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Maria D. Fitzpatrick
Cornell University

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Intergovernmental (Dis)incentives, Free-Riding, Teacher Salaries and Teacher Pensions *

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Maria D. Fitzpatrick
Cornell University and NBER
email: maria.d.fitzpatrick@cornell.edu

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ABSTRACT

In this paper, I document evidence that intergovernmental incentives inherent in public sector defined benefit pension systems distort the amount and timing of income for public school teachers. This intergovernmental incentive stems from the fact that, in many states, local school districts are responsible for setting the compensation that determines the size of pensions, but are not required to make contributions to cover the resulting pension fund liabilities. I use the introduction of a policy that required experience-rating on compensation increases above a certain limit in a differences-in-differences framework to identify whether districts are willing to pay the full costs of their compensation promises. In response to the policy, the size and distribution of compensation changed significantly. On average, public school employees received lower wages largely through the removal of retirement bonuses. However, the design of the policy led some districts to increase compensation, rendering the policy less effective that it might have otherwise been.

JEL Classification Codes: H75, H72, H77, J26, I21, I28,

Key Words: Intergovernmental Incentives, Teacher Compensation, Teacher Retirement

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Maria Fitzpatrick, Department of Policy Analysis and Management, Cornell University and NBER. Mail: 103 Martha Van Rensselaer Hall, Ithaca, NY 14853. Email: maria.d.fitzpatrick@cornell.edu Phone: (607) 255-1272.

Introduction

In recent years, much attention has been paid to the relatively large fractions of their lifetime income that public sector employees receive in the form of deferred compensation, like back-loaded salary increases and retirement benefits. This is particularly true of teachers, whose wages increase quite significantly at the end of their careers, despite a lack of agreement amongst researchers about whether quality also increases over this period (Papay and Kraft 2011; Wiswall, 2011; Clotfelter etal. 2006; Rivkin, Hanushek and Kain, 2005; and Rockoff, 2004). Also drawing attention to teacher pensions is the fact that some teacher pension benefits provide retirees with income replacement rates over 85 percent, making retirement benefits much more generous than, for example, the median Social Security benefit (Wu et al. 2013).

Despite the growing interest, relatively little is known about why these deferred compensation mechanisms are used so heavily in the public sector. Both pensions and end-of-career-salary increases have a discontinuous nature, which, because productivity is unlikely to change discontinuously at high levels of experience, makes it doubtful that the increases are driven by increases in employee productivity. One oft-cited theory motivating such deferred compensation in the private sector is that high end-of career salaries encourage effort by giving employers leverage to discontinue the contract before the high payoff occurs in occupations where monitoring is imperfect or costly (Lazear 1979). That is unlikely to be the case in public school systems today where employees are protected by tenure after just a few years on the job. Another theory is that this compensation structure attracts the best employees, but recent work has shown that employee preferences cannot be used to motivate generous end-of-career wages and pensions (Fitzpatrick 2014). This suggests focus on other theories, most of which involve the political nature of public employee wage determination. In the current paper, I focus on one

such potential explanation: intergovernmental incentives distort the true costs to school districts' taxpayers of back-loading salaries for their employees.

Intergovernmental grants and incentives are often used to promote equity across local jurisdictions. However, local governments may respond to grants or incentives from a higher-level government in ways that were not intended by the granting agency. Existing literature examines the extent to which local governments respond to intergovernmental grants (Feldstein 1978; Knight 2002; Gordon 2004; Baicker and Staiger 2005; Brooks and Phillips 2010; Lutz 2010; Cascio et al. 2013). Generally, this work finds that intergovernmental grants increase local spending on the subsidized good, at least in the short run, though there are examples where this is not the case. The current work complements the previous literature in a number of ways. First, while the existing literature is largely focused on grants from the federal to state or local governments, I examine the link between state and local governments decision-making.

Second, the setting of teacher compensation is not one of grants per se, but rather of an incentive. In this setting, distortion of the behavior of local government results from the structure of public employees' compensation streams. In all but one state in the U.S. employees participate in some form of defined benefit pension system, in which pension benefits paid to employees are based on the employees' end-of-career salaries. In most of these states, the salaries of teachers are determined at a local level by the district. But, in 22 states where salaries are set at the local level, the required employer contributions to the pension fund are not fully "experience-rated" to take into account the full costs of pension benefits resulting from end-of-career salary differences across districts (Loeb and Miller 2007).[1]

[1] These states include many of the largest and many of those with the most underfunded pension liabilities: CA, CO, FL, GA, ID, IL, IA, KY, MA, NB, NM, ND, OH, OK, SC, SD, TX, UT, VT, WV, WI and WY.

Given this structure of the pension systems, there is a large return to the employee of an extra dollar of salary at the end of her career relative to just a bit earlier in her career because she will receive an increased annual retirement benefit (which she receives at least from the time she retires to the end of her life). Ignoring stickiness in wages, the cost to the district of an extra dollar of salary at these two different points is relatively similar, making the district (or its administrators) relatively indifferent to the timing of the salary payments. However, if the district were forced to internalize the cost of the salaries that count toward retirement benefit calculation, it might not remain as indifferent about the timing of wages.

To see whether this is the case, I make use of a natural experiment that shifted the intergovernmental incentives between the state of Illinois and its public school districts. Specifically, in 2005, the state legislature passed a law requiring districts to pay the full cost of end-of-career salary increases above six percent that served to increase the retirement benefits of public school employees. The legislature applied the new policy only to compensation covered in contracts or collective bargaining agreements put into place after the law's passage in June 2005. Because contract negotiation timing is arranged at the time of the previous contract and staggered across districts over time, there is exogenous variation in implementation of the policy across districts over time. This allows me to use traditional difference-in-difference methods to estimate the effects of the disincentive policy shift on teachers' compensation.

First, I document the prevalence of salary backloading and present evidence that this practice is directly related to incentives inherent in the pension system. Using administrative employer-employee linked data from Illinois Public Schools (IPS) from the period before the disincentive policy, I isolate only the variation in salaries related to year-to-year progression by focusing on employees who do not switch districts, positions or educational attainment. I show

that those most likely to retire, i.e. those with 31 or more years of experience, receive salaries that are higher, on average, than their less experienced counterparts with just a year or two less experience. Also, they are much more likely to receive salary increases of at least 20 percent, the maximum allowed for pension benefit calculation. The change in salaries for these experienced workers is discontinuous, suggesting it is not driven by increases in productivity, but rather by these employees' impending eligibility for retirement. This is a costly practice. If every member of a cohort of employees receives an additional four years of $9000 of end-of-career salary that contributes to pension benefit calculation, the present discounted value of additional costs to the pension fund are over $250 million per cohort of employees.[2]

To estimate the effects of the disincentive policy, I combine data on individual teacher compensation, district salary schedules and other forms of compensation, and contract negotiation timing from the Illinois State Board of Education from 2003 to 2012. I exploit the fact that the compensation of employees within four years of retirement is most likely to have been affected by the disincentives policy. My difference-in-difference framework compares compensation and turnover of employees who are most likely affected by the disincentives policy (because they are the more likely to be within four years of retirement) to those who are less likely to be affected by the policy (because they are less likely to be within four years of retirement) just before and after their contracts are renegotiated subsequent to the introduction of the disincentives policy. I control for time-varying teacher and district characteristics and for district-by-year-by-age and district-by-year-by-experience fixed effects.

[2] The difference-in-difference estimates detailed in this paper suggest employees receive nearly $9,000 on average during their last years before retirement. An increase of $9000 per year for each of the four end-of-career salary years results in a $2,250 higher pension benefit for someone retiring with the maximum benefit, which is 75 percent of average end-of-career salary. The Illinois TRS uses a discount factor of approximately 13 for fully-eligible employees, which is based on their assumptions of life expectancy and uses 8.5 percent interest earnings. The present discounted value of the pension increase is about $30,000 and there are almost 3000 employees who have 30 years of service in 2005.

Identification therefore stems from comparison of compensation for similarly aged and experienced employees within a district, some of whom are closer to retirement than others, before and after the incentives policy takes effect. The identifying assumption with this strategy is that differential trends in employee compensation of those more or less likely to be within four years of retirement in districts that are subject to the disincentives policy in later years (because of predetermined contract negotiation schedules) are appropriate counterfactuals for the differential trends in the compensation of similar employees in districts that are subject to the disincentives policy in earlier years. I present event-study-style evidence consistent with this assumption.

The results show that the salaries of employees who are within three years of retirement are much more likely to increase by exactly six percent after the disincentives policy is in effect. Despite this shift, on average, the backloading of salary for employees in the last four years of their careers is not completely eliminated by the policy. This is likely because the retirement bonuses available to employees in some districts increase while in other districts the bonuses decrease. In other words, the six percent salary increase becomes salient even for districts that were not giving their employee bonuses in the pre-policy period. Because of this pattern of effects, the changes in the costs of employee pensions resulting from the salary disincentives policy were not as large as they otherwise might have been. Using data on observed salaries in combination with the estimated effects of the policy, I find the annual costs to the pension fund of end-of-career salary bonuses only decreased by 60 percent because of the policy.

In what follows, I begin by describing the data and the general structure of the pension system in IPS. Then, I document the backloading of employee salaries and its close connection to the incentives inherent in the pension system. I follow this with a description of the salary

disincentives policy and an empirical strategy for determining its effects. The results are then followed by discussion and conclusion.

Data Description

To conduct the analysis, I use four sources of data, the Teacher Service Record (TSR), data on employees' age from the Teacher Retirement System, salary schedule and contract timing from the Teacher Salary Study (TSS) and other data on compensation collected from school district contracts.

The TSR contains data on employees of IPS collected by the Illinois State Board of Education (ISBE). Because the data are from administrative records of all employed service in IPS, I can completely characterize the employment and earnings experiences of every employee of IPS. In the summer of 2002, the state began requiring summer earnings to be included as part of the recorded compensation of teachers. [3] This makes compensation difficult to compare before and after 2003, so I begin the analyses in 2003.[4]

The TSR is a database compiled by the ISBE from school district administrators to track employment and salaries of teachers, staff and administrators in public schools throughout the state. Each observation in the TSR is an employee-school record for a given school year. The TSR includes the following information about employees in IPS: the school and district in which the employee works, total compensation (as reported to the relevant retirement system), number of months employed at the position, full-time equivalent percentage of the position and the percent of time that is administrative. The data also contain information on the number of years

[3] I use the year corresponding to the spring of a school year to index school years of employment.

[4] The results are unchanged if the pre-period is extended. Results are available from the author upon request.

of school experience (within the district, within Illinois and out-of-state), the position and the highest degree held by the employee.

The reported compensation includes scheduled salary, extra-duty pay (coaching, clubs, etc.), vacation and sick day buyouts, bonuses, school-board-paid retirement contributions, and other compensation that the Teachers Retirement System (TRS) includes in total creditable earnings.[5] Unfortunately, the available data does not indicate what fraction of total compensation is from each of these different categories, which is why, as I describe later, I supplement this data with information from the TSS and district contracts. However, importantly for the current work, the compensation measure recorded in the TSR is a precise measure of total creditable earnings toward the retirement system and therefore the earnings that are used to calculate pension benefits. I use the terms creditable earnings, salary and compensation interchangeably to refer to this measure of total creditable earnings.[6] Because the state policymakers levied fees on increases in nominal salary, nominal salary is likely the measure most affected by the policy. Therefore, in what follows, these compensation measures are reported in nominal terms unless otherwise specified.

Age is an important factor determining retirement eligibility. Information on age or date of birth is missing from the TSR, so I use data on age from the Teacher Retirement System. These data are administrative data collected for the purposed of determining retirement benefits for IPS employees. The TRS data and TSR data do not share a common identifier, so I use fuzzy matching techniques to merge the two data sources based on employees' names, experience and employers. The merge results in a 98 percent match rate between the two data sets.

[5] This measure of compensation does not include the cost of employer-paid health insurance or other benefits provided by the school-board to the employee.

[6] Employees may work in multiple districts. I define an employee's salary is as her salary across all IPS employers and her employer as the employer at which she spends the most of her time.

The school district contract data comes from the collective bargaining agreements between school district administrators and teachers' unions. Some information from these contracts is gathered by the ISBE in the form of the Teacher Salary Study (TSS). The TSS reports summary information about compensation governed by the contracts. Importantly for this project, it includes information about the timing of contract renegotiation. Additionally, it contains information on the beginning and maximum salaries for teachers by educational attainment, as well as the number of years of experience in the district that is required to meet the maximum scheduled salary. It also contains information on longevity payments available to employees who have passed the highest step on the salary schedule.

A few other sample selection choices are worth note. Because turnover and employee compensation in the first few years of employment is much more variable than that in later years, I only include employees with at least five years of experience. Chicago Public Schools (CPS) participates in a separate pension system, so I exclude employees of CPS from the analysis.[7] I also omit the 1.8 percent of employees from employers without negotiated contracts (e.g. preschools, regional boards of education, prisons, etc.). Some of the outcome variables measure employee turnover, exit and salary changes between one school year and the next, so, even though the data are available through 2012, I include only those employees between 2003 and 2011 in the analysis sample. There are therefore a total of 150,514 unique employees in the sample over this period and 874,939 employee-year observations.

The first panel of the Table 1 includes summary statistics of measures of the employee characteristics that I use as controls. Across all the years of data, the average experience of employees is 16 years and the average age is 46. Seventeen percent are non-white and 24

[7] The fact that Chicago is responsible for setting both the size of employees' salaries and the costs of the resulting pensions means there is no intergovernmental distortion and the disincentive policy is unlikely to have any direct effect. Results are similar if Chicago is included and are available from the author upon request.

percent are male. The vast majority of these employees (81 percent) are teachers. Thirteen percent are staff and six percent are school leaders, i.e. principals, deans, etc. Most employees have either a Bachelors degree (32 percent) or a Masters degree (66 percent).

The second panel of the table reports information about employees' compensation and labor supply. While nearly all of these employees (97 percent) work full-time, slightly fewer (91 percent) work full-time two years in a row. In part, this is because 6 percent of these employees leave IPS from one year to the next. Two percent switch districts from one year to the next. Finally, average nominal salaries are $64,451. The average annual increase in salary is around $3,500. The average change in salary from year-to-year is a 5.5 percent increase.[8]

Table 2 presents summary statistics on the information contained in the TSS. The average scheduled starting salary across districts is $33,016 or $36,487, depending on whether a teacher has an MA degree. Average maximum salaries are $49,289 and $61,428 for those teachers with BA and MA degrees, respectively. Longevity payments increase these maximum salaries by about $1,500 per year, on average.

To further understand the structure of compensation, I surveyed the 910 districts in the IPS school system in 2012 requesting copies of their collective bargaining agreements from 2003 to 2011. Of the 910 districts, 33 (4 percent) were districts that did not exist in their current form in 2006,[9] 10 (1 percent) are districts without teachers' unions, and 46 (5 percent) responded but could not locate contracts from before 2005. Another 302 districts did not respond to the survey at all, which means the response rate of my survey was 64 percent. [10] When I use this data in

[8] I have top- and bottom-coded percent changes in salary at 20 and -20 percent because no increases in nominal salary above 20 percent are included in the calculation of retirement benefit levels.

[9] Some districts have consolidated since 2006. Others that exist today are new schools, e.g. charter schools, most of which do not have collective bargaining agreements.

[10] The response rate of districts, and the resulting sample selection in the analyses using this data, is not associated with the propensity of a district to be offering its employees salary increases above 6 or 20 percent in the pre-disincentives policy period. That said, smaller districts, which are also those with lower salaries and fewer

analyses, I limit the sample to the 528 districts that responded and have pre-treatment data. Of the 528 districts, 448 (84 percent) have some form of retirement bonus in 2005.

General Information about Retiree Benefit Calculation

Employees of IPS are participants in a defined benefit pension plan. Their annual benefit upon retirement is calculated using a predetermined formula, which is a function of the accrued service at retirement and average end-of-career earnings. Each year of service an employee accrues contributes 2.2 percent of her end-of-career earnings to her annual retirement benefit, up to a maximum benefit equal to 75 percent of one's end-of-career earnings.[11] The measure of end-of-career earnings used in the calculation of the employee's retirement benefit is the average of her four highest consecutive annual salaries in the last ten years of creditable service. For most employees, this is the average across her salary in each of her last four years of employment. Any salary above 120 percent of the previous year's salary is not included in the end-of-career earnings for the purposes of retirement benefit calculation.

Annual benefits are available to members of the TRS when they terminate active service with IPS and meet the following age and service requirements: age 55 with 35 years of service, age 60 with 10 years of service, or age 62 with 5 years of service. Retiring employees can count up to two years of sick leave as creditable service, meaning 55 year olds can reach eligibility and the maximum retirement benefit with 33 years of service. Creditable service also may include some years spent on medical or military leave, years spent in reciprocal pension systems of other

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teachers with Masters Degrees, were slightly less likely to respond to the survey. See Appendix Table 2. This may affect the generalizability of the results using the district contract information to very small schools.

[11] The "2.2 formula" was introduced in 1998. For service accrued prior to 1998, the formula for calculating the annual retirement benefit is nonlinear and depends on the accumulation of creditable service in the system. The contribution proportions are 1.67, 1.9, and 2.1 percent of end-of-career salary per year for the first, second and third decades of service, respectively, and 2.3 percent per year for any service beyond 30 years. Employees with service in 1998 that had accrued pension benefits at the old rate could be updated to the new higher rate for a one-time fee (Fitzpatrick 2014).

Illinois public employers and, for a fee, years of service spent in private schools. In addition, one can retire at between ages 55 and 60 with at least 20 years of creditable service and receive an annuity that is discounted by 6 percent for each year between the retiree's age and 60. To avoid the actuarial discounting, the employee can choose the Early Retirement Option (ERO), which involves both the retiree and her employer paying a one-time fee that is proportional to the employee's distance in age and experience from full retirement eligibility.

Background on Salaries of Illinois Public School Employees before the Disincentives Policy[12]

There are a number of reasons why an IPS employee's salary may change over the course of her career. First, the three main determinants of teacher salary are one's educational attainment, years of service and employer. Although many novice employees already have Master's degrees, many employees earn their Master's degrees after they have begun teaching. For example, while 23 percent of first-year employees in 2003 and 2004 have Master's degrees, the fraction rises to 33 percent for those with 5 years of service and to 55 percent for those with 10 years of service. This pattern is likely driven by the return to a Master's degree in the salary schedules agreed upon by the district and teachers' unions. On average, teachers with Master's degrees earn $4,835 a year more than equally experienced teachers in the same district.[13] Similarly, almost all districts pay teachers according to a schedule whereby salary increases by a predetermined amount for each year of experience a teacher has accrued with the district.[14]

[12] In this section, I present evidence about the evolution of employee salaries over the timelines of their careers. To do this, I use only data from Illinois Public Schools in 2003 and 2004, the period before the state legislature introduced its six-percent rule.

[13] This reported return to a Master's degree is the average coefficient on a dummy for Master's degree across a set of regressions of salary on said dummy and experience fixed effects for each district in Illinois. Examination of district contracts suggests the return to a Master's degree ranges from around $1,000 to over $10,000.

[14] The salary schedules for most Illinois Public School teachers are delineated in terms of educational attainment and years of service within the district. It is up to each individual district how to treat a new employee's

These salary schedules differ across districts, so even conditional on experience and educational attainment, one's employer is a major determinant of salary.

Other determinants of salary include the number of hours worked by the employee, i.e. whether she is full- or part-time and whether she works the entire school year, and her eligibility for bonuses offered by the district. The latter can be given for any number of reasons. One relevant type of bonus for this setting is the longevity bonus, which is usually given to employees who have remained in a district for a set number of years and have passed the highest step on the salary schedule. Another is the retirement bonus, which is given to employees just before they retire. Also, many employees take on extracurricular duties for additional pay. Such duties are often offered on the basis of seniority and the return to these activities is also usually outlined in the collective bargaining agreements between employees and districts. Finally, an employee's salary depends on her position in the district. Generally, school leaders and district administrators earn more than teachers and staff.

There are therefore many reasons that a public school employee's salary may be higher towards the end of her career relative to the beginning of her career. Evidence of the extent to which this occurs has been presented in previous studies of teacher salaries. For example, Lankford and Wyckoff (1997) document the large share of resources spent on veteran teacher salaries in the state of New York between 1970 and 1994. Similarly, Ballou and Podursky (2002) profile the steep wage-tenure profile of public school teachers in the 1993-1994 Schools and Staffing Study (SASS) and Grissom and Strunk (2012) do the same with the 2007-2008 SASS. These studies concluded that this use of resources was likely inefficient from a productivity standpoint. In light of this previous work on teacher wage profiles, one contribution

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years of service accrued at another district for the purposes of salary calculation. Usually the terms of doing so are defined in the contract. For example, a district may allow up to 10 years of service with another district, but no more, to be included as creditable years of service for salary determination.

of this paper is to provide empirical evidence in favor of a particular theory motivating the use of high salaries for senior teachers.

To illustrate the type of end-of-career backloading that is the focus of this study, I first present information on the year-to-year changes in salary, i.e. the change in salary from t to t+1, isolating only the variation in salary that is related to changes in experience. I do this by using only the employees in 2003 to 2004 who are employed full-time and who do not switch positions, level of educational attainment or employers between t and t+1.

Figure 1 illustrates the type of end-of-career backloading that is the focus of this study. In Panel A, I plot the fraction of employees in 2003 with each level of experience who receive salary increases above 6, 10 and 20 percent. As can be seen in the figure, the fraction of employees receiving such raises initially decreases with experience and then increases once experience reaches approximately 30 years of service. For example, 62 percent of employees with 5 years of experience receive raises of more than 6 percent. The fraction receiving raises of at least 6 percent bottoms out at just 28 percent of those with 27 years of service and reaches 50 percent of those with 33 years of service.

Notably, many employees with over 30 years of service who receive 6 percent raises are receiving 20 percent raises. For example, 50, 34 and 21 percent of employees with 32 years of service receive raises of at least 6, 10 and 20 percent, respectively. This is in contrast to the pattern for less experienced employees, where very few of the employees receiving six percent raises are also receiving raises above 20 percent.

The pattern of decreasing likelihood of employees receiving raises of 6, 10, and 20 percent as their experience increases is due to the fact that I have measured raises in Panel A in percentage terms rather than levels. Since the salaries of employees increase as they gain

experience, the same sized raise in dollar terms will represent a smaller fraction of one's salary as one progresses through her career. For this reason, in Panel B, I present information on raises in levels rather than percent changes. The solid line in Panel B traces out average increases in nominal salary from t to t+1 for each level of accrued experience. For those with five to ten years of service, average raises are around $3,200. The average raises for those with 10 to 28 years of service are around $3,700. At 29 years of service there begins to be a noticeable increase in the average raises for IPS employees such that raises average approximately $6,500 for those with 31 years of service or more. The dashed line shows a similar pattern in the probability of workers receiving raises of over $10,000. Only about 10 percent of employees with 5 to 28 years of service receive raises of $10,000 or more, while over 40 percent of those with more than 30 years of service receive such large raises.

These large raises are notable because they are not driven by changes in position or educational attainment. (By construction, the samples in Figure 1 only include those who do not switch position or educational attainment levels.) One factor driving the pattern of end-of-career salary backloading seen in Figure 1 is the offer by some districts of end-of-career bonuses. Such bonuses are often written into the contracts between districts and employees. For example, in 2005, 84 percent of contracts collected documented some form of end-of-career bonus. Usually, these are described as rewards for service with the district (and therefore come with minimum service requirements) or as retirement bonuses or incentives. Among districts with retirement bonuses written into their contracts in the pre-treatment period, the modal end-of-career bonus, was a 20 percent increase in salary for anywhere from 1 to 5 years before retirement. This is probably directly related to the fact that salary increases over 20 percent do not factor into the calculation of an employee's retirement benefit.

Different types of districts may find it more or less advantageous to engage in this type of salary backloading. Understanding which districts engage in end-of-career salary backloading of the type described here is important because taxpayers in districts that give their employees end-of-career salary bonuses in the face of this intergovernmental incentive are free-riding off of taxpayers in districts that do not. For example, wealthier districts may have an easier time offering their employees end-of-career bonuses because they have more resources than poorer districts. On the other hand, low-income districts may use the end-of-career salary increases to reward employees who may have accepted lower pay while working in a relatively poor district. Evaluation of the welfare effects of the intergovernmental incentive depends in part on which districts are free-riding off of other districts.

In Table 3, I report the results of an exercise to determine which districts engage in free-riding. Specifically, I regress salary outcomes of interest on individual worker characteristics and school district characteristics using data from 2003. To see if certain types of districts are engaging in free-riding by increasing compensation among those close to retirement, I interact the district characteristics with a measure of whether an employee is within four years of being eligible for an undiscounted retirement benefit. Because I also control for age and experience fixed effects, the results are able to tell us whether certain types of districts are more likely to give end-of-career compensation bonuses to those nearing retirement than they are to similarly aged and experienced employees who are not near retirement.

I use three dummy variable outcome measures of salary backloading: (i) the employee's salary increases by more than 20 percent, (ii) the employee's salary increases by more than 10 percent, and (iii) the employee's salary increases by more than $10,000. Notably, each of these outcomes occurs more frequently among employees who are retirement eligible or close to it.

The estimates in the first row of Table 3 show that employees near retirement eligibility are 7.1, 7.4 and 9.0 percentage points more likely to get salary increases of at least 20 percent, at least 10 percent and at least $10,000, respectively.

There is no clear pattern across the three outcomes in the propensity of low- or high-income districts to give salary increases of one form or another to employees who are not approaching retirement eligibility (row 2). However, districts with more low-income students are less likely than their counterparts with fewer low-income students to give bonuses to employees approaching retirement. For example, a one standard deviation increase in the percent of students who are low-income is associated with a 0.3 percentage point decrease in the probability of a retirement eligible employee receiving a 20 percent salary increase. This suggests that, on average, high-income districts are free-riding off of low-income districts in this setting.

Districts negotiating with a more experienced workforce may find their employees' more amenable to salary increases for experienced employees, as would be suggested by a median voter theory of union negotiation (Freeman 1986). On the other hand, uniform increases in compensation for experienced teachers are more costly for a more experienced workforce. Districts with more experienced staff are less likely to give employees who are not nearing retirement eligibility large end-of-career salary increases (row 3). However, they are more likely to give large salary increases to employees near retirement than districts with less experienced staff. For example, a one standard deviation increase in the average experience of teachers in a district is associated with a 1.5 percentage point decrease in the likelihood of an employee receiving a 20 percent salary increase from year to year. However, employees nearing retirement eligibility in the district with more experienced employees are 0.5 percentage points more likely

than their peers to receive 20 percent salary increases. This suggests experienced employees may use their leverage to bargain for end-of-career compensation increases when they will count for pension benefit calculations.

A Shift in State Policy Regarding End-of-Career Salary Increases

In 2005, the legislators of Illinois instituted new laws requiring public school districts to pay the costs of pension benefits ensuing from creditable salary increases over six percent. Specifically, if a district gives an employee a raise over six percent and that raise increases the employee's retirement benefit (because it is used in the calculation of end-of-career salary) the district is required to pay a fee to the TRS. Even before 2005, the TRS had an existing salary cap, refusing to pay retirement benefits on end-of-career salary increases above 20 percent. This cap remains in place. The new rule therefore requires that any salary increases between 6 and 20 percent carry not only their current cost to a school district, but also a lump-sum payment to TRS at the time of the teacher's retirement. The size of the lump-sum payment is the actuarial value of the increase in lifetime retirement benefits to be paid to the employee because of the salary increase.

To give a sense of the magnitude of the policy, consider a teacher with $80,000 in creditable earnings in the 35th year of her career, which will be her last.[15] A six percent raise is $4,800, while a seven percent raise is $5,600. Before the policy shift, it would therefore have cost the district $800 to give a seven percent salary increase rather than a six percent one. However, because she is eligible for the maximum pension benefit and assuming this raise will

[15] This is around the average total salary for employees close to retirement, i.e. those with 30 to 33 years of experience in IPS.

count as one of her four highest earning years, her retirement benefit will increase by $150.[16] The TRS calculates the present discounted value of this annual increase, which would be approximately $2,000, and charges the district this fee.[17] The $800 raise now costs the district three and a half times as much.

To get an idea of how the salary disincentives policy may have affected employee salaries over the course of their careers, graphical evidence on salaries and salary increases following the policy's introduction are useful. In Panels C and D of Figure 1, I present analogous information to that in Panels A and B, but for the 2010 school-year rather than the 2004 school-year. The most notable feature of the curves plotted in both panels is the relative lack of a discontinuous jump in year-to-year salary changes as employees reach retirement. Instead, the probability of having a 6, 10 or 20 percent raise declines as employees gain experience (Panel C), as would be expected given increases in wages with experience. In Panel D, even under the disincentive policy, there is an increase in the year-to-year change in nominal salary of about $1,000 when employees reach 32 years of service. However, this $1,000 increase is much smaller than the $3,000 increase seen for the most experienced employees in Panel B. It appears that the disincentives policy served to change the structure of salary increases for experienced public school employees, but the differences-in-differences strategy serves to eliminate other possible explanations.

[16] This is based on the fact that a one-year $800 increase in salary in her four highest-earning years increases the average end-of-career salary by $200. Since she has 35 years of service, she has reached the maximum benefit amount of 75 percent of her end-of-career salary.

[17] Actual costs are calculated by TRS and vary based on the age of the employee. An online calculator is provided by TRS to help employers estimate the costs. I used this calculator to estimate the costs for the described salary increase in the 35th year of employment for an employee aged 55 to 59 at the time of retirement and obtained estimates ranging between $2,110 and $1,992 for employees between the ages of 55 and 60 at the time of retirement. http://trs.illinois.gov/employers/calculators/excesssalincrcalculator.aspx

Identifying the Effect of Intergovernmental Incentives on Senior Teacher Salaries

In what follows, I present difference-in-difference models estimating the effect of the end-of-career salary disincentives policy on teacher salary and turnover. The identification strategy hinges on the fact that the policy only applied to salaries negotiated under collective bargaining agreements entered into after the policy's passage in the summer of 2005. Generally collective bargaining between district leadership and the teachers' unions in Illinois takes place at pre-determined intervals ranging from every year to every 7 years.[18] This pattern means that each year some of the districts in the state renegotiate the wage contracts with their employees. As time passes, therefore, the new policy will apply to increasingly more districts and to the earnings of increasingly more teachers.

To illustrate the variation in contract renegotiation timing, Figure 2 presents the fraction of schools in the 2004-2005 school-year that have contracts set to expire in each successive year.[19] Contacts expiring in 2005 are those that expire after the 2005 school year and where a new contract would apply to the 2005-2006 school year, i.e. those expired between June of 2005 and August of 2005. As can be seen in the figure, 37 percent of districts in Illinois had contracts that expired 2005. Another 27 and 28 percent of contracts were renegotiated after 2006 and 2007, respectively. Most of the remaining eight percent of districts renegotiated their contracts after 2006.

This variation across districts in pre-determined contract renegotiation timing creates exogenous variation across districts in when they were bound by the salary disincentive policy. Note that the contract expiration year used in the figure and for identification was recorded in the

[18] A collective bargaining agreement can be signed between the two parties that lasts for any amount of time agreed upon by both parties. However, in the data is rare to see agreements that take more than 7 years to expire.

[19] Information on contract renegotiation timing comes from the ISBE's Teacher Salary Study.

fall of the 2004-2005 school-year, before the policy was introduced. Using the contract expiration date from before the policy was instituted ensures no post-policy contract renegotiation confounds my estimates of the effects of the policy on teacher salaries.[20]

Figure 2 also presents the percent of employees in the sample who can be considered treated after the school-year reported on the vertical axis. For example, 35 percent of employees in the sample were employed in districts that renegotiated their collective bargaining agreements between 2005 and 2006 and therefore would be subject to the disincentives policy in the 2006 school year. By 2008, nearly all employees are covered by the policy.

Contracts between districts and employees often delineate specific salary schedules for each school-year of the contract. Thus, if a shock occurs during the middle of a contract period, salaries may not adjust until the next planned negotiation. To illustrate, consider how contracts would adjust if there were a negative economic shock in the fall of 2004. Salaries in districts negotiating their contracts in the summer after the 2004-2005 school-year would adjust by the 2005-2006 school-year, but those not negotiated until the summer after the 2005-2006 school-year would not. Such a shock would bias estimates of the disincentive policy because the coefficient would capture the effect of both the policy and the shock.

It is therefore important to disentangle the effects of the disincentives policy and any concurrent budgetary or economic shock. To do this, I make use of the fact that the compensation of some employees is more likely to be affected than the compensation of others. Which employees' salaries are most likely affected by the policy? The policy introduced an extra cost to districts giving their workers salary increases of over six percent when those raises would serve to increase the employees' retirement benefits. The salaries that go into the

[20] The exemption for only those employees under contracts and collectively bargained agreements that were entered into before June 1, 2005 was strictly upheld by the TRS. It required annual affidavits verifying the timing and nature of contract negotiations from any district claiming to be exempt from the fee on raises above six percent.

calculation of the retirement benefit are the four highest consecutive salaries in the last ten years of an employee's career. Therefore, the only teachers whose salaries can be subject to the extra lump-sum charge to the district are those who are in the last 10 years of their careers. Moreover, not all of the salaries earned in the last ten years of one's career count, but only the highest four. Nominal salaries most likely increase over time because inflation adjustments are built into wage contracts and teachers move up the career-salary-ladders (if they have not already reached the maximum salary step). Therefore, the highest four years of earnings are usually the last four earned. As such, the policy is most likely to affect the compensation of employees in their last four years.

Ideally, I would compare the compensation of employees in the last four years of their careers to that of similar employees earlier in their careers before and after they were subject to the disincentives policy. Unfortunately, censoring of the data make it difficult to know which employees are at the end of their careers. Even without censoring, retirement behavior could respond to the disincentives policy. To circumvent these problems, I create a measure of treatment intensity using pre-treatment data to determine how likely it is that in a given year an employee is in her last four years of employment. Specifically, I use data from 2003 and 2004 to calculate the probability that an employee of a given age and experience level will exit employment in each of the next four years. The more likely it is that an employee is within four years of exit, the more likely her compensation is to be used in determining the size of her pension benefit and, therefore, the more likely it is that the policy would have affected her compensation.

In Illinois, teachers can retire at any point, subject to the age and experience criteria already described. However, as other authors have documented, nonlinearities in the retirement

benefit accumulation formulas of defined benefit systems like TRS make the incentives to retire at certain points in one's career quite large (Costrell and Podgursky, 2009; Costrell and Podgursky, Forthcoming; Brown, 2010). Based on the eligibility information described in the previous section, employees are only eligible to receive a pension if they are at least 55 with 20 years of service or 60 years with at least 12 years of service. I therefore set this measure of treatment intensity to zero for employees younger than 50 with less than 15 years of service or younger than 60 with less than 10 years of service.[21]

For all other employees, the measures of treatment intensity are a set of four variables measuring the probability that, conditional on experience and age, an observation is within one, two, three or four years of an employee's exit. I also include controls for employee characteristics such as age and experience fixed effects. Therefore the assumption underlying my differences-in-differences identification strategy is, for example, that, conditional on age, experience and other employee characteristics, changes in compensation that occur with the first-post-2005 contract negotiation for employees who are less likely to be one year from retirement adequately capture the shifts in compensation unrelated to the salary disincentives policy for workers more likely to be one year from retirement.

Graphical Evidence on the Effects of the Disincentive Policy

To further illustrate the variation underlying my identification strategy, in Figure 3, I present histograms of the percent change in salary from year t to t+1 for two distinct groups of employees with 31 to 35 years of service in IPS based on the *ex ante* expected timing of contract negotiation for their employers. Specifically, the black outlined bars trace out the distribution of

[21] Results are similar with other definitions of treatment intensity. Results are available from the author upon request.

salary changes in a given year for employees that were scheduled to negotiate their contracts in 2005, while the khaki bars do the same for the other districts, i.e. those that negotiate after 2005. Because salary increases above 20 percent do not count toward pension benefit calculation and to make the histogram tractable, I have rounded salary changes below -20 and above 20 to -20 and 20, respectively.

The first panel presents the histograms of salary increases between the 2003 and 2004 school-years. The distribution of salary changes for districts that were scheduled to negotiate in 2005 and those scheduled to negotiate after 2005 are fairly similar. However, those districts that are scheduled to negotiate in 2005 are slightly more likely to offer raises of between 3 and 5 or at least 20 percent. The second panel shows a similar pattern across the salary changes for employees in these two sets of districts in 2004, which is the other year in the sample before the policy takes effect for districts negotiating in 2005.

In theory, the salary increases from the 2005 to 2006 school year should be the first to be affected for employees from districts that negotiated their collective bargaining agreements in 2005. However, in practice, some districts grandfathered employees into old end-of-career bonus payment systems even upon contract renegotiation.[22] This may be why the change in the distribution in salary increases in 2005 is somewhat subtle even for employees in the districts that should have been affected by the disincentives policy. There is only a very small increase in the mass of raises of six percent and not much change in the rest of the distribution.

By 2006, the effects of the policy become more evident. Among employees in districts that negotiate in 2005, there is more mass at raises between zero and six percent than there is in the districts that negotiate later. There is also less mass at raises above 6 percent, particularly at 20 percent. Note that by 2006, some of the districts represented by the khaki colored bars have

[22] This information is from close reading of district contracts.

renegotiated their contracts and therefore their employee salaries may be affected by the policy. Hence, even for the group negotiating after 2005 there is also increased mass between raises of 0 and 6 percent relative to that in the earlier years. This pattern continues in 2007 and 2008.[23] Importantly, the same shift in salaries is not seen for employees with less experience (Appendix Figure 1), which suggests these shifts are due to the effects of the disincentives policy on the salaries of workers nearing retirement.

Estimation Evidence on the Effects of the Disincentive Policy

To isolate only the variation in post-2005 salaries that is driven by the salary disincentives policy, I combine data on all employees with at least 5 years of experience and estimate the following equation allowing the policy's introduction to have different effects on salaries depending on an employee's eligibility for retirement benefits:

$$y_{idt} = \alpha + \sum_{k=1}^{4} \pi \Pr(t = R - k \mid age_{it}, \exp_{it}) + \sum_{k=1}^{4} \gamma \Pr(t = R - k \mid age_{it}, \exp_{it}) \times Policy_{dt} + X_{it}\beta + \delta_{jdt} + \rho_{adt} + \varepsilon_{idt} \quad (1)$$

In equation (1), y_{idt} is the outcome for employee *i* in district *d* in year *t*. The variable Policy is a dummy variable equal to one if the year of the observation is between 2005 and 2011 *and* district *d*'s wage contact had been renegotiated since the policy was introduced. X_{it} are employee characteristics, such as fixed effects for educational attainment, position at the school and subject matter taught. I use ordinary least squares methods; since many outcomes of interest are binary, these are therefore linear probability models. Standard errors are clustered at the district level.

[23] In 2008, among employees in districts that negotiate after 2005, there is a relatively large fraction of employees who experience decreases in salary from 2008 to 2009. This is driven by the economic downturn that started that year and is isolated among the employees in districts that had recently renegotiated their contracts. Results are similar if I omit employees in districts that were most likely negatively affected by the Great Recession.

I also include year-by-district-by-experience fixed effects (δ_{jdt}) and year-by-district-by-age fixed effects (ρ_{adt}) to capture any shocks to salaries among similarly aged and experienced employees in a district. An important example of such a shock is the 2005 change in the ERO described earlier, which led to a large number of exits from the data. These fixed effects also control for any employer-specific variation in the outcomes, e.g. if certain districts are more likely to offer high wages or have higher turnover rates.

As described earlier, I allow the coefficient estimates of the effects of the policy, γ, to vary across people based on how likely it is that an employee is between one and four years before retirement. The measure of treatment intensity, $\Pr(t = R - k \mid age_{it}, \exp_{it})$, is the pre-treatment probability that an employee of a given age and experience level exits the data after one, two, three or four more years of employment. Therefore the estimates of π can be interpreted as the differences in salary before the disincentives policy for employees who are within one, two, three or four years of retirement relative to similarly aged and experienced employees. The γ represent the estimates of the policy's effect on the salaries of those within one, two, three or four years of retirement.

Note that because of the rich set of fixed effects included, the effect of the policy is identified using only districts that have multiple employees of the same age or experience in a given year. Fortunately, there is substantial variation in the eligibility categories within district-by-year-by-experience and district-by-year-by-age groups.[24]

[24] At a minimum across the eligibility categories, between 23 percent of districts have at least five employees in a particular district-by-year-by-experience or district-by-year-by-age group and have variation in the relevant eligibility category for that group.

Evidence of Pre-treatment Trends in Outcomes?

An assumption underlying my use of the differences-in-differences identification strategy in this setting is that there were no other changes in policy or environmental factors that differentially altered the trajectory of compensation and turnover of employees more or less likely to be within four years of retirement and occurred systematically at the time of the first post-2005 contract negotiation other than the disincentives policy that I study. In order to provide support for this assumption, in Figure 4, I present event style estimates of the changes in compensation in each year relative to when the policy takes effect in an employee's district. More precisely, the solid line traces coefficient estimates from estimation of equation (1) replacing the binary treatment variable, *Policy*, with distributed leads and lags measuring the number of years before or after the policy's enactment in the district that an observation occurs.

Two observations from these graphs are worth mention. First, there are no pre-treatment trends. In fact, when the outcome is the probability that compensation increased by exactly six percent, almost all of the coefficient estimates on the variables representing pre-treatment periods are quite close to zero. When the outcome is an employee's total salary, the pre-treatment estimates are between $4000 and $7000. This is consistent with the previously presented evidence showing that before the policy's implementation, employees nearing retirement receive increased compensation. These pre-treatment estimates are not statistically different from one another. This evidence supports the assumption that underlies the differences-in-differences estimation strategy, i.e. there were no pre-treatment trends in employee compensation.

Second, once the policy becomes effective in a district, there is a marked increase in the probability that an employee's increase in salary from year-to-year is exactly equal to 6 percent

and decrease in an employee's resulting compensation in t+1. In results not reported here, I also examine patterns of change in other salary measures and the other measures of treatment intensity (within two, three or four years of retirement eligibility) in years relative to the policy's introduction. Importantly, for each outcome and measure of treatment intensity, there is no evidence of a pre-treatment trend in salary outcomes.

Difference-in-Difference Estimates of the Disincentives Policy by Employee Eligibility Status

Due to the demanding nature of the event-style models with many distributed lags and leads used in creating Figure 4, I now turn to estimation of equation (1), replacing the lags and leads for time relative to the first year of treatment with a single variable measuring whether the salary disincentives policy has been implemented in the district of employment at the time of the observations. The results of this estimation framework are reported in Table 4. In the table, there are five dependent variables: whether a salary increase is equal to six percent, less than 6 percent or more than 6 percent, the percent change in salary and the total compensation in year t+1.[25]

The first thing worth noting about the results in Table 4 is that, in the last three years before retirement, employees receive higher increases in salary between one year and the next (column 4) and therefore higher salaries in the following year (column 5). For example, those who will retire after the one year received salary increases that were 5.84 percentage points higher, on average, than their counterparts of similar age and similar experience who were not retirement eligible. As such, these employees received salaries in t+1 that were almost $6,000 higher than those counterparts. Similarly, an employee that is in her second year before

[25] It is difficult to define a percent increase in salary for those employees whose salary is zero, therefore these observations are dropped from the analysis when the dependent variable represents changes in salary. Results from analyses with other dependent variables are similar if those with zero reported salary are similarly omitted.

retirement receives $3,492 more in compensation that her similarly aged and experienced counterparts. All of these estimates are statistically significant at the one percent level. This is also confirmed by the evidence in columns 2 and 3, which shows that those employees who are within the last three years prior to retirement are less likely to receive raises less than six percent and more likely to receive raises greater than six percent.

Second, the evidence in the table suggests that the salary disincentives policy had an effect on the distribution of wage changes among employees who were close to retirement. Just as in the event-study-style analyses, those employees nearing retirement were more likely to receive a raise of exactly six percent after the policy was implemented. For example, those within one, two or three years of retirement were 23, 20 and 13 percentage points more likely to receive raises of exactly six percent after the incentives policy took effect in their districts. Given that just four to six percent of these employees are receiving a six percent raise in the pre-period, these are extremely large increases. And, because there were no other systematic policy changes to compensation that directly targeted salary increases of six percent, we can attribute this entire effect to the incentives policy itself.

Note that these increases in the probability of receiving a raise equal six percent are largely driven by decreases in the probabilities of raises being above six percent, though some employees that were previously receiving raises below six percent are now receiving raises of exactly six percent. For example, employees within one year of retirement are 36 percentage points less likely to receive raises above six percent and actually 13 percentage points more likely to receive raises below six percent. At the same time, the policy leads those three years from retirement to be six or seven percentage points less likely to receive raises above or below six percent, though these estimates are not statistically significant.

These shifts in the distribution of raises in percent terms are translated into changes in wages in level terms. For example, employees who are one year from retirement receive $5,308 less in creditable compensation because of the incentives policy than they otherwise would have, an estimate that is statistically significant at the one percent level. Similarly, those two years from retirement receive compensation that is $1,500 lower than they otherwise would have, though the estimate is not statistically significant. The incentives policy also leads to slightly lower compensation for those three years from retirement and slightly higher compensation for those four years of retirement. However, the estimates are small and not statistically different from zero, leading me to conclude the effect of the policy on average salaries was negligible for these groups.

To summarize, before the disincentives policy, employees approaching retirement receive higher compensation than similar employees who are not as close to retirement. The disincentives policy shifts the lifetime compensation paid to teachers from the final years of their careers. However, the changes in compensation are not large enough to completely offset the existing backloading behavior. Using the coefficients in Table 4, I estimate that the observed pre-policy backloading cost state taxpayers about $250 million per year. The disincentives policy saved taxpayers about 60 percent of those costs, but the salaries of employees in the last four years before retirement are still higher than those of similar employees further from retirement, particularly in the second or third years prior to retirement.

One possibility for why the policy did not have more of an effect is that districts are willing to pay the full costs of some their employees' end-of-career compensation. Another is that districts are shifting wage increases to the years just before retirement, i.e. those years in which compensation increases are not subject to the disincentives policy. Another possibility is

that salaries may have been redistributed across the years over which salaries count towards benefit calculation so as not to avoid the penalty that comes with a one-year increase above six percent. For example, a district offering a 20 percent bonus in the final year may move to four consecutive years of five percent bonuses for retiring employees. As I discuss later, the data on salary schedules and bonuses collected from school district contracts is useful for determining how districts are responding to the incentives policy.

Effects of the Disincentives Policy on Employee Turnover and Mobility

By making it less likely that employees would receive large end-of-career salary increases, the salary disincentives policy may have had an effect on employee retirement and turnover. For example, employees who were waiting for large end-of-career increases before retiring will find it less attractive to wait. Others may switch districts so as to increase wages or find a district with larger end-of-career bonuses. Also, employees may find it particularly attractive to switch districts because the salary disincentives policy does not apply to IPS employees who switch districts.[26]

In Table 5, I present difference-in-difference estimates of the effects of the incentives policy on employee turnover, including exit from IPS and movement across schools. There is little evidence of a systematic effect on employee exit. Most of the estimated effects of the policy on turnover in Table 5 are extremely close to zero and only one of the sixteen estimates is statistically significant (which is what we would have expected through chance alone). The policy also had little effect on employee's movement across districts or their propensity to change positions or obtain more education (columns 2 through 4).

[26] Despite this possibility, in results not displayed, there is little evidence that employees are systematically switching districts because of the salary disincentives policy.

Were There Anticipatory Effects of the Policy's Introduction?

The disincentives policy was implemented with the first contract negotiation subsequent to its introduction in 2005. As such, there was an interim period between the policy's introduction and implementation during which employees and employers knew about the structure of the new policy but were not bound by its regulations. During this period employees and employers may have behaved strategically in ways that are related to the policy. For example, compensation may have increased in this interim period to offset the future decreases in compensation due to the disincentives policy. Even more likely, employees near retirement may have realized their future compensation would be lower than expected. The effects of this expected change in compensation could have either increased or decreased the propensity to retire depending on whether the income or substitution effects dominate for these employees.

To determine whether the policy had any anticipatory effects in this interim period, I add separate measures of the treatment intensity for the interim period (from 2005 to the first contract expiration in one's district of employment) to equation (1). The estimates from this specification are in Table 6. None of the estimates of effects in the interim period are statistically significant and nor do they suggest a clear pattern.

Effects on Different Types of Employees

The sample I used thus far included all public school employees in the available data, which contains teachers, staff and administrators. The compensation of these various types of employees may respond differently to these incentives. For example, teacher compensation may be more uniform and rigid than that of staff or administrators if the latter two groups of

employees are not governed by collective bargaining agreements. Therefore, a natural first step in determining how total compensation of employees shifted is to determine whether the disincentives policy had a differential effect on employees in various positions.

In Table 7, I present results of estimating equation (1) separately for teachers versus staff and administrators. The compensation increases associated with being one and two years away from retirement are $6,086 and $3,892, respectively, for teachers. The disincentives policy decreased the salaries of these teachers by $5,601 and $2,700 in the year before and second year prior to retirement. All of these coefficient estimates except that of the effect of the policy in the second year before retirement are statistically significant at least at the 5 percent level. Staff and leaders, receive similar, sometimes even larger, increases in salary just before retirement and similar decreases in salaries just before retirement due to the disincentives policy. However, estimates using the sample of leaders and staff are much noisier than those using the larger sample of teachers.

What Components of Compensation Shifted?

Thus far, I have shown that the disincentives policy shifted the measure of employee compensation used for calculating pension benefits. Recall that this measure is the sum of multiple forms of compensation, including scheduled salary, longevity pay, bonuses, extra-duty pay, and other compensation that the Teachers Retirement System (TRS) includes in total creditable earnings. Because changes in different forms of compensation may have differing effects on employee productivity, it is of interest to determine which pieces of total compensation are affected by the policy.

First, teachers are paid according to a salary schedule determined by their level of educational attainment, employer and experience. Second, once an employee gains enough experience to have reached the last step in the salary schedule, depending on her district, she may be eligible for longevity payments. Just as the salary schedule is the same for all teachers, these longevity payments are bonuses available to all employees who have reached a given level of experience within a district.

To see whether the disincentives policy altered the salary schedules and longevity payments offered to teachers, I use the ISBE-conducted survey of information contained in districts' collective bargaining agreements with districts, the TSS. With this district-level data, I use a parsimonious differences-in-differences strategy that relies only on the timing of the first-post-2005 contract expiration for identification of the disincentive policy's effect. That is, I estimate the equation $y_{dt} = \alpha + \lambda Policy_{dt} + X_{dt}\beta + \delta_d + \rho_t + \varepsilon_{dt}$.

The estimated effects of the policy on maximum scheduled salaries and longevity payments are in Table 8. The estimated effect of the disincentives policy on these measures is positive. For example, the maximum salary for teachers with MA degrees (including a longevity bonus) increased by $420. This estimate that is statistically significant at the five percent level, though few of the other estimates in the table are statistically significant at conventional levels. However, the positive coefficients suggest that the decreases in employee compensation presented earlier are not the result of decreases in scheduled salaries or longevity payments. In fact, the positive coefficients may represent a shifting of compensation from the years close to retirement to earlier years, though the estimates are too noisy to put much weight on them.

The assumption underlying the interpretation of λ as the effect of the disincentives policy is that the only thing altering maximum scheduled salaries and longevity payments in the first

post-2005 contract renegotiation is the disincentives policy. This is stronger than in my earlier specifications where the wages of similarly experienced and aged employees controlled for time-varying shocks to the employees of the district that occurred at the same time as the contract renegotiation. To confirm this assumption, I also estimated the effect of the disincentives policy on beginning salaries of teachers with BA or MA degrees.[27] The estimated effects are similar to the effect on maximum salaries, and are not statistically significant, which leads me to conclude the incentives policy had little effect on scheduled salaries or longevity payments.

Above and beyond the well-known salary schedule and longevity payments, there are additional forms of monetary compensation available to teachers. For example, many districts offer retirement bonuses. Some of these retirement bonuses are explicit early retirement incentives aimed at inducing employees to retire earlier than they otherwise would have. They do so by stipulating that employees will only be eligible for the bonus in their first year of retirement eligibility. Other retirement bonuses offer a bonus to any employee eligible to retire regardless of whether she is in her first year of eligibility. As such, they are not explicitly retirement incentives, though they may serve to induce employees to retire earlier than they otherwise would have.

To get a sense of the effect of the policy on retirement incentives and bonuses, I make use of the data on these forms of compensation collected from the text of collective bargaining agreements between districts and teachers. For each year of each contract in the sample, information on the size, type and availability of bonuses was coded. I combine information on the size and number of years of the bonus with information on the average salary across districts

[27] A decrease in compensation at the end of employees careers may make them push for increases in salaries earlier in their careers. To the extent that this happens, my triple-difference estimates of the effects of the policy may be underestimates. However, the evidence in Table 8 suggests that scheduled salaries earlier in the career are not changing by much, if at all.

to obtain a measure of the dollar value of end-of-career salary bonuses. Using the timing of the policy's implementation across districts for identification, I estimate the effects of the policy on the propensity of districts to offer retirement bonuses and size of retirement bonuses.

The estimated effects of the incentives policy on retirement bonuses are presented in Table 8. In the seventh column, the dependent variable is a dummy variable indicating whether a district's contract mentions a retirement bonus. The results indicate that the incentives policy made codifying a retirement bonus 4 percentage points more likely in the collective bargaining agreements of IPS. Given that 84 percent of contracts had retirement bonuses in 2005, this is a 5 percent increase in the probability of offering a retirement bonus. The results in the eighth column indicate that the value of retirement bonuses decreased by nearly $3,000 because of the disincentives policy. The estimate is statistically significant at the 1 percent level. Given an average pre-policy bonus of about $15,000, this represents an 18 percent decrease in the average retirement bonus offered to employees.

The decrease in retirement bonus is smaller than the decrease in overall compensation shown in Table 4. The remaining decrease in overall compensation is likely driven by two factors. First, districts may have placed more stringent limits on who could receive a retirement bonus. Although retirement bonuses are generally written into the contract and are therefore available for all teachers regardless of quality, oftentimes districts only offer the bonuses to teachers who have been employed with the district for some minimum number of years. For example, in 2004, 377 districts set within district service requirements for their retirement bonus program. By 2010, 466 districts set such requirements. This rendered fewer teachers eligible for the smaller retirement bonuses, which implies a larger change in total compensation than if we just consider the size of the bonus available.

The other mechanism through which total compensation may have decreased is through a change to the pay for or assignment of extracurricular activities. As with any form of compensation that counts for the pension, the value to the employee of the pay for extracurricular duty assignments increases if she is in a year of employment where her salary will count for pension benefit calculation. Because of this, employees with more experience may use their seniority to obtain extracurricular activity assignments. Once the disincentives policy is implemented, and districts have to pay the full costs of salary increases above six percent, they may not be willing to assign these tasks in the same manner as previously. Unfortunately, to my knowledge, information on the assignment of these activities does not exist.

Conclusion

In this paper, I have shown that the intergovernmental incentives inherent in the structure of compensation decisions lead to large end-of-career increases that are unlikely to be related to worker productivity. A state-level policy aimed at disincentivizing the use of large end-of-career salary increases for public school employees served to change the level and timing of compensation over employee's careers.

Of interest is how effective the policy was at saving the pension fund, and hence the taxpayers of Illinois, from the increased liability due to end-of-career salary increases. To determine the annual costs of the backloading described earlier in the paper, I use the estimates of salary bonuses for near-retirement employees before the policy was in effect (Table 5) and counts of the number of employees in each eligibility category in the data in 2004. Using this information, I find that a total of $250 million of compensation in 2004 was due to the end-of-career backloading of salaries unrelated to changes in education, position, district or experience.

The policy lowered salaries of some retirement-eligible employees and increased salaries of some employees nearing retirement eligibility. In total, it decreased the amount of end-of-career bonuses by about $150 million, or about 60 percent.

The pension fund assets were also likely increased as school districts continued to pay end-of-career salary increases of more than six percent to nearly 10 percent of employees who were about to retire, most of whom do not change positions or districts. The policy mandated that the increases in promised pension benefits resulting from these large salary increases be paid for by the district. Of particular interest for future research is the motivation behind districts' continued use of large end-of-career salary increases and inter-district nature of the salary backloading patterns.

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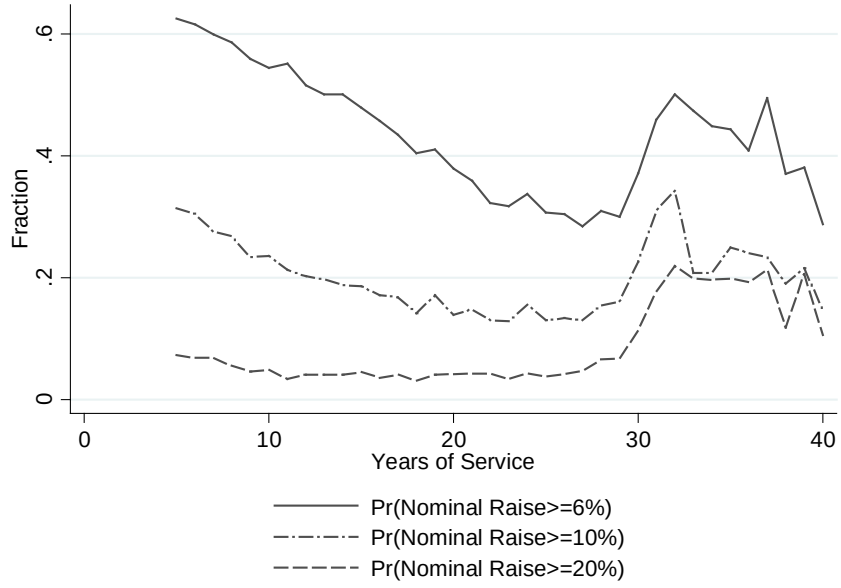
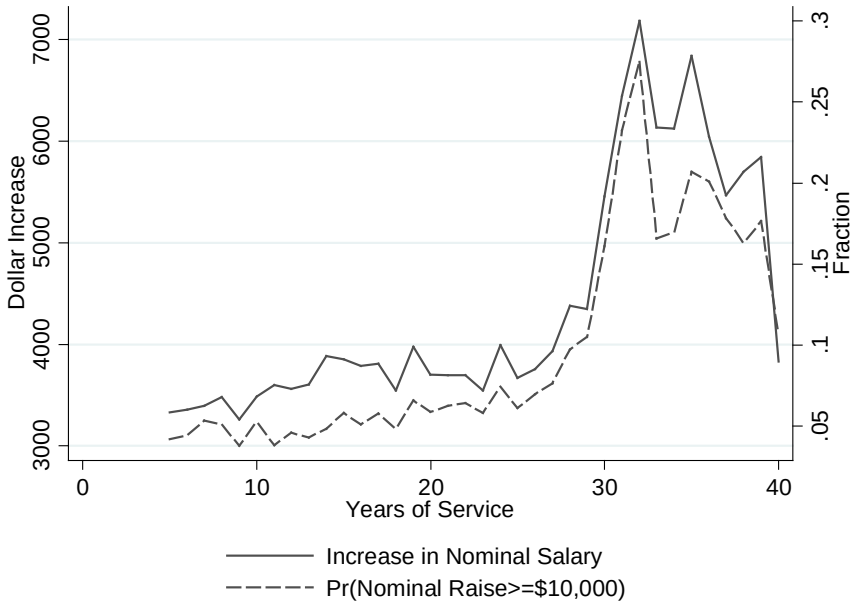
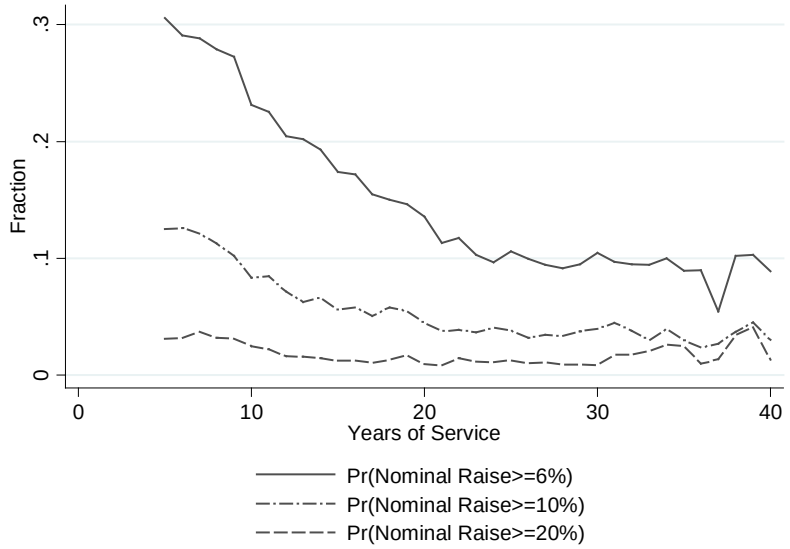
Figure 1. Year-to-year Salary Increases for Illinois Public School Employees
Panel A. Percent Change in Salary from t to t+1, by Experience Level of Employee, 2003-2004



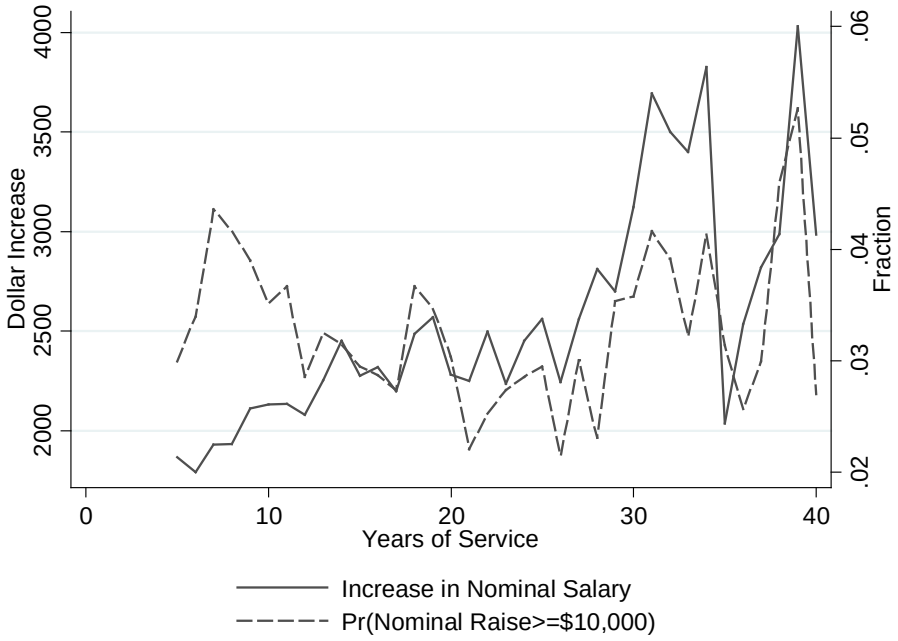
Panel B. Percent Change in Salary from t to t+1, by Experience Level of Employee, 2003-2004



Panel C. Percent Change in Salary from t to t+1, by Experience Level of Employee, 2009-2010

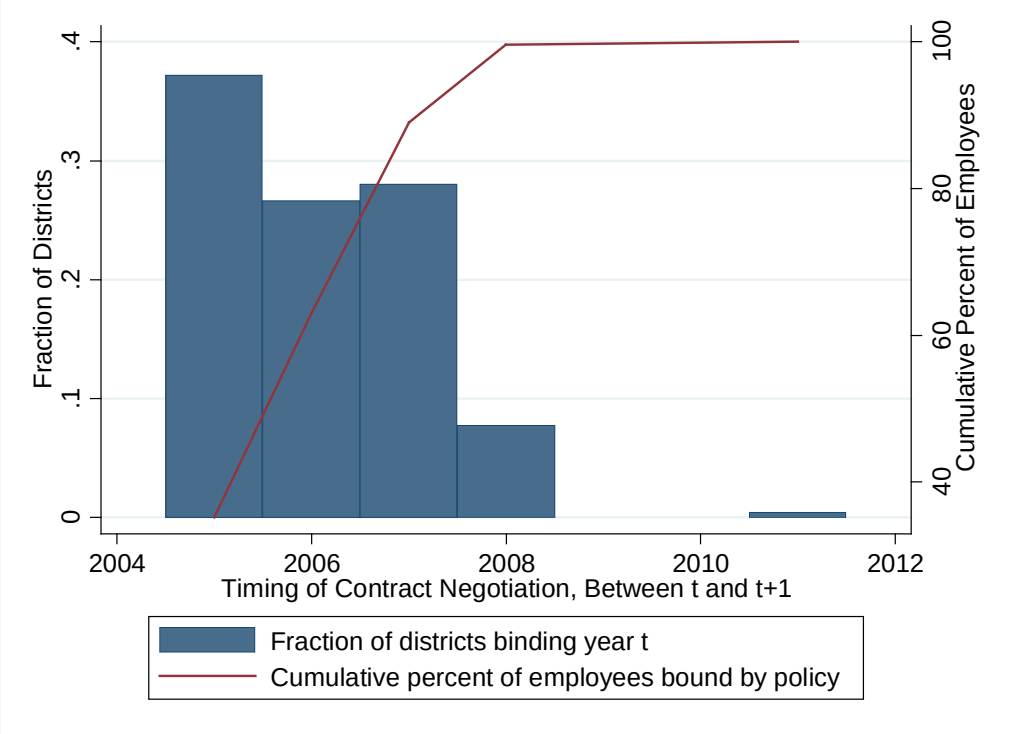


Panel D. Percent Change in Salary from t to t+1, by Experience Level of Employee, 2009-2010



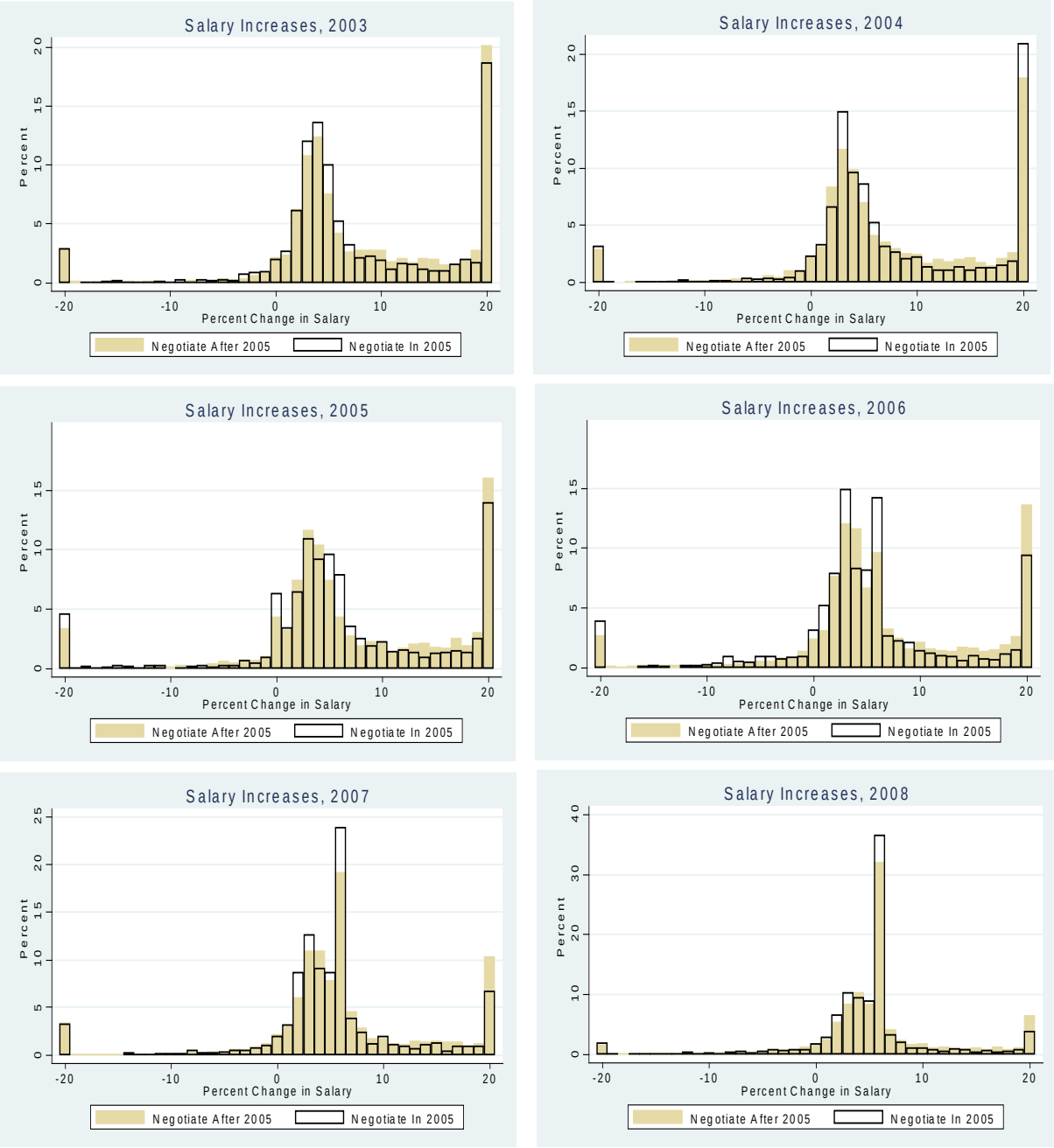
Notes: Based on the author's calculations using data from the Illinois Teacher Service Record for the 2002-2003 and 2009-2010 school years. Data include only employees who do not switch positions or districts and do not change their level of educational attainment between t and t+1.

Figure 2. Schedule of Contract Negotiation Timing as of the 2004-2005 School-Year



Notes: Based on the author's calculations using the Illinois Teacher Service Record in 2005-2012 in conjunction with the Teacher Salary Study from 2005. Contract negotiation timing is as reported by districts in the fall of the 2004-2005 school-year, i.e. the school-year before the end-of-career salary disincentives policy was introduced. Contracts scheduled to be negotiated between June 1 and August 30 of 2005 are assumed to take effect for salaries beginning in the 2005-2006 school year. Contracts scheduled to be negotiated between September 1 and August 30 of later school-years are assumed to take effect in the subsequent school-year. The cumulative percent of employees bound by the policy is the percent of employee observations in an indicated school-year that work in a district that was scheduled to have renegotiated its contract in time for the end-of-career salary disincentives policy to be applicable.

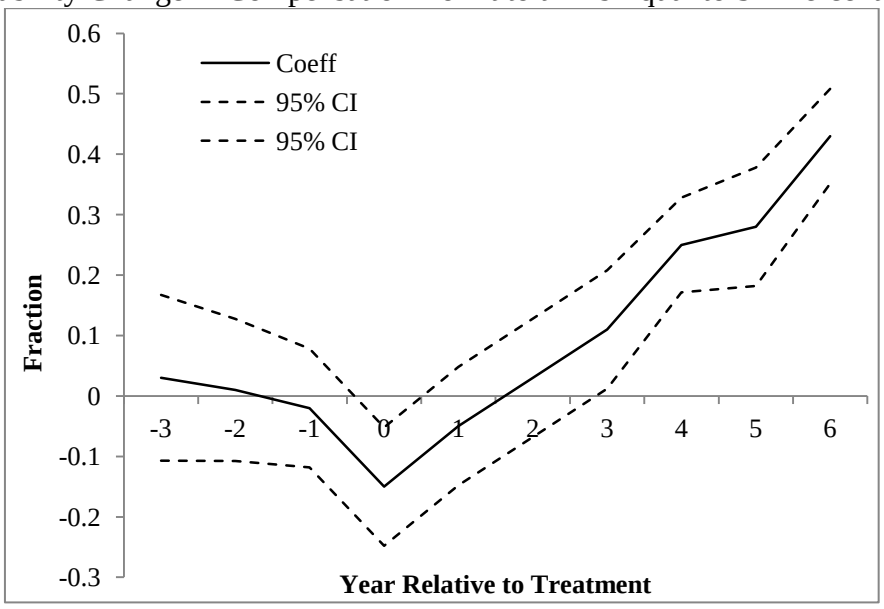
Figure 3. Distribution of Salary Increases for Employees with 31 to 35 Years of Experience, by Whether the District Renegotiated in 2005 or Later and by Year



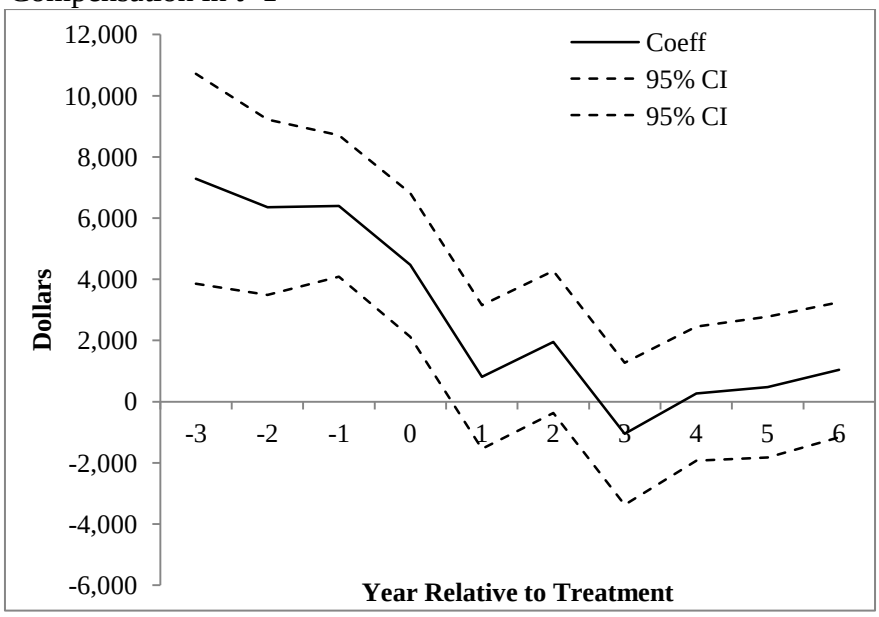
Note: Based on the author's calculations using the Illinois Teacher Service Record, 2003 to 2008. Histograms are of percentage changes in salaries for employees with 31 to 35 years of experience, by whether the district's first post-policy contract was scheduled to be negotiated in the summer of 2005 or later. Salary changes have been top- and bottom-coded at 20 and -20, respectively.

Figure 4. Event-Study-Style Estimates of Changes in Compensation, by One-Year-from-Retirement Treatment Intensity and Year Relative to Policy Implementation

Panel A. Probability Change in Compensation from t to t+1 is Equal to Six Percent



Panel B. Total Compensation in t+1



Note: Based on the author's calculations using the Teacher Service Record for employees between 2003 and 2011. Solid lines trace out coefficient estimates of equation (1) with distributed leads and lags in time relative to treatment rather than a single dichotomous variable for policy implementation.

Table 1. Characteristics of Employees of Illinois Public Schools, 2003-2011

	Mean	Standard Deviation	10th Percentile	90th Percentile
Panel A.				
Experience in IPS	16.47	8.93	6.00	30.00
Age	46.22	10.47	32.00	59.00
Non-white	0.17	0.38	0.00	1.00
Male	0.24	0.43	0.00	1.00
School Leaders	0.06	0.23	0.00	0.00
Teachers	0.81	0.39	0.00	1.00
Staff	0.13	0.34	0.00	1.00
Bachelors degree holders	0.32	0.47	0.00	1.00
Masters degree holders	0.66	0.48	0.00	1.00
Panel B.				
Full-time in current year	0.97	0.18	1.00	1.00
Full-time in current year and following year	0.91	0.29	1.00	1.00
Exit IPS after current year	0.06	0.23	0.00	0.00
Exit district after current year	0.08	0.28	0.00	0.00
Total Salary	64,450.77	24,718.78	39,552.47	96,308.57
Change in total salary from current year to next	3,499.43	7,364.45	-14.78	8,556.04
Percent change in total salary from current year to next	5.45	6.73	-0.02	13.97
Number of observations		874,939		

Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011.

Table 2. Summary Statistics on End-of-Career Salary Increases from Collective Bargaining Agreements

	Mean	Standard Deviation	10th Percentile	90th Percentile
Maximum Scheduled Salary for Teacher with BA Degree	49,289	9,139	38,604	61,509
Maximum Scheduled Salary for Teacher with MA Degree	61,428	13,661	45,639	80,240
Highest Scheduled Salary	66,963	17,430	47,725	91,072
Maximum Scheduled Salary for Teacher with BA Degree with Longevity Bonus	50,676	10,096	39,268	63,789
Maximum Scheduled Salary for Teacher with MA Degree with Longevity Bonus	63,294	14,675	46,500	83,607
Highest Scheduled Salary with Longevity Bonus	69,315	19,390	48,829	94,939
Beginning Scheduled Salary for Teacher with BA Degree	33,016	5,008	27,101	39,747
Beginning Scheduled Salary for Teacher with MA Degree	36,487	5,853	29,501	44,295
Number of Years of Service Required to Reach Maximum Salary with BA Degree	18	8	9	29
Number of Years of Service Required to Reach Maximum Salary with MA Degree	29	624	15	32

Note: Based on author's calculations using the Illinois Teacher Salary Study from 2003 to 2011.

Table 3. Relationship between District Characteristics and End-of-Career Salary Increases, by Whether an Employee is Near Retirement

	Change in Salary Is At Least 20%	Change in Salary Is At Least 10%	Change in Salary is At Least $10,000
Within 4 years of Full Retirement Eligibility	0.071***	0.074***	0.090***
	(0.002)	(0.002)	(0.002)
Percent of the Students that are Low-Income	0.001*	-0.001	0.002***
	(0.001)	(0.001)	(0.001)
Average Experience of FTE Teachers	-0.015***	-0.051***	-0.012***
	(0.001)	(0.001)	(0.001)
<u>Interaction Between Being within 4 Years of Retirement Eligibility and:</u>			
Percent of the Students that are Low-Income	-0.003**	-0.007***	-0.009***
	(0.001)	(0.002)	(0.002)
Average Experience of FTE Teachers	0.005***	0.014***	-0.003*
	(0.002)	(0.002)	(0.002)

Note: Based on the author's calculations using the TSR, TRS, TSS and Illinois State Report Card Data from 2003. Each column presents results from a regression of the outcome indicated by the column header on individual employee characteristics including position, educational attainment, gender, race, salary and experience and age fixed effects, as well as the other measures indicated in the table. The variables measuring the percent of students in a district who are low-income and the average experience of full-time-equivalent (FTE) teachers have been standardized to have mean zero and standard deviation of one. The dummy variable measuring an employee's being within four years of full retirement eligibility measures whether an employee's age and years of service are such that she is within four years of eligibility for retirement with an undiscounted annuity. Standard errors are in parentheses. ***, **, and * represent coefficient estimates that are statistically significant at the one, five and ten percent levels, respectively.

Table 4. Difference-in-Difference Estimates of the Salary Disincentives Policy on Salary Outcomes

	(1) Raise is 6%	(2) Raise is <6%	(3) Raise is >6%	(4) % Change in Total Compensation	(5) Total Compensation in t+1
Year Before Retirement	-0.05*	-0.36***	0.41***	5.84***	5,843.21***
	(0.03)	(0.06)	(0.06)	(0.83)	(1,011.97)
Two Years Before Retirement	-0.06**	-0.26***	0.32***	4.12***	3,492.03***
	(0.03)	(0.06)	(0.06)	(0.97)	(1,166.02)
Three Years Before Retirement	-0.04	-0.07	0.11**	1.75**	1,157.11
	(0.03)	(0.05)	(0.05)	(0.79)	(926.48)
Four Years Before Retirement	0.03	0.05	-0.09**	-1.00*	-967.89
	(0.02)	(0.04)	(0.04)	(0.51)	(657.22)
Effects of the Policy on:					
Year Before Retirement	0.23***	0.13*	-0.36***	-4.32***	-5,307.80***
	(0.04)	(0.07)	(0.06)	(0.95)	(1,366.81)
Two Years Before Retirement	0.20***	0.05	-0.25***	-2.65***	-1,500.65
	(0.04)	(0.07)	(0.06)	(0.94)	(1,333.05)
Three Years Before Retirement	0.13***	-0.07	-0.06	-0.93	-94.33
	(0.04)	(0.06)	(0.05)	(0.84)	(1,061.54)
Four Years Before Retirement	-0.00	-0.05	0.05	0.81	217.79
	(0.03)	(0.05)	(0.04)	(0.58)	(860.81)
Number of Observations	789,082	794,060	789,082	789,082	789,082

Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011. Each row and column combination presents difference-in-difference estimates for the employees in the year indicated by the row header when the dependent variable is as indicated by the column header. Employee characteristics, school-year-by-district-by-experience and school-year-by-district-by-age fixed effects are also included. Standard errors are clustered at the district level and ***, **, and * indicate estimates statistically significant at the 1, 5, and 10 percent levels, respectively.

Table 5. Difference-in-Difference Estimates of the Salary Disincentives Policy on Employee Turnover

	(1)	(2)	(3)	(4)
	Exit IPS	Switch Districts	Change Position	Change Educational Attainment
Year Before Retirement	0.26***	0.02**	-0.00	0.02
	(0.03)	(0.01)	(0.02)	(0.01)
Two Years Before Retirement	0.05	-0.01	-0.02	0.01
	(0.04)	(0.01)	(0.02)	(0.01)
Three Years Before Retirement	-0.03	0.01	0.01	0.02**
	(0.03)	(0.01)	(0.02)	(0.01)
Four Years Before Retirement	0.02	0.00	0.01	0.01
	(0.03)	(0.01)	(0.01)	(0.01)
Effects of the Policy on:				
Year Before Retirement	-0.03	-0.02	-0.01	-0.02
	(0.04)	(0.01)	(0.02)	(0.02)
Two Years Before Retirement	0.00	0.02	0.02	-0.00
	(0.05)	(0.01)	(0.02)	(0.01)
Three Years Before Retirement	0.00	-0.00	0.00	-0.01
	(0.03)	(0.01)	(0.02)	(0.01)
Four Years Before Retirement	-0.05*	-0.01	-0.01	0.00
	(0.03)	(0.01)	(0.02)	(0.01)
Number of Observations			846,996	

Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011. Each row and column combination presents difference-in-difference estimates for the employees of the age and retirement eligibility status indicated by the row header when the dependent variable is as indicated by the column header. Employee characteristics, school-year-by-district-by-experience and school-year-by-district-by-age fixed effects are also included. Standard errors are clustered at the district level and ***, **, and * indicate estimates statistically significant at the 1, 5, and 10 percent levels, respectively.

Table 6. Difference-in-Difference Estimates of the Salary Disincentives Policy, Including any Anticipatory Effects

	Raise is 6%	Total Compensation in t+1	Exit	Switch Districts
Year Before Retirement	-0.04	6,376.78***	0.23***	0.02
	(0.04)	(1,238.09)	(0.04)	(0.02)
Two Years Before Retirement	-0.07**	2,684.58**	0.06	-0.01
	(0.03)	(1,082.91)	(0.04)	(0.01)
Three Years Before Retirement	-0.05	1,952.62**	-0.02	0.01
	(0.03)	(987.84)	(0.03)	(0.01)
Four Years Before Retirement	0.03	-1,635.58**	0.02	-0.00
	(0.03)	(751.34)	(0.03)	(0.01)
Interim Effects:				
Year Before Retirement	-0.03	-1,493.37	0.07	0.01
	(0.07)	(2,348.72)	(0.06)	(0.02)
Two Years Before Retirement	0.03	2,180.56	-0.01	-0.00
	(0.07)	(2,664.44)	(0.07)	(0.02)
Three Years Before Retirement	0.03	-2,117.29	-0.02	0.00
	(0.06)	(1,734.13)	(0.05)	(0.02)
Four Years Before Retirement	0.00	1,821.27	-0.03	0.02
	(0.05)	(1,531.27)	(0.05)	(0.02)
Effects of the Policy:				
Year Before Retirement	0.22***	-5,841.37***	-0.00	-0.02
	(0.05)	(1,477.59)	(0.04)	(0.02)
Two Years Before Retirement	0.21***	-693.21	-0.00	0.01
	(0.04)	(1,229.07)	(0.05)	(0.01)
Three Years Before Retirement	0.14***	-889.83	-0.00	-0.00
	(0.05)	(1,167.45)	(0.04)	(0.01)
Four Years Before Retirement	-0.00	885.48	-0.06*	-0.00
	(0.04)	(895.45)	(0.03)	(0.01)
Number of Observations	789,082	794,060	846,996	846,996

Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011. Each row and column combination presents difference-in-difference estimates for the employees of the age and retirement eligibility status indicated by the row header when the dependent variable is as indicated by the column header. Employee characteristics, school-year-by-district-by-experience and school-year-by-district-by-age fixed effects are also included. Standard errors are clustered at the district level and ***, **, and * indicate estimates statistically significant at the 1, 5, and 10 percent levels, respectively.

Table 7. Difference-in-Difference Estimates of the Salary Disincentives Policy, by Employee Position

	(1)	(2)	(3)	(4)
	Teachers		Leaders and Staff	
	Raise is 6%	Total Compensation in t+1	Raise is 6%	Total Compensation in t+1
Year Before Retirement	-0.07	6,086.66***	-0.05	5,167.39
	(0.04)	(1,703.71)	(0.21)	(9,341.11)
Two Years Before Retirement	-0.07*	3,892.93**	0.12	8,761.39
	(0.04)	(1,632.62)	(0.26)	(12,218.03)
Three Years Before Retirement	-0.04	936.33	-0.15	5,115.79
	(0.04)	(1,027.58)	(0.17)	(7,387.79)
Four Years Before Retirement	0.04	-951.58	-0.02	-3,272.03
	(0.04)	(771.45)	(0.14)	(6,255.97)
Effects of the Policy:				
Year Before Retirement	0.25***	-5,601.01***	0.27	-7,447.97
	(0.07)	(1,788.33)	(0.31)	(11,531.05)
Two Years Before Retirement	0.21***	-2,700.27	0.10	-6,197.62
	(0.06)	(1,860.14)	(0.33)	(12,768.81)
Three Years Before Retirement	0.18***	536.71	0.25	-1,440.02
	(0.07)	(1,436.55)	(0.23)	(7,684.33)
Four Years Before Retirement	0.00	476.58	-0.03	1,879.41
	(0.05)	(1,016.84)	(0.23)	(7,752.59)
Number of Observations	543,864	544,614	142,062	143,740

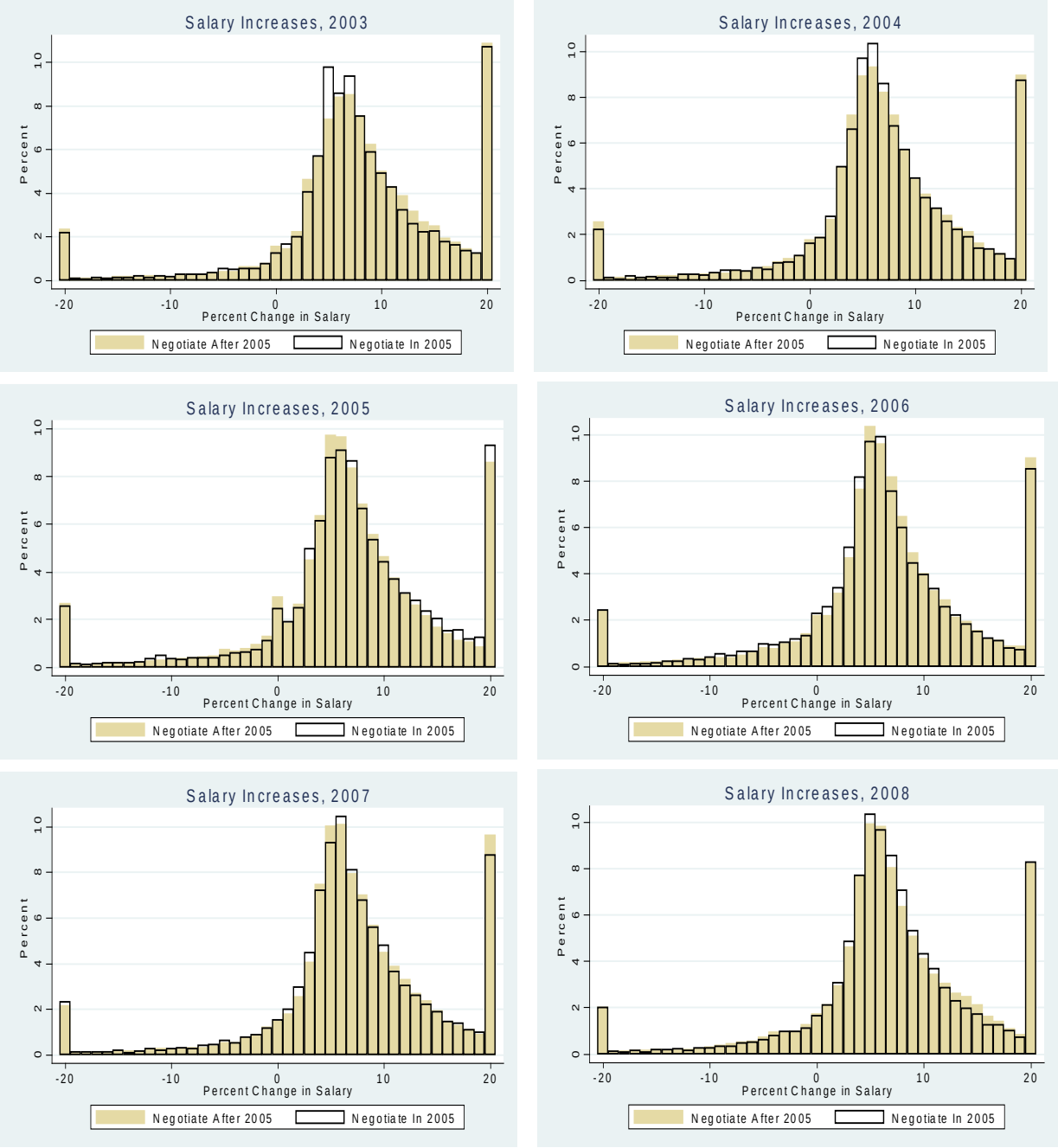
Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011. Each row and column combination presents difference-in-difference estimates for the employees of the age and retirement eligibility status indicated by the row header when the dependent variable is as indicated by the column header. Employee characteristics, school-year-by-district-by-experience and school-year-by-district-by-age fixed effects are also included. Standard errors are clustered at the district level and ***, **, and * indicate estimates statistically significant at the 1, 5, and 10 percent levels, respectively.

Table 8. Difference-in-Difference Estimates of the Salary Disincentives Policy on Scheduled Salaries and Longevity Payments

	(1) BA Maximum ($)	(2) BA Maximum + Longevity ($)	(3) MA Maximum ($)	(4) MA Maximum + Longevity ($)	(5) Highest Possible ($)	(6) Highest Possible + Longevity ($)	(7) Probability of Offering Retirement Bonus ($)	(8) Retirement Bonus ($)
Effects of Policy	160.56	419.83**	287.34	170.39	343.03*	574.21	0.040***	-2,709.985*
	(163.32)	(171.67)	(237.46)	(218.34)	(208.23)	(751.57)	(0.012)	(682.663)
Number of Obs.	9,382						6,273	

Note: Based on author's calculations using the Illinois Teacher Salary Study from 2003 to 2011. Each row and column combination presents difference-in-difference estimates when the dependent variable is as indicated by the column header. District and year fixed effects are also included. Standard errors are clustered at the district level and ***, **, and * indicate estimates statistically significant at the 1, 5, and 10 percent levels, respectively.

Appendix Figure 1. Distribution of Salary Increases for Employees with 2 to 10 Years of Experience, by Whether the District Renegotiated in 2005 or Later and by Year



Note: Based on the author's calculations using the Illinois Teacher Service Record, 2003 to 2008. Histograms are of percentage changes in salaries for employees with 2 to 10 years of experience, by whether the district's first post-policy contract was scheduled to be negotiated in the summer of 2005 or later. Salary changes have been top- and bottom-coded at 20 and -20, respectively.

Appendix Table 1. Characteristics of Employees of Illinois Public Schools in the Analysis Sample, 2003-2011

	Mean	Standard Deviation	10th Percentile	90th Percentile
Panel A.				
Experience in IPS	16.00	8.54	6.00	29.00
Age	45.71	10.24	32.00	58.00
Non-white	0.17	0.38	0.00	1.00
Male	0.25	0.43	0.00	1.00
School Leaders	0.06	0.23	0.00	0.00
Teachers	0.82	0.38	0.00	1.00
Staff	0.12	0.33	0.00	1.00
Bachelors degree holders	0.33	0.47	0.00	1.00
Masters degree holders	0.65	0.48	0.00	1.00
Panel B.				
Full-time in current year	1.00	0.00	1.00	1.00
Full-time in current year and following year	1.00	0.00	1.00	1.00
Exit IPS after current year	0.00	0.00	0.00	0.00
Exit district after current year	0.02	0.16	0.00	0.00
Total Salary	65090.30	23016.91	41274.31	95312.00
Change in total salary from current year to next	3636.84	6301.97	0.00	8404.43
Percent change in total salary from current year to next	5.53	6.34	0.00	13.54
Number of observations		789,082		

Note: Based on author's calculations using the Illinois Teacher Service Record from 2003 to 2011.

Appendix Table 2. District Characteristics in 2005, by Survey Response

	(1)	(2)	(3)
Survey Response	Yes	No	P-value of Difference
Fraction of Employees within 4 years of Full Retirement Eligibility	0.39	0.36	0.191
Fraction of Employees that Receive 6% Salary Increase	0.06	0.06	0.861
Fraction of Employees that Receive 20% Salary Increase	0.32	0.34	0.517
Fraction of Employees within 4 years of Full Retirement Eligibility who Receive 6% Salary Increases	0.10	0.09	0.229
Fraction of Employees within 4 years of Full Retirement Eligibility who Receive 20% Salary Increases	0.02	0.02	0.834
Fraction Male	0.31	0.28	0.809
Fraction Non-white	0.07	0.06	0.563
Average Total Salary ($1,000)	56.26	54.03	0.029**
Average Employee Experience	17.59	17.73	0.838
Fraction with an MA	0.54	0.48	0.000***
Fraction in Leadership Positions	0.06	0.07	0.318
Percent of Students who are Low-Income (standardized)	23.59	28.99	0.097*
Total Enrollment of Students	2331	1412	0.000***
Number of Districts	302	574	

Note: Average district characteristics based for districts based on whether they provided contracts for any year between 2003 and 2011. Column 3 presents the p-value of the t-statistic from a regression of a dummy variable indicating response on the characteristic indicated in the row header.