Reductions in the Generosity of State and Local Employee Pensions: Comparison of Plans with and without Social Security Coverage

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Abstract

We offer a concise history of retirement plans for state and local workers in the United States with a specific focus on the decreases in the generosity of these plans over the past 20 years. We survey the 85 state-managed plans that cover state, municipal and county workers, and teachers. Employees in 17 of the retirement systems are not covered by Social Security, and in 27 states teachers are in stand-alone plans separate from those of other public-sector employees. The historical review focuses on why more than half of the states chose to operate separate plans for teachers, and why a disproportionate number of plans not in Social Security are teacher-only plans (10 of 17). We find that retirees from teacher-only plans had a decline in benefits that was 12.2 percentage point smaller than all other plans, which is a 50% smaller reduction in initial benefits. Another objective is to compare benefit declines, over the past two decades, for plans not in Social Security with declines in plans covered by Social Security. We find that the average decline in initial retirement benefits, since 2000, is roughly 15%. The average decline in the plans included in Social Security are smaller than the declines in plans outside of the system. Also plans with a funding level of less than 75% had benefit declines that were about twice the size of plans with a funding ratio of greater than 75%.

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I. Issues

In recent years, in response to the rising fiscal burdens of public-sector pension plans, many state and local governments have decreased the generosity of the benefits promised to the participants of their retirement plans. Benefit reductions in defined benefit (DB) plans have come through a variety of methods, including reductions in benefit multipliers, increases in the number of years used to calculate final average salary, and increases in the age and service requirements for normal retirement.[1] While most of these changes have been applied to new hires, the net value of pension benefits for current employees has also been reduced through increased employee contributions[2] and reductions in cost of living adjustments (COLAs), which tend to be imposed on current workers and retirees.[3] Finally, a number of states have terminated their traditional DB plans and introduced new defined contribution plans and/or hybrids plans (NASRA 2020a).

[1] The most common method employed by public retirement plans to reduce future retirement benefits has been increases in age and service requirements for normal retirement. These changes reduce the benefit available to retirees for any combination of age and years of service. Brainard and Brown (2018a) report that at least 33 states, covering 40 public employee plans, increased their retirement requirements in recent years.

[2] Brainard and Brown (2018a) also report that 40 plans in 39 states increased employee contributions between 2009 and 2018. Increases in employee contributions usually affect current employees as well as future hires. Aubry and Crawford (2016) report similar widespread reductions in benefits by state and local plans. Also see Center for State and Local Government Excellence (2014) and NASRA (2019).

[3] Reductions or modifications in COLAs generally have been applied to current retirees. The expectation of lower COLAs decreases the expected real present value of all future benefits, including those of current employees. See NASRA (2020b).

Our previous work on public-sector pensions suggests that the characteristics of, and changes over time in, state and local pension plans are related to the characteristics of the workers covered by the plans.[4] Table 1 shows the distribution of state retirement plans by the workers covered by these plans, i.e. (a) teachers only, (b) state employees plus teachers and local employees, (c) state employees and teachers, (d) state and local employees, (e) state employees only, and (f) local employees only.

[Insert Table 1 here.]

Focusing on the 85 large, state-managed plans in Table 1, we analyze the changes in the plans across several of the dimensions noted above.[5] Specifically, in this paper, we focus on six questions. First, why were teachers typically the first state workers to receive pension plans? Second, why did more than half of the states decide to continue operating separate retirement systems for teachers, even after creating a plan for other state employees? Third, why did some states decide to keep some or all of their public employees outside of Social Security? Fourth, why are most of the plans in which employees are not covered by Social Security teacher-only plans? Fifth, does the type of worker covered affect the level of benefits and the rate of decline in benefits since 2000? Finally, have plans outside of Social Security reduced benefits at a faster rate, or by a larger amount, than plans in which state workers are covered by Social Security?[6]

[4] See, for example, Clark et al. (2003), Clark and Craig (2010), and Clark et al. (2011).

[5] The sample for this analysis is taken from the Wisconsin Legislative Council (WLC) study of public retirement plans. The table reflects our recent review of all 85 plans in the WLC study.

[6] Quinby, et al. (2020) examine the related question of whether changes in plans outside of Social Security have resulted in benefits falling below the requirements for plans to continue to remain outside of Social Security.

Clearly, Social Security forms an important component of our story. Public employees are among the last American workers who are allowed to remain outside the Social Security system. Table 1 shows that in 17 of the 85 plans in our sample plan participants are not covered by Social Security, and 10 of those 17 plans are teacher-only plans.[7] While Clark and Craig (2010) and Abashidze et al. (2020) focus on the economics of teacher-only plans, this paper concentrates on benefit changes within all 85 state-managed plans reported in WLC. Specifically, Section II answers Questions 1 and 2, above; and Section III answers Questions 3 and 4; and Section IV and Questions 5 and 6. Section V summarizes our results and presents our conclusions.

II. Why Did So Many States Create and Retain Teacher-only Plans?

Primary and secondary school teachers, along with municipal police officers and firefighters, were the first state and/or local public employees to be covered by employer-provided pension plans (Clark et al. 2003).[8] New York City established the first such plan for its police officers in 1857. Initially, the New York City police pension plan was a disability plan, but a retirement feature was added in 1878 (Mitchell et al. 2000). Many of the larger cities in the United States began establishing retirement plans for their public-school teachers near the end of

[7] Johnson and Kolasi (2020) examine recent changes to 43 traditional state-managed plans that cover teachers, and find that 20 of those plans increased the normal retirement age; 15 plans increased the number of years in the FAS calculation; 13 plans lowered the benefit multiplier; 12 increased years for vesting; and 25 plans increased the employee contribution rate.

[8] Typically, "teacher" plans cover "certified" staff, which, in practice, can include licensed teachers, support staff, and administrators. In some states, however, teacher plans cover a broader set of public-school employees (Clark and Craig 2010; McCamman 1951).

the nineteenth century.[9] In most states, retirement plans for teachers ante-dated by several decades the creation of plans for other *state* employees. In many locations, teachers were the first or among the first public-sector employees to have access to a pension plan. For example, New York City and Brooklyn formed the first plan for teachers in 1887, which was formally known as the "Old-Age and Disability Annuity Association." Initially, participation in the plan was voluntary, but, according to McCamman, "it became compulsory in 1894 when New York City teachers obtained State legislation providing that deductions from their pay because of absence were to be turned over to the retirement fund." New Jersey followed with a statewide plan for its teachers in 1896. As with the New York City and Brooklyn plans, initially, participation in the plan was voluntary; however, it was subsequently "made compulsory for new entrants" (McCamman, 1943, p. 31).

Despite the relatively late start, the subsequent growth of such plans in the United States was rapid. By 1916, 159 cities had a plan for one or more of these groups of workers, and 21 of those cities included other municipal employees in some type of pension coverage (*Monthly Labor Review* 1916). In 1917, 85 percent of U.S. cities with 100,000 or more residents maintained a police pension plan; as did 66 percent of those with populations between 50,000 and 100,000; and 50 percent of cities with a population between 30,000 and 50,000 had some pension liability (James 1921). These figures do not mean that all of these cities had a formal *retirement plan*. They only indicate that the municipality had at least $1 of pension liabilities. This liability could have been from a disability pension, a forced savings plan, or a discretionary

[9] Generally, the state legislatures had to pass enabling acts before municipalities or local school boards could establish and fund pension plans. These early plans were typically financed, at least in part, by local property taxes, though other taxes and fees were also employed (Clark et al. 2003), and the municipalities' management of the plans was often regulated or overseen by the state governments.

pension. Still, by 1928, the *Monthly Labor Review* (April 1928) could characterize police and fire plans as "practically universal." At that time, all cities with populations of over 400,000 had a pension plan for either police officers or firefighters or both. Only one did not have a plan for police officers, and only one did not have a plan for firefighters. Several of those cities also had plans for their other municipal employees, and some cities maintained pension plans for their public school teachers separately from state teachers' plans.

Eventually, some states also began to establish pension plans for their other, i.e. non-teacher, employees. As noted above, the early state plans were primarily limited to teachers, like the early New Jersey plan. Massachusetts established the first retirement pension plan for general state employees in 1911, but, as late as 1929, only six states had anything like a civil service pension plan for their (non-teacher) employees (Millis and Montgomery 1938). Thus, pensions for state and local civil servants – other than teachers, police officers and firefighters – are, for the most part, mid-twentieth-century developments.[10] However, after individual municipalities began adopting plans for their teachers in the early twentieth century, the states moved fairly aggressively in the 1910s and 1920s to create or consolidate plans for the remainder of their teachers.

The first teacher retirement plan in the state of Michigan was the Detroit Teachers' Retirement Fund established in 1895. This plan was limited to teachers and excluded other school personnel. In 1917, the Michigan Teachers' Retirement Fund was organized to pay benefits to retired teachers with 30 years of experience. Initially this plan was funded only by employee contributions, but a 1937 act provided for state contributions. Around 1940, non-

[10] Following Clark et al. 2003 and Clark et al. 2011, we use the expression "civil servants" here to distinguish other or "general" public-sector workers from police officers, firefighters and teachers.

teaching school employees were allowed to join both the Michigan system and the Detroit system.[11] In 1907, the Indiana legislature created a plan for teachers in Indianapolis; the state followed with a plan for other teachers in 1915. Similarly, the Illinois legislature created a plan for Chicago in 1907, and a plan for other teachers in 1915 (Clark et al. 2011, Table 4-5). Other states quickly followed suit and allowed local governments to establish teacher retirement plans in major cities, including Denver, Omaha, and New Haven. All of the early municipal plans in New York were incorporated into the state pension plan for teachers in 1921. By the late 1920s, 21 states had formal retirement plans for their public-school teachers (Clark et al. 2003, Table 10-5).

A review of state and local pension plans suggests that of all of the political units in the United States, the states themselves were the slowest to create pension plans for their civil service workers. However, this observation is slightly misleading. Clark et al. estimate that in "1930, 40 percent of all state and local employees were schoolteachers, [and]…Of roughly 400,000 state employees covered by a pension plan in 1929, 370,000 were teachers" (2003, p. 200); the 21 states that maintained a plan for their teachers included the most populous states at the time.[12] While public-sector pensions at the state and local level were far from universal by the 1920s, they did cover a substantial proportion of public-sector workers, and that proportion was growing rapidly in the early decades of the twentieth century, and by 1940, 1.5 million (46 percent) state and local employees were covered by an employer-provided retirement plan (or 46 percent of 3.25 million total state and local workers; see Table 2).

[Insert Table 2 here.]

[11] The Michigan and Detroit systems were merged into one statewide system in 1980.

[12] Although the quote is from Clark et al. (2003), the latter figure is from Millis and Montgomery (1938).

Nearly 60 percent of school system employees were covered by 1940. (The figure was 38 percent for non-school employees.) Two states (California and New Mexico) covered one hundred percent of their public-education employees; four (Connecticut, Michigan, Ohio, and Pennsylvania) covered "almost nine-tenths". Only six states had no plan for their teachers (Alabama, Idaho, Missouri, North Carolina, Oklahoma, and South Dakota), and all but one of those states (Idaho) were either in the process of creating a plan for their teachers or soon would create one (Clark et al. 2011, Table 4-5). In the remainder of the states, at least some substantial proportion of teachers, and/or public education employees more broadly, were covered (McCamman 1943, p. 34).[13] By 1952, there were 1.9 million public school employees, including non-instructional staff, in the United States; 75 percent of these workers were covered by a pension plan (McCamman 1951, Table 1). However, as we discuss below, the 1940s saw tremendous growth in the pension coverage of other state and local workers as well. By 1950 two-thirds (3.0 million out of a total of 4.5 million) of state and local workers were covered by a pension plan, including roughly 60 percent of non-teachers (McCamman 1951, Table 1). These significant changes in pension coverage are shown in Table 2.

Two of the questions we address in this section are: Why were teachers typically the earliest state employees to receive pension plans? And, even after those states began providing plans for their other state employees, why did teachers remain in separate plans? Of course, the short answer to these questions is: Because the labor market for teachers differed and continues to differ from those for other state employees. However, in what follows, in this section and the

[13] Interestingly, the early teacher plans tended to be contributory, while the plans for other state employees were typically financed entirely by state funds (McCamman 1943, p. 31).

next, we offer more detailed arguments that help explain those labor market differences and how they continue to manifest themselves in pension coverage and generosity.

First, with respect to why teachers were typically among the earliest state employees to be provided with pension coverage, Clark et al. (2003) and Clark and Craig (2010) offer two explanations. One revolves around the cost of teacher turnover. It is a well-known feature of defined benefit pension plans that, through vesting requirements and the late career accumulation of pension wealth, they will tend to reduce turnover.[14] If teacher turnover is especially costly, then the pension contract could be used to tie teachers to the state school system. Today, teacher turnover *is* relatively costly. A recent study by Carver-Thomas and Darling-Hammond (2017) highlights those costs, putting the average figure at around $20,000 per teacher, which, as a percentage of salary is substantially higher than that of other entry-level state workers (Merhar 2020). In addition, Carver-Thomas and Darling-Hammond argue that turnover has a substantial negative impact on student performance; they conclude that "high turnover rates reduce achievement for students whose classrooms are directly affected" (2017, pp. v-vii).[15] Although we do not have estimates of the turnover costs for teachers from the early-20th century, we have reason to suspect that they were relatively large and certainly positive; whereas the turnover costs for many other public-sector employees may well have been negligible or even negative, as

[14] See, for example, Figure 1 in Aldeman (2019) and Figures 2-1 through 2-3, and the accompanying exposition in Clark et al. (2003).

[15] In contrast, Fitzpatrick and Lovenheim (2014) find no negative impact on student test scores from teacher turnover due to early retirement. Indeed, they conclude that an early-retirement program in Illinois "led to increased student achievement in most cases" (2014, p. 141). This question ultimately revolves around the productivity of the teachers who leave relative to their replacements. It is possible, perhaps even likely, that productivity differs among new entrants, mid-career movers, and retirees (Rockoff 2004), but that issue is beyond the scope of this study.

it was a not uncommon feature of the patronage systems in operation at the time for workers to, in essence, purchase their positions.[16]

Related to the issue of turnover, was the fact that women have made up the largest share of public-school teachers since such data were first collected in 1860. The share of teachers who were women peaked in 1920 at 85 percent; and the share has not been below 75 percent since the nineteenth century. (See Figure 1.) Midthun highlights the fact that the profession was dominated by women, and this played an important role in the progressive movement's quest for pensions for school teachers: "Historically, teachers were primarily young, underpaid, single women who earned low salaries, were faced with a rising cost of living, and were bound to a location by family ties, thus unable to pursue higher salaries elsewhere" (2021, p. 19). As Graebner puts it, "single, female, and poor, the average public-school teacher was a perfect candidate for aid" (1980, p. 104; see also Hansen 2010).[17]

Early studies of public-sector retirement plans also recognized the disproportionate number of women among public school teachers, but not necessarily in a positive way. Specifically, A.J. Altmeyer, writing in the *Social Security Bulletin* in 1945, observed the importance of women in the profession and commented on the fact in two contexts. One was the loss of pension wealth due to turnover, presumably, in the case of women resulting from

[16] Often these monies were laundered as donations to the political machines, and the politicians who ran them, and doled out public-sector jobs. As White notes "remunerative offices provided the kickbacks that funded political parties and politicians" (2017, p. 360). See also Badger (1989, pp. 210-211) and, more generally, Parillo (2013).

[17] Midthun (2021, p. 19) also notes that younger teachers resented making contributions to plans with lengthy vesting periods, often twenty years or so. Since marriage was often a cause for the dismissal of female teachers, these younger teachers recognized that the plans blatantly redistributed income from younger workers to retirees.

marriage or pregnancy, and the other was the "need" for pension coverage in other (male-dominated) positions. According to Altmeyer, the men in these (currently uncovered position) were "likely to need social insurance [more than female school teachers] because they are married, and have families dependent upon their earnings [and] are probably underrepresented in the covered group" (1945, p. 4). This perspective is likely to find less support today than it did at the time.[18]

[Insert Figure 1 here.]

In addition to the difference in the turnover costs between teachers and other state employees, and the importance of women in the profession, another reason teachers were the most likely state employees to receive retirement benefits is because, grouped by trade or profession, they were typically the largest identifiable group of state employees; as noted above, as late as 1930, 40 percent of all state and local employees were schoolteachers.

While it makes sense that the early state-level pension plans were concentrated among school teachers, an early start in and of itself does not necessarily explain why, even today, so many teacher plans continue to include *only* teachers. After all, one could make the case that the marginal cost of adding additional state workers, that is non-teachers, to the teachers' plans would have been relatively inexpensive compared to the cost of establishing and managing separate plans for those workers. However, public choice theory suggests that the probability of success in bargaining over pension wealth would be enhanced by being in a stand-alone plan.[19]

[18] The authors thank Maria Fitzpatrick for pointing out the importance of women in the labor market for teachers.

[19] "Bargaining" here does not necessarily mean "collective bargaining." See Libecap (1989) and North (1990).

Well-defined, and/or more homogeneous, groups tend to be more successful than heterogeneous groups in governmental bargaining situations in general and in securing the organizational quasi-rents associated with public-sector employment in particular. These rents are derived from the high cost of monitoring or measuring government output, or from free riding, which would limit an individual citizen's inclination to bear the costs of attempting to replace legislators and executive officers, such as governors.[20] One observation consistent with this hypothesis is the numerous examples of public support for higher teacher pay and support for retirement plans, while there is little obvious support for raises for general state employees.[21]

[20] For a discussion of organizational quasi-rents, see Aoki (1984). On the presence of these quasi-rents in the public sector, in general, see Mueller (1989); with respect to, specifically, their distribution among public-pension stakeholders, see Craig (1995). While Buchanan and Tullock (1962) and Olson (1965) are often cited as the seminal works on the importance of group homogeneity in the economics of collective action, it is worth noting the James Madison expounded on this point in Federalist #10. Subsequent generations of scholars, with the blessing of hindsight, have emphasized the *political* aspects of Madison's dissection of "factions," projecting them onto the political parties that formed almost immediately after the Constitution's ratification, and which have dominated the U.S. political landscape since. However, in the passages that follow Madison's seminal characterization of factions, he focuses on their *economic* dimensions. To offer just one example:

> Those who hold and those who are without property have ever formed distinct interests in society. Those who are creditors, and those who are debtors, fall under a like discrimination. A landed interest, a manufacturing interest, a mercantile interest, a moneyed interest, with many lesser interests, grow up of necessity in civilized nations, and divide them into different classes, actuated by different sentiments and views. The regulation of these various and interfering interests forms the principal task of modern legislation, and involves the spirit of party and faction in the necessary and ordinary operations of the government (Madison 1788 (1982), p. 44).

[21] In general, in many states, teachers have been treated more generously than other state employees. In North Carolina for example, between 1988 and 2008, average teacher pay nearly doubled, increasing by 93 percent; whereas, other state employees received, on average, only a 56 percent increase (Stoops 2009, p. 1).

In his theoretical model of negotiating over and contracting for property rights, Libecap emphasizes the importance of low organizational (i.e. transaction) costs in facilitating exchange in the political arena; he notes specifically that as "groups become larger, organizational costs rise" (1989, p. 17). While that argument supports the perpetuation of teacher-only plans holding other things constant, the reductions in organizational costs in bargaining from maintaining a teacher-only plan would need to be weighed against the reduction in administration costs from administering a combined plan.[22] The literature contains numerous examples of situations in which a particular group is successful because of group homogeneity and the pursuit of a well-defined goal. For example, Olson (1965) and Olson and McFarland (1962) illustrate the point through the interaction of monopoly power, the profits that accrue to it, and by implication, the willingness of the monopolists to employ those profits in the perpetuation of their monopoly power.[23] Similarly, Alexander and Libecap argue that the presence of "homogeneous" producers insured the successful cartelization of some agricultural markets under the New Deal's Agricultural Adjustment Act relative to the failure to cartelize other markets under the National Recovery Act (2000, p. 124). Heckelman et al. summarize the point with "small groups may expect greater net benefits from using their resources to lobby for benefits for themselves" (2000, p. 2).

Thus, public choice theory suggests that, controlling for other social and economic factors, we should, in at least some and perhaps many cases, see teachers pursuing the

[22] Lower bargaining costs would generate greater (net) quasi-rents to be shared among teachers, legislators, plan administrators, and so forth (Craig 1995).

[23] Olson focuses on the difficulties associated with organizing larger collections of firms (Olson 1965, p. 48); while Olson and McFarland refer to the creation and maintenance of "obstacles" to competition (1962, p. 622), that are necessary for the perpetuation of monopoly rents.

perpetuation of their own plans, separate from those for other state employees. This is in fact what we tend to find in the data. As noted above, more than half the states maintain a separate plan for their teachers. But, also as noted above, teachers would only be expected to support the maintenance of a separate plan if, on net, that option yielded quasi-rents greater than they expected to receive from a combined plan.[24] The most obvious manifestation of that outcome would be if teachers received higher pension replacement rates and have lower employee contributions when they are in plans that do not include other state employees.

Clark and Craig (2010) investigate and formally test this hypothesis. In short, they find that, over the course of late-20th and into the early-21st centuries, teachers in teacher-only plans did receive higher replacement rates than any other sub-group of state workers. To give just one example, in 1982, the replacement rates in teacher-only plans were, on average, 5.9 percent greater than those for "combined" plans that included other workers, and in 2006, the teacher premium was 8.7 percent.[25] So, there are reasons why teachers received pension benefits earlier than other state workers, and there are reasons why they continued to remain in separate plans once other state workers began receiving pensions. We now turn to the question of: Why did so many teacher-only plans not join Social Security? And why, today, are teachers disproportionately remain outside of the Social Security system?

[24] Our discussion here reads as if the choice is solely up to the teachers. Obviously, in practice, there are other parties (e.g. legislators, governors, plan administrators, and so forth) to whatever bargain is ultimately reached. North (1990, p. 87) highlights the importance of these other parties. Qualitatively our summary here is consistent with his treatment of the basic question.

[25] Authors' calculation from Clark and Craig (2010). These results are for "all" plans in each category. More detailed analysis, such as looking at plans in and out of Social Security, reveals the same qualitative result: Teachers benefited financially from being in their own plans.

III. Why Did So Many Teacher-only Plans Not Join Social Security?

Title II of the Social Security Act of 1935 created the federal old-age insurance (OAI) plan, which was broad-based, though hardly universal, and, importantly for our story, it was contributory. In the initial act, public-sector employees were prohibited from participating in the Social Security system. This was at least partly a response to concerns about the constitutionality of including those workers, and thus forcing their state and local government employers to contribute the employers' share of the payroll tax.[26] The creators of Social Security were concerned that the federal courts would interpret the employers' share of the payroll tax as a direct federal tax on the states, which at the time was considered unconstitutional (Myers 1975, p. 33).[27] Because of the constitutional issues raised by the Supreme Court, in its

[26] In addition to the constitutional issues explored below, there was also a political factor. At the time the Social Security Act was passed, slightly less than half of U.S. state and local workers were already covered by a retirement plan. Granting, what was in effect, a federal pension to these workers, on top of the employer-provided pension, to which they were already entitled, was viewed as a costly and politically untenable financial windfall during the country's worst economic disaster. Although market forces might have been expected to force a downward adjustment in the relative generosity of public-sector plans in response to the addition of Social Security, the political process did not initially take that possibility into account. Thus, adding a Social Security benefit to, what was perceived by many to be, already overly-generous public-sector compensation packages was a political loser in Congress.

[27] Article I, Section 9, Clause 4.1 of the U.S. Constitution prohibits the imposition of direct taxes, "unless in Proportion to the Census or enumeration herein before directed to be taken." In *Pollock v. Farmers' Loan and Trust*, 157 U.S. 429 (1895), the U.S. Supreme Court ruled that the federal government could only impose direct taxes if they were apportioned among the states in proportion to their representation in Congress. This doctrine was circumvented somewhat by the 16th Amendment. ("The Congress shall have power to lay and collect taxes on incomes [i.e. a direct tax], from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration.") However, there was no matching employer contribution to the income tax, and thus it remained an open question whether or not Congress could force the states to remit payroll tax revenues to the U.S. Treasury.

reviews of several key pieces of New Deal legislation, the authors of the Social Security Act decided to be as careful as possible when it came to those constitutional issues. For this reason, in addition to omitting state and local workers from the system, the taxing and funding functions of the Social Security Administration were denoted in separate titles of the act, with, as noted above, the benefits proclaimed in Title II and the payroll tax imposed under Title VIII. The more general constitutional issue with the payroll tax was the court's past objection to specific taxes being levied on specific individuals or groups to then be distributed to other specific individuals or groups. Prior to the passage of the Social Security Act, the court raised this issue its *Butler* and *Alton* decisions.[28]

Not surprisingly, a test case on Social Security soon found its way into the federal courts in the form of *Helvering v. Davis*, with the Supreme Court hearing arguments during its spring

[28] As the Social Security Act was working its way through Congress, the Supreme Court ruled, in *Railroad Retirement Board v. Alton Railroad Co.*, 295 U.S. 330 (1935), that the Railroad Retirement Act was unconstitutional on the grounds that the forced contributions from employers, which were ultimately transferred to workers, were a violation of the "takings" clause of the Fifth Amendment to the Constitution. In effect, the court said that the government was taking property *directly* from the railroads and *directly* transferring it to workers without due process. Similarly, this issue would, in the following year, lead the court to reject the administration's main agricultural relief plan, the Agricultural Adjustment Act (*U.S. v. Butler*, 297 U.S. 1 (1936)). The *Butler* decision, which involved a tax on the processors of agricultural products, is often presented, like *Alton*, as one that revolves around the spending power (granted to Congress under Article I, Section 8 of the Constitution) for the *general welfare of the people*, a standard which neither the AAA nor the Railroad Retirement Act could claim to meet (Black 2003, p. 377; and Kennedy 1999, p. 329). However, the majority opinion in *Butler* also focuses on the allocation of power between the federal government and the states, which was, more or less, the concern of the authors of the Social Security Act when they omitted state and local employees from Title II coverage. Badger (1989 p. 160) notes the importance of both issues.

1937 term; the ruling was issued later that year.[29] Unlike its rulings in *Butler* and *Alton*, the court found nothing objectionable in the structure of the Social Security system; thus the creation of the Reserve Account and the exclusion of state and local workers had served their purposes. Unlike it had done in *Butler*, the court did not consider old-age security an issue exclusively reserved for the states. As it had in *Butler*, the court recognized the powers of Congress to tax for the general welfare. Writing for the court, Justice Benjamin Cardozo emphasized the role of "discretion" in defining the general welfare. He noted that such discretion "is not confided to the courts. The discretion belongs to Congress, unless," he added, somewhat unhelpfully, "the choice is clearly wrong, a display of arbitrary power, not an exercise of judgment."[30] With respect to the states-rights issue, he added:

> [the] problem of security for the aged, like the general problem of unemployment, is national, as well as local… the ill is . . . not greatly different whether men are thrown out of work because there is no longer work to do or because the disabilities of age make them incapable of doing it… [the] laws of the separate states cannot deal with it effectively…*States and local governments are often lacking in the resources that are necessary to finance an adequate program of security for the aged*.[31]

Thus, the Roosevelt Administration and Social Security's congressional supporters could interpret *Helvering* in one of two ways: Either the court was in effect saying that the act's prohibition against state and local employees' participation in the system was not a constitutional

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[29] *Helvering v. Davis*, 301 U.S. 619 (1937).

[30] Since the court decided what was "wrong", "arbitrary", and "not an exercise of judgment", Cardozo was essentially saying the ultimate discretion did, in fact, belong to the court. See *Helvering v. Davis*, 301 U.S. 619 (1937).

[31] Emphasis added. See https://constitutionallawreporter.com/2018/01/09/helvering-v-davis-1937/ August 15, 2020.

issue, which in turn meant the collection of payroll taxes from the states was not a constitutional issue, or the payroll tax would have been an issue, but the exclusion of those workers rendered the point mute. With *Helvering* the court clearly dispensed with the general welfare issues raised by *Alton* and *Butler*, and at least some of the states' rights issues raised by the latter, and so Social Security became a pillar of the so-called second New Deal and of the welfare state more generally, but, initially, it did so without the participation of state and local workers.

The subsequent evolution of case law on the matter of Congress's taxing and spending powers through the end of the 1930s, into World War II and beyond rendered moot the now-quaint concerns about the exercise of federal power in general and the taxing power in particular. The subsequent expansion of the Social Security system and the increase in the value of its benefits created, in effect, a nearly universal national pension plan, but one that, for legal and political reasons, initially excluded state and local workers. In a few legislative strokes over a period of only a few years, by expanding the system, Congress had added millions of Americans to the list of those with a pension plan; while in the process bypassing public-sector workers, who had historically been the sector of the population with the most extensive pension coverage.[32] It followed that this expansion would have an impact in the labor market for public-sector employees who were without pensions. As both pension coverage in the private sector and Social Security expanded, public employers without a retirement plan were at a competitive

[32] In 1939, even before the first Social Security benefits had been paid, Congress passed two sets of amendments to the Social Security Act. First, several auxiliary beneficiary categories were created, with dependent benefits tied to the earnings, and hence expected future benefits, of the worker. This was the beginning of the widow, spouse, child, and parent eligibility structure that remains in the current system. Second, the benefits to be paid were based on the average monthly wage (AMW) the worker earned after 1936 (Social Security numbers were issued at the end of 1936), rather than cumulative lifetime earnings, as had been the case in the original legislation, which increased benefits (Clark et al. 2011, pp. 59-64).

disadvantage in the labor market. In addition, the World War II wage controls, during a period of rapid expansion in the demand for labor, caused both public and private sector employers to expand the non-wage component of the compensation they offered to their workers. In April 1948, the National Labor Relations Board ruled that pensions were a mandatory issue in collective bargaining, and the ruling was subsequently upheld by the Supreme Court.[33] Overall, following the passage of the National Labor Relations Act, the late 1930s and the 1940s saw dramatic grow in the unionized share of the U.S. labor force. (See Figure 2.) Although the vast majority of the growth was in the private sector, public employers competed with private employers in the market for labor, and so there were spillover effects from the expansion of collective bargaining in the private sector.

[Insert Figure 2 here.]

A look at the expansion of state pension plans during the decade illustrates the point. Of the 85 separate state pension plans for teachers and state civil servants reported by the Wisconsin Legislative Council;[34] 22 of these plans had been created before 1920, and seven plans were created in the 1920s; 14 plans were created in the 1930s; 26 plans were created in the 1940s (22 independent plans and four plans covering both teachers and other state workers), and 20 plans were created after 1949 (15 independent plans and five plans covering both teachers and other state workers). Thus, the '40s was the watershed decade, at least at the state level, for the

[33] The relevant case was *In re Inland Steel Company and Local Nos.1010 and 64, United Steel Workers of American (CIO)*. See National Labor Relations Board 77 NLRB 1 (1948) and the discussion in Somers and Schwartz (1950).

[34] The number of plans exceeds 85 because of the consolidations that have occurred over the intervening decades. (See Table 4 of Appendix A to Abashidze (2020).) In fact, the total number of plans created is much larger than this figure, as many states have very narrowly drawn plans for specific groups, such as legislators and judges. We focus here only on the state's plans for teachers and civil servants.

expansion of public-sector pension plans. Clark et al. (2003) and Clark et al. (2011) attribute the dramatic growth of public-sector pensions in the 1940s to the expansion of Social Security, the growing importance of labor unions, and wartime wage controls. As a result of the growth in pension coverage in the 1940s, Clark et al. (2011) estimate that, by 1950, at least three-quarters of the nation's public-sector workers were covered by a retirement plan, but the state and local workers who did not yet have access to a pension plan realized that they were missing out on a benefit enjoyed by roughly two million of their public-sector colleagues across the country. Individual employees, as well spokespersons for the various professional organizations, had been lobbying the Social Security Board for participation in the system. As one commentator put it, "It is an indisputable fact that State and local government workers who do not belong to retirement systems have an urgent need for social insurance" (Altmeyer 1945, p. 4). Furthermore, the vesting requirements of state and local plans created an obstacle to accumulating pension wealth among workers who left state or local employment.

During the 1940s, the legislatures of three States (Utah, Vermont, and Washington) passed legislation, which would enable their employees to join the Social Security System, if Congress would amend the Social Security Act permitting their state employees to participate in the system. The legislatures of at least eight additional states (Alaska, Arkansas, Delaware, Montana, Oklahoma, Oregon, South Carolina , and Texas; and in Arkansas and Oregon) passed resolutions calling on Congress to amend the Social Security Act to include some or all state employees, not just their own. The legislatures of two states (Idaho and New York) approved resolutions calling for the expansion of Social Security to previously uncovered occupations in both the public and private sectors. And the mayors or city councils of local governments in at least ten states (Arizona, Colorado, Connecticut, Florida, Missouri, Nevada, New Jersey, North

Carolina, Pennsylvania, and Washington) explicitly petitioned Congress, requesting the extension of Social Security to municipal and county employees.

Surrendering to this pressure, and no longer troubled by constitutional issues we outlined above, in 1950, Congress passed legislation amending the Social Security Act and permitting states to enter into voluntary agreements (often referred to at the time as "coverage agreements") with the Social Security Administration. The amendments allowed public employees not covered by an employer-provided retirement system to participate in Social Security (Mitchell et al. 2000).[35] The move had to be approved through referenda submitted to workers covered by an existing public-employee retirement plan. Because most states and many municipal governments already provided pension plans for their workers by that date, the decision by state and local governments to enter the Social Security system raised the question of whether or not to alter their existing plans and have their workers join Social Security.[36] The 1950 amendments extended coverage to the 1.4 million state and local employees without an employer-provided pension plan. The act called for the creation of coverage agreements, negotiated between the respective states and the Social Security Administrator; however, before a state executive branch

[35] Police officers and firefighters, for whom separate plans were in place at the time, were still prohibited from joining Social Security. They were excluded as a result of lobbying by the associations representing their interests. As Congressman Ray Madden (D-Indiana) noted in the *Congressional Record*, "Also policemen and firemen who have an adequate retirement system have been excluded by reason of the request from the various police and firemen organizations throughout the country" (1954, p. 7418).

[36] The authority allowing voluntary participation in Social Security by public employees is contained in section 218 of the Social Security Act. As a result, these state agreements are referred to as section 218 agreements. Each state's Social Security Administrator is responsible for managing the state's agreement with the Social Security Administration.

agency could enter into such an agreement, its state legislature had to pass enabling legislation. At the time the amendments were passed, twelve states had already passed the relevant legislation: Arkansas, California, Idaho, Kentucky, Massachusetts, North Carolina, Oklahoma, South Dakota, Utah, Vermont, Washington, and West Virginia (Liebowitz 1950, p. 8).

The 1950 amendments still prohibited state local employees, who were covered by a pension plan, from participating in social security. However, the Virginia state legislature found a loop-hole in the amendments. There was no provision that prevented a state from simply abolishing its current plan, placing its now-uncovered workers in the Social Security system, and then creating a new plan that incorporated Social Security into its calculus. In fact, it appears that the Virginia legislature negotiated a coverage agreement with the Social Security system before abolishing its old plan creating a new one. Mississippi made a similar move the following year (McCamman 1951, p. 9). Once Virginia and Mississippi established the precedent of violating the spirit of the 1950 amendments, which were designed by Congress to aid state and local employees without a pension plan, other states quickly followed, going "through the cumbersome, but necessary, procedure of abolishing existing staff retirement systems in order to get old-age and survivor's insurance coverage plus protection under a supplementary staff system" (Marquis 1955, p. 4).

Rather than fight the states on this issue, in 1954, Congress passed additional amendments allowing state and local employees who were covered by an employer-provided retirement plan to obtain Social Security coverage at the request of the public employer and its employees, whose decision was based on a referendum. As James Marquis, writing in the Social Security Bulletin, put it at the time:

> To ensure that the interests and wishes of the retirement system members are respected, the amendments require that the Governor of the State certify that a

> referendum by secret written ballot was held among the members of the system and that a majority of those eligible to vote actually voted in favor of coming under old-age and survivors insurance. Generally speaking, all members of the system must be afforded an opportunity to vote and must be given at least 90 days' notice of the referendum (1955, p. 7).

With the 1954 amendments, Congress made a good-faith effort to cover all state and local workers; however, those workers could only join the system if their state legislature passed enabling legislation and a majority of their fellow workers approved the change. Also, importantly, the amendments make clear that it was the policy of Congress that the total pension wealth accumulated by workers currently covered by a plan could not be reduced if they joined the Social Security system. In other words, in the language of the day, their pension wealth could not be impaired.

Of course, it would be up to the executive branch to oversee the process of adding workers to the system, and, the relevant agency was the Bureau of Old-Age and Survivors Insurance. Accordingly, the bureau's director, Victor Christgau, in a memo summarizing the 1954 act, explained the two key provisions for state and local worker, who were previously prohibited from joining the system:

> A state can bring members of a State or local retirement system (except policemen and firemen) under its old-age and survivors [sic] insurance agreement subject to a referendum in which a majority of the members of the system eligible to vote in the referendum vote for coverage...
>
> The legislation states that it is the policy of the Congress in making coverage available to retirement system members that there be no impairment of the protection of members and beneficiaries of a retirement system by reason of the extension of old-age and survivors insurance coverage to employment covered by the retirement system. This declaration of policy is designed to make clear the

> intent of the Congress in providing the opportunity for coverage of members of State and local retirement systems...[37]

This memo makes clear that, that the state government holds the option on whether or not to present its public sector employees with the choice of voting to join the system. In other words, state support is a necessary but not sufficient condition; similarly, worker support (as represented by yes/no vote) is also necessary but not sufficient. But there would be no vote unless the state sanctions one. It also clearly states that inclusion in Social Security should not be accompanied by a reduction in state or local pension benefits.[38] In other words, it was the intent of Congress that there was to be "no impairment" of the benefits currently enjoyed by public-sector workers.

By 1956, more than 1.25 million additional state and local government employees were covered by Social Security under the voluntary agreements made possible by the 1950 and 1954 amendments. Agreements were in place for 46 of the 48 states. Of these, roughly 500,000 received both a pension plan from their public-sector employers and Social Security (McCamman 1956, p. 15).[39] The first states to follow the procedures for adding their workers,

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[37] U.S. Bureau of Old Age and Survivors Insurance (1954).

[38] The discussion in the Congressional Record would seem to support the view that Congress did not intend for employee benefits to be reduced as a result of the amendment. See U.S Congress (1954, p. 7418-7425), though the fact that a vote was required to join the system suggests the point might have been more nuanced than indicated by the Bureau of Old Age and Survivors Insurance memo cited above.

[39] At the time the McCamman study was being written, in the fall of 1955, Texas state employees, excluding the state's teachers, had just held a referendum (Texas teachers remain outside the system to this day), and the Michigan State Employees Retirement System (with 23,000 members; the North Carolina Teachers and State Employees Retirement System (65,000 members); the North Carolina Local Governmental Employees Retirement System (8,000 members): and the New Jersey Teachers Pension

who already were covered by a plan, under the 1954 amendments were Alabama, Indiana, Kansas, and South Carolina. Interestingly, almost 70 percent of the workers with "duel coverage" received it in states that had disbanded their old plans, following the passage of the 1950 amendments, and reconstituted their plans to include Social Security coverage.

Since coverage was in a sense voluntary under the 1950 and 1954 amendments, public employers who had entered the Social Security system under the terms of their voluntary agreements could, if they chose, also terminate this relationship. Thus, participation in the system was in principle something of a two-way street for the state and local governments; theoretically, they could come and go as they pleased. However, as part of the 1983 Social Security reforms, Congress repealed this option, and states could no longer rescind their decisions to participate in Social Security. Once in the system, public employers were now required to remain in the system.[40] Finally, in 1990 Congress amended the act such that, beginning in 1991, Social Security coverage was made mandatory for all state and local employees who are not covered by an employer-provided retirement plan (Social Security Administration 2007). With the 1990 amendment, Congress charged the Internal Revenue Service with defining a sufficient retirement plan for legal purposes. The IRS ruled that workers are enrolled in "qualified retirement system" if they participate in a pension plan "that provides retirement benefits, and has an accrued benefit or receives an allocation under the [plan] that is comparable to the benefits [the participant] would have or receive under Social Security."[41]

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and Annuity Fund (36,000 members) were either holding referenda or had them scheduled (McCamman 1956, p. 17).

[40] Legislation enacted in 1986 requires that all state and local employees hired after March 31, 1986 must be covered by Medicare; however, to date no such mandatory coverage is required for Social Security.

[41] Quoted in Aldeman (2019).

By 2007, all 50 states had signed Section 218 agreements with the Social Security Administration, allowing some or all of the public employees in each state to be covered by Social Security. However, even today, many state and local employees still remain outside of the Social Security system. The majority of public employees who do not participate in Social Security are police officers, firefighters, and teachers. According to one recent estimate, approximately 40 percent of the nation's K through 12 teachers remain outside the system (Aldeman 2019, p. 1).[42] The members of these groups were typically among the first non-military public workers to receive pensions in the United States; thus, employees in these occupations typically were already covered by a retirement plan when Social Security was established (Clark et al. 2003).[43]

As we noted above, currently, there are seventeen pension plans, maintained at the state level, that have at least some employees not in the social security system. In ten of those seventeen states, the teachers-only plans exclude teachers from Social Security: Alaska, California, Connecticut, Illinois, Kentucky, Louisiana, Massachusetts, Missouri, Ohio, and Texas. Two of those states (Louisiana and Massachusetts) maintain separate plans for general state employees that remain outside the system. Another two of those states (Alaska and Ohio) maintain separate plans for general state employees and local government employees that remain

[42] In 2005, Streckewald estimated that 28 percent of *all* state and local workers remained outside of the Social Security system.

[43] Nearly 75 percent of the public employees who remain outside the Social Security system reside in just seven states: California, Ohio, Texas, Massachusetts, Illinois, Colorado, and Louisiana.

outside the system. And Colorado, Maine, and Nevada maintain plans for teachers, general state employees, and local government employees that remain outside the system.[44]

The status of state-provided retirement plans following the states' voluntary entry into the Social Security system offers an interesting economic and public policy experiment. Both employers and employees are often interested in allocating a portion of total compensation to retirement benefits. If the pre-Social Security plan supplied the optimal level of benefits given the state's human resources objectives, employee preferences, and the cost of providing these benefits, then the introduction of Social Security would tend to encourage the states to reduce the generosity of their retirement benefits and reduce the employer contributions to their pension plans, despite the intention of Congress that they not do so following the 1954 amendments. From the workers' perspective, however, the calculation is not trivial: They have two benefits to consider, a Social Security benefit and a pension benefit, but both have costs, the payroll tax and the employee's contribution to the employer-provided retirement pension, respectively. Only with the knowledge of the relative magnitudes of these variables could the worker make an optimal choice.

When the states began offering Social Security coverage to their employees and the employees accepted the offer through referenda, eight states made no reductions in the generosity of their own state retirement plans. In addition, 15 states modified their systems slightly, but in all of these cases, total retirement benefits – that is, social security plus employer pension benefits – were greater than the retirement benefits earned prior to Social Security coverage. Finally, another eight states integrated their systems with Social Security and

[44] State employees in Alaska were once included in Social Security; however, in 1980, Alaska withdrew its employees from the system.

markedly reduced benefits payable under their state systems (Mueller 1961).[45] While technically a violation of Congress's "no impairment" rule, there was no cost to be paid for reducing the state benefit, and given that the state initiated the workers' entry into the Social Security system, and that workers voted to join, one could reasonably conclude that both parties were better off as a result of the final arrangement.

There are at least three factors that explain the patterns we see with respect to Social Security and its inclusion in, or absence from, teacher-only state pension plans. First, the no-impairment rule meant, to the extent it was honored, that, if a state included Social Security coverage in an *existing* state plan, then workers currently covered by the plan would unambiguously be better off, as long as the Social Security benefit, net of payroll taxes, yielded a competitive rate of return. For the initial cohort of public employees covered by the amendment it most likely did (Clark et al. 2011, pp. 62-63). However, from the perspective of the other parties to the public-sector pension bargain, such as legislators and plan administrators, including workers in the Social Security system, with no other changes to the labor contract, generated no new quasi-rents.[46] The state would incur the costs of the payroll tax with little or no benefit to non-participant stakeholders. The presence of an efficiency wage premium might generate an

[45] The Pension Task Force (1978) on public pension systems reported that some plans were terminated and restructured when public employees were first covered by Social Security.

[46] An example of this thinking is shown in the final report of the Special Commission to Study the Massachusetts Contributory Retirement Systems (2009). "The Commission agreed from the outset that, as a matter of fiscal policy, Massachusetts should continue to oppose Social Security coverage of its public employees, because the costs would exceed the benefits. While Massachusetts employers and employees each would be required to pay 6.2 percent of payroll to Social Security, only three quarters of that amount would pay for benefits; at least one quarter would go to cover Social Security's legacy costs, associated with having provided benefits in excess of contributions to early generations."

increase in productivity and thus, to the extent that output was not fully appropriated by the workers who generated it, some net new quasi-rents would have been on the table. However, one could reasonably expect such a gain to be small compared to the employer's share of the payroll tax.

Note that this would not be the case for pension plans created *after* the passage of the 1954 amendments. In creating a new plan, with Social Security as an option, bargaining over the distribution of quasi-rents would simply include Social Security as one of the initial factors to consider. While Social Security might be an additional complicating factor in the bargaining process, with workers accepting lower future pension benefits relative to what they might have received in the absence of the Social Security option, there would have been no additional prohibitive costs in arriving at a contract.[47] Thus, we would expect plans created after 1954 to disproportionately include their teachers in Social Security, and that is what we see in the data. Ten of the eleven state teacher plans that were created or substantially revised after 1954, included their teachers in Social Security (Clark et al. 2011, Table 4.5).

Second, while the no-impairment rule explains why newer, post-1954 state and local plans would tend to include their workers, including their teachers, in Social Security, by itself, it doesn't explain why the older plans would necessarily remain out of the system, especially after it became clear that states were not honoring the no-impairment clause.[48] The older plans did in

[47] In fact, holding other factors constant, with a larger potential net benefit on the table (i.e. through the combination of pension and Social Security benefits), contracting theory predicts it would be easier to obtain an agreement: "The larger the expected aggregate gains, the more likely a politically acceptable share arrangement can be devised…" (Libecap 1989, p. 21).

[48] As Clark and Craig (2010) and Clark et al. (2011) show, plans that include their teachers in Social Security have, on average, lower lifetime benefits than teacher plans that do not, and many of these plans existed before 1954. Congress recognized as much, when, in 1990, it amended the Social Security Act

fact disproportionately remain out of Social Security. The age of the plans per se does not necessarily explain why those plans remained outside the system, but the theory of prior possession does. As Libecap notes, prior possession can be a key criterion when contracting for property rights in the public sector. Prior possession "is politically attractive, because it reflects the existing distribution of property and wealth" (1989, p. 23). It follows that disturbing the existing allocation of rents is costly, and decision makers, in this case primarily the state legislators who would initiate the move to Social Security, would only incur those transaction costs if the rents, and more specifically their share of the rents, were large enough to warrant the costs. As noted above, the opportunity to move state teachers, with their own pension plans, into the Social Security system, simply did not present the states with enough new wealth to incur the bargaining costs that would be required to distribute it.

Third, as noted above, government employment yields quasi-rents that are shared among a diverse collection of parties, in this case including, but not necessarily limited to: teachers, other state employees, and legislators, and with respect to the pension component of the workers' contracts, pension plan administrators and any financial firms that handle pension funds. The older, teacher-only plans would have had a *deeper* more diverse set of rent-seekers.[49] For

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mandating coverage was for all state and local employees who are not covered by an employer-provided retirement plan (Social Security Administration 2007). In addition, Congress charged the Internal Revenue Service with defining a sufficient retirement plan for legal purposes. The IRS ruled that workers are enrolled in "qualified retirement system" if they participate in a pension plan "that provides retirement benefits, and has an accrued benefit or receives an allocation under the [plan] that is comparable to the benefits [the participant] would have or receive under Social Security" (quoted in Aldeman 2019, p. 4). If the no-impairment rule had been honored, then the qualified-retirement standard would have been unnecessary.

[49] Not necessarily larger, that would have been a function of the plan's size, but more diverse and heavily invested in the current plan.

example, older plans would have participants spread over the life cycle, including retirees. Plan administrators would be well imbedded in the state's bureaucracy; investment advisors would have established relationships with plan administrators; legislators would have longer-standing ties to members of all of these groups. Contracting theory predicts that the number, diversity, and size of the claims of bargaining parties will, along with prior possession, drive up the costs of bargaining over any changes in the rent pool. As Libecap summarizes the issue: "The greater the number of competing interest groups with a stake in the new definition of property rights, the more claims that must be addressed by politicians in building a consensus on institutional change" (1989, p. 21), and thus the higher the transaction costs in achieving a new allocation of rents. As North notes, exchange in this context can only "be accomplished at a low enough cost of transacting to make [the transaction] worthwhile" (1990, p. 109). So, the problem with the older plans was not that they were old, but that over time, the number of parties, their diversity, and the complexity of the relationships between them were such that the costs of renegotiating the distribution of quasi-rents among them simply mathematically overwhelmed any gains expected from the activity.

So, the theories of contracting for property rights and institutional change suggest that the combination of the no-impairment rule, the value of prior possession, and the number and diversity of the parties associated with the older teacher-only plans helped to keep those plans out of Social Security, and, as we have seen they remain disproportionately out of the system to this day. We now turn to a review of the recent and current status of those plans, and, in particular, focus on the recent changes to them relative to the plans that have joined the Social Security system. Specifically, we ask: Does the type of worker covered affect the level of benefits and/or the rate of decline in benefits since 2000? And: Have plans outside of Social

Security reduced benefits at a faster rate, or by a larger amount, than plans in which state workers are covered by Social Security?

IV. Reduction in Plan Benefits and Social Security Coverage

Virtually all public plans have significantly reduced retirement benefits for future retirees since 2000. As we noted above, initial retirement benefits have been reduced by modifications to the benefit formula such as reducing the benefit multiplier, increasing the number of years in the averaging formula, raising the age for normal retirement, and increasing the reduction in benefits for retirement prior to the normal retirement age. Lifetime benefits have been further reduced by caps on COLAs and changes to how COLAs are calculated.[50] In addition, to expecting lower retirement benefits, public employees are being required to make higher contributions to support the retirement plan. Thus, the total present value of retirement benefits has been reduced by plan changes that reduce the initial pension benefit at retirement, lower real benefits in retirement due to reductions in COLAs, and the higher employee contributions imposed on plan participants during the working years. In this section, we describe the primary methods used to reduce future retirement benefits by public sector retirement systems and the impact of these plan changes on the initial retirement benefit.

Appendix Table 1 lists the 85 plans included in this study and indicates the type of plan that existed in 2000 and in 2020. Over these two decades, most of the retirement systems retained traditional defined benefit pension plans; however, some states switched to defined contribution plans while others adopted cash balance plans and hybrid plans. In addition, a number of the systems offered employees a choice of the type of plan. The benefit decline analysis at retirement

[50] Fitzpatrick and Goda (2020) examine the impact of COLA changes on the present value of lifetime pension benefits once individuals have retired.

focuses on the 67 state managed plans that have retained traditional defined benefit plans. We calculate the reduction at retirement for individuals who retired under benefit formulas in existence in 2000 relative to public employees retiring under benefit rules in effect in 2020. The objective is to determine the decline in benefits at retirement for career employees who participated in these plans. We also highlight the changes in type of pension plans during these two decades.

Calculating Benefit Reductions for Employees Retiring in 2020 Compared to 2000 Retirees.

Initial retirement benefits in traditional defined benefit plans depend on the benefit formula and the work history of the retiree. There are numerous methods of showing how the changes in the benefit formulas affect retirement benefits. We measure the impact on the benefit reductions using the following assumptions.

- First, we calculate a retirement benefit using the formula in place prior to the post-2000 changes in the formula for retirees at the normal retirement age with a salary of $50,000.[51] We assume a salary increase of 2 percent per year during the employee's working years, and we calculate the benefit at retirement for an individual with 15, 20, and 30 years of service.
- Second, we employ the same assumptions and calculate a benefit using the formula in place in 2020. If the normal retirement age has been increased and the employee retires at the same age as before the benefit changes, early retirement benefit reductions will apply.

[51] When the retirement plan lists several options for the normal retirement age, the selection is based on the minimum age at which an individual qualifies for unreduced retirement benefits. For example, assume the plan has two options: (1) to retire at age 62 with at least 5 years of creditable service or (2) to retire under the 'Rule of 90'. To calculate the benefits, we use age 62 as the retirement age for retirees with either 15 or 20 years of service, and age 60, for retirees with 30 years of service.

Based on these assumptions, we calculated the percent change in benefits for each of the 67 plans that retained a traditional defined benefit plan. To illustrate this methodology, we present two examples describing how estimates for retirement benefits are calculated separately for pre- and post-reform periods. The retirement benefit calculation is based on the following formula:

$$Benefits = Early * M * YOS * FAS$$

where, $Early$ denotes the early retirement reduction factor that is applied to individuals claiming benefits prior to attaining the normal retirement age and years-of-service requirements for unreduced benefits, M is the benefit multiplier, YOS refers to years of service at retirement, and FAS is the final average salary. These components and the normal retirement age vary by retirement plans.[52]

For example, a pre-reform member of the teacher's retirement system of Illinois is eligible to retire at age 60 with 10 years of creditable service and receive unreduced benefits. In the retirement plan, the multiplier is 2.2% and the final average salary is the average of the highest four consecutive salaries. To calculate retirement benefits, we assume a teacher who retires at age 60 with 15 years of service and with an annual salary of $50,000. Upon retirement, she will receive a $1,335 (=1*0.022*15*$48,549/12) monthly benefit.[53] The monthly payments will increase with the years of service to $1,780 and $2,670 for 20 and 30 years of service, respectively.

In a post-reform period, the normal retirement age has increased to 67 with 10 years of service. In case of early retirement, the benefit is reduced by 6 percent for each year before the

[52] Examples of how retirement systems changed the benefit formulas are shown in Appendix Tables 2 for teacher only plans covered and not covered by Social Security and Appendix Table 3 for teacher only plans where employees are also covered by Social Security.
[53] Salaries for the last four years are $47,116, $48,058, $49,020, and $50,000, conditional on the 2 percent salary increase per year.

normal retirement age. For example, the early retirement reduction factor is 0.58 (=1-0.06*7) for an employee who retires at age 60 with at least 10 years of service. The final average salary is defined as the average of the highest eight consecutive annual salaries. At retirement, a 60-year-old employee with 15 years of service will receive a $745 (=0.58*0.022*15*46,700/12) monthly benefit, which is a reduction of $590 from the pre-reform regime. Similarly, the estimated monthly benefit will be $993 ($1,490) for a 60-year-old employee who retires with 20 (30) years of service. In each of our examples, there is a 44 percent reduction in initial retirement benefits for future teachers retiring at age 60.

In the case of the teacher's retirement system of Kentucky, for both pre- and post-reform periods, the normal retirement age is 60 with at least 5 years of service, and the final average salary is the average of the highest five salaries until an employee attains 27 years of service and age 55, after which the average of the highest three annual salaries is used. In the pre-reform period, the benefit multiplier was 2.5 percent, while in the post-reform period, it varies with years of service. To estimate the monthly benefits, we assume a pre-reform teacher retires at age 60 with 15 years of service and a salary of $50,000. At retirement, she will receive a $1,502 (=0.025*15*4,006) monthly benefit. Alternatively, if she retires with 20 or 30 years of service, the monthly retirement benefit will increase to $2,003 or $3,064, respectively.

In the post-reform period, the benefit multiplier is 1.7 percent per year for the first 10 years, 2 percent for the next 10 years, 2.3 percent for the next 6 years, 2.5 percent for the next 4 years, and 3 percent thereafter. Therefore, the monthly benefit for a 60-year-old teacher who retires with 15 years of service will be $1,082 (=0.018*15*4,006), while for 20 or 30 years of service the monthly benefit will be $1,482 or $3,064, respectively. The Kentucky example shows how the benefit reductions are a function of years of service, as a 60-year-old retiree with 20

years of service has a 26% lower retirement benefit; however, a person with 30 years of service has the same initial retirement benefit before and after the pension reforms.

Magnitude of Reductions in Benefits at Retirement.

The primary aims of this study are to determine the decline in benefits at retirement by public plans based on whether the employees are cover or not covered by Social Security and whether benefit declines differ by the type of employees included in the retirement system. Tables 3-8 report the monthly benefit for 2000 and 2020 retirees and the percent change in benefits based on the modification to benefit formulas between 2000 and 2020 based on Social Security coverage and type of employees covered.

We begin with a review of the changes in benefits in the 27 teacher-only plans. Chart 1 indicates how these plans are distributed across the United States. Table 3a reports the percent reduction in initial retirement benefits for teacher-only plans outside of Social Security; while Table 3b shows similar results for plans where the workers are covered by Social Security. The tables show substantial differences in the percent reduction in initial benefits, post-reforms in both groups. For retirees with 30 years of service reductions in benefits in plans without Social Security ranged from 0 percent in Kentucky and Missouri to 44 percent in Illinois and 22 percent in California. Among states where employees are also covered by Social Security, the reduction in benefits for retirees with 30 years of service were the highest in New Jersey (24 percent) and in Alabama (20 percent). Eight of these states had no change in initial retirement benefits. The average benefit reduction for retirees with 30 years of service in the plans outside of Social Security was 12%, compared to only 6% for the plans where workers were covered by Social Security. The reduction in initial benefits was also great in the non-Social Security plans for retirees with 15 and 20 years of service.

[Chart 1 here]

[Insert Table 3 here.]

In addition to the reduction in initial benefits shown in the tables, the value of lifetime participation in the plans has declined due to increased employee contributions and limits on post-retirement increases. In this analysis, we have focused only on plans that have retained their defined benefit plans. Plan changes have occurred in Alaska (defined benefit to defined contribution), Michigan, and Pennsylvania (defined benefit to defined contribution or hybrid) while Indiana retained a hybrid plan.

Next, we examine state plans that cover State and Local Employees along with teachers. Benefit changes for these plans are shown in Table 4. The average benefit reduction for the three plans that remain outside of Social Security for retirees with 30 years of service was 21% (Table 4a) compared to a reduction of 16% for plans where workers were covered by Social Security (Table 4b). Once again, we observe substantial differences in the decline of initial benefits within each group but the average decline was greater for plans that remain outside of the Social Security System. For example, among the noncovered plans, benefit reductions ranged from minus 52% in Colorado to a plus 7% in Nevada. Among the covered plans, benefit changes ranged from 0% in four plans to minus 57% in Arizona.

[Table 4 here]

Employees in each of the three state plans that cover only state employees and teachers are also included in Social Security. Retirees with 30 years of service in both Delaware and North Carolina had no change in their retirement benefits (see Table 5). Rhode Island is excluded from the table because it transitioned to a hybrid plan.

[Table 5 here]

Turning to the plans that do not include teachers, there are 14 state systems that cover only State and Local employees. Only two of these plans remain outside of the Social Security System – Ohio and Indiana. The Indiana plan is a defined contribution plan and thus, is not included in Table 6a. Retirees with 30 years of service from Ohio based on the 2020 benefit formula will experience a 26% reduction compared to those who retired under the 2000 formula. Large benefit reductions of over 35% are shown in Table 6b for retirees in New Jersey, New York, Washington, West Virginia, and California. The average benefit reduction for the 11 plans in this group for retirees with 30 years of services was 30%.

[Table 6 here]

Eleven states have systems that cover only State employees, of these two remain outside of the Social Security System – Louisiana and Massachusetts. Table 7a shows the reduction for initial retirement benefits was 29% in Louisiana and 19% in Massachusetts. In comparison, the average benefit reduction in the states covered by Social Security was 16% with Illinois and Missouri having reductions in benefit of 30% or more.

[Table 7 here]

In all of the eight states that maintain plans that cover only Local government employees, workers are also covered by Social Security. Three of these states are not included in the analysis: Kentucky which has a cash balance plan, Nebraska has a cash balance and a defined contribution plan; and Texas which has a formula that bases benefits on both employee and employer contributions. Four of the remaining five plans had no change in the initial retirement benefits while Illinois reduced benefits for future retirees by 33% (see Table 8).

[Table 8 here]

In summary, the review of the change in initial retirement benefits for these 67 state plans shows considerable variation in the change in initial benefits across plans and among all of the employee and Social Security coverage categories. Using our method for estimating the change in benefits at retirement, we find that 45 of the plans amended the benefit formulas in a manner that resulted in reductions in the initial retirement benefit under the formula in place in 2020 compared to the formula that existed in 2000, for employees retiring with 30 years of service. Two state plans (Arkansas and Nevada), made changes that actually increased benefits; however, the increase in Arkansas was due in part to the adoption of a required employee contribution. Thus, for 20 of the plans in our sample, the benefit for future retirees using formulas in place in 2020 was unchanged compared to the benefit for individuals retiring under the 2000 formulas. It is important to note that the results shown in the tables also indicate that the changes in benefit formulas vary by years of service at retirement.

In addition, to the changes in initial benefits in systems that maintained traditional defined benefit plans between 2000 and 2020, a number of plans switched from offering only defined benefit plans to offering cash balance plans, defined contribution plans, or some type of hybrid plans. Examining the impact of these changes in plan type on future retirees would require a series of assumptions that would impact individuals differentially based on their own contributions and investment behavior.

Explaining the Reduction in Benefits.

As discussed earlier, the primary objectives of this research are to (1) determine the impact of Social Security coverage of employees in these plans on the percent decline in initial retirement benefits and (2) to test whether the decline is influenced by the coverage of public employees in the plan. These factors may influence the decisions of state legislatures and

governing boards of the plans concerning changes in the generosity of the plans. It is also possible that the employer cost of Social Security, and the expected benefits from Social Security, might influence decisions on reducing pension benefits.

In addition to these two factors, there is an extensive literature in labor economics concerning the effect of union power and collective bargaining on wages and benefits. To assess whether unions have been successful in preventing or reducing cuts in pension benefits, we include a measure of union power in the states. We do not have direct indicators of whether the specific plan is the product of a collective bargaining agreement. Instead, we use a measure of the duty to bargain in state plans covering teachers developed by Valletta and Freeman (1988) and updated by Reuben to 1996, as presented in Lovenheim and Willen, (2019, Table 1, page 296).

The financial status of retirement plans is expected to influence the ability and willingness of states to maintain existing levels of benefits. Plans that are substantially underfunded are expected to be more likely to consider benefit reforms that reduce future costs of maintaining the plan. States typically have a number of different plans for alternative groups of public employees. In an overall budget of the state, there will be linkages across the various plans as expenditures come from the general revenues of the state. To measure the pressure of underfunding, we use the funding ratio of all the plans in the states. This measure "combines the assets and liabilities of each state's pension plans in order to calculate each state's pension funding ratio" (US Department of Labor, 2021, Figure 17, Page 82). The funding ratios are for plan year 2019 as reported by the states.

The mean declines in benefits at retirement for public plans by these characteristics are shown in Table 9. We find that benefit declines in the 23 teacher-only plans are smaller than the

average decline in the 44 other plans in our study. In addition, the average decline in the 52 plans included in Social Security are smaller than the mean decline in plans outside of the Social Security System. Also plans with a funding level of less than 75% had benefit declines that were about twice the size of plans with a funding ratio of greater than 75%. Finally, we observe that the decline in benefits for plans in states with a duty to bargain is very similar to plans in states without this requirement.

[Table 9 here]

To better understand the factors that influenced pension reforms that lowered initial retirement benefits, we estimate the percent change in benefits as a function of the following variables: type of employees covered, whether the employees were also covered by Social Security, measures of union power in the state, and the funding ratio of the plan as of 2020. The dependent variable in the regressions is the absolute value of the percent change in initial retirement based on the 2020 formula minus the benefit from the 2000 formula divided by the 2000 benefit using the assumptions described above. Two observations concerning these results are that we have only a relatively small number of observations (67) and that as shown in Tables 3-8, there are considerable differences in change in benefits within all plan groups that we examine. It is also important to note that the magnitude of benefit declines differs across our three measures of years of service at retirement.

Table 10 reports the regression results from the three benefit change equations. Since the dependent variable is the absolute value of the decline, negative coefficients imply that the benefit decline between the 2020 and the 2000 benefit formulas is smaller than indicated by the base case (the omitted category in the regressions). Consistent with our earlier discussion

concerning the relative success of more homogenous bargaining groups, the coefficients indicate that teacher-only plans had smaller declines in initial retirement benefits compared to plans covering other type of employees. For employees with 30 years of service at retirement, the estimated coefficient is statistically significant and indicates that retirees from teacher-only plans had a decline in benefits that was 12.2 percentage points smaller than all other plans, or more than a 50% smaller reduction in initial benefits. To further investigate the impact of type of employees covered, we estimated similar equations for the 41 plans in states that cover teachers (see Appendix Table 4 for these results). Compared to plans that include other types of employees along with teachers, the teacher-only plans had 9.9% smaller declines in initial benefits.[54]

[Table 10 here]

Although not statistically significant, the Social Security coverage variable indicates that for retirees with 20 and 30 years of service, benefit declines were 3.9 to 5.5 percentage points smaller compare to the declines in plans outside of the Social Security System. Compared to the overall mean of benefit declines for 30-year employees (15.0%), this result implies that plans not included in Social Security had benefits declines of more than 25 percent. The funding ratio of the plans, as reported by the systems themselves in 2019, has a large and statistically significant impact on benefit reductions. The coefficients on this variable indicate that an increase in the funding ratio is associated with a smaller reduction in the initial retirement benefit. Finally, the duty to bargain variable does not have an important impact on the size of benefit declines. In

[54] In the equation for all plans covering teachers, Social Security coverage and the funding ratio of the plan also indicate that benefit declines are small for plans covered by Social Security and have higher funding ratios.

summary, our results in benefit declines based on Social Security coverage, type of employees covered, and funding ratios are consistent with the hypotheses described earlier in the paper.

V. Summary of Historical Precedents and Empirical Findings

Primary and secondary public school teachers were, along with municipal police officers and firefighters, among the first state and local public employees to receive pensions. While state teacher plans originated at the local level, they were eventually merged with state-level plans. As states added other state workers to their pension rolls, or created new plans for them, many states continued to maintain separate plans for their teachers. Today, there are still 27 stand-alone, state pension plans for teachers only.

We argue that teacher plans started earlier than plans for other state workers because the cost of teacher turnover was substantially higher than that of other entry-level state workers, and teachers were the largest well-defined category of state employees. Furthermore, because well-defined, and/or more homogeneous, groups tend to be more successful than heterogeneous groups in bargaining for organizational rents, teachers successfully managed, in many states, to keep their own plans, separate from other employees.

Of the 17 state-managed plans not in Social Security, 10 are teacher-only plans. When the Social Security Act was passed, because of Constitutional concerns, state and local employees were excluded from the system. Through two amendments in the 1950s, state and local workers could be added to the system. However, teachers disproportionately remained out of the system.

We offer three reasons for the disproportionate number of teacher plans that are not in Social Security. First, initially, the "no impairment rule" meant that, from the state's perspective there were few or no new quasi-rents associated with participating in Social Security. Second,

the doctrine of prior possession suggests that, as the party with well-defined (early) property rights in an established plan, teachers would be reluctant to renegotiate the prior distribution of rents, and with little net new wealth on the table, other stakeholders would be inclined to go along with this position. Third, and finally, successful bargaining can only "be accomplished at a low enough cost of transacting to make [the transaction] worthwhile" (North 1990, p. 109). Over time, the number of parties, their diversity, and the complexity of the relationships between them were such that the costs of renegotiating the distribution of quasi-rents among them mathematically overwhelmed any gains expected from the activity.

In recent years, in response to the rising fiscal burdens of public-sector pension plans, many state and local governments have decreased the generosity of the benefits promised to the participants of their retirement plans. Benefit reductions in defined benefit (DB) plans have come through a variety of methods, including reductions in benefit multipliers, increases in the number of years used to calculate final average salary, and increases in the age and service requirements for normal retirement. Our primary objective in this paper is to compare benefit declines, over the past two decades, for plans not in Social Security with declines for plans covered by Social Security. We find that the average decline in future retirement benefits, since 2000, is roughly twice as large for the teacher-only plans outside of Social Security compared to the plans in which teachers are also covered by Social Security.

It is important to remember that our estimates of the decline in the initial retirement benefit represent a minimum decline in the present value of public sector retirement plans. The elimination and reduction of COLAs in many plans has reduced the real value of pension annuities in retirement. The increase in employee contributions while working has increased the

total cost of participating in public pension plans even as the present value of benefits have declined.

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Chart 1. States with Teacher-only Retirement Plans Chart 1.

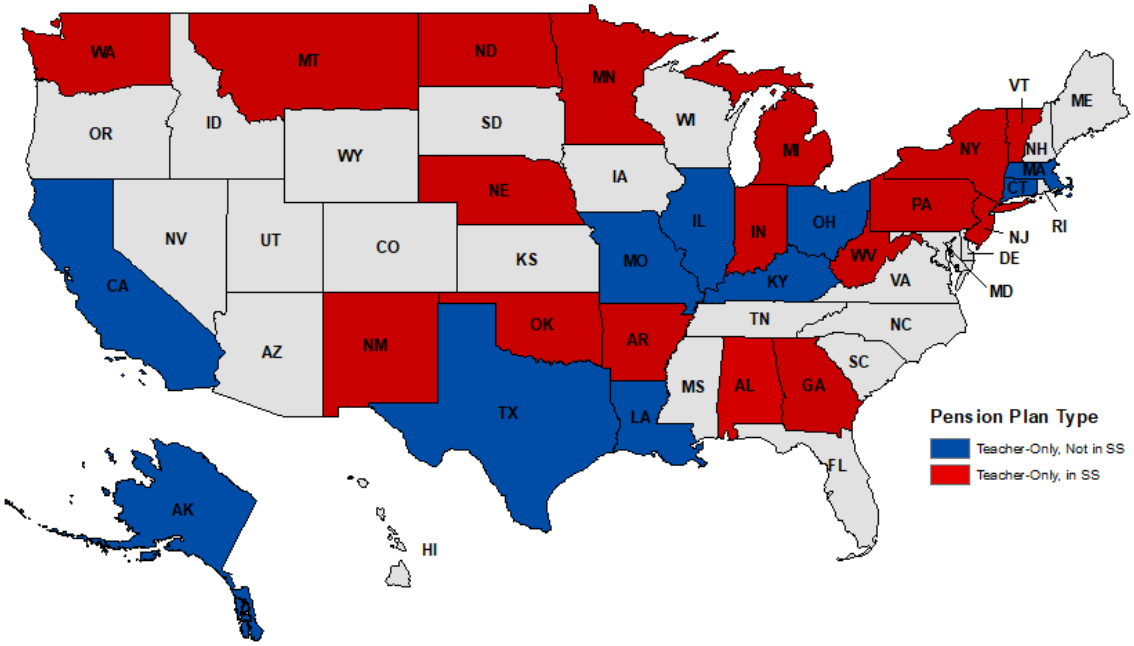
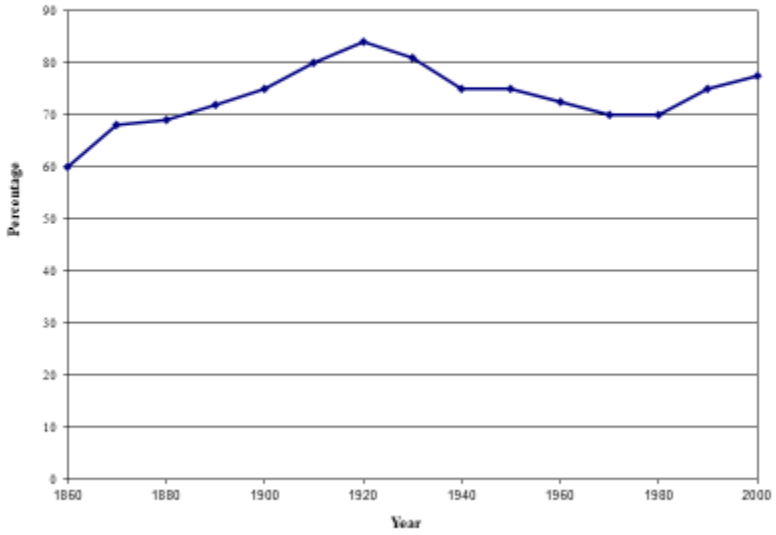
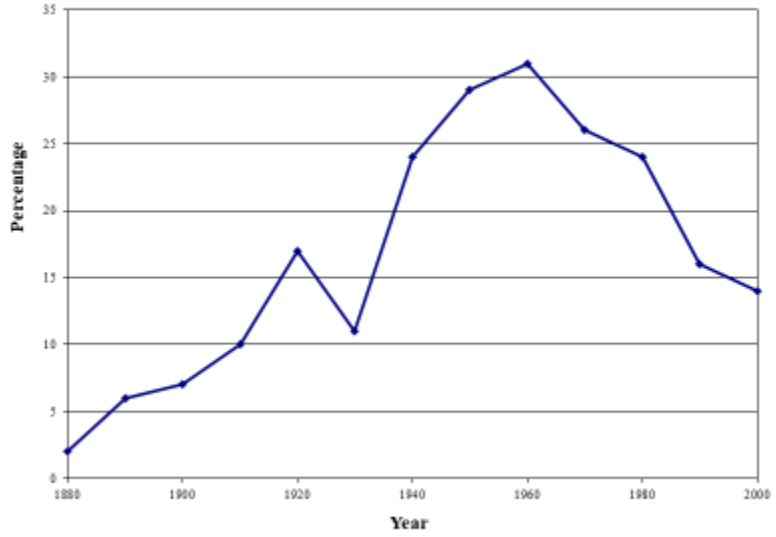


Figure 1: Female Share, U.S. School Teachers, 1860-2000



Source: U.S. Census, various years, as reported in Fitzpatrick (2020, Figure 1).

Figure 2: Unionized Share of the U.S. Labor Force, 1880-2000



Source: https://ilsr.org/when-unions-are-strong-americans-enjoy-the-fruits-of-their-labor/.

Table 1. Managed Public Plans by Type of Employees Covered and SS

Employees Covered	Social Security	No Social Security	Total
Teachers only	17	10	27
State, Local, Teachers	17	3	20
State and Teachers	3	0	3
State and Local	12	2	14
State only	11	2	13
Local only	8	0	8
Total	68	17	85

Table 2: State and Local Employees Covered by an Employer-Provided Pension Plan (1942 and 1952) and Social Security (1952)

	Number of Workers Covered by a Plan 1942	Percent of Workers Covered by a Plan 1942	Number of Workers Covered by a Plan 1952[1]	Percent of Workers Covered by a Plan 1952	Number of Workers Covered by Social Security 1952[1]	Percent of Workers Covered by Social Security 1952
Alabama	2,700	5.8	39,000	54.1	17,600	24.3
Arizona	3,951	32.1	13,400	54.5	5,400	21.8
Arkansas	12,766	39.3	15,800	37.1	17,300	40.5
California	147,408	76.4	299,900	77.2	12,800	3.3
Colorado	8,626	27.6	28,400	61.1	6,900	14.9
Connecticut	29,656	69.4	48,400	78.2	3,900	6.2
Delaware	1,065	14.8	7,500	72.5	400	3.4
District of Columbia	5,700	37.1	19,900	100.0	0	0
Florida	28,000	56.0	69,700	69.0	7,100	7.1
Georgia	8,204	14.3	49,500	57.6	0	0
Idaho	0	0	5,700	27.5	12,300	58.7
Illinois	88,164	51.7	182,700	76.4	(3)	(3)
Indiana	25,988	32.2	(2)	(2)	16,900	15.0
Iowa	3,707	5.4	74,000	81.2	0	0
Kansas	16,990	29.5	21,300	32.5	28,800	44.0
Kentucky	22,414	46.9	24,200	39.3	29,400	47.8
Louisiana	20,170	33.7	55,900	70.9	400	0.5
Maine	13,514	50.5	17,100	56.5	2,100	6.9
Maryland	23,600	60.4	(2)	(2)	2,200	3.4
Massachusetts	70,443	65.7	129,400	77.8	(3)	(3)
Michigan	68,004	47.3	157,400	77.8	9,100	4.5
Minnesota	37,649	43.0	(2)	(2)	0	0
Mississippi	754	1.8	1,800	3.1	36,800	65.9
Missouri	4,248	5.5	35,800	34.2	54,400	51.9

Table 2: State and Local Employees Covered by an Employer-Provided Pension Plan (1942 and 1952) and Social Security (1952), Cont.

Montana	5,838	35.3	14,500	69.6	0	0
Nebraska	1,731	4.4	18,600	38.3	17,400	35.9
Nevada	1,002	24.2	5,900	85.7	0	0
New Hampshire	1,430	7.9	9,800	50.3	1,200	6.1
New Jersey	66,028	58.5	90, 700	66.3	0	0
New Mexico	7,435	57.5	15,400	70.1	0	0
New York	303,500	75.7	426,600	84.0	0	0
North Carolina	2,832	4.3	66,900	64.9	4,500	4.4
North Dakota	7,959	37.8	16,900	69.8	0	0
Ohio	128,350	73.2	185,200	79.2	(3)	(3)
Oklahoma	1,238	2.4	24,400	34.7	30,300	43.1
Oregon	2,373	7.6	34,900	65.3	3,800	7.1
Pennsylvania	146,821	66.1	168,300	71.4	5,100	2.2
Rhode Island	11,031	62.1	15,300	72.7	3,300	15.5
South Carolina	1,041	4.4	37,600	69.2	0	0
South Dakota	443	1.7	400	1.7	19,200	79.3
Tennessee	8,292	14.9	(2)	(2)	8,100	10.2
Texas	53,230	36.0	137,100	66.3	12,700	6.1
Utah	6,288	33.0	10,900	42.5	4,300	16.8
Vermont	1,168	10.6	5,200	40.5	2,300	17.9
Virginia	20,504	35.1	50,900	59.3	28,500	33.2
Washington	20,100	38.1	61,200	71.2	4,100	4.8
West Virginia	18,573	45.8	24,200	48.7	17,800	35.8
Wisconsin	32,520	35.3	69,300	59.9	8,900	7.7
Wyoming	335	4.0	5,400	48.8	2,800	25.4
U.S. Totals:	1,494,714	46.0	3,021,300	67.0	438,100	9.7

Sources: McCamman (1943 and 1953).

Notes: [1]Figures are rounded to the nearest hundred in source. [2]Data not available at the time the original data were collected. [3]In California, Illinois and Ohio, workers covered by both a state or local plan and Social Security were only counted in the former category.

Table 3a. Teachers-Only Plans not Covered by Social Security

State	Year 2000			Year 2020			% Change in Benefits		
	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos
California	1,226	1,634	2,750	1,079	1,438	2,157	-12%	-12%	-22%
Connecticut	919	1,634	2,451	901	1,603	2,404	-2%	-2%	-2%
Illinois	1,335	1,780	2,670	745	993	1,490	-44%	-44%	-44%
Kentucky	1,502	2,003	3,064	1,082	1,482	3,064	-28%	-26%	0%
Louisiana	1,532	2,043	3,064	1,502	2,003	3,005	-2%	-2%	-2%
Massachusetts	1,226	1,634	2,451	871	1,162	1,953	-29%	-29%	-20%
Missouri	1,532	2,043	3,064	1,532	2,043	3,064	0%	0%	0%
Ohio	1,348	1,798	2,696	1,322	1,763	2,644	-2%	-2%	-2%
Texas	1,409	1,879	2,819	1,382	1,659	2,488	-2%	-12%	-12%

Notes:

The average changes across all nine plans are 15 YOS – 13%; 20 YOS – 14%; 30 YOS – 12%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Alaska is excluded from this list as it shifted from a defined benefit plan to a defined contribution plan.

In Louisiana, the change in the initial benefit for the post-reform retiree is estimated; however, the estimate is obtainable only at age 62 and not at age 60 that was available to the pre-reform retiree.

In Massachusetts, the pre-reform individuals could retire at age 55 while post-reform the earliest retirement age is 60. Thus, the entry in the table compares individuals retiring at age 60. This change does not reflect the fact that some individuals who could have retired between 55 and 60 now must wait until age 60.

Table 3b. Teachers-Only Plans Covered by Social Security

State	Year 2000			Year 2020			% Change		
	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos
Alabama	1,233	1,644	2,467	992	1,322	1,983	-20%	-20%	-20%
Arkansas	1,344	1,792	2,688	1,344	1,792	2,688	0%	0%	0%
Georgia	1,238	1,650	2,475	1,238	1,650	2,475	0%	0%	0%
Minnesota	1,142	1,522	2,284	1,142	1,522	2,284	0%	0%	0%
Montana	1,021	1,362	2,043	1,002	1,336	2,003	-2%	-2%	-2%
Nebraska	1,226	1,634	2,451	1,202	1,603	2,404	-2%	-2%	-2%
New Jersey	1,114	1,486	2,228	1,002	1,335	1,703	-10%	-10%	-24%
New Mexico	1,412	1,883	2,825	890	1,304	2,825	-37%	-31%	0%
New York	1,023	1,634	2,451	938	1,311	2,060	-8%	-20%	-16%
North Dakota	1,226	1,634	2,451	1,202	1,603	2,019	-2%	-2%	-18%
Oklahoma	1,202	1,603	2,404	962	1,282	2,404	-20%	-20%	0%
Vermont	1,226	1,634	2,451	1,226	1,634	2,451	0%	0%	0%
Washington	1,202	1,603	2,404	1,202	1,603	2,404	0%	0%	0%
West Virginia	1,202	1,603	2,404	1,202	1,603	2,404	0%	0%	0%

Notes:

The average changes across all 14 plans are 15 YOS – 7%; 20 YOS – 8%; 30 YOS – 6%

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Indiana, Michigan, and Pennsylvania are excluded from this list because they either shifted from a defined benefit plan or had another retirement plan in place pre-reform.

For Alabama, the change in the initial benefit for the post-reform retiree is estimated; however, the estimate is obtainable only at age 62 and not at age 60 that was available to the pre-reform retiree.

In Nebraska, the pre-reform individuals could retire at age 55 with 30 years of service under the ‘rule of 85’, while post-reform the earliest retirement age is 60. Thus, the entry in the table compares individuals retiring at age 60 and does not account for the fact that some individuals who could have retired between 55 and 60 now must wait until age 60.

For West Virginia, benefits for the pre- and post-reform retirees are the same; however, the benefit obtainable only at age 62 in the post-reform period and not at age 60 that was available to the pre-reform retiree.

Table 4a. State & Local Employees & Teachers Plans not Covered by Social Security

	Year 2000			Year 2020			% Change		
State	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**
Colorado	1,532	2,043	3,064	1,502	637	1,472	-2%	-69%	-52%
Maine	1,226	1,634	2,451	1,005	1,340	2,010	-18%	-18%	-18%
Nevada	1,532	2,043	3,064	1,636	2,182	3,272	7%	7%	7%

The average changes across all sixteen plans are 15 YOS – 4%; 20 YOS – 27%; 30 YOS – 21%.

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Table 4b. State & Local Employees & Teachers Plans Covered by Social Security

	Year 2000			Year 2020			% Change in Benefits		
State	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**
Arizona	1,287	1,716	2,605	1,262	1,683	1,124	-2%	-2%	-57%
Florida	962	1,282	1,923	794	1,059	1,588	-17%	-17%	-17%
Hawaii	766	1,021	1,532	766	1,021	1,532	0%	0%	0%
Idaho	1,195	1,593	2,390	1,195	1,593	2,390	0%	0%	0%
Iowa	1,226	1,634	2,451	1,202	1,603	2,404	-2%	-2%	-2%
Maryland	1,103	1,471	2,206	919	1,226	1,838	-17%	-17%	-17%
Mississippi	1,214	1,618	2,529	1,214	1,618	2,427	0%	0%	-4%
New Hampshire	1,021	1,362	2,043	929	1,238	1,857	-9%	-9%	-9%
South Carolina	1,115	1,487	2,231	1,094	1,458	1,641	-2%	-2%	-26%
South Dakota	1,042	1,389	2,084	974	1,298	1,082	-7%	-7%	-48%
Tennessee	901	1,202	1,803	901	1,202	1,803	0%	0%	0%
Wyoming	1,302	1,838	2,681	1,202	1,603	1,803	-8%	-13%	-33%
Wisconsin	981	1,307	1,961	981	1,307	1,961	0%	0%	0%

The average changes across all thirteen plans are 15 YOS –5%; 20 YOS –5%; 30 YOS – 16%.

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Kansas (cash balance), Oregon (hybrid plan), Utah (DC or hybrid plan), and Virginia (hybrid plan) are excluded from this list because they shifted from a defined benefit plan.

In New Hampshire, the pre-reform individuals could retire at age 60 while post-reform the earlier retirement age is 65. Thus, the entry in the table compares individuals retiring at age 65. This change does not reflect the fact that some individuals who could have retired between 60 and 65 now must wait until 65.

Table 5. State Employees & Teachers Plans Covered by Social Security

	Year 2000			Year 2020			% Change in Benefits		
State	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**
Delaware	1,134	1,512	2,267	998	1,512	2,267	-12%	0%	0%
North Carolina	1,104	1,473	2,209	1,104	1,473	2,209	0%	0%	0%

Notes:

The average changes across these two plans are 15 YOS – 6%; 20 YOS – 0%; 30 YOS – 0%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Rhode Island (hybrid plan) is excluded from this list because it transitioned to a hybrid plan.

Table 6a. State & Local Employees Plans not Covered by Social Security

	Year 2000			Year 2020			% Change		
State	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**
Ohio	1,348	1,798	2,696	1,256	1,675	1,983	-7%	-7%	-26%

Notes:

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Indiana (DC) is excluded from this list.

Table 6b. State & Local Employees Plans Covered by Social Security

	Year 2000			Year 2020			% Change in Benefits		
State	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**	**15 yos**	**20 yos**	**30 yos**
Alabama	1,233	1,644	2,467	992	1,322	1,983	-20%	-20%	-20%
Arkansas	1,054	1,405	2,147	1,226	1,634	2,492	16%	16%	16%
California	1,226	1,634	2,451	797	1,062	1,593	-35%	-35%	-35%
Montana	1,094	1,459	2,232	586	804	784	-46%	-45%	-65%
New Jersey	1,114	1,486	2,228	1,002	1,335	1,703	-10%	-10%	-24%
New Mexico	1,838	2,451	3,677	1,502	2,003	3,005	-18%	-18%	-18%
New York	1,017	1,634	2,451	933	1,311	1,058	-8%	-20%	-57%
North Dakota	1,226	1,634	2,451	1,072	1,430	1,287	-13%	-13%	-48%
Oklahoma	1,226	1,634	2,451	962	1,282	2,404	-22%	-22%	-2%
Washington	1,238	1,650	2,475	1,202	1,603	1,563	-3%	-3%	-37%
West Virginia	1,238	1,650	2,475	1,202	1,603	1,563	-3%	-3%	-37%

Notes:

The average changes across all 11 plans are 15 YOS – 15%; 20 YOS – 16%; 30 YOS – 30%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Indiana (hybrid plan) is excluded from this list.

Arkansas changed from a non-contributory (employee was not contributing toward their pension) to a contributory plan. The increase in pension is due to the increase in a multiplier across non-contributory and contributory plans.

Table 7a. State Employees - Only Plans not Covered by Social Security

	Year 2000			Year 2020			% Change in Benefits		
State	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos
Louisiana	1,532	2,043	3,064	1,382	1,843	2,163	-10%	-10%	-29%
Massachusetts	1,226	1,634	2,451	871	1,162	1,986	-29%	-29%	-19%

The average changes across these two plans are 15 YOS – 19%; 20 YOS – 19%; 30 YOS – 24%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

In Massachusetts, the pre-reform individuals could retire at age 55 while post-reform the earlier retirement age is 60. Thus, the entry in the table compares individuals retiring at age 60. This change does not reflect the fact that some individuals who could have retired between 55 and 60 now must wait until 60.

Table 7b. State Employees - Only Plans Covered by Social Security

	Year 2000			Year 2020			% Change in Benefits		
State	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos
Connecticut	815	1,087	1,630	607	810	1,407	-25%	-25%	-14%
Illinois	1,013	1,351	2,027	682	910	1,365	-33%	-33%	-33%
Minnesota	1,022	1,362	2,043	1,022	1,362	2,043	0%	0%	0%
Missouri	1,022	1,362	2,043	715	954	1,430	-30%	-30%	-30%
Pennsylvania	1,226	1,634	2,451	1,042	1,389	2,084	-15%	-15%	-15%
Texas	1,409	1,879	2,819	1,037	1,382	2,488	-26%	-26%	-12%
Vermont	1,023	1,365	2,047	819	1,092	1,924	-20%	-20%	-6%

The average changes across all seven plans are 15 YOS – 21%; 20 YOS – 21%; 30 YOS – 16%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Georgia (hybrid plan), Kentucky (cash balance), Michigan (DC), and Nebraska (cash balance) are excluded from this list.

In Illinois, the pre-reform individuals could retire at age 60 while post-reform the earlier retirement age is 62. Thus, the entry in the table compares individuals retiring at age 62. This change does not reflect the fact that some individuals who could have retired between 60 and 62 now must wait until 62.

Table 8. Local Employees - Only Plans Covered by Social Security

State	Year 2000			Year 2020			% Change in Benefits		
	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos	15 yos	20 yos	30 yos
Illinois	1,011	1,416	2,225	681	953	1,498	-33%	-33%	-33%
Michigan	1,226	1,634	2,451	1,226	1,634	2,451	0%	0%	0%
Minnesota	1,022	1,362	2,043	1,022	1,362	2,043	0%	0%	0%
Missouri	1,202	1,603	2,404	1,202	1,603	2,404	0%	0%	0%
North Carolina	1,123	1,497	2,245	1,123	1,497	2,245	0%	0%	0%

Notes:

The average changes across all five plans are 15 YOS – 7%; 20 YOS – 7%; 30 YOS – 7%;

Assumptions used to calculate benefits and change in benefits: pre-reform employee retired at normal retirement age under 2000 benefit formula; post-reform employee retired under new benefit formula and at the same age as the pre-reform retiree.

Kentucky (cash balance) and Nebraska (cash balance or DC) are excluded from this list. Texas is also excluded from this list because the benefit is calculated based on employer and employee contributions.

Table 9. Mean Benefit Decline by Plan Characteristics

Group	No. of Plans	Average % change (15 YOS), [20 YOS], {30 YOS}
All plans	67	(-10.4%) [-11.7%] {-15.0%}
Teacher only	23	(-9.6%) [-10.2%] {-8.0%}
All other plans	44	(-10.9%) [-12.4%] {-18.6%}
SS coverage		
Yes	52	(-10.0%) [-10.2%] {-14.6%}
No	15	(-12.0%) [-16.9%] {-16.1%}
Duty to Bargain		
Yes	43	(-11.8%) [-12.0%] {-15.5%}
No	24	(-8.0%) [-11.1%] {-14.0%}
Funding Ratio		
Below 75%	35	(-14.8%) [-16.5%] {-19.1%}
Above 75%	32	(-5.6%) [-6.4%] {-10.5%}

Table 10. Estimates of Decline in Initial Retirement Benefits

	Δ in benefits (15 YOS)	Δ in benefits (20 YOS)	Δ in benefits (30 YOS)
	(1)	(2)	(3)
Teachers only	-0.022	-0.048	-0.122**
	(0.033)	(0.037)	(0.047)
Social Security Coverage (=1 if yes)	0.000	-0.055	-0.039
	(0.039)	(0.043)	(0.055)
Union Duty to Bargain (=1 if yes)	0.029	0.001	0.007
	(0.031)	(0.035)	(0.045)
Funding Ratio	-0.385***	-0.389***	-0.220
	(0.118)	(0.133)	(0.168)
Adjusted R2	0.116	0.118	0.063
Mean dependent variable	0.104	0.117	0.15
Number of observations	67	67	67

Note: A reference category includes all other plans.

The dependent variable is the percent change in initial retirement benefits based on the 2020 formula minus the benefit from the 2020 formula. In the regression, the decrease in benefits is given in absolute value so that a positive coefficient indicates that this variable increases the percent decline in initial retirement benefits.

Appendix Table 1. Review of 85 State Managed Retirement Plans

State	Name of Plan	Employees Covered	Plan Type 2000	Plan Type 2020	SS	Percent Change (30 YOS)
Alabama	ERS	S, L	DB	DB	Yes	-19.6%
Alabama	TRS	T	DB	DB	Yes	-19.6%
Alaska	PERS	S, L	DB	DC	No	NA
Alaska	TRS	T	DB	DC	No	NA
Arizona	SRS	S, L, T	DB	DB	Yes	-56.9%
Arkansas	PERS	S, L	DB	DB	Yes	16.1%
Arkansas	TRS	T	DB	DB	Yes	0.0%
California	PERS	S, L	DB	DB or Hybrid	Yes	-35.0%
California	TRS	T	DB	DB	No	-21.6%
Colorado	PERA	S, L, T	DB or DC	DB or DC	No	-51.9%
Connecticut	SERS	S	DB	DB	Yes	-13.7%
Connecticut	TRS	T	DB	DB	No	-1.9%
Delaware	SEPP	S, T	DB	DB	Yes	0.0%
Florida	FRS	S, L, T	DB	DB, DC or Hybrid	Yes	-17.4%
Georgia	ERS	S	DB	Hybrid	Yes	NA
Georgia	TRS	T	DB	DB	Yes	0.0%
Hawaii	ERS	S, L, T	DB, DC or Hybrid	DB, DC or Hybrid	Yes	0.0%
Idaho	PERS	S, L, T	DB	DB	Yes	0.0%
Illinois	SRS	S	DB	DB	Yes	-32.7%
Illinois	TRS	T	DB	DB	No	-44.2%
Illinois	MRF	L	DB	DB	Yes	-32.7%
Indiana	PERF	S, L, T	Hybrid	Hybrid	Yes	NA
Indiana	TRF	S, L, T	Hybrid	Hybrid	Yes	NA
Iowa	PERS	S, L, T	DB	DB	Yes	-1.9%
Kansas	PERS	S, L, T	DB	Cash Balance	Yes	NA
Kentucky	KERS	S	DB	Cash Balance	Yes	NA
Kentucky	CERS	L	DB	Cash Balance	Yes	NA
Kentucky	TRS	T	DB	DB	No	0.0%
Louisiana	SERS	S	DB	DB	No	-29.4%
Louisiana	TRSL	T	DB	DB	No	-1.9%
Maine	PERS	S, L, T	DB	DB	No	-18.0%
Maryland	SRPR	S, L, T	DB	DB	Yes	-16.7%
Massachusetts	SERS	S	DB	DB	No	-19.0%
Massachusetts	TRS	T	DB	DB	No	-20.3%
Michigan	SERS	S	DC	DC	Yes	NA
Michigan	MERS	L	DB, DC or Hybrid	DB, DC or Hybrid	Yes	0.0%
Michigan	PSERS	T	DB	DC or Hybrid	Yes	NA
Minnesota	MSRS	S	DB	DB	Yes	0.0%
Minnesota	PERA	L	DB	DB	Yes	0.0%
Minnesota	TRA	T	DB	DB	Yes	0.0%
Mississippi	PERS	S, L, T	DB	DB	Yes	-4.0%
Missouri	SERS	S	DB	DB	Yes	-30.0%
Missouri	LAGERS	L	DB	DB	Yes	0.0%
Missouri	PSRS	T	DB	DB	No	0.0%
Montana	PERS	S, L	DB	DB or DC	Yes	-64.9%
Montana	TRS	T	DB	DB	Yes	-1.9%
Nebraska	SEPP	S	DC	Cash Balance	Yes	NA
Nebraska	SPP	T	DB	DB	Yes	-1.9%
Nebraska	CEPP	L	DC	Cash Balance	Yes	NA
Nevada	PERS	S, L, T	DB	DB	No	6.8%

New Hampshire	NHRS	S, L, T	DB	DB	Yes	-9.1%
New Jersey	PERS	S, L	DB	DB	Yes	-23.6%
New Jersey	TPAF	T	DB	DB	Yes	-23.6%
New Mexico	PERA	S, L	DB	DB	Yes	-18.3%
New Mexico	ERA	T	DB	DB	Yes	0.0%
New York	ERS	S, L	DB	DB	Yes	-56.9%
New York	TRS	T	DB	DB	Yes	-16.0%
North Carolina	TSERS	S, T	DB	DB	Yes	0.0%
North Carolina	LGERS	L	DB	DB	Yes	0.0%
North Dakota	PERS	S, L	DB or DC	DB or DC	Yes	-47.5%
North Dakota	TRF	T	DB	DB	Yes	-17.6%
Ohio	PERS	S, L	DB, DC or Hybrid	DB, DC or Hybrid	No	-26.5%
Ohio	STRS	T	DB, DC or Hybrid	DB, DC or Hybrid	No	-1.9%
Oklahoma	PERS	S, L	DB	DB	Yes	-1.9%
Oklahoma	TRS	T	DB	DB	Yes	0.0%
Oregon	PERS	S, L, T	DB	Hybrid	Yes	NA
Pennsylvania	SERS	S	DB	DB	Yes	-15.0%
Pennsylvania	PSERS	T	DB	Hybrid	Yes	NA
Rhode Island	ERS	S, T	DB	Hybrid	Yes	NA
South Carolina	SCRS	S, L, T	DB	DB	Yes	-26.5%
South Dakota	SRS	S, L, T	DB	DB	Yes	-48.1%
Tennessee	CRS	S, L, T	DB	DB or Hybrid	Yes	0.0%
Texas	ERS	S	DB	DB	Yes	-11.7%
Texas	TRS	T	DB	DB	No	-11.7%
Texas	MRS	L	DB	DB	Yes	NA
Utah	SRS	S, L, T	DB	DC or Hybrid	Yes	NA
Vermont	SRS	S	DB	DB	Yes	-6.0%
Vermont	TRS	T	DB	DB	Yes	0.0%
Virginia	SRS	S, L, T	DB	Hybrid	Yes	NA
Washington	PERS	S, L	DB	DB or Hybrid	Yes	-36.9%
Washington	TRS	T	DB	DB or Hybrid	Yes	0.0%
West Virginia	PERS	S, L	DB	DB	Yes	-36.9%
West Virginia	TRS	T	DB	DB	Yes	0.0%
Wyoming	WRS	S, L, T	DB	DB	Yes	-32.8%
Wisconsin	WRS	S, L, T	DB	DB or DC	Yes	0.0%

Appendix Table 2: Changes in Teacher-Only Plans not in SS: 2000-2020 Table 2: Changes in Teacher-Only Plans not in SS: 2000-2020

State	FAS	Benefit Multiplier	Normal Retirement	Vesting	COLAs
Alaska	Changed from DB to DC plan				
California	1 year to 3 years		60 to 62 Ended 50/30		
Connecticut	3 years to 5 years		60/20 to 63/25		Reduced COLA
Illinois	4 years to 8 years		62/5 to 67/10	5 years to 10 years	Reduced COLA and eliminated compounding
Kentucky		2.5% changed to 1.7%-2.5%	Increased penalty for early retirement		
Louisiana	3 years to 5 years		60/5 to 62/5 (Ended 30 years only)		Tied to financial status of plan
Massachusetts	3 years to 5 years		55/10 to 60/10 Ended 20 years only		Reduced COLA
Missouri					Reduced COLA
Ohio	3 years to 5 years	Reduced multiplier for 30 plus years (2.5% changed to 2.2%)	33 any age change to 60/35		Reduced COLA
Texas	3 years to 5 years		Age/service increase		

Appendix Table 3: Changes in Teacher-Only Plans in SS: 2000-2020

State	FAS	Benefit Multiplier	Normal Retirement	Vesting	COLAs
Alabama	3 years to 5 years	2.0125 to 1.65%	60/10 to 62/10 Ended 25 years only		
Arkansas		Lower multiplier for less than 10 years and for non-contributory service with more than 10 years			
Georgia	No changes				
Indiana	Hybrid Plan				
Michigan	Changed to DC or Hybrid plan in 2010				
Minnesota			Linked retirement age to SS age up to 66		
Montana	3 years to 5 years		Increased any age 25 years to 55/30		
Nebraska	3 years to 5 years		Increased min age from 55 to 60		
New Jersey	3 years to 5 years	Reduced (Years/55 to years/60)	Increased from 60 to 65		
New Mexico		Reduced (2.35% to 1.35% - varies by years)	Increased		Reduced COLA
New York	3 years to 5 years	Reduced	55/5 to 55/10	5 years to 10 years	
North Dakota	3 years to 5 years		Increased rule of 85 to rule of 90 min age 60	3 years to 5 years	
Oklahoma			Increased min age 60 to 65, rule of 80 to 90		
Pennsylvania	Changed to Hybrid plan in 2019				
Vermont					
Washington			Increased benefit reduction for early retirement (3% to 5%)	5 years to 10 years	
West Virginia			Increased (62/5 or 60/20 to 64/10 or 63/20)	5 years to 10 years	

Appendix Table 4. Coefficients are estimated for all Plans Covering Teachers: Teachers only, Teachers and Local Employees, and Teachers and State & Local Employees.

	Δ in benefits (15 YOS)	Δ in benefits (20 YOS)	Δ in benefits (30 YOS)
	(1)	(2)	(3)
Teachers only	0.028	-0.019	-0.099*
	(0.036)	(0.046)	(0.053)
Social Security Coverage (=1 if yes)	-0.023	-0.093*	-0.041
	(0.041)	(0.051)	(0.059)
Union Duty to Bargain (=1 if yes)	0.022	-0.026	-0.036
	(0.036)	(0.045)	(0.052)
Funding Ratio	-0.218	-0.237	-0.197
	(0.138)	(0.174)	(0.201)
Adjusted R2	0.041	0.093	0.021
Mean dependent variable	0.076	0.093	0.112
Number of observations	41	41	41

Note: A reference category combines S & T plans (state employees & teachers) and S, L, & T (state and local employees and teachers) plans.

The dependent variable is the percent change in initial retirement benefits based on the 2020 formula minus the benefit from the 2000 formula. In the regression, the decrease in benefits is given in absolute value so that a positive coefficient indicates that this variable increases the percent decline in initial retirement benefits.