*Retiree Health Insurance for Public School Employees: Does it Affect Retirement and Mobility?*

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Abstract: Despite the widespread provision of retiree health insurance for public sector workers, little attention has been paid to its affects on employee mobility and retirement. This is in stark contrast to the large literature on health-insurance-induced "job-lock" in the private sector. In this paper, I use the introduction of retiree health insurance for public school employees in combination with administrative data on their retirement and mobility to identify the effects of retiree health insurance. As expected, the availability of health insurance for older workers that is not contingent on employment allows employees to retire earlier, e.g. rather than waiting for Medicare-eligibility, and increases job-to-job transitions.

KEYWORDS: Retirement, Health Insurance, Public Sector Employment, Teacher Labor Supply
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*I. Introduction*

In the U.S., as in many other OECD countries, public sector pension funds are severely underfunded.[1] At the same time, the funds set aside to pay for the health insurance promised to retired state and local government employees, like teachers, represent an even smaller fraction of the estimated future health care liabilities than pension funds do pension liabilities (Clark and Morrill 2010). While the promised pension benefits to public employees are considered constitutionally protected in many states, retiree health insurance is not. Therefore, facing considerable deficits and a poor economic climate, state and local governments may soon decide to discontinue or significantly scale back retiree health insurance programs for their employees.

Economic theory would predict that the offer of retirement-contingent health insurance to public sector employees would decrease public sector employment of older workers for two reasons. First, there is an income effect of subsidized health insurance that discourages work. Second, health insurance that is tied to retirement from the public employer does not preclude employment in the private sector; the reduction of "job-lock" may lead employees to retire from the public sector but continue to work elsewhere. In addition to effects on retirement, retiree health insurance may have effects on mobility of public employees. For example, the offer of retiree health insurance that is not connected to employment with a particular employer, like an individual school district, may allow employees to search for another employer that will provide better current (rather than future) benefits to employees.

[1] Novy-Marx and Rauh (2009) estimate U.S. public pension funds are $3 trillion underfunded. For information on OECD public pensions, see http://www.oecd.org/finance/private-pensions/47827915.pdf.

[2] Evidence from Medicare on labor supply of older Americans is limited, likely in part due to the fact that it is difficult to disentangle the eligibility for Medicare from the eligibility for Social Security and other retirement contingent programs for which people become eligible at age 65. Some existing studies generally overcome this problem using identification assumptions based on functional form and find positive effects (Rust and Phelan, 1997;

However, there has been relatively little research into the magnitude of any effects of retiree health insurance on *public sector* employment. Research on similar programs, e.g. Medicare, COBRA and the Veterans Affairs insurance expansion, provides some indication (Gustman and Steinmeir, 1994; Karoly and Rogowski, 1994; Madrian, 1994; Gruber and Madrian, 1995; Lumstaine, Stock and Wise, 1996; Rust and Phelan, 1997; Blau and Gilleskie, 2001, 2006, 2008; Johnson et al. 2003; Boyle and Lahey, 2010; Robinson and Clark, 2010; Strumpf, 2010; French and Jones, 2011; Coe et al., 2013; Martin and Woodbury, 2013; Nyce et al., 2013). This literature has generally shown that health insurance available for retirement-aged individuals induces retirement, though the magnitudes of the effects vary across settings.[2] This work has focused on *private sector* employees. Differences between both public employee retiree health insurance plans and private insurance or Medicare and public and private employees suggest the effects of retiree health insurance may be different across the public and private sectors. For example, research has shown public sector employees are particularly responsive to the nonlinearities in their pension benefits (Costrell and Podursky 2009; Brown 2010) and are more knowledgeable about their retirement benefits (DeArmond and Goldhaber 2010) than their counterparts in the private sector.

More recently, two studies have focused specifically on the effects of retiree health insurance one the labor supply of public sector retirees. Leiserson (2013) uses administrative data on public bureaucrats in Pennsylvania to investigate how employee exit responds to retiree

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health insurance eligibility. He leverages both the inherent variation caused by standing eligibility requirements for pensions and the retiree health insurance program and a natural experiment caused by an increase in the service requirement for retiree health insurance eligibility (but not pension eligibility) from 15 to 20 years. Shoven and Slavov (2013) use data on all federal, state and local government employees from the Health and Retirement Study coupled with data on retiree health insurance availability and generosity to determine the effects of retiree health insurance on the labor supply of older workers, i.e. those between 58 and 64. Both studies find that the availability of health insurance that is not contingent on public sector employment increases the likelihood that employees will be either out of the labor force or at least no longer working at their public employer.

The current study provides a nice compliment to this emerging literature because, as described below, I am able to bring in administrative data on the main group of of public sector workers, namely, teachers and other public school employees.[3] I am also able to leverage a natural experiment that is different in nature than those used in Leiserson and Shoven and Slavov and has as its counterfactual a world without retiree health insurance in the public sector. Also, as with the other studies, the nature of my data allow me to pay careful attention to other endogenous factors that may be driving retirement, e.g. pension eligibility and generosity. Moreover, the weakness of my study – my use of data and identifying variation from the early 1980s – does not plague the other studies. As such, the findings of all three studies can be used in concert to more fully understand the relationship between retiree health insurance and public sector employee labor supply.

[3] The BLS reports that in May of 2013, there were 19,100,000 state and local government workers, 53 percent of which were education related employees. http://www.bls.gov/news.release/empsit.t17.htm

To be more specific, in this paper, I provide direct evidence about how public sector retiree health insurance availability affects the labor supply of public employees by examining the introduction of retiree health insurance for public school employees in Illinois. Today, former employees of Illinois Public Schools (IPS) who receive retirement benefits from the Illinois Teacher Retirement System (TRS) can participate in a health insurance plan called the Teachers Retirement Insurance Program. The state legislators introduced this retiree health insurance program for teachers and other public school employees, which I call TRHIP, in January of 1980 and permitted the first enrollments on July 1, 1980.[4] At the time, premiums for enrollees were 50 percent subsidized. In order to enroll, former IPS employees needed to be receiving retirement benefits from the TRS and have at least 8 years of creditable service with the TRS.

Using administrative data from IPS, I use a differences-in-differences framework to compare the labor supply of teachers old enough and with enough accumulated experience to be eligible for TRHIP to those who were ineligible (because they were too young or had too little experience to be eligible for retirement benefits and THRIP) just before and after the TRHIP was introduced. The identifying assumption is that there were no other policies or environmental factors that disproportionately affected the labor supply of teachers eligible for THRIP. Importantly, using historical TRS documents, I can confirm there were no concurrent policy changes by the Illinois TRS related to either pension benefit size or eligibility. To further

[4] The name Teachers Retirement Insurance Program was introduced in 1995 when the state created the Teachers' Health Insurance Security Fund as an agency (separate from the pension fund) responsible for collecting state, district and employee contributions, managing the investment of funds and providing payment for the healthcare received by members. Before that, the retiree health insurance program was managed by the TRS and generically called the retiree health insurance program. For consistency, and to distinguish it from the program available only after 1995, I will refer to the program as the TRHIP throughout the paper.

support the identification assumption, I examine pre-treatment trends in labor supply of the eligible and ineligible groups of public school employees.

The main outcome of interest is the retirement from the IPS system. I find that eligibility for retirement-contingent health insurance induces a clear shift in the age profile of retirement for public school employees. Before retiree health insurance is introduced, the exit of employees from IPS is highest at age 65, when eligibility for Medicare begins. After TRHIP is introduced, the exit rate at age 65 decreases 40 percent, from 0.51 to 0.29. At the same time, exit rates when employees first become eligible for retirement benefits at age 55 were just 0.054 before the TRHIP was introduced. Afterwards, the exit rate at this age, which now determines not just eligibility for retirement benefits but also retiree health insurance, jumps to 0.098, an increase of 45 percent. These descriptive statistics relate closely to the estimated causal effects of TRHIP on public school employees in Illinois.

In Section II, I provide an overview of the Illinois teacher pension and retiree health insurance programs as they exist today, and their historical genesis. I describe the data in Section III and the empirical methodology in Section IV. I present results in Section V before concluding with a brief discussion in Section VI. Implications for employees and governments today are discussed, including how the current underfunding of both pension systems and retiree health care systems may be affected.

*II. Illinois Teacher Retiree Health Insurance Program*

Today, former employees of Illinois Public Schools who receive retirement benefits from the Illinois TRS can participate in a health insurance plan officially called the Teachers Retirement Insurance Program (TRIP). For retired employees enrolled in the managed care plan,

the monthly premium is $203 if the retiree is under age 65 and $80.23 if the retiree is age 65 or older and enrolled in Medicare as the primary insurer. Premiums are higher in the alternative Teachers' Choice Health Plan. Notably, unlike Medicare, the TRHIP program covers dependents; premiums for dependents are more expensive than premiums for retired employees. Currently, there is no annual or lifetime limit on the coverage in any plan offered by the Illinois TRHIP. In the managed care program, there is no annual deductible, though there are copayments for certain services, e.g. $20 for a physician's visit. The out-of-pocket maximum is $3,000. The Teachers' Choice Health Plan has a $500 deductible, but only a $1,200 out-of-pocket maximum for in-network services.

As mentioned in the introduction, in order to enroll in the TRHIP, former IPS employees must be receiving retirement benefits from the TRS and have at least 8 years of creditable service with the TRS. Eligibility for retirement benefits from TRS is determined by an employee's age and years of creditable service in IPS.[5] An employee is eligible to receive a full retirement benefit when she is age 55 with at least 35 years of experience, age 60 with at least 10 years of experience, or age 62 with at least five years of experience. During the period studied, employees who had accumulated up to one-half a year of sick leave could count this as creditable service. Additionally, throughout this period, employees could retire at age 55 with just 20 years of experience and receive an actuarially discounted annuity.

The state legislators introduced the health insurance program for retired teachers in January of 1980. The first enrollments were on July 1, 1980. At the time, premiums for enrollees were 50 percent subsidized such that the annuitant's monthly premium cost was $81.70

[5] Creditable service can also be earned in Chicago Public Schools or other state employers that have reciprocal arrangements with IPS. Also, employees can pay a fee to have some service credited for time spent teaching in private schools, time in the military, maternity leave, etc.

for people under age 65 and $29.21 for people age 65 and older.[6] The annual deductible was $847 and $7,056 for people on Medicare and those under age 65, respectively. Initially, and until 1995, the retiree health insurance program was part of the TRS, so the subsidy was financed by funds in the pension system, which were comprised of state appropriations, employee contributions and investment returns.

In the absence of retiree health insurance, the single largest insurance provider for public school retirees was Medicare. In 1980, Medicare consisted of hospital insurance and medical insurance.[7] For people ages 65 and older who have worked at least 10 years (40 quarters) in jobs that were subject to Medicare FICA taxes, Medicare hospital insurance is free. The same is true if one's spouse worked at least 10 years in a job covered by Medicare taxes. IPS teachers did not pay Medicare taxes on their earnings until after 1986, and even then Medicare taxes were levied only on teachers newly hired by a district. Therefore, even once employees were 65, unless they were eligible for the free hospital insurance through their spouse's work credit, many IPS employees paid a hospital insurance premium. In 2012, the premium for the hospital insurance was scaled based on the amount of FICA covered work history; the highest premium was $451 per month. In addition, all Medicare enrollees pay a premium for the medical insurance coverage. In 2012, the base premium was $99.90 a month, but the premium increased with a beneficiary's earnings.

In contrast, IPS employees younger than age 65 would have had one of five options for obtaining health insurance. The first would be to remain employed and receive health insurance

[6] Premiums and deductibles from 1980 have been converted to $2013. If retirees were Medicare eligible, the teacher retiree health insurance program only paid for the balance of covered expenses minus any Medicare coverage, regardless of the person's actual participation in Medicare.
[7] Medicare Advantage was introduced in 1997 and the prescription drug component of Medicare was passed into law in 2003.

through an employer. Since all school districts provide employee health insurance and tenure rules protect the most senior teachers from termination of employment, continuing insurance coverage in this manner would have been at the discretion of the employee. A second way for IPS employees to obtain health insurance was through their spouse. Given that most of the employees in my sample were female and, during the period studied, likely secondary breadwinners, this may have been a viable alternative to continued employment until Medicare eligibility. Third, it may have been the case that individual school districts allowed former employees to continue participation in the district's employee health insurance plan after leaving employment with the district. Fourth, retiring employees could have purchased their own health insurance, either through COBRA or the private market. Finally, Medicare ineligible retirees could have gone without any health insurance.

Unfortunately, available data do not allow me to say much about the pre-THRIP insurance coverage of IPS workers.[8] However, some evidence can be gleaned from the pre-TRHIP retirement behavior of IPS employees. In Figure 1, I plot retirement rates of IPS employees by age before the TRHIP became available (the dashed blue line). There are noticeable increases in retirement behavior that correspond to the eligibility for pension benefits that some employees obtain at age 55 and age 60. But, by far the most notable spike in the retirement of IPS employees occurs at age 65 and 66. In fact, the retirement rate at age 65 is at least twice as large as the retirement rate for employees of any other age before age 65. Based on this figure, it's clear that eligibility for Medicare is a strong factor determining retirement behavior before retiree health insurance is introduced.

[8] At the time of introducing the retiree health insurance program, the TRS conducted a survey of a randomly selected subset of its members to gather information about their insurance coverage that could be used in shaping the policy offered by TRS. Unfortunately, according to correspondence with TRS representatives, the results of this survey cannot be found.

Additional evidence comes from tabulations of health insurance coverage reported in the Current Population Survey. In Figure 2, I present information about the fraction of people in Illinois who classify their occupation as teachers who obtained health insurance coverage through their employer. I report this information for the period from 1980 to 1985 separately for teachers ages 40 to 54 and 55 or older. Over this period, nearly all people aged 40 to 54 in Illinois who classify themselves as teachers were covered by group health insurance from their employer, former employer or spousal employment. The same is true for teachers ages 55 and older in 1982 onwards. However, in 1980 and 1981, just 50 to 60 percent of the retirement eligible teachers (those ages 55 and older) are covered by employer or spousal health insurance. Unfortunately, this evidence is limited in scope because of small sample sizes, ambiguity of survey questions and changes in survey wording over time,[9] but it provides a hint that retiree health insurance increased coverage available to retired teachers.

*III. Data*

The main sources of data are IPS administrative files called the Teacher Service Record (TSR) for 1970-1971 to 1991-1992 school years.[10] (For the rest of the paper, I will refer to school-years by their spring year.) Each observation in the data contains information about an employee's service in a particular year including her experience, salary, position (teacher, principal, etc.) and main assignment (math, reading, special education, etc.) at a school. I omit

[9] For example, in 1986 all teachers in Illinois ages 65 and older are classified as enrolled in Medicare, while before 65, there is variation in the fraction of these teachers reporting Medicare enrollment. This suggests the Census changed either the wording of the question or the nature of the coding in 1986, perhaps to classify all people with Medicare and group coverage as covered by Medicare. This is one reason I limit this exploratory analysis to the period before 1986.

[10] The TSR continues collecting data after 1992, which is what allows me to define exit between 1992 and 1993. I use only the data from 1971 to 1992 because a large early retirement incentive for employees of the IPS was introduced in 1993 and led to a large number of retirements.

the 3 percent of employees who work at vocational schools, schools in prisons, special education cooperatives, etc. Employee records for Chicago are only available beginning in 1979, so I drop employees of Chicago public schools from the analysis. Therefore, my results may not be representative of employees of public schools in extremely large cities.

An employee is eligible for the retiree health insurance with TRHIP when she leaves employment in IPS and begins collecting retirement benefits. I am interested in the effect this eligibility for retiree health insurance has on employee labor supply, namely on an employees' decision to stop working in IPS. Therefore, I use termination of employment with IPS as the dependent variable. In other words, the dependent variable is a dichotomous variable equal to one if the employee permanently discontinues employment with IPS after year t and 0 otherwise. I refer to this exit behavior as retirement, though it may not be synonymous with complete exit of the labor force if public school employees become employed elsewhere, e.g. the private sector, after discontinuing employment with IPS.

Other covariates of interest include years of experience, educational attainment, position (or title) and main employee assignment. For an employee's years of experience, I use only the years of service accrued in IPS, which does not include service in public schools that are outside of Illinois or reciprocal service earned in other Illinois public employee retirement systems or private schools. While the former does not count as creditable service in the TRS system, the latter does. Not observing this information means there is measurement error in my controls for pension and TRHIP eligibility. To the extent that accrued experience in IPS does not capture the full credited experience with TRS, I will be underestimating some employees' creditable

experience.[11] As such, I will be classifying some employees as ineligible who are actually eligible. This will lead me to underestimate the effects of both pension and TRHIP eligibility.

Educational attainment falls into one of four mutually exclusive categories: Bachelors degree, Masters degree, Doctorate, or other (including RN and special certificates). I group employees into nine distinct position categories: superintendent, principal, dean, administrative staff, teacher, special education teacher or specialist, health related staff, other staff, and final category for those employees whose position information is missing in the data. I group teaching assignment categories in the following way: English as a second language, foreign languages, sciences, reading, social sciences, math, teachers in self-contained classrooms, other assignments, and a final category for employees whose assignment is unknown or missing in the data. Finally, I also include a measure of the employee's annual salary in IPS, which I convert to $2012.

To the TSR administrative files, I add information on the age of employees from administrative files obtained from the TRS.[12] Unfortunately, the two systems do not have a common identifier. However, both systems do record information on an employee's name, years of service and most recent employer. As such, I can use this information to match across the two datasets. This match is imperfect for three reasons. First, many employees who do not vest are not included in the TRS files. Therefore, I am less likely to find age information for employees with very few years of service in IPS. Second, employees with work experience at another public employer in the state that has a reciprocal arrangement with IPS, e.g. the Chicago Teacher Pension Fund, can choose to retire in the other system and have their IPS service count towards

[11] Using data on a subset of TRS members, I found that 28 percent had some additional purchased or reciprocal service. The average amount of additional service was 3.6 years.
[12] For the sake of simplicity of presentation, I top-code age at 75.

calculation of their retirement benefit. The employees that do this are those with the majority of their years of service with another employer and so are also disproportionately those with little experience in IPS. Finally, the match based on name does not work well for employees who have changed their name, e.g. when they married.

Using the information available, I am unable to find age information for 504,812 observations or 102, 221 employees. The majority of the unmatched employees, 88 percent, are those with less than 6 years of experience. I assign unmatched employees the modal age of other employees who have the same amount of service accrued and the same first year of employment as other employees in their county. To be clear, this will lead to measurement error. Because the employees with imputed age information are disproportionately those with the least amount of experience and employees with the least amount of experience are more likely to be beginning career employees, the procedure systematically assigns young ages to those observations with missing age information. As such, some teachers who are retirement benefit and TRHIP eligible in my data will not appear to be so, which should attenuate the estimated effects of these programs.

Notably, although pension-eligible individuals are less likely to have imputed age information for the reasons just described, the pension- and TRHIP-eligible are no more or less likely to have imputed age information than employees who are only pension-eligible. To investigate the sensitivity of the results to the imputation of missing age information, in Section V, I also conduct the analysis using only data for which true age information is available and only data on employees with at least 6 years of experience. The results change little with these alternative samples, leading me to conclude that the missing age information is not biasing the estimates much.

In Table 1, I present summary statistic information for the 2,129,191 IPS employee-year observations in the data. Seven percent of employees leave IPS each year, on average. The average age over the period from 1971 to 1992 was 39. The mean experience in IPS of the employees in my sample is 12 years and the average salary is $55,709. Fifty-six percent of employees hold Bachelor's degrees and 43 percent Master's degrees. The remaining employees are about equally likely to either hold a doctorate or some other degree. The vast majority of the employees in the sample are teachers (77 percent) or special education teachers and specialists (9 percent). Five percent are superintendents, principals or deans. Another 9 percent of employees are staff. The assignments of teachers are also detailed in the table. Self-contained teachers comprise one quarter of the sample, and math and reading teachers are another 13 percent. The 19 percent of the sample that has an unknown main assignment classification is largely made up of administrators and staff without instructional duties.

*IV. Difference-In-Differences Strategy*

In order to identify the effects of availability of retiree health insurance on the labor supply of experienced public employees, I make use of the fact that the eligibility for TRHIP was determined by an employee's age and experience. Note that this is true for two reasons. First, in order to collect the retiree health insurance an employee must be collecting a pension benefit from TRS and pension-benefit-eligibility is determined by age and years of service. Second, those with 8 years of service or more are explicitly eligible for retiree health insurance, while those with less than 8 years of experience are not. Therefore, I use a difference-in-differences strategy that compares exit behavior pension-eligible employees before and after they were also eligible for TRHIP to that of pension-ineligible employees before and after TRHIP introduction.

Moreover, the value of the TRHIP is determined by the availability of alternative forms of insurance, most notably Medicare, and eligibility for Medicare is determined by age. In the pre-TRHIP period, if an employee did not have access to insurance through her spouse or to retiree insurance through her school district of employment, waiting until age 65 to retire allowed employees to avoid paying the high costs of privately insuring themselves. After TRHIP introduction, there was no longer a need to delay retirement until age 65 for the sake of insurance alone. Instead, employees were eligible any time after they reached age 55 and met the requirements for pension benefit collection. Therefore, I examine how the effects of TRHIP introduction on retirement behavior vary by the age of employees.

To determine the effects of TRHIP on public employee retirement, I estimate the following equation, equation (1):

$$Y_{idt} = \alpha + \sum_{age} \pi^{age} Eligible_{idt} + \sum_{age} \beta^{age} EligibleXPost_{idt} + \gamma X_{idt} + \delta^{exp} + \varphi^{age} + \theta_{dt} + \varepsilon_{idt} .$$

The outcome measure, $Y_{idt}$, is a dichotomous variable with a value of one if the teacher i in district *d* exits IPS after school-year *t* and zero otherwise. The vector X includes measures of teacher and district characteristics that vary over time, including measures of employee's educational attainment, position in the school (e.g. principal, teacher, staff, etc.), subject matter of specialization, and salary as described in the previous section. There is a full set of district-by-year fixed effects, $\theta_{dt}$, which capture any district-year-specific shocks to employee labor supply across districts, such as those resulting from changing macroeconomic conditions. Standard errors are clustered at the experience-level to account for any serial correlation in the error terms within employees of similar experience.[13]

[13] I have also conducted the analyses with standard errors clustered at the level of employees' age or at the district level. The results are similar to those reported and available from the author upon request.

The variable $Eligible_{idt}$ is a dummy variable indicating that teacher *i* employed at district *d* is eligible for a full retirement benefits and has at least 8 years of service in year *t*. The variable $EligibleXPost_{idt}$ is a dummy variable indicating that teacher *i* employed at district *d* is eligible for full retirement benefits has at least 8 years of service in year *t* and that the observation occurs after TRHIP was introduced, i.e. post-1979. Both of these variables measuring eligibility for TRHIP are interacted with age-category or age-specific fixed effects allowing me to obtain coefficient estimates of the age-related effects of full-retirement-benefit-eligibility and THRIP-eligibility on retirement behavior, $\pi^{age}$ and $\beta^{age}$ , respectively. The model also includes age fixed effects. Therefore, the effects of pension-eligibility on the retirement of employees by age, $\pi^{age}$, are identified by the differences in retirement behavior across individuals of the different ages who have the same amounts of accrued service, e.g. the 59 year old with 30 years of experience who is ineligible as compared to the 60 year old with 30 years of experience who is eligible. (I have also included experience fixed effects, which should control for average differences in retirement propensity throughout the career-cycle.) The effects of retiree health insurance eligibility, $\beta^{age}$ , are determined by the difference between the retirement behavior of different age employees with the same experience levels before and after 1980, the point when TRHIP was introduced. The underlying assumption in using this identification strategy is that there were no other concurrent policy or environmental changes that would have affected pension- and TRHIP-eligible employees differently than other employees of the same age and experience.

One limitation of much of the existing literature is the lack of data or identifying variation that allows for distinction between eligibility for retiree health insurance and eligibility for pension benefits. During the time period I study, the eligibility for and generosity of full-

pension-benefits did not change. As such, the employees in the pre-period that I classify as those who would have been eligible for the TRHIP had it existed are those eligible for full pension benefits.[14] Comparing their retirement behavior to the behavior of full-pension and TRHIP eligible employees in the post-TRHIP introduction period allows me to separate out the effects of pension benefit eligibility from TRHIP eligibility. The fact that the TRHIP was introduced in this way means the counterfacutal in this setting is a world with pensions, but no insurance. Therefore, the effects of TRHIP I estimate may not be the same as introducing TRHIP for people who are not pension-eligible.

## *V. Effects of Retiree Health Insurance Availability on Retirement Behavior*

### *V.i. Graphical Evidence*

Before turning to the difference-in-difference estimates of the effects of TRHIP on employee exit, it is helpful to look at the raw data for evidence of an effect. As described, in Figure 1 the dashed line presents information on the retirement rates of public school employees by age before retiree health insurance was provided by the state. There are local peaks at the places where pension eligibility broadens, ages 55 and 60, and a rather large global peak in retirement rates at age 65 and 66, when an employee becomes eligible for Medicare.

The solid line in the figure traces retirement rates for public school employees by age in the period after TRHIP is introduced. Notice that the retirement rate increases at the age when employees first become eligible for either retiree health insurance or a pension, i.e. age 55, but the rate of retirement at age 65 decreases significantly. This is suggestive that public school employees change their labor supply decisions in response to the availability of retiree health insurance by retiring earlier than they otherwise would have. Employees whose labor supply is elastic with respect to the availability of retiree health insurance retire when it becomes available to them, e.g. at age 55 if they have accrued enough experience. The retirement rates at older

[14] Note that while, by definition, all employees eligible for TRHIP are also eligible for pension benefits, not all employees eligible for pension benefits are eligible for TRHIP. Specifically, a former IPS employee with between 5 and 7 years of service is eligible for a retirement benefit, but cannot participate in the retiree health insurance program.

ages are no longer as sensitive to the Medicare eligibility because only those employees who have a strong attachment to the labor force (and whose labor supply is therefore less responsive to health insurance availability) remain employed until reaching these older ages.

Because TRHIP was introduced at a point in time, not for a particular cohort, many public school employees may not have been eligible for TRHIP at the same time they became eligible for their pension. This is because many employees may have already passed the age and years-of-service combination when they first became eligible for a pension before 1980. (For example, consider the person with 12 years of experience in 1978.) For these constrained employees, the shifting forward of retirement rates with retiree health insurance eligibility in Figure 1 will be an underestimate of the true shift in retirement rates had they always had access to retiree health insurance. Therefore, in Figure 1, Panel B, I plot exit rates of three groups of employees by age. First is the solid line, indicating the retirement rates of employees by age before the TRHIP is introduced. (This is the same as the dashed blue line in Panel A.) Second, I have split the retirement rates after the program into two groups: those who were ages 54 and younger before TRHIP was introduced (and could therefore completely adjust their retirement decision to its availability) and those who were 55 or older when TRHIP was introduced (and may therefore have been limited in terms of their behavioral adjustment). The line with smaller dashes traces exit rates of the former, and the line with longer dashes traces those for the latter. As would be expected, the retirement of employees who are younger when the program is introduced have more time to adjust and we see a larger response (i.e. smoothing) of their labor supply across ages.

*V.ii. Difference-in-Difference Estimates*

As indicated in the descriptive tabulations of exit rates with age before and after TRHIP presented in Figure 1, the difference-in-difference estimates also show that exit of public school employees is responsive to the incentives of both the pension and retiree health insurance systems. This can been seen in Table 2, where I report the difference-in-difference estimates of the effects of pension-eligibility and TRHIP-eligibility for different age groups. Here, I have separately estimated the effects of eligibility for employees who are 55 to 59, 60 to 64, and 65

and older.[15] Across the four columns in the table, estimates are reported for specifications that include different sets of fixed effects. In the first column, the model includes only year, age and years-of-service fixed effects. In the second and third columns, I add first age-by-year and then years-of-service-by-year fixed effects. Finally, in the fourth column, I include both age-by-year and then years-of-service-by-year fixed effects.

Looking across the columns in the table, a few patterns emerge. First, public school employees' retirement is responsive to the nonlinearities in their pension-benefit-accrual formula. For example, employees ages 60 to 64 who are pension-eligible are 7 percentage points more likely to retire than 60 to 64 year olds who are not pension-eligible. Given that the exit rate of 60 to 64 year olds who are pension ineligible is 0.14, this represents a 50 percent increase. Somewhat surprisingly, the 55 to 59 year olds who are pension-eligible are slightly less likely than their pension ineligible counterparts to exit. However, this estimate becomes closer to zero and is not consistently statistically significant across the specifications, indicating that the effects of pension eligibility are negligible for this group. Perhaps this is due to the fact that so few 55 to 59 year olds have obtained the 35 years of experience necessary to be eligible for a full pension, rendering it hard to identify an effect.

At the same time, pension-eligible employees who are 65 or older, and therefore eligible for Medicare, are 29 percentage points more likely to exit than employees their age who are pension ineligible.[16] Since there is no discrete change in pension-eligibility at age 65, the increased likelihood of retirement for those 65 and older can be attributed entirely to their eligibility for Medicare. Clearly, health insurance eligibility was a key factor in the retirement decisions of public school employees even before their employer offered a retiree health insurance program.

Turning to the effects of TRHIP-eligibility, the coefficient estimates of the effect for 55 to 59 year olds is positive, but not consistently statistically significant across the specifications reported in Table 2. The coefficient estimates of the effect of TRHIP-eligibility on the

[15] The pension and Medicare rules could allow for meaningful differences in retirement behavior at the following ages: 55, 60 and 62 (because of the rules determining eligibility for full pension benefits) and 65 (because of eligibility for Medicare). In the data, there is little difference in retirement propensities for people ages 60-61 and those ages 62-64, so I group these ages together. Later, I present age-specific effects.

[16] Notably, pension ineligible 65 year olds are 8 percentage points more likely than pension ineligible 64 year olds to exit. This is calculated as the difference between the estimates of the age-specific fixed effects for 64 and 65 year olds from the specification in Column 1 of Table 2.

retirement of 60 to 64 year olds is quite close to zero and rarely statistically significant. The employees most affected by the introduction of TRHIP were those ages 65 and older who were pension eligible. For these employees, TRHIP-eligibility results in a 22 percentage point decrease in the propensity to retire. Recall that employees 65 and older who are pension-eligible are 29 percentage points more likely to retire than those who are pension-ineligible. The combination of eligibility for both pension benefits and health insurance before age 65 renders 65 a less salient age for retirement, which can be seen from the fact that the eligible employees of this age are just as likely as their same-age counterparts who are ineligible for either pension or retiree health insurance benefits to retire. Said differently, once TRHIP is introduced, pension-eligible employees are much less likely to wait until after age 65 to retire.[17]

*V.iii. Estimated Effects of TRHIP Using Different Samples*

There may be concern that early career employees do not make the best comparison group for employees that are further into their careers. For one thing, last-in-first-out rules make it likely that any cyclical variation in labor supply will necessarily disproportionately affect teachers with limited experience. Moreover, the labor supply patterns of women have changed greatly over the last 50 years such that the employment decisions of 30 year olds in 1980 may not adequately compare to those aged 50 at the same time even if the two groups have similar public school experience profiles. Although the age, experience, age-by-year and experience-by-year fixed effects included in previous specifications used should help control for these types of differences, for even more evidence that these effects are not driven by spurious relationships between age or experience and exit decisions, I now estimate the effects of the program using more tightly defined comparison groups.

First, in Table 3, I use only observations for public school employees ages 50 and older. Then, in Table 4, I include only observations for employees with at least 6 years of employment in IPS. The format of these tables is identical to that of Table 2. Notably, the pattern and size of the estimates is nearly identical to the pattern and size of the estimates in Table 2 as well. All of the estimates in Tables 2, 3 and 4 are statistically indistinguishable from one another (i.e. their 95

[17] The importance of age 65 for pension ineligible employees remains the same before and after TRHIP introduction, as indicated by little change in the difference between the estimates of age-specific fixed effects for 64 and 65 year olds over time. Results not reported here, but available from the author upon request.

percent confidence intervals overlap). This instills confidence that the estimated effects of pension- and TRHIP-eligibility are not generated by the choice of sample. Furthermore, since most of the employees missing age information have less than 6 years of service, the similarity of results in Tables 2 and 4 instills confidence that the age-imputation algorithm is not driving my results.

To be even more assured that the age-imputation algorithm is not driving my results, in Table 5, I present estimates where I limit the analysis sample to those public school employees for whom age information is available (and not imputed). Here again, the estimated relationships between pension and TRHIP eligibility across all three age groups are statistically indistinguishable from those when I use the entire sample of employees. Across all of the specifications and all of the samples used, it is clear that TRHIP-eligibility decreases the propensity of teachers to retire at age 65.

*V.iv. Age-specific Estimates of the Effects of Retiree Health Insurance*

Thus far, when investigating the effects of pension- and TRHIP-eligibility, I have focused on three age groups: employees ages 55 to 59, 60 to 64 and 65 or older. It may be the case, however, that within these age ranges there are differential responses to the offer of a pension or retiree health insurance, in part because the eligibility for these programs changes with age. To determine if this is the case, I estimate equation (1) with year-of-age-specific fixed effects in place of the age-group fixed effects. The results of this estimation are presented in Figure 3. For simplicity, I have plotted only the coefficient estimates of the responsiveness of employee exit to pension eligibility (solid black line) and to the eligibility for TRHIP and a pension (dashed grey line), by age. The asterisks next to each age indicate whether the coefficient estimate for the effect of TRHIP-eligibility, that is the vertical difference between the two lines, is statistically different from zero.

The results in the figure confirm the descriptive information provided in Figure 1. Most strikingly, there is a large statistically significant difference between the retirement rates of employees over age 65 who are eligible for either pensions and TRHIP or pensions alone. There is also a small, but statistically significant, increase in retirement at ages 55 and 56 because of the TRHIP eligibility. From this evidence, we can conclude that employees are shifting their

retirement forward in their careers based on their eligibility for health insurance that is not contingent on their employment.

*V.v. Event Study-Style Estimates of the Effects of Retiree Health Insurance*

The difference-in-difference estimates show that the retirement of public school employees is sensitive to their retiree health insurance eligibility. The underlying assumption with the identification strategy used is that there were no other changes to the pension system or other relevant factors that would have affected the retirement behavior of eligible employees differently than that of ineligible employees. To find support for this assumption, I estimate equation (1) using the measure of pension-eligibility interacted with dummy variables for each year relative to TRHIP introduction. These eligibility related distributed leads and lags are then interacted with age-specific fixed effects to determine if there is any time-pattern to the retirement of pension-eligible employees of each age that predates the introduction of TRHIP.

The results of this event-study-style analysis are presented in Figure 3. For the sake of brevity, I present only the estimates for employees ages 55, 65 and 75 in Panels A, B and C, respectively. In each figure, the coefficient estimates are delineated with a solid line and the 95 percent confidence intervals are indicated with the dashed lines. The estimates in Panel A suggest that there were neither pretreatment trends nor TRHIP-related changes in the retirement behavior of pension-eligible 55 year olds. Generally, the retirement rates of pension-eligible 55 year olds are similar to that of pension-ineligible 55 year olds.

In Panel B, the elevated exit rates for pension-eligible 65 year olds before TRHIP was introduced are evident from the statistically significant pre-treatment coefficient estimates that hover between 20 and 40 percentage points. Importantly, there is no pre-treatment trend in the retirement rate of pension-eligible 65 year olds evident in the Figure. After TRHIP was introduced, the exit rates of pension-eligible employees aged 65 begins to trend downwards, though not for a few years. This delay is likely due to the fact that employees had been optimizing before TRHIP was introduced and therefore may have found it difficult to immediately adjust. For example, consider an employee who was 64 in the year TRHIP insurance was introduced. If she had been planning to retire at 65, the year after TRHIP was introduced, she is likely to still do so.

Finally, the retirement rates of pension-eligible 75 year olds are also elevated in the pre-TRHIP period. On average they are approximately 30 percentage points more likely to retire than their ineligible counterparts, though it should be noted that there are very few pension-ineligible 75 year olds, which makes the estimates in Panel C noisy. As in the previous panels, the estimates in Panel C show no evidence of a trend in exit rates of pension-eligible employees relative to their pension-ineligible counterparts that pre-dates the TRHIP introduction. This evidence supports the underlying assumption in my use of a differences-in-differences framework to estimate the effects of retiree health insurance availability on employee exit.

*V.vi. Effects of Retiree Health Insurance on the Movement of Employees Across Districts*

By breaking the link between a particular job and the future health insurance benefits it promises, the introduction of retiree health insurance for all public school employees may free employees to search for alternative employers who will provide better benefits to current employees. To see if this is the case, in Table 6, I present difference-in-difference estimates of the effects of TRHIP on employee movement across districts. Here, the dependent variable takes on a value of one if the employee moves from one district to another in the following year and zero otherwise. Notice from the results in the table that pension eligibility reduces turnover, which might be the case if workers who are unsatisfied at their positions are able to retire rather than move across districts. TRHIP-eligibility, on the other hand, increases the likelihood that older employees find jobs with another district. The increased mobility may be driven by a desire to increase salary, which will factor into the generosity of the pension benefit, or by a desire to find more pleasant working conditions.

## VI. Conclusion

The evidence presented above shows that the labor supply of public school employees in Illinois was responsive to the introduction of a retiree health insurance program. Most notably, the retiree health insurance program served to move forward the timing of job separations for older workers. Although still a salient age for retirement, many fewer employees wait until age 65 to retire, likely because of the availability of non-employment-contingent insurance at an earlier age. Similarly, more employees retire at the earliest age at which they gain eligibility for retiree health insurance. Meanwhile, there is evidence that employee mobility increases because

of retiree health insurance availability, particularly the mobility of the most senior public school employees.

The sensitivity of the retirement behavior of older teachers to the provision of retire health insurance has many implications for public school employees and government funding. First, the retiree health insurance programs are having an effect on the pension funding since workers with retiree health insurance are retiring earlier and therefore likely receiving lower benefits but for a longer period of time than they otherwise would have in the absence of retiree health insurance. Depending on the balance of the cost savings due to the smaller benefit size and the cost increases due to the longer time horizon over which benefits are paid, the availability may be contributing to or mitigating the problem of pension underfunding.

Second, because retiree health insurance programs in the public sector are not constitutionally protected in the same way pensions are, the programs may become less generous or be dissolved all together. If either happens, the labor supply of older public school employees will be affected. This will have productivity effects that will depend on the quality of older versus younger employees.[18] In addition, it will have effects on local and state budgets due to changes in both the wage bill and pension bills for public employees. The effects of changes in retiree health insurance will depend on the counterfactual environment, which, due to changes embedded in the Affordable Care Act, is likely to be different in the future than it is now or was in the early 1980s. Regardless, there are likely to be some labor supply effects of changing public sector employee access to retiree health insurance that will in turn have effects on public sector budgets and liability funding.[19]

[18] The question of the relative quality of senior- versus early-career teachers is currently debated in the literature (Wiswall, 2011; Rivkin, Hanushek and Kain, 2005; Rockoff, 2004).

[19] Specifically, even without employer provided retiree health insurance, many public sector retirees will be able to purchase health insurance at full-price in the health care exchange markets. Since these markets will be priced based on the participation of both young, relatively inexpensive to insure and older, more costly to insure people, the market prices for insurance will be lower than if purchased on the current private market. However, even before retiree health insurance was introduced, many public school teachers had the option to purchase insurance through their former employer, pricing in which is akin to the pricing in the mixed market exchanges.

*References*


Blau, David M. and Donna B. Gilleskie. 2008. "The Role of Retiree Health Insurance in the Employment Behavior of Older Men." *International Economic Review*, 49(2), 475-514.

Blau, David M. and Donna B. Gilleskie. 2006. "Health Insurance and Retirement of Married Couples." *Journal of Applied Econometrics*, 21(7), 935-953.

Blau, David M. and Donna B. Gilleskie. 2001. "Retiree Health Insurance and the Labor Force Behavior of Older Men in the 1990s." *Review of Economics and Statistics*, 83(1), 64-80.

Boyle, Melissa A. & Lahey, Joanna N., 2010. "Health insurance and the labor supply decisions of older workers: Evidence from a U.S. Department of Veterans Affairs expansion," *Journal of Public Economics*, vol. 94(7-8), pages 467-478, August.

Brown, Kristine M. 2010. "The Link Between Pensions and Retirement Timing: Lessons From California Teachers." Manuscript. University of Illinois.

Clark, Robert L. and Melinda Sandler Morrill. 2010. *Retiree Health Plans in the Public Sector: Is there a Funding Crisis?* Northampton, MA: Edward Elgar Publishing Inc.

Coe, Norma B., Mashfiqur R. Kahn, and Matthew S. Rutledge. 2013. "Sticky Ages: Why Is Age 65 Still A Retirement Peak?" Working Paper 2013-2. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Costrell, Robert M. and Michael Podgursky. 2009. "Peaks, Cliffs, and Valleys: The Peculiar Incentives in Teacher Retirement Systems and Their Consequences for School Staffing." *Education Finance and Policy*. vol 4(2): 175-211.

DeArmond, Michael and Dan Goldhaber. 2010. "Scrambling the Nest Egg How Well Do Teachers Understand Their Pensions, and What Do They Think About Alternative Pension Structures?" *Education Finance and Poli*cy 5(4): 558-586.

French, Eric and John Bailey Jones. 2011. The Effects of Health Insurance and Self Insurance on Retirement Behavior. *Econometrica*, 79(3), 693-732.

Gruber, Jonathan and Bridgette C. Madrian. 1995. Health Insurance Availability and the Retirement Decision. *The American Economic Review*, 85(4), 938-948.

Gustman, Alan L. and Thomas L. Steinmeier. 1994. Employer Provided Health Insurance and Retirement Behavior. *Industrial and Labor Relations Review*, 48(1), 124-140.

Karoly, Lynn A. and Jeannette Rogowski. 1994. "The Effect of Access to Post-Retirement Health Insurance on the Decision to Retire Early." *Industrial and Labor Relations Review*,

48(1), 103-123.

Leiserson, Greg. 2013. “Retiree Health Insurance and Job Separations: Evidence from Pennsylvania State Employees.” Manuscript. Massachusetts Institute of Technology.

Lumsdaine, Robin L., James H. Stock, and David A. Wise. 1996. “Retirement Incentives: The Interaction between Employer-Provided Pensions, Social Security, and Retiree Health Insurance.” In Michael D. Hurd and Naohiro Yashiro (Eds.), *The Economic Effects of Aging in the United States and Japan* (pp. 261-293). Chicago: University of Chicago Press.

Madrian, Bridgette C. 1994. “The Effect of Health Insurance on Retirement.” *Brookings Papers on Economic Activity*, 25(1), 181-232.

Marton, James and Stephen A. Woodbury. 2013. “Retiree Health Benefits as Deferred Compensation: Evidence from the Health and Retirement Study.” *Public Finance Review*, 41(1), 64-91.

Novy-Marx, Robert and Joshua D. Rauh. 2009. "The Liabilities and Risks of State-Sponsored Pension Plans" *Journal of Economic Perspectives*, 23(4): 191-210.

Nyce, Steven, Sylvester Schieber, John B. Shoven, Sita Slavov, and David A. Wise. 2013. “Does Retiree Health Insurance Encourage Early Retirement?” *Journal of Public Economics*, 104, 40-51.

Robinson, Christina and Robert Clark. 2010. “Retiree Health Insurance and Disengagement from a Career Job.” *Journal of Labor Research*, 31(3), 247-262.

Rivkin, Steven G., Eric A. Hanushek and John F. Kain. 2005. “Teachers, Schools, and Academic Achievement.” *Econometrica* 73(2): 417-458.

Rockoff, Jonah E. 2005. “The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data.” *American Economic Review Papers and Proceedings* 94(2): 247-252.

Rust, John and Christopher Phelan, 1997. “How Social Security and Medicare Affect Retirement Behavior in a World of Incomplete Markets,” *Econometrica*, 65(4): 781-831.

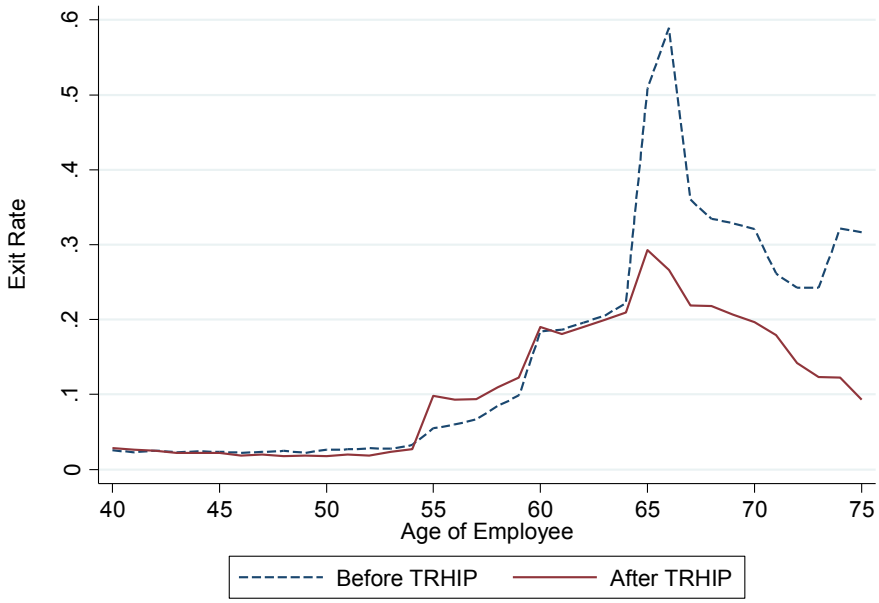
Shoven, John and Sita Nataraj Slavov. 2013. “The Role of Retiree Health Insurance in the Early Retirement of Public Sector Employees.” Prepared for Presentation at the NBER Conference on State and Local Health Plans for Active and Retired Public Employees, August.

Strumpf, Erin. 2010. “Employer-Sponsored Health Insurance for Early Retirees: Impacts on Retirement, Health, and Health Care.” *International Journal of Health Care Finance and Economics*, 10(2), 105-147.

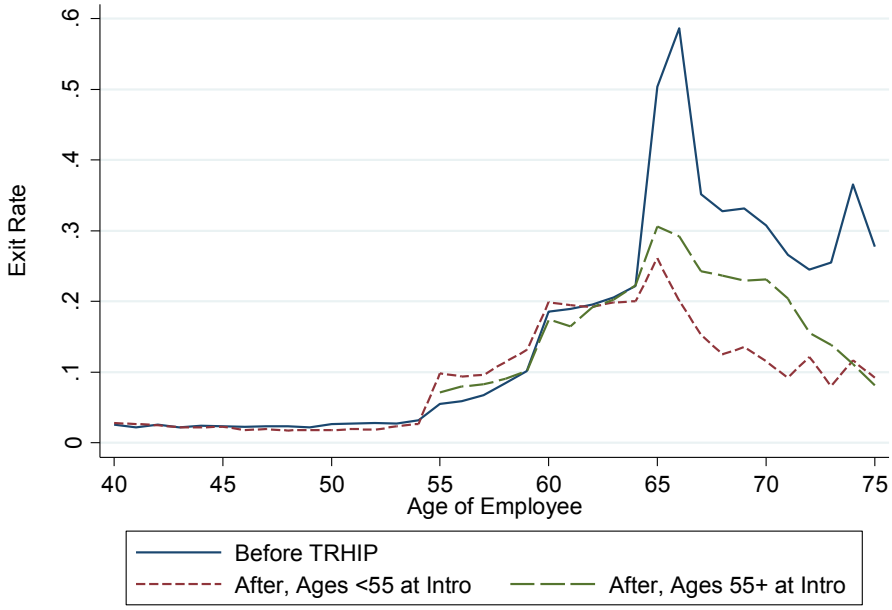
Wiswall, Matthew. 2011. “The Dynamics of Teacher Quality.” SSRN Working Paper. Available at SSRN: http://dx.doi.org/10.2139/ssrn.1911309.

Figure 1. Retirement Rates of IPS Employees by Age and Existence of TRHIP

Panel A.

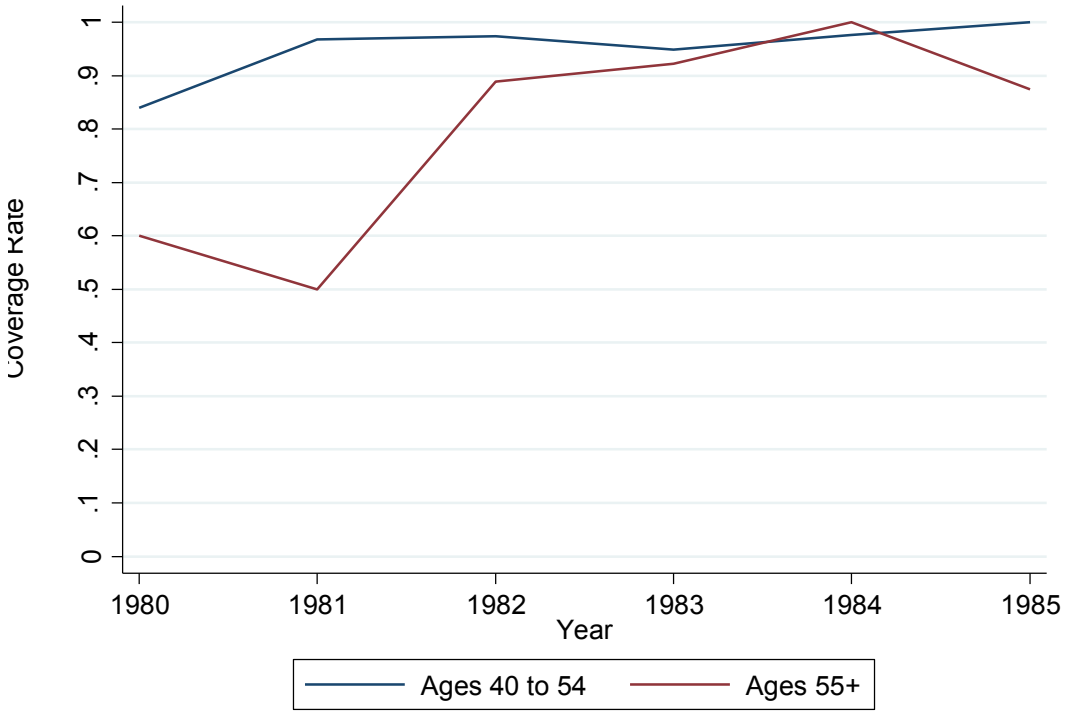



Panel B.



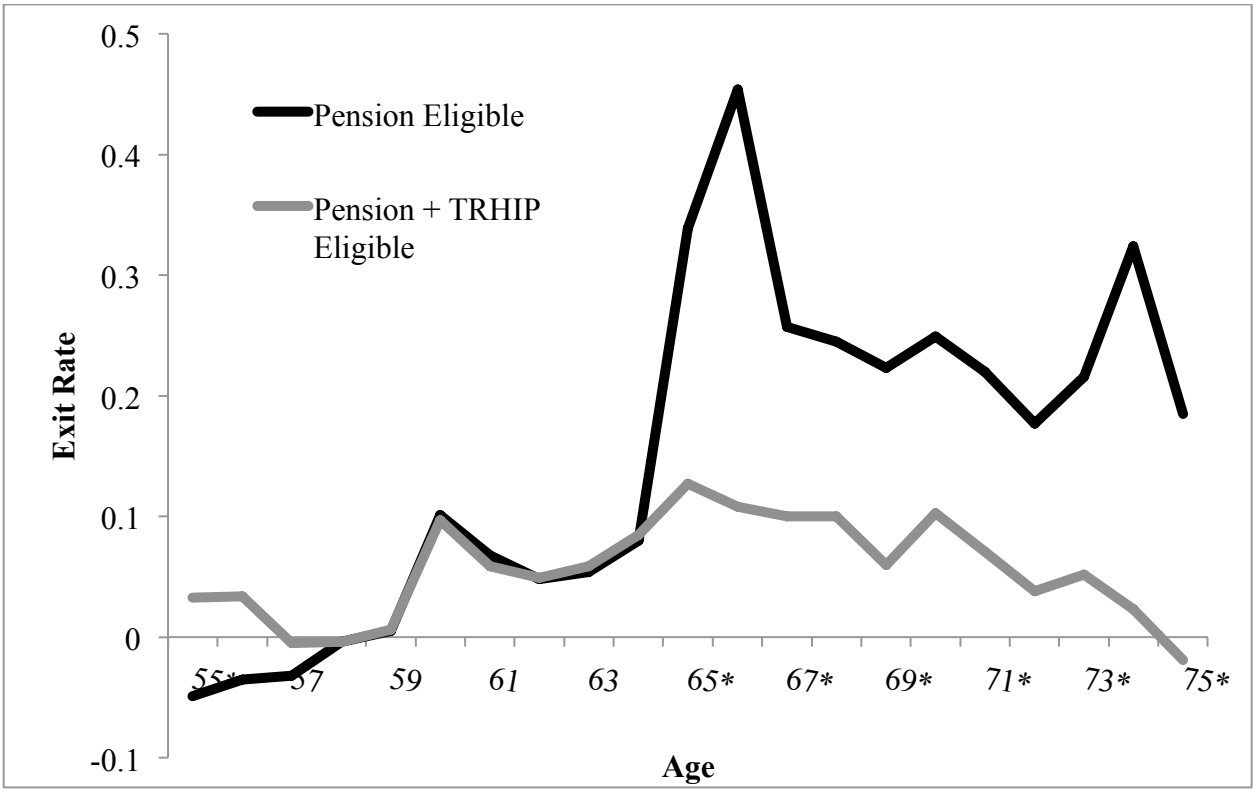

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. The 'before TRHIP' period covers 1971 to 1979 and the 'after THRIP' period covers 1980 to 1992. Only employees ages 40 and older are included in the calculation of exit rates. The exit rate plotted on the vertical axis represents the rate at which employees of each age leave the sample between school year t and t+1.

Figure 2. Group Insurance Coverage Rates for Illinois Teachers, 1980-1985, by Age, from the Current Population Survey




Notes: Based on the author's calculations using the Current Population Survey, 1980-1985.

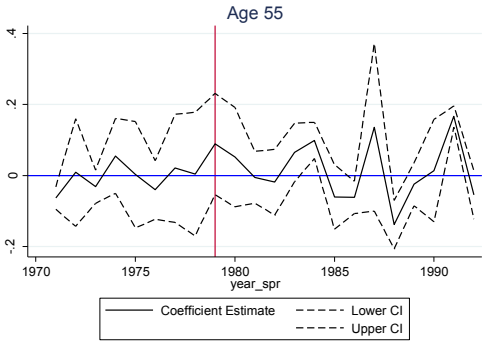
Figure 3. Estimates of the Effects of TRHIP across Employees of Different Ages



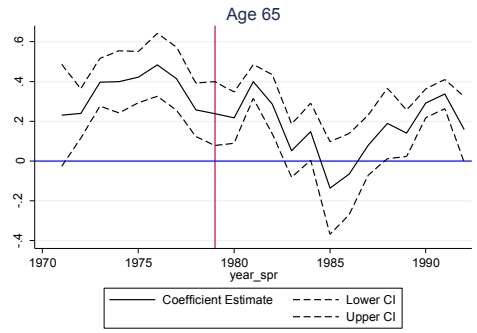

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. The 'before TRHIP' period covers 1971 to 1979 and the 'after THRIP' period covers 1980 to 1992. Only employees ages 40 and older are included in the calculation of exit rates. The exit rate plotted on the vertical axis represents the rate at which employees of each age leave the sample between school year t and t+1. The solid black line presents difference-in-difference estimates of the effects of pension eligibility at each age on the horizontal axis from a specification that includes age-by-year, experience-by-year and district fixed effects, as well as other available information on employee characteristics. The solid grey line presents age-specific difference-in-difference estimates of the effects of retiree health insurance eligibility on retirement rates from the same specification.

Figure 4. Estimates of the Event Study Estimates of the Effects of TRHIP on Teacher Exit

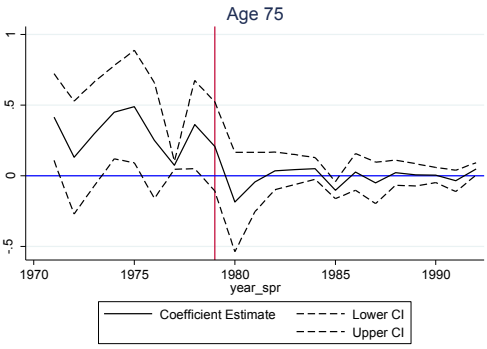
Panel A. Age 55




Panel B. Age 65




Panel C. Age 75




Note: Based on author's calculations using TRS and TSR data on employees of IPS schools or older from 1971 to 1992. The vertical line represents the last period before TRHIP introduction. Only employees ages 50 and older are included in the calculation of exit rates. The exit rate plotted on the vertical axis represents the rate at which employees of each age leave the sample between school year t and t+1. Coefficients and confidence intervals plotted are from an event-style model where eligibility for pensions and retiree health insurance is interacted with age-by-year specific dummies. Also included in the specifications are experience-by-year and district fixed effects, as well as controls for employee characteristics.

Table 1. Descriptive Characteristics of IPS Employees

| | Mean | Standard Deviation |
|---|---|---|
| Exit | 0.071 | 0.256 |
| Age | 39 | 11 |
| Experience | 12 | 8 |
| Salary (thousands $2013) | 55.709 | 18.789 |
| Other Degree | 0.008 | 0.089 |
| BA Degree | 0.555 | 0.497 |
| MA Degree | 0.427 | 0.495 |
| PhD Degree | 0.010 | 0.101 |
| Position Held by Employee | | |
| Superintendents | 0.015 | 0.121 |
| Principals | 0.037 | 0.188 |
| Deans | 0.003 | 0.058 |
| Administrative Staff | 0.009 | 0.094 |
| Teachers | 0.766 | 0.424 |
| Special Education Position | 0.089 | 0.285 |
| Health Staff | 0.041 | 0.198 |
| Other Staff | 0.040 | 0.196 |
| Main Assignment of Teachers | | |
| ESL | 0.003 | 0.056 |
| Foreign Language | 0.019 | 0.135 |
| Science | 0.047 | 0.211 |
| Reading | 0.092 | 0.289 |
| Social Science | 0.023 | 0.151 |
| Math | 0.044 | 0.206 |
| Self-Contained Classroom | 0.250 | 0.433 |
| Other | 0.331 | 0.471 |
| Unknown | 0.191 | 0.393 |
| Number of Observations | 2,129,191 | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992.

Table 2. Difference-in-Difference Estimates of the Effects of TRHIP on IPS Employee Retirement

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Pension Eligibility, Ages 55 to 59 | -0.041** | -0.018 | -0.023 | -0.009 |
| | (0.015) | (0.016) | (0.016) | (0.017) |
| Pension Eligibility, Ages 60 to 64 | 0.069*** | 0.067*** | 0.074*** | 0.068*** |
| | (0.007) | (0.007) | (0.007) | (0.006) |
| Pension Eligibility, Ages 65+ | 0.291*** | 0.288*** | 0.296*** | 0.287*** |
| | (0.017) | (0.019) | (0.018) | (0.019) |
| TRHIP Eligibility, Ages 55 to 59 | 0.063*** | 0.029** | 0.037*** | 0.014 |
| | (0.011) | (0.011) | (0.012) | (0.012) |
| TRHIP Eligibility, Ages 60 to 64 | 0.008 | 0.013* | 0.000 | 0.011 |
| | (0.005) | (0.007) | (0.004) | (0.008) |
| TRHIP Eligibility, Ages 65+ | -0.218*** | -0.223*** | -0.227*** | -0.223*** |
| | (0.011) | (0.017) | (0.011) | (0.018) |
| Age FE | Y | Y | Y | Y |
| Experience FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Age x Year FE | | Y | | Y |
| Experience by Year FE | | | Y | Y |
| Number of Observations | 2,129,191 | | | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. Estimates presented are from a differences-in-differences specification in which eligibility for pensions and retiree health insurance are interacted with age-group fixed effects. The specification includes controls for employee characteristics and district fixed effects as well as the other fixed effects indicated by the column notes.

Table 3. Difference-in-Difference Estimates of the Effects of TRHIP on IPS Employee Retirement, for Employees Ages 50 and Older

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Pension Eligibility, Ages 55 to 59 | -0.023 | -0.009 | -0.005 | 0.007 |
| | (0.016) | (0.016) | (0.016) | (0.017) |
| Pension Eligibility, Ages 60 to 64 | 0.086*** | 0.080*** | 0.090*** | 0.085*** |
| | (0.009) | (0.008) | (0.009) | (0.009) |
| Pension Eligibility, Ages 65+ | 0.320*** | 0.309*** | 0.324*** | 0.313*** |
| | (0.021) | (0.022) | (0.021) | (0.023) |
| TRHIP Eligibility, Ages 55 to 59 | 0.051*** | 0.028** | 0.022* | 0.004 |
| | (0.011) | (0.012) | (0.012) | (0.012) |
| TRHIP Eligibility, Ages 60 to 64 | -0.004 | 0.009 | -0.011** | -0.000 |
| | (0.005) | (0.007) | (0.004) | (0.007) |
| TRHIP Eligibility, Ages 65+ | -0.231*** | -0.225*** | -0.239*** | -0.233*** |
| | (0.011) | (0.017) | (0.012) | (0.019) |
| Age FE | Y | Y | Y | Y |
| Experience FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Age x Year FE | | Y | | Y |
| Experience by Year FE | | | Y | Y |
| Number of Observations | 424,010 | | | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. Estimates presented are from a differences-in-differences specification in which eligibility for pensions and retiree health insurance are interacted with age-group fixed effects. The specification includes controls for employee characteristics and district fixed effects as well as the other fixed effects indicated by the column notes.

Table 4. Difference-in-Difference Estimates of the Effects of TRHIP on IPS Employee Retirement, Only for Teachers with at least 6 Years of Service

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Pension Eligibility, Ages 55 to 59 | -0.038** | -0.018 | -0.024 | -0.009 |
| | (0.015) | (0.016) | (0.016) | (0.017) |
| Pension Eligibility, Ages 60 to 64 | 0.079*** | 0.075*** | 0.081*** | 0.072*** |
| | (0.009) | (0.008) | (0.008) | (0.007) |
| Pension Eligibility, Ages 65+ | 0.288*** | 0.253*** | 0.292*** | 0.252*** |
| | (0.017) | (0.020) | (0.017) | (0.020) |
| TRHIP Eligibility, Ages 55 to 59 | 0.058*** | 0.027** | 0.037*** | 0.013 |
| | (0.011) | (0.012) | (0.012) | (0.012) |
| TRHIP Eligibility, Ages 60 to 64 | 0.004 | 0.015 | -0.000 | 0.020* |
| | (0.005) | (0.010) | (0.004) | (0.010) |
| TRHIP Eligibility, Ages 65+ | -0.219*** | -0.175*** | -0.224*** | -0.173*** |
| | (0.011) | (0.014) | (0.011) | (0.015) |
| Age FE | Y | Y | Y | Y |
| Experience FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Age x Year FE | | Y | | Y |
| Experience by Year FE | | | Y | Y |
| Number of Observations | 1,555,929 | | | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. Estimates presented are from a differences-in-differences specification in which eligibility for pensions and retiree health insurance are interacted with age-group fixed effects. The specification includes controls for employee characteristics and district fixed effects as well as the other fixed effects indicated by the column notes.

Table 5. Difference-in-Difference Estimates of the Effects of TRHIP on IPS Employee Retirement, Only for Teachers with Non-imputed Age Data

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Pension Eligibility, Ages 55 to 59 | -0.037** | -0.018 | -0.022 | -0.008 |
| | (0.014) | (0.015) | (0.015) | (0.016) |
| Pension Eligibility, Ages 60 to 64 | 0.080*** | 0.076*** | 0.082*** | 0.072*** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| Pension Eligibility, Ages 65+ | 0.309*** | 0.304*** | 0.314*** | 0.300*** |
| | (0.020) | (0.022) | (0.021) | (0.021) |
| TRHIP Eligibility, Ages 55 to 59 | 0.062*** | 0.034*** | 0.037*** | 0.016 |
| | (0.011) | (0.012) | (0.013) | (0.013) |
| TRHIP Eligibility, Ages 60 to 64 | 0.003 | 0.013* | -0.002 | 0.017** |
| | (0.005) | (0.007) | (0.005) | (0.007) |
| TRHIP Eligibility, Ages 65+ | -0.230*** | -0.233*** | -0.237*** | -0.226*** |
| | (0.013) | (0.017) | (0.013) | (0.017) |
| Age FE | Y | Y | Y | Y |
| Experience FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Age x Year FE | | Y | | Y |
| Experience by Year FE | | | Y | Y |
| Number of Observations | 1,628,700 | | | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. Estimates presented are from a differences-in-differences specification in which eligibility for pensions and retiree health insurance are interacted with age-group fixed effects. The specification includes controls for employee characteristics and district fixed effects as well as the other fixed effects indicated by the column notes.

Table 6. Difference-in-Difference Estimates of the Effects of TRHIP on IPS Employee Movement Across Districts

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Pension Eligibility, Ages 55 to 59 | -0.012* | -0.009 | -0.012* | -0.007 |
| | (0.006) | (0.006) | (0.006) | (0.006) |
| Pension Eligibility, Ages 60 to 64 | -0.026*** | -0.022*** | -0.030*** | -0.030*** |
| | (0.004) | (0.006) | (0.005) | (0.006) |
| Pension Eligibility, Ages 65+ | -0.071*** | -0.093*** | -0.073*** | -0.102*** |
| | (0.005) | (0.010) | (0.006) | (0.010) |
| TRHIP Eligibility, Ages 55 to 59 | 0.017*** | 0.015*** | 0.018*** | 0.012* |
| | (0.006) | (0.005) | (0.006) | (0.006) |
| TRHIP Eligibility, Ages 60 to 64 | 0.023*** | 0.016* | 0.029*** | 0.029*** |
| | (0.003) | (0.009) | (0.002) | (0.008) |
| TRHIP Eligibility, Ages 65+ | 0.071*** | 0.089*** | 0.076*** | 0.104*** |
| | (0.004) | (0.010) | (0.004) | (0.011) |
| Age FE | Y | Y | Y | Y |
| Experience FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Age x Year FE | | Y | | Y |
| Experience by Year FE | | | Y | Y |
| Number of Observations | 2,129,191 | | | |

Note: Based on author's calculations using TRS and TSR data on employees of IPS schools from 1971 to 1992. Estimates presented are from a differences-in-differences specification in which eligibility for pensions and retiree health insurance are interacted with age-group fixed effects. The specification includes controls for employee characteristics and district fixed effects as well as the other fixed effects indicated by the column notes.