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A Study of the School Principal Labor Market in Arkansas: Implications for Incentive-Based Compensation Policies to Improve Principal Quality

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A STUDY OF THE SCHOOL PRINCIPAL LABOR MARKET IN ARKANSAS: IMPLICATIONS FOR INCENTIVE-BASED COMPENSATION POLICIES TO IMPROVE PRINCIPAL QUALITY

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of the requirements for the degree of
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Abstract

Improving principal quality in Arkansas may be a partial solution to the public policy problem of low performing public schools. Just as policymakers in other states are beginning to explore incentive-based compensation policies to improve principal quality, education policymakers in Arkansas should look to these policies as a way to align goals and minimize agency costs. Setting incentives tied to transparent, publicly available performance measures can resolve monitoring difficulties inherent in principal-agent relationships and can improve goal congruence by signaling clearly about policy priorities. Before plowing forward with performance pay reforms for school principals, Arkansas policymakers could make better decisions in light of research about the Arkansas principal labor market. Specifically, understanding whether more effective principals earn larger salaries or get higher increases in pay can inform policymakers about the incentives that currently exist in the principal labor market and can guide their policy reform decisions about how to improve principal quality.

The original research in this study indicates that principals in Arkansas are not meaningfully rewarded for superior performance, either through explicit performance bonuses or though earning higher salaries by being hired in better paying principalships. Variation in principal pay is driven by the district and school enrollment, the amount of wealth in a district, a principal's experience, and a principal's degree level. If policymakers would like to focus principal attention on performance, rather than encouraging them simply to earn higher degrees or to seek employment in large, wealthy districts, policymakers should consider instituting performance-based pay.

This dissertation is approved for
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Chapter 1: Introduction

Introduction

An essential feature of the reauthorization of the Elementary and Secondary Education Act in 2001 – the landmark federal education policy commonly known as No Child Left Behind (NCLB) – was the stated focus on teacher quality as a critical component for improving public education (Darling-Hammond and Sykes, 2003; U.S Department of Education , 2003). NCLB's accountability system, focusing on standardized testing and the threat of sanctions for poor performance, included a requirement that participating states design a policy for ensuring that all students were being taught by a Highly Qualified Teacher (HQT) by the end of the 2005-06 school year (U.S. Department of Education , 2003).

Just as NCLB has focused attention on the importance of providing each student with a highly qualified teacher, educational policymakers at the national, state, and local levels are now beginning to turn their attention to school principal quality. At a hearing of the House Education and Labor Committee in May 2007, witnesses testified before Congress that initiatives to improve principal quality should be central to reauthorization of NCLB (Office of George Miller, 2007). Education reformers and legislators are choosing to focus on improving the quality of human resources because of the mounting evidence that good principals can (Marzano et al., 2005; Brewer, 1993; Hallinger and Heck, 1998; Nettles and Herrington, 2007) and good teachers (Hanushek and Rivkin, 2004; Sanders and Rivers, 1996, Darling-Hammond, 2000; Rivkin, Hanushek, and Kain, 2005) do make a difference for student achievement (Office of George Miller, 2007).

Education reforms to address low student achievement can be categorized generally into four categories: (a) those which focus on governance reforms, such as charter schools, (b) those which seek to drive improvement by creating higher standards through standards and testing, (c) those aimed at improving curriculum, and (d) those which focus on human capital improvements. A school's key human resources include teachers and principals. Because principals can impact educational outcomes, either directly (Marzano et al., 2005) or indirectly (Brewer, 1993; Hallinger and Heck, 1998; Nettles and Herrington, 2007), some policymakers believe that improving principal quality will lead to better student achievement. To improve student achievement by raising principal quality, policymakers consider the policy levers available that can impact features of the existing principal labor market.

Some local and state policymakers across the nation have already begun to experiment voluntarily with new solutions to the problem of low student academic performance by focusing their attention on school principal quality (Goldhaber, 2007). As examples of this growing trend, I describe below several state initiatives in Texas and two local initiatives – New York City school district's principal evaluation program and the Pittsburgh PULSE program.

According to Lewis and Springer (2008), pay-for-performance plans have been a part of the Texas public education landscape since the 1980's. In the last three years, in addition to having nine districts participating in federally funded performance pay programs through the Teacher Incentive Fund (TIF), Texas has implemented three state-funded incentive pay programs for educators as a part of the Governor's Educator Excellence Award Program (GEEAP) – the Governor's Educator Excellence Grant

(GEEG), the Texas Educator Excellence Grant (TEEG), and District Awards for Teacher Excellence (DATE) (U.S. Department of Education, 2008; Terry, 2008; Lewis and Springer, 2008). GEEG and TEEG are targeted at high poverty, high performing districts (Terry, 2008). The DATE grants, though they provide recipient districts with some flexibility, stipulate that districts must use a certain portion for teacher awards tied directly to student performance and a certain portion for other incentives, including principal incentives (Terry, 2008). Not all of these programs focus primarily on principal performance, but many of them provide rewards for principals based on the student achievement of their students.

In the Austin Independent School District, for example, principals can earn up to $8,000 in bonuses depending on the magnitude of student growth in reading and math on Texas state achievement tests (Terry, 2008). Dallas Independent School District (DISD) has been providing pay incentives for principals as a part of the district's school performance awards program since 1992 (Ladd, 1999, Terry, 2008). Although DISD stopped using that program in 2007-08, it recently instituted a new performance pay plan that includes bonuses of up to $10,000 for principals (Terry, 2008). In addition to receiving state funds through GEEG and TEEG (Terry, 2008), this new DISD plan is also federally-funded through a TIF grant (U.S. Department of Education, 2008). As Goldhaber (2007) and Terry (2008) note, Houston Independent School District (HISD) also has a performance pay plan that includes financial rewards for principals. Having evolved from the merit pay plans HISD has used over the last decade (Terry, 2008), HISD's current incentive pay plan is funded by TIF money, foundation support, and state grants, and district principals can earn up to $12,000 for superior performance (Houston

Independent School District, 2007). Local incentive pay programs are also emerging across the country as well.

In January 2008, New York City public schools administration announced reforms to improve the selection and evaluation of principals (Gootman, 2008). The new selection process would involve centralized screening of applicants. The new evaluation system would incorporate a 0-4 rating scale based on detailed criteria, including student test scores. With biannual ratings, this new system would replace the existing annual rating system of principals that had a satisfactory-unsatisfactory grading scale (Gootman, 2008). Similarly, Pittsburgh Public Schools have begun to reform training, evaluation, and accountability systems of the district's principals.

Just as in New York, principals in Pittsburgh have traditionally been rated on a satisfactory-unsatisfactory scale and have been compensated primarily based on experience. With the initiation of the Pittsburgh Urban Leadership System for Excellence (PULSE) program in the 2007-08 school year, principals are now evaluated and compensated based on their performance (Pittsburgh Public Schools, 2008). Through the program's pay-for-performance component, principals can earn a $2,000 raise as a part of their salary for earning proficient ratings across the evaluation rubric (Pittsburgh Public Schools, 2008; Goldhaber, 2007). They can also earn up to $10,000 as a bonus for improvements in student achievement, measured in part by performance on standardized tests (Pittsburgh Public Schools, 2008; Goldhaber, 2007).

As is evident in the state and local principal evaluation and compensation reform efforts described above, policymakers are looking at new ways to select, evaluate, and compensate principals to assure that students can benefit from the learning communities

produced by high quality school leaders. When policymakers attempt to provide incentives to motivate behavioral changes by principals and teachers regarding their career choices, policymakers are using levers that can change the public education labor market. Unfortunately, policymakers are often operating without a comprehensive understanding of the principal labor market. Indeed, as Goldhaber (2007) notes, little research on school principal compensation has been performed either at a general descriptive level or at a detailed analytical level. It is safe to say that the efforts of policymakers to institute incentive-based reforms designed to improve principal quality would benefit from a broader understanding of the existing principal labor market.

These incentive-pay policy proposals rely on assumptions informed by principal-agent theory and on research regarding teacher performance pay plans. Before plowing forward with performance pay reforms for school principals, Arkansas policymakers could perhaps make better decisions in light of research about the Arkansas principal labor market. Moreover, the applicability of principal-agent theory to this educational context must be analyzed. Additionally, potential differences between the principal and teacher labor markets may in fact render such policy solutions unnecessary. Namely, a performance pay system for principals may already be in place. In other words, there may be variation in principal pay in different school settings statewide, and highly effective principals may already be sorting themselves into better paying jobs. This study is intended to inform policymakers about the existing features of the school principal labor market in Arkansas and about the merits of policy proposals that include principal performance pay. Further, this study will add to the scholarly literature on incentive-

based compensation policies to improve student achievement through better educational leadership.

Statement of the Problem

Improving principal quality in Arkansas may be a partial solution to the public policy problem of low performing public schools. Arkansas K-12 student achievement is relatively low both in comparison to other states and in absolute terms. Performance data in Table 1.1 from the National Assessment of Education Progress, NAEP, reveal that the academic achievement of K-12 students in Arkansas lags behind the rest of the nation. Arkansas students ranked 31st out of 51 in 2007 on the Grade 4 Math Exam and 36th out of 51 on the Grade 4 Reading Exam. On the Grade 8 Math and Reading Exams, Arkansas students fared even worse. They ranked 42nd out of 51 on Grade 8 Reading and 40th on Grade 8 Math.

Table 1.1: *Arkansas Performance in Average Scale Scores on 2007 National Assessment of Education Progress Compared to Other States (Including DC)*

	Grade 4 Math	**Grade 4 Reading**	**Grade 8 Math**	**Grade 8 Reading**
Ranking out of 51	***31st***	***36th***	***42nd***	***40th***
Arkansas	238	217	274	258
National Average	239	220	280	261

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2007 Mathematics Assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

In absolute terms, this low relative performance ultimately results in an extremely high college remediation rate. According to the 2007 Arkansas School Performance Report issued annually by the National Office for Research on Measurement and

Evaluation Systems at the University of Arkansas, the college remediation rate in 2007 was 48.1 percent (Arkansas State Report Card, 2007). This figure means that approximately 50 percent of students who have taken the ACT would need to take a remedial college course in Mathematics, English, or both subjects (Remediation Rate, 2008).

Rationale for the Study

This study is designed as a guide Arkansas state policymakers who are considering improvements in educational leadership at the school level as strategy for raising student achievement in the state. Very little research has been conducted on the features of the school principal labor market. At the conclusion of a recent study on principal compensation, teacher and principal compensation expert Dan Goldhaber (2007) noted:

> … outside of a few high-profile examples, we have virtually no systemic knowledge about the structure of principal compensation including the extent to which compensation is linked to specific principal credentials or characteristics, or covered by collective bargaining agreements; whether principals are financially rewarded for taking tough leadership assignments; and whether there is a link between their compensation and measures of their performance. It should come as no surprise that a researcher is recommending more research on a topic, but, in this case, the need is profound. (p. 15)

Indeed, there is a dearth of research on the school principal labor market, and policymakers in Arkansas would benefit from a comprehensive understanding of the characteristics of this sector before proposing substantive changes.

For this reason, this study includes a broad exploration of the topic, including explanation of the barriers to entry into the profession that are designed to ensure

principal quality. For example, I discuss educational and experience prerequisites that impact the supply of principals. I also consider current monitoring, or evaluation, practices that are intended to reinforce high standards for educational leadership performance. Alongside this discussion about policies and practices that influence school principal quality, I present descriptive statistics about features of the workforce that has resulted from these policies. I also investigate the factors that impact both changes in the level of principal pay and the rate of increase in principal pay.

Before designing policy solutions to ameliorate potential educational inadequacies related to leadership, policymakers need a clear understanding of the principal pay and quality landscape and the nature of any patterns of principal sorting. For example, policymakers should understand if, in fact, low-income or low-performing students are routinely served by low quality principals before offering monetary incentives that can motivate higher quality principals to choose to work in such settings. Specifically, this study will reveal the sorting patterns of principals with varying characteristics and whether high-performing principals are already being rewarded for meeting student achievement standards. With this information about the incentives inherent in the current principal labor market, policymakers can better evaluate policies that propose to modify how principals are evaluated and paid.

Outline of the Study

In Chapter One, I establish the relevance of investigating principal quality reform policies given the current thrust of education policy discussions nationally. I provide examples of principal quality reform plans that are already being implemented in other states and assert that policymakers are adopting these policies without a comprehensive

knowledge of the principal labor market in American K-12 public education. I state the problem of insufficient student achievement for which improvements in principal quality might form a partial solution. Finally, I provide a rationale for this study by suggesting that education policymakers in Arkansas would benefit from an exploratory and analytical investigation of the principal labor market in the state.

Chapter Two has three objectives. First, I discuss and critique the theoretical policy framework – principal-agent theory (PAT) – on which incentive-based principal compensation reforms are grounded. The purpose of this policy theory explanation and analysis is to explore whether in fact incentive-based policies are appropriate for education reform and how such policies might work. Second, I discuss recent related research about incentives in the principal labor market, a body of scholarly research to which this study will contribute. Third, as a foundation for policy recommendations about monitoring principal performance by analyzing student academic performance, I present literature to show that principals can, in fact, impact student achievement. This section of chapter two is essential for this study because policy principals' attempts to monitor agent performance are a central problem in principal-agent theory. Further, policy recommendations calling for monitoring principal performance through data on student performance would be unfounded and unfair if principals were actually incapable of impacting student achievement outcomes.

I begin Chapter Three by describing features of the Arkansas principal labor market that are designed to ensure a high level of principal quality. Specifically, I focus on the barriers to entry into the labor market including licensure, certification testing, required experience, and completion of an authorized training program. This exploration

of these quality control mechanisms, which are related to principal preparation and qualifications, contributes to the overall discussion of policies that can positively impact the quality of educational leadership in the state. In the second part of Chapter Three, I describe current principal evaluation practices, which are intended to solve the monitoring difficulty that is a part of the principal-agent theory framework. To set these current practices in context, I also provide a review of the literature concerning the dispute over the best methods for monitoring principal performance. The purpose of including this background is to create an understanding that it is possible for Arkansas policymakers to consider alternative evaluation, or monitoring, strategies. I conclude Chapter Three by presenting the other descriptive data related to principal pay patterns in the state of Arkansas and in the region. This entire chapter is descriptive and provides context for the study's analysis of the principal labor market and for the policy recommendations in Chapter Seven.

In Chapter Four, I present the research questions and hypotheses of the study, and I describe the methods and data used to answer them. The two research questions are designed to uncover the factors that are associated with higher levels of principal pay and with larger changes in principal pay. My first research question focuses on the relationship between pay differentials and observable characteristics.

Research Question One: To what extent is the level of principal pay impacted by observable characteristics of the populations they serve and of principals themselves, including their performance in the prior year?

This first research question concerns the levels of principal pay in Arkansas and whether there are systematic variations in salary according to principals' observable

characteristics and those of the populations they serve. This question addresses the need for policymakers to have a comprehensive understanding of the levels of principal salaries and the factors that drive variations in principal pay across the state. These potential patterns of variation may have implications for policy, as the placement of higher paid – and therefore potentially higher quality – principals among certain groups of students may be contributing to educational inequities across the state. Before designing policy solutions to ameliorate potential educational inequities, policymakers need a clear understanding of the principal pay and quality landscape and the nature of any patterns of principal sorting.

The second question explores if there is a positive relationship between school performance and annual changes in principal salaries.

Research Question Two: To what extent does a principal's performance in the prior year impact the magnitude of the change in his or her salary?

This question concerns whether principals who perform better in the prior year (meet AYP or have higher percent proficient) earn greater salary increases year-over-year. The answers to the second research question will also inform the study's primary policy recommendations. Understanding whether more effective principals earn differentially higher rewards year-over-year can inform policymakers about the incentives that currently exist in the principal labor market and can guide their policy reform decisions about how to improve principal quality.

Chapter Five presents the results for each of the research questions. The first line of investigation for research question one involves a descriptive analysis to discern principal pay patterns related to their own characteristics and the characteristics of the

populations they serve. This descriptive analysis does not control for the factors that drive differences in pay, but merely portrays the reality of what types of principals are serving what types of student populations. Thus, the findings for research question one include results for two subquestions. The first subquestion findings address: How are principals sorted among different student populations with regard to their own observable characteristics and the observable characteristics of the student populations they serve? That is, without holding constant the factors that impact principal salaries, are principals of, for example, high poverty districts and schools paid less than those in low poverty districts and schools? Similarly, how do other school and district characteristics, such as size of enrollment or percentage of the population that is minority, impact the level of a principal's pay? The findings for the second subquestion for research question one address the following: When controlling for various independent factors that impact the level of principal pay, which factors drive the differences in principal salaries? For example, are principals of high minority schools and/or districts, small schools and/or districts, or high poverty schools and/or districts paid less, when holding equal all other factors, such as their own experience or degree level? I then present the findings for research question two.

In Chapter Six, I discuss these findings. This chapter also includes consideration of the study's limitations and reflection on potential avenues for further inquiry.

Finally, in Chapter Seven I conclude with policy recommendations for continued research on this topic and for Arkansas policymakers based on the evidence provided.

Chapter 2: Literature Review

This chapter has three objectives. First, I discuss and critique the theoretical policy framework – principal-agent theory (PAT) – on which incentive-based educator compensation reforms are grounded (Davies et al., 2005; Cullen and Mazzeo, 2007, Billger, 2007, Podgursky and Springer, 2007). The purpose of this policy theory explanation and analysis is to explore whether in fact incentive-based policies are appropriate for education reform.

Second, I discuss recent related research about incentives in the principal labor market, a small body of scholarly research to which this study will contribute. This second body of literature relates directly to the literature on incentive-based reforms to improve principal quality and indirectly to principal agent theory, as other studies of related principal quality reforms are also grounded in this theoretical framework.

Third, as a foundation for policy recommendations about monitoring principal performance by analyzing student academic performance, I present literature to show that principals can, in fact, impact student achievement. This background is important because policy recommendations calling for monitoring principal performance through data on student performance would be unfair and potentially counterproductive if principals were actually incapable of impacting student achievement outcomes. This third section of Chapter Two is linked to the rest of the study, since policy principals' traditional challenges to monitoring agent performance are a central issue in the principal-agent framework (Cullen and Mazzeo, 2007).

Policy Framework: Principal-Agent Theory

The Conventional Principal-Agent Model

This section presents a discussion of how principal-agent theory, on which performance pay incentive systems are based, may be applicable to the education policy reform context. Traditionally, the principal-agent theoretical framework has been applied to the field of economics to describe and evaluate the relationships between boards of directors or shareholders and managing executives (Davies et al., 2005; Bohren, 1998; Shapiro, 2005; Garson, 2007; Cullen and Mazzeo, 2007; Miller, 2005; Garen, 1994). Over the past thirty years, principal-agent models have been applied to frame organizational relationships in other disciplines, including sociology and political science (Bohren, 1998; Worsham and Gatrell, 2005). Recently, principal-agent theory has also been applied to conceptualize reforms in the education field, specifically those regarding incentive pay (Ferris, 1992; Davies et al., 2005; Podgursky and Springer, 2007; Billger, 2007; Cullen and Mazzeo, 2007; Goldhaber, 2007).

The central concept of principal-agent theory (PAT) for purposes of public policy analysis is that policy principals have goals that they need policy agents to accomplish (Garen, 1994; Petersen, 1993; Ferris, 1992). In a hierarchical transaction between the policymaker and a policy implementer, the policymaker attempts to identify performance indicators and to set performance incentives to create goal alignment (Worsham and Gatrell, 2005; Miller, 2005; Garen). Pursuant to this tasking, the agent chooses a course of action that may or may not be in compliance with the principal's interests. In the conventional principal-agent model, four primary assumptions exist.

The first assumption of PAT is that both principals and agents are rational actors whose acts are grounded in self-interest to maximize their own utility (Petersen, 1993; Waterman and Meier, 1998; Bohren, 1998; Bishop and Wossman, 2004). In a labor context, utility for the principal is maximized by having the agent fully accomplish the principal's goals in the most efficient, cost-effective manner. For the agent, utility is similarly maximized by accomplishing his or her own goals with the lowest marginal cost, at a standard that is still satisfactory to the principal (Bohren, 1998; Bishop and Wossman, 2004). Principals incur agency costs – or losses – when the utility maximizing behavior of agents does not fulfill the priorities of principals (Miller, 2005; Worsham and Gatrell, 2005).

As a natural consequence of having self-interested actors, the second assumption of PAT involves the potential for misalignment of goals between principals and agents (Miller, 2005; Waterman and Meier, 1998; Ferris, 1992). As mentioned above, PAT specifies that this misalignment of preferences can lead to shirking because attending to the principal's goals can involve costs to the agent, who is assumed to be self-interested (Miller, 2005; Sappington, 1991; Douglas, 1989; Bishop and Wossman, 2004; Bohren, 1998; Ferris, 1992). In the broader policy literature, goal misalignment is often viewed as a major challenge to policy reformers. The common term for alignment of goals is goal congruence, which is the level of coordination and agreement between policy principals and policy agents in the implementation of public policy. Meyers, Riccucci, and Lurie (2001) define goal congruence as: "the extent of agreement between the *official* or formal policy goals of political officials and the *operative* goals of the organizations or networks charged with delivering that policy." Goal congruence is impacted not only by the

communication and monitoring of managers, but also by street-level bureaucrats' discretion and perceptions of the legitimacy of a given policy and its policy principals (Lipsky, 1980; McDermott, 2004).

A study by Riccucci et al. (2004) in the welfare reform policy context demonstrates the important role of managerial communication and monitoring in promoting goal congruence within a given policy context. These researchers investigated the extent to which front-line workers in welfare offices implemented policy changes. The welfare reforms of the 1990s shifted the policy focus from granting means-tested benefits such as food stamps to getting eligible welfare recipients off of welfare and into jobs. Riccucci et al. (2004) examined how front-line staff evaluated the importance of the reform's goals in comparison with their traditional work of processing claims. These authors also looked at variation in goal priorities across agency settings and at how managers can influence goal priorities of front-line workers. Riccucci et al. (2004) found that front-line workers generally prioritized their traditional role of processing benefits claims ahead of the new goal of getting welfare recipients into jobs. In settings where managers measured claims processing, front-line workers valued those responsibilities the most; however, in settings where managers monitored work placements, workers focused on that goal first. These findings show that managers, who wish to alleviate goal misalignment and resulting agency costs, must clearly communicate expectations of new policy priorities and must measure the activities and attitudes that are most important in the implementation of new policy.

Related to the study by Riccucci et al. (2004) above, the third assumption of PAT is that barriers often exist to inhibit the effective monitoring of agents by principals

(Petersen, 1993; Miller, 2005). These difficulties in monitoring may be due to information asymmetry, whereby the agent has a knowledge and skill advantage over the principal (Ferris, 1992; Miller, 2005). These monitoring difficulties and asymmetrical information can lead to contractual inefficiencies that benefit the agent. It is for this reason that principals may seek to create incentives to motivate agents appropriately (Garen, 1994; Miller 2005). Incentives for performance can provide rewards for exceptional performance, such as through bonuses or profit-sharing (Shapiro, 2005). Alternatively, principals can use sanctions for poor performance, such as discontinuing an agent's contract. Because agents are presumed to be are risk averse (Shapiro, 2005; Sappington, 1991; Garson, 2007; Douglas, 1989), the use of sanctions can be especially powerful to motivate goal alignment.

The fourth assumption of conventional PAT involves the ability of principals to set contractual provisions unilaterally (Miller, 2005). To the degree that this assumption holds, principals will yield extraordinary power. In hierarchical relationships, both principals and agents have power. To a certain extent, however, power actually rests with the agent and not with the policy principal because the agent is the one who must carry out the principal's directives and because the agent has an information and skill advantage (Miller, 2005; Garson, 2007; Waterman and Meier, 1998; Ferris, 1992).

Revisions to Basic Principal-Agent Theory

Various scholars (e.g., Waterman and Meier, 1998; Perrow, 1986; Worsham and Gatrell, 2005) have proposed revisions to the basic principal-agent model and expanded its applicability to explain organizational dynamics in settings that do not contain all features demanded by the conventional PAT model. Waterman and Meier (1998) argue

that two of the key assumptions behind the theory – information asymmetry and goal conflict – do not always hold. They offer an alternative view of the principal-agent relationship that in some policy contexts approximates an advocacy coalition framework. Though their suggestion is not entirely useful for describing the relationships between teachers and school principals and their policy principals, Waterman and Meier's (1998) challenge to the rigid assumption of information asymmetry may have some value in conceptualizing the principal-agent relationship in education.

Waterman and Meier's (1998) objections to the notion that there must be a profound information asymmetry between principal and agent may be enlightening for analysis of the education policy context, as it is not obvious what information advantage the agents in this setting have. Perhaps, the information asymmetry could lead to school principals or teachers arguing as agents that they should not be held accountable for student achievement gains because they cannot control such outcomes. By arguing from the position of the front-line bureaucrat that only they know how much their students can achieve, teachers or school principals could perhaps attempt to create a low system of accountability for measurable and transparent outcomes (Ferris, 1992).

In this study of education policy, I incorporate some of Waterman and Meier's challenges to conventional PAT, but I also argue that many aspects of the conventional PAT are fitting. I argue that policy principals (school boards) can employ relatively objective and publicly available measures to set performance targets for their agents, (school principals) as a way to minimize agency costs. Thus, the assumption of a profound information asymmetry can be resolved and need not apply in this policy context. However, I do not accept Waterman and Meier's (1998) objection to the notion

that goal conflict as a constant in the principal-agent model. Rather, I assert the applicability of this assumption in the education policy context, as conflict between principals and agents about policy goals in public education is a commonly accepted phenomenon.

Many scholars have also identified potential weaknesses in the explanatory power of the conventional PAT model because it assumes a single principal and a single agent (Miller, 2005; Waterman and Meier, 1998; Shapiro, 2005; Worsham and Gatrell, 2005; Ferris, 1992). Citing the work of Mitnick (1973), Waterman and Meier (1998) write that the basic principal-agent model cannot predict which goals agents will embrace when they must serve multiple principals with multiple and, sometimes, conflicting goals. Moreover, as Shapiro (2005) notes, the basic model does not account for the fact that there are agents and principals who have dual roles. That is, middle managers, such as school principals, must attend to the directives of their superiors (school boards), while at the same time acting as principals monitoring the actions of agents (teachers).

Worsham and Gatrell (2005) assert that incorporating the complexity of multiple principals into the principal-agent model is a *sine qua non* for its use. They write: "Agency theory, then, can offer important insights into why bureaucracy does what it does as long as one recognizes that the relationship is one in which *multiple* principals work to *influence* the actions of bureaucratic agents in a constantly evolving process" (p. 365). Indeed, Worsham and Gatrell (2005) convincingly argue that the traditional model should be extended to include consideration of the actions and incentives of agents when there are multiple principals, whose potentially conflicting goals may exacerbate the problems of goal conflict inherent in hierarchical, bureaucratic relationships.

Worsham and Gatrell (2005) examined an expanded principal-agent model in their study of how policy principals can attempt to influence the behavior or agents through signaling about issue salience, rather than through direct legislative action that codifies agent responsibility. That is, Worsham and Gatrell (2005) were concerned with principals can effectively communicate their policy goals to agents through indirect methods. Specifically, Worsham and Gatrell (2005) studied how potential policy principals at the federal level have attempted to signal to agents – in the Bureau of Indian Affairs (BIA) and the Federal Energy Regulatory Commission (FERC) – that they should focus their efforts on particular policy goals when conducting rulemaking activities.

In examining how policy principals attempt to influence agents in federal rulemaking, Worsham and Gatrell (2005) found that signaling through indirect methods – e.g. the holding of hearings or media reports relating policymaker preference – has less of an impact on BIA agency rulemaking than on FERC agency rulemaking. Worsham and Gatrell (2005) hypothesized that differences in the agencies may explain this phenomenon. They explained that the key difference between FERC and BIA agencies involves the degree of complexity in the policy context. Worsham and Gatrell (2005) portrayed the organizational structure, the institutional history, and the personnel involved in FERC as creating an environment conducive to effective signaling through indirect methods of communication. Regarding the BIA on the other hand, Worsham and Gatrell "[suggested] that the mix of policy types that constitutes BIA policy, the historical problems with regard to clear lines of authority and subunit coordination, the lack of professional training and normally low morale among BIA personnel, along with the congressional urge to micro-manage various aspects of BIA policy responsibilities,

makes the BIA a particularly difficult agent to signal" (p. 367). Worsham and Gatrell's (2005) analysis of the obstacles to achieving goal congruence in complex policy contexts that mirror the BIA be instructive when policymakers are looking to cut through the intricate web of conflicting policy goals and messages that can confound principal-agent relationships. That is, Worsham and Gatrell's (2005) analysis identifies how difficult it can be in certain policy contexts for policy principals to use indirect communication methods to align their policy goals with agent action.

Worsham and Gatrell's (2005) expanded principal-agent model, which includes multiple principals and multiple agents, is instructive for achieving goal congruence in education reform policy context. Worsham and Gatrell's (2005) description of the complex policy environment in which the BIA operates has many similarities to the education policy context in which school principals act as agents. The public education policy climate is marked by unclear lines of authority, a diversity of policy mandates, attempts of state and local policymakers to micromanage implementation, and historical problems regarding coordination across levels of government. Thus, as in the complex BIA policy context, education policy principals may similarly find indirect communication about issue salience to be insufficient for achieving goal congruence. In the education reform policy context, policy principals can perhaps communicate much more clearly and successfully by setting transparent performance indicators tied to performance awards as a way to signal to agents the goals that should become their priorities (Davies et al., 2005; Ferris, 1992). In the next section, I describe how this setting of financial awards, that are linked to high levels of achievement, can provide incentives to maximize agent efforts in a manner consistent with policy principals' goals.

Setting Incentives to Resolve Perceived Goal Misalignments

As noted above, the complexity of having multiple principals and agents with their own priorities can lead to severe goal misalignment in public sector work, including education policy context (Burgess and Ratto, 2003; Propper and Wilson, 2003; Goldhaber, 2007). To align goals and minimize agency costs, education policy principals may wish to adopt performance-based compensation policies that tie compensation to increases in student achievement. Setting incentives tied to transparent, publicly available performance measures can resolve monitoring difficulties inherent in principal-agent relationships and can improve goal congruence by signaling clearly about policy priorities (Ferris, 1992). Moreover, when designed properly and implemented successfully, performance pay policies in education have the potential to raise student achievement (Lavy, 2007; Figlio and Kenney, 2006; Podgursky and Springer; 2007). However, policy principals (school boards) considering these pay reforms should be aware of threats to successful policy implementation.

One significant obstacle to successful implementation of performance-based pay reforms is teacher, or agent, buy-in. Even if policy principals, such as school boards, are able to agree upon using student achievement as measured on standardized tests as a way to monitor performance, ultimately teachers and principals have to adopt the goal of raising student achievement as their own priority (McDermott, 2004). That is, in choosing the right incentives to motivate policy actors, policymakers must they also must keep in mind how policy agents will respond to the incentives. One possibility is that educators will see themselves as having to abandon their commitments to serving the needs of young people because the incentives created by policy principals do not align

with teachers' concepts of their duties to attend to student needs (McDermott, 2004; Lipsky, 1980). As Lipsky (1980) suggested in his scholarship on street-level bureaucrats, educators may object to measurement of performance by student test scores and view these policy prescriptions and their superiors who support such prescriptions as illegitimate.

In her article about the implementation of education reform policy in Massachusetts's K-12 public schools during the 1990s, McDermott (2004) showed that in the education policy context, educators' perceptions of the legitimacy of the leaders who determine education policy at both the state and local level impact the implementation of policy. McDermott (2004) examined how street-level bureaucrats viewed the legitimacy of policy mandates imposed by policy principals at the state level. McDermott explained that teachers at the local school level did not embrace the accountability reforms because they had a mistrust of the top level bureaucrats and saw them as imposing a punitive policy from above. McDermott showed how cooperation between state bureaucrats and teachers never truly occurred, and her case study demonstrates how a lack of cooperation can threaten goal congruence and the successful implementation of policy. To some degree, her findings confirm the theory Pressman and Wildavsky (1984) and deLeon and deLeon (2002) who note that a high level of cooperation at multiple implementation levels is necessary for successful policy implementation.

One way that policymakers can seek to get teacher and school principal buy-in to support performance-based pay is to involve teachers and school principals in the design of their merit pay plans (Heneman, Milanowski, and Kimball, 2007). Indeed, one characteristic of well-conceived policy is that, though the original policy intents may be

addressed at a hierarchically super-ordinate level, the ultimate implementation decisions are left to policy actors at the street level, who can develop an appropriate implementation strategy that would best fit their local circumstances (DeLeon and DeLeon, 2002). That is, even though state policymakers can mandate that localities implement performance-based pay that involves measuring educator success by gains in student achievement on standardized tests, policy principals may wish to include policy agents in designing performance-based pay programs the local level.

By tying compensation directly to student performance, as measured by their gains on standardized tests, policy principals in the education policy context can reform the institution of public education in a way that will align goals of all actors in the institution (Billger, 2007). An emerging body of literature has begun to explore the role and existence of performance incentives in school principal labor markets. In the following section, I describe this literature to which my study will contribute.

Incentives in the Principal Labor Market

In his own study on principal compensation, Goldhaber (2007) noted that little research has been performed on principal compensation systems and the viability of performance pay programs for these school leaders. At the time of writing, Goldhaber (2007) succinctly stated: "there doesn't seem to be a single large-scale quantitative study linking the pay structure of principals to any measure of performance that includes student achievement" (p. 8). My own literature review largely confirms Goldhaber's assertions about the paucity of scholarship in this field. [1]

[1] For the review of literature on the role of pay incentives in the principal labor market, I searched major academic databases, internet search engines, and reference lists of articles located. To be included, an

In addition to reviewing Goldhaber's study, I include the work of a few other researchers who have begun to explore accountability mechanisms and incentives in school principal labor markets. For example, Cullen and Mazzeo (2008) and Billger (2007) have recently investigated whether some aspect of pay for performance for principals may already exist. Additionally, a specific program evaluation by Ladd (1999) considered how performance monitoring of principals can lead to changes in the composition of the principal workforce. These research studies constitute the small body of research that delves into whether principals' career paths and compensation might be tied to the success of their schools in producing desired educational outcomes.

In his own study of principal compensation referenced above, Goldhaber (2007) used the principal-agent framework to explore school principal compensation generally and the potential presence of performance pay systems for school principals specifically. With three years of data (1993-94, 1999-00, and 2003-04) from the nationally representative *Schools and Staffing Survey* (SASS), Goldhaber investigated the factors that are responsible for the variation in the level of school principals' salaries. He regressed principal salary on observable characteristics of principals – including their race, experience, and degree level – and of the populations they served – including school size, school level, school racial composition, school poverty, school urbanicity – to make inferences about the potential presence of performance pay. Goldhaber found that 45 percent of the variance in principal salaries could be explained by observable variables. In particular, he noted that "…more experience is rewarded; urban and suburban principals receive substantially higher salaries than those in rural schools; principals in

scholarly article had to be conducted after 1988, had to involve the compensation of school principals in the United States, and had to include a quantitative measure of performance or the use of principal salary data.

larger districts or leading larger schools receive higher salaries; and secondary school principals receive higher salaries than those leading elementary schools" (p. 12). He also found that there were significant returns to having an advanced degree beyond a master's. Goldhaber (2007) then suggested that part of the unmeasured variation in principal salaries may be due to performance pay components. He contrasted the 45 percent of measured variation in principal pay due to observables to an accepted figure of 60 percent of measured variation in teacher salaries due to observables. Based on this difference in variation explained, Goldhaber (2007) proposed that it is more probable for principals than teachers to have part of their compensation determined by performance pay.

The one large-scale study of principal pay that includes performance measures was conducted recently by Cullen and Mazzeo (2008). Situating their study in a principal-agent theoretical framework, Cullen and Mazzeo (2008) analyzed the relationships between the performance of Texas schools between 1989 and 2006 and the career paths of school principals. They argued that their data set was particularly well suited to the investigation of this question because it "combines the 'monitoring' information – detailed campus-level scores from state-administered standardized tests – and the 'incentives' information – the complete employment and wage histories of all school principals during this period" (p. 2). In analyzing the career paths of full-time principals, they found that principals of the highest performing schools experienced greater increases in wages than did principals of low performing schools when moving to new positions. Moreover, when examining the wage changes for principals who remained at their current jobs, they found that principals of the highest performing schools similarly experienced greater wage growth than did principals of low performing schools.

Their findings suggest that there are implicit rewards in the principal labor market related to higher performance.

In a loosely related study mentioned by both Goldhaber (2007) and Cullen and Mazzeo (2008), Billger (2007) investigated whether the presence of accountability mechanisms leads to greater school and principal performance. Billger's (2007) definition of accountability was that a school faced some level of public reporting or publicly communicated performance goals. However, she did not require that a school would face sanctions for poor performance for it to be operating under an accountability system. Using cross-sectional data from the 1999-2000 restricted-use *Schools and Staffing Survey* (SASS), Billger's study is of little value. At best, her correlational findings regarding implicit threat of sanctions associated with public reporting give a glimpse into some principal pay and performance patterns. In this study set in a pre-NCLB public education context, Billger reports that "[state] sanctions correspond to more negative salaries for the worst principals and higher salaries for the best, suggesting that these sanctions may be an effective reward/punish system. On the other hand, [she finds] that other accountability measures correspond to lower salaries, particularly for the best principals, suggesting that strong performance may not be well-rewarded in this labor market" (p. 21).

In another related study of how accountability and performance award systems impact various aspect of school including principals, Ladd (1999) analyzed the impacts of the Dallas Independent School District's school-based performance incentive program. In this program which started in 1991, schools were measured on their ability to raise student performance on standardized tests. Those schools that were most effective –

approximately the top 20 percent in the district – received financial bonuses, which were distributed to everyone on the school staff, including principals. In addition to seeing positive impacts on student performance that were at least in part attributable to the program, Ladd (1999) found a dramatic increase in principal turnover over the course of the performance incentive program's implementation. Ladd showed that prior to the program, principal turnover rates in least effective schools, average effective schools, and most effective schools were 2.4 percent, 6.7 percent, and 6.3 percent, respectively. By the end of the program these rates had increased to 24.6 percent, 25.0 percent, and 24.4 percent, respectively. Ladd (1999) asserted, "Thus, it appears that the new emphasis on accountability made the District much more willing than in the past to change principals" (p. 14). She concluded that this compositional effect on the principal workforce may have been due to the program and that this change, which was most dramatic in the lowest performing schools, could have positive impacts on student performance.

Three conclusions might be drawn from these studies. First, higher rewards for performance may exist implicitly in the labor market (Cullen and Mazzeo, 2008) or explicitly through targeted incentive pay programs (Ladd, 1999; Goldhaber, 2007). Second, when pay is related to performance, there is a potential for positive outcomes, such as sorting more effective principals into higher paying positions (Cullen and Mazzeo, 2008; Billger, 2007) or the removal of potentially less effective principals from the profession (Ladd, 1999). Third, this important area of research has not been sufficiently probed, and policymakers appear to have little concrete research on which to base incentive policy reforms to improve principal quality.

These studies on policies involving pay incentives for school leaders to bring about gains in student academic achievement assume that principals can actually impact student learning. Above, I argued that agents must see the policy prescriptions as legitimate for successful policy implementation (McDermott, 2004; Lipsky, 1980; Goldhaber, 2007). For this reason, in the next section, I present research to support legitimacy of using student academic achievement data to monitor and reward principal performance.

The Validity of Monitoring Principal Performance by Measuring Student Achievement

As a foundation for policy recommendations about monitoring principal performance by analyzing student academic performance, I present literature showing that principals can, in fact, impact student achievement. As explained above, how policy principals attempt to monitor agent performance is a central issue in principal-agent theory. This background literature on how school principals can impact student outcomes is essential for this study because policy recommendations calling for monitoring principal performance through data on student performance might be perceived as illegitimate and unfair if principals were incapable of impacting student achievement outcomes. As McDermott (2004) and Goldhaber (2007) note, perceptions by agents (school principals) that they would be held accountable for outcomes out of their control might undermine chances for successful policy implementation.

In a meta-analysis of studies that measured the magnitude of the direct relationship between principals and student achievement, Marzano et al. (2005) included

studies after 1970 and in US schools or in school settings akin to those in the US. These studies all measured student achievement with a standardized achievement test and reported statistics that would allow for computation of effect sizes. Of the 69 included studies, the majority of studies (39) were conducted in elementary schools, with the other 30 studies distributed relatively evenly over the other school levels.

In these studies of principal effectiveness, the independent variable was teacher ratings of principal leadership from questionnaires. The analysis was conducted at the school level, so "each school had a single summary score representing the average achievement of the students and one or more summary scores representing the average perception of teachers regarding general leadership behavior and one or more specific leadership behaviors of the principal" (p. 30). The authors then calculated a correlation between the ratings of general leadership and student achievement. They found a correlation of .25, and they explain this correlation to mean that an increase in certain principal behaviors by one standard deviation "is associated with a gain in the overall achievement of the school from the 50^{th} percentile to the 60^{th} percentile" (p. 30). Marzano et al. did not report statistically significant differences in the relationship between leadership and achievement at the different levels of schools. Thus, this meta-analysis provides some evidence that principals can impact student achievement as measured on standardized tests.

Witziers, Bosker, and Kruger (2003) also conducted a meta-analysis to determine the degree to which principals directly affect student achievement. They framed their study in the context of whether holding principals responsible for student achievement is a reasonable and valid accountability approach. Witziers and colleagues included studies

conducted from 1986 to 1996 that had valid measures both of principal leadership and of student achievement. Of the 37 qualifying studies, 25 used data from the International Association for the Evaluation of Educational Achievement (IEA) on reading literacy in 25 different countries. Witziers and colleagues found positive significant effects for principal leadership on student achievement, but their effect sizes were quite small. Including all studies, they found an effect of 0.02, and without the IEA studies, they calculated and effect size of 0.04. When isolating studies conducted in the US at the elementary school level, they found the effect size of leadership on student achievement to be 0.11. Despite the findings in this small sample, Witziers and colleagues concluded that principals do not directly affect student achievement and that leadership does not appear to matter more in US schools than in other countries.

Both Marzano et al. (2005) and Witziers et al. (2003) used teacher ratings of principal behaviors as the measure of principal effectiveness. Then, they associated student achievement with these teacher ratings. So the critical assumption, or link, in concluding that principals who are better at leadership have students who perform better on tests is based on the assertion that teacher ratings of principals are in fact an appropriate and accurate assessment of principal leadership behaviors. Using this methodology, Marzano et al. (2005) found a strong relationship between these two variables, and Witziers et al. (2003) did not.

As Marzano et al. (2005) point out, three differences exist between these meta-analyses that account for the difference in their findings. First, 25 of the 37 studies in the Witziers et al. (2003) analysis were international studies. Second, Marzano et al. make more of an effort to exclude outliers in their main analysis. Third, Marzano et al. conduct

an attenuation adjustment to address the relatively low reliability of the study's instruments. These instruments were student achievement tests and leadership behavior surveys, each of which had a separate reliability coefficient. This adjustment inflated their correlations by dividing the first correlation by the square root of the reliability of the instrument.

In reviewing the findings and methodologies of these studies, it appears that Marzano and colleagues have made a strong effort to show that leadership matters and Witziers and colleagues set out to show the opposite. The Marzano et al. study is most relevant for a study of leadership in US schools, but the efforts to inflate the correlation probably overstate a principal's direct effect in these studies. The central finding of the Witziers et al. study is not particularly relevant, given that the majority of studies were conducted abroad. Combined with the positive, but overstated, findings of the Marzano study, the findings in the limited study of leadership in US elementary schools from the Witziers et al. study suggest that principal leadership probably does directly impact student achievement. However, these conclusions should be qualified because both of these meta-analyses use a rather suspect measure of principal leadership effectiveness – i.e. teacher perception surveys.

The majority of the studies included in these meta-analyses and of other descriptive studies focus on elementary school principals. A standout individual, large-scale study by Brewer (1993) at the high school level is also worth mentioning. Brewer conducted his analysis on data from *High School and Beyond*, a national survey by the US Department of Education from 1980-1986 which measured the verbal and quantitative attainment of a representative sample of 10^{th} and 12^{th} grade students in 1100

high schools nationwide. Brewer's dependent variable was the gain in achievement for those 10th graders who were tested in 1980 and then again as seniors in 1982. The independent variables related to principal characteristics – such as a principal's prior years of experience as a teacher, prior years as an administrator, years of experience in current head of school role, percentage of total faculty appointed during his/her tenure, and the focus of a principal on academic goals – came from the *Administrator and Teacher Survey*. Of these independent variables, the percentage of total faculty appointed during a principal's tenure and the focus of a principal on academic goals had significant positive effects on student achievement gains. Moreover, Brewer found that "The greater the percentage of teachers appointed by a principal with high academic goals (PTACH) the higher are student test score gains; the greater the percentage of teachers appointed by a principal with low academic goals (PTACL) the lower are student test score gains" (p. 286-87). Brewer's study (1993) suggests that principals can impact student achievement and indicates two of the ways in which principals' actions can lead to academic success.

Brewer's study was also included in a descriptive synthesis of research on principals and their impacts on student achievement conducted by Heck and Hallinger (1998). These authors characterize the principal actions in Brewer's study as indirect, or mediated. That is, Heck and Hallinger (1998) argue that principals can best contribute to improving the effectiveness of schools through influencing the school culture and the values and goals of teachers. Heck and Hallinger's research synthesis involved 40 studies of principals and student achievement, of which 11 occurred outside of the US. Their main finding was that "principals exercise a measurable, though indirect effect on

school effectiveness and student achievement" (p. 186). They add, "While this indirect effect is relatively small, it is statistically significant, and we assert, meaningful" (p. 186).

Other descriptive syntheses (e.g. Cotton, 2003; Leithwood, Seashore Louis, Anderson, and Wahlstrom, 2004) also point to positive impacts of principals on student achievement and attempt to isolate the behaviors of principals that tend to lead to greater student achievement. For example, Leithwood and colleagues (2004) asserted that successful principals must "create and sustain a competitive school," "empower others to make significant decisions," "provide instructional guidance," and "develop and implement strategic school improvement plans" (p. 26-27). In her narrative review of the literature, Cotton (2003) identified 25 principal behaviors that impact student achievement, such as creating a safe environment and being a role model of professionalism.

Based on these descriptive studies and the empirical evidence in the meta-analyses and standout studies, it is probably fair to conclude that principals can impact student achievement to varying degrees. Despite the research that exists on direct principal impacts on student achievement, researchers such as Nettles and Herrington (2007) argue that there needs to be more research on direct effects of principals on student achievement using more recent student level data and better methodologies. Contrary to their views on existing direct effects studies, Nettles and Harrington suggested that studies of indirect effects of principals have been relatively conclusive that principals matter for student achievement.

Thus, with these findings in mind, it appears that the implementation of performance-based pay incentives should not be undermined the legitimacy of

monitoring principal performance through measurement of student achievement gains. Of course, before holding school principals accountable for student achievement gains, policy principals would need to ensure that conditions are in place to support school principal empowerment. Otherwise, school principals may be reluctant to embrace this system of measurement as legitimate.

Chapter 3: Practices Designed to Affect Quality in the Arkansas Principal Labor Market

I begin this chapter by describing features of the Arkansas principal labor market that are designed to ensure a high level of principal quality. Specifically, I focus on the barriers to entry into the labor market including licensure, certification testing, required experience, and completion of an authorized training program. This exploration of these quality control mechanisms in Arkansas, which are related to principal preparation and qualifications, contributes to the overall discussion of policies that can positively impact the quality of educational leadership in the state.

Next in Chapter Three, I describe current principal evaluation practices, which are intended to solve the monitoring difficulty that is a part of the principal-agent theory framework. To set these current practices in context, I also provide a review of the literature concerning the dispute over the best methods for monitoring principal performance. The purpose of including this background literature is to create an understanding that it is possible for Arkansas policymakers to consider alternative evaluation, or monitoring, strategies. This chapter is descriptive and provides context for the study's analysis of the principal labor market and for the policy recommendations in Chapter Seven.

The final section of this chapter is a presentation of other descriptive data related to principal pay patterns in the state of Arkansas and in the region. These data on average levels of administrator pay allow for comparisons of the findings in the study's original analysis. This entire chapter is descriptive and provides context for the study's analysis of the principal labor market and for the policy recommendations in Chapter Seven.

The data necessary for the exploration of the topics in this chapter come from the Arkansas Department of Education manuals and website, various websites of Arkansas colleges of education, the website of the Educational Testing Service (ETS), from various higher education institution websites, and from the Bureau of Labor Statistics. I also conducted phone interviews with key personnel at the Arkansas Department of Education to learn more about current licensure and training practices.

Barriers to Entry into the Principal Labor Market

One intent of requiring educators to go through certain training and licensure programs is to ensure that they have the knowledge and skills to be effective practitioners (Hess, 2001). A related aspect of principal certification is that it may deter insufficiently committed or incapable prospects from entering the field of school leadership. Typically, when professions erect barriers to entry by requiring licensure, there is a belief that the required coursework and past experience in the profession are directly related to future effectiveness (Hess, 2001). In essence, through these barriers to entry, the profession is attempting to establish a floor on quality. In this section, I present information about the various obstacles that prospective principals must overcome to obtain licensure. This section contains an overview of the certification process, a detailed look at the state's principal training programs, and a short clarification about the different types of administrator licenses. This information about entry into the labor market is relevant to the overall study, as it provides context for investigation of performance and pay of those who obtain employment as principals.

Overview of the Arkansas Principal Certification Process

Principals can serve in Arkansas public schools by participating one of two different programs - the traditional route for principals and the Administrator Licensure Completion Program (ALCP) (Rules, 2003).

Under the traditional preparation route, principals must meet four criteria. First, principals must have completed four years of teaching experience, of which three years must have been at the level that the principal license covers (Rules, 2003). Second, the principal must have earned a graduate degree in educational leadership from a NCATE or regionally accredited administrator preparation program approved by the Arkansas Department of Education (Rules, 2003). If a prospective principal has earned a graduate degree in a field other than educational leadership, he/she can undertake a specialized plan of study as determined by one of the approved principal training programs in the state (Rules, 2003). Third, principals, who participate in an approved educational leadership program and those with graduate degrees in other fields, must complete an internship and a principal portfolio (Rules, 2003). The internship is coordinated as a part of the principal's preparation program, and it places the prospective principal in an administrative role under the supervision of a current administrator. The principal portfolio is also completed as a part of the principal's preparation program, and this body of work contains evidence that the candidate has demonstrated competence in the knowledge and skills covered by the Arkansas Administrator Licensure Standards (Rules, 2003). The fourth requirement is that the principal have a valid Arkansas Standard Teacher License (Rules, 2003).

Upon proof of completion of these four requirements, principals can earn the Initial Administrator License, which is valid for up to three years (Rules, 2003). To apply for the Standard Administrator License, the principal must have participated in Administrator Induction, which is an official mentoring program that lasts between one and three years. During the induction period, a beginning principal works with his/her assigned mentor to complete a Professional Learning Plan according to state guidelines (Beginning Administrator Induction Program, 2007). By the end of the induction period, the principal must pass a state-mandated licensure principal assessment exam (Beginning Administrator Induction Program, 2007). The passing score on the School Leader Licensure Assessment is 158 (see Table 3.1 below), and students have up to three years from the time of graduation from an approved program to meet this requirement (Educational Testing Service, 2008). Upon completion of these requirements, a principal obtains the Standard Administrator License (Rules, 2003).

Arkansas is one of 17 states and Washington, DC, which require that principals pass the School Leaders Licensure Assessment (SLLA) (Educational Testing Service, 2008). Administered by the Educational Testing Service (ETS), this six-hour exam aims to test whether principals can demonstrate the knowledge and skills represented in the ISLLC standards (Educational Testing Service, 2008). The format includes four sections which require the examinee to write written responses to case studies and situations in which a principal must decide the best course of action (Educational Testing Service, 2008). One section also prompts examinees to analyze data related to teaching and learning (Educational Testing Service, 2008).

The test score range on this exam is 100-200, and ETS reports that individual states set their own passing scores for this exam (Educational Testing Service, 2008). For 19,364 test takers nationally from 2004-07, the median score was 178, and the reported average score range was 172-183 (Educational Testing Service, 2008). Passing scores by state are presented in Table 3.1 below. Policymakers may want to consider if this relatively lenient requirement is actually accomplishing its intended goal.

Table 3.1: *State Passing Scores on the SLLA*

State*	Passing Score	Rank
California	173	1
Louisiana	168	2
Maine	168	3
Missouri	167	4
Indiana	165	5
Kansas	165	6
Kentucky	165	7
Mississippi	165	8
Virginia	165	9
Connecticut	161	10
Washington, DC	160	11
Arkansas	158	12
Maryland	157	13
Tennessee	156	14
North Carolina	155	15
New Jersey	148	16

*Georgia's score not reported.

The second route for principals to serve as administrators is to participate in the Administrator Licensure Completion Program (ALCP), which is coordinated through the Office of Professional Licensure. The ACLP is an alternate administrator certification program for personnel who have been hired into an administrative role prior to completing the traditional certification route. Any one of the three administrator licenses can be earned through this program, and the temporary license granted to participants is

valid for up to three years. To participate in ALCP, a principal must have a Standard Teaching License, have four years of teaching experience (three years of which must have been at the level in which the principal is serving), be enrolled in an approved educational leadership graduate program, and have already been hired as a principal.

Principals, who have not completed a traditional licensure program, may only serve as a building administrator in an Arkansas public school if they obtain a waiver from the ADE. School districts may submit requests to the Director of the Department of Education for temporary waivers (up to three years) for principals who do not have administrator licenses if that potential principal has demonstrated applicable skills and knowledge. The request must include a justification of need for the waiver, the qualifications of the potential principal, the outcome expectations for the principal, and an annual accountability plan. Principals who serve successfully under the waiver program do not earn an initial or standard administrator license. During the 2007-08 school year, 19 building level administrators were granted waivers and permitted to serve in public schools across the state.

Training Programs for Arkansas Principals

A key barrier to entry into the principalship is completion of a master's degree from an approved principal training program (Arkansas Department of Education, 2009). Nine universities in Arkansas are approved to train public school principals (building administrators), curriculum/program administrators, and district administrators (Arkansas Department of Education, 2009). These degree programs are at the following institutions: Arkansas State University, Arkansas Tech University, Harding University, Henderson State University, Southern Arkansas University, University of Arkansas, Fayetteville,

University of Arkansas at Little Rock, University of Arkansas at Monticello, and University of Central Arkansas (Arkansas Department of Education, 2009). The master's level coursework is offered at each of these nine universities as a part of principal preparation programs that lead to licensure, both for both the P-8 and 7-12 building administrator licenses.

Basic facts about the approved administrator licensure preparation programs at Arkansas State University, University of Arkansas, Fayetteville, and the University of Arkansas at Little Rock are presented as examples in Appendix A. The coursework required for each master's degree program can be found in Appendix B.

The Three Administrator Licenses in Arkansas

Completion of a master's degree at an approved principal training program is necessary for licensure, but not sufficient. Moreover, there is not just one type of certification for principals, as the various licenses only cover certain areas of responsibility.

Three levels of administrator licensure exist to qualify administrators to serve in public schools and public school districts in Arkansas the state. First, the building level administrator license, which is the basic license that covers principals, vice principals, and assistant principals, is issued to cover either grades P-8 or 7-12. Before a principal can earn the Standard Administrator License, which is valid for five years, beginning principals must complete the requirements associated with the Initial Building Level Administrator License. Second, the curriculum/program administrator licenses exist to certify administrators responsible for coordinating specialized programs and personnel. Like the building level administrator license, the curriculum/program administrator

licenses are issued for a certain group of grades. Curriculum/program administrators can be certified in the following areas: special education, gifted and talented education, career and technical education, content area specialist, and curriculum specialist. The third administrator license is the district level administrator license which qualifies superintendents, assistant superintendents, and deputy superintendents. The district level administrator license covers grades P-12.

This first section of Chapter Three included discussion of the training and licensure process that attempts to ensure a high level of quality for incoming principals. In the rest of this chapter, I present research about the various methods for measuring principal performance once they have moved through the certification process and are on the job. The presentation of research on the debate over methods for monitoring principal performance is included because policymakers should be aware that there is not consensus in the field about how best to evaluate principals. Armed with an awareness that there is not an established "best practice" when it comes to principal evaluation, policymakers may feel more willing to experiment with new ways to measure principal effectiveness. I conclude the chapter by describing the performance monitoring system that currently exists in Arkansas.

The Debate over Methods for Monitoring Principal Performance

As indicated in the discussion of principal agent theory in Chapter Two, the manner in which policy agents are evaluated and compensated can direct their actions and lead them to prioritize certain job responsibilities (Ferris, 1992; Riccucci et al., 2004). The debate over the best method for evaluating school principals is complicated by the fact that principals have multiple responsibilities and must serve a wide and

diverse group of stakeholders. As Green (2004) notes, principals must be master teachers, understand curriculum, maintain and enforce student discipline, manage building level finances, and serve as a human resources specialist. In these roles, principals must meet the often conflicting demands of teachers, students, parents, central office personnel, school board members, and the community at large (Slaughter, 1989; Green, 2004; Cullen and Mazzeo, 2007). As such, these sundry roles and responsibilities can make the choices about evaluation of principal performance complicated (Brown, Irby, and Neumeyer, 1998).

In this section, I present the existing research on principal evaluation to set the stage for the study's main research question regarding whether Arkansas K-12 public school principals are evaluated and, in fact, held accountable based on school's academic performance. This research on the current approaches to the evaluation of school principals provides a background for assessing the suitability of principal performance pay policies that rely on student achievement outcomes as a measure of principal performance.

Green (2004) asserts that the three reasons to evaluate principals involve the need for superintendents to have data for making informed personnel decisions, the need for the school board to clarify expectations to school leaders, and the need for principals to identify areas for professional development. These claims regarding evaluation of principals in the US are similar to research in Canada. For example, Thomas, Holdaway, and Ward (2000) found that Canadian superintendents reported evaluating principals for the purposes of "promot[ing] professional growth and improvement," "provid[ing]

information for administrative decisions," and "clarify[ing] and communicat[ing] role expectations" (p. 225).

Though the reasons for evaluation appear straightforward, there is less agreement about which of these goals in principal evaluation should be stressed the most. Not only is there a lack of consensus over which of the goals of evaluation should take priority, but there is also contention regarding the various evaluation methods used. Slaughter (1989) asserts that a "sound principal evaluation system has five characteristics: it pinpoints principal accountability; it is understandable; it is manageable; it is fair; and it is supported by members of the school board" (p. 3). As Ediger (2002) asserts, "there are a plethora of methods to use in assessing the achievement of school principals" (p. 90). I have divided these evaluation methods into two categories: evaluation focused on process and evaluation focused on outcomes.

The policy relevance of this study is in part related to whether changes in principal pay are impacted by the outcomes of a principal's actions. The stated policy in Arkansas is for principal performance to be monitored based on process, not outcomes. If I find that principal pay is not positively impacted by student performance, then this finding may suggest that the stated policy is in fact being implemented.

However, if I find that changes in principal pay are impacted by student performance, there will be evidence that an implicit monitoring and rewards system based on student outcomes is already in place. With the findings in this analysis in hand, policymakers who wish to introduce incentive-based policies to improve principal quality can better evaluate policy proposals.

Evaluation Focused on Process

Principal performance evaluation methods focused on process tend to have at their core a value that the principal should be an active participant in the evaluation process. For advocates of evaluation methods focused on process, the primary aim of evaluation is to promote learning and improving. Although not exclusively formative, evaluation methods focused on process are designed to promote reflective practice. In this section, I present research about three methods of principal evaluation that are focused on practice. For each, I provide a definition and then summarize its underlying principles.

Portfolios

Strong advocates for the use of the principal portfolio as an evaluation tool, Brown and Irby (1997) define the portfolio as "a collection of thoughtfully selected exhibits or artifacts and reflections indicative of an individual's experiences and ability to lead and of the individual's progress toward and/or attainment of established goals or criteria" (p. 2). The portfolio is often organized around the ISLLC or National Association for Elementary School Principals (NAESP) standards (Green, 2004). ISLLC standards define the characteristics and behaviors of school principals. Standard one is "A school administrator is an educational leader who promotes the success of all students by facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community" (Missouri Professors of Education Administration). In constructing the portfolio, principals include narratives of self-reflection, and supporters of using the portfolio in principal evaluation posit that

the portfolio is most helpful because of its ability to promote self-assessment and reflection (Brown and Irby, 1997; Green, 2004).

Among the four potential uses of the principal portfolio, Brown and Irby (1997) include its suitability for summative evaluation. They argue that when districts use the portfolio evaluation method principals feel as though evaluation is done "*to* them rather than for or with them" (p. 5). Brown and Irby add that portfolio evaluation systems contribute to improved communication between principals and their supervisors and allow for principals to demonstrate evidence of their success in a wide variety of responsibility areas. Brown and Irby (1997) explain that principals include goals statements which demonstrate to the evaluator that the principal identifies organizational needs and has a plan for accomplishing those objectives. According to Brown and Irby (1997), the goals portion "is the heart of the portfolio," and the accompanying documentation of accomplishments "provides critical information to the reviewer regarding the abilities, professionalism, and character of the principal" (p. 19).

Few studies measure the effectiveness of any of the various evaluation methods. In one isolated qualitative study, Johnston and Thomas (2005) described the experience of principals involved in a pilot project of a state-wide portfolio evaluation system for new principals in Ohio from 1999-2002. Ohio was one of five states that participated in this test of the Portfolio Assessment for School Leaders, a performance-based evaluation system designed by the ISLLC and the Educational Testing Service (ETS). The six ISLLC standards formed the basis of the portfolio. The portfolios created in the pilot project from the participants in the five pilot states were to be used by ETS to produce scoring norms. Johnston and Thomas (2005) divided study participants into three groups

based on whether they found the portfolio process helpful or burdensome. The authors ultimately concluded that portfolios can be useful for guiding professional development if they are implemented as a part of a larger professional development program. They suggested that the extra work to create a portfolio is only justified if states are interested in producing evidence that principals exceed minimum competency standards.

Rating Scales

The use of rating scales is another method for principal evaluation that is primarily focused on principal processes and characteristics, rather than outcomes. The rating instruments often list domains – such as communication – which have a number of competencies listed under each, on which the supervisor scores the principal on a Likert scale. These scales are often constructed with reference to the standards of ISLLC and NAESP.

Green (2004) describes as the use of rating scales as the most "popular" method. Notwithstanding the fact that the data supporting this claim come from another study (Green, 2002) which merely surveyed participants in a Southern California education administration program and their colleagues at local schools, it is safe to say that rating scales are currently in use in public schools. As Green indicates, this traditional evaluation process involves a pre-evaluation conference in which the supervisor shares the rating form and the rating criteria. Then supervisors collect performance indicators and report those findings to the principal in a post-evaluation conference. Often principals also fill out a self-evaluation form to facilitate the post-evaluation conference.

360-degree Evaluation

With the 360-degree evaluation approach, a principal's evaluation is based on the assessments by representatives from all of the stakeholder groups that he or she must serve. As Manatt (2000) notes, "360-feedback can be used at three levels: 1) for developmental purposes (for the employee's eyes only), 2) for appraisal and 3) for compensation" (p. 2). Manatt (2000) adds that this evaluation technique can help to facilitate communication between leaders and their constituents.

Dyer (2001) explains that the value of using 360-degree evaluation – also called multi-rater feedback and full-circle evaluation – is that principals can learn from others whether their actions are being perceived as intended. Dyer (2001) adds that getting feedback from multiple viewpoints is more fair and comprehensive than using a single supervisor rating. She explains that the survey instruments and questionnaires for this model of evaluation solicit feedback from a leader's constituents regarding behaviors and skills such as delegating and communicating.

Objecting to the practice of using of 360-evaluation for summative evaluation, Dyer asserts that supervisors should select this evaluation model as a way to help principals develop as leaders. McCauley and Moxley (1996) go further in advocating that 360-evaluation should be a tool of formative evaluation. They explain, "One of our fears is that 360-feedback will be seen as *the* developmental event rather than as a potential unfreezing event that opens the individual to a developmental process" (p. 18). Thus, these researchers are most concerned with using this model of evaluation in the development of reflective leaders.

Evaluation Focused on Outcomes

In contrast to evaluation methods focused on process, models for evaluating principals based on outcomes are intended to focus principals and the entire school organization on the results that the school is attempting to achieve. The underlying principle of measuring principal performance by outcomes is that how results are achieved is less important whether or not they are achieved. In this section, I describe evaluation methods focused on outcomes and present the theoretical arguments both for and against their use.

Among the sources that can be used in outcome-focused evaluations are data on student safety, student dropout rates, student attendance, student graduation rates, and student achievement test scores (Hoy and Miskel, 2001). Decisions regarding the appropriateness of possible data sources depend on the outcomes that school boards and other policymakers decide matter most. Given that the thrust of the current accountability movement is a focus on student academic achievement on standardized tests, there is a growing trend for policymakers to consider changes to traditional process-based evaluation of school principals.

Models of principal evaluation based on outcomes can also be classified as "management by objectives" models (Hoy and Miskel, 2001; Green 2004). These model attempt to focus principal behavior on attaining certain preset outcomes, such as distinct student achievement test score gains, by providing incentives for attaining predetermined goals (Hoy and Miskel, 2001). Green (2004) writes that in this model "The professional knowledge and skills that the principal will use to meet the objective are not discounted, but they are merely a means to the end" (p. 23). Using slightly different terminology, Hogan, Curphy, and Hogan (1994) refer to outcomes-based evaluation as measuring a

leader by the "actual performance of [his or her] team or organizational unit" (p. 7). One of the primary merits of evaluation focused on outcomes rests in the objectivity of using results-based criteria, which are, as Slaughter (1989) notes, "much less ambiguous than a description of how someone behaved" (p. 58).

Although the above authors (e.g. Slaughter, 1989; Hogan, Curphy, and Hogan, 1994; Green, 2004; Hoy and Miskel, 2001) note that evaluation based on outcomes has the advantage of offering clear expectations and definitive performance measures, these researchers also suggest potential drawbacks to these methods. Hogan and colleagues explain that the largest threat to the validity of measuring a leader by the organization's performance is that the criteria used will be "contaminated." In other words, they are concerned that leaders will be held responsible for outcomes that may be affected by events beyond their control. Green (2004) suggests that this approach can lead to undesirable unintended consequences, such as focusing on superficial short-term, rather than meaningful long-term goals. Hoy and Miskel (2001) suggest that this approach is problematic for evaluating principals because it reflects a top down management structure, which depends on a more tightly coupled organizational setting than is found in public education. Slaughter (1989) notes that the objection to results-based principal evaluation is that it assumes first that principals are capable of impacting school outcomes and second that they have the freedom to do so.

Ediger (2002) expands on these objections by listing ten perceived problems associated with measuring principal performance by student test scores. Among these objections is his argument that state-mandated standardized tests fail to capture "student achievement results from daily class work throughout a school year" (p. 90). Second,

they focus on too narrow a set of Gardner's multiple intelligences. Third, students do not consider test items to be relevant or important. Ediger concludes by noting that it may not be fair to measure principals by student test scores because of their "not having that much influence over teachers to raise student test scores, [and] not having adequate time to work with the curriculum due to many other tasks involved in school administration" (p. 91).

Indeed, an evaluation system that holds principals accountable for student achievement would not be fair if principals are simply incapable of impacting student's academic performance. It is for this reason that I presented a summary of research that refutes this claim in Chapter Two. The argument that principals can impact student academic performance is critical for crafting incentive pay policies for improving principal quality. Moreover, the above discussion of school principal performance evaluation connects principal agent theory to the practical policy discussion because it helps to minimize monitoring problems and information asymmetry that lead to agency costs.

Principal Evaluation in Arkansas

The methods for principal evaluation are not standardized in Arkansas. That is, local districts can determine the instruments to be used, the personnel who will participate in conducting evaluations, and the frequency of these performance assessments. At the very least, principals must be evaluated annually, as they hold and must maintain their teaching licenses.

Principals, like certified teachers, must complete 60 hours of professional development each year to maintain their teaching licenses (Rules, 2005). Each principal

must complete an individual professional development plan which documents how he/she will satisfy annual training requirements. These requirements include a minimum of three hours of professional development in developing relationships with parents and promoting parental involvement (Rules, 2005). In addition, principals must complete six hours of technology training annually. The other hours of professional development should be tailored to address an individual principal's needs but should generally be focused around the topics of data disaggregation, instructional leadership, and fiscal management. Each district must verify and report principals' completion of these requirements annually to the Arkansas Department of Education through the Arkansas Comprehensive School Improvement Plan. State funding is available for approved professional development activities. Additionally, federal No Child Left Behind Title II funds associated with teacher and principal quality may be used to pay for principal professional development.

Comparison of Administrator Pay in Arkansas to Other States

In this final section of Chapter Three, I present descriptive data regarding administrator pay trends across the state and region to provide context for the study's original findings in Chapter Five. National salary data for school principals was collected online from the website of the United States Department of Labor Bureau of Labor Statistics (BLS). The most current information is the 2007 wage data, which was released in May 2008. For this question, I also gathered information about the other 16 Southern Regional Education Board States from the SREB website. Arkansas is a member of the organization, which is a non-profit group that works to improve public education. Comparisons among these member states can provide a regional context for

understanding the level of principal wages in Arkansas. These data on principal wage variation across the state of Arkansas were also gathered from the BLS website. I selected the metropolitan service areas and report the most current wage information below.

Arkansas's 246 school districts employed 2,180 elementary and secondary education administrators in 2007. The annual mean salary for the state's administrators was $68,000, compared to the national average mean wage of $77,612. This figure ranks Arkansas 42nd nationally of 51 states and Washington, DC. The annual median salary for Arkansas education administrators in elementary and secondary schools was $68,130, which ranks the state 41st. The national median wage was $77,880.

The data in Table 3.2 show that, compared to six bordering states, the mean wage for Arkansas administrators of $68,000 ranked the state 3rd and above the average mean wage of $66,410. Arkansas's median wage for administrators of $68,130 ranked the state 3rd and above the average median wage of $66,587.

Table 3.2: *Comparison of Wage Data for Arkansas K-12 Education Administrators With Neighboring States*

State	Number Employed	Annual Mean Wage	Mean Wage Rank	Annual Median Wage	Median Wage Rank
Missouri	4450	$72,060	1	$73,500	1
Texas	18940	$68,110	2	$67,120	5
Arkansas	2180	$68,000	3	$68,130	3
Mississippi	2190	$67,740	4	$68,530	2
Tennessee	3640	$67,220	5	$68,120	4
Louisiana	3390	$61,030	6	$60,560	6
Oklahoma	2890	$60,710	7	$60,150	7
Average		*$66,410*		*$66,587*	

Data from Bureau of Labor Statistics. Data from May 2007 released May 2008.

As compared to that of the 16 Southern Regional Education Board (SREB) states, Arkansas's mean wage of $68,000 ranked the state 11th and was below this group's average mean wage of $72,359. In comparisons of the annual median wage with SREB states (Table 3.3), Arkansas ranked 10th with $68,130 and was below the group's average median wage of $72,318.

Table 3.3: *Comparison of Wage Data for Arkansas K-12 Education Administrators with SREB States*

State	Number Employed	Annual Mean Wage	Mean Wage Rank	Annual Median Wage	Median Wage Rank
Delaware	530	$98,220	1	$100,350	1
Maryland	5080	$88,650	2	$89,440	2
Florida	6620	$82,480	3	$82,010	3
Virginia	5980	$79,570	4	$78,040	5
Georgia	6910	$78,730	5	$79,850	4
Kentucky	3490	$72,670	6	$72,470	6
South Carolina	3160	$70,940	7	$70,690	7
Alabama	2960	$68,970	8	$69,190	8
Tennessee	3640	$68,120	9	$67,220	11
Texas	18940	$68,110	10	$67,120	12
Arkansas	2180	$68,000	11	$68,130	10
Mississippi	2190	$67,740	12	$68,530	9
North Carolina	8340	$66,060	13	$63,710	13
Louisiana	3390	$61,030	14	$60,560	14
Oklahoma	2890	$60,710	15	$60,150	15
West Virginia	1870	$57,750	16	$59,630	16
Average		*$ 72,359*		*$ 72,318*	

Data from Bureau of Labor Statistics. Data from May 2007 released May 2008.

Administrator Pay Trends across the State of Arkansas

In both metropolitan- and non-metropolitan regions across the state (Table 3.4), average wages for elementary and secondary education administrators range from $62,860 to $72,890. The average mean wage for these twelve regions was $66,766. Of course, this figure is lower than the state average of $68,000.

Table 3.4: *Comparison of Arkansas K-12 Education Administrators by Metropolitan Service Area*

Area name	Number Employed	Annual Mean Wage	Mean Wage Rank	Annual Median Wage	Median Wage Rank
Fayetteville-Springdale-Rogers, AR-MO	280	$72,890	1	$72,650	1
Little Rock-North Little Rock, AR	500	$70,360	2	$71,590	2
Fort Smith, AR-OK	220	$68,170	3	$68,020	5
Jonesboro, AR	100	$67,770	4	$67,550	6
Hot Springs, AR	60	$67,590	5	$69,460	4
Memphis, TN-MS-AR	840	$67,530	6	$70,010	3
Central Arkansas nonmetropolitan area	190	$66,760	7	$66,520	7
South Arkansas nonmetropolitan area	320	$64,770	8	$64,620	10
East Arkansas nonmetropolitan area	280	$64,720	9	$64,790	9
West Arkansas nonmetropolitan area	160	$64,240	10	$65,240	8
Pine Bluff, AR	110	$63,530	11	$59,970	12
Texarkana-Texarkana, TX-AR	100	$62,860	12	$61,480	11
Average		*$66,766*		*$66,825*	

Data from Bureau of Labor Statistics. Data from May 2007 released May 2008.

Chapter Three Summary

As policymakers are turning their focus to improving principal performance, they must choose how they will evaluate the effectiveness of these critically important school leaders. The current literature about measuring the effectiveness of school principals can

be characterized in two main categories. The first approach to principal evaluation focuses on judging principals' characteristics and behaviors. These process evaluations use the following three methods: the principal portfolio, the rating scale, and the 360-degree evaluation. The second approach centers on the concept that principals should be measured by the results that their organizations produce, such as student achievement test scores. At the heart of the debate over the appropriateness of evaluating principals based on outcomes is an assumption that principals can actually impact student performance. In Chapter Two, I presented the findings of critical syntheses and meta-analyses which suggest that, whether through direct or indirect means, principals can in fact play a critical role in improving student outcomes.

In the final section of this chapter, I presented descriptive data on administrator salaries in various regions of the state and regionally. Arkansas administrators are paid relatively lower salaries among the SREB states and about average among neighboring states. The summary salary data, which demonstrate the variation in pay that exists across regions of the state, show that principals in the northwest corner of the state and in Little Rock have higher salaries than those in the other regions of the state. These data provide context for the study's original findings on principal pay, which are reported in Chapter Five.

Chapter 4: Data and Methods

In this chapter, I present the data and methods used in the analysis of the study's two main research questions. The first question investigates which factors influence the level of a principal's pay. I consider the characteristics of principals themselves – such as their experience and degree level – and the characteristics of the populations served – including the school and district size, racial makeup, and poverty level. For question one, I run two alternate models that include cross-sectional school level academic performance information from the prior year. The findings from this first line of inquiry will also include information about principal sorting across different populations. The complete findings of research question one, which is primarily exploratory in nature, will be informative for policymakers inquiring about what factors drive differences in the levels of principal pay and about the settings in which higher paid, better credentialed, and more experienced principals are serving.

The second question involves an investigation of whether a principal's performance – as measured by student academic test performance – impacts changes in a principal's salary. This question is an important aspect of the study because the answer will inform the study's primary policy recommendations. Understanding whether more effective principals get higher increases in pay can inform policymakers about the incentives that currently exist in the principal labor market and can guide their policy reform decisions about how to improve principal quality.

Research Question One: Factors Influencing the Level of Principal Pay

The first research question is: *To what extent is the level of principal pay impacted by observable characteristics of the populations they serve and of principals themselves, including their performance in the prior year?*

The answer to this question will indicate whether are there systematic variations in salary according to principals' observable characteristics and those of the populations they serve. This question addresses the need for policymakers to have a comprehensive understanding of the factors that drive variations in principal pay. These potential patterns of variation may have implications for policy, as the sorting of higher paid – and therefore potentially higher quality – principals among certain groups of students may be contributing to educational inequities across the state. Before designing policy solutions to ameliorate potential educational inequities, policymakers would benefit from a clear understanding of the principal pay and quality landscape and the nature of any patterns of principal sorting.

The first line of investigation for research question one involves a descriptive analysis to discern sorting patterns of principals by their own characteristics and the characteristics of the populations they serve. This descriptive analysis does not control for the factors that drive differences in pay, but merely portrays the reality of which types of principals are serving which types of student populations. The question may be instructive for policymakers who are considering differential pay incentives to change principal sorting patterns.

Thus, research question one includes two subquestions. The first subquestion is: How are principals sorted among different student populations with regard to their own

observable characteristics and the observable characteristics of the student populations they serve? That is, without holding constant the factors that impact principal salaries, are principals of, for example, high poverty districts and schools currently making lower salaries than those in low poverty districts and schools? Similarly, how do other school and district characteristics, such as size of enrollment or percentage of the population that is minority, impact the level of a principal's pay?

The second subquestion for research question one is: When controlling for various independent factors that impact the level of principal pay, which factors drive the differences in principal salaries? For example, are principals of high minority schools and/or districts, small schools and/or districts, or high poverty schools and/or districts paid less, when holding all other factors – such as their own experience or degree level – equal?

Data for Research Question One

Principal Salary Data

The data set of Arkansas principals was collected from the Arkansas Department of Education. The strengths of the data set are that it contains a large sample size with salary, demographic, work experience, and educational background information for each individual. Principals and assistant principals from all public schools K-12, excluding charter schools, were included for the school years from 2004-05 through 2007-08. Although this data set had holes, I was able to collect a large portion of the missing information by making email and telephone inquiries to district personnel across the state. In addition, I searched district websites for information about some principals' subsequent career choices and salary figures.

The data set's shortcomings did present some challenges. Principals are not identified with a unique identifier; therefore, combining data sets over multiple years involved creating matches on principals by name. Potential uncertainty created by duplicate names was settled by examining other information in the individual entries. The largest challenge occurred after combining data sets over a two-year period. After identifying which principals moved from their current position, those "movers" fell into two main categories. The first category of movers includes those who stayed in the data set. Members of this first category either switched to a new position as a principal or assistant principal. The second category of movers includes those who left the data set altogether. To fill in this missing data, I sent approximately 250 email requests to superintendents in the districts where those principals had served to determine the successive career choice for each principal who left the data set. I also searched online to find missing employment and salary data for some former principals for whom I did not receive an email response. Across the three combined data subsets (e.g. 2004-05 and 2005-06 formed one subset), 450 principals were missing; I received information on the successive career choices for 187. I was interested to determine the successive career choice so that I could include an estimate of salary for that individual, where possible.

To assess secondary analysis of principal career choices, I collected data about the following successive career choice categories:

1) Went back to being a classroom teacher;
2) Moved to a central office position;
3) Retired;
4) Left the education profession, but did not retire;
5) Went back to school full time;

6) Deceased; or
7) Unknown.

Additionally, in filling missing data and making salary estimates, the following criteria were applied:

- For those individuals who went back to being a classroom teacher, I entered a salary estimate based on the salary schedule in that district, given the teacher's experience and degree.
- For those who moved to a central office position, I found salary figures for some former principals online. However, for most of these individuals, I did not locate a salary figure. They were removed from the data set for the primary analyses.
- Just as with the central office personnel for whom I was unable to locate a salary figure, I dropped from the analysis sample the individuals who left the education profession, who went back to school full-time, who were deceased, or unknown.
- Combining records with a lack of information about successive choices, those for whom I could not make an accurate salary estimate, and those with missing data within the individual record, the total data attrition rate was 20.1%.

District and School Poverty Levels, Extent of Minority Population, and District and School Size Data

Data for the various analyses regarding district and school poverty levels, the extent of the district and school minority populations, and district and school size data were collected from the Arkansas Department of Education Statewide Information System for all relevant years

Data on Former Principal Career Choices

To collect this information, I assembled a list of Arkansas school principals who left the data set entirely from year to year. I then emailed the superintendents of each district to gather data on the career choices of those who left the district. I received responses from 187 of 450.

Principal Performance Data

To analyze how principal salaries might be affected by principal performance, it was necessary to select a performance variable. Because the principal is the chief executive of the school, I used school-wide performance information. Indeed, a principal's unit of responsibility is the school building, and the academic performance at the school level one measure of his or her effectiveness.

The performance variable in the study's primary analysis is based on the Arkansas Comprehensive Testing Assessment and Accountability Program (ACTAAP) with regard to No Child Left Behind and the measure of Adequate Yearly Progress (AYP). Although the use of an AYP performance measure began nationally for Title I schools with the 1994 Improving America's Schools Act (IASA) reauthorization of the Elementary and Secondary Education Act (ESEA) (Shields et al., 2004), AYP as it is calculated and implemented currently in Arkansas was initiated in 2003 (Arkansas Department of Education, 2008).

The goal of NCLB's AYP measure is to for the state to ensure that 100 percent of students will be proficient in mathematics and reading/language arts by 2013-2014 school year (Arkansas Department of Education, 2008). In practice, this 100 percent proficiency

goal of NCLB has led Arkansas to establish a performance baseline and have divided the gap between 100 percent proficiency and the baseline into twelve annual proficiency goals (Arkansas Department of Education, 2008). The baselines for each of the grade levels (K-5, 6-8, and 9-12) are presented in the table below:

Table 4.2: *Adequate Yearly Progress Baseline Percent Proficient for Literacy and Mathematics by Subject*

School Level (Grades)	Subject	Baseline Percent Proficient (Revised 2006)	Annual Gain Needed to Meet AYP
K to 5	Literacy	42.4	7.20
K to 5	Mathematics	40.0	7.50
6 to 8	Literacy	35.2	8.10
6 to 8	Mathematics	29.1	8.86
9 to 12	Literacy	35.5	8.06
9 to 12	Mathematics	29.2	8.85

Data Source: Arkansas Department of Education (2008)

All Arkansas schools participate in this accountability program, which involves annual testing scheduled at varying times during the school year. The current AYP calculation system was adopted in for the 2007-2008 school year, but the testing and AYP system that were in place during the testing time period of this study – testing years 2004-05 to 2006-07 – operated differently. During the time period of this study, to make Adequate Yearly Progress, a school must have been above the percent proficient bar each year in both Literacy and Mathematics (Arkansas Department of Education, 2008). The percent proficiency was calculated as a three year average of the percent of students scoring above a certain cut score on a given exam (Arkansas Department of Education, 2008). For example, if a K-5 school was at 60 percent proficient in Literacy in 2005-06 (based on the test scores for 2003-04, 2004-05, and 2005-06) and at 40 percent proficient

in Mathematics, that school would have made AYP. That school would have been designated as "Meets Standards" for the 2006-07 school year. On the 2006-07 testing in Mathematics, the school would have needed for its new three-year-average percent proficient average (based on testing in years 2004-05, 2005-06, and 2006-07) to reflect an increase of 7.5 percent of its students scoring proficient to make AYP again. If that school were to have maintained, or even declined, in the percent of its students who scored proficient in Literacy, it would have continued to make AYP, provided the three-year-average of the percent of students scoring proficient was above the proficiency bar of 49.6.

Under both the older and current AYP systems, when a school fails to make AYP for two consecutive years, it is designated as in "School Improvement". Each year that the school fails to meet AYP, the schools moves farther down the School Improvement Status ladder. Each successive categorization of the School Improvement Status is to result in increasingly stringent sanctions. The table below, adapted from Arkansas Department of Education documents, lists the sanctions to be applied for failure to meet AYP.

Table 4.3: *School Performance and Actions/Sanctions Associated with Varying Levels of Improvement Status*

School Performance	**School Improvement Status for the Following Year**	**Action/Sanction**
First year a school's performance is below AYP starting point or first year a school or school district fails to make adequate yearly progress.		Review school improvement plan and establish professional development needs for faculty and staff
Second year of a school's failure to make AYP.	School Improvement Status (Year 1)	School must provide choice option for students to attend another school in the district not in improvement. May, at the option of the school/district offer supplemental services if choice is not an option.
Third year of a school's failure to make AYP	School Improvement Status (Year 2)	School must continue to provide choice and add the option of supplemental services to students who qualify.
Fourth year of a school's failure to make AYP	School enters corrective action status (Year 3)	The State is required to establish and implement a plan of corrective action
Fifth year of a school's failure to make AYP.	Reconstruction status (Year 4)	The State is required to act to restructure the identified school.

Although the designation of meeting or failing AYP may be considered a poor measure of school quality for a variety of reasons, I chose it as a measure of principal performance because it is an accepted, publicly reported signal of school quality per federal law. It is conceivable that superintendents and school boards involved in school

principal hiring decisions might judge the quality of a school, and therefore its principal, by whether or not the school made AYP.

I did, however, use a second measure of school performance in addition to the AYP designation as a principal performance variable. The second performance variable included in this study was a combined percent proficient and advanced variable on math and language on state academic assessments for the school in which the principal served in the prior year. This percent proficient variable was primarily chosen because it has a more continuous quality, ranging from 0 to 100. Again, it is plausible that superintendents and school boards involved in school principal hiring decisions might judge the quality of a school, and therefore its principal, by whether or not the school had a high percentage of students at the level of proficient or above. It is true that both performance measures – AYP and percent proficient – do not take into account the fact that principals may be serving different types of student populations. These absolute measures are, however, the publicly reported and readily available measures of school performance.

Methods for Question One

This analysis is designed to determine the relative impact that various factors have on differences in the level of principal pay. For examples, the factors that might be expected to lead to variations in principal pay may include: a principal's experience, degree level, district or school size, district or school wealth, district or school minority percentage, and school level – elementary, middle, and high. To estimate the relative magnitude and significance of these potential factors, I conducted three different analyses using OLS regression. The primary difference is that the first equation does not include

performance data from the prior year. The second and third equations differ in the type of performance data used. The equations are below. Variables included in these models are informed by the previous related studies (Cullen and Mazzeo, 2008; Goldhaber, 2007) of principal pay. Some of the differences in the models below and those in previous studies concern data limitations.

Question One – Model 1 (No performance data included)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{middle} + \beta 2\mathit{high} + \beta 3\mathit{degreeBA} + \beta 4\mathit{degreespecialist} + \beta 5\mathit{degreedoctorate} + \beta 6\mathit{experience} + \beta 7\mathit{districtsize} + \beta 8\mathit{districtpoverty} + \beta 9\mathit{districtminority} + \beta 10\mathit{districtwealth} + \beta 11\mathit{schoolsize} + \beta 12\mathit{schoolpoverty} + \beta 13\mathit{schoolminority} + \beta 14\mathit{female} + \beta 15\mathit{principalminority} + \beta 16\_\mathit{year2006\text{-}07} + \beta 17\_\mathit{year2007\text{-}08} + e$$

Question One – Model 2 (Includes AYP performance data)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{middle} + \beta 2\mathit{high} + \beta 3\mathit{degreeBA} + \beta 4\mathit{degreespecialist} + \beta 5\mathit{degreedoctorate} + \beta 6\mathit{experience} + \beta 7\mathit{districtsize} + \beta 8\mathit{districtpoverty} + \beta 9\mathit{districtminority} + \beta 10\mathit{districtwealth} + \beta 11\mathit{schoolsize} + \beta 12\mathit{schoolpoverty} + \beta 13\mathit{schoolminority} + \beta 14\mathit{female} + \beta 15\mathit{principalminority} + \beta 16\_\mathit{year2006\text{-}07} + \beta 17\_\mathit{year2007\text{-}08} + \beta 18\mathit{meetstandards}_{t-1} + e$$

Question One – Model 3 (Includes Percent Proficient/Advanced)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{middle} + \beta 2\mathit{high} + \beta 3\mathit{degreeBA} + \beta 4\mathit{degreespecialist} + \beta 5\mathit{degreedoctorate} + \beta 6\mathit{experience} + \beta 7\mathit{districtsize} + \beta 8\mathit{districtpoverty} + \beta 9\mathit{districtminority} + \beta 10\mathit{districtwealth} + \beta 11\mathit{schoolsize} + \beta 12\mathit{schoolpoverty} + \beta 13\mathit{schoolminority} + \beta 14\mathit{female} + \beta 15\mathit{principalminority} + \beta 16\_\mathit{year2006\text{-}07} + \beta 17\_\mathit{year2007\text{-}08} + \beta 18\mathit{percentproficient}_{t-1} + e$$

Table 4.1: *Research Question One Variables and Variable Descriptions*

Variable Name	Variable Description
$Salary_t$	The dependent variable in this equation is a principal's salary in dollars in a given year 2005-06, 2006-07, or 2007-08.

$\beta 0$	This is a constant. It represents the average salary in dollars earned by a male, elementary principal during the 2004-05 school year, with a master's degree, zero years of experience, a district population of zero students, and a district Free and Reduced Lunch population of zero.
Middle and high	These are school level variables, and elementary is the omitted category. The coefficients on these dummy variables represent the return to a principal in dollars of salary for working in a middle or high school relative to working in an elementary school, holding all else constant.
degreeBA, degreespecialist, and degreedoctorate	These are principal degree levels, and degreeMA is the omitted category. The coefficient on these dummy variables represent the salary increases in dollars that are attributable to having a BA, specialist, or doctorate degree, as compared to having a master's degree, holding all else constant.
Experience	The coefficient on this continuous variable relates the marginal increase in salary due to annual increase in experience on the job, holding all else constant.
districtsize and schoolsize	These continuous variables relate the marginal increase in salary due to a single student increase in a district or school enrollment, holding all else constant.
districtpoverty and schoolpoverty	These variables range from 0 to 100 as a percent and represent the variation in salary that is due to a marginal increase in the percent of students in a district or school that are eligible for Free or Reduced Lunch, holding all else constant.
Districtwealth	This variable ranges from 0 to 1, where larger values represent higher district wealth. This variable is a state figure used in facilities funding, and it represents the revenues raised based on the local tax base. Specifically, it is defined as the result of one (1) minus the ratio of local revenue per student divided by the difference between foundation funding and local revenue per student.

Districtminority and schoolminority	These variables range from 0 to 100 as a percent and represent the variation in salary that is due to a marginal increase in the percent of students in a district or school that are non-white, holding all else constant.
Female	This is a dummy variable with a value of 1 for principals who are female. The coefficient on this indicator variable represents any variation in salary that may be systematically related to a principal's sex, holding all else constant.
Principalminority	This is a dummy variable with a value of 1 for principals who are non-white. The coefficient on this indicator variable represents any variation in salary that may be systematically related to a principal's being non-white, holding all else constant.
year2005-06, year2006-07, and year2007-08	These are year dummy variables, for which the coefficients represent the dollar differences in salary that exist each year relative to the salary in year 2004-05, holding all else constant.
meetstandards $_{t-1}$	The coefficient on this performance variable relates to the dollar difference in level of salary that is attributable to meeting performance standards (i.e. meeting AYP) on the state academic performance assessments at the school level. A positive and significant coefficient indicates that principals of schools that meet standards receive a larger salary as a result of their performance that is over and above what is earned on average simply by staying on the job for another year, holding all else constant.
percentproficient $_{t-1}$	This performance variable is an average of the percent proficient or advanced in reading and math on the state academic performance assessments at the school level in year t-1. The coefficient on this variable equals the dollar salary increase that corresponds to a one percent increase in school proficiency on the state assessment, holding all else constant.
E	The error term represents any source of variation in salary that is not accounted for by the independent variables included in the model.

Summary of Analytic Strategy for Question One

As a first step in the study's analysis, I explore how principals with varying characteristics are sorted among the districts and schools of Arkansas, without holding constant variables that can impact the level of principal pay. I divide the schools and districts into various groups (quintiles) based on their characteristics (percent FRL, percent minority, percent, etc). I also present basic principal sorting and pay patterns by school level (elementary, middle, high).

These basic statistics tell whether principals in certain settings tend to have higher pay, experience, or degree level. The fact that higher paid principals are in, for example, larger districts may have to do with the fact that the larger districts pay better, or it could be due to their being more experienced and better trained. For this reason, I then conduct the regression analysis to determine what factors are actually driving the differences in pay. Any differences between the analysis of principal pay with and without controls for the various factors that impact pay will be informative for policymakers, who wish to provide incentives to motivate certain changes in principal behaviors. After conducting the combined sample analyses, I then conduct subgroup analyses by school level.

Research Question Two: Factors Influencing Changes in Principal Pay

The second research question is: *To what extent does a principal's performance in the prior year impact the magnitude of the change in his or her salary?*

This second research question involves a direct investigation of whether a principal's performance impacts changes in a principal's salary. This question is

measured by examining the school level academic performance on state-mandated standardized tests of a principal's school in the prior year. The reason that I use building level academic performance data is because the principal's unit of assignment is the school. The significance of this question is that it provides a better understanding of whether more effective principals get higher increases in pay. These findings can inform policymakers about the incentives that currently exist in the principal labor market and can guide their policy reform decisions about how to improve principal quality.

Data for Research Question Two

Principal Performance Data

To analyze how changes in principal salaries might be affected by principal performance, it was necessary to select a performance variable. Because the principal is the chief executive of the school, I used school-wide performance information, as in question one. Indeed, a principal's unit of responsibility is the school building, and the academic performance at the school level one measure of his or her effectiveness.

Principal Salary Data

The principal salary data used for this research question is described above under research question one.

Methods for Research Question Two

To investigate the existence and magnitude of the relationship between increases and salary and school performance, I conducted three separate analyses. First, I regressed the salary in a successive year on the prior year salary, a school performance variable, and indicator variables for change in degree. The model intentionally excludes anything

that might be related to earning a higher salary as a result of better performance. That is, the model is allowing for high performing principals to sort themselves into higher paying jobs in better paying districts or to move to higher paying jobs, such as the superintendency or a spot in a bigger school district. As the preliminary descriptive analysis indicates, for example, there may returns to working in a larger district or at various school levels (elementary, middle, high). Second, I dropped out the change in degree variables to determine if these variables have a practical impact the coefficients. Third, I changed the performance variable from "meets standards," a dichotomous AYP measure, to a more continuous variable, a measure of proficiency on state academic assessments. The equations are below, and as with question one described above, the inclusion of control variables is informed by previous studies cited in Chapter Two.

Question Two - Model 1 (AYP performance and change in degree)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{salary}_{t-1} + \beta 2\mathit{meets\_standards}_{t-1} + \beta 3\mathit{earn\_specialist}_{t-1} + \mathit{earn\_doctorate}_{t-1} + \beta\mathit{year2006\text{-}07} + \beta\mathit{year2007\text{-}08} + e$$

Question Two – Model 2 (AYP performance; no change in degree)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{salary}_{t-1} + \beta 2\mathit{meets\_standards}_{t-1} + \beta\mathit{year2006\text{-}07} + \beta\mathit{year2007\text{-}08} + e$$

Question Two – Model 3 (percent proficient/advanced; no change in degree)

$$Y\mathit{salary}_t = \beta 0 + \beta 1\mathit{salary}_{t-1} + \beta 2\mathrm{percentprof}_{t-1} + \beta 3\mathit{year2006\text{-}07} + \beta 4\mathit{year2007\text{-}08} + e$$

Table 4.4: *Research Question Two Variables and Variable Descriptions*

Variable Name	Variable Description
salary $_{t}$	This is the salary in dollars earned by a principal or former principal in one of three school years: 2005-06, 2006-2007, or 2007-08.
B0	This is a constant. It represents the average salary for all principals in time t-1.
salary $_{t-1}$	The is a principal's salary in dollars in time t-1. The coefficient on this variable represents a portion of the change in an individual's salary between times t and t-1 that is dependent on the magnitude of the salary in time t-1,holding all other factors constant.
earn_specialist	This a dummy variable that equals 1 when a principal earns a specialist degree in time t-1. The coefficient on this variable represents the return in dollars of salary in year t when a principal moving from a master's degree to a specialist degree. This change variable is included in the model because any increase in salary that is due to a difference in degree is unrelated to the potential return to meeting performance standards, holding all else constant.
earn_doctorate	This a dummy variable that equals 1 when a principal earns a doctorate degree in time t-1. The coefficient on this variable represents the return in dollars of salary in year t when a principal moving from a specialist degree to a doctorate degree. This change variable is included in the model because any increase in salary that is due to a difference in degree is unrelated to the potential return to meeting performance standards, holding all else constant.
meets_standards $_{t-1}$	The coefficient on this performance variable relates to the dollar change in salary that is attributable to meeting performance standards (i.e. meeting AYP) on the state academic performance assessments at the school level. A positive and significant coefficient indicates that principals of schools that meet standards receive an increase in salary as a result, that is over and above what is earned on average simply by staying on the job for another year, holding all else constant.
percentprof $_{t-1}$	This performance variable is an average of the percent proficient or advanced in reading and math on the state academic performance assessments at the school level in year t-1. The coefficient on this variable equals the dollar salary increase that corresponds to a one percent increase

	in school proficiency on the state assessment, holding all else constant.
year2006-07 and year2007-08	These dummy variables are included to account for the average change in pay that occurs annually which is unrelated to performance. The coefficients represent dollar increases in salary simply for being a principal in the following year, holding all else constant. The omitted category is year2005-06.
E	This error term includes the unmeasured sources of variation not accounted for by the independent variables included in the model.

Chapter Four Summary

As a first step in the study's analysis, I explore pay patterns for principals with varying characteristics and how these principals are distributed among the districts and schools of Arkansas, without holding constant variables that can impact the level of principal pay. This descriptive analysis involves comparisons of principal groupings based on principal characteristics and the characteristics of the populations served. These basic statistics tell whether principals in certain settings tend to have higher pay, experience, or degree level. The fact that higher paid principals are in, for example, larger districts may have to do with the fact that the larger districts pay better, or it could be due to their being more experienced and better trained. For this reason, I then conduct the regression analysis to determine what factors are actually driving the differences in pay. Any differences between the analysis of principal pay with and without controls for the various factors that impact pay will be informative for policymakers, who wish to provide incentives to motivate certain changes in principal behaviors.

Next, to investigate the existence and magnitude of the relationship between increases and salary and school performance, I conduct three separate analyses. First, I regress the salary in a successive year on the prior year salary, a school performance variable, and indicator variables for change in degree. The model intentionally excludes anything that might be related to earning a higher salary as a result of better performance. That is, the model is allowing for high performing principals to sort themselves into higher paying jobs in better paying districts or to move to higher paying jobs, such as the superintendency or a spot in a bigger school district.

Chapter 5: Findings

In this chapter I present the findings for the two primary research questions. Research question one is: To what extent is the level of principal pay impacted by observable characteristics of the populations they serve and of principals themselves, including their performance in the prior year? Additionally, because there may be patterns in the performance variables at each of the three school levels, I analyzed principal subgroups by school level. Alongside the findings for question one, I present descriptive analysis of principal pay patterns across different school types based on the pay incentives that exist in the labor market. In the final part of the chapter, I present the findings of research question two: To what extent do current pay and evaluation policies reward school principals for performance with increases in pay?

Findings of Research Question One: Factors Influencing the Level of Principal Pay

Table 5.1 below is a presentation of the complete findings for research question one, which explores the factors that impact the level of a principal's salary. After the complete findings table, I divide the various independent variables into groups and discuss the impact of each group separately. In each variable group discussion, I first present descriptive information about principal pay patterns with reference to certain district and school characteristics, and then I present data from the regression analysis to investigate if there is a difference between the controlled and uncontrolled relationships with the given variables and principal salaries.

Table 5.1: *Regression Coefficients for Question One – Factors that Impact the Level of a Principal's Salary from 2005-06 to 2007-08*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Experience (years)	160.20** (21.15)	159.93** (21.15)	158.31** (21.25)
Female	-633.54 (401.22)	-638.89 (401.20)	-710.78 (405.30)
Principal Minority (non white)	-905.10 (613.67)	-877.95 (613.98)	-689.18 (626.16)
BA	-4813.11* (1506.88)	-4748.57* (1507.58)	-4742.76* (1507.25)
MA (Omitted)	-----	-----	-----
Specialist	2619.09** (467.86)	2613.92** (467.83)	2656.32** (470.68)
Doctorate	5321.44** (935.91)	5389.72** (937.38)	5258.16** (950.45)
Elementary School (Omitted)	-----	-----	-----
Middle School	3575.33** (496.51)	3668.60** (501.97)	4016.51** (514.21)
High School	4253.74** (534.57)	4308.74** (536.31)	4950.29** (583.76)
District Enrollment	.80** (.04)	.80** (.04)	.80** (.04)
District _FRL%	-83.31* (28.03)	-82.97* (28.03)	-92.16** (28.34)
District_Minority%	58.38* (26.95)	58.79* (26.95)	65.60* (27.27)
District_Wealth	26.78* (10.56)	26.34* (10.57)	24.53* (10.63)
School Enrollment	14.11** (0.75)	14.25** (.76)	14.01** (.76)
School_FRL%	-3.97 (23.42)	-2.82 (23.43)	13.44 (24.05)
School_Minority%	-7.06 (24.84)	-4.27 (24.94)	-2.03 (25.37)
Year 2005-06	-----	-----	-----

Year 2006-07	3357.48** (429.42)	3362.59** (429.39)	3152.76** (441.89)
Year 2007-08	6237.82** (432.60)	6253.60** (432.74)	5746.59** (462.77)
Meets_AYP	-----	606.54 (482.66)	-----
Average % proficient time t-1	-----	-----	44.78* (15.42)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

Next, I present the regression coefficients for the subgroup analysis of Question One, which is an examination of the extent to which various factors impact principal pay by school level – elementary, middle, and high school. Here, I only present the coefficients from Question One Model 3, which includes the percent proficient performance variable,[2] for each subgroup and for the complete analysis sample. Model 3 includes the better performance variable. All three models for each subgroup are included in Appendix C.

[2] To explore the possibility that superintendents and school boards might also use change in percent proficient as a crude growth measure as an indicator of principal performance, I ran the models for both question 1 and question 2 including this performance variable. In these alternative models, principal performance, as measured by change in percent proficient, did not have a statistically significant positive impact either on the level of pay or the change in pay.

Table 5.2: *Regression Coefficients for Question One Analysis of School Level Subgroups – Factors that Impact the Level of a Principal's Salary from 2005-06 to 2007-08*

Dependent Variable: Level of Principal Salary (M $86,000; SD $13,093)				
Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
Experience (years)	139.20** (28.74)	57.45** (0.19)	267.05** (44.36)	158.31** (21.25)
Female	1.43 (525.07)	-1391.62 (751.63)	-1188.02 (1039.89)	-710.78 (405.30)
Principal Minority (non white)	-1669.04* (742.91)	1009.78 (1444.80)	1704.91 (1680.49)	-689.18 (626.16)
BA	-5971.00** (2249.50)	-3619.42** (2954.22)	-4473.58 (2834.48)	-4742.76* (1507.25)
MA (Omitted)	-----	-----	-----	-----
Specialist	2557.18** (638.27)	3995.10** (864.41)	1560.28 (1094.73)	2656.32** (470.68)
Doctorate	6895.68** (1338.32)	4664.68** (1478.88)	3520.93 (2528.21)	5258.16** (950.45)
District Enrollment	.74** (.06)	.82** (.10)	.76** (.13)	.80** (.04)
School Enrollment	13.01** (.76)	17.18** (2.11)	14.61** (1.40)	14.01** (.76)
District_Minority%	46.22 (30.45)	88.62 (81.82)	-39.67 (96.36)	65.60* (27.27)
School_Minority%	7.87 (27.53)	7.12 (80.60)	86.91 (92.74)	-2.03 (25.37)
District _FRL%	-77.95* (28.03)	-152.38** (32.61)	-32.35 (82.46)	-92.16** (28.34)
School_FRL%	-25.60 (26.20)	92.02 (76.65)	-54.61 (69.35)	13.44 (24.05)
District_Wealth	58.35** (14.68)	.63 (21.27)	-25.27 (21.78)	24.53* (10.63)
Elementary School (Omitted)	-----	-----	-----	-----
Middle School	-----	-----	-----	4016.51** (514.21)
High School	-----	-----	-----	4950.29** (583.76)

Average % proficient time t-1	45.37* (19.49)	109.71** (40.23)	8.48 (34.34)	44.78* (15.42)
Year 2005-06	-----	-----	-----	-----
Year 2006-07	2930.41** (590.06)	3202.10** (895.36)	3584.80** (928.88)	3152.76** (441.89)
Year 2007-08	5236.24** (629.64)	5677.85** (975.76)	6670.35** (932.69)	5746.59** (462.77)
Intercept	65, 984.14** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

The Extent to Which Principal Characteristics Impact the Level of Principal Pay

The descriptive statistics below include information regarding principal experience, sex, and minority status with respect to school level – elementary, middle, and high school. These statistics provide information about principal pay patterns for principals with varying characteristics relative to different school levels. I then compare these descriptive findings to those from the question one regression analysis that focuses on how a principal's demographics impact the level of his or her pay, while holding constant other observable factors that might influence the level of a principal's salary.

Tables 5.3, 5.4, and 5.5 show aspects of principal pay patterns among the three levels of schooling based on selected principal characteristics for a three-year period from 2005-06 to 2007-08. Table 5.3 reveals two interesting patterns. First, there are disproportionately more female principals serving in elementary grades, and second, there is a small percentage of minority principals across all levels of schooling. The largest percentage of minority principals can be found in elementary grades (17 percent

non-white). The total percentage of minority principals across all grade levels for this time frame was 14 percent.

Table 5.4 shows that very few principals at any level hold either bachelor's or doctorate degrees. Overwhelmingly, principals hold master's degrees; the only real source of variation in credential by grade level is that middle schools appear to be staffed at a greater percentage (than either elementary or high schools) with principals holding specialist degrees. Table 5.5 shows that there are relatively proportionate distributions of principals holding various degrees across all levels of schools. For example, 52 percent of all principals serve in elementary schools, and 53 percent of all principals with master's degrees serve in elementary schools. Again, middle schools are staffed with a disproportionately higher share of principals with specialist and doctorate degrees.

Table 5.3: *Descriptive Statistics of Principal Characteristics by School Level from 2005-06 to 2007-08*

School Level	Elementary	Middle	High	Total
N Total	1341	512	717	2570
Average Experience (years)	23.57	22.52	21.9	22.89
Range Experience (years)	0-47	0-46	0-48	0-48
N Female	910	199	125	1234
Percent Female by Level	68%	39%	17%	48%
N Minority	236	68	60	364
Percent Minority by Level	18%	13%	8%	14%

Sample N = 2,570 is for all individuals with a complete record.

Table 5.4: *Number and Percent of Principals by Highest Degree Level Attained from 2005-06 to 2007-08*

School Level	Elementary	Middle	High	Total
N Bachelor's	15	8	13	36
Percent Bachelor's	1%	2%	2%	1%
N Master's	1046	341	575	1962
Percent Master's	78%	67%	80%	76%
N Specialist	235	127	110	472
Percent Specialist	18%	25%	15%	18%
N Doctorate	45	36	19	100
Percent Doctorate	3%	7%	3%	4%

Sample N = 2,570 is for all individuals with a complete record.

Table 5.5: *Distribution of Principals with a Given Degree by School Level from 2005-06 to 2007-08 Compared to that School Level's Share of Total Principals in the Data Set*

	Percent Bachelor's	Percent Master's	Percent Specialist	Percent Doctorate	School Level Share of Total
Elementary	42%	53%	50%	45%	52%
Middle	22%	17%	27%	36%	20%
High	36%	29%	23%	19%	28%
TOTAL	100%	100%	100%	100%	100%

Sample N = 2,570 is for all individuals with a complete record

Table 5.6, which is the analysis of the combined sample, below shows that, as with teacher pay, a principal's own characteristics appear to impact his or her salary. Principal pay is significantly affected by experience and degree level. For each year of experience, a principal can expect to see a salary increase of approximately $160. Further, principals with specialist and doctorate degrees tend to earn approximately $2,520 and $5,300 dollars more than principals with master's degrees respectively. Those principals with only a bachelor's degree tend to earn approximately $4,775 less than principals with masters' degrees.

Table 5.6: *Relationship between Principal Characteristics and Salary*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Experience (years)	160.20** (21.15)	159.93** (21.15)	158.31** (21.25)
Female	-633.54 (401.22)	-638.89 (401.20)	-710.78 (405.30)
Principal Minority (non white)	-905.10 (613.67)	-877.95 (613.98)	-689.18 (626.16)
BA	-4813.11* (1506.88)	-4748.57* (1507.58)	-4742.76* (1507.25)
MA (Omitted)	-----	-----	-----
Specialist	2619.09** (467.86)	2613.92** (467.83)	2656.32** (470.68)
Doctorate	5321.44** (935.91)	5389.72** (937.38)	5258.16** (950.45)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

Neither a principal's race nor a principal's sex appears to impact the level of his or her salary. It is important to note that these models do not contain all variables that impact the variation in principal salaries. Table 5.7 below is a comparative analysis of the extent to which a principal's demographic characteristics, education, and degree level impact his or her salary. With a few exceptions, the findings of the subgroup analyses of

the impact of these variables on a principal's salary are consistent with the findings for the complete sample.

Table 5.7: *Relationship between Principal Characteristics and Salary by Subgroup*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)

Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
Experience (years)	139.20** (28.74)	57.45** (0.19)	267.05** (44.36)	158.31** (21.25)
Female	1.43 (525.07)	-1391.62 (751.63)	-1188.02 (1039.89)	-710.78 (405.30)
Principal Minority (non white)	-1669.04* (742.91)	1009.78 (1444.80)	1704.91 (1680.49)	-689.18 (626.16)
BA	-5971.00** (2249.50)	-3619.42** (2954.22)	-4473.58 (2834.48)	-4742.76* (1507.25)
MA (Omitted)	-----	-----	-----	-----
Specialist	2557.18** (638.27)	3995.10** (864.41)	1560.28 (1094.73)	2656.32** (470.68)
Doctorate	6895.68** (1338.32)	4664.68** (1478.88)	3520.93 (2528.21)	5258.16** (950.45)
Intercept	65, 984.14** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

The Extent to Which Characteristics of Populations Served Impact the Level of Principal Pay

In this section, I present data on principal pay patterns across districts and schools with different levels of enrollment, percent of minority students, and percent of poverty students. I also include a description of pay patterns according to district wealth. Following this descriptive presentation, I present analysis of the extent to which these characteristics of districts and schools impact the level of a principal's salary, when controlling for other related factors.

District and School Enrollment

The data in Tables 5.8 and 5.9 show that principals of districts and schools with larger enrollments have higher salaries than those in smaller districts and schools. What is unclear from these data is whether the larger salaries result specifically from having greater enrollments, or if there are other related factors – such as the school level or a principal's degree level – that may be at least in part responsible for these pay patterns.

Table 5.8: *Average Salary by District Enrollment Quintile from 2005-06 to 2007-08*

District Enrollment Quintile	District Enrollment Quintile Min 2007-08	District Enrollment Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	317	780	$ 73,747	$ 77,266	$ 78,882
2	781	1,387	$ 77,005	$ 79,329	$ 83,037
3	1,421	2,895	$ 81,378	$ 84,549	$ 87,000
4	2,946	8,406	$ 86,843	$ 91,373	$ 95,466
5	9,002	25,738	$ 95,213	$ 98,381	$ 100,837

Table 5.9: *Average Salary by School Enrollment Quintile from 2005-06 to 2007-08*

School Enrollment Quintile	School Enrollment Quintile Min 2007-08	School Enrollment Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	0	247	$73,780	$77,234	$79,916
2	249	345	$79,541	$82,845	$84,055
3	346	448	$82,057	$84,485	$88,370
4	449	607	$85,861	$88,907	$93,073
5	609	3135	$93,134	$97,342	$99,980

The analysis in Table 5.10 below suggests that district and school enrollments do have a significant impact on principal salaries, when holding constant other factors related to the variation in principal pay. Specifically, principals can expect to earn approximately one dollar more in salary for each student enrolled in the district and approximately fourteen dollars more in salary for each student enrolled in his or her school.

Table 5.10: *Excerpt from Regression Table for Question One – The Extent to Which District and School Enrollment Impact Differences in the Level of Principal Pay*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) For Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
District Enrollment	.80** (.04)	.80** (.04)	.80** (.04)
School Enrollment	14.11** (0.75)	14.25** (.76)	14.01** (.76)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at p<0.05; **Significant at p<0.01

The coefficients, presented in the subgroup analysis of Table 5.11 below, regarding the impact of district and school enrollments, are consistent with those of the combined sample.

Table 5.11: *Excerpt from Regression Table for Question One – The Extent to Which District and School Enrollment Impact Differences in the Level of Principal Pay by Subgroup*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)				
Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
District Enrollment	.74** (.06)	.82** (.10)	.76** (.13)	.80** (.04)
School Enrollment	13.01** (.76)	17.18** (2.11)	14.61** (1.40)	14.01** (.76)
Intercept	65, 984.14** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at p<0.05; **Significant at p<0.01

District and School Percent Minority

The data in Tables 5.12 and 5.13 show that principals of districts and schools with larger percentages of minority students enrolled generally have higher salaries than those in districts and schools smaller percentages of minority students enrolled. Again, it is unclear from these data whether these larger salaries result specifically from having greater minority enrollments, or if there are other related factors – such as the school level or a principal's degree level – that may be at least in part responsible.

Table 5.12: *Average Salary by District Percent Minority Quintile from 2005-06 to 2007-08*

District Percent Minority Quintile	District Percent Minority Quintile Min 2007-08	District Percent Minority Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	1	4	$ 77,072	$ 80,324	$ 83,485
2	4	13	$ 80,223	$ 82,890	$ 85,638
3	13	33	$ 83,172	$ 86,731	$ 90,490
4	33	50	$ 88,584	$ 91,279	$ 93,218
5	50	97	$ 85,266	$ 89,511	$ 92,523

Table 5.13: *Average Salary by School Percent Minority Quintile from 2005-06 to 2007-08*

School Percent Minority Quintile	School Percent Minority Quintile Min 2007-08	School Percent Minority Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	0%	4%	$77,159	$80,637	$83,359
2	4%	11%	$80,349	$83,150	$85,539
3	11%	31%	$84,579	$86,584	$91,036
4	31%	55%	$85,725	$90,316	$92,557
5	55%	100%	$86,561	$86,157	$92,792

The analysis in Table 5.14 below is consistent with the patterns above and suggests that district minority enrollment percentages do have a significant, positive impact on principal salaries, when holding constant other factors related to the variation in principal pay. Specifically, for each percentage point increase in minority enrollment at the district level, principals earn an additional 60 dollars per year. School minority percent is, however, not a significant predictor.

Table 5.14: *Excerpt from Regression Table for Question One – The Extent to Which District and School Minority Enrollment Percentages Impact Differences in the Level of Principal Pay*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124)			
For Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
District_Minority%	58.38* (26.95)	58.79* (26.95)	65.60* (27.27)
School_Minority%	-7.06 (24.84)	-4.27 (24.94)	-2.03 (25.37)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

The coefficients, presented in the subgroup analysis of Table 5.15 below, regarding the impact of district and school enrollments on principal pay, are not consistent with those of the combined sample. Specifically, district percent minority is no longer a significant predictor of variation in principal salary, when the combined sample is disaggregated by school level.

Table 5.15: *Excerpt from Regression Table for Question One – The Extent to Which District and School Minority Enrollment Percentages Impact Differences in the Level of Principal Pay by Subgroup*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)				
Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
District_Minority%	46.22 (30.45)	88.62 (81.82)	-39.67 (96.36)	65.60* (27.27)
School_Minority%	7.87 (27.53)	7.12 (80.60)	86.91 (92.74)	-2.03 (25.37)
Intercept	65, 984.14** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

District and School Poverty

The data in Table 5.16 show that principals in wealthier districts – i.e. those that have larger income per pupil related to that district's local tax base – are generally better paid than principals in lower wealth districts. Further, the data in Tables 5.17 and 5.18 show that principals of districts and schools with larger percentages of poverty students enrolled generally have lower salaries than those in districts and schools smaller percentages of poverty students enrolled. Again, it is unclear from these data whether the smaller salaries result specifically from having higher percentages of poverty students, or if there are other related factors that may be at least in part responsible for these patterns.

Table 5.16: *Average Salary by District Wealth Index Quintile from 2005-06 to 2007-08*

District Wealth Index Quintile	District Wealth Index Quintile Min 2007-08	District Wealth Index Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	0.14	0.37	$78,946	$82,702	$85,621
2	0.37	0.46	$77,899	$81,613	$83,992
3	0.47	0.61	$79,437	$83,052	$85,848
4	0.61	0.83	$84,325	$86,684	$91,833
5	0.86	1	$93,748	$96,669	$98,043

Table 5.17: *Average Salary by District Percent FRL Quintile from 2005-06 to 2007-08*

District Percent FRL Quintile	District Percent FRL Quintile Min 2007-08	District Percent FRL Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	16	45	$85,719	$88,677	$93,520
2	46	53	$87,819	$88,104	$88,729
3	53	60	$78,917	$83,451	$90,719
4	60	70	$84,502	$88,428	$87,659
5	70	100	$77,360	$81,927	$84,782

Table 5.18: *Average Salary by School Percent FRL Quintile from 2005-06 to 2007-08*

School Percent FRL Quintile	School Percent FRL Quintile Min 2007-08	School Percent FRL Quintile Max 2007-08	Salary 05-06 (N=869)	Salary 06-07 (N=860)	Salary 07-08 (N=841)
1	0%	41%	$87,936	$91,503	$96,322
2	41%	51%	$85,353	$86,136	$89,199
3	52%	62%	$80,984	$85,098	$86,388
4	62%	73%	$78,821	$82,802	$85,667
5	74%	100%	$81,341	$85,262	$87,735

The analysis in Table 5.19 below suggests that district wealth has a positive, significant impact on principal pay and that district percentages of poverty students have a significant, negative impact on principal salaries. Specifically, for each percentage point

increase in district percent poverty enrollment, principals earn over 85 dollars less per year. However, school percentages of poverty students do not tend to have a significant impact on principal salaries, when holding constant other factors related to the variation in principal pay.

Table 5.19: *Excerpt from Regression Table for Question One – The Extent to Which District and School Percent Poverty and District Wealth Impact Differences in the Level of Principal Pay*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124)			
For Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
District _FRL%	-83.31* (28.03)	-82.97* (28.03)	-92.16** (28.34)
School_FRL%	-3.97 (23.42)	-2.82 (23.43)	13.44 (24.05)
District_Wealth	26.78* (10.56)	26.34* (10.57)	24.53* (10.63)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

The coefficients, presented in the subgroup analysis of Table 5.20 below – regarding the impact of district and school percentages of poverty students and the influence of a district's wealth on principal pay – are only partially consistent with those of the combined sample. In particular, the district wealth index variable only retains significance in the elementary principal sample and district FRL is not significant in the high school sample analysis.

Table 5.20: *Excerpt from Regression Table for Question One – The Extent to Which District and School Percent Poverty and District Wealth Impact Differences in the Level of Principal Pay by Subgroup*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)				
Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
District _FRL%	-77.95* (28.03)	-152.38** (32.61)	-32.35 (82.46)	-92.16** (28.34)
School_FRL%	-25.60 (26.20)	92.02 (76.65)	-54.61 (69.35)	13.44 (24.05)
District_Wealth	58.35** (14.68)	.63 (21.27)	-25.27 (21.78)	24.53* (10.63)
Intercept	65, 984** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

School Level

The data in Table 5.21 show that principals of high schools earn more than principals of elementary schools, but that principals of middle schools earn more than principals of high schools. It is unclear from these data whether there is in fact a higher salary return for working in a middle school, or if there are other related factors that may be at least in part responsible for these patterns.

Table 5.21: *Average Principal Salaries by School Level from 2005-06 to 2007-08*

School Level	N 2005-06	Avg Salary 2005-06	N 2006-07	Avg Salary 2006-07	N 2007-08	Avg Salary 2007-08	Total N	Avg Overall
Elementary	453	$81,288	455	$84,568	434	$87,350	1342	$84,361
Middle	163	$86,416	175	$89,553	174	$92,252	512	$89,472
High	253	$83,456	230	$86,717	234	$89,847	717	$86,588
Total	869	$82,881	860	$86,157	841	$89,059	2570	$85,999

The data in Table 5.22 below indicate that principals of middle schools and high schools both earn higher salaries relative to their elementary school colleagues, holding all things constant. However, contrary to the patterns revealed in table 5.20 above, middle school principals are not paid more than high school principals due to school level, when holding constant other factors that might influence principal pay.

Table 5.22: *Excerpt from Regression Table for Question One – The Extent to Which School Level Impacts Differences in the Level of Principal Pay*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124)			
For Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Elementary School (Omitted)	-----	-----	-----
Middle School	3575.33** (496.51)	3668.60** (501.97)	4016.51** (514.21)
High School	4253.74** (534.57)	4308.74** (536.31)	4950.29** (583.76)
Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at

p<0.05; **Significant at p<0.01

The Extent to Which a Principal's Prior Performance Impacts the Level of Pay

In this section, I present an excerpt from the question one regression analysis that focuses on the extent to which a principal's performance in a previous year impacts the level of his or her salary in the subsequent year, while holding constant other observable factors that influence the level of a principal's pay.

Table 5.23 below is a comparison of principals who were in schools that met AYP in the prior year as opposed to those who were in schools that failed AYP in the prior year. At the elementary school level, there is virtually no difference between the salaries of those who met and those who failed AYP. At the middle and high school levels, principals who met AYP in the prior year were actually lower paid on average than principals who failed AYP. This pattern could reflect a number of possibilities, including the potential that smaller schools or districts were more likely to meet AYP or that high minority districts were less likely to meet AYP. It is also noteworthy that the experience levels – which do impact pay – are also virtually the same between the two groups of principals at the middle and high school levels.

Table 5.23: *Characteristics of Principals who Failed AYP in Time t-1 vs. Principals who Met AYP in Time t-1 from 2004-05 to 2007-08*

School Level	Elem	Middle	High	Total
N Principals (Met AYP)	1409	389	696	2494
N Principals (Failed AYP)	280	207	210	697
Average Salary (Met AYP)	$76,379	$78,916	$76,337	$76,765
Average Salary (Failed AYP)	$76,130	$85,421	$84,091	$81,289
Average Experience (Met AYP)	22.7	21.9	21.3	22.2
Average Experience (Failed AYP)	23.4	21.1	22.5	22.4
Percent Female (Met AYP)	68%	34%	16%	48%
Percent Female (Failed AYP)	70%	44%	22%	48%

Table 5.24 below presents the extent to which the level of performance of a principal in a prior year impacts the level of his or her salary. In Model 1, no performance data are included. When including AYP data in Model 2 – i.e. whether a principal served in a school that met AYP in the prior year – the predictive power of the model is not appreciably larger. Moreover, according to the data in Table 5.24, whether or not a principal met AYP in the prior year does not have a significant impact on the level of his or her salary. Therefore, it can be said that the differences in the salaries observed at the middle and high school levels in Table 5.23 above not influenced by a principal's performance, as measured by AYP.

Table 5.24: *The Extent to which Prior Performance of a Principal Impacts the Level of Principal Pay*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Meets_AYP	-----	606.54 (482.66)	-----
Average % proficient time t-1	-----	-----	44.78* (15.42)

Intercept	68,631.30** (1,337.33)	67,913.54** (1,54.06)	65,468.37** (1,715.44)
N observations	2570	2570	2538
R2	0.541	0.542	0.540

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

In Model 3, however, which includes a different performance variable – the average percent proficient of the students on the state academic assessment in the school where the principal served in the prior year – performance is a statistically significant predictor of variation in the level of a principal's salary, holding all other factors constant. It is worth noting that this performance variable, though statistically significant, does not appear to have a particularly large impact on the level of salary in terms of actual dollars. Increasing the percent proficient by one standard deviation – a relatively large increase (approximately a 17 percentage point increase in percent proficient is required to move from the 50^{th} percentile to the 84^{th} percentile of the percent proficient performance distribution, or literally moving from the mean of 55 percent proficient to 72 percent proficient) – would result in a salary increase of about 0.03 standard deviations – about $760, or not even 1 percent of the average principal salary during this time period. Additionally, it is noteworthy that including this variable in the model does not improve its explanatory power.

The subgroup analysis by school level on the impact of a principal's performance, as measured by percent proficient on principal salary levels, is generally consistent with the findings above. It is noteworthy that the coefficient on performance is much larger at

the middle school level than at the elementary level and not at significant at the high school level. These positive coefficients are still not particularly large, however.

Table 5.25: *The Extent to which Prior Performance of a Principal Impacts the Level of Principal Pay by Subgroup*

Dependent Variable: Level of Principal Salary (M $85,999; SD $13,124) for Model 3 (M $86,000; SD $13,093)				
Variable	**Elementary School** Model 3 (Percent Proficient)	**Middle School** Model 3 (Percent Proficient)	**High School** Model 3 (Percent Proficient)	**Combined Sample** Model 3 (Percent Proficient)
Average % proficient time t-1	45.37* (19.49)	109.71** (40.23)	8.48 (34.34)	44.78* (15.42)
Intercept	65, 984.14** (2,291.14)	65, 731.23** (3,724.04)	69,819.54** (3,266)	65,468.37** (1,715.44)
N observations	1341	508	697	2538
R2	0.523	0.620	0.526	0.54

Independent variables included: School and district level poverty, size, wealth, and race variables; principal degree level, experience, race, and sex variables; year indicator variables and performance variables. Omitted variables are Master's degree, Male, Year 2005-06, Fails AYP, Principal non-minority. *Significant at $p<0.05$; **Significant at $p<0.01$

Characteristics and Effectiveness of Principals Who Leave the Profession

The data in Table 5.26 below show that, across school levels, principals who leave the profession tend to have roughly the same characteristics as those who stay in the profession. Further, there is virtually no difference between the performance of those who leave and those who remain in the profession.

Table 5.26: *Comparisons between Principals who Stay in the Data Set and Those who Leave from 2005-06 to 2006-07*

School Level	Elem	Middle	High	Total
N Leavers	186	78	162	426
N Stayers	1503	518	744	2765
Average Salary Leavers T-1	$74,384	$79,415	$79,162	$77,083
Average Salary Stayers T-1	$76,580	$81,435	$77,938	$77,859
Average Experience Leavers T-1	24.2	23.2	24.1	24
Average Experience Stayers T-1	22.6	21.4	21	22
Percent of Leavers Who Are Female	68%	27%	21%	42%
Percent of Stayers Who are Female	68%	39%	17%	49%
Percent of Leavers Who Meet AYP	84%	68%	79%	79%
Percent of Stayers Who Meet AYP	83%	65%	76%	78%
Average Percent Proficient of Leavers	57%	49%	48%	52%
Average Percent Proficient of Stayers	59%	53%	49%	55%

The data in Table 5.27 below show that there is a difference in the turnover rates of principals – defined as one minus the ratio of principals who remain in the same position in the same school year over year – based on performance. In this analysis principals were grouped as high- (principals in the top third in percent proficient), medium- (principals in the middle third in percent proficient), and low-performing (principals in the bottom third in percent proficient).

Table 5.27**:** *Turnover Rate for Group of Principals by Performance Category*

	Principal Performance Category		
Year	Low Performing	Medium Performing	High Performing
2004-05 to 2005-06	27.2%	21.6%	21.3%
2005-06 to 2006-07	32.5%	18.0%	19.9%
2006-07 to 2007-08	23.4%	17.1%	16.3%

These data indicate that there is greater turnover among principals at low-performing schools than at medium- or high-performing schools. There is not an appreciable difference between turnover at medium- and high-performing schools.

Summary of Question One Findings

In sum for question one, I find that the following are significant predictors of the variation in a principal's salary:

- a principal's experience (positive) and degree level (positive), but not his or her sex or race;
- the school level at which a principal serves, where high school principals are paid more than middle school principals, who are in turn paid more than elementary principals;
- district factors, including district size (positive), district wealth (positive), district percent of poverty students enrolled (negative), and district percent of minority students (negative) enrolled, for combined sample only;
- school size (positive), but not a school's percent of poverty students enrolled, nor a school's percent of minority students enrolled;
- the year (positive) in which a principal is employed;
- performance (positive) when reported as percent proficient, but not when given as meeting AYP.

Subgroup analyses of the impacts of the included variables on principal salary by school level largely confirm the findings for the combined sample. The most noteworthy

difference was the district percent minority is not significant in any of the subgroup samples, in contrast to the finding for district percent minority for the combined sample. Of these variables, the largest determinants are: school level, degree level, and year. District and school variables that were significant have a very small impact on salary variation.

Findings of Research Question Two: Factors Influencing Changes in Principal Pay

Research question two focuses on the extent to which a principal's performance impacts the magnitude of the change in his or her principal's salary. That is, I am investigating whether a principal's performance in time t-1 impacts the magnitude of the principal's salary increase between time t and time t-1. The findings of this question combined with those of question one above give insight into the presence of performance incentives that may already exist in the principal labor market.

The district and school factors – e.g. size and poverty status – that impact the level of a principal's pay are intentionally excluded from this analysis. Not controlling for these sources of variation in the level of principal pay allows the model to measure the effects of, for example having highly successful principals to move from less lucrative positions to better paying principalships in larger schools or districts. Experience is excluded from the models in question two because all principals in the analysis will be seen to gain a one-year change in experience; this average gain will be captured in the year dummy variable. Further, a principal's own time invariant characteristics (race and sex) are excluded. The change in level of degree, however, is included, as a principal can increase his or her degree level from year to year.

Table 5.28: *Regression Coefficients for Question Two – The Relationship between School Performance and the Change in Principal Pay from 2005-06 to 2007-08*

Model 1 Dependent Variable: Salary in Time t (M=86,057; SD=13,114) **Model 2 Dependent Variable: Salary in Time t (M=$86,058; SD=13,083)**		
Variable	Model 1 (AYP)	Model 2 (Percent Proficient)
Meets_AYP	-289.61 (312.23)	-----
Percent Proficient Plus	-----	-130.23 (799.64)
Salary t-1	.79** (.01)	.79** (.01)
Earned Specialist Degree	681.17 (1220.58)	623.40 (1244.69)
Earned Doctorate Degree	6,455.45** (2924.08)	6,423.56** (2931.53)
Year 2006-07	-6,753.51** (337.00)	-6,715.51** (344.33)
Year 2007-08	-6,912.86** (351.62)	-6,869.99** (365.68)
Intercept	28,844.49** (745.61)	28,771.98** (798.41)
N Observations	2550	2518
R2	0.753	0.751

*Significant at p<0.05; **Significant at p<0.01

The findings in Table 5.28 suggest that a principal's performance – as measured by meeting AYP or by the percent of students scoring proficient or better on state achievement tests – is not a significant predictor of change in his or her salary year to year. Those principals who earn doctorate degrees do, however, receive a rather large increase on average. It is also interesting to note that the change in salary from 2005-06 to 2006-07 was on average much larger than the change in salary over the successive two years. This large average change in salary in the first year of the analysis may have been due to infusions of money into the education system that resulted from the *Lake View* decision.

Chapter Five Summary

The findings of the analysis presented above can best be summarized by addressing the study's research hypotheses.

Research Hypothesis 1a: The findings above confirm that principals of high schools and middle schools can expect to earn higher salaries than those in elementary schools and that principals of high schools earn more than those in middle schools, when holding constant the other factors that influence the variation in principal pay. The fact that pay patterns by school level show that Arkansas middle school principals earn more than high school principals is not related to school level, but to other characteristics of those principals.

Research Hypothesis 1b: The findings above confirm that school enrollment is a significant, positive determinant of principal pay both at the district and school level, holding all else constant.

Research Hypothesis 1c: The findings above confirm that principals in lower income districts and in schools that serve poorer students earn less than principals in wealthier districts and schools that serve fewer poor students, holding all else constant.

Research Hypothesis 1d: The findings above do not confirm that principals in districts with higher minority student populations are significantly better paid than those in districts with lower percentages of minority students, all else equal. Although the combined analysis confirmed the positive impact of increased minority enrollment at the district level on salary, the subgroup analysis failed to reinforce this finding.

Research Hypothesis 1e: The findings above confirm that principals with advanced degrees (specialist, doctorate, etc.) and more experience (years on the job) earn more than those with lower level degrees and less experience, holding all else constant. As anticipated, the higher the level of a principal's educational attainment, the higher the salary he or she earns, all else equal.

Research Hypothesis 1f: The findings above show that neither principal race nor principal sex is a significant predictor of principal pay.

Research Hypothesis 1g: The findings above largely fail to support the hypothesis that principal pay increases as principals are more successful, as measured by their performance in the prior year, when holding all else constant. When principal performance in the prior year is measured by whether his or her school met AYP in the prior year, principal pay is not affected. There is a significant effect on pay of the percent proficient in the prior year, however, when performance is measured by the percent proficient or better on the state assessments of the principal's school in the prior year. The subgroup analyses indicate that more successful principals, as measured by the

percent proficient variable, earn higher salaries as a result in elementary and middle schools, but not in high schools. It is important to note that these statistically significant finding are practically unimportant. For the combined sample, increasing the percent proficient by one standard deviation results in an increase of 0.06 standard deviations in salary. Additionally, it is noteworthy that including either performance variable in the model does not improve its explanatory power.

Research Hypothesis 2: The findings above fail to support the hypothesis that principals who perform better in the prior year (meet AYP or have higher percent proficient) earn greater salary increases year-over-year.

Chapter 6: Discussion

Pay Incentives in the Existing Principal Labor Market

This study was designed to investigate the nature of pay incentives in the existing principal labor market. Specifically, I was investigating if principals who perform better earn higher salaries and if better principals are differentially rewarded with larger pay raises – either by earning performance pay awards or by moving to higher paying jobs. In exploring these questions, I also investigated the extent to which a principal's own characteristics, such as a principal's race, degree level, and experience, might impact both the level of pay and the magnitude of change in pay. At the same time, I attempted to gauge the extent to which the characteristics of the populations served, with respect to a district or school's racial makeup, poverty status, size, or level, might impact both the level of a principal's pay and also the size of changes in a principal's pay.

Alongside these analyses, I examined patterns of principal pay with respect to enrollments, racial composition, or poverty levels, without holding constant related factors. The purpose of presenting these descriptive findings in comparison to the findings of the regression analyses was to determine whether any apparent patterns of principal pay may be reflecting principals' own characteristics or performance, rather than the characteristics of the populations served. For example, I investigated whether principals serving districts with higher poverty rates tended to be paid less because, in fact, those districts might not be able to pay higher salaries, or because, for example, poorer districts might not be able to attract mostly experienced principals. The findings in the regression analyses provided insight into this type of question by showing, on average, whether any variation in principal pay was due to the poverty level of the

district, and if so, the extent of that negative impact. The comparison of the descriptive patterns of principal pay across districts with varying levels of percent poverty to the findings in the regression analysis, in which district percent poverty was an included variable, did not in itself fully resolve the question of whether poorer districts pay less or have inexperienced principals. However, the findings of the regression analysis do suggest, in the current case at least, that principals, regardless of their experience, tend to earn less in higher poverty districts.

Impact of Principal's Performance on Pay

A principal's performance has little to no impact on his or her pay. Those principals who met AYP in the prior year neither earned a higher salary nor earned a larger raise in salary than principals who led schools that failed AYP. This finding suggests either that performance has no impact on pay, or that meeting or failing AYP is simply an irrelevant measure of principal performance to those who monitor a principal's work.

When including a continuous (and better) measure of principal performance – the percent of students in a principal's school in the prior year who performed proficient or better on the state's standardized achievement test – I did find a positive, significant impact on principal pay. However, even when the performance variable was statistically significant, its impact on the variation in principal pay was extremely small. A very large one standard deviation increase in percent proficient resulted in a less than 1 percent increase in principal pay. Interestingly, the subgroup analyses indicated that more successful principals, as measured by the percent proficient variable, earn higher salaries in elementary and middle schools, but not in high schools. One of the reasons for

conducting the subgroup analysis by school level was to unpack how the differences in school performance by school level might be related to differences in pay. It is the case that elementary schools tend to have higher levels of percent proficient, as there is a greater variance in student performance as students progress through school. Nonetheless, there is not a obvious explanation for why performance might be differentially rewarded at one school level rather than the other.

Impact of a Principal's Characteristics on Pay

The findings in this study suggest that principals wishing to increase their pay would do better to expend extra effort earning an advanced degree after school hours, than to expend any additional effort on raising student performance during the day. On average, principals with specialist's degrees earn three percent more than those with master's degrees, and principals with doctorate degrees earn over six percent more than those with master's degrees, all else equal. Moreover, in the year after that the doctorate degree is earned, principals can expect to see a large, statistically significant pay increase of approximately seven percent. Fortunately, from the perspective of pay equity, a principal's race and sex are unrelated to his or her level of pay.

Impact of the Characteristics of Population Served on Principal Pay

All else equal, principals wishing to increase their salaries should seek to work in middle or high schools instead of in elementary schools. The difference between the average middle and high school salary is not particularly large as a percent of total average salary. But on average, principals of middle schools earn over four percent more

than elementary principals, and principals of high schools earn over five percent more than elementary principals, all else equal.

The findings in this study related to school and district enrollment demographic characteristics and enrollment size suggest that variation in principal pay among districts is greater than principal pay variation within districts. Of the included school characteristics, only school enrollment was a significant predictor of the variation in principal pay. For the combined sample, all district level variables were significant predictors of principal pay, but the subgroup analysis failed to reinforce the finding that high minority districts pay better salaries.

Despite my original inability to identify a policy that might account for the hypothesis that principals in high minority districts would earn better pay, I did in fact predict that increases district minority would be associated with higher principal pay because of the findings in Barnett, Ritter, and Riffel (2008) regarding pay patterns for Arkansas teachers. In a purely descriptive analysis, Barnett, Ritter, and Riffel (2008) had found that teachers in high minority districts were better paid than those in low minority districts. So, I assumed that these patterns would be duplicated at the principal level. Before running the subgroup analyses, I did nonetheless seek to determine if there could be a policy-relevant explanation for my findings regarding the combined sample.

Because there was not a policy relevant explanation for the combined sample finding that high minority districts would pay principals better than low minority districts, all else equal, I re-ran the regression analyses and included a dummy variable for the three districts that have received significant state desegregation aid since the late 1980's. Little Rock School District, North Little Rock School District, and Pulaski

County Special School District together receive approximately $70 million annually from the state (Howell, 2008). Including this dummy variable for districts that receive desegregation money did not, however, provide more clarity or appreciably change the coefficient on minority or its significance. The explanation for this combined sample finding may be contained in the error term. Fortunately, given the fact that the only apparent policy explanation for the significant positive combined sample finding on district percent minority turned out to be untenable, the subgroup analyses did provide some clarity that a district's minority percentage are rather unlikely, after all, to be a significant predictor of variation in principal pay.

Findings in Context of Existing Related Literature

As noted in the introductory chapters, little research has been performed on principal compensation systems and the viability of performance pay programs for these school leaders (Goldhaber, 2007). Two studies (Cullen and Mazzeo, 2007) and Goldhaber (2007) directly explore the factors that are responsible for the variation in principal salaries. In his study of national data, which were pulled three times over a ten-year period from 1993-94 to 2003-04, Goldhaber (2007) attempted to uncover the specific district and school level factors that impact principal pay. He did not use a direct performance variable, but inferred that the lower amount of variance explained by observed variables included in his models, relative to the amount that can be explained in similar models of teacher pay, may include some aspect of performance pay. Cullen and Mazzeo (2007) explored principal labor market data in Texas from 1989-2006. Although they did include information about the relative impact of control variables, Cullen and Mazzeo (2007) provided direct – as opposed to inferred – evidence that more effective

principals are rewarded with higher salaries. Table 6.1 below summarizes key features of the current study with relation to these prior studies.

Table 6.1: *Comparison of Current Study Findings to those in Existing Principal Compensation Literature*

	Current Study (2009)	Goldhaber (2007)	Cullen and Mazzeo (2007)
Study Location	Arkansas	National Data Set	Texas
Time Frame of Total Study Sample	3 years	3 data pulls over 10 year period	16 years
Dates for Analysis Sample	2005-2008	1993-94, 1999-00, 2003-04	1989-2005
N	2,570	9,098	14,723
Range of Explained Variance All Models	0.540-0.750	0.44-0.46	Not Reported
Principal Race	NS	S/NS	Unclear
Principal Sex	NS	S/NS	Unclear
Principal Experience	S	S	Unclear
Advanced Degree	S	S	Unclear
Prior Teaching/Admin Experience	Not Included	S	Unclear
School Enrollment	S	S/NS	Unclear
School Race	NS	S/NS	Included/Not Reported
School Percent Poverty	NS	S/NS	Included/Not Reported
School Percent LEP	Not Included	Not Included	Included/Not Reported
District Enrollment	S	S/NS	Included/Not Reported
District Race	S	Not Included	Included/Not Reported
District Percent Poverty	S	Not Included	Included/Not Reported
District Wealth Variable	S	Not Included	Included/Not Reported
Urbanicity	Not Included	S	Included/Not Reported
Region of Country	Not Relevant	S	Not Relevant

School Level	S	S	Included/Not Reported
Pupil-Teacher Ratio	Not Included	S/NS	Not Included
Performance Variable	S/NS	Not Included	S

The information in Table 6.1 above indicates that the current study's findings are largely consistent with those of Goldhaber (2007). In particular, in both studies, principals of secondary schools earn higher salaries than those in elementary schools, and principals in larger and wealthier districts earn higher salaries. In addition, principals with more experience and with advanced degrees are better paid in both studies. Moreover, school and district size are significant, positive predictors of principal pay in both studies.

The most useful comparison to Cullen and Mazzeo (2007) involves the principal performance variable. In analyzing the career paths of full-time principals, they found that principals of the highest performing schools experienced greater increases in wages than did principals of low performing schools when moving to new positions. Moreover, when examining the wage changes for principals who remained at their current jobs, they found that principals of the highest performing schools similarly experienced greater wage growth than did principals of low performing schools.

In the current study, I only found performance to be a significant, positive predictor of principal pay in the models that included the percent proficient variable of for principal performance. And, the impact of this variable on salary was very small. Further, my findings regarding implicit rewards – i.e. the notion that high performing principals find a way to sort themselves into higher pay principalships – do not indicate that such a system is operating in the Arkansas principal labor market. By contrast,

Cullen and Mazzeo (2007) argue that their findings provide evidence of implicit rewards in the Texas principal labor market related to higher performance. In addition to the likely presence of implicit financial rewards in the Texas principal labor market, key policy differences between Arkansas and Texas that have impacted principal pay may also contribute to the difference in findings between these studies. As described in Chapter One, performance pay programs for educators in Texas have surfaced across districts in Texas over the last two decades (Lewis and Springer, 2008).

One other existing study of the relationship between principal performance and rewards in the labor market in Texas (Ladd, 1999) has relevance for contextualizing the current study's findings. In her study of how accountability and performance award systems impact various aspects of schooling, Ladd (1999) analyzed the impacts of the Dallas Independent School District's school-based accountability and performance incentive program. In this program which started in 1991, schools were measured on their ability to raise student performance on standardized tests. Those schools that were most effective – approximately the top 20 percent in the district – received financial bonuses, which were distributed to everyone on the school staff, including principals (Ladd, 1999). In addition to seeing positive impacts on student performance that were at least in part attributable to the program, Ladd (1999) found a dramatic increase in principal turnover over the course of the performance incentive program's implementation. Ladd showed that prior to the program, principal turnover rates in least effective schools, average effective schools, and most effective schools were 2.4 percent, 6.7 percent, and 6.3 percent, respectively. By the end of the program these rates had increased to 24.6 percent, 25.0 percent, and 24.4 percent, respectively. Ladd (1999) asserted, "Thus, it appears that

the new emphasis on accountability made the District much more willing than in the past to change principals" (p. 14). She concluded that this compositional effect on the principal workforce may have been due to the program and that this change, which was most dramatic in the lowest performing schools, could have positive impacts on student performance.

In the current study, I also conducted an exploratory analysis of the differences in principal retention patterns among various performance levels. I found that across school levels, principals who leave the profession tend to have roughly the same characteristics as those who stay in the profession. Further, there is virtually no difference between the performance of those who leave and those who remain in the profession. I did, however, find that there is a difference in the turnover rates of principals – defined as one minus the ratio of principals who remain in the same position in the same school year over year – based on performance. In this analysis of principal turnover by performance level, I grouped principals as high- (principals in the top third in percent proficient), medium- (principals in the middle third in percent proficient), and low-performing (principals in the bottom third in percent proficient). My findings of differential turnover rates by level of performance might have several explanations. It could be that, as Ladd (1999) suggested, low-performing schools have, at times, been more likely to change their principals. Alternatively, new principals might get their first jobs at low-performing schools, and after getting a few years of experience, they might be eager to move to less-challenging principalships elsewhere. Further investigation of these, and other, hypotheses should be conducted in future studies.

Study Limitations

The greatest limitation for this study is that the measures of principal performance are relatively basic. Although there is a reasonable justification for using principal performance measures that are publicly reported, as I have done, the performance variables in this study only take into account the performance of a principal in the prior year. It is true that both performance measures – AYP and percent proficient – do not take into account the fact that principals may be serving different types of student populations.

High performing schools, and principals, could be seen to be those that contribute to disproportionate growth in student performance, after controlling for the prior performance of the student body and student demographics. By predicting a school's performance and then determining whether a school beats that prediction, I could have a different measure of principal effectiveness. My analysis could then explore whether principals, who are viewed as effective by looking at absolute performance measures, are in fact the same ones who are effective in promoting student achievement growth. I could then compare pay differentials based relative to this new performance measure.

Finally, the lack of availability of data on principals' prior and subsequent career choices and salaries also limits the strength of inferences that can be drawn. Additionally, some cases were lost due to missing salaries or other control variables. In total, attrition was approximately 20 percent. To the extent that the analysis sample did not accurately represent the population, my findings will be skewed.

Chapter 7: Recommendations

Recommendations for Policymakers

This study was designed to be a guide Arkansas state policymakers who might consider improvements in educational leadership at the school level as strategy to address the public policy problem of low student achievement. To date, little research has been conducted on the principal labor market to determine what drives differences in principal pay and to examine how introducing pay incentives into the principal labor market might impact current principal behaviors, regarding their prioritizing of job responsibilities or concerning their decisions about where to work. Before considering modifications to principal compensation structures, policymakers in Arkansas – both at the state and local level – need to know what incentives exist already and how principals have tended to respond to those incentives.

The theoretical framework for the study was principal-agent theory. As noted above, the complexity of having multiple principals and agents with their own priorities can lead to severe goal misalignment in public sector work, including the education policy context (Burgess and Ratto, 2003; Propper and Wilson, 2003; Goldhaber, 2007). To align goals and minimize agency costs, education policy principals may wish to adopt performance-based compensation policies that tie compensation to increases in student achievement. For this recommendation to be valid, it will be necessary for policy principals to reach consensus on measuring principal performance through student test scores. Even in the climate of testing and accountability that has been established by No Child Left Behind, the diverse stakeholders in public education will not easily arrive at agreement that student test scores are a practical and appropriate way to monitor principal

performance. At its very core, public education is perceived as being designed to serve a variety of purposes, not simply educating students in academic fundamentals. Policymakers who are interested in experimenting with incentive-based principal quality reforms will likely need to compromise and may wish to allow for the use of a variety of performance indicators in principal rating schemes. For example, rating strategies such as peer reviews may provide evidence of principal effectiveness in meeting other perceived goals of public education. Nonetheless, setting incentives tied to transparent, publicly available performance measures can resolve monitoring difficulties inherent in principal-agent relationships and can improve goal congruence by signaling clearly about policy priorities (Ferris, 1992). Moreover, research shows that when designed properly and implemented successfully (Lavy, 2007; Figlio and Kenney, 2006; Podgursky and Springer; 2007), performance pay policies in education have the potential to raise student achievement. However, policy principals (school boards) considering these pay reforms should be aware of barriers to successful policy implementation.

One significant obstacle to successful implementation of performance-based pay reforms is teacher, or agent, buy-in. Even if policy principals, such as school boards, are able to agree upon using student achievement as measured on standardized tests as a way to monitor performance, ultimately teachers and principals have to adopt the goal of raising student achievement as their own priority (McDermott, 2004). Teachers must also agree that measuring student achievement by standardized test scores is meaningful. That is, in choosing incentives to motivate policy actors, policymakers also must keep in mind how policy agents will respond to these incentives. One possibility is that educators will see themselves as having to abandon their commitments to serving the needs of

young people because the incentives created by policy principals do not align with teachers' concepts of their duties to attend to student needs (McDermott, 2004; Lipsky, 1980). As Lipsky (1980) suggested in his scholarship on street-level bureaucrats, educators may object to measurement of performance by student test scores and view these policy prescriptions and their superiors who support such prescriptions as illegitimate. When this occurs, policies are undermined and not implemented as designed.

One way that policymakers can seek to get teacher and school principal buy-in to support performance-based pay is to involve teachers and school principals in the design of their merit pay plans (Heneman, Milanowski, and Kimball, 2007). Indeed, one characteristic of well-conceived policy is that, though the original policy intents may be addressed at a hierarchically super-ordinate level, the ultimate implementation decisions are left to policy actors at the street level, who can develop an appropriate implementation strategy that would best fit their local circumstances (DeLeon and DeLeon, 2002). That is, even though state policymakers can mandate that localities implement performance-based pay that involves measuring educator success by gains in student achievement on standardized tests, policy principals may wish to include policy agents in designing performance-based pay programs the local level.

This study has one primary recommendation and two positive potential outcomes related to the recommendation. First, the original research in this study indicates that principals are not meaningfully rewarded for superior performance, either through explicit performance bonuses or though earning higher salaries by being hired in better paying principalships. Variation in principal pay is driven by the size of the district and school in which a principal works, the amount of wealth in a district, a principal's

experience, and a principal's degree level. If policymakers would like to focus principal attention on performance, rather than encouraging them simply to earn higher degrees or to seek employment in districts with certain characteristics, policymakers should consider instituting performance-based pay.

Second, evidence from research on the principal labor market in Texas indicates that introducing performance rewards increases scrutiny of performance and can drive changes in the composition of the principal workforce (Ladd, 1999). Perhaps as in Texas the institution of performance awards in Arkansas by policymakers can improve their monitoring abilities and might lead to a greater willingness on the part of school leaders to make personnel changes when principals are shown to be low performing. As with setting performance indicators, there will likely be political obstacles to introducing these performance incentives both at the state and local levels. In particular, these new policies may be difficult to implement because of the inherent controversy involved when employment changes occur.

Recommendations for Researchers

As noted repeatedly above, very little research has been conducted on the features of the school principal labor market. At the conclusion of his recent study on principal compensation, teacher and principal compensation expert Dan Goldhaber (2007) noted:

> … outside of a few high-profile examples, we have virtually no systemic knowledge about the structure of principal compensation including the extent to which compensation is linked to specific principal credentials or characteristics, or covered by collective bargaining agreements; whether principals are financially rewarded for taking tough leadership assignments; and whether there is a link between their compensation and measures of their performance. It should come as no surprise that a

> researcher is recommending more research on a topic, but, in this case, the need is profound. (p. 15)

In addition to echoing Goldhaber's (2007) call for more research on this topic, I would refine his suggestion by calling for state-by-state research on principal labor markets, principal performance pay, and principal compensation systems. Simply by contrasting the findings from research on the Texas principal labor market to the Arkansas principal labor market, the current study demonstrates that there are policy differences across states. After researchers uncover these differences across states, they should begin to explore whether these policy differences could be related to variation in student performance.

Second, I would recommend that the exploration of the principal labor market in Arkansas be extended to explore the role of deferred compensation, such as principal pension plans, in its relation to principal turnover rates and patterns. Recently, Costrell and McGee (2009) have shown that teacher retirement behavior in Arkansas is impacted by the incentives that are created by the features of the teacher retirement system. Retirement behaviors of principals in Arkansas should be explored with respect to pension incentives particularly with reference to principal performance. Specifically, are low performing principals being induced to stay on the job because of the structure of their deferred compensation?

In conclusion, the original research in this study indicates that principals in Arkansas are not meaningfully rewarded for superior performance, either through explicit performance bonuses or though earning higher salaries by being hired in better paying principalships. Variation in principal pay is driven by the district and school enrollment,

the amount of wealth in a district, a principal's experience, and a principal's degree level. If policymakers would like to focus principal attention on performance, rather than encouraging them simply to earn higher degrees or to seek employment in large, wealthy districts, policymakers should consider instituting performance-based pay.

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Appendices

Appendix A: Examples of Admission and Graduation Requirements for Principals

Basic Facts about Three Approved Administrator Licensure Preparation Programs (See Appendix B for detailed course requirements by program)

University	Degree	Admission Requirements	Graduation Requirements
Arkansas State	Master of Science in Education (MSE)	1. Hold a valid teaching license 2. Minimum undergrad GPA of 3.00 (on a 4.00 scale) 3. Have two years of teaching experience 4. Have a written commitment from a practicing building-level administrator who will function as your mentor during the degree program/program of study*	1. Completion of 36 hours in required course of study. Courses in Ethical Leadership, School Law, Supervision and Evaluation of Teaching, etc. 2. Completion of Supervised Internship in last semester 3. Completion of program portfolio
U of A Fayetteville	Master of Education in Educational Leadership (MEd)	1. Completion of a bachelor's degree from an accredited institution 2. Prior admission to the University of Arkansas Graduate School, involving a separate application process 3. Submission of proof of a currently valid teaching certificate 4. A completed Educational Leadership Program Application for Admission Form 5. At least three supporting letters of recommendation 6. An undergraduate cumulative grade point average of 3.00 or higher on a 4-point scale*	1. Completion of 33 hours in required course of study. Courses in School Law, Analytical Decision Making, School Building Finance, etc. 2. A cumulative grade-point average of at least 3.00 on all course work is required for the degree. No grades below "C" are accepted for graduate degree credit 3. Satisfactory performance on a written comprehensive examination or portfolio presentation 4. Completion of Internship

U of A Little Rock	Master of Education (MEd) in Educational Administration and Supervision	1. A baccalaureate degree from a regionally accredited institution 2. A cumulative grade point average of at least 2.75 (4.0 scale) or 3.0 in the last 60 hours 3. A valid teacher license 4. An autobiographical data form 5. Two letters of reference 6. A recommendation of the program advisor 7. Evidence of two years teaching experience at a level appropriate to the individual's program emphasis. *	1. Completion of 37 hours in required course of study. Courses in Education Law and Ethics, Supervision of Learning Services, School Finance, etc. 2. Master's Degree Portfolio presentation to program faculty and an outside administrator/ practitioner. 3. Two Semesters of Administrative Internship

*conditional admission requirements exist for those not meeting these criteria)

http://education.astate.edu/ease/masters_edlead.htm; http://ualr.edu/edleadership/; http://edle.uark.edu/4335.htm

Appendix B: Coursework required for administrator licensure by program

Arkansas State University

Master of Education Leadership (M.Ed.) Degree Course Requirements
http://education.astate.edu/ease/masters_edlead.htm

A. Foundation Courses

- *ELFN 6773 Introduction to Statistics and Research*
- *ELFN 6763 Philosophies of Education*
  (These two foundation courses should be taken early in the program.)

B. Introductory/Prerequisite Course

- *ELAD 6103 Ethical Leadership*
  (Action Research and the Portfolio are initiated in this course which also serves as the prerequisite to all other ELCI/ELAD courses; this course can be, however, taken concurrently with another ELCI or ELAD course.)

C. Educational Administration and Curriculum/Instruction Core Courses

- *ELAD 6073 School Law*
- *ELAD 6003 School and Community Relations*
- *ELAD 6033 Administration and Supervision of Special Education*
- *ELAD 6053 Planning and Resource Allocation*
- *ELCI 6533 Theories of Instruction*
- *ELCI 6083 Supervision and Evaluation of Teaching*
- *ELCI 6063 Curriculum Management*

  [One of the following curriculum courses; (ELCI 6063 is a prerequisite)]
- *ELCI 6323 Elementary School Curriculum*
- *ELCI 6423 Middle School Curriculum*
- *ELCI 6523 Secondary School Curriculum*

D. Internship

ELAD 6593 Supervised Internship

University of Arkansas – Fayetteville

Master of Education (M.Ed.) Degree Course Requirements http://edle.uark.edu/1000.htm

A. Completion of the following required common courses in Educational Leadership twenty-four (24) hours):
    - *EDLE 5013 School Organization and Administration*
    - *EDLE 5023 The School Principalship*
    - *EDLE 5043 Ethical Leadership*
    - *EDLE 5053 School Law*
    - *EDLE 5063 Instructional Leadership, Planning and Supervision*
    - *EDLE 5083 Analytical Decision Making*
    - *EDLE 5093 Effective Leadership for School Improvement*
    - *EDLE 574V Internship (3 hours)*

B. Completion of nine (9) credit hours from a common core of designated three-hour courses required by the University of Arkansas College of Education and Health Professions, including:
    - *EDLE 5033 Psychology of Learning*
    - *EDLE 5073 Research for School Leaders*
    - *EDFD 5013 Research Methods in Education or EDFD 5393 Applied Educational Statistics*
    - *EDFD 5303 Historical Foundations of Modern Education*

University of Arkansas – Little Rock

Master of Education (M.Ed.) Educational Administration Degree Course Requirements http://ualr.edu/med/EDAS/

A. Educational Foundations (6 hours)
    - *EDFN 7303*
    - *Introduction to Educational Research EDFN 7370*

B. Educational Assessment Building Level Internship (6 hours)
    - *EDAS 7380 Administrative Internship (First Semester)*
    - *EDAS 7380 Administrative Internship (Second Semester)*

C. Required Coursework Educational Administration (23 hours)
    - *EDAS 7209 Building Coalitions in School and Community*
    - *EDAS 7300 Foundations of Educational Administration*
    - *EDAS 7301 Administration and Assessment of Curricular Programs*
    - *EDAS 7302 School Finance and Human Resource Allocation*

- *EDAS 7303 Education Law and Ethics*
- *EDAS 7304 Supervision of Learning Services*
- *EDAS 7305 The Principalship*
- *EDAS 7310 Facilitating School Improvement Counselor Education (2 hours)*
- *CNSL 7212 Effective Communication in the Educational Organization*

Appendix C: Complete Question 1 Tables for Subgroup Analyses

Appendix Table C.1: *Complete Research Question One Regression Table for Elementary School Principals*

Dependent Variable: Level of Principal Salary (M $84,358; SD $12,305) for Model 3 (M $84,416; SD $12,314)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Experience (years)	141.49** (28.64)	142.87** (28.62)	139.20** (28.74)
Female	101.09 (522.02)	61.31 (521.95)	1.43 (525.07)
Principal Minority (non white)	-1810.47* (733.99)	-1767.32* (733.64)	-1669.04* (742.91)
BA	-5900.41** (2249.77)	-5927.46** (2247.66)	-5971.00** (2249.50)
MA (Omitted)	-----	-----	-----
Specialist	2564.80** (637.96)	2565.55** (637.35)	2557.18** (638.27)
Doctorate	6582.45** (1322.98)	6662.97** (1322.41)	6895.68** (1338.32)
District Enrollment	.741** (.06)	.74** (.06)	.74** (.06)
District _FRL%	-77.95* (28.03)	-78.11* (32.29)	-87.57** (32.61)
District_Minority%	40.58 (30.21)	41.40 (30.19)	46.22 (30.45)
District_Wealth	62.11** (14.60)	60.32** (14.62)	58.35** (14.68)
School Enrollment	13.34** (1.47)	13.52** (1.47)	13.01** (.76)
School_FRL%	-25.60 (26.20)	-22.84 (26.21)	-9.12 (27.09)
School_Minority%	1.75 (27.12)	6.16 (27.20)	7.87 (27.53)
Year 2005-06	-----	-----	-----
Year 2006-07	3249.95** (568.50)	3230.90** (429.39)	2930.41** (590.06)

Year 2007-08	5823.03** (577.52)	5812.64** (577.00)	5236.24** (629.64)
Meets_AYP	-----	1253.88 (666.85)	-----
Average % proficient time t-1	-----	-----	45.37* (19.49)
Intercept	68,774.88** (1,917.19)	67,459** (2,039.11)	65, 984** (2,291.14)
N observations	1341	1341	1341
R2	0.522	0.523	0.523

Appendix Table C.2: *Complete Research Question One Regression Table for Middle School Principals*

Dependent Variable: Level of Principal Salary (M $89,471; SD $12,678) for Model 3 (M $89,510; SD $12,701)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Experience (years)	63.63 (44.25)	59.22 (44.35)	57.45** (0.19)
Female	-1175.89 (757.08)	-1098.13 (758.96)	-1391.62 (751.63)
Principal Minority (non white)	-176.83 (1424.54)	-163.93 (1423.61)	1009.78 (1444.80)
BA	-4330.97 (2981.34)	-4169.37 (2981.96)	-3619.42** (2954.22)
MA (Omitted)	-----	-----	-----
Specialist	3655.95** (865.37)	3666.28** (864.82)	3995.10** (864.41)
Doctorate	4575.63* (1498.37)	4801.46** (1507.53)	4664.68** (1478.88)
District Enrollment	.82** (.10)	.83** (.10)	.82** (.10)
District _FRL%	-146.42 (84.81)	-150.03 (84.80)	-152.38** (32.61)
District_Minority%	89.26 (82.68)	88.09 (82.63)	88.62 (81.82)
District_Wealth	11.42 (21.23)	10.33 (21.23)	.63 (21.27)
School Enrollment	18.12** (2.10)	18.42** (2.11)	17.18** (2.11)
School_FRL%	75.35 (77.59)	-82.77 (77.75)	92.02 (76.65)
School_Minority%	-25.03 (80.41)	-18.93 (80.50)	7.12 (80.60)
Year 2005-06	-----	-----	-----
Year 2006-07	3552.13** (882.06)	3577.12** (881.68)	3202.10** (895.36)
Year 2007-08	6903.50** (884.76)	7011.42** (888.10)	5677.85** (975.76)
Meets_AYP	-----	1126.03 (871.48)	-----

Average % proficient time t-1	-----	-----	109.71** (40.23)
Intercept	68,774.88** (1,917.19)	70,199.17** (3,177.31)	65, 731.23** (3,724.04)
N observations	512	512	508
R2	0.607	0.609	0.620

Appendix Table C.3: *Complete Research Question One Regression Table for High School Principals*

Dependent Variable: Level of Principal Salary (M $86,588; SD $14,349) for Model 3 (M $86,470; SD $14,253)			
Variable	Model 1 (No Performance Data)	Model 2 (AYP Data)	Model 3 (Percent Proficient)
Experience (years)	267.80** (43.67)	267.81 (43.70)	267.05** (44.36)
Female	-1302.83 (1001.80)	-1305.78 (1003.90)	-1188.02 (1039.89)
Principal Minority (non white)	1959.29 (1597.54)	1966.72 (1607.32)	1704.91 (1680.49)
BA	-4346.58 (2809.25)	-4337.18 (2819.13)	-4473.58 (2834.48)
MA (Omitted)	-----	-----	-----
Specialist	1614.55 (1061.66)	1614.25 (1062.43)	1560.28 (1094.73)
Doctorate	4402.57 (2368.17)	4406.19 (2371.24)	3520.93 (2528.21)
District Enrollment	.75** (.13)	.75** (.13)	.76** (.13)
District _FRL%	-25.79 (79.22)	-25.49 (79.54)	-32.35 (82.46)
District_Minority%	-42.46 (91.61)	-42.73 (91.87)	-39.67 (96.36)
District_Wealth	-26.45 (21.48)	-26.47** (21.50)	-25.27 (21.78)
School Enrollment	14.86** (1.68)	14.86** (1.38)	14.61** (1.40)
School_FRL%	-21.22 (66.16)	-21.38 (66.31)	-54.61 (69.35)
School_Minority%	86.91 (87.35)	87.58 (88.67)	86.91 (92.74)
Year 2005-06	-----	-----	-----
Year 2006-07	3569.52** (902.98)	3572.18** (905.59)	3584.80** (928.88)
Year 2007-08	6770.87** (898.65)	677.04** (900.60)	6670.35** (932.69)
Meets_AYP	-----	50.97 (1142.54)	-----

Average % proficient time t-1	-----	-----	8.48 (34.34)
Intercept	70,653.55** (2,543.02)	70,592.68** (2,887.65)	69,819.54** (3,266)
N observations	717	717	697
R2	0.537	0.537	0.526