

A longitudinal analysis of the effects of collective bargaining on interstate teacher
salary differences from 1960 to 2000

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ABSTRACT

TATE O'GARA GOULD: A longitudinal analysis of the effects of collective bargaining on interstate teacher salary differences from 1960 to 2000
(Under the direction of Dr. Carol Malloy)

The current study examined how collective bargaining provisions affected average teacher salary trends for states from 1960 to 2000, after controlling for various economic, social, and demographic variables. Results show that collective bargaining had a significant, but waning, effect on teacher pay increases over the 40 year period with slight effects found in the 1970s after the initial organization of unions. Further, results show this effect in certain regions, but not others. Finally, results show that after controlling for other factors, the difference in teacher pay between collective bargaining and non-collective bargaining states has changed little over the last 40 years. Any increases experienced in the collective bargaining states were also experienced in the latter, either simultaneously or shortly thereafter.

This study is the first interstate historical comparison of teacher pay that controls for teacher educational attainment and experience over a 40 year period, as well as adjusting for inflation and cost of living. The implications for this comprehensive and innovative approach calls for a refocusing of research on teacher salaries such that these findings combined with other studies of similar rigor and depth will be able to better inform educational policy decisions.

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DEDICATION

I would like to dedicate this work to my mentor Carol, whose standards for teaching and commitment to students has been a model for me and should be for all who enter the profession.

TABLE OF CONTENTS

LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
ABBREVIATIONS.....	xi
Chapter	
I. INTRODUCTION OF PROBLEM.....	1
Statement of Problem	1
Purpose of Study	3
Significance of Study	5
II. REVIEW OF THE LITERATURE.....	9
Politics of the Teacher Salary Issue	10
Unions and the Public Sector	13
Factors Affecting Teacher Salary Differences	37
Need to Improve Methodologies.....	45
Theoretical Framework	57
Questions for Analysis	67
III. METHODOLOGY.....	71
Study Design.....	71

Measures.....	74
Analytic Framework.....	84
IV. RESULTS	90
V. DISCUSSION.....	98
Summarizing the Study	98
Limitations and Future Directions	113
Conclusions.....	125
APPENDICES.....	142
REFERENCES.....	146

LIST OF TABLES

Table	Page
1. Research Questions for Current Study	127
2. Variables used in Current Study and Sources for Data	128
3. Descriptive Statistics for Dependent and Independent Variables	129
4. Correlations among Variables of Interest	130
5. Question 1: Baseline Model	131
6. Question 2: Twenty Year Comparisons	132
7. Question 2: Decade Effect	133
8. Hypothesis 3: Regional Effect - Northeast.....	134
9. Hypothesis 3: Regional Effect - South	135
10. Hypothesis 3: Regional Effect - Midwest.....	136
11. Hypothesis 3: Regional Effect - West	137

LIST OF FIGURES

Figures	Page
1. Theoretical Framework: General Model of Study	138
2. CBI Index For States: Average Index from 1960 to 2000	139
3. Regressed Teacher Salaries for States by Collective Bargaining	140
4. Regressed Teacher Salaries for States by Collective Bargaining Percent Differences	141

ABBREVIATIONS

Abbreviation	Meaning
AFL-CIO	American Federation of Labor - Congress of Industrial Organizations
AFT	American Federation of Teachers
CBI	Collective Bargaining Index
CEI	Cost of education index
COL	Cost of living (index)
ESEA	Elementary and Secondary Education Act
IPUMS	Integrated Public Use Microdata Series
HLM	Hierarchical Linear Modeling
NEA	National Education Association
NBER	National Bureau of Economic Research
OLS	Ordinary Least Squares
PCSE	Panel corrected standard errors
TSCS	Time series Cross Sectional
TURN	Teacher Union Reform Network
SASS	Schools and Staffing Survey

CHAPTER I

INTRODUCTION OF PROBLEM

STATEMENT OF PROBLEM

Teacher compensation remains an anvil for educational reform. Consuming a majority of the public education expenditure budget, the issues of wages and benefits act as a bottleneck, not just financially but politically, consuming the attention of policy makers, teacher unions, and politicians (Lankford, Ochsorn, & Wycoff, 1996; Thornton, 1971). Despite decades of pressure from teacher advocates to increase teacher salaries to “just” or acceptable levels, incremental wage increase has been the standard practice in most districts since the nineteenth century. Sub-standard teacher pay exists despite a wealth of research that connects adequate wages to positive teacher motivation (Frase, 1992; Schein, 2003), successful teacher recruitment and retention (Murnane & Olsen, 1990), and improved professional status (Goodson & Hargreaves, 1996; Johnson & Donaldson, 2006). The issue of compensation has prompted several reform efforts such as bonus incentives, pay for outstanding performance, and career advancement. Still, most initiatives manage to incite more newspaper headlines than school officials’ embracement of new policies. Teachers are the largest profession in the United States and the issue inherently draws several stakeholders into the debate (Murnane & Olsen, 1990).

The issue of teacher pay is complicated based on its intertwining with community, business, and politics. A ceiling remains suspended over the issue of compensation because teachers are primarily paid through public tax dollars. Any substantial pay increase would likely involve a significant tax hike for citizens. Meanwhile, parents and students are perpetually affected by a troubling teacher attrition rate. Almost fifty percent of new teachers leave the profession within five years, creating staffing instability in many schools; especially in critical needs and/or specialty areas where instructor turnover persists. The bottom line is that teacher consistency enables student success, but under the current compensation system¹, a pay increase must benefit all teachers, regardless of the publicly perceived quality of the teacher, which sometimes leads to less collective public support for substantial teacher pay increases.

A teacher's role and the pedagogical delivery of a curriculum appears relatively similar regardless of the area, region, or state, however, there is significant difference in the amount of monetary compensation. Compared to the private business sector, such pay differences are commonplace. Various industries supplement salaries due to increases in product sales, faster production times, or labor pressure. In the public sector, specifically in education, reasons for pay variation remain less apparent. Some equate higher pay with a more qualified

¹ The terms wages, salaries, and compensation are used interchangeably in this report, following the style of several similar studies that are referenced. Some economists differentiate among the three, with compensation including fringe benefits and amenities and wages measured as pay by the hour. For this report, much like others in the field, all three terms will assume to be describing the annual salary paid to a teacher, ignoring benefits.

teacher workforce, resulting in better education. Others assume that teacher pay is greater in wealthier districts because these particular school districts can access larger budgets. If schools are financed by public tax dollars, usually property taxes, then areas with greater tax bases can afford to pay their teachers more in order to attract and recruit.

Perhaps the only assumption concerning wages that has been studied is the existence of teacher unions and their subsequent impact on the fluctuation of wages. For example, both service sector and auto industry unions have pressured management to increase worker pay-- often with great success. The impact of unions regarding the teaching profession remains overshadowed by conflicting local and state and political interests. Studies can be politically motivated; in some instances research serves as a defense for union advocates. On the other hand studies may seek to discredit unions. In either case, skewed outcomes gravitate towards supporting a specific political agenda as opposed to exploring or questioning union's efficacy. In essence, research may dissect and present collected data supporting one extreme or another. Studies concerning the overall effectiveness of union influence on teacher pay allow no exception to the debate.

PURPOSE OF STUDY

This study intends to research the longitudinal effects of the labor movement on teacher pay among the various states. In this longitudinal quantitative study, I incorporated research on selective regional adjustments, a methodology that

postdates the majority of previous research of teacher pay. Moreover, because the issue of teacher wages involves many stakeholders not limited to those actively participating in the profession, I examined and included several factors that have contributed to the widely varying pay trends nationwide. By employing updated, comprehensive statistical methods, I balanced and organized the staggering complexity of interaction among these variables, generating a clearer understanding for how the union movement has affected teacher pay over a half century.

The dataset includes 40 years of state level statistics dealing with various aspects of teacher pay. These factors were pulled from economic, labor, and social data sets and covered the following eras of educational reform: unionization of the teacher force in the 1960s, the teacher accountability movement beginning in the 1980s, and the rise of the “education governors” in the last two decades. From this dataset, I explored the following research questions:

- How do the collective bargaining laws affect teacher pay in the last 40 years, after controlling for the influences of social and economic forces?
- How does the influence of collective bargaining laws on teacher pay, controlling for the influence of social and economic forces, differ over various eras in school reform?
- How does the influence of collective bargaining laws on teacher pay, controlling for social and economic forces, differ by region of the country over the past 40 years?

SIGNIFICANCE OF STUDY

Teacher salaries continue to be a much politicized and debated issue in the education field. Undoubtedly, selfless dedication and commitment are obvious traits inherent to longevity in the teaching profession. More often than not, it becomes almost commonplace to assume that monetary compensation should be accepted at face value. In other words teaching is primarily viewed as an altruistic profession; that is, collectively, teaching professionals are humble, civil servants. The idea of teaching monetary for gain is, in some cases, perceived as frivolous. This stereotype can be traced back to the days of the one- room schoolhouse when teachers “boarded ‘round,” exchanging teaching services for free room and board and little if any pay (NEA Salary Committee & Evenden, 1923). But the professional status of the classroom teacher has evolved into a prominent occupational role in our society. Teaching is a legitimately recognized profession and those in and around the education community consistently voice the need for equal and fair compensation.

Too often, high attrition rates plague the professional fate of many new teachers (Murphy, 1990). Teachers’ grievances extend beyond what comprises gross earnings in a paycheck. Teachers have continually sought a revamped image of professionalism and respect in society, but understand that compensation is closely connected (Goodson & Hargreaves, 1996; Lagemann, 2000). Thus, compensation issues are crucial when discussing issues of teacher retention or an instructor’s overall satisfaction and success in the workplace.

Understanding how unions affect salary increases has been an area of interest in many facets of research, however, the implemented methods as well as the access to recently-released historical data place this study at the forefront of understanding unions and their influence on teacher salaries. Collective bargaining has been the primary method of negotiation in the last 50 years and teacher salary increases have been a “litmus test” for unions’ success. Despite some of the initial criticism that unions receive, many teachers feel at bare minimum, “at least we are paid better than if there were no unions.” Quantifying this difference in pay versus situations where unions are nonexistent has been difficult to parlay into a research model. Often times, the interpretation of specific data is limited to a narrow chronological window. Placing unions at the focal point of a study often initiates apprehensiveness from union advocates. Conversely, union critics may seize the opportunity to seek flaws in union’s overall effectiveness, judged merely on the gains sought in pay. Regardless, the function of teacher unions remains more politically volatile and complex than the tempered politics of teacher salaries. Extensive consideration and research must attempt to balance extrinsic political motivations with an educator’s desire for fair wage.

This study relies on more recent methodological developments that consider detailed regional adjustments. Homogenized generalizations and snapshots of national statistical average cannot provide a diversified interpretation of the data. In addition, the research includes more contemporary methods of inquiries related to

overall disparity concerning teacher salaries. These trends appear to influence research in accordance with specific past social and political issues.

The first research wave occurred in the 1940s following the wave of implementation of the single salary schedule. Researchers were curious about causes, trends and fluctuations in monetary compensation after 99 percent of the nation's school districts evolved from a standard, differential pay structure, which discriminated based on race and gender. The single salary schedule attempted to rectify this flaw by paying teachers based on education level and years of teaching experience. The second wave of research occurred in the 1970s which sought to understand the effect of collective bargaining on the education public sector (Fournier & Rasmussen, 1986). These laws encouraged teachers to unionize and employ traditional labor strategies to improve pay and work conditions. The third and most recent research wave follows the teacher accountability movement in the 1980s. Policy makers and the general public placed additional pressure on school officials to audit educational expenditures and their effects on student achievement and success. Each historical wave capitalizes on evolving and improved statistical methodologies as well as a further understanding of the complexities attempting to determine the quantitative value of teachers' wages.

In order to examine this subject using quantitative approaches, the methods must be capable of balancing the delicate complexity of how labor, social, educational, and economic factors combine and interact. Understandably, this kind of study must be coupled with a qualitative approach to further comprehend and

extract conclusions when compared with quantitative trends and correlations. The study will act as the first step toward unraveling previous historical events which underlie the research trends and conclusions that have affected decades of statistics collected on the topic.

Through this study, I capitalized on several improvements used to interpret to the cost of living research. Although common assumption implies that certain cost variations exist between services and goods in different regions (commonly referred to as the “cost of living index”), the statistical application of these indices was problematic and controversial even up to the 1990s. These methods interpreted based on costs of consumer goods and land valuations, ignoring variables specific to the education profession and related work conditions. Furthermore, cost of living theory only recently has been applied to the field of education, which does not follow the typical trends in a market-based, private economy (Chambers, 1995; Fournier & Rasmussen, 1986). Researchers have only recently begun to understand the applications and limitations of cost of living comparisons to the field.

Finally, I constructed one of the most extensive and comprehensive state-level data sets encompassing statistics specifically related to teacher wages. These statistics predated many educational compensation reforms, such as the evolution of teacher pay, unionization, and the accountability movement. A cross-sectional approach that includes collecting data during every one year or even ten years merely provides a researcher a snapshot in time. I offer a complete history of state teacher compensation during the last 40 years.

CHAPTER II

REVIEW OF THE LITERATURE

Interpreting teacher salary trends has been thoroughly researched but continues to elude researchers as to specific factors contributing to differences in pay (Lankford & Wyckoff, 1997). As outlined earlier, researching teacher salary emulates waves of contrasting critical trends that shape the basis of educational reform. Economists and education researchers remain conscious of the impact on teacher salaries in relation to society: public education accounts for almost half the state spending while teacher salaries and employee benefits consume almost eighty percent the education budget (Podgursky, 2004). The weight of public funding education draws attention from policymakers, politicians, economists, public taxpayers, and powerful teacher associations. Because of these influences, teacher salary research is often characterized by the view of public education in the public eye.

The following literature review accomplishes four objectives: 1) to demonstrate the political nature surrounding teacher salaries, the involvement of several stakeholders in the process, and how these influences can be studied in the current analyses, 2) review the research on teacher unions, categorizing the three most dominant debates in teacher labor literature: professional, gender, and the

legal debate, 3) review the statistical findings relating teacher unions to salaries, covering the quantitative and qualitative findings from previous researchers, and 4) argue for necessary improvements while studying differences amongst teachers' salaries, showing that an informed perspective facilitates the greater understanding of union's effect as well as an improvement for what variables should be considered in examining teacher wages.

POLITICS OF THE TEACHER SALARY ISSUE

The politics of teacher pay is perhaps one of most underrated issues in education today. It accounts for most of a district's budget and is a substantial investment for localities and states. The issue draws in large numbers of stakeholders, not just based on the public funding for education, but based on the role schools play in our society. (Brimelow, 2003; Lankford, Ochsorn, & Wycoff, 1996; Murnane, Singer, & Willett, 1987). Employers in most occupations demand highly skilled and trained workers (Goodson, 2003). Programs funded by state or local tax dollars can be hampered by the enormous budgets of education. Political leaders are pressured by one of the largest and most powerful lobbying groups at all levels of governments - teacher unions, which devote their attention to funding issues of its memberships (Lieberman, 1997). The issue affects multiple special interest groups and invites several players to the negotiation table.

Perhaps the first time teacher pay became a national issue was in the early 1900s with the Chicago Teacher Tax Crusade in the 1900s. Inspired by school

teachers (Haley, 1904), Chicago teachers became frustrated with their demand for fair wages. Teachers' voices were ignored and their interests were consistently dismissed. As a result, teachers joined forces with local labor leaders and uncovered almost \$2 million in unpaid corporate taxes, helping to fund teacher salary raises and spark several similar battles in other large city school districts. The mostly female groups demanded just and equal pay similar to their male coworkers for doing the same work (Murphy, 1990). The eventual adoption of the single salary system helped eliminate discriminatory pay, however, the debate continued over low teacher pay relative to other professions' salaries (Goodson & Hargreaves, 1996; Shen & Hsieh, 1999).

In order to appease both the growing frustration of teachers under the differential pay plan, as well as ease the managerial headaches for administrators as schools consolidated, public schools adopted the single salary schedule. The adoption of this new schedule purported to pay all teachers the same, regardless of race and gender. Emphasizing years of experience and levels of education, the single salary schedule became the fixture for teacher pay, and it remains the primary determinant of payment in almost every school district in the country (Podgursky, 2004). A limited wave of research followed this reform. Researchers attempted to understand the trends in teacher pay following this national reform movement. Because of the limited data collected and the lack of modern statistical methods, this research is rarely cited or referenced in later studies. It does mark in time a growing scrutiny of public spending on education (Davis, 1943; Elsbree, 1941). Two

observations were made during this period. First, the role that teachers perform is similar across most of the United States; yet, the salaries were remarkably different across districts, regions, and states (Bechdolt, 1942). Second, although several factors are attributed to the varying levels of pay, compensation needs to be adapted for living adjustments which account for the varying cost of goods and services in different parts of the country (Borgersrode, 1942; Davis, 1943; Staffelbach, 1942). The latter observation predated the extensive cost of living indices that were developed in the 1970s, and thus remained a suggestion for future inquiry.

Advocates for teacher pay initiative received a significant boost when states began allowing public sector workers to unionize in the 1960s. Within a decade, a majority of the states allowed their teachers to unionize (Fuller, Mitchell, & Hartman, 2000). Although many challenges were placed in front of teacher unions, such as improving work conditions and reducing class sizes, the issue of increasing teacher wages and benefits would serve as the barometer of success for their existence (Duplantis, Chandler, & Geske, 1995; Freeman & Medoff, 1979; Hoxby, 1996; Murphy, 1990; National Education Association, 1969). Much like the successes found in the labor movements of the private industry, the teacher union movement sought to obtain similar successes in obtaining just and fair pay for its members.

Besides the financial burden, research points to a growing issue between districts and states: teacher recruitment. Policymakers are constantly pressured to increase teacher salaries with little or no knowledge about the "market price" for

teacher salaries; they usually compare national averages in order to gauge salaries. This power this has been proven to be highly inaccurate benchmark based on the number of regional differences that exist. In an era of increasing worker mobility, districts and states lure teacher candidates based on salaries and benefits (Einhorn, 2001). This competitiveness presides at both local and state levels, so much so that the state comparison issue has become more on the radar of politicians' agendas. Florida, for example, recently published a scathing report that criticized the national reports on state teacher pay which are annually released by the NEA (Florida Department of Education & McDougal, 2006). The "Annual State Rankings" criticized the inaccuracies for defining the role of teacher, excluding supplemental or bonus pay, and not adjusting for cost of living differences. State politicians must constantly defend (or promote) its average state pay of teachers and with the teacher unions making a presence at every election, teacher pay regularly becomes a political issue (Odden & Kelly, 1997).

UNIONS AND THE PUBLIC SECTOR

The educational landscape was redrawn by the passing of the federal 1947 Public Employment Relations Act. The act granted public workers, including school teachers, the ability to unionize which in turn forced open the door for teachers to come to the policy table (Johnson & Landman, 2000). After decades of ignoring and marginalizing teachers' impact in decision making, school boards were forced to bargain with unions that were better organized and politically equipped. Beginning

in the 1960s, teachers quickly organized and became one of the most unionized professions in the country, as well as one of the most controversial (Hannaway & Rotherham, 2006). Supporters of teachers' unions point to higher salaries and benefits, better working conditions, and a respectable place at the stakeholder table (Blackburn & Prandy, 1965; Duplantis, Chandler, & Geske, 1995). Critics point to an added layer of bureaucracy, a slowing of educational reform, and the tendency to focus on teacher issues rather than student interests (Brimelow, 2003; Freeman & Medoff, 1979). The political quagmire of teacher unions has severely hampered any substantive scholarly debate (Hannaway & Rotherham, 2006; Loveless, 2000).

The current research on the effects of collective bargaining tends to be categorized as one of three ongoing debates: professional, social, and legal. In terms of viewing the issues through a *professional* lens, I review the debate around the capacity that unions have contributed to the professional growth of the teaching occupation. From the *social* lens, I present the limited literature reviewing the effect of a female-dominated workforce within a mostly male-managed profession. Finally, I review the research on the *legal* ramifications on teachers, understanding the limitations and effects of how "state scope" affects teacher union involvement.

Professional Debate: White versus Blue

Unlike the term suggests, *teacher unions* have not always been classified as a coherent, unified organization. Two separate and competing unions exist: the National Education Association (NEA), which tends to behave more like a

professional association, and the American Federation of Teachers (AFT), which employs tactics like a traditional labor union. The following will review the current theory on professions and what constitutes a career as a profession versus a trade. Then, I review the current works surrounding the impact of unions on the professionalization of teachers, highlighting two distinct approaches. Understanding the theoretical basis for what defines a profession can better explain why teaching endured difficulty garnering acceptance with the same professional stature as law or medicine. However, defining varying levels of professionalism has become a contested topic, with the concept stirring up political contention (Casey, 2006). Understanding that such contention exists, the following idea provides common, recurrent themes that exist in academic literature.

The theory of professional development can be described as a tiered process, with some referring to it as an “evolutionary stage” of growth (Goodson, 2003). The highest tier of professions is considered the “classical profession,” commonly used to define law or medicine.² These professions are usually highly ranked in terms of public status and publicly recognizable (Hargreaves, 2000). There is a specialized knowledge base or shared technical culture, a strong service ethic with a commitment to meeting the customer or client's needs. They are self-regulated and defined by collegial powers rather than external bureaucratic control over its recruitment and training or its codes of ethics (Hargreaves, 2000). Although few

² It is recognized that a difference exists between a *profession* and a *professional*. For instance, Sachs (2003) states that one can be considered a *professional* but still not be a member of a *profession*. The term professional applies more to how the member exudes a work ethic or commitment to the work. This distinction is important, but will not be debated or discussed in this paper.

professions are considered “classical” or elite, an immediate criticism points to the value system benefiting more to male workers. Hence, only male-dominated careers tend to be classified as “classical,” and often, female dominated careers are considered less-than-elite professional status” (Bascia, 1998).

If a field is not considered “classical,” according to the literature, it can be considered flexible, practical, extended, or complex (Hargreaves, 2000; Soder, 1990; Wilensky, 1964). As listed in that order, they represent a continuum of professional organization, with “flexible” being the least rigid or organized and “complex” assimilating to many of the principles of a classical profession. Flexible professionalism is rooted in shared or collaborative communities, with scientific certainty replaced with situational certainty defined by local groups. Practical professionalism is based on the experiences of its members and places value on reflective practice, a common rejection in a university setting where theory is derived among the elite thinkers as opposed to the practitioners. Extended professionalism draws on experience coupled with its commitment to theory. Finally, complex professionalism derives status through demonstrating the field’s complex and intense nature associated with the work. Illustrating that the trade has several levels of complexity, it is inherently worthy of respect in a society (Rowan, 1994).

When applying professional theory to teaching, a “square peg/round hole” dilemma exists. While teaching does have a strong service ethic intrinsic in its devotion to academically improving each student's life, public schooling

incorporates numerous levels of bureaucratic control based on the funding structure and the public involvement. In terms of developing a "shared technical culture," Booth (1988) states that teaching will forever be hampered by the "ordinary language" problem: the technical language used in the teaching profession is not that different from common language outside the profession. Rosenholtz (1991) further states that teaching will never experience an age of discovery, such as the medicine field, which helps to separate a profession from common public understanding. Finally, Ozga (2004) suggests that teachers adopt most of their pedagogical practice from either previous experience as a student or trial-by-error experiments in their own classrooms, questioning the need of formal training or education as in other classical professions. Based on these observations as well as the inherent discrimination of the allowance for a profession to be considered "classical," it is questionable if teaching can ever be considered a classical profession.

The idea of a "shared technical culture" appears problematic for teaching to augment its professional status based on the following three criticisms. First, teaching and its organization, public schools, were incorporated on the pretence of local control. Each school and respective school district is held to a standard of accountability by the community. Similarly, each community must hire teachers, resulting in four to five times as many teachers as lawyers and doctors, respectively. Rosenholtz (1991) argues that the number of teachers required to teach does not allow itself to be secluded or privatized. The public school system serves the

community and thus, all teachers must operate as if held accountable to the community. Second, the teacher's connection to the community is still an important aspect of the profession. If teachers begin to use technical language that separates them from parents or the community, the idea of local control becomes challenged, potentially setting up the division between teacher and community, similar to the division found in medicine between doctor and patient. Finally, in order for teaching to become self regulated, teachers must be allowed to broaden their job descriptions to take on such roles. Currently, the majority of teaching review is performed by an administrator, certification is granted by the state department, and mentoring plans are delegated by state legislatures. Self regulation requires teachers to have active (not honorary) decision making powers, yet the current job description limits teachers' involvement outside the classroom (Rowan, 1994). A common rebuttal blames teacher unions for narrowing work details and extra duties, ranging from bus supervision to such things as committee work, as well as limiting teachers' potential participation in more decision making roles and processes.

Teaching has evolved over the years, continually growing in professional stature. Teaching was considered a flexible profession in the days of the one-room school house model, with professionalism defined more by the community and the teacher's "moral standing," rather than scientific theory or rooted pedagogical practice (Tyack, 1974). Once schools began to consolidate, teaching entered a stage of practical professionalism based on the similar consolidation of teachers within a

similar building. With the rise of teacher colleges established within the university system, teaching began to root itself more in research and theory, and adhered more to the principles of extended professionalism. Teaching reforms following the release of the *A Nation At Risk*, in 1983, appeared to follow the fourth tier of complex professionalism. Reforms such as site based management, merit systems, and career ladders established paths to differentiate between teachers' role assignments. These reforms attempted to add complexity (through additional responsibilities and challenges) to the profession of teaching, redefining the idea that teachers "only instruct." However, this movement insignificantly impacted the profession because most of the reforms that increased the complexity of the teacher's role also increased the workload, piling on new obligations along with previous duties. Certainly, reforms such as site based management allowed teachers to demonstrate skills such as financial management within a school's budget; however, proper training for these roles was never adequate. In some districts, teacher unions vehemently opposed such reforms, protecting its members from taking on added responsibilities which were viewed as managerial (Haar, Lieberman, & Troy, 1994; Johnson & Landman, 2000).

Looking at the initial missions of the NEA in the late 1800s, there was a tendency to model more classic professions. Marshall and Andre-Bechely (in press) state that the NEA was original setup as a "national policy making organization," with the creation of a National Council, research divisions, and numerous committees appointed to be experts on educational agendas. Unfortunately, these

efforts largely excluded women who held a vast majority of teaching positions within the profession. A rift ensued between the policy makers (administrators/ men) and the policy doers (teachers/ women). As the literature suggests, in the beginning of the twentieth century, this exclusion as well as rampant discrimination within the NEA forced women to seek alternative methods for getting their voices heard (Murphy, 1990; Urban, 1982). At this point in the stage of professionalism, teaching faced a crossroad. Teachers, who had not been pressured by hiring practices and compensation, tried to voice their concerns using the current associations such as the NEA. Through discrimination, their demoralizing status in the NEA forced them to take stronger action. Teachers in mostly urban areas began to affiliate with the local unions in order to voice their concerns and gain political power to create change (Blum, 1969; Haley, 1904). The NEA continued to focus on the membership of its administrators and largely ignored the educators, which helped fuel teachers' motivation to seek out other means of voicing their disapproval, eventually giving rise to its present competitor, the AFT.

If teaching is not a "classical profession" as the previous research suggests, then can it follow the principles of unionism? The following reviews the research on the theory of labor unions, the model that the AFT and more recently, the NEA has endorsed. It will be argued that even though the strategies of these two organizations appear to behave like unions, teaching appears to be bridging the divide between white and blue collar professions.

There are three main principles of labor union theory. The first is that the interests of labor and management are at odds. There are limited resources and one person's loss is another person's gain with a firm. Second, standardized practices are more desirable under the theory of labor unions since uniform operations across all sectors of work make for a better and more efficient management. Third, similarly skilled laborers are interchangeable and should be treated alike (Freeman & Medoff, 1979). Applying these principles to education creates a clear division between the role of teacher and administrator, with rampant discrimination occurring since the creation of the position of principal (Tyack, 1974). After 50 years of the NEA's existence, teachers felt powerless and yearned for change. If teachers could become unionized, then their collective voices would be difficult to ignore, much like the successes found in the private sector unions.

As demonstrated in the New York City teachers' strike in 1960, the strategies of blue collar unionism initially showed great benefits to its members, something not achieved through the NEA approach up to that time. Prior to the 1960s, the NEA refused to be called a union, did not allow its members to strike, and prohibited its members to collective bargain with local districts. With the NEA losing the right to solely bargain for teachers in (mostly urban) districts, they began to shed their white collar professionalism for more aggressive labor-like strategies, or as the longtime NEA executive director, Don Cameron, stated, the NEA changed "from a tea and crumpets organization" into a union (Hannaway & Rotherham, 2006).

Two questions so far have been raised: can teachers be considered a “classical profession” and does the labor union model suitable for teaching? As discussed, teaching has a difficult time being considered a classical profession, based on the issues previously reviewed. In fact, it may benefit teaching to remain inclusive and inviting and to reflect the broader relationship between schools and the community. Turning attention to unions, teaching does not appear to fit the three labor principles outlined above. Although teachers have been at odds with administrators, the “limited resource” cannot exclude students. Teachers generally understand that substantial raises mean less money for school operations, curriculum, and student resources. The parent group of the AFT, the AFL-CIO, recognized also recognized this. As most of the group’s members in the private sector unions were losing membership, the public sector union was quickly gaining ground, forcing union officials to rethink the labor model (Selden, 1985; Urban, 1982). Even as late as 1959, the AFL-CIO president, George Meaney, was incorrect in assuming that unions in the public sector would not be successful because “it is impossible to bargain collectively with the government” (M. Green, 1996). With membership rates surpassing most private sector industries, Meaney and labor leaders balanced the power of teacher organization but understood the need to adopt the model to public sector.

Following the massive decade of unionizing, an interesting shift occurred with the teacher union approach. The AFT, which originated from traditional blue collar unions, understood the potential benefit of unionizing white collar professions

(Braun, 1972; Selden, 1985). Thousands of teachers were eagerly joining the union, surpassing membership percentages unlike most private sector unions. The need for organization existed at all levels of government, from local to federal. Unionizing became less of an outlet for some urban districts and more of a mainstream component of the teaching profession in all districts. A core communication of unions, collective bargaining, came under question as to its intents for depicting teachers as either blue or white collar professionals.

Collective bargaining research receives mixed reviews concerning the advantages of promoting a professional identify. Several researchers have discovered benefits collective bargaining has brought to teaching, such as reduced class sizes (Eberts & Stone, 1985), reduction and protection against “extra assigned duties” (Eberts & Stone, 1987), and even refined student discipline policies (Hechinger, 1967). Yet despite these benefits, the combativeness approach typified in union bargaining scrutinized the collective bargaining process. Calls for “reform bargaining” and “collaborative bargaining” were attempts to transform traditional union negotiating into constructive communication (Johnson & Kardos, 2000; Kerchner & Koppich, 1993)

An effort that encapsulated the principles of white collar professionalism was the formation of the National Boards Certification program. With two of its key sponsors, the NEA and AFT, the reform was an impressive first step towards large scale efforts by the union to improve the professionalism of teaching. Shen (1999) states that teachers will only be able to improve their professional identify through

either improvement of teacher education and certification, or increase salary. It was the most recent large scale effort to professionalize teaching, creating higher standards to differentiate instructional practices. As Johnson (2001) points out, National Certification must balance the principles of unionism with leaving room for self regulation like that of white collar professions. Other efforts such as peer review and career ladders attempted to “un-flatten” the teaching career but largely failed due to the divide it created among teachers (Nelson, 1996). As stated before, a principle of unionization theory is that similarly skilled laborers are interchangeable and should be treated alike. Nelson points out that peer review has created levels of teachers where some teachers act as managers, placing the union in a precarious position, attempting to resolve conflicts among its own members. In one case, the managing teachers (promoted to these positions based on their position on the career ladder) were forced to leave the union as their responsibilities were considered managerial, even though their title was still “teacher.”

This ongoing discussion of blue versus white collar approaches to unionize serve two overarching purposes for this study. First, it is clear that blue collar unionism dominated the strategies of the both the NEA and the AFT in the 1960s and partly in the 1970s. As the research later indicates, there are moderate gains in teacher pay also during this period. But as discussed, the blue collar approach cannot be considered a long term application towards teacher professionalism. Thus, in order to understand union effects, one must analyze gains at different time periods in order to assess whether the style of bargaining continues to reap the

apparent raises witnessed in the 1960s. Second, the contrast between blue and white collar union approaches becomes blurred following the period of the 1980s, meaning the NEA openly adopted traditional labor union approaches while the AFT understood the need to employ more professional strategies like reform bargaining and conciliatory negotiations. Although this study will look at union effect as a whole, it cannot distinguish between the two methods, thereby limiting its analysis as to what method was more impactful. Although states that do not have collective bargaining tend to utilize the NEA's traditional method of bargaining (through lobbying, collective voice, policy influence), it cannot be implied that states with collective bargaining laws are considered "blue" while non-collective bargaining states are considered "white."

Gender Debate: Women as Professionals

Although reviewed in a separate context, the gender debate has a common thread through most analyses of educational policy. Females make up a substantial majority of the profession, accounting almost 80 percent of all teachers; yet there is a troubling disconnect between this majority and the attention of researchers on gender (Marshall & Andre-Bechely, in print). The topic of gender and power is usually addressed in historical references, citing discrimination of laborer and manager, or issues of pay. Yet, the research has been slow to implement issues of gender and leadership power into current scholarly work. Gibby-Wachter (2000)

claims that leading scholars of union history often ignore issues of gender all together, thus leaving a gap in any analysis of union theory.

The reason teachers joined unions is perhaps the most written and discussed topic of gender in education. Scholars repeatedly point out the rampant discrimination in pay, position, and respect between gender and race since the beginning of the one-room schoolhouse model. Teaching has been considered “inherently a politically and bureaucratically subordinate occupation” (Bascia, 1998, p. 551). As schools consolidated in the early 1900s, the only outlet available was the NEA, but because it was controlled by male administrators, women like Margaret Haley and Catherine Groggin turned to the local labor unions, ironically, also a mostly male institution at the time (Murphy, 1990). Teachers had few other options because their own professional organization was essentially shutting the door on their issues. Larson (1977) reasoned that this alliance with unions narrowed the types of issues that teachers could address. The push for the single salary schedule in the 1930s came largely the “equal pay for equal work” approach, and administrators quickly endorsed the plan not just as a way to curb inequity but also to ease administration of the new pay system (Podgursky, 2004). Gibby-Wachter states that even after the adoption of the pay system, women were discriminated from taking on higher pay positions such as administrators or high school teachers.

The alliance with unions was not simply about women striving for equal pay and better work conditions, a long-held assumption for female involvement. In some districts, female teachers were prohibited from marrying or having children, as

late as the middle of the twentieth century (Murphy, 1990; Tyack, 1974). Women were discouraged from balancing families and work because men were given more prominent status (and higher paying jobs) under the assumption that they were providing for a family (Bascia, 1998; Shen & Hsieh, 1999). Although equality was an issue, many women were trying to support their families, sometimes violating contract language that prohibited otherwise. Even still, Bascia (1994) found a correlation between teacher union support and the lack of educational reforms and educational support for students. What has been disproved, despite common assumption, was unions entered the teaching profession largely in part due to an influx of male teachers in the 1950s and 1960s. Although male teachers were much a part of the union movement for similar reasons as women, the foundation for women unionizing occurred well before the 1950s and, as pointed out, had several reasons for motivation (Bascia, 1998; Cole, 1969; Murphy, 1990). Some women teachers have rejected the combativeness and negotiation style of labor unions, and instead, opting for more diplomatic methods for dealing with conflicts (Bascia, 1998).

These multiple reasons forcing women to unionize are often ignored in union research, prompting Marshall and Andre-Bechely (in press) and Bascia (1994) to call for a revisiting of union research. This can help deepen our understanding of educational policy, in particular, for what we know about unions. For example, the inability for the NEA and AFT to merge is often connected to the two approaches to professionalizing, the blue versus white debate (Prandy, Stewart, & Blackburn, 1983;

Wesley, 1957). It is incorrect to assume that teachers who unionize also endorse the ideology of that organization, similar to the dilemma within a two party political system, where a voter may not agree with all the views of the party, but votes for the best choice. Often, no other outlet exists to voice disapproval of policies and unions are limited in the number of bargained issues or negotiated terms, inviting criticism that unions narrowly focus on salary and benefit issues (Brimelow, 2003; Lieberman, 1997; Rabban, 1991). Hargreaves (1994) states that union activity, which require some members to become politically active, often draw criticisms of colleagues and peers who see such work as taking away from their classroom duties. In her interviews with teachers, Bascia (1994) found many women teachers opposed to unionism due to its focus on bargaining over wages and salaries and issues that did not attract them to the profession. This was also found in a similar research study conducted by Gibby-Wachter (2000) who found that some women rejected the tactics of unionizing as a way to increase professionalism, for they saw this as a threat to the feminine model that they used as a basis for their careers" (p. 7). Women were forced to choose between two patriarchic systems of organization, the NEA or the AFT, in order to voice their concerns or push for change.

Because women have had to revert to patriarchic forms of action, this has created a confusing and often critical status of teachers. The literature critical of unions have labeled them as anvils for educational reform, slowing the process because of a narrowed focus on only teachers' concerns and issues (Lieberman, 1997), ignored the policies of younger teachers and instead defended incompetent

tenured teachers (Haar et al., 1994), and are primarily rentseeking by raising school budgets but lowering student achievement through the decrease of productivity (Hoxby, 1996). Yet these criticisms can be constructs of a predominantly male media corps, male administrations, and sometimes male-led teacher unions. As Gabby-Wachter reviews in the case study of the famous 1960s Utah strike, the female president to the Utah Education Association as merely a “figurehead” while the lead negotiator with the school system and the press contact was a male who was linked to creating a militant union public image. The direction was “inherently masculine” and the failure to see any results from the strike “directly related to the socially constructed feminized ideal for teachers and the low value of feminized work” (p. 5). There was an assumption that had developed that teachers were nurturing, moral role models, and compliant. Because of the nature of the work, there was an expectation for serving and teaching children, rather than picket for better wages. Any action that questioned this image was immediately criticized in the press and other outlets of public relations. The result was a public not ready to receive images of teachers striking or picketing, regardless if the work conditions were unfair (Kahlenberg, 2006; Kerchner & Koppich, 1993; Murphy, 1990).

The public image of teacher unions still is highly criticized by some national leaders, such as the then-Secretary of Education Rod Paige likening teacher unions to terrorist organizations (Goldstein, 2004). Bob Dole also stated openly at the Republican National Convention: “If education were a war, you would be losing it. If it were a business, you would be driving it into bankruptcy. If it were a patient, it

would be dying” (PBS Foundation, 1996). Teacher unions have traditionally donated less than three percent to the national Republican party (and 97 percent to the Democratic Party), drawing criticisms that the donation ratio does not reflect the political affiliation of its members (Lieberman, 1997).

Most scholars admit that in terms of public relations, teacher unions have lost out to the expected ideal of the feminized teacher. Unions have made inroads for women as policy entrepreneurs, but the traditional expectations of the moral teacher seem to predominate. When dealing with unions, especially at politically tense times, strikes and/or labor contract renegotiations, this is a common tactic to criticize the teachers’ motivations as “selfish” at the expense of focusing on “educational issues.” The negotiated terms are usually limited in scope, thus leaving unions to bargain job responsibilities or narrow the focus of the teacher’s duties, again fueling the gendered assumptions of a teacher’s “abilities or interests” (Acker, 1992; Bascia, 1994). For example, a bargained contract that limits the workday of a teacher to specific times before and after school may be an effort to protect teachers from being taken advantage of with extra duties. On the other hand, it is possible to interpret these terms as a statement of personal desire to spend time with children, claiming that they chose to continue working after the bargained times of work are over for a workday. Although this implication exists in most other unionized careers, the service ethic and the unfair gender expectations placed on teachers, appears to be augmented in the education profession.

It is important to consider gender issues when undertaking any study of teacher unions. As previously stated, such a consideration should go beyond just historical trivialization and instead, use a lens that reveals the hidden values placed on teachers or the often lost agendas from female teachers who do not have a place to voice these concerns either inside or outside the union. Teacher unions are typically the most powerful lobbyist in education politics (Hannaway & Rotherham, 2006). Although most active teachers are members of teacher unions, most active teachers are not necessarily active union members. The union agenda cannot be considered an agenda for women's suffrage and it should not be the value system by which the female teacher is measured. Likewise, the feminist lens also states that the minority number of male teachers, whose role and agenda are often lost in similar analyses, cannot be assumed to be the voice of the union, which operates politically and under a patriarchic framework. In essence, any analyses undertaken by the union should be just that: the union agenda, and not blanketed on the teaching profession or worse, the "female or male" agenda. As these scholars point out, teacher unions represent millions of school teachers but the unions are run by only a few teachers. Despite female teachers reverting to unions as their only source of organized voice in the 1900s and well into today, it can be assumed that the alliance is only temporary, that is, until the foundation for education control becomes better balanced and not cursory towards teacher inputs.

Legal: Debate over Scope

The state passage of collective bargaining laws provides the pedestal for teacher unionization. At the root of the laws is the scope, or parameters for bargaining, which is usually defined as wages, benefits, and other conditions relating to employment. An ongoing debate in union research has been the effectiveness of collective bargaining on public sector work, especially public *service* work such as education. Even as late as 1959, the year Wisconsin became the first state to allow public employees to unionize, the AFL-CIO president stated that, "It is impossible to bargain collectively with government" (Hannaway & Rotherham, 2006, p. 9). Because the scope is supposed to outline what can be bargained, much of the research has reviewed the effects of the scope as it plays out with union-district relations or other consequences on school performance. A general consensus exists in the literature calling for states to revisit the collective bargaining laws from a legal perspective. States have not generally expanded the scope of bargaining since the original passage of the laws leaving districts and schools to bargain under laws that were written in the segregated environment of the 1960s, resulting in endless revisions to what teacher contracts' boundaries push what can be bargained. Both critics (Moe, 2005) and advocates (Urbanski, 1998) of teacher unions have called for a revisiting of the laws, as one principal commented on the thickness of the teacher contract, "The thickness, the scope, of this phone book contract of a contract is, in my view, an indictment of how administrators ran their schools in the past" (Johnson & Kardos, 2000). The following will review the two general

categories of research that has studied the legal implications of collective bargaining: limit or expand the current scope versus reforming the collective bargaining process.

Research advocating for the expansion of scope argues that both the teaching profession and the students will benefit. Teachers are not laborers, they argue, and the current scope forces unions to focus their efforts on labor issues such as wages and benefits. By expanding the scope, unions can bargain for issues such as curriculum decisions, assessments, and standards for hiring, which can greatly benefit the workplace for teachers and students (Koppich, 2006). The ability for teachers to organize helped prove that they can effectively bring about change and organize as a profession. This collective power can champion ideas such as the collaboration of developing student assessments or curriculum. These issues exist at the classroom level, and allow bargainers to exercise their power beyond labor issues. The current scope, despite its limitations, has brought teachers further into the decision making arena, positioning them closer to the decision making process. Still, they are held at bay for *making* decisions, and instead, considered part of the *advising* process (Eberts & Stone, 1984; McDonnell & Pascal, 1979). Expanding the scope gives them decision-making power, something that has been missing for teachers.

Another argument states that expanding the parameters will better reflect what already exists in many districts (Hannaway & Rotherham, 2006). Issues such as class size, extra duties, and work schedules may not fall under the state scope, but districts have still bargained these issues with success. These districts have been

proven examples where government and worker can bargain outside the typical labor issues. Expanding the scope may allow these isolated successes to encourage other districts to expand beyond the scope (Kerchner, 1978).

A third argument exists that changing the scope is required in order to stay abreast with the changing dynamics of the school organization (Kleingartner, 1973). When states set up their legal provisions for bargaining in the 1960s, the current events and the relationships were remarkably different than what exists today. The “technology of teaching” has also changed, becoming less isolating and resistant to the patriarchic forms of administrations that existed in the 1960s. Team teaching, peer review, and other collaborative forms of instruction could blossom if protected under collective bargaining agreements. Currently, many of these reforms fail because unions are wary of management, with unions trying to establish differences in responsibility between teacher and administrator (Urbanski, 1998).

Conversely, an argument exists for limiting the scope, not expanding it, in order to control the growing power teacher unions. The impressive power teacher unions exert on all levels of government has been highly criticized due to the narrowed focus of the efforts. Even though teacher unions defend their focus based on a narrowed scope, critics point to several instances where unions go beyond the legal limitations, but only in instances where it benefits the teachers’ self interests, and rarely for the betterment of student interest or broader educational reform (Brimelow, 2003; Hess & West, 2006; Moe, 2005). Teacher unions have extended beyond their scope of bargaining to lobby all levels of government, support political

candidates, and act as a powerful state level education stakeholder, but these efforts appear to benefit teacher interest and issues, with issues like pay increases or electing supportive school board candidates. Thus, expanding the scope may expand teacher union powers over more – not less – teacher issues. As one of the primary tenants of labor union theory states: there exist limited resources with management and laborers at odds. Unions serve to defend the laborer, securing as many resources as possible.

Few critics of scope expansion would doubt that teachers require a voice, especially in a gendered-imbalanced institution such as schools; however, unions can sometimes create a hostile environment not just within the school, but also within the community (Freeman & Medoff, 1979; M. Green, 1996). Unions set up an adversarial relationship, pitting teachers against administrators and teachers against school boards. Based on the slow progress of school reform, some believe that the legal scope of bargaining should limit teachers' capacity in union power, specifically outlining what can and cannot be bargained. This will help "rein in" teacher union power and area of focus.

Limiting scope is not always synonymous with "union busting" or other terms that hint towards breaking up teacher unions, as has been done in the private sector. In fact, limiting the scope can have positive effects (Kerchner, 1978).

Because collective bargaining brings an adversarial tone to the table, limiting the scope may also limit the areas where combativeness can occur. For example, if a state's scope of bargaining does not specifically include curriculum decisions,

teacher unions would likely use contract negotiations or other traditional means of labor negotiation to bargain curriculum decisions. Thus, the issue of curriculum gets tangled with issue of wages, benefits, and other labor-like issues. By separating curriculum from the collective bargaining process, it removes this discussion from the sometimes hostile process of contract renewals (Kerchner, 1978; Loveless, 2000).

In the 1990s, there was a rise in popularity for reforming the bargaining process, rejecting the legal expansion or limitation of scope. Scholars such as Johnson, Kerchner, Koppich, and Urbanski proposed setting up a “collaborative bargaining” between the district and union, essentially, reforming the combative process of contract renewal and issue debates. Johnson (1987) stated, “Collective bargaining as a bartering process is for adversaries; collective bargaining as a problem solving process requires trust and good intentions” (p. 276). These redefined relationships will promote better teacher involvement and grant them more decision making skills, at the same time create a better representation for education stakeholders. Kerchner (1978; 1986) argues that two groups need to be included in the collective bargaining process. Principals, whose voices were essentially lost in the rise of unionization, need to have a legitimate seat at the table, instead of being cast aside or marginalized and allowed to become critical of teacher unions. Parents need to also have a legitimate role in the bargaining process, not being forced to choose between polarizing issues involving unions and school boards Industrial bargaining, as currently utilized in education, does not match the

current needed relationships between schools, community, administrators, and teachers.

For this research, the legal debate is of primary focus. The measured variable, collective bargaining, is measured based on how limiting or expansive a state has set their scope of bargaining. It is not simply an issue of whether or not states have passed such laws, but to what *degree* does the scope relate to the impact over teacher wages. No state has passed laws to reform the process, coined by phrases such as “trust agreements” or collaborative bargaining,” so although the idea has been presented, no state has ventured beyond the industrial scope set up in the 1960s. Yet, it should be noted that several districts already engage in such relationships, such as the unions that make up the national organization, the Teacher Union Reform Network (TURN). A growing amount of evidence suggests that such relationships are more dependent on the individual relationships between a select few, such as the union leader and superintendent, and less, mandated by the scope or the legal parameters for bargaining. So although such unions exist, it is difficult to identify the percent of those unions (or relationships) that exist within a state.

FACTORS AFFECTING TEACHER SALARY DIFFERENCES

Given the broad literature that covers various debates on the professional, demographic, and legal repercussions of teacher unions, a surprisingly scant amount of research exists that explores the outcomes of collective bargaining. Several reasons have been attributed to this sufficient lack of knowledge. First and

most noticeable, is the politicized nature of unions, causing most research, either publishing positive or negative effects, to be quickly dismissed in ongoing political battles. Second, it can be difficult to measure union activity based on the study of contracts, the end result of collective bargaining. Contract language can be voluminous and cumbersome, sometimes being loosely interpreting and implemented, and other times being used a formula for how teachers should work within a district or school. As Hannaway (2006) states, “collective bargaining is a process rather than a predetermined set of outcomes” (p. 112). Comparing contracts across districts can be dependent on how they are interpreted and implemented, leaving researchers to try to measure the union activity through a variety of means or simply categorizes it as union or not union.

Finally, the effects of collective bargaining do not occur in isolated instances. Public schools become both involved and influenced by the numerous tides of social change. Federal legislation such as the No Child Left Behind or the ESEA Title I Act can alter how local and state governments fund education. Similarly, social changes can influence how teachers are funded. In the 1950s, over 80,000 experienced African American teachers were fired in the South following Brown versus Board, after all-black schools were closed and mostly inexperienced white teachers were hired in place (Toppo, 2004). In the 1970s, women’s career opportunities expanded, thus allowing women who would traditionally enter the profession to seek opportunities elsewhere. Even though the inclusion of several statistical variables can help account for some changes, it should not be expected that collective

bargaining or unionization would remain the sole influence on of educational change.

The following reviews two areas of research that pertains to this study: teacher salaries and work benefits. Researchers have explored the effects of unionizing on areas beyond what is included, most noticeably, student achievement or teacher quality; however, the focus of this research is wages and benefits, the two main aspects that are within the scope of bargaining.

Collective Bargaining and Teacher Salaries

Beginning in the 1970s, researchers focused on unionization's impact on teacher salaries. The objectiveness of reports have been called to question (Peltzman, 1996; Snyder, 1994), with some studies acting more as political ammunition, than adding to the field of knowledge. Kasper's (1970) study was the first such study that questioned the affect of unions on teacher wages. By polling thousands of superintendents across the country, he found that unions had no significant impact on increasing teacher salaries, controlling for other variables such as income and urbanization. This study admittedly contained several statistical problems and posed more questions than answers, however, his findings created a heated debate, rather than an ongoing dialogue. Critics pointed to the limited focus of one school year, essentially ignoring pre and post data (Lipsky & Drotning, 1973). He was criticized for using superintendents' responses as a measure of union

effectiveness, despite the often tumultuous relationship that exists between unions and administrators (Lipsky & Drotning, 1973; Mitchell, 1979).

Following his findings, the bulk of union wage affect research has either found no effects of unionization on teacher salary (Balfour, 1974; Mitchell, 1979; Smith, 1972), slight increases in pay between three and six percent in union districts (Baugh & Stone, 1982; Frey, 1975; Hall & Carroll, 1973; Lipsky & Drotning, 1973), and larger increases around 15 to 30 percent that resemble raises found in the private labor sector (Baugh & Stone, 1982; Schmenner, 1973). Following the union research boom in the 1970s, it is commonly agreed that unions have had a small but significant effect that is between 3 to 6 percent (Gustman & Segal, 1976; Lipsky, 1975; Loveless, 2000; Mitchell, 1979; Murphy, 1990; Nelson, 1996; Prandy et al., 1983; Rabban, 1991). It is unlikely that pay raises greater than ten percent occurred due to collective bargaining and occurred due to the sharp increase in inflation in the 1970s. Conversely, the null effects found by Kasper and others are generally disregarded because of the positive effects in the private sector research. Also, because unions are founded upon securing more resources for its members (Freeman & Medoff, 1979), it is unlikely that union popularity would have boomed if teacher pay had not experienced significant, albeit, small increases.

In the last ten years, researchers have begun to revisit teacher salary trends. Improved methodologies and statistical approaches have allowed a better composite of siphoning the effects of unions away from many other social influences. Hoxby's (1996) study was the first to employ such methods and remains one of the most

comprehensive looks. By using data collected from the Censuses of Governments, Hoxby constructed a data set that included every school district in the United States for 1972, 1982, and 1992. Demographic data, student achievement, teacher salary, and other statistics were included in an attempt to produce an unbiased estimate of union wage premium. As with any quantitative research, several assumptions were made that have been later questioned, yet her research remains as a benchmark for any future research. She substantiated the earlier findings that unions have increased teacher salaries around 5 percent, but also found several negative effects of unionization such as an increased student dropout rate, lower student achievement, and a decrease in teacher productivity. No other studies have attempted to replicate the depth or methodology as the Hoxby study.

There has also been a focus on beginning and veteran teacher pay studies, again finding mixed results due to unionization. Hoxby and Leigh (Hoxby & Leigh, 2003) found that collective bargaining reduced the variation in beginning teacher pay, thus as the authors conclude, accounts for almost three quarters of the decline in teacher aptitude over the last 30 years. In addition, another reason attributes an improvement of career opportunities for women. Despite advanced methodology used for the study, the sample is limited by female teachers immediately entering the profession out of college, thus excluding lateral entry or women who may have delayed their entering of the profession. On the other end of the pay scale, veteran teachers seem to benefit more from collective bargaining than beginning teachers. Unions tend to favor policies that protect seniority and favor transfer policies for

veteran teachers (Ballou & Podgursky, 2002; Moe, 2005). Similarly, Lankford and Wycoff (1997) found that increases in teacher pay tends to favor more experienced teachers, with “novice teachers [receiving] far less than a proportionate share of the large salary increases” from the collective bargaining process (p. 381). Again, the findings are less clear as to whether “backloading” pay can benefit the teaching profession. On one hand, teaching beyond five years of experience has not been found to have a significant impact benefiting student achievement (Ballou & Podgursky, 2002), while others have found that higher teacher pay for veteran teachers helps promote professional status and in turn, has led to increases in educational spending (Greenwald, Hedges, & Laine, 1996; E. A. Hanushek, 1989).

It is apparent that unions do have some influence for teacher salaries based on previous findings. They are included in this research. However, union effects cannot be measured alone and must be balanced with the host of other influences and factors contributing to teacher pay. Teacher pay, unlike private sector labor pay, is not determined based on production and profits. Teacher unions are one group, albeit a powerful one, among which several stakeholders contribute to funding patterns in education. Therefore, it is important to broaden the scope of factors to include other variables, as discussed below.

Collective Bargaining and Work Conditions

The second stipulation that commonly falls under the scope of bargaining is work conditions. The definition of work conditions varies with each contract

negotiation, and unions have repeatedly tried to expand the interpretation of “work conditions” to include anything from class size restrictions to restroom facility upkeep. Length of work day, preparation time for lesson planning, and teachers transfer policies appear to be the most popular bargained items under what specifies ‘work conditions.’

In other areas of work conditions, unions again have been shown to have positive and significant benefits for its members. Union polices affecting class size enrollment caps have been the most researched work condition provision, possible due to the ease of measurement coupled with the strain an over-populated class places on a teacher’s workload. High teacher/student ratio has been a factor in teacher turnover, yet reducing such ratios can be very costly to districts, thus reducing the likelihood. Most findings have shown a positive effect of unionization, protecting its members from overloaded classrooms. Eberts and Stone (1985) found that student - teacher ratios were 12 percent lower in bargained districts than in non-bargained districts while other reports have found an increase in contracts including provisions to limit or reduce class size (McDonnell & Pascal, 1979). In 1970, 20 percent of the contracts they studied had included class-size provisions; five years later, 34 percent had included such provisions. The enforcement of these provisions range, with some contracts requiring the hiring of a new teacher if the class size is exceeded, while other contracts may expect the district to work in “good faith” to lower the class size. In other areas of work conditions, unions again have been shown to have positive and significant effects for its members.

Beyond class size, unionized teachers have been shown to have 4 percent more preparation time than nonunionized districts (Eberts & Stone, 1987; Hoxby, 1996). Tighter discipline policies have been introduced as well as more protection of “extra duties,” that tend to infringe on a teacher’s work day. Outside the classroom, unions have also bargained for stricter protections over transfer policies as well as protecting the dismissal of teachers simply because they marry, get pregnant, or other discriminating reasons.

The growing influence and involvement of unions’ interests in teacher contracts has become alarming. The bargained provisions, while seen as protecting the individual teacher, have been criticized as hampering the production of teaching, and ultimately hindering the student’s learning. This criticism is dangerous to unions, both politically as well as fundamentally. For example, the transfer policies in many unionized districts have often been criticized as reducing flexibility and fend off educational reforms (Kahlenberg, 2006). These policies overwhelmingly protect veteran teachers, while novice teachers, despite having union membership, may be fired in order to reassign a veteran teacher, regardless of a teacher’s quality. The reported cost of firing a teacher in New York in the 1990s was estimated at \$200,000 (Toch, 1996). Hoxby (1996) found that such policies have hampered educational production, with student achievement dropping over a 30 year period. In terms of the industrial model of bargaining in education, Johnson and Kardos state, “Often contracts, particularly those in large urban districts, defined teachers’ responsibilities narrowly and minimally, thus making teaching

more like labor and less like a profession” (p. 12). Most research critical of union effects on teaching can be summarized by the protection it has on mediocrity while sacrificing innovation and reform. In terms of this research, many of the discretionary work conditions were not studied because of data collection issues, such as extra duty protections or work times, however, other work conditions, such as student-teacher ratios and school resources were analyzed in connection with higher teacher pay.

NEED TO IMPROVE METHODOLOGIES

The first step for researching teacher salaries is to better understand the factors effecting teacher salary pay, as stated previously. The second important step is to better understand the ways in which these factors are studied against the pay averages. The following reviews several needed improvements that should be undertaken in order to fully understand how these factors influence and effect teacher pay increases over time.

Extending the Time Frame of Analysis

It is also important for teacher wage studies to account for the slow pace regarding educational change. Teacher wage research must respect the gradual evolution of education reform. The process for decision making in schools is hampered by several special interest groups, creating several layers of political power and influence (Marshall & Gerstl-Pepin, 2005). Schools are funded by a wide

spectrum of public taxes, inviting ownership from all tax payers. Industries rely on the products (graduates) of public education to be well skilled and competitively trained for the demands of the market. The number of stakeholders with interests in education can be expansive and involve multiple levels of influence, power, and bureaucracy (Marshall, 1984). Understandably, in order for some reforms to be brought to fruition, they must be compromised at the lowest common denominator, offering multiple benefits for several groups or and the diversity of stakeholders.

Too often, teacher wage studies focus on limited years of data to include in the study (Eberts & Stone, 1986; Hall & Carroll, 1973; Kasper, 1970; Thornton, 1971). This creates problems when understanding the effects of certain factors. Lipsky and Drotning (1973) draw conclusions on union influences based on data collected from one school year, however, unions, like many educational reforms, may take years to realize their impact. Frey's study (1975) was the first teacher wage study to look at salaries' trends beyond one year of data. His six year analysis included five years prior to unionization and the following year teachers voted to join a union. Any significant changes in policy, including teacher salary increases, may not have been accounted for in the limited time following the decision to unionize. The limited union effect may have pushed wages higher than what was outlined in the study. Conversely, non-unionized districts may have "caught up" in pay differentials in order to stay competitive, through recruitment and retention thereby minimized the gains of unionization.

Other studies have attempted to take a more “longitudinal” approach but still are subject to similar criticism comprising only one year of study. Baugh and Stone (1982) collected data from two years, 1974 and 1977, and draw conclusions from gains and differences within the three year period. Again, this hardly can account for tumultuous economic trends or periods of recession that may take over a decade to impact education. Hoxby’s (1995) study remains as the most comprehensive look at the various factors on teacher compensation, drawing data from 1970, 1980, and 1990. The study has no results pertaining to the years prior to unionization or compensation reform in the 1940s. In order to understand regional differences in pay, a study cannot be limited to even a speculative twenty year window.

Teacher salary research must not only extended time period of analysis but also include data pre-and post the pivotal teacher salary reform movements. Hoxby’s large-scale study attempts to compensate for this pace, analyzing data from 1970 to 1990. Despite this effort, current studies still do not include data prior to the period of unionization. Little remains to be known about the comparisons between districts or states prior to this pivotal reform in public education. Districts that eventually unionize are assumed to have a more politically active environment, so it is possible that attention to increasing wages existed prior to unionization. Thus, teacher wages may have always been higher due to this heightened political activity, regardless of union auspices. Although unionization may have helped increase the salary difference compared to a non-unionized district, this remains an assumption

without a more expansive time period of study pertaining to a period greater than twenty years.

Need for Regional Adjustments

Inherent in teacher wage research remains relegated to comparing various school districts or states in order to measure pay increases. These comparisons are commonly used for policy decisions, justifying current pay levels for its teachers, or drawing indirect assumptions on the level of quality of instruction (Chambers, 1995; Georgiou, Villarreal, & Moore, 2005). Economic theory stresses the need to adjust for regional cost differences before such comparisons are made. The power of the dollar is not consistent in every district or region, just like it fluctuates in the international economy. Thus, one must adjust for regional cost differences in teacher wage research. There are several approaches to adjust prices, and no one method has been endorsed in education, however, this remains a critical step in modern teacher wage research (Chambers, 1995; Fowler & Monk, 2001; E. Hanushek, 1997; Nelson, 1991; Stoddard, 2005).

Regional adjustments are not just limited to the power of purchasing dollars. (Chambers, 1995). Most school districts pay teachers on a single salary schedule that is determined by years of experience and education levels. Some states require teachers to obtain graduate degrees in order to stay employed, thus boosting the education level and the overall average salaries of its teaching workforce. For example, North Dakota ranks almost at the bottom for teachers with advanced

education credentials. Almost 80 percent of its teachers only hold a bachelor's degree which would minimize its reported average teacher salary. Connecticut on the other hand, reports that almost 80 percent of its teachers have some kind of post bachelor's degree experience. In order to make an accurate comparison between Connecticut and North Dakota, a regional adjustment must account for teacher experience (Chambers, 1995; McMahon, 1994). The same argument is applied to adjusting for experience levels among the teachers.

Adjusting for regional differences improves the analyses of education cost outputs. With an increased attention on accountability and a school's spending, neglecting geographical or demographical variations can alter conclusions.

Claiming a state pays its teachers above the national average or ranks high on per pupil expenditure may be ill-founded after regional adjustments are applied.

Walden (1998) finds that almost two-thirds of teacher wage differences across states can be attributed to regional adjustments. Barro (1993) also finds that adjusting for rural versus urban population can dramatically affect raw average comparisons on teacher pay. Teachers in urban areas are usually paid higher based on greater revenue sources. Comparing a state such as Iowa, which is largely rural, to a state with a high percentage of urban dwellers such as New York, is not viable. Ideally, the rural teachers of New York must be compared to the rural teachers of Iowa, thus making a logical and consistent comparison.

In order to understand how this will affect my study, two methods are reviewed: cost of living (COL) and cost of education (CEI). The COL approach was

developed from economic theory, as a method to adjust costs and salaries based on the prices of standard consumer needs, regardless of location. The cost of education index evolved from this research, but sought to include several school specific factors.

Cost of Living Approach. Cost-of-living research was the forerunner for making regional adjustment and has spawned several variations since its emergence in the 1970s. Higher cost-of-living yields higher wages and salaries for its workers (Fournier & Rasmussen, 1986). If it is expensive to live in a location, companies and employing institutions will pay higher wages in order to attract workers to the area. McMahon and Melton (1978) published the first interstate cost-of-living index that normalized index values on 100 representing an average cost of living. Areas that have a higher cost-of-living are assigned an index above a hundred and vice versa. This index (interpreted as a percentage) can be divided into the actual teacher salary cost and the result will estimate the adjusted pay controlling for regional variation.

One method for making a COL adjustment is through the use of the Consumer Price Index based on the “market basket” prices for goods, services, and rent in a particular region. By collecting the prices for thousands of typical items purchased regardless of geographical area, the total costs can be compared to illustrate differences in the cost of living (Taylor & Keller, 2003). A second strategy for estimating geographical variations is using the “comparable wage” method. It is assumed that all professions will demand better wages in high cost of living areas. Similarly, profession will also have to offer high wages in order to attract workers.

Thus, schools in an area of high cost of living will be pressured to offer higher-than-average salaries in order to attract more qualified candidates.

The cost-of-living approach has several advantages both in its methodology and reporting. The factors creating the index, such as prices or rent, are clearly defined and recognized by the public, even though the statistical methodology is complex and confusing. This has helped policy makers and the public to understand its significance, interpret its findings, and accept the adjustments (Fowler & Monk, 2001; Nelson, 1991; Taylor & Keller, 2003). Also, the factors that calculate the index are clearly defined and measurable such as housing prices or consumer goods (Nelson, 1991). These factors benefit the historical application of the cost-of-living adjustment allowing researchers to calculate adjusted prices, salaries, and costs for over 60 years. There is little variation in how this data is collected across various states, minimizing the error usually involved in multi-regional data collection efforts.

However, some education researchers resist applying the cost-of-living approach because of the several education-specific factors ignored through COL methodology. Even though rent and consumer goods prices account for teacher wage differences, no connection can be made to the quality of instruction or student achievement (Taylor, Alexander, Gronberg, Jansen, & Keller, 2002). Thus, two districts may pay their teachers equally after the cost-of-living adjustment; however, the quality of life may be remarkably different (Stoddard, 2005). A common example involves comparing a high wealth suburban area compared to a district in a

large inner-city. Based on rent and market good prices, these two districts may appear to pay teachers equally following cost of living adjustments, but the quality of life and available amenities in teaching in these two districts may be drastically different. Stoddard (2005) also finds problems applying a cost of living adjustment to interpreting education data. She finds that teacher salaries were negatively associated with student test scores after the cost of index was applied. For the study, not only do the cost-of-living and rent adjustments fail to adjust for differences in teacher wages but “may actually exacerbate existing differences” (p. 333). Also, she finds that inappropriately adjusting for cost-of-living differences may affect other factors such as unionization.

Cost of Education Approach. The development of the cost of education (CEI) approach stems directly from the criticism of applying consumer good prices and rent costs to adjust for educational expenditures. Although the CEI has been recently developed in the last ten years, this method is the preferred for adjusting education expenditures (Barro, 1993; Chambers, 1995; Stoddard, 2005; Taylor et al., 2002; Taylor, Chambers, & Robinson, 2004). CEI accounts for various regional differences uniquely attributable to the field of education such as teacher work conditions, benefit packages, student-teacher ratios, and teacher experience or background (E. Hanushek, 1997). The latter, years of teacher experience and education levels, are the principle determinations for how most public school teachers are paid since the mid 20th century (Podgursky, 2004). Not adjusting for

membership longevity, tenure or graduate level experience leads to incorrect comparisons in teacher wage research (Gaines, 2001; Goldhaber, 1999).

Work conditions, defined by protection clauses or school safety, are also a critical component of regional adjustments. A cost of education index can adjust for various work conditions so that suburban areas of similar work conditions can be compared to other similar districts. The cost of living approach groups districts by rent prices, which may compare two remarkably different school environments (Taylor et al., 2004).

Despite its wide acceptance in the education community, the CEI approach has several criticisms based on its implementation. Its inclusion of discretionary factors such as teacher satisfaction or general working conditions, raise questions about the reliability of measurement (Taylor et al., 2004) Some CEI approaches include discretionary factors such as marital status, military experience of citizens, and climate, prompting reasonable questions about their relevance to the financial aspects of education (E. Hanushek, 1997). In terms of public acceptance, quantifying these variables in terms of an index can be statistically confusing. Understandably, the CEI approach has not been commonly used outside the educational economic community. Policymakers have been less likely gravitate or endorse CEI findings since it becomes difficult to translate the findings to the public (Chambers, 1995). Based on the two popular annual teacher salary surveys published by the American Federation of Teachers and the National Education Association, only the AFT

includes an adjustment for regional differences using the cost-of-living approach (Nelson, 1991)

The consistency of data collection is also a common criticism of the cost of education index. Many of these additional CEI factors are not collected through the US Census or Bureau of Labor. Other factors can be quite subjective and costly to measure on a consistent basis, such as teacher satisfaction. Although the Schools and Staffing Survey administered by the National Center of Educational Statistics is highly regarded as the best efforts to collect education statistics at the individual, school, and district level, the survey is only administered every four to five years. Based on the four administered surveys of SASS data, CEI researchers are only beginning to understand how various discretionary factors are related to aspects of education.³

Comparisons of Indices. Several studies use multiple adjustment indices in order to show similarities in accounting for various factors or to compare the differences in CEI to cost of living (COL) indices. Taylor and Alexander (2002) have provided the most comprehensive look at adjustment index comparisons for intrastate studies on Texas:

- Basic Cost of Education Indices
 - Current Texas CEI (Monk & Walker, 1991)
 - Updated Texas CEI (Alexander et al., 2000)
 - Texas Teacher Cost Index (Alexander et al., 2000, 2002)
 - Geographic Cost of Index (Chambers, 1999)
- CEI's based on Student Achievement

³ Including in the methodology section is a more comprehensive list of variables that will be used to adjust for regional differences in this report

- A&A Cost Function Index (Alexander et al., 2000)
- I&R Cost Function Index (Imazeki & Reschovsky, 1999)
- Cost of Living Index
 - Cost of Living Index – based on comparable wages (Alexander et al., 2000)

They found that the cost associated with paying teachers fluctuated dramatically on seven different indices used in various studies. The most conservative adjustment estimated the higher cost of living districts were paying 18 percent more than the lower cost of living districts, meaning, it costs 18 percent more to pay for similar services and teacher salaries than the typically rural districts. More generous estimates implied an inflation of up to ten times the cost for similar sources between the high-cost versus low-cost districts. She also mentioned that the latter finding was highly sensitive to the index strategy and a more realistic variation would be around 69 percent. Substantial variation was in some districts, with adjustment index ranging from 1.02 to 2.83 for one district. To illustrate the variation in index computation, if the average teacher salary is \$30,000, in this district, the figure would be adjusted (based on various factors) from \$30,600 to as much as \$84,900. Although this was an extreme case, the variation in index adjustment casts a shadow of doubt on the various methods. Taylor and Alexander attributed this difference primarily to the methodologies used to develop the index. The COL index also skewed adjustments based on the use of comparable wages, which are problematic when used for adjusting wages.

Taylor also cautioned the use of indices for two other reasons: rural regions and student outcomes. Such adjustments are typically highly correlated, since they use similar factors to develop the index. In terms of rural counties, Taylor found that the variation was more pronounced, drawing conclusions on the sensitivity of data and stability of estimates. Even though this study focused on districts within one state, it requires closer scrutiny over the percentage of the population living in metropolitan areas versus rural areas. Also, the use of student outcomes, defined by student test scores, was a poor factor for adjusting salaries, which was to be expected. In fact, Taylor found an inverse correlation between cost estimates based on input prices and cost estimates based on educational outcomes.

Best approach for current study. Based on other studies that have compared indices across CEI and COL adjustments, I employ the only published historical adjustment index by Berry and colleagues (2000), which uses a cost of living approach. The CEI indices do improve the applicability to the field of education, however, they are more dependent on discretionary data and they do not include the years for this study. As exemplified, most CEI indices are highly correlated with COL indices, since they include major factors such as land and consumer prices. As outlined in later sections, I will also include data on teacher-level specifics, such as teacher age and education. As of printing, this was the first attempt to apply historical data at the teacher level and combining this with a COL approach.

THEORETICAL FRAMEWORK

The adoption of the single salary schedule has been one of the most pivotal reforms to teacher compensation that influenced the professional status of educators (Cohen & Geske, 1990; Davis, 1943; Lankford & Wyckoff, 1997). By recognizing training and experience as the sole identifiers for paying teachers, the single salary system helped to transform teaching into an egalitarian profession (Lortie, 1969) in which the role of the teacher became standardized regardless of race, gender, subject matter, or background. Although the reform helped “fix” the previous system of unequal pay for equal work, the financial restructuring followed a larger pattern of organizational standardization of the public schooling system, sometimes referred to as the factory model of schooling (Tyack, 1974). Yet, despite this similarity in operation and teacher roles, the “unequal pay for equal work” is still prevalent when comparing teacher salaries across districts or states. While wealthier districts pay premium rates for their teachers and have waiting lists for applicants, poorer districts have relied on state enticements and bonuses to recruit qualified teachers to the area because of lower teacher pay. Consequently, there are a host of influences leading to differences in teacher pay across various districts and states.

Uncovering the reasons for these differences requires one to navigate through the countless number of interest groups and stakeholders involved in the complex arena of policy-making (Marshall & Gerstl-Pepin, 2005). Three major factors have been identified in teacher wage research as influencing differences in teacher pay: labor, economic, and social forces.

Labor Forces

Labor theory sets up why the interests of managers and workers are at odds as well as why unions focus mostly on wages. Unions seek to increase wages and improve work conditions for its members. Laborers, typically with less power than managers, use unionizing as a way to seek better wages, work conditions, and benefits. Meanwhile, firm profits are a factor of revenue and shifts in demand, minus real wages and employment (Abowd & Lemieux, 1990). Because firms' purpose are to maximize profits by minimizing costs (including employment), there is an inherent push against raising employment costs unless this yields increased production, and subsequently, higher profits (Blanchflower & Machin, 1996; Oswald & London School of Economics and Political Science Centre for Labour, 1987). Labor union principles rest upon the idea that the interests of labor and management are at odds due to limited resources and divergent interests, or profits versus wages (Nickell, 1999). Unions maximize their efficiency of representation by assuming uniform operations across all sectors, such that one contract can cover a maximum number of employees. Under these uniform operations, unions argue that similarly skilled laborers are interchangeable and should be treated alike (Kerchner, 1986; Loveless, 2000).

However, applying the previous theories of the labor approach to the public sector can be somewhat problematic. First, the roles of management and laborer are different, with little need for oversight or supervision. The skill set of principals is to

oversee the operations of the schools, but they are not required to be the leaders or models of instructional pedagogy. They rarely are in positions to train teachers on the job, leaving this role to assistant principals, leader teachers, or no one at all. This sets up a different relationship between school leader and teacher, as opposed to the private sector manager and laborer. Specifically, the management of a school is spread across multiple roles such that teachers are managers of practice, department chairs are managers of curriculum and efficiency, and curriculum coaches are managers of teachers and practice. Simply put, the aims of both administrators and teachers are more inline than separate, when compared to the private sector.

Second, there exists limited resources for public education and limited opportunity for increased wages. Schools, unlike firms, do not operate with unlimited profit potential. Arguably the definition of school profit can be interpreted as efficient education of the child, rather than the revenue generated from operations (Gyurko & Tracy, 1991). Schools are funded by public tax dollars which are subject to public and political support. Based on the current structure of school payrolls, also supported by teacher unions, all teachers receive wage increases, regardless of race, gender, and quality of teaching. Because teacher pay exhausts much of the education budget for local districts, teacher pay raises must be balanced against funds for teacher resources, student support funds, and other school operations that are inherently tied to teacher function. In that sense, teacher pay increases are connected to the successful functioning of school operations, and

one may argue, are more in line with the “profit margin” (defined by student success) of a school.

Because the model of labor unions does not neatly fit the public sector of education profession, several researchers have hypothesized why teachers would have adopted the model. Hoxby (1996) states that one reason may be attributed to the teachers’ parallel objective (with parents) for student achievement, but that informational and market imperfections lead teachers to desire different school input levels. These differences in desires may be defined by the teachers' expertise about student needs or their ability to understand the external forces acting upon education, thus using teacher unions as a voice for these desires. Bascia (1998) takes this idea a step further, stating that teachers were not allowed to voice their expertise, based on the systemic discrimination felt by a largely women teacher workforce and a largely male administrator workforce. In this model, teachers and administrators did not have aligned goals (as stated previously), and were forced to take action.

The previous models appear to be more social in explanation, but Hoxby also puts forth an economic incentive as well:

[Teachers also] demand a union [because] they have a different objective function than parents or administrators, presumably one in which school policies that directly affect them, such as teacher salaries, receive greater weight than policies that only indirectly affect them by affecting student achievement. A rent-seeking teachers' union can militate for school inputs

that maximize the objectives of teachers, rather than those of parents or administrators. (p. 672)

Based on the adoption of the single salary schedule, the labor union model can benefit from advocating better resources for all workers through an aligned system of pay. The school board and local government that bargain with unions, however, are not equal or standardized. Some exert more control or power over the educational process while others succumb to the demands and will of the teacher unions. A common belief is that politically weak governments lead to higher public expenditures due to a susceptibility of stronger interest advocated, such as teacher unions (Falch & Strøm, 2005). Uniting the will and desire of a district or state's teachers can provide for a powerful lobbying voice in front of politicians (Marshall & Gerstl-Pepin, 2005). Therefore, labor has an impact on state expenditure, and specifically teacher compensation.

Taken together, teachers unionized for social as well as economic benefits. Reasons that relate more to Hoxby's second model, teacher unions as "rent seeking," may provide *a* (not *the*) foundation for why teachers' public status as union members has been difficult to win popular support. Teachers, unlike workers, are public servants with a duty to serve the children of their schools. The idea that teachers adopt a "rent seeking" behavior contradicts an assumption for why teachers teach.

Economic Factors

Another factor affecting teacher pay differences is the economic funding structure for school operation. Because schooling is a public service with most of its funding coming from taxes collected by local and state governments, the “ability to pay” (at the state level) is defined by the internal sources collected through the entities revenue-raising ability and the availability of external sources such as federal grants or business partnerships (Barro, 1993). States with relatively high internal fiscal capacity are also likely to have relatively high percentage of pupils from well-educated, prosperous families and relatively high living costs, a factor positively associated with the supply price (Boix, 2001; Cohen & Geske, 1990). However, economic development does not automatically lead to a larger public sector. These taxes are established through political mechanisms requiring politicians to match the preferences of the enfranchised (Boix, 2001; Eberts & Stone, 1985). Therefore, the state’s ability to pay must be tempered with the citizens’ *willingness* to pay for educational services in the context of their willingness to pay for other publicly funded programs. Consequently, a study needs to include both inputs and outputs of state funding in order to understand economic impact.

The inverse assumption also holds true: poorer areas tend to negatively affect teacher salaries (Loeb & Page, 2000). The less capable a district can pay (low levels of taxability), the fewer resources will be provided to schools. Chambers (1996) found that rates of one standard deviation below the mean for unemployment (3.2

percent) resulted in higher teacher salaries by 1.1 percent (controlling for all other factors) while a standard deviation above the mean (8 percent) resulted in a statistically significant decrease in teacher salaries by almost 1 percent. Li (2002) also found a positive correlation between unemployment and teacher salaries, but reasoned this anomaly with the study's limited scope of study of one year. Several districts located in inner cities, where residential wealth tends to be lower, also pay above average wages in order to recruit and retain teachers.

Using a longitudinal framework may be useful to add clarity to the ambiguity over residential wealth and teacher pay. Although schools are affected by market indicators, such as unemployment, the financial effect on schools is buffered by bureaucratic barriers and population trends. For example, even though the economy may lead to a recession and higher unemployment rates, it is unlikely that school enrollment will be significantly affected. Because school enrollment determines the number of teachers employed, teacher salaries are more likely to be affected by increases and decreases in school population trends (Barro, 1993).

Admittedly, public schools are not immune to the market economy and have been disadvantaged in times of district recession (such as Portland public schools in 2003), but at the macro level, teacher salaries tend to resist significant fluctuations based on the market economy (Antos & Rosen, 1975). The relationship between teacher salary trends and market economy fluctuations can be understood over a significant time period of study and including several factors that may impact educational funding.

Social Factors

The two main factors that determine pay scales are teacher experience (longevity) and educational experience (educational credits or degrees). Once the single salary schedule was introduced in the 1920s, almost every district in the country adopted some form of this pay system. Regardless of quality or need, teacher experience and education determined pay. The system was set up such that regardless of gender, race, or grade, all teachers would be paid equally. Some states require teachers to eventually achieve advanced education degrees and some states continue to reward teachers pay increases with every year of experience. Consequently, any study trying to understand meaningful influences or trends in teacher pay must take into account, first and foremost, teacher education and experience.

This willingness to pay for education services is related to the state's economic growth but also with its social desire and attitudes for such services, the second factor of influence. Applying one interpretation of Wagner's Law, as the state evolved industrially, the public expenditures rises along with the social progress of its citizens. The types of public services offered, such as defense, police, welfare, and education, allow the development and social progress of its citizens (Peacock & Scott, 2000). Understandably, these services do not simultaneously expand in direct relation to the growth of the overall economy; they do expand based on the demand for services from the public. Therefore, the desire for education, measured by the public's willingness to spend on education, will increase

in relation to the percentage of citizens who have benefited from the service of education (Boix, 2001). A state that has a large well-educated population will more than likely exert greater financial effort to support education (Barro, 1993).

Teacher salaries have also been found to be correlated with metropolitan areas (Chambers, 1995; Lankford et al., 1996). If more residents live within a specific district or locality, more taxes are generated, increasing the district's ability to spend more on education. Although higher salaries are common in larger districts typically found in and around metropolitan areas, it remains unclear whether these salaries are a result of unionization. Larger urban districts generally tend to pay teachers higher than rural districts (Gaines, 2001; Lankford et al., 1996). Although there is no single cause for this difference, factors may include unionization (which generally tend to happen in metropolitan areas), more financial resources, and a greater need to attract teachers to less than favorable working conditions.

In addition, several studies have tried to measure the impact of teacher gender and race on average teacher salaries. Prior to the single salary schedule, females and nonwhite teachers were often discriminated against through lower pay despite equal work (Figlio, 1997; Haley, 1904; Podgursky, 2004). After teacher compensation adopted the single salary schedule, it is less clear whether discrimination existed. Some studies have found that female teachers are paid slightly less than male teachers (Walden & Newmark, 1995) and similar pay differences exist in racial comparisons (Cohen & Geske, 1990). Under the single salary system, experience and education are the only determinants of standard pay

levels for a state or region. Unfortunately, few studies can accurately connect education and experience to teacher pay based on gender and race (Chambers, 1995). Only the Schools and Staffing Survey (SASS) has collected national on data individual statistics for teachers, however, the survey is not administered consistently or often.

Finally, age considerations have been questioned as a factor impacting teacher salary differences. The elderly population, a powerful voting demographic population, is indirectly less inclined to support increases in education spending (Preston, 1984; Ward, 1988). Recent studies have shown that despite elderly populations being supportive of education spending, they are less likely to support tax increases (Miller, 1996). Burbridge (2002) also found that the elderly population had a positive impact on spending for education but a negative impact on tax effort, which indirectly influences education spending. These findings support the need to account for the percentage of the elderly population when considering influences on teacher pay.

Theoretical Framework for Current Study

As previously outlined, social, economic, and labor forces have all historically exerted direct and indirect influences on teacher salaries. Taken together: a more educated population leads to more support for educational services and expenditures (social); public support for these services is balanced by the state's inputs and outputs for education versus other public services (economic); and the

deliverers of these services, the teachers, feel valued and compensated for their service as professionals (labor). Because these factors depend on the complexity of the political environment in which they reside, each of these factors have historically exerted a differential influence across the various states. The resulting effect, in my opinion, is unequal pay for equal work.

In order to understand how any one factor exerts its influence over time, it must be considered in light of the other influencing factors. To the best of my knowledge, no study has attempted to understand or control for all these factors, while also controlling for teacher experience and educational attainment. In addition, no study looked at these factors over time, accounting for long term trends in teacher pay. With the focus on collective bargaining provisions, this theoretical framework will guide the analyses for the following questions of interest. See Figure 1 for a graphical depiction of the framework.

QUESTIONS FOR ANALYSIS

Question 1: How do the collective bargaining laws affect teacher pay in the last 40 years, after controlling for the influences of social and economic forces?

Using states as the level of analysis, I examined the impact of labor forces on the teaching salaries following the height of unionizing in the 1960s. I hypothesize that union effects, controlling for all other variables, will have a small but significant effect on overall teacher pay, between one and 3 percent at the state level. Collective bargaining helped organize the profession and redefined the relationship between

school boards and the teachers. By employing the labor model of collective bargaining, teachers were able to capitalize on a vulnerable, unorganized level of school governance. The pressure of a unified teaching corps created tension and confusion, but also helped bring about needed pay raises and improvements to work conditions. Although a host of issues were brought to the attention of teacher unions, teacher unions were first judged against their ability to raise wages. The success still found in teacher unions is evidence that there was some success in the public sector.

These successes, however, have been minimal. Although previous studies claim unions have raised salaries as much as 20 percent, I reason that these numbers are inflated due to two reasons. First, most union wage research was conducted in the 1970s, following the period of the collective bargaining turmoil in the 1960s. During this time, the country's inflation was steadily increasing, and thus, public sector salaries were also increasing. Any study that does not account for inflation and other factors may be narrowed in its interpretation. Also, most studies were conducted under limited time frames, with few if any studies accounting for data prior to the age of collective bargaining. Thus, conclusions amount the differences due to collective bargaining may be ignoring prior increases due to other factors such as state wealth and regional differences in cost of living.

Question 2: How does the influence of collective bargaining laws on teacher pay, controlling for the influence of social and economic forces, differ over various eras in school reform?

The relationship and approach of teacher unions has changed over time. The degrees of militancy, labor-like approaches, have seemed to subside, understanding that long term successes are attributed to productive relationships with school boards and community leaders. Also, teacher unions have made significant strides in bringing attention to a largely female workforce who have been discriminated and managed unfairly by mostly male administrators. The only stagnant piece of this relationship has been the focus of teacher union bargaining: teacher salaries. It is still argued today that despite the many criticisms of teacher unions, “at least they bring about better pay.” Using a data set that spans several ages of teacher professionalization, from the era of teacher unionizing to the era of accountability, I hypothesize that teacher unions have had a slowing, if not, null effect on teacher salary increases since their inception almost fifty years prior. States that are not unionized have recently made strides in order to overcome the pay gap. Although teacher organizations (mostly the state level NEA association), has been a powerful force in nonunion states, this method of organization, not the local unionized model, has brought about significant increase in pay.

Question 3: How does the influence of collective bargaining laws on teacher pay, controlling for social and economic forces, differ by region of the country over the past 40 years?

Teacher unions cannot and should not be assumed to act and behave similarly across all regions. Much of the structure and culture of the teacher unions has been adopted by the cultural of unions within the locality or region of the country. By studying regional differences and union impact, I hypothesize that regional differences will account for most of the variation in teacher pay differences, creating a non-significant effect of teacher unions on pay differences. I reason that teacher salary differences have always existed, prior to collective bargaining. This may be a function of the organization of schooling, such that teachers received better pay in places where the school system and its infrastructure are better organized. It may also be due more to the wealth of the state and region, and its ability to pay teachers more. Regardless, I hypothesize that regional differences existed prior to collective bargaining, and thus, unions have had little if any success in affecting this difference.

CHAPTER III

METHODOLOGY

STUDY DESIGN

State Level Analysis

The current study uses a state level, as opposed to a regional design, because there are several advantages to using states as the unit of analysis. First, states are both “legally and fiscally, the center of gravity for elementary and secondary education” (James, 1991, p. 190). Teacher pay is indirectly and directly regulated at the state level, either through supplemental state funding or through state pay scales with local bonuses. Legally, states must respond to an increase in litigation aimed at resolving the inequity of school services among districts (Burbridge, 2002). Second, states have increased their fiscal capacity from increased tax revenue, which has allowed states to supplement the costs of education services (Salmon, 1987). Although it is unclear whether the increase in revenue has directly benefited teacher salaries, and more than likely has helped pay for school improvements or federally mandated programs, increases in state aid may allow districts to increase teacher salaries (Bradbury, 1993). Third, schools remain “locally controlled,” based on governance structures or their connection to the community, however, schooling has become much more of a global process. Some states are trying to bring balance to

the funding of schools, which is usually tied to local wealth. For example, states such as South Carolina have moved beyond the locally funded model by voting to eliminate all local property taxes and instead fund all schools through state revenues of sales taxes. This change is in hopes that equal funding, regardless of residential wealth, will bring equal resources to all districts.

In addition, a state level design may yield analytic benefits. In terms of unionization, the spillover effect (union districts influencing nonunion neighboring districts to raise wages) is more likely to occur at the district level. Accounting for the spillover effect can be a very challenging to account for quantitatively.

Collective bargaining laws are mandated at the state level, and although there may be evidence of neighboring states influencing teacher wages, it is less likely to occur (Barro, 1993; Burbridge, 2002). Also, states that have not passed collective bargaining laws tend to have powerful state level teacher associations, similar to district level unions based on their powerful lobbying efforts and impressive memberships; however, they are not defined as a "union" (C. Marshall, personal communication, 2005). Consequently, a state level analysis may yield better insight into the gains in teacher pay through state teacher organization efforts, which may be ignored through a district level study.

Although there are critics of a state level approach, I feel that this is the best approach for my questions of interest. Critics of a state level approach argue that taking into account the number of stakeholders, interest groups, and factors affecting teacher salaries is sizably more difficult than the number needed at the

district level. Thus, the higher the level, the more a study needs to account. Frey (1975) frames a second reason for district level studies: improved data collection methods. He argues that if a study centers around a region or district, the data collected will be less likely inconsistent, since it is collected with a controlled area.

The current study addresses these criticisms in several ways. First, I employ a historical approach, including data for 40 years, from 1950 to 2000, allowing for trends in teacher pay rather than snapshots of cross sectional analyses. This creates a comprehensive data set that allows one to study trends at the state level. Second, each variable in the current study was collected by the same agency or source, which addresses the previous concern over issues of inconsistency in data collection across states. For example, most state revenue data has been collected by the US Statistical Abstracts using the same methodology and collection strategy across all states. To this end, I ignore discretionary data such as teacher satisfaction surveys that may be constructed differently for different parts of the country. Although this requires the reduction of certain variables, it allows for a more historical approach to understanding trends in teacher pay.

Data Sources

For the current study, teacher salary data was drawn from several governmental data sets such as the US Statistical Abstracts, US Bureau of Census, the National Education Association, and the National Bureau Economic Research. Because of the longitudinal design of the study, it was important that all included

variables were collected throughout the duration of the study. All variables and their sources are presented in Table 2. All economic indicators, such as state wealth and expenditures, were collected through the US Statistical Abstracts, an annual report that compiles many statistics from various federal departments and organizations (US Census Bureau, 2005). The political data was supplied by the National Council of State Legislatures (T. Storey, email communication, February 15, 2007). Other social factors, such as teacher experience, teacher educational attainment, teacher race, were extracted from the Integrated Public Use Microdata Series (IPUMS). Using actual Census responses from the decennial surveys, I was able to create state-level data based on individual teacher respondents for each of the social factors. Because each of these variables is generated from Census data, the collection was consistent across all states and all years.

MEASURES

Dependent Variable: Annual Teacher Salaries

The most common method for analyzing teacher salaries is to use the NEA or AFT annual reports, which are collected, published, and written by both these teacher union organizations. Although the NEA data has been collected for almost 60 years (and is used as the primary report for government documents such as the US Statistical Abstracts), there has been recent criticism surrounding the method of collection as well as the inherent bias of teacher unions reporting on salary data (Florida Department of Education & McDougal, 2006). Both organizations rely

solely on state department surveys. These surveys ask state departments to report out various statistics, including average teacher salaries paid in the last year. The survey method has been criticized for differences in the way states interpret and report on various items. For example, in the AFT survey some states include support staff in the calculations, thus lowering the overall average. Alternately, the NEA does not allow supplemental pay, such as bonus supplements, to be factored into average pay. This increases their overall average for some states but not others. Even though the differences may seem insignificant, taken together, they decrease the precision with which my dependent variable would be assessed.

Consequently, I used the decennial US Census Data as a way to calculate the average teacher salary for each state with increased rigor and consistency. As with all census data, the surveying remains consistent throughout the period of focus. Additionally, individual-level reporting allows for a better understanding of true wages, defined by a teacher's extra duties such as coaching or bonus pay. Through the use of the Integrated Public Use Microdata Series (IPUMS), a publicly available tool used to extract Census data, I was able to calculate the average state teacher salary for employed, non-private school teachers, from 1950 to 2000 (Integrated Public Use Microdata Series, 2006). Consequently, the average teacher salary is measured from the individual, consistent across all states and time, as opposed to the NEA data, which is inconsistently reported by states, and measured from the state department (and not individual).

Once the data was collected for each of the decade time points, I used the following method to interpolate the missing data between the “non Census years.” I used the rate of change for each year, taken from the NEA annual salary data, to calculate the rate of change for the Census data using the following formula:

$$y_{t+1} = \left(\frac{y_{n+10} - y_n}{x_{n+10} - x_n} \right) * (x_{t+1} - x_t) + y_n$$

Where y_{t+1} represents the estimated Census salary based on the 1) rate of change between the Census decennial time points $y_{n+10} - y_n$ and the same time points for the NEA salary $x_{n+10} - x_n$, 2) multiplied by the difference from NEA current (x_{t+1}) and previous year (x_t), and 3) added to the previous Census year represented by y_n . This formula produces a rate of change for each year and allowed for the interpolation of the teacher salary Census data between the decennial time points (G. Henry, personal communication, November 29, 2006).

Finally, I adjusted all salary data for regional cost differences and inflation using a historical cost of living index (Berry et al., 2000). The index provides a constant for every state and every year from 1960 to 2000. By dividing the average teacher salary by the cost of living adjustment, I adjusted all salary data to be measured in the year 2000 dollars. The benefit of using this method is to compare salaries adjusted at the same dollar value, measured in the dollar value. For example, the actual average teacher salary in 1960 for Arizona was \$5,404 and the average salary in 2000 was \$35,983. By adjusting for cost of living and inflation

(COL index for 1960 = 18.4), the adjusted salary for 1960 in 2000 dollars, is \$30,630. Choosing not to adjust actual salary data for cost of living (and instead using the COL as an independent variable), would result in the dependent variable needing to be adjusted for inflation and cost of living, in order to make comparisons across states and over time. Furthermore, the current study is less interested in the effects of cost of living and inflation as a controlled variable, and more interested in the effects of other variables such as state wealth, demographics, etc.

Independent Variable: Collective Bargaining Laws

In order to measure the degree to which states have passed laws favorable to collective bargaining, I used the 14-item data set from the National Bureau of Labor Relations Public Sector Collective Bargaining Law (NBER) (Valletta & Freeman, 1988), which measures collective bargaining laws for all 50 states from 1955 to 1985. The NBER Collective Bargaining data set has been used in similar longitudinal studies of teacher unions such as Hoxby (1996), Farber (2006), and Freeman (1986). It documents the year (and month) for each state's passing of the collective bargaining laws, allowing researchers to test various economic, social, or demographic shifts that may have occurred after the legal passing of unionization.

I also acquired the update to the data set from 1986 to 1997 (K. Rueben, email communication, September 6, 2006). Finally, I carried forward the data from 1997 to the remaining years in the study. This method has been used in previous studies, mostly because collective bargaining laws have rarely changed since the 1990s.

Similarly, prior to 1959, public sector employees were not allowed to bargain, thus the laws were unchanged from 1950 to 1954 (Farber, 2006). Appendix A provides a detailed description of the 14 labor provisions classified as well as the values assigned for each level of provision passed.

In order to collapse all the collective bargaining variables, I created a Collective Bargaining Index (CBI) which weighted and summed the variables, centering them around 0 (no provisions), and ranging from -14 (actively prohibiting unions) to 63 (union friendly). I weighted the first labor provision, “collective bargaining” to match the sum of all others, thus accounting for half the total score a state could receive. This was done for two reasons. First, all other variables, such as strike provisions and union agency dues provisions, hinge on the allowance of collective bargaining laws, thus without collective bargaining, none of the others would even be possible. Equating the variable “collective bargaining” with all other provisions provides a balanced weighting between the allowance of bargaining and the additional provisions that could either enhance or limit union activity.

In terms of the current study, it is questionable as to the connection between collective bargaining (the primary independent variable of interest) and the influence of teacher unions. The scope of allowed bargaining within a state does not always reflect the presence of unions within a state. In some states, teacher unions have a powerful presence at the state level where teacher salaries are determined. Union activity is mostly occurring at the local level and more active in metropolitan areas as opposed to rural. Thus, in a state with a generous scope of bargaining, but

lacking a strong labor presence usually found in metropolitan areas, union activity may not be as strong. This refers to the conceptual difference in some literature between *collective bargaining* and *unionization*, two terms that are often used synonymously. Collective bargaining is set at the state level, which may not necessarily reflect the popularity of unionization at the local level.

The gap between union and collective bargaining is most apparent in short term studies. However, in the current study, a 40 year analysis allows for state legislation to invite local activity. In more metropolitan areas (which is controlled for in the study), unionization occurred quickly, due to the labor groups that existed in the private sector (McDonnell & Pascal, 1979; Murphy, 1990). Teacher unions were quick to organize, with some affiliates (mostly AFT), part of the local AFL-CIO. Rural areas may not have been as quick to unionize based on the lack of union activity or the spillover effect of the larger urban areas. By extending the time frame of the study, I can allow for a significant window of “spillover” into the non-urban areas. Also, by controlling for metropolitan areas, I can account for the likelihood of union activity usually centered in larger cities. In addition, collective bargaining reflects state level which better maps onto state level unit of analysis of the current study.

Control Variables: Social Factors

Teacher demographics. Several factors for teacher characteristics were collected from the US Census

- Experience
- Educational attainment
- Gender
- Race
- Place of work

In terms of *years teaching*, I used the average reported age of the teachers, knowing that age does not perfectly equate to experience (lateral entry, mid-career transitions), but overall, there is a high correlation between age and experience. In terms of *education attainment*, I constructed an education index that combines two Census variables, Highest Grade Completed and EDUC99, which combined, span the time period of study from 1950 to 2000. A 4-point scale was used to classify each teacher's education attainment, valued "1" (high school or below), "2" (some college), "3" (college degree), and "4" (beyond Bachelors). A rating of 4 applied to teachers who completed work such as educational credits that could be considered credit for teacher pay increases.

It was also important to understand where the teachers are employed within the state. Chambers finds that districts located in more densely populated counties and those that are located near major urban centers pay higher salaries for teachers. Districts located within 75 miles from three central cities pay its teachers 2.2 percent higher than districts located within the same distance of only one city. This could be due to the vigorous competition for teacher candidates, since teachers do not necessarily live in the districts they teach and are willing to seek better pay. For the current study, I used the Census data to extract the regional variable, *teachers working in a metropolitan area (percent)*.

I found that overall, 41.8% of all teachers working within a metropolitan area while 56.4 percent of the general population lived in a metropolitan area. However, I used the prior statistic since teacher salaries are more influenced as to where they work rather than where they live.

Other teacher characteristics were included in the data collection, such as

- Female teachers (percent)
- Race of teachers (percent)

The average percent of teachers who were *female* within a state and found that overall, 69.8 percent (SD = .057) of all teachers were female. In terms of race, because the Census only collected the race of White, Black, and “Other” for my time period of study (specifically 1950 and 1960), I classified all future teachers into one of these three classifications. Overall, 90.7 percent of all teachers are White (SD = .097) and 8.0 percent of all teachers were Black (SD = .099). Other social factors included various population statistics, such as the racial background to the state population, the percent of the population over 65 years old, and the percent of the population living in a metropolitan area.

Educational Attainment – General Population. The second category of social factors was educational attainment of the general population:

- High school diploma earners (percent)
- High school diploma earners by race (percent)
- College degree earners (percent)
- College degree earners by race (percent)
- Population of 5 to 17 year old enrolled in school (percent)

These variables were collected at the decennial level and linearly interpolated in order to fill in the missing data, following a popular procedure for Census data.

Political Party Control. Finally, I constructed a *political party control* variable to reflect the degree to which states were controlled by one political party:

- State Senate control (Democratic, Republican, or other)
- State house control (Democratic, Republican, or other)
- Governor's office (Democratic, Republican, or other)

If there was a unified controlling political party across all three branches of government, then the state was assigned either a -1 (Democratically unified), 0 (split control), or 1 (Republican control). The index was centered at 0 in order to better interpret whether either political party had a positive or negative effect on teacher salary increases. This variable was calculated annually for all states in the study.

Control Variables: Economic Factors

State Wealth. In order to measure state wealth, I collected several factors both on state revenue and expenditures for every state and every year in the study:

- State revenue per capita (dollar)
- State expenditures per capita (dollar)
- State expenditures on education K-16 (Percent)
- State expenditures on education K-12 per pupil (dollar)
- Per capita income (dollar)

At the time of data collection, it was unclear as to what variable would best measure state wealth, so several competing variables were chosen. All variables used for the model have been used in previous studies to measure state wealth. I

also calculated the percent of state expenditures on education in order to measure the state's dedication for spending on education, reasoning that if the state used a larger percentage of its resources on education, there may be a tendency to pay better teacher wages. Per pupil expenditure is a common statistic used to compare how much a district or state spends on education, with the assumption that this also measures how much a district or states supports education, because of its financial decision to spend versus how many students are enrolled.

For this study, I chose not to use per pupil expenditure for a number of reasons. First, the calculation of the variable includes the line item of teacher salaries, the dependent variable. Instead, I chose to use a two-variable approach to assess the state input and state output. For input, this would be defined as the revenue a state receives, through local and state taxes, and other resources. This revenue is not specifically slated for education use, but rather, the general operating funds for states. For output, I wanted to assess how much of this was being spent for education purposes, in relation to all other public services funded by the local and state governments. In some states, education (and teacher salaries) is primary funded by local districts and supplemented with states funds, if at all. Other states operate under a state centered approach, with local districts offering optional district bonuses. In order to compare across both types of states, I assessed input and output for the combined local and state districts, but herein referring to them as "state revenue" and state education expenditure.

Finally, all economic variables were adjusted for cost of living and inflation, similar to the dependent variable. This was done so that all economic measures were valued at the dollar value in the year 2000 and both the dependent and independent variables were valued on the same scale. Descriptive statistics for all variables can be seen on Table 3. In addition, bivariate correlations among all variables can be seen in Table 4.

ANALYTIC FRAMEWORK

Time Series

The organization of the longitudinal/cross sectional data of the current study requires the use of Time Series Cross Sectional analysis (TSCS) (Beck, 2001), a division of time series study in econometrics. The use of this approach in quantitative studies is relatively new, despite the concept of understanding data over time and space has existed for decades (Adolph, Butler, & Wilson, 2005). Despite the complexity of the methodology, the statistical analysis has been aided through the development of computer software able to handle the intense quantitative load of these methods.

TSCS studies are characterized by their data structure over space and time. Similar to hierarchical or panel data, TSCS data is organized such that there are multiple levels both vertically and horizontally, much like studies that analyze students within a class within a school over time. However, there are distinct differences that separate TSCS from quantitative methods such as Hierarchical

Linear Modeling or traditional panel-level analyses. HLM or panel level data is usually collected over a limited time frame, perhaps a pre and post or even a few years of study. If the panel, or units of subject, are referred to as N , and the time points as T , then these studies usually identify an $N > T$ characteristic. The asymptotic nature of the data set is focused on the subjects, usually respondents to a survey or, as in the case above, students within schools. Thus, a sample of students is collected in order to make generalizations over a population of students not otherwise included in the model. Consequently, the focus is on generalizing to a larger population. Alternatively, in TSCS studies, the asymptotic focus is on T , while the subjects, such as states or countries, are the population, rather than the sample (Ramanathan, 1993). Understandably, because the approach of traditional ordinary least squares uses assumes $T < N$, several adjustments must be made in order to proceed with a TSCS study.

The TSCS methodology can be used for data, such as that used in the current study that traditionally violates many of the Gauss-Markov assumptions of the often-used ordinary least squares (or its derivatives). In OLS, residuals must be independent and identically distributed, however in TSCS, this is not necessary. The errors in a typical TSCS study may show panel heteroscedasticity (state errors have their own variances), contemporaneous correlation (error of one state correlated with another in the same year), or serially correlated errors (error of state is correlated with its previous year). Although TSCS is able to account for such violations, ignoring such violations and not making the needed corrections in TSCS

studies results in overinflated standard errors, and thus, overestimation of model fit and specification. Consequently, a study needs to check for both assumptions and violations.

Assumptions Checks – Heteroscedasticity and Serial Correlation

I first specified a baseline model in order to examine the impact of the three variables we know: teacher experience, educational attainment, and area of work (metropolitan status). Consequently, the baseline model is:⁴

$$TeachSalCOL_{i,t} = \beta_0 + \beta_1 Exp_{i,t} + \beta_2 Educ_{i,t} + \beta_3 Metro_{i,t} + \varepsilon_{i,t}$$

with i representing the panel or state, and t representing the year from 1960 to 2000, and β_n represent a vector of marginal effects of the time varying explanatory variables. Thus, the ε_{it} or disturbance term, will now include the variance from unobserved differences across states and time, as well as within states and time.

First, I examined the degree to which teacher salaries violated the assumptions of Gauss Markov, common to Ordinary Least Squares (OLS) analyses. I tested for the existence of the heteroscedasticity, or whether the estimated variances of the residuals from the linear regression are dependent on the values of the independent variables. Using the Breusch-Pagan test for heteroscedasticity, I found that the $X^2(1)$ statistic was 24.01 a significant at the .001 level. Thus, I can

⁴ The baseline model refers to the basic model of factors we know influence teacher pay (e.g. controlled variables). Specifically, the baseline model includes variables such as teacher experience, educational attainment, and metropolitan status of work.

reject the null hypothesis that the model is homoscedastic. I also confirmed this by plotting the residuals of the linear regression against the dependent variable, and visually confirmed the presence of heteroscedasticity.

In order to correct for panel heteroscedasticity, specifically contemporaneous correlation, I used what Beck (2001) refers to as panel corrected standard errors (PCSE). This is required when disturbances are not independent and identically distributed, as in the case of the current data set. The variance disturbance is unique to each case and each pair of cases has their own covariance. This is preferred over the commonly used Generalized Least Squares method, or the Parks-Kmenta method, which has been shown to incorrectly adjust the standard errors, usually overly optimistic, thus resulting in over prediction or inflated model fit (Beck & Katz, 1995; Ramanathan, 1993). The PCSE corrects for heteroscedasticity and the model uses an AR(1) process, or autoregressive process of the first order. While an AR process describes a stochastic process that can be described by a weighted sum of its previous values and a white noise error, an AR(1) process is a first-order one, meaning that only the immediately previous value has a direct effect on the current value. In terms of the current study, this would mean that the correction uses the previous year's teacher salary data in order to correct for autocorrelation, as opposed to using the salary data from 2 or three years lagged. Typically in time series studies, AR(1) models are used to correct for serial correlation unless there exists strong theoretical justification to use more than one year lagged models.

The second step was to test the existence of serial correlation, or correlation among the residuals over time. Again, typically in time series studies, it is expected that serial correlation would exist, since the reason for error in one year is likely related to the error in the subsequent years. Using the Wooldridge test, which studies the idiosyncratic errors of a linear panel-data model (Wooldridge, 2002). Based on the results, I found that the F statistic was significant ($F(1,47) = 276.403, p < .001$), and that there is a presence of serial correlation in the data. It should also be noted that the type of autocorrelation is panel-specific, meaning that the correlation is not pooled or assumed to be the same across all states, but rather, specific to each state.

Model Specification

I first tested whether to use either a fixed effects or random effects regression for the model. Typical time series studies often use fixed effects for their regression, since it is not a cross sectional dominated study (Western & Beckett, 1999). In this type of study, random effects would be used if the data was unbalanced (meaning unequal N , states, to t , years) toward the N . Although the current study is somewhat balanced, I wanted to use changes in the variables over time to estimate the effects of the controlled variables of interest on average teacher salaries (dependent variable). It is cautioned that using fixed effects, when the model calls for random effects, can lead to a misspecified model, much like an omitted variable issue. Using fixed effects has the consequence of removing any of the average state

to state variation, asking whether intra-state changes in the dependent variable are associated with the intra-state changes in the factors (D. P. Green, Kim, & Yoon, 2003) but as Beck and Katz (2003) point out, typical TSCS analyses welcome this type of analysis, since the identification of panel (or differences within the panel) is the study of focus. In summary, using fixed effects precluded the analyses from interpreting anything about the inter-state effects of the independent variables, since these effects have been removed.

In order to proceed with dealing with the heteroscedasticity, I attempted to model it, as opposed to the previous approach of considering it a nuisance. Each state has its own intercept:

$$TeachSalCOL_{i,t} = x_{i,t}\beta_0 + f_i + \beta_1Exp_{i,t} + \beta_2Educ_{i,t} + \beta_3Metro_{i,t} + \varepsilon_{i,t}$$

where f_i is a dummy variable representing the state. To formally test if the model is indeed, fixed, as opposed to in-between or random, I used the Hausman test to test the null hypothesis of a random effects model being consistent and efficient, ruling out a fixed effects. This was conducted even though fixed effects are typically the model of choice for TSCS data (Beck, 2001). The results showed a highly significant p-value ($X^2(3)=19.65$, $p < .001$), thus rejecting the null hypothesis that a random effects model would be consistent and efficient.

The baseline model I used to begin the analyses was as follows:

$$TeachSalCOL_{i,t} = \beta_0 + \beta_1Exp_{i,t} + \beta_2Educ_{i,t} + \beta_3Metro_{i,t} + \varepsilon_{i,t}$$

CHAPTER IV

RESULTS

Descriptive Statistics

As previously referenced, the descriptive statistics and correlations among variables can be seen in Tables 3 and 4. Adjusting for cost of living and inflation, the average teacher salary has slowly increased over the past 40 years. The average teacher salary across all years and states was \$32,298 (SD = \$5,273). Across all years, New Mexico (m = \$26,245; SD = \$1,276), Mississippi (m = \$26,586; SD = \$3,736), and North Carolina (m = \$27,293; SD = \$3,210) averaged the lowest pay in teacher salaries after adjusting for cost of living and inflation. The three states with the highest teacher pay across all years were New Jersey (m = \$41,397; SD = \$7,588), California (m = \$40,058; SD = \$3,207), and Michigan (m = \$38,921; SD = \$4,848).⁵ Although figures have been adjusted for cost of living and inflation, they have not been adjusted for other factors such as teacher experience, education levels, and other variables that provide a better comparison historically across states.

In terms of the Collective Bargaining Index (CBI), there was wide variability across states and time as measured by the 14 collective bargaining provisions. Out of a possible range of -14 to 63 points (the higher the index, the more a state was

⁵ All teacher salary figures are reported in year 2000 dollars

considered “legally union friendly”), the mean CBI index across all states and years was 15.70 (SD = 19.37) for all 2,448 observations. The mean CBI index for 1950 was .10 (SD = 2.35) and the mean for 2000 was 27.33 (SD = 20.12), indicating a general increase in unionization over time. The maximum reported CBI values for states *across all years* were Wisconsin (32.3) and Connecticut (30.4) and the lowest index was Alabama (-8.3) and North Carolina (-5.4). Figure 2 displays the average CBI value for each state across all 50 years.

Establishing the baseline model for the study

I needed to first understand the variance explained by the known factors of teacher salaries, such as teacher experience, education, and area of work (metropolitan). To build the baseline model for understanding the teacher salary differences, I first used these variables in the model while correcting for panel specific AR(1) autocorrelation using single lag OLS of residuals. The overall regression was linear with panel-corrected standard errors (Beck, 2001) in order to correct for contemporaneous correlation, as previously noted. All variables were statistically significant in the positive direction at the .05 level, as expected, and each was a significant predictor of teacher salaries over the 40 years. Together, these variables explained 77.7 percent of the variation in teacher salaries. Results of the baseline model can be seen in the first column of Table 5.

Next, I fit a series of models to test the additional contribution of economic, social, and educational attainment characteristics on teacher salaries. Each group of

the independent variables (e.g. economic factors) was examined separately in order to understand which factor(s) within each group explained the most variation on teacher salaries. That was done so that I could select the minimal number of variables from each group to take care of any multicollinearity issues that would most likely occur if I used too many variables from one group. By selecting the factors in each group with the strongest prediction, I used a conservative, yet parsimonious, approach that is explaining as much variations in teacher salaries in the baseline model as possible, prior to adding the CBI variable.

I first tested the various economic variables, such as income per capita, state expenditures per capita, state revenue per capita and percent of state expenditures spent on education. Correlations among these variables showed state expenditures and state revenue were so highly correlated with each other (0.9882), they were nearly redundant. I chose state revenue per capita in order to measure the state wealth and percent of funds spent on education to assess state spending on education. Second, because income per capita was highly correlated with the dependent variable (since the dependent variable is part of the calculation of income per capita), I also dropped it from the study. Consequently, I chose state revenue per capita (to define input) and the percent of funds spent on education (output). I found that these economic factors explained an additional 14 percent of the teacher salary variation ($R^2 = 0.9026$; Wald $X^2(5) = 350.61$; $p < .001$).

The second group of variables I tested was the educational attainment of the population. Factors included the percent of the population with a Bachelor's degree

and the percent of population age 5 to 17 years old enrolled in school. When adding these to the model with established control variables, I found that neither variable was statistically significant (Percent Bachelor's: $z = 1.418, p = .139$; percent enrolled: $z = 1.82, p = .069$). Because of the degree to which youth age 5 to 17 enrolled in school was marginally significant, I left it in the model.

The third group of variables I tested was the political factors, such as political party control and percent of the population over 65 years old. When added to the already established control variables, the baseline and economic factors, political party control was not a significant predictor of teacher salaries and was thus dropped from further study. Interestingly, the population over 65 was positively statistically significant ($z = 2.45, p < .05$) which is inconsistent with previous findings that have found a negative effect of an older population on teacher salaries (Walden & Newmark, 1995).

When testing the demographic variables such as race and gender of teacher as well as student enrollment in the Free and Reduced Lunch federal program. The earlier significance found for population over 65 was no longer significant and thus dropped from the model. Also, the percent of teacher female was not significant ($z = -0.79, p = .430$) and dropped from further study. Both variables may have further statistical influence on teacher salaries. The race of teachers, limited to only "non white" due to the historical breadth of the study, was significant ($z = -2.84, p < .01$). Although the percent of free and reduced lunch was not significant at the .05 level, it is important to control for when making interstate comparisons, and thus left in the

model, because of the theoretical connections between student demographics and teacher pay.

Thus, the final baseline model of all control variables included teacher education and experience, working in a metropolitan area, state revenue per capita, percent spent on education, percent of students enrolled in Free and Reduced lunch, and teacher race. The overall baseline model was significant (Wald $X^2(9) = 361.55$; $p < .001$) and explained 92.4 percent of the variance in teacher salaries from 1960 to 2000.

$$\begin{aligned}
 \text{Teach_SalaryCOL}_{i,t} &= \beta_0 + \beta_1 \text{TeachExp}_{i,t} + \beta_2 \text{TeachEduc}_{i,t} + \beta_3 \text{TeachMetro}_{i,t} \\
 &+ \beta_4 \text{EducExpen}_{i,t} + \beta_5 \text{StateRevenue}_{i,t} + \beta_6 \text{FreeLunch}_{i,t} \\
 &+ \beta_7 \text{Teach_Nonwhite}_{i,t} + \varepsilon_{i,t}
 \end{aligned}$$

Question 1: How do the collective bargaining laws affect teacher pay in the last 40 years, after controlling for the influences of social and economic forces??

In order to understand the added effect of the collective bargaining laws on teacher salaries, I initially tested a linear relationship by including the Collective Bargaining Index (CBI) as an independent variable, which specifies that labor forces have a consistent effect on teacher salaries over 40 years. Initially, the CBI was not statistically significant given a linear relationship ($z = 1.50$; $p = 0.133$). However, based on the hypothesis of collective bargaining having a waning effect, I tested a quadratic model fit, and found that both the linear component ($z = 2.49$; $p < 0.05$) and the quadratic component ($z = -2.25$; $p < 0.05$), of the CBI were significant.

Consequently, a quadratic fit representing was the model fit used for the remainder of the study. The following formula represented for Question 1 was:

$$\begin{aligned} Teach_SalaryCOL_{i,t} &= \beta_0 + \beta_1 TeachExp_{i,t} + \beta_2 TeachEduc_{i,t} + \beta_3 TeachMetro_{i,t} \\ &+ \beta_4 EducExpen_{i,t} + \beta_5 StateRevenue_{i,t} + \beta_6 FreeLunch_{i,t} + \beta_7 \\ &+ Teach_Nonwhite_{i,t} \beta_8 CBI_{i,t} + \beta_9 CBI_{i,t}^2 + \varepsilon_{i,t} \end{aligned}$$

The overall model was significant (Wald $X^2(9) = 370.64; p < .001$) and explained 92.5 percent of the variation in teacher salaries. Results can be seen in the second and third columns of Table 5.

Question 2: How does the influence of collective bargaining laws on teacher pay, controlling for the influence of social and economic forces, differ over various eras in school reform?

I originally hypothesized that collective bargaining did not have the same impact on teacher salaries across all years of the study, particularly in the most recent years. Although the previous model results support my hypothesis (which showed that a quadratic model fit was indicating a gradual increase, but tapered off), I wanted to better understand the relationship between CBI and teacher salaries over various time periods. I conducted two model tests to examine decade level differences of labor effects.

In the first model, I split the data set by the year 1980 and tested the same model for 1960 to 1980. I found prior to 1980, similar results for control variables such as teacher experience, educational levels, etc. The linear fit for CBI was

significant ($z = 2.33; p < .05$) and the quadratic fit was also statistically significant ($z = -2.65; p < .01$), meaning an overall positive effect of CBI, but dropping off toward 1980. The overall model explained 96.1 percent of the variation. This increase in explained variance was to be expected, since the model only accounted for 20 years of the data as opposed to 40 years, having the model fit a smaller number of data points. In a second model, I took data from 1980 to 2000 and fit a similar model. Again all other variables retained their similar statistical significance as before, except for the race of teachers, which was no longer statistically significant. The quadratic effect of collective bargaining was also no longer significant ($z = -1.78; p = .075$). Results can be seen in Table 6.

I used the same approach within each decade in order to further isolate the effects of collective bargaining on teacher salary variance. I divided the data set by decade and created 4 separate models, similar to the one just outlined. Results can be seen in Table 7. I found that only within the 1970s was there a statistically significant effect of collective bargaining on teacher salaries ($z = -2.14; p < .05$).

Question 3: How does the influence of collective bargaining laws on teacher pay, controlling for social and economic forces, differ by region of the country over the past 40 years?

In order to further understand the effects of CBI on teacher salary differences, I tested several models to examine any regional effects on teacher salaries. I used an adjusted regional code based on the US Census and the mean for each state's CBI for original and re-categorized states (see Appendix B for regional classifications of

states). This created 11 geographic regions. I then specified the same model for each of the 11 regions. Model results for the Northeast region can be seen in Table 8, South in Table 9, Midwest in Table 10, and West in Table 11.⁶

As expected, the three regions that had low CBI values, and thus either prohibit or do not pass provisions allowing collective bargaining, showed no statistically significant results the effect of collective bargaining on teacher salaries. Only the Mountain West region (AZ, CO, NM, UT, WY) showed a statistically significant relationship between collective bargaining and teacher salary variation ($z = 2.46; p < .05$).

Of the remaining 7 regions, the South Atlantic region (TN, FL, MD, DE) showed significant positive effects for collective bargaining on teacher salaries ($z = 2.71; p < .01$). Three regions showed a marginally significant relationship ($p < .10$): East North Central (IN, IL, MI, OH, and WI), Middle Atlantic, (NY, NJ, and PA), and the Pacific (CA, OR, WA).

⁶ Alaska and Hawaii were not included in this study because of the unique funding and organizational structures of their public school system.

CHAPTER V

DISCUSSION

SUMMARIZING THE STUDY

The current study is the first of its kind to examine trends in teacher salaries over an extended longitudinal period, as a function of social, economic, and demographic factors as well as teacher-specific characteristics. The results will hopefully prompt further research to understand the many questions posed from this study, as well as to use similar rigorous methodology. Several trends were discovered in these analyses; however, three particular conclusions may be drawn with respect to the impact of collective bargaining on teacher pay. First, collective bargaining's overall influence on increasing teacher salaries from 1960 to 2000 has been steadily waning. Second, during the 1970s, collective bargaining laws had the most impact above and beyond other influences. Third, the collective bargaining provisions influence specific geographical regions differently.

Impact of Collective Bargaining

In terms of collective bargaining, the results confirm the original hypothesis that stated unions have had a significant but slowing effect on teacher pay based on the positive linear, but negative quadratic relationship found from the model. As

found in other studies, unions appear to have been successful in increasing teacher pay once educators became organized. Most likely, because initially, teacher unions were well organized and had more resources to use for negotiations and bargaining. The initial strength of unions was surprising for many school board officials who underestimated the willingness of teachers to unionize, as well as the legal muscle that could be flexed in the public setting (Loveless, 2000). Prior to unionizing, teachers had been underpaid and under recognized, so unionizing may have helped achieve the incremental pay jumps that were found in the results.

The results from the second set of models supports the second part of the hypothesis –collective bargaining provisions had the most impact during the 1970s, above and beyond other influences, but have had little if any effect in the last two decades. Based on the negative quadratic model fit (versus a positive linear), union effect has tapered off, resulting in a limited influence in terms of improving teacher pay. This study is limited in its explanation for why collective bargaining had a waning influence over time. One possible explanation based on the effect sizes of the factors included in the study, I would argue that the significant influence of state wealth influences (explaining almost 14 percent of the teacher variation), there may exist a financial limitation for how much pay increase unions can achieve under a publicly-funded profession such as teaching. A majority of teachers are still paid based on public taxes, making them susceptible to factors such as state revenue, political support, and public approval. Unlike the private sector, where wages are

determined by production, profits, and managerial support, public education competes for a limited pot of available funds.

Beyond the ability to pay teachers higher due to financial constraints, perceptions surrounding the professional identity of teaching debate affect how dollar amounts equate to teachers' pay. Teachers have greatly improved their professional status from the days of the single room schoolhouse, but they do not receive the same professional merit or respect as medicine or law. One obvious contrast is the gender differences that exist between these comparisons, with law and medicine being mostly male dominated, much like the higher pay found in school administration. There also exists an ideological struggle (and evolution) between the NEA and the AFT has garnered public scrutiny for decades. Over previous decades, collective bargaining strategies have shifted between amicable negotiations to the extreme of organized strikes; the profession continually seeks a balance between teacher demands and public expectations. The public must perceive the teachers' status as white-collar professionals in order to support and approve and promote increased teacher pay. The incremental boosts in wages that unions have fought for over the years are beneficial, but the larger, symbolic wage increases have not been achieved. Teachers' pay expectations do not reflect the integrity and dedication equated with the professional status currently associated with the occupation.

Historical Trends

Based on the current results, collective bargaining appears to have had the greatest impact on teacher salary differentiation in their first part of its existence, and more specifically in the 1970s. In fact, no statistical relationship arises between collective bargaining and growth in teacher salaries in the last two decades included in the study's considerations. These findings reflect the larger trend of teacher union evolution and support the original hypotheses of a possible "ceiling effect" of union influence on teacher pay.

In my opinion, a closer study surrounding the historical events support the lack of finding any significant effect in the 1960s, namely, the passing of the laws and the rise of state teacher associations. Many identify the decade of the 1960s with an undeniable attention garnered by teacher unions. A majority of the national media spotlight focused on the 1960 New York teacher strike and the publicity that gave rise to nearly 300 other unions that followed. However, most initial activity occurred only in the major metropolitan areas where local labor unions strengthened the organization of teacher unions. The NEA lost several major elections to the AFT, but it remained powerful through its representation in both rural and non-urban areas (Murphy, 1990). In fact, the largest membership enrollments of the NEA occurred in the years 1972 through 1975 (US Census Bureau, 2005), where they experienced the only double-digit percentage increases in membership over the last seven decades. Because the current study focused on teacher salaries for all districts (state averages), it is more likely that the effect of collective bargaining at the state

level occurred much later than most district level studies due to the reluctance of unionizing in districts outside larger municipalities.

It seems that the NEA (and the AFT to some extent) began to wield its influence and organization at the state level in the 1970s. The 1970 NEA convention saw a drastic reorganization, creating a leaner, more strategic organization that shifted its focus from white collar to blue collar negotiation tactics. The NEA helped form the Coalition of American Public Employees, which proved that it can operate with other labor groups, a monopoly that the AFT enjoyed for a majority of its existence (Murphy, 1990). The NEA also improved the organization of its state level associations, which helped all districts within a given state to diversify its resources and spread unions overall influence. If the 1960s is viewed as the building period based on the membership spike, the 1970s could be considered the era when the machine began to run.

Beyond the education world, several social changes were also occurring that impacted teacher salary increases in the 1970s. Collectively, the United States was reeling from the empowerment of the Civil Rights movement. This movement not only produced a cohort of effective women leaders in union positions, it additionally fostered opportunities for leadership roles both in education and in policy making. The Civil Rights Act of 1964 that defined gender discrimination did not initially apply to educators until it was amended in 1972. Union's involvement in these issues showed its compassion, not just as an advocacy group for teachers, but bolstered a larger battle pitted against gender discrimination. Bargaining for better

wages would be best serviced if policy makers were more receptive and understanding (Ravitch, 1983). Two other factors were influencing the profession: a general decline in incoming teachers with academic achievement and a general concern in the quality of public education (Lanfkord & Wyckoff, 1997). These could contribute to the overall average pay, based on educational experience, and the public's willingness to support pay increases in a period of sharp inflation.

It is important to preface the professional advances of women with the perceived advances of racial equality, and the findings of this study are hesitantly optimistic that such gains were made. Results shows that from 1960 to 1980, for each percent increase in nonwhite teachers at the state level, teachers were paid approximately \$45 less. This becomes apparent when comparing similar social and economic characteristics of a state. Because this was a state level analysis, the difference should not be interpreted as nonwhite teachers being paid less than white teachers within the same district, but rather (when controlling for similar state demographic and economic characteristics), states that had greater diversity in demographic workforces tended to pay teachers less. It is less clear as to why these pay differences existed. Further qualitative or historical analysis would better serve the purpose of gaining insight into specific possibilities for these differences. However, in the current study, no significant relationship affecting racial inequalities was found in the years after 1980, concluding that race of the teacher population at the state level was no longer a significant factor in determining teacher salary variation.

Regional Differences

From the results, I found that collective bargaining strategies have had varied effects in different geographical regions. In fact, it appears that collective bargaining has had more of an effect in regions based on the types of bargaining provisions rather than the geographical location. Specifically, regions that adopted middle-of-the-road provisions, ranging in CBI values from approximately 4 to 21, tended to have the most impact on teacher salary differences. These values were indicative of states that either passed various policies allowing collective bargaining (such as meet and confer guidelines), or promoted collective bargaining but restricted some of the more liberal union tactics such as striking or agency shops.

Several plausible explanations may exist for the result of intermediate CBI values found in certain states. First, this study specifically examined teacher wages and the direct effects of collective bargaining. Teacher benefits and working conditions were not measured in this study. So, teacher unions may have had more of an effect in improving benefits and work conditions, despite a limited effect found on increasing teacher pay. Second, the regions that found a significant effect of collective bargaining provisions are geographically located between regions of significantly lower and higher pay regions. The first region, the South Atlantic Union region (TN, FL, MD, DE), falls statistically in between two border regions (New England and Southeast) where teachers are paid at significantly different rates when controlling for all other variables. Because the evidence exhibits some slight spillover effect, these four states may have served as a bridge between lower

(Southeast) and higher pay states (Middle Atlantic). Prior to collective bargaining, these states may have been teetering between two separate salary approaches for teachers. Unionization may have helped motivate these states to increase overall pay based on the regional differences. In other words, there may have been a gradual tendency to match teacher pay to the higher paying districts.⁷

A second explanation may be the various political implications regarding specific legislative decisions. In both regions, laws were passed to limit unionization, but statutes left power to delegate the managing of certain groups. In these regions, some states are considered “right to work states,” by allowing teachers to either choose to join the local union or not. There were restrictions placed on labor strikes, which is generally considered a labor union strategy for negotiation stalemates. In both regions, teacher unions would generally be regulated by stringent negotiation provisions versus a traditional worker picket like a traditional as historically observed in the auto industry or certain service sectors. This balance, as outlined by respective collective bargaining statutes, may have also helped refine the image of public school teachers, and ultimately, sway public approval for unionizing efforts. The general public seems comfortable with viewing teachers as individuals who commit to a moral cause, perform public service, and select teaching because of a “calling,” similar to the profession of the ministry. The image of teachers as a card-holding union member striking for better work conditions has consistently been

⁷ Models testing decade within region showed similar results to Question 2, with collective bargaining having a significant effect for time closer to the passage of collective bargaining, however, regional effects within decades was not fully developed for the current study.

negatively viewed. It is possible that collective bargaining provisions have helped foster the balance of unions approach and promote the organization of teachers, however, restrictions may temper hard-line negotiating tactics used in some of the industrial labor sectors.

General Conclusions about Collective Bargaining

Synthesizing these results leads to three formidable conclusions: 1) Collective bargaining has had an overall positive effect on teacher pay over the past 40 years, although its influence is apparently waning, 2) collective bargaining has had the largest effect on pay in the 1970s, and 3) collective bargaining has affected regions that have adopted compromised provisions, rather than an outright prohibiting or unduly adoption of teacher unions. In terms of reflecting on my original hypotheses, I initially conjectured that states considered “nonunion states,” have been consistently increasing teacher pay, closing in on the national average and making up for grounds stymied in the decades when teacher unions were first attempting organization. However results have not confirmed these hypotheses. The pay differences that exhibited between union and nonunion states prior to the 1960s remained largely unchanged. Figure 3 displays regressed values of teacher salaries, controlling for all variables and adjusting salaries to be constant at the dollar value for the year 2000, for both union and nonunion states. Plotting this over the 40 years of study, I found that there existed a general parallel relationship

between union and nonunion states. In order to thoroughly understand how these differences have changed over time, I then calculated the percent differences between the two, and again plotted them over the 40 years (See Figure 3 and Figure 4).

Two immediate conclusions can be drawn from these figures: 1) teacher pay has been on a steady but slow increase over the last 40 years in both union and nonunion states, and 2) the difference between the two salaries has slowly been narrowing since the 1970s. Studying the percentage differences, the largest pay difference between the two groups of states existed in 1960, a time when union states paid almost 11 percent higher than nonunion states, controlling for all other variables. Between 1960 and 1967, this difference decreased to almost 6 percent. In the 1970s, the pay difference increased to only about 9 percent in 1978, and then gradually (and quickly) declined back to 6 percent in 1987. In terms of collective bargaining, this data supports a “spillover effect,” which claims that districts or states that may not unionize or, benefit from neighboring districts or states that do unionize (Gallagher, 1978).

These “parallel” trends could invite explanations outside the “teacher union argument” presented in this study. Because union and nonunion states appeared to increase and decrease together, other factors that are acting on the profession may be contributing to the changes. These factors are driving the profession, regardless of teacher union existence. Such factors may be as overt as historical events such as war time or recession, or as covert as national perception of teacher pay. Although

this study is limited in its ability to present various hypotheses, including average salaries from other professions could provide a relative comparison for pay trends. For example, using state government employee salaries as a comparison, one may be able to understand if the slowdowns that occurred in the 1970s were indicative on public employees in general, or just teachers. Likewise, using other comparable professions that may be characterized by similar gender differences between worker and manager (such as nursing) may help to understand and interpret the gains in relation to the gender debate of teaching.

In terms of the trends from Figure 4, the increase in percent difference provides evidence that union states began to pay their teachers more, as much as 7 percent more than nonunion states toward the end of the 1970s. After 1980, nonunion states began to “catch up,” either because of the incremental salary gains made in union states, or because of a “cooling effect” of sudden teacher raises in union states. In the last twenty years, there has been no major shift in higher pay for union states, and in fact, the opposite appears to have occurred. Thus, union states do pay teachers more than nonunion states. However, these states have *always* paid teachers more, even before the advent of collective bargaining. This calls into question whether collective bargaining laws were the actual catalyst for the pay increases.

Factors Related to Teacher Salaries

As expected, three variables were the main contributors to the overall variance in increases in teacher salaries: teacher education, occupational experience, and work environment. Following the logic of the single salary schedule, almost every school district in the country uses the standard, stepped pay scale: teachers are paid incrementally, based on earned education credits and cumulative years of experience. Factors related to the work environment were equally important. Similar to the results found by other researchers such as Chambers (1995) and Stoddard (2005), teachers are paid more in proximity to larger cities. These three variables contributed to over 77 percent of the variation in teacher pay over the past 40 years.

Beyond these established factors, the results show that economic state capacity also contributes to a significant variation in teacher pay. Economics factors influence teacher salary variation more so than the social, demographic, or general education level of a given population segment. This follows that education is a compensated public service; that is, the more spending power a state has, the more it can pay for such services since state revenue is a function of wealth and tax effort (Goertz, 1998). As school funding inequity becomes closely linked with student achievement and opportunity, such a finding can bolster the argument that states either need to improve their overall funding of education or seek other means to supplement the funding. States have become the overseer of equity within their borders (Burbridge, 2002). Some states have eliminated local funding for education

and instead, turned to a state funding as a sole provider or monetary resources. Other states have eliminated local property taxes in order to evenly distribute funding throughout all its districts. Although these findings do not endorse either method, they support the fact that wealth and teacher pay are closely related, regardless of governmental entity (local or state).

Perhaps the most troubling result from the model was the impact of race on teacher pay, controlling for students enrolled in the federally subsidized Free and Reduced Lunch program. For every percent increase in nonwhite teachers, this study found a decrease in average pay of \$54. If you consider the border states of California or Texas, or southern states such as Georgia and the Carolinas, a greater amount of diversity exists among its teaching force. Based on the study's findings, this disparity may be quite significant. Because this is the first study that includes accounting for the race of teachers in a historical analysis, this disturbing finding necessitates performing additional research to investigate this result. A conclusive interpretation of these results would emphasize that nonwhite teachers are not paid lower than white teachers *within* the same state. Instead, states that have a higher number of nonwhite teachers are paid less, controlling for all other factors.

Factors Found Unrelated to Salaries

Two variables showed no statistically significant affect on teacher salary variation: the gender of teachers and the age of the voting population. After further review, I believe the insignificance was confined to the current organization of the

study, as opposed to any generalizations made on teaching salaries. One particular study, compiled data though by the Schools and Staffing Survey data concluded that the gender of teachers does have significant bearing concerning pay (Chambers, 1995). This finding raised speculation, since was based on a limited time frame, however, the question remains: are females paid inferior compared to males?

Initially, the immediate answer would be “no,” since according to a generic teaching salary schedule, it is impossible to vary pay on the basis of gender. Furthermore, one could argue that men have greater tenure than female teachers, so they would be paid higher according to their overall teaching experience. According to the current study, controlling for all such factors, there is still no immediate, relevant effect on teacher pay.

In order to accurately answer this inconsistency, I would argue that a study based on a smaller unit analysis, such as district or county, would more accurately address the discrepancy. A state level designs sample polls of all teachers from a particular state. This reduces the likelihood for units (in this case, states), to have wide variety of percent of the teaching workforce polled to be primarily female. In the current study, the average percentage of the teaching population was 69.8 percent female with a standard deviation of 1.2 percent across all 2,448 observations. At this level, there was limited variation among the states in order to compare differences. It would be more appropriate to contrast two districts with similar characteristics, but varying percentages of a gendered workforce.

The current study also found no evidence of an older population (percent of 65 years old) affecting teacher salary variation. The assumption follows that the older a districts population becomes, the less likely this age demographic would vote to support education spending increases. Consequently, this assumption indirectly limits potential increases in teacher pay. This powerful voting group has been shown to be less supportive of increased tax spending (Preston, 1984; Ward, 1988) and less likely to support tax increases (Miller, 1996). Burbridge (2002) shows the elderly population having a positive impact on spending for education but a negative impact on tax effort, which indirectly influences education spending. Yet, in this study, no effects were found between the elderly voting demographic and varying teacher salary differences.

The only reason that could potentially explain the statistical anomaly of this age populations' conservative education spending tendencies is a consistently increasing lifespan. Because this study covers a period over 40 years, the life expectancy in the 1960 was lower than in the year 2000. Statistically, a greater lifespan increases the population of citizens older than 65. Any gain in teacher salaries over the past 40 years varies concurrently with an increase in the percent of the population margin greater than 65 years old. In order to test this hypothesis, I would introduce test the model within a limited time frame in order to "cut off" any significant increases in population growth for percent of citizens over 65 years old.

LIMITATIONS AND FUTURE DIRECTIONS

Although the current study has a number of relevant and plausible strengths, it is important to understand the study's limitations. First and foremost, this study attempts to look at teacher salaries for 48 states over a 40-year time period. Various factors acting within states are not accounted for as well as the several factors acting on the economic variables or that define the labor relations within a state. Few quantitative studies can or should proclaim its accounting for all the social, economic, and political forces acting on states to produce such differences. As James (1991) states, "Cultural configurations, technological and economic development, professionalization, class conflict, social mobility, and crises such as wars and depressions" (p. 176), all contribute to the tug and pull of educational change, as well as educational funding. It is unlikely and unreasonable that a quantitative research could proclaim its accounting for all these factors using measures and scales to test interactions.

But this study still can act as a "first step" to understanding the trends and changes in teacher pay over time. It is the first of its kind to look at teacher salaries using a large scale historical database, with uniform measures and rigorous analytic examination of questions of interest. It also explains 92 percent of the variation in teacher pay, accounting for the primary variables of influence for economic social, demographic, and labor factors. If anything, it should be used as a platform for further quantitative and qualitative studies, in order to understand the various historical factors that are not being accounted for. Based on this study's uniqueness

in approach, I offer limitations plus areas where improvements could be made, some speaking more to a conceptual or theoretical improvement rather than one that is attainable with our current data collection.

Unionization versus Collective Bargaining

The conceptual difference of unionizing versus collective bargaining is crucial to understanding the parameters of this study. Based on the independent variable, I have studied the collective bargaining effects on teacher salaries, or the legal provisions that a state allows its teachers to organize its labor force. Although these provisions are critical for the allowance (and development) of teacher unions, it does not measure the activity of *unionization*, or the local activity that elicits new membership and ultimately feeds (both financially and representatively) the state and local organizations.

Unionization does not occur unless state laws permit collective bargaining; conversely, the reverse may not necessarily be true. States may bargain without local unions. In states that have permitted as well as prohibited collective bargaining, state level teacher associations have amassed a great deal of power by representing all teachers within a particular state. The result provides an impressive collection of combined voting power. Even if this representation is not formally established through dues or membership, these state level associations are

sometimes billed as one of the top legislative lobbying presences, influencing both written policy and policy makers.

In terms of the current study, this phenomenon poses challenges towards its ability to generalize the study's findings over the teacher unionization movement. Through the use of measuring political contributions, membership percentages, or possibly their lobbying presence, a criteria may be established for gauging the political presence of state associations. All of these variables (and the admission of additional variables), serve as legitimate methods to measure union presence in a given state, district or unit. Perhaps, once these variables are collected and controlled, states that have been traditionally considered "nonunion" may look and measure like states that are labeled "union." Thus, stating that collective bargaining has no significant impact on teacher salaries may imply neglect in accounting for the power and influence of state associations.

State level associations comprise another layer of teacher organization. Because they operate outside the collective bargaining and unionizing concept, they were not included in this study. These associations realize the necessity for voicing a presence at the state level--especially in states where pay is set up as a state level salary base with additional funding through local supplements. By omitting their presence in the current study may seem potentially deficient for drawing conclusions on the influence teacher unions. However, I could argue that state level associations are not considered unions. State level associations operate under a different dynamic than local teacher unions. Associations operate more subtle in

accordance with the strategies associated with white collar professionalism-- influencing policy through special interest politics. The strength of the local labor approach involves the unified decision making of its members. They resort specifically on the ability to cancel production if they are not in accord with the firm's policies. Schools are not a separate entity from the community as may be the case with a firm or company. The leverage derived from shutting down a school may be beneficial in the short term, but this tactic can create rifts within the local community. Instead, the bargaining process may be best served when organized as through an association either at the state or local level.

This study confirms that the legal framework governing collective bargaining has had a limited affect on teacher salary variation. As Figure 3 shows, the differences between teacher pay in union versus nonunion states has not changed much over the past 40 years. Comparatively, when measuring the percent differences, salary gaps between union and nonunion states actually diminished. Future research could potentially determine the influence of teacher associations versus collective bargaining in order to draw additional comparisons.

Benefits and Work Conditions

Teacher unions do not narrow their bargaining power to negotiating wages and salaries. As demonstrated through the literature review, unions have served to draw considerations surrounding working conditions and employee benefits.

Benefits, including health insurance, comprise an important aspect of compensation, and one could argue that teacher pay should include health coverage as an integral part of measuring overall pay (Eberts & Stone, 1987). In terms of examining working conditions, the issue becomes more abstract to study quantitatively. It may include the number of different classes on a teacher's workload which can substantially increase a teacher's workload. Unpaid duties such as cafeteria or bus supervision cannot be measured as a component of teacher pay, but their existence improves the overall working and learning environment. At times, teacher unions regulate how and when additional responsibilities beyond instructional duties are assigned to staff members. Strictly measuring salaries may not capture the overall benefits or responsibilities of working conditions within a state or district that has unionized pay.

Although future studies will need to examine other key indicators, we know that pay and benefits are correlated (Barro, 1993). Consequently, findings may expose similar relationships amongst benefits and pay as illustrated between relating collective bargaining and pay. Drawing from the literature, it appears that teacher unions facilitated dialogue about various work condition issues, such as the number of preps assigned or unfair staff transfer policies. Unions helped break through the impasse that existed long before collective bargaining (Fuller, Mitchell, & Hartman, 2000; Hannaway & Rotherham, 2006). These issues leached into districts and states that either prohibited collective bargaining or had not adopted the union approach. This study does not include potential improvements in work

conditions, mostly due to the individual subjectivity in measuring for these changes. To remain consistent, the study draws conclusions on the quantifiable relationships between pay and collective bargaining.

Comparable Wages

Considerable debate arises concerning the implications of “comparable professions” when contrasting teacher salaries to other professions. Wage rates and labor market conditions in comparable professional and white collar careers are likely to figure prominently in relation to any empirical explanation of teacher salary levels (Barro, 1993; Stoddard, 2005; Taylor & Keller, 2003). For example, many male teachers left the profession in the early 1900s to seek better wages (Elsbree, 1941). Women would experience similar professional opportunities almost a half a century later. In the last thirty years, females have competed within an ever-expanding array of occupational prospects previously available only to men. This permeated the primarily exclusive pool (unfortunately based on discrimination nonetheless) of female teacher candidates. In terms of skills, the occupational job market pays a premium for those with a knowledge base in math and sciences. The demand has resulted in a depletion of qualified candidates possessing the background deeming persons ‘qualified’ to teach the subject material.

These criticisms are often misunderstood due to using comparable wages to *adjust for* or *control against* the dependent data of teacher salaries. The first method, using comparable wages for adjusting teacher wages, is statistically sound but

theoretically problematic. If a comparable profession, defined by requiring the same qualifications and general experience as teaching were to be paid differently in one region versus another, then teacher salaries would be adjusted in order to control for this difference. Because professions in a market economy seek better wages and working conditions for its employees, differences in a non-teaching profession will help control for the pay differences in a teaching profession. To further understand how this consideration affects adjustments, the following mathematical example (albeit hypothetical), is depicted. Comparing teacher salaries in two different regions averaging \$45,000 and \$50,000 respectively, the difference will be compared to the average salaries of comparable professions, which for example, would be \$50,000 and \$75,000. Despite teachers making \$5,000 more in the second region, this will be adjusted (probably lower) because in relation to the salaries of the comparable profession, teachers are paid substantially lower. Thus, using other typical cost of living adjustments such as rent prices, the Consumer Price Index, and other economic factors, the adjusted salaries for teachers in the second region may be less than the teachers in the first region (Chambers, 1981). Adjusting teacher salaries based on the criteria of comparable wages has been used in previous wage studies (Stoddard, 2005; Taylor & Keller, 2003).

Using comparable wages is relevant to outlining teacher wage research, but not as a means for adjusting salaries. The mere definition of comparable profession implies that the same market forces acting on teaching are acting collectively on these careers. This extrapolation resides on the implausible assumptions that two

different profession parallel trends in terms of competition, equilibrium, and mobility in the labor market. By adjusting for comparable wages across two different regions, this assumes that the factors resulting in the wage differences are comparable (Goodson, 2003). More often than not, teaching is a public sector job which resists many private sector market trends (Gyurko & Tracy, 1991). Although teacher wage increases are subject to economic trends such as inflation rates and supply and demand theory, the teaching profession, surrenders itself to the availability of adequate revenue funding, strong community support, and positive public image. For these reasons, adjusting teacher salaries by controlling for wages in “comparable professions” is inherently flawed.

The better application of comparable wages should be used as a factor contributing to wage trends, rather than in an adjustment index. The use of comparable wages as a proxy for the cost of teachers rests implicitly on the theory of intersector competition for labor and intersector wage (Barro, 1993). The teaching profession continually competes with other professions for workers. If the wages for other professions are considerably high in one particular area, teaching opportunities in that region must also be lucrative enough to recruit eligible candidates. This should not be interpreted as teacher salaries being comparable to other professions, but rather teacher salaries must be consistent enough compared to the teacher salaries in other districts. Although some findings have tried to separate the idea that teachers are motivated by monetary rewards (Borgersrode, 1942; Herzberg, Mausner, & Snyderman, 1959), more recent studies have better defined

the relationship between teachers and salaries. Teacher pay may not be a recruiting motivator, but it does influence decisions on entering the profession (Jenkins, Mitra, Gupta, & Shaw, 1998; Odden & Kelly, 1997), the ability to work in difficult school conditions (Einhorn, 2001; Frase, 1992), and decision to leave the profession (Murnane & Olsen, 1990).

The difficulty in determining comparability resides with what professions to include in such a contrast. "Comparable professions," based on similar years of training and educational levels have been defined from careers ranging from accounting to nursing. There is a tendency to over-generalize these comparisons. Nursing has been used as a comparable profession because it, like teaching, was one of the few professional opportunities open to women prior to the 1960s. Accounting has been used as an effort to match careers of similar professional status, although again, these comparisons have little if any theoretical basis or occupational similarity. Other methods include grouping several professions' salaries, using only manufacturing wages (since they too are unionized), and even comparing private sector teaching salaries. Although all methods seem to present as many benefits as hesitations in some instances, most literature agrees that such a comparison be made, based on economic theory; however, this aspect falls short of defining the control group.

In terms of teacher salaries, perhaps a future inquiry would look at the gains made of a similar class of compensated employees, state government workers. This would be integrated in a comparison of salary differences rather than absolute value

comparisons. State workers include all levels of professional status, and do not encapsulate one group that is similar to teachers. But the trends and growth that state workers' experiences could be a proxy for better understanding the trends in the teaching profession. If the gains found in teacher pay mirror that of state governmental employees, than this may be attributed more to the overall economy rather than something specific within education. Or, if the teacher associations are shown to be closely aligned with state worker associations, these gains may show a larger effort by public worker unions to work together in influencing higher pay. Unlike other limitations, state governmental pay and collective bargaining laws do exist for the time period of study, and could aid in analyzing how isolated or parallel the teacher pay trends are to the larger publicly compensated professions.

Including Private Schools

Although this study does include charter school teachers and all teachers working in public schools it does not account for the large number of private school teachers working across the country. The exclusion of private school teachers was omitted for two reasons: 1) it is unclear as to how the unionization movement has impacted private school teachers, and 2) the private school system is loosely connected, in terms of organizational structure and culture. Private school teacher salaries do not follow the same factors as public school pay. They are not dependent on local tax money or public support. Financially, compensation is often generated independently, and their success is more in part to their overall enrollment and

customer base. In fact, it could be argued that in order to appropriately study private school wages, one would need to account for a variety of other economic factors that are not relevant to this study.

Despite this decision, because the study does not include private schools, these findings cannot be generalized to this type of teacher profession. Future studies could use private school teacher pay as a comparison for public school pay. This comparison could be used to better understand the long term trends of teacher pay, but I would argue that a district or even state level approach may be problematic. I would propose that national averages should be used in order to aggregate the collective whole, since private schools are organized quite different in terms of socioeconomic accessibility.

Measuring Political Influence

The findings from this study suggested that there was little if any impact for political effect. For example, the study found no effect of political solidarity, defined by one party control across state House, Senate, and governor's office. It also found no effect between the population over 65 and increases in teacher pay based on the previously mentioned reasons. For future analysis, two improvements should be made in order to better understand how the political effect may help drive or suppress teacher pay. First, I would propose looking beyond the political party solidarity, and instead looking at the individual states' approaches to developing policy. There are several competing groups for state and local funds, and although

it is generally assumed that the Democratic Party generally supports education funding increases, the ideology of the state, and its citizens, is not consistent across all states. The voting patterns and the ideology of the policy makers and citizens may be more important than their political party affiliation. For example, several southern states have had voted in Democratic governors and state legislatures, but in some states, the ideology may be very conservative (Berry, Ringquist, Fording, & Hanson, 1998).

Beyond ideology, there also exists a culture that varies among states (Marshall & Gerstl-Pepin, 2005). “These political cultures are not defined by borders but by traditions” that can predominate beyond the simple political party label (p. 169). The difficulty in including these cultures over the current study is the appropriate label applied. Although not often, state culture may change, especially considering the longitudinal nature of the study. Also, this state culture may be defined more by the issue than the service. To further improve the measure of state culture, Marshall et al. (1989) suggest including the state’s underlying public values taken defined by the several political actors, legal provisions passed within a state, and other stakeholders of influence. In terms of the current study, it is unlikely that the collective bargaining provisions were passed and enforced under the same culture and value system, despite a parallel in the scope of bargaining.

Despite the limitations in using ideology or state culture, specifically on the comprehensive data collection needed to account for culture and public values, I would propose that both methods can better capture the political effects on teacher

differences. In terms of applying these approaches to methods similar to the current study, it is advised to limit the time period to one that can account for state influence defined by Marshall et al. in order to better control for differences that may occur over time within a state.

CONCLUSIONS

Findings from the current study provide new ways to understand where and how the legal provisions of collective bargaining have impacted teacher pay from 1960 to 2000. Based on the results, it is apparent that gains in teacher pay were positively impacted by collective bargaining provisions soon after they were passed as well as in certain areas of the country. Also, there is evidence to suggest that states with collective bargaining provisions beyond just “no provisions” but short of a full prescription of legal allowances, tends to show the most progress in teacher pay, when controlling for all other variables. Finally, teacher pay, regardless of union or nonunion states, has experienced a parallel and gradual increase over the past 40 years. It is apparent that union states pay teachers significantly higher than nonunion states; however, this difference has remained steady across all years, even prior to collective bargaining. The ability for nonunion states to stay with the increases in union states might be evidence for the strength of state associations to pressure the state to keep pace with unionized states or it could be evidence of a

larger and slower, uniform increase of professional pay that invites a host of other players, factors, and social trends.

In terms of how these findings can best be used for policy, my enthusiasm for the innovation and rigor of these findings, as well as the utilization of rich methodology and newly available Census data on teachers, must be tempered with the expansiveness of the study. I must respect what James (1991) calls, “the elusive dream” of political researchers, who seek to collect predictors and categorize influences in order to influence the policy making process. These findings can be part of larger effort to improve what we know about teacher pay, by understanding the complexities of educational change and accounting for these changes utilizing both quantitative and qualitative approaches. I also must recognize the politically charged nature of teacher unions, and hope that such findings not be ill-used for this debate. Although it is my firm belief that research (regardless of approach) is the best tool for understanding change, I hope that this study adds to the rigor of the methods and lenses we use to study teacher salaries, in hopes that soon, we will better understand how teacher compensation has changed over time.

Table 1: Research Questions for Current Study

Questions	
Question 1	How do the collective bargaining laws affect teacher pay in the last 50 years, after controlling for the influences of social and economic forces?
Question 2	How do the collective bargaining laws affect teacher pay in the last 50 years, after controlling for the influences of social and economic forces?
Question 3	How does the influence of collective bargaining laws on teacher pay, controlling for social and economic forces, differ by region of the country over the past 40 years?

Table 2: Variables used in Current Study and Sources for Data

Category	Variable	Source
<i>Dependent</i>	Average Teacher Salaries	US Census (rate of increase from National Education Association)
<i>Labor</i>	Collective bargaining provisions	Valletta and Freeman (1988), Rueben (email commun., 2007)
<i>Teacher Statistics</i>	Experience	IPUMS (2006)
	Education	IPUMS (2006)
	Place of work (Metropolitan)	IPUMS (2006)
	Race	IPUMS (2006)
	Gender	IPUMS (2006)
<i>Economics</i>	Revenue	US Annual Statistical Abstracts
	Expenditures Total	US Annual Statistical Abstracts
	Expenditures on Education	US Annual Statistical Abstracts
	Per Capita Income	US Annual Statistical Abstracts
	Per Pupil Expenditure	US Annual Statistical Abstracts
	Cost of Living Index	Historical Cost of Living Index (Berry et al, 2000)
<i>Social</i>	Percent with Bachelor's	US Census
	Percent of 5 - 17 year olds enrolled in school	US Annual Statistical Abstracts
	Free and Reduced Lunch enrollment	US Annual Statistical Abstracts
<i>Political</i>	State Party Control	T. Storey, National Council of State Legislatures (email commun., 2007)
	Population over 65	US Census

Table 3: Descriptive Statistics for Dependent and Independent Variables

	Mean	Standard Deviation	Number of Observations
Teacher Salaries (in 2000 dollars)	\$32,298	\$5,273	1,968
Collective Bargaining Index	15.7	19.3	2,448
Teacher Age (years)	40.34	1.93	2,448
Teacher Educational Attainment	3.18	0.21	2,448
Teacher Race - Percent White	90.7	9.71	2,448
- Percent Black	7.98	9.91	2,448
Teachers in Metro Area (percent)	41.8	23.1	2,448
Population over 65 (percent)	10.7	2.26	2,448
Bachelor's (percent)	13.7	6.33	2,448
High School Diploma (percent)	59.0	17.0	2,448
Education Expenditures K-12	\$3.88 x 10 ⁹	\$4.74 x 10 ⁹	1,968
Per Pupil (in 2000 dollars)	\$4,602	\$1,985	1,968
Income per capita (in 2000 dollars)	\$19,743	\$5,580	1,968
State Spending on Education K-16 (percent)	35.0	8.93	2,400
State Revenue per Capita (in 2000 dollars)	\$2,278	\$922	1,968
Percent Enrolled 5 - 17 years olds	87.9	6.55	2,448
Free and Reduced Lunch (Percent)	50.9	17.4	2,304
State Party Control (Democrat = -1; Split = 0, Republican = 1)	-0.16	0.70	2,448

Table 4: Correlations among Variables of Interest

	1. Teacher salaries	2. Teacher experience	3. Teacher education	4. Teacher Race (Nonwhite)	5. Teacher in metro area	6. Education expenditures	7. State revenue	8. F/R Lunch	9. CBI
1. Teacher salaries	1								
2. Teacher experience	.267**	1							
4. Teacher Race (Nonwhite)	-.046*	-.106**	-.030	1					
5. Teacher in metro area	.389**	.148**	.162**	.096**	1				
6. Education expenditures	-.045*	-.102**	-.063**	-.167**	.232**	1			
7. State revenue	.609**	.347**	.256**	-.036	-.166**	-.552**	1		
8. F/R Lunch	-.076**	-.186**	.279**	.381**	-.394**	-.338**	.345**	1	
9. CBI	.422**	.085**	.464**	-.257**	-.055**	-.136**	.413**	.178**	1

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 5: Question 1: Baseline Model

Dependent Variable: Teacher Salaries	Model 1		Model 2		Model 3	
	β	Z	β	Z	β	Z
Teacher Age (years)	534.89	2.32*	61.44	0.45	74.65	0.55
Teacher Educational Attainment	16067.77	5.95***	6069.21	4.35***	5862.69	4.24***
Teachers in Metro Area (percent)	7837.43	4.74***	9452.21	8.15***	9449.38	8.45***
Teacher Race (Percent Nonwhite)			-6685.58	-2.84**	-5423.60	-2.39*
Percent of State Education Expenditures			6100.05	4.55**	6171.07	4.62***
State Revenue per Capita			3.72	10.99***	3.67	11.27***
Free and Reduced Lunch (Percent)			493.22	0.37	231.82	0.18
Collective Bargaining Index					39.70	2.49*
Collective Bargaining Index (squared)					-.774	-2.45*
R²	.7774		0.9273		0.9252	
Wald X²	118.33***		346.46***		370.64***	

Table 6: Question 2: Twenty Year Comparisons

Dependent Variable: Teacher Salaries	1960 - 1980		1980 - 2000	
	β	Z	β	Z
Teacher Age (years)	-143.17	-1.28	961.41	4.39***
Teacher Educational Attainment	5106.66	3.66***	4763.03	2.84**
Teachers in Metro Area (percent)	11711.09	7.78***	5026.44	5.70***
Teacher Race (Percent Nonwhite)	-4491.27	-2.53*	3291.90	1.18
Percent of State Education Expenditures	6294.02	4.15	8374.10	3.61***
State Revenue per Capita	4.18	8.43**	2.46	6.63***
Free and Reduced Lunch (Percent)	-137.21	-0.11	-2345.82	-1.19
Collective Bargaining Index	37.88	2.33*	47.02	2.03*
Collective Bargaining Index (squared)	-1.00	-2.65**	-.798	-1.78
R²	.9606		0.9637	
Wald X²	327.31***		259.95***	

Table 7: Question 2: Decade Effect

Dependent Variable: Teacher Salaries	1960s		1970s		1980s		1990s	
	β	Z	β	Z	β	Z	β	Z
Teacher Age (years)	-339.99	-3.90***	511.11	4.24***	1094.81	6385***	362.22	1.95*
Teacher Educational Attainment	4972.95	6.48***	2605.37	1.52	7050.44	3.15**	9545.50	4.27***
Teachers in Metro Area (percent)	7775.32	8.56***	8978.32	7.57***	3216.67	3.05**	4184.45	4.75***
Teacher Race (Percent Nonwhite)	-4999.00	-5.43***	3170.71	1.52	1970.72	1.03	13460.19	7.14***
Percent of State Education Expenditures	7486.20	5.01***	11134.52	4.97***	4648.33	1.65	14798.12	5.12***
State Revenue per Capita	5.66	12.38***	3.61	7.52***	3.63	15.61***	3.33	10.99***
Free and Reduced Lunch (Percent)	-1168.72	-0.73	-6636.93	-5.48***	-4546.53	-2.06*	-5422.85	-2.99**
Collective Bargaining Index	28.10	1.35	29.62	1.42	-1.23	-0.06	75.64	3.08**
Collective Bargaining Index (squared)	-.9720	-1.61	-.9648	-2.14*	-.3513	-0.77	-.7570	-1.81
R²	.9823		0.9903		.9843		0.9899	
Wald X²	1044.48***		519.89***		403.13***		259.18***	

Table 8: Hypothesis 3: Regional Effect - Northeast

Dependent Variable: Teacher Salaries	New England		Middle Atlantic	
	β	Z	β	Z
Teacher Age (years)	-68.80	-0.35	-856.89	-3.84***
Teacher Educational Attainment	2535.51	-0.67	-9039.76	-2.68**
Teachers in Metro Area (percent)	3551.66	2.69**	2887.32	1.91
Teacher Race (Percent Nonwhite)	58685.00	2.14*	-106168	-5.51***
Percent of State Education Expenditures	5951.06	2.15*	13172.88	4.18***
State Revenue per Capita	3.63	6.61***	10.69	16.17***
Free and Reduced Lunch (Percent)	-3581.91	-1.52	-3443.85	-0.79
Collective Bargaining Index	114.93	1.61	157.45	1.84
Collective Bargaining Index (squared)	-2.54	-1.54	-3.33	-1.83
R²	.8257		0.9787	
Wald X²	169.86***		809.40***	
CBI (Mean)	26.4		25.1	

Table 9: Hypothesis 3: Regional Effect - South

Dependent Variable: Teacher Salaries	East South Central		South Atlantic A		South Atlantic B		West South Central	
	B	Z	β	Z	β	Z	β	Z
Teacher Age (years)	-213.89	-0.49	-9.8771	-0.06	29.62	0.14	-1297.48	-5.70***
Teacher Educational Attainment	2553.30	0.51	8499.19	2.16*	16937.62	4.63***	-4551.38	-1.22
Teachers in Metro Area (percent)	11902.1	3.63***	17282.53	9.47***	14258.97	7.73***	12461.37	5.40***
Teacher Race (Percent Nonwhite)	-6884.67	-1.65	-13693.83	-3.90***	-29901.53	-3.59***	-10130.26	-1.80
Percent of State Education Expenditures	8595.22	1.66	10093.6	2.88**	6700.96	1.81	12407.71	2.98**
State Revenue per Capita	3.70	-1.65	3.83	6.88***	4.03	8.13***	5.17	9.89***
Free and Reduced Lunch (Percent)	2344.65	0.89	4996.09	2.42*	525.21	0.25	-5323.45	-2.18*
Collective Bargaining Index	144.70	2.02*	92.11	3.21**	-195.35	-3.06**	-46.36	-0.68
Collective Bargaining Index (squared)	8.54	0.75	1.03	0.15	4.47	2.71**	-5.10	-0.60
R²	0.8150		0.9451		0.9266		0.9661	
Wald X²	586.01***		502.72***		505.51***		252.74***	
CBI (Mean)	-1.67		-0.79		20.63		1.71	

Table 10: Hypothesis 3: Regional Effect – Midwest

Dependent Variable: Teacher Salaries	West North Central		East North Central	
	B	Z	β	Z
Teacher Age (years)	-7.90	-0.04	-39.28	-0.32
Teacher Educational Attainment	1202.65	0.67	5937.19	3.19**
Teachers in Metro Area (percent)	8202.20	4.37***	6856.91	3.83***
Teacher Race (Percent Nonwhite)	21648.42	2.43*	12137.22	2.93**
Percent of State Education Expenditures	1560.51	0.61	12577.97	4.17***
State Revenue per Capita	1.97	3.81***	6.07	14.90***
Free and Reduced Lunch (Percent)	2891.95	1.38	-9013.97	-3.82***
Collective Bargaining Index	51.24	1.55	70.39	1.50
Collective Bargaining Index (squared)	-0.84	-1.20	-1.75	-1.89
R²	0.8623		0.9389	
Wald X²	96.62***		403.10***	
CBI (Mean)	21.0		22.8	

Table 11: Hypothesis 3: Regional Effect - West

Dependent Variable: Teacher Salaries	Mountain A		Mountain B		Pacific	
	B	Z	β	Z	β	Z
Teacher Age (years)	337.29	2.68**	1946.56	4.83***	-390.48	-1.28
Teacher Educational Attainment	5627.47	1.57	19572.81	3.18**	14997.60	5.04***
Teachers in Metro Area (percent)	5137.21	3.34**	-6256.15	-2.18*	14349.14	4.81***
Teacher Race (Percent Nonwhite)	15305.91	1.33	52493.10	1.89	-5501.42	-0.73
Percent of State Education Expenditures	14162.24	4.08***	-1488.00	-0.30	3229.34	0.63
State Revenue per Capita	3.23	9.49***	1.54	1.96*	6.69	11.16***
Free and Reduced Lunch (Percent)	4409.69	1.41	-6071.18	-1.57	-12022.57	-3.53***
Collective Bargaining Index	-271.45	-1.76	68.44	1.41	89.86	1.46
Collective Bargaining Index (squared)	43.74	2.46*	-1.18	-1.20	-2.13	0.08
R²	0.9727		0.7894		0.9649	
Wald X²	241.98***		132.11***		412.81***	
CBI (Mean)	3.88		24.1		28.7	

Figure 1: Theoretical Framework: General Model of Study

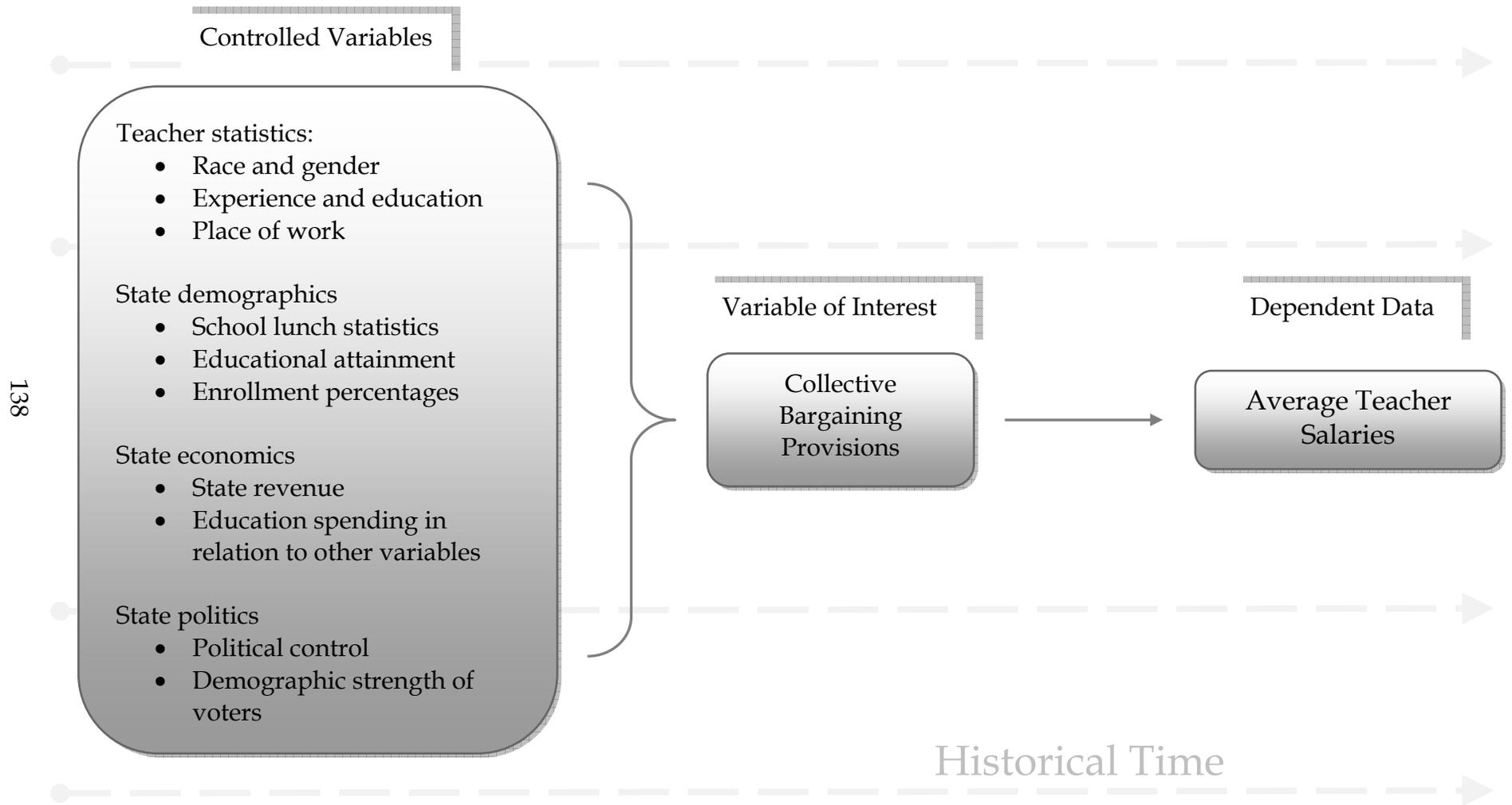


Figure 2: CBI Index For States: Average Index from 1960 to 2000

- CBI Index: -10 to 0 (No/Few Provisions allowed)
- CBI Index: 1 to 20 (Some provisions allowed)
- CBI Index: 21 to 55 (Several provisions allowed)

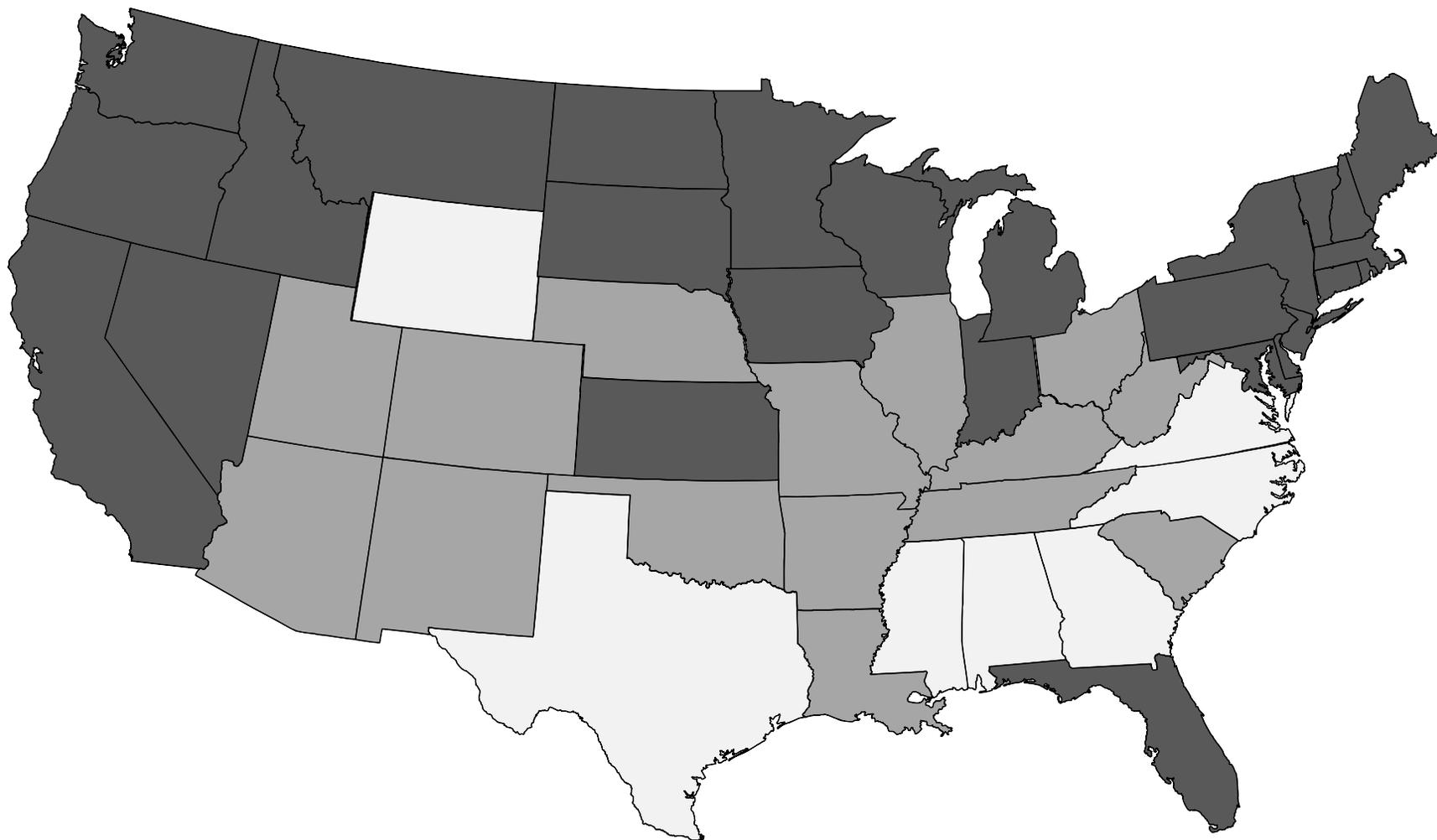


Figure 3: Regressed Teacher Salaries for States by Collective Bargaining

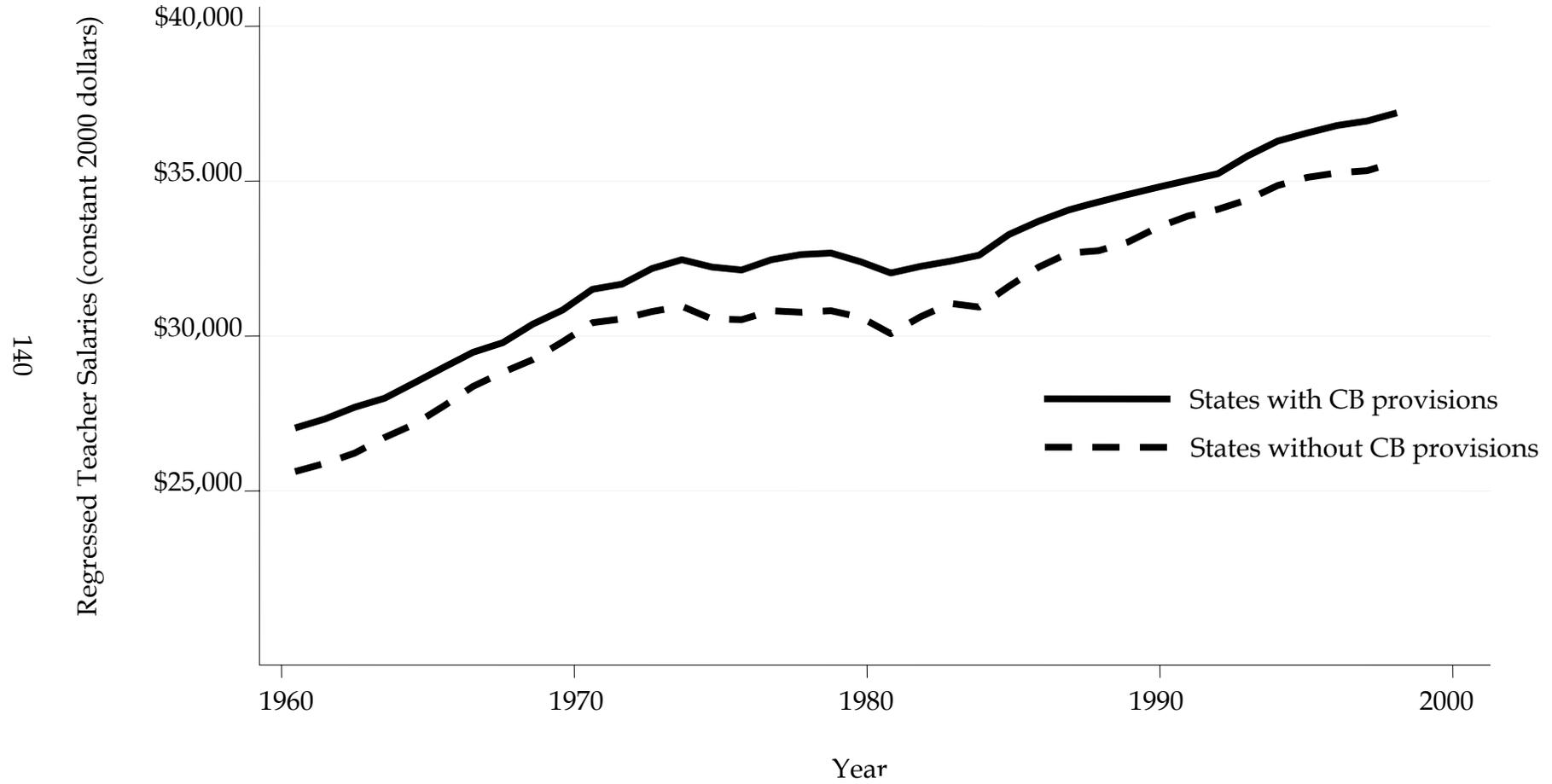
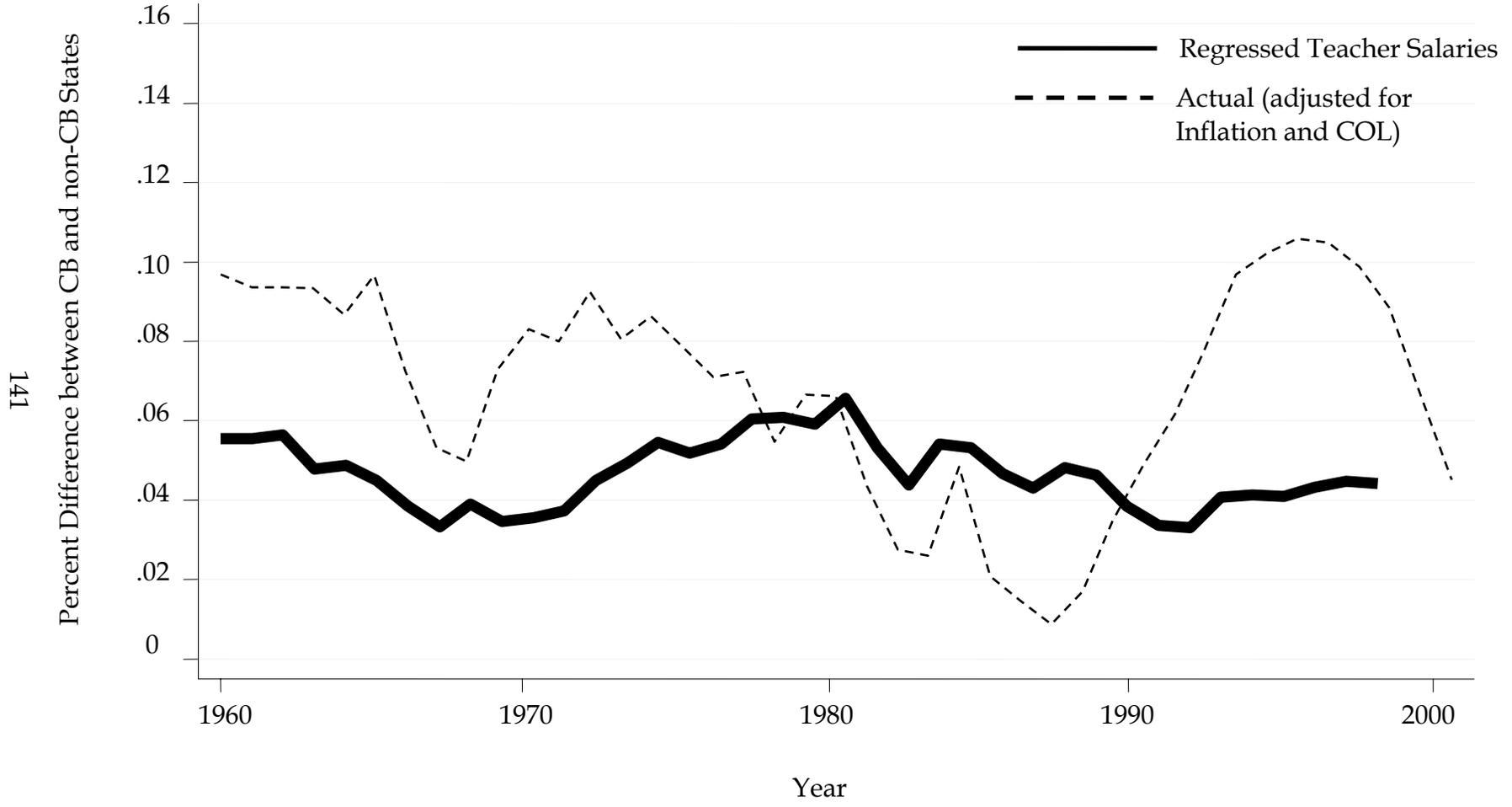


Figure 4: Regressed Teacher Salaries for States by Collective Bargaining Percent Difference



Appendix A:

Collective Bargaining Index

Collective Bargaining

- 1 Collective bargaining prohibited
- 0 No provision
- 1 Employer authorized but not required
- 2 Right to present proposals
- 3 Right to meet and confer
- 4 Duty to bargain (implied)
- 5 Duty to bargain (explicit)

Strike Policy

- 2 Prohibited with penalties specified
- 1 Prohibited with no penalties (discretion of court)
- 0 No provision
- 1 Permitted with qualifications

Right to Work

- 0 Has "right to work" laws applying to teachers
- 1 Has no "right to work laws" applying to teachers

Union Scope

- 0 No provision
- 1 Excludes compensation
- 2 Includes compensation

Election provisions

- 0 No provision
- 1 Nonexclusive allowed or required
- 2 Exclusive; petition and election procedure not specified
- 3 Exclusive; petition and election procedure specified

Election Terms

- 0 No provision
- 1 Any time after certification
- 2 At least 12 months since last election
- 3 At least 12 months since last election and previous collective
- 4 At least 24 months since last election

Agency Shop

- 1 Agency shop prohibited
- 0 No provision
- 1 Agency shop negotiable
- 2 Agency shop compulsory

Union Dues

- 0 No provision
- 1 Dues check-off negotiable
- 2 Dues check-off compulsory

Union Shop

- 1 Union shop prohibited
- 0 No provision
- 1 Union shop negotiable

Union Mediation

- 0 No provision
- 1 Voluntary
- 2 Discretionary
- 3 Mandatory

Union Fact Finding

- 0 No provision
- 1 Voluntary
- 2 Discretionary
- 3 Mandatory

Arbitration Available

- 1 Specifically prohibited
- 0 No provision
- 1 Voluntary
- 2 Discretionary
- 3 Mandatory

Arbitration Scope

- 0 No provision
- 1 Issues other than compensation
- 2 All negotiable issues

Arbitration Type

- 0 No provision
- 1 Conventional
- 2 Final offer - Issue basis
- 3 Final offer - package basis
- 4 Any of these types may be used

Appendix B:

Regional Coding based on US Census and Collective Bargaining Index

Regional Classification	States
Northeast: New England	CT, ME, MA, NH, RI, VT
Northeast: Middle Atlantic	NJ, NY, PA
Midwest: East North Central	IN, IL, MI, OH, WI
Midwest: West North Central	IO, KS, MN, OK, NE, ND, SD
South: South Atlantic A	GA, NC, SC, VA, WV
South: South Atlantic B	TN, FL, MD, DE
South: East South Central	AL, KY, MS,
South: West South Central	AR, LA, TX, MO
West: Mountain A	AZ, CO, NM, UT, WY
West: Mountain B	ID, MT, NV
West: Pacific	CA, OR, WA

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