apply for Phase I funds, and by 2011, the final round, only four states had not attempted to
receive some RttT federal funding at some point throughout the duration of the study (see Table 5).

Table 5

*Race to the Top Fund Aspiration*

<table>
<thead>
<tr>
<th>Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not apply for RttT funds and did not adopt.</td>
<td>3</td>
</tr>
<tr>
<td>Did not apply for RttT funds and did adopt.</td>
<td>1</td>
</tr>
<tr>
<td>Did apply for RttT funds and did not adopt.</td>
<td>22</td>
</tr>
<tr>
<td>Did apply for RttT funds and did adopt.</td>
<td>24</td>
</tr>
</tbody>
</table>

*N = 50 cases* 50

**Internal Determinant-Related Variables**

**Republican party control.** The political composition of a state often influences policy adoption, implementation, and maintenance. Unified political party control of both the legislative and executive branches of state government has shown to have significant effects on policy outcomes during legislative sessions (Schneider et al., 2015). Furthermore, conservative political stances most influence education finance reform (Roch & Howard, 2008).

Throughout the duration of the study, 2009 to 2011, the Republican Party was the dominant party in control of both the legislature and governor seat in nine different states. The Democratic Party held majority control in 15 states, and in 23 instances, both parties shared control of the state’s government. Only in one instance was there both an independent governor and independent controlled legislation. It is important to note that of the nine times the Republican party was in control of a state’s government, eight of
those states adopted performance pay policies during the duration of the study; whereas when a party other than Republican (or no dominant party at all) was in control, less than half adopted PFP policies.

Table 6

State Republican Party Control

<table>
<thead>
<tr>
<th>Party Control and Adoption</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republican Party Control and No Adoption</td>
<td>1</td>
</tr>
<tr>
<td>Republican Party Control and Adoption</td>
<td>8</td>
</tr>
<tr>
<td>Other Party Control and No Adoption</td>
<td>22</td>
</tr>
<tr>
<td>Other Party Control and Adoption</td>
<td>19</td>
</tr>
<tr>
<td>N = 50 cases</td>
<td>50</td>
</tr>
</tbody>
</table>

**Education spending.** Boehmer et al. (2008) noted that the higher the spending on education, the greater the likelihood that education improvement policies are adopted. To evaluate this predictor, data were collected and averaged for the years covered in this study from the U.S. Census Bureau for 2009, 2010, and 2011. Descriptive statistics (Table 7) show that the sample’s average percent of total revenue dedicated to education expenditures was close to 37% ($M = 36.85, SD = 7.40$). The minimum percent of revenue spent on education within the sample was 22%, while one state spent an average of 61% of its annual revenue on education expenditures during 2009 to 2011.

**Chance for Success Index (CFSI).** To isolate the need-based determinants (Daley & Garand, 2005; Sapat, 2004), the Education’s Research Center’s Chance for Success Index (CFSI) was collected from the 2009 and 2011 yearbooks and averaged for this study. The CFSI score encompasses a variety of indicators of the health of a state’s
education system. In reference to Table 7, the lowest CFSI in the entire 50 case sample was 67.70 (New Mexico), and the maximum was 93.70 (Massachusetts), out of a possible 100, and the average was 78.9 ($SD = 6.27$).

**Teacher union strength.** Teachers unions tend to be performance-pay foes, and extensive empirical research demonstrates the barriers strong teachers unions pose in policy adoption (Ballou & Podgursky, 1993; Figlio & Kenny, 2007; Lavy, 2007). Because the teacher union strength covariate is a constant rank and not a time variant, there was no change over the course of the three-year period covering this study. The same score applied to each state consistently every year and did not require averaging for the purposes of this study. As shown in Table 7, the minimum score, representing the state with the strongest teachers union, was 6.75 (Montana), and the score representing the state with the weakest teachers union was 47.75 (Arizona). The sample as a whole maintained an average score of 25.29 ($SD = 9.28$), which accurately reflects the rank of the 50 states.

**Innovation score.** The innovation score, compiled by Boehmke and Skinner (2012) was also time invariant. The lower the score, the lower the inclination of a state to adopt innovative policies and the higher the score, the more apt a state is to adopt innovative policies. Berry and Berry (1990) and LaVenia et al. (2015) both noted that innovative status is a factor in the adoption of innovative policies and LaVenia et al. (2015) found a statistically significant association between state adoption of Common Core Standards and innovation. The range of scores was 2.87 (Alabama) to 9.83 (California), with an average of 5.19 ($SD = 1.36$). See Table 7.
Table 7

*Continuous Variable Descriptive Statistics*

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>( M )</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education Spending</td>
<td>21.86</td>
<td>61.12</td>
<td>36.85</td>
<td>7.40</td>
</tr>
<tr>
<td>Chance for Success Index (CFSI)</td>
<td>67.70</td>
<td>93.70</td>
<td>78.95</td>
<td>6.27</td>
</tr>
<tr>
<td>Teacher Union Strength</td>
<td>6.75</td>
<td>47.75</td>
<td>25.29</td>
<td>9.28</td>
</tr>
<tr>
<td>Innovation Score</td>
<td>2.87</td>
<td>9.83</td>
<td>5.19</td>
<td>1.36</td>
</tr>
</tbody>
</table>

\( N = 50 \) cases

**Analysis**

A binary logistic regression model was used to identify variables associated with performance-pay policy adoption. The general model was specified as: 

\[
PFP = \beta_0 + \beta_1(\text{REGAD}) + \beta_2(\text{RTTT}) + \beta_3(\text{INN}) + \beta_4(\text{SUCCESS}) + \beta_5(\text{EDEX}) + \beta_6(\text{TCHUN}) + \beta_7(\text{REP}) + \text{Error}
\]

The alpha level of 5% was employed throughout the study. The variable-free classification table showed that the success rate in predicting PFP adoption without any model would be correct 50% of the time; however, the model classification table revealed that the model correctly classified 82% of cases, a marked improvement. Significant tests of predictors have fewer than 50 degrees of freedom.

The Omnibus test for coefficients, used to test whether the explained variance in a set of data is significantly greater than the unexplained variance, utilized the chi-square value as the test statistic. The test revealed \( \chi^2(7, N = 50) = 22.67, p < .002 \), which indicated there were significant predictors in the model. With the Hosmer and Lemeshow test, a low p-value, such as \( p < 0.05 \), indicates a model with poor fit. The chi-square statistic in this test, \( \chi^2(8, N = 50) = 13.68, p < .090 \), failed to disconfirm the null, meaning the data were amendable to being modeled.
According to the Nagelkerke R Square, the model accounted for approximately 49% of the variance in adopting PFP policies. Table 8 shows the parameter estimates with the significance of each predictor in the presence of the other predictors.

Table 8

*Table of Coefficients*

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Sig.</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race to the Top Aspiration</td>
<td>1.629</td>
<td>2.102</td>
<td>.600</td>
<td>.438</td>
<td>5.098</td>
</tr>
<tr>
<td>Prior Adoption by Regional Neighbors</td>
<td>.584</td>
<td>.674</td>
<td>.750</td>
<td>.386</td>
<td>1.793</td>
</tr>
<tr>
<td>Chance for Success Index</td>
<td>-.036</td>
<td>.074</td>
<td>.232</td>
<td>.630</td>
<td>.965</td>
</tr>
<tr>
<td>% of Revenue on Ed. Expenses</td>
<td>-.010</td>
<td>.057</td>
<td>.029</td>
<td>.864</td>
<td>.990</td>
</tr>
<tr>
<td>Republican Controlled Government</td>
<td>.523</td>
<td>1.357</td>
<td>.148</td>
<td>.700</td>
<td>1.686</td>
</tr>
<tr>
<td>State Innovation Score</td>
<td>.273</td>
<td>.278</td>
<td>.966</td>
<td>.326</td>
<td>1.314</td>
</tr>
<tr>
<td>Strength of Teacher’s Union</td>
<td>.153</td>
<td>.062</td>
<td>6.085</td>
<td>.014</td>
<td>1.166</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.223</td>
<td>6.520</td>
<td>.420</td>
<td>.517</td>
<td>.015</td>
</tr>
</tbody>
</table>

Table 8 shows there is only one significant predictor, Strength of Teachers Union, \(p = .014\). As the rank of a state’s teachers union strength increases by one unit (a rank scale with 1 being the highest ranking and strongest teachers union and 50 being the lowest and weakest teachers union), the odds a state is likely to adopt PFP was 1.17 times less, in other words, 17% less likely.

Although not significant predictors in the model, Table 8 shows the directional contributions of the remaining predictor variables. When a state aspires for RttT funds, the estimated odds ratio 5.098 equates to a 5.1 times more likely inclination to adopt PFP policies compared to those states who do not apply for RttT funds, controlling for other
variables in the model. Although not a statistically significant association, the directional correlation is worth noting. In the same fashion, the estimated odds ratio 1.793 indicated that a state whose regional neighbors have already adopted PFP policies are 1.8 times more likely to adopt PFP policies themselves. Equally, states that have Republican controlled governments are 1.17 times more likely to adopt PFP versus states with either no dominant controlled government or Democratic party controlled government, again insignificantly reported in the model.

The inclusion of Chance for Success Index, or percent of state revenue spent on education, had little effect on the result of policy adoption because their odds ratio was very close to one. However, the odds ratio showed that with a one-unit increase, the odds of a state’s adoption of performance pay actually decrease slightly. On the other hand, despite being insignificant to the model, for every unit increase in the innovation score of a state, the odds ratio 1.314 suggests that the likelihood of a state adopting performance pay is 1.3 times greater, controlling for all other predicting variables.

Although the predictors in the model revealed little statistical significance in relation to the adoption of performance pay, the model did reveal directional relationships with adoption and non-adoption, which does provide a better understanding of the role of various predictors in PFP adoption and could be explored in future studies.
CHAPTER 5

DISCUSSION

The current study was conducted to model the factors that are associated with statewide performance-pay policy adoption in state legislatures throughout the United States. Based on binary logistic regression, results showed that one out of seven explanatory factors used in the study (strength of a state’s teachers union) significantly predicted performance-pay policy adoption. This result is consistent with Hartney and Flavin (2011) and Julnes and Holzer (2001), who contended that the role of teachers union interest groups greatly influences a state’s adoption of performance-pay policy. Conversely, adoption of a similar policy by regional neighbors, the score of a state’s inclination to adopt innovative policies, percent of revenue spent on education, Chance for Success Index, RttT Aspiration, or Republican-controlled government did not have statistically significant effects on a state’s inclination to adopt performance-pay policy.

Utilizing data from the years in which states were eligible to apply for RttT funding (2009 to 2011), a binary logistic regression was implemented to determine the factors that predict a state’s adoption of performance-pay policy. Contributing to the literature of innovation diffusion and policy-adoption studies, this study informs the discussion within political science and education about the use of federal aid to leverage policy priorities, the role of interest groups in policy adoption, as well as what determinants are inclined to affect the adoption of statewide education policy. While this study demonstrated significance in only one determinant, it provides a scope of analysis on the effects of all predictor variables studied.
The analysis failed to show the comparable importance of diffusion related variables. Regional, nor vertical, diffusion explained adoption behavior among states. Although there are directional correlations between the diffusion-based covariates (vertical diffusion = RttT aspiration and regional diffusion = adoption of PFP by regional neighbors), neither of the two predictors showed significant effects in the model.

One section of the RttT application, worth 28 points, focused directly on the adoption of performance-pay policies. Only one state awarded RttT funds did not include language supporting performance-pay adoption in its application (Illinois) and chose to forgo points for that particular section of the application. Accordingly, at no time during the study did Illinois adopt a performance-pay initiative, and as of 2015 (the most recent available data) still had not shown support for performance pay. Of the 46 states that applied for RttT funds in the duration of the study, 12 of the states that did not receive the funding did not adopt, while 16 states that applied and did not receive funding still chose to adopt PFP. On the other hand, 10 of the states that applied for RttT funds and were awarded funding still had not adopted PFP by the end of 2011, and only three of them had done so by 2015, as reflected in the data then available. Equally, eight of the states that applied for and were awarded RttT funds did adopt performance-pay policies within the timeframe of the study. At first glance, it seems that being awarded funds is not enough incentive to spur states to adopt federally encouraged policy; the results suggest, although not at a significant level, that simply providing an opportunity to apply for RttT funds does have some directional correlation to encourage states to adopt federally suggested initiatives, as minor as it may be. However, aspiration for RttT funds was not statistically significant; therefore, these findings are not in alignment with the prior study
utilizing RttT aspiration to predict the adoption of a federal initiative (Lavenia et al., 2015). Confirming or disconfirming the influence of the federal program on states’ adoption behavior does not necessarily support or reject the impact of federal incentives, but in the case of this study, RttT was not a significant predictor of adoption. It is unclear why participation in national policy associations did not show a relationship to policy adoption as in prior studies (McLendon & Cohen-Vogel, 2008; Mintrom & Vergari, 1998). Interviews with state policymakers assessing the perceptions and beliefs about PFP policy adoption could help researchers probe this further.

The other diffusion-related variable, regional neighbor adoption, also did not show a significant association with state adoption of performance-pay policy as mirrored in LaVenia et al. (2015). Specifically, this study provided no evidence that influences from regional neighboring states affect the adoption of performance pay policy. Innovation diffusion emphasizes that when attempting to explain state adoption behavior, it must be considered through the activity of a state’s regional neighbors or involvement in national policy networks. In the study, the predicting variable analyzed was the influence of regional neighbors, which did not demonstrate any statistical significance; however, there was an insignificant directional correlation between the number of regional neighbors and a state’s inclination to adopt like policy. Between the two diffusion-related variables, there was insufficient statistical significance to make any claims about the role of diffusion in the adoption of performance pay. Like the Karch (2007) and the LaVenia et al. (2015) studies, this study revealed no statistically significant relationship between regional neighbors and policy adoption. Possibly the technological innovations, close networking, and ease of access to information is
connecting entities more than ever, and the immediate effects of regional diffusion lack the strength they had at the conception of the DOI framework.

The application of multiple frameworks holds greater promise for fuller understanding than does the application of any single framework. Because the diffusion framework is limited in its ability to explain the full picture of policy adoption, internal determinants were included. The internal determinants used as predictors in this model include Republican government control, innovation score to assess a state’s proclivity to adopt innovative policies, Chance for Success Index to evaluate the relationship between the health of a state’s education system in connection to policy adoption, the percent of revenue spent on education, and the role of interest groups, specifically teachers unions, in PFP adoption. Of the internal determinants, the only determinant statistically significant was the strength of a state’s teachers union, which showed that the stronger the union, the less likely was PFP adoption. Future research on the adoption of PFP may benefit from a framework that looks at the shared strength between state and federal actors in the adoption of state-level education policy.

The findings in this study show the crucial role teachers unions hold in the adoption of state-level policy, particularly performance pay. The National Education Association firmly stated its opposition to performance-pay programs (Raabe, 2009) and in some states has actively protested against the adoption of such. This study confirmed this finding—the strength of a state’s teachers union truly does have an impact on a state’s ability to adopt policy. When state education systems intend to adopt a policy, it would be in their best interest to invest the time and energy to secure the support of the state teachers unions to ensure the best chance of adoption. The same recommendation
applies to the federal-level policymakers, as this study demonstrated an insignificant relationship between performance-pay policy adoption and aspiration for RttT funds, although relationally correlated. Simply offering the possibility of financial incentives for policy adoption does not appear to spur states to take on new policy, especially contentious policies such as pay for performance.

Although studies have noted that some states with a history of innovative policy adoption are more inclined to adopt policy eagerly (Boehmke & Skinner, 2012; Walker, 1969), this study did not reveal the same. Possibly a more specific breakdown of the innovation score limited solely to education policy would paint a different picture, as the score of innovation is a combined score of locality policy, economic policy, social policy, and education policy.

Unlike the findings in Ecks’ study (2016), Republican Party control did not significantly contribute to the likelihood of policy adoption, although there was an insignificant directional correlation. Why conservative political environments affect the adoption of some policies, such as compulsory education laws in a study conducted by Ecks in 2016, but not others, such as performance-pay policy adoption, is unclear. One possible explanation could be that the opposition of such policies by interest groups outweighs the support from the party, thereby inhibiting its adoption. To explain the relationship between these two opposing variables more clearly, a different statistical approach might be appropriate.

Two predicting variables had little to no effect on the model, positively or negatively. Problem severity was measured by the Chance for Success Index, an annual score compiled by the Education Research Center, ultimately giving each state a score,
assessing the health of its individual education systems. There was virtually no effect from the inclusion of the index in the model, possibly because the index comprised too many variables to be able to pinpoint the predictors of policy adoption. Likewise, the economic explanation had no effect on the model and included the percent of a state’s total revenue on education expenses. The range for each state was very broad, and it appeared that there were no significant effects from a lower or higher contribution to a state’s education expenses. Possibly looking at specific dollar amounts normed for average cost of living in each state would provide a more accurate relationship.

**Contributions and Limitations**

This dissertation contributes to the education policy literature in its merger of two conceptual frameworks, DOI and ID. Rogers’ DOI framework has been a long-standing conceptual framework utilized in policy-adoption studies, but just over two decades ago it was challenged to include other determinants for policy adoption, especially those internal to an organization or entity. This model merges the two frameworks to explain the adoption of PFP. Future research utilizing a combined conceptual framework approach would help to provide a greater picture of the overall policy adoption process at all stages and levels.

Secondly, this dissertation contributes to the literature by providing a historical account of performance-pay policy, and similar to other policy studies, this study finds that the internal determinants of states have significant effects on policy adoption. However, additional research on modern PFP policy needs to address the extent of the implementation of PFP, how states are truly “supporting” the policies, and the
effectiveness of the adoption. Simply because a state legislature has written laws adopting such policy does not necessarily equate to implementation with fidelity.

A number of potential limitations and biases are in the study, beginning with the PFP policy variable. The PFP variable was a secondary variable collected from the National Center on Teacher Quality and was subject to collection biases. For a state to qualify as a supporter of PFP adoption, it not only had to have written legislation stating such, but it also had to provide funding for program implementation. The discrepancy in this variable is how the state chooses to implement it locally; some states such as Florida, prohibit districts from approving collective bargaining agreements that preclude salary incentives. A policy meta-analysis may provide a clearer delineation of the specifics of PFP and engender a better understanding of PFP policy adoption.

Another limitation of the study was the small sample size in the dataset. There are only fifty states; therefore, only fifty degrees of freedom. The ratio of variables to cases did not meet the ideal of 10 cases per variable (Peduzzi et al., 1996), although, Vittinghoff and McChulloch (2007) argued that the ratio of 10:1 may be too strict for logistic regression. In any case, to alleviate the concern for a poorly proportionate variable to case ratio, bootstrapping or accumulating more years of data and creating a pure time-series model when more data are available could be potential solutions. Additionally, because control trials are not possible (all states were offered the incentive of RttT funding), there are limits to the ability to drawing casual inferences, meaning that the potential of federal incentives offered to states that adopted PFP cannot, as a result of this study, be claimed as the cause of PFP adoption. There are also undoubtedly other ways to measure some of the variables included in the model. Where possible, each
variable was clearly evaluated and included to measure the specific determinant in the conceptual model; however, other researchers should be encouraged to expand the list of measures or pursue measures that were not available at the time of analysis. Case studies that use retrospective interviewing and document collection and analysis could also offer insight that logistic regression does not supply by moving beyond quantitative correlations to reveal variability in policies and adoption characteristics to explain PFP adoption.

Lastly, a multilevel methodological approach utilizing data structures may deliver an alternative insight into a more complex model. A variety of methodologies were considered for this study, and due to the nature of the outcome variable, binary logistic regression best suited the research question; however, given the constraints of this approach, many potential explanatory variables were omitted from the study to maintain the ideal case to variable ratio and the integrity of the model. Incorporating a combination of time variant and time invariant models as well as state-level fixed effects would lay the groundwork for further analysis.

A number of variables utilized in this study presented limitations, most notable, that of Republican Party control. Only in a handful of cases did the Republican Party have control of both the legislative and executive branches for all three years of the study; however, they were identified as Republican if the party was in power at least two of the three years. In all but two cases, this was accurate. A model sensitive to time variant variables would most likely be beneficial in addressing this issue in the future. The roles of other predictors of performance-pay policy adoption, such as teacher retention rates and absenteeism, were not readily available at the state level. Future
studies addressing alternative variables, or like variables gathered at the district level, could be tested to determine the potential effect, other than the strength of teachers unions on the adoption of performance pay.

Secondary variables posing bias were difficult to identify because researchers representing various organizations such as the Education Research Center by Quality Counts, the Fordham Institute, and the National Council on Teacher Quality compiled them. Although all these organizations are reputable, utilizing primary data would eliminate the unknown and unidentifiable researcher bias. Lastly, the exclusion of qualitative accounts of performance-pay policies and adoption across the states prevents a comprehensive understanding of the policy and its adoption. A blended methodological approach is recommended for future researchers.

**Conclusions and Recommendations**

Performance-pay policies have cycled in and out of trend in the campaign to solve any number of education’s ills, but specifically as part of attempts to raise student achievement and success through improved teacher quality. From the earliest recorded pay-for-performance attempt, PFP has been considered a viable option to achieve education goals. Though its popularity waxes and wanes, pay for performance continues to surface in public policy proposals.

Today, performance pay continues to hold hope for policymakers, especially at the federal level. Through diffusion via federally managed incentives, the national education policymakers, with bipartisan support, are attempting to align states with their agenda. Interestingly, while half of all states have made a formal statement of support for performance-pay policy adoption, the issue continues to be highly contested.
As researchers gather more data, studies can reveal not only the predictors of performance-pay policy adoption, but also the predictors of performance-pay policy abandonment, as well as an analysis of the cycles throughout history. Furthermore, studies examining the effectiveness of such policy would also greatly contribute to the literature, including the development of an assessment tool to analyze the impact performance-pay policy has on education systems, thereby potentially explaining why the policy continues to cycle in and out of educational trends. One thing is certain, however: federal support for performance-pay policy shall remain a core component of American education policy with the newly enacted Every Child Succeed Acts, which furthers national support for performance-pay policy adoption.

Despite showing limited statistically significant effects on the adoption of performance pay, this model informs adoption studies examining factors within state education systems that influence performance-pay policy adoption. Understanding how predicting variables relate to the adoption of performance pay allows policymakers at all levels approach the issue armed with information that will allow better understanding of how to implement change. Because of the limited power of the model due to the small sample size, conclusions regarding the significance of the independent variables must be viewed in context and further studies are warranted. Furthermore, looking at predicting variables specific to teacher quality, teacher recruiting, and teacher retention would reveal hiring-related relationships to PFP adoption. Lastly, this study brings to light the insignificant effects of diffusion-related predictors, thereby bringing to question the use of the DOI framework, conceived over five decades ago. Communication channels and technological innovations have changed substantially over the past 50 years, which may
alter the influence of geographical proximity in policy adoption. Looking deeper into networking connections versus geographical location may offer a different picture of the role of diffusion. Future research on policy adoption may also better benefit from the application of Manna’s 2006 “borrowing strength model,” which argues that our nation’s education agenda takes shape through the interaction of policy actors at national and state levels who “borrow strength” from one another to formulate and enact reforms (LaVenia et al., 2015).

Future studies regarding PFP adoption are endless in nature, and taking an alternative conceptual approach could greatly enhance the body of literature surrounding policy adoption in general.
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