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# Determinants of the Generosity of Pension Plans for Public School Teachers, 1982-2006

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## ABSTRACT

We offer a concise history of teacher retirement plans in the United States, highlighting the increase in the generosity of the plans over the past 25 years. We employ data from plans in all fifty states to estimate the impact of a set of social and economic variables on the plans' replacement rates for a hypothetical teacher. We find that, at the state level, population growth and the share of the labor force that is unionized positively affect replacement rates; while expanding plan membership to include other state employees and participating in Social Security negatively affect replacement rates.

## DETERMINANTS OF THE GENEROSITY OF PENSION PLANS FOR PUBLIC SCHOOL TEACHERS, 1982-2006

The first retirement plans for public school teachers were established more than 100 years ago. Initially, these pension plans covered only teachers in single school districts and were found only in larger municipalities (Clark et al. 2003). During the twentieth century, many of these local retirement plans were merged to form a state teachers' retirement plan, typically covering all of the school districts in a state. In most states, retirement plans for teachers predate the establishment of plans for other state employees. Indeed, some states did not establish plans for civil servants until the 1960s and 1970s.[1] During the second half of the twentieth century, many states merged plans for teachers with those covering other state employees, thus creating a single state retirement plan that covered both civil servants and teachers (and, in some cases, local government employees as well). In 2008, twenty three states have a single retirement plan covering state employees and teachers; while the remaining states retain separate plans.[2]

This paper examines the development of retirement plans for teachers during the twentieth century. Specifically, it analyzes the differences in retirement benefits between plans that cover teachers *only* and plans that cover teachers *and* other state (and sometime local) employees. We begin with a history of the development of teacher retirement plans. This history is necessarily linked to the growth in retirement plans for other state employees. Next, we present data on the benefit formulas and contribution requirements for teacher plans in all fifty states over the past quarter century or so. In general, we show that the generosity of teacher plans has increased over time, and in particular, income replacement rates for teachers have increased by about 10 percent over the past quarter century or so. We then estimate the determinants of plan generosity and explain the variation in pension benefits across states. Finally, we present some conclusions about the current state of teacher retirement plans.

## I. Evolution of Teacher Pension Plans in the United States

Teachers, along with municipal police officers and firefighters, were the first state or local public employees to be covered by employer-provided pension plans.[3] (Military personnel were the first public-sector employees to be covered by pension plans in the United States, see Clark et al. 2003.) Initially, these plans were developed at the local level, typically by large municipalities. The development of teacher pension plans in the twentieth century includes the establishment of pension plans for teachers in every state along with the merger of teacher plans with those for other state employees in some states. The extension of Social Security to public employees on a voluntary basis beginning in 1951 resulted in a wave of states deciding to allow their employees to be covered by Social Security. By the mid-1970s, these structural changes in the retirement systems of the various states had, for the most part, run their course. However, over the past three decades, important plan characteristics continued to evolve, as governments increased the generosity parameters in teacher pension plans resulting in higher replacement rates for the same years of service and lower the age and service requirements for early and normal retirement.

### Establishing Teacher Retirement Plans

Teachers were among the first public sector employees to be covered by pension plans. At the end of the nineteenth century, many of the larger cities in the United States began establishing retirement plans for their public school teachers. Generally, the state legislatures had to pass enabling bills before local school boards could establish and fund pension plans. These early plans were generally financed by local property taxes; however, the actions of the

municipalities were often overseen by the state. In most states, retirement plans for teacher ante-dated similar plans for other state employees by several decades.

A review of the experience of some of these plans provides insights into the early development of teacher retirement plans by local school districts and how they evolved into statewide plans in most states. In 1894 and 1895, the New York state legislature passed acts that permitted New York City and Brooklyn to offer teacher pension plans. In the ensuing decade, further legislation was enacted allowing other cities to offer plans. With the exception of New York City, all of these plans were incorporated into the New York state pension plan for teachers in 1921. In 1907, the Indiana legislature created a plan for teachers in Indianapolis, and the Illinois legislature created a plan for Chicago in the same year. Other states quickly followed suit and allowed local governments to establish teacher retirement plans in major cities such as Denver, Omaha, and New Haven.

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-teaching employees were allowed to join both the Michigan system and the Detroit system. Finally, the two systems were merged into one statewide system in 1980.

Teacher retirement plans originated at the local level, however, many state legislatures moved toward statewide plans in the early and mid part of the twentieth century. Table 1 provides dates for the establishment of some state teacher retirement plans and when or if they merged with plans for other civil servants. The history across the states is quite varied, however,

some commonalities can be observed. First, in most states, the first retirement plans were established in the largest cities in the states after enabling legislation was passed by the state legislature. Second, states tended to establish statewide pension plans for teachers but these laws often allowed for the preexisting plans of the major cities to remain outside the state plan. In many states, these large city plans were eventually incorporated into the state plan. Third, the state plans for teachers typically were established prior to the development of similar plans for other state employees. Fourth, in the middle of the twentieth century, a number of states merged their teacher plans with the plan for state employees.

[Table 1]

The evolution of teacher retirement plan over the past 100 years raises a series of issues that are relevant to the pension plans for teachers in the twenty-first century.

- If the labor market for teachers is different than that for other state employees, should public employers develop different plans with different retention and retirement incentives? Specifically, should we observe differences in early and normal retirement ages and vesting requirements?
- Will retirement plans for teachers be more generous if coverage is limited to teachers? Does broad coverage of plans increase or decrease the ability of teachers to achieve more generous retirement plans?

On the one hand, if teacher turnover is especially costly, then the pension contract could be used to tie teachers to the state school system by, for example, stretching out vesting times and otherwise back-loading the accumulation of pension wealth. On the other hand, if teachers

command a premium over other state employees in the labor market, *ceteris paribus*, then that might be reflected in the relative generosity of their pension contracts, through for example shorter vesting times and front-loading pension compensation. As for the impact of being in a pension plan with other state workers, public choice theory suggests, bargaining over pension wealth would be enhanced by being in a stand-alone plan.

**Social Security and Public School Teachers**

In 1935 Congress established the Social Security system covering most private employees but excluding state and local workers from the system. In the 1950s, federal legislation permitted state and municipal governments including teachers to voluntarily include their employees in the Social Security system. By that time, most states and many municipal governments had already developed retirement systems for their teachers and other employees. Thus, governmental units were allowed to determine whether to enter the Social Security system or continue to maintain their own retirement plans without Social Security coverage. If the public employer decided to enter the Social Security system, they then had to decide whether they would reduce the generosity and cost of their own employer plans.

While most governmental units decided to join Social Security, some state and local employers chose to remain outside of the Social Security system. Currently, approximately 28 percent of all state and local public employees remain outside the system (Streckewald 2005), and the majority of public employees who do not participate in Social Security are teachers, police officers, and firefighters. As noted, 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).[4]

Periodically, there are proposals in Congress to require that all newly hired public employees be included in the Social Security system. In general, teachers and other employees outside Social Security and their national representatives oppose being required to be covered by Social Security. There currently are seven states whose general state employees, including teachers, are outside the Social Security system: Alaska, Colorado, Louisiana, Maine, Massachusetts, Nevada, and Ohio.[5] In addition, teachers and local employees in California, Connecticut, Illinois, Kentucky, Missouri, and Texas do not participate in Social Security (Munnell 2005). We would anticipate that the retirement plans for teachers not covered by Social Security would be more generous than the plans covering teachers who were also participating in Social Security.

## II. RECENT TRENDS IN TEACHER RETIREMENT PLANS

Despite the 30-year trend among private sector employers away from defined benefit plans and toward a greater emphasis on defined contribution plans, defined benefit plans remain the dominant type of retirement plan for teachers and other employees in the public sector. In 2007, the U.S. General Accounting Office reported that with the exception of Alaska and Michigan, all states offered defined benefit plans as their primary retirement plan for general state employees.[6] In addition, two states, Indiana and Oregon, had adopted primary plans that included components of both defined benefit and defined contribution plans, and Nebraska had established a cash balance plan for its employees. In addition to their primary retirement plan, every state offered its employees the opportunity to participate in voluntary defined contribution

plans such as 403(b) or 457(b) plans. In contrast to the private sector, public employers often do not match employee contributions. Only twelve states match employee contributions to defined contribution plans up to a specified limit (GAO 2007).[7]

To examine the effect of changes in teacher retirement plans over the past 25 years, we calculated the replacement rate provided to teachers from state retirement plans using pension plan characteristics compiled by the Wisconsin Legislative Council (1982, 2006). The replacement rate is the most useful indicator of the value of a pension to teachers nearing retirement. It indicates the percent decline (or increase if the rate exceeds 100 percent) in income from the final working years to the initial retirement years. It is also a measure used by employers as they consider the cost and generosity of their pension plans.

The first two columns of Table 2 show the replacement rates for retirement plans covering teachers in 1982 and 2006. These replacement rates are calculated using the benefit formulas in each state for a hypothetical employee who retired at age 60 with 30 years of service. In 1982 the mean replacement rate for teachers was 53.7 percent. By 2006, the replacement rate had risen by more than five percentage points (nearly 10 percent) to 58.8 percent. The replacement rates in 2006 range from a low of 43.7 percent in Michigan and Tennessee to a high of 80.0 in Massachusetts. The replacement rates increased in 31 of the states, remained the same in 12 states, and declined in only 2 states (Florida and South Dakota).

[Table 2]

In 23 states, other state employees participate with teachers in a combined plan; however, the other 27 states maintain separate plans. For the reader's edification, Table 2 also reports the

replacement rates for retirement plans for state retirement plans that do not include teachers (columns 3 and 4). For states that maintained two retirement plans, one for teachers and one for other state employees, the mean replacement rates in the plans for other state employees were slightly below those for teachers, 52.7 percent in 1982 and 58.1 percent in 2006. In the 26 states where teachers and state employees were in different retirement plans, 14 states had the same replacement rates for teachers and other state employees; seven had smaller benefits for teachers; and five had larger benefits for teachers. Following the public choice literature (see, for example, Buchanan and Tullock 1962; Olson 1965; and Libecap 1989), we argue that, controlling for other social and economic factors, teachers should receive higher replacement rates when they are in plans that do not include other state employees. This hypothesis follows from the observations that well-defined, or more homogeneous, rent-seeking groups tend to be more successful than heterogeneous groups, *ceteris paribus*, of course.

Thus, we can divide the teacher, state, and combined plans into four categories: Plans containing teachers *and* other state employees (we call these "combined" plans); plans containing *only* other state employees ("state-only" plans); *all* plans containing teachers ("teacher" plans); and plans containing *only* teachers ("teacher-only" plans). Figure 1 presents the mean replacement rate for these four categories. Although on average the generosity of all of the plans increased between 1982 and 2006, teacher plans had more generous increases than those offered to other state employees.

[Figure 1]

Another useful comparison is to contrast the replacement rates for teachers in plans where employees are covered by Social Security to employer provided plans in which participants are not part of the Social Security system. Teachers in 13 states remain outside of Social Security. In 1982, the mean replacement rate for teachers with 30 years of service in these plans was 61.8 percent (see Figure 2). By 2006, changes in the plan formulas had increased the mean replacement rate to 68.6 percent (Figure 3). In contrast, the 30 year mean replacement rate for teachers in states who were participants in Social Security was 50.5 percent in 1982 and 55.2 percent in 2006. Thus, employer-provided teacher retirement plans in states where teachers are not included in Social Security provided, on average, a replacement benefit for teachers with 30 years of service that was 13.4 percentage points higher than the benefit in states where teachers were participants in Social Security.

[Figures 2 and 3]

The replacement rates are a function of the benefit formulas and changes in the replacement rates occur only when the benefit formulas are changed. To better understand the increases in the replacement rates between 1982 and 2006, one needs to observe the changes in the actual benefit formulas. Appendix Table 1 presents information from teacher retirement plans in 1982 and 2006. The information includes: The normal retirement age specified in the plan, the number of years used to determine the final salary average, and the retirement multipliers in the benefit formula. Comparing the 1982 and 2006 parameters illustrates how teacher retirement plans have evolved over the past 25 years. In general, these plans have become more generous over the years. The normal retirement ages (NRA) in the plans have been

lowered in 32 states allowing teachers to retire at earlier ages with fewer years of service while only six states have raised the NRA. Fifteen states reduced the number of years in the averaging period, thus raising final pension benefits and no state increased the number of years in the salary average. Finally, 31 states increased the multipliers and/or eliminated Social Security offsets, and three states reduced the multipliers used to calculate retirement benefits. As a result of these changes, holding other factors constant, the typical teacher will retire with a higher replacement ratio in 2006 than in 1982.

Appendix Table 2 reports the employer and employee contribution rates for teacher retirement plans in 1984 and 2006. Employee contributions rates vary from a low of 3.0 percent in Delaware, Michigan, and New York to a high of Massachusetts of 11.0 percent. Florida, Tennessee and Utah do not require an employee contribution. Between 1984 and 2006, 22 states increased employee contributions while nine states reduced the employee contribution rate. Employer contributions often vary with state economic conditions and are changed more regularly. Finally, 19 states reduced the number of years of service required for 100 percent vesting. Overall, then the data reported here suggest a general upward trend in the generosity of teacher retirement plans over the past quarter century.

## III. DETERMINANTS OF THE GENEROSITY OF TEACHER PENSION PLANS

In this section, we attempt to explain differences in the replacement rates that teachers will achieve, depending on their state of employment, and how these differences have evolved over time. Our efforts are limited by the relatively small number of teacher plans in our sample, only 50 in total (as well as the multi-collinearity in many of the factors that likely impact the level of benefits that state political leaders wish to provide the employees of the state). We

estimate a rather simple model of the determinants of the generosity of teacher retirement plans. Research on employee compensation suggests that any such model should consider including measures of a state's population growth; an indicator of collective bargaining strength of public employees; the plan's connection or lack of connection to Social Security, and whether the plan covers only teachers or also includes other state employees (see, Clark et al. 2003; Craig 1995; Fishback and Kantor 1995, 2000; Gruber and Krueger 1991; Moore and Viscusi 1990; and Munnell 2005). Given the data limitations, the model we estimate is:

$$\text{Replacement Rate}_{it} = \alpha + \beta_1 \text{PopulationGrowth}_{it} + \beta_2 \text{Union}_{it} + \beta_3 \text{SocialSecurity}_{it} + \beta_j \text{Plan}_{ijt} + \varepsilon_{i,}$$

Where the Replacement $\text{Ratio}_{it}$ is the income replacement rate for a representative worker with thirty years of service in the *ith* state pension plan in year *t*; the $\text{PopulationGrowth}_{it}$ is the average annual compounded rate of population growth during the most recent ten-year period in the *ith* state; $\text{Union}_{it}$ is the share of the public sector employment covered by a collective bargaining agreement in the *ith* state in year *t*; the $\text{SocialSecurity}_{it}$ is a dummy variable that takes on the value one if the teachers in the *ith* state plan are covered by Social Security, zero otherwise; and the $\text{Plan}_{ijt}$ is a dummy variable which takes on the value one for plans that cover teachers and other state employees in year *t* and zero for plans that include only teachers.

We anticipate that the population growth and union variables will have positive coefficients in the estimated equation shown above. Population growth serves as a proxy for the overall economic climate of the state in question. We hypothesize that a more rapidly growing state will have a greater need for public school teachers and that this increased demand would lead to more generous retirement benefits. The union variable reflects the collective bargaining strength of the state's public sector workers. Unfortunately, we do not have access to the

proportion of *teachers* in each state that are covered by collective bargaining contracts. It seems likely that teachers have a higher incidence of unionization than general state employees and this could influence the results of the regression since we are attempting to estimate the impact of teacher retirement plans with and without other state employees. The impact of Social Security, coverage as captured by the dichotomous coverage variable, should be negative. Economic theory suggests that workers excluded from Social Security will tend to receive a compensating differential in the form of a higher replacement rate from their employer pension. Finally, following the logic of the public choice literature, that the more homogeneous the group the more successful its rent-seeking, we expect the sign on the plan dummy variable to be negative.

To estimate equation (1), we constructed a data set that includes the income replacement rates relative to the last five years of earnings, which were calculated for a hypothetical worker in each state utilizing plan characteristics reported in Appendix Table 1. Key plan parameters used to calculate the replacement rates included the number of years used to calculate the final average salary, the generosity parameter, and the normal retirement age. The Social Security variable was also constructed from these sources.

In order to construct the replacement ratio for the hypothetical worker, we assumed that this worker had annual earnings of $50,000 in the fifth year before retirement, and this salary was increased by 3 percent per year until retirement, which is assumed to occur at age 60. Finally, the replacement ratio is calculated under the previous assumptions using the benefit formulas for each state retirement plan for those states with defined benefit plans. Other types of plans are excluded.[8] The population growth variable was created from data supplied by the *Statistical Abstract of the United States* (U.S. Department of Commerce various years). The

unionization variable is from Hirsch and Macpherson (2007).[9] Table 3 contains the means and standard deviations of the dependent and independent variables.

[Table 3]

The results from estimating three versions of equation (1) are shown in Table 4. Columns one and two contain the estimated coefficients for 1982; while columns three and four contain the results for 2006. Columns five and six report the findings from a pooled regression that includes observations from both years and a dummy variable for 2006, which reflects the increase in replacement rates. The estimated coefficients in the 1982 regressions are consistent with our expectations. Turning first to the results shown in column one, an expanding state economy, as measured by population growth, puts upward pressure on the replacement rate. The estimated coefficient indicates that a one percentage point (per year) increase in the population growth rate is associated with a 3.1 percentage point increase in the replacement rate. While this might seem like a large impact, the reader should note that the mean annual population growth rate among the states is only 1.4 percent per year so an increase of one percentage point represents a substantial increase in the rate of growth of a state's population.

Greater unionization of the state government labor force is expected to produce a greater demand for teachers and more generous retirement benefits. The estimated union effect has the expected positive sign in 1982 indicating that a one percentage point increase in the unionization of the public sector is associated with a 0.14 percentage point increase in the replacement rate.[10] In 1982, the states with the highest unionization rates also had the highest replacement rates. (The ten most unionized states had a mean replacement rate of 53.6 percent; whereas the mean

for the ten least unionized states was 50.9 percent.) However, in 2006 the low-union states actually had higher mean replacement rates (59.6 percent versus 58.3 percent).

Teachers in plans that also cover other state workers have a 4.9 percentage point lower replacement rate compared to plans that only cover teachers. More generous benefits for teacher-only plans could arise for several reasons, including differential political power or other factors correlated with teacher-only plans. One such factor is coverage by Social Security. Teacher-only plans are more likely to be outside the Social Security system than plans that cover teachers and state employees. Participation in Social Security is expected to be associated with less generous employer provided retirement plans. When the Social Security variable is added to the equation, the estimated coefficient is negative and implies that participation in Social Security reduces the replacement rate from the pension by 10.2 percentage points, a magnitude similar to the differences in the mean replacement rates reported earlier. (This finding is consistent with that in Clark et al. 2009.) Adding the Social Security variable to the specification reduces the magnitude of the coefficients of all of the other variables, and the unionization and plan coverage variables become statistically insignificant.

[Table 4]

With one notable exception, the results for the 2006 regressions are qualitatively similar to those for 1982. The key difference is in the sign of the coefficient on the share of the government labor force unionized; a one percentage point increase in the unionized share of the government labor force led to a statistically insignificant 0.03 percentage point *decrease* in the replacement rate. In addition, in the 2006 model, the magnitude and level of significance of the

plan coverage variable are increased. Now, the inclusion of other state employees in the same pension plan lowers the replacement rate for teachers by 6.8 percentage points. Column 4 shows that including the Social Security variable in the 2006 regression reduces the importance of including other state employees in the plan. The Social Security variable indicates that teachers who do not participate in Social Security are in retirement plans that provide a 12.8 percentage point higher replacement rate.

The results shown in the first four columns of Table 4 suggest some quantitative difference between the factors that explain the replacement rates in 1982 and 2006. To further test the possibility that the influence of these variables changed over time, we pooled the observations from 1982 and 2006 and then created a dummy variable that takes the value one for 2006, zero otherwise. The 2006 dummy suggests that replacement rates increased by roughly five to six percentage points during the period.

## CONCLUSION

We have provided a brief history of the development of teacher retirement plans since the first plans were established in the second half of the nineteenth century. This history helps us understand the evolution of these plans, including their subsequent changes, among which their merger with plans for other state employees in many state and their interface with Social Security are the most salient. The main story of the past quarter century has been the increased generosity of teacher retirement plans. Normal retirement ages have been reduced, generosity parameters increased, and the number of years in the salary averaging period have been reduced. As a result, replacement rates rose by 5 percentage points, or almost 10 percent, between 1982 and 2006. The history we provide may raise concerns for the sustainability of the current

generosity of teacher retirement plans, especially in light of the emergence of very large unfunded liabilities associated with retiree health benefit plans that are provided by most states (Clark 2009).

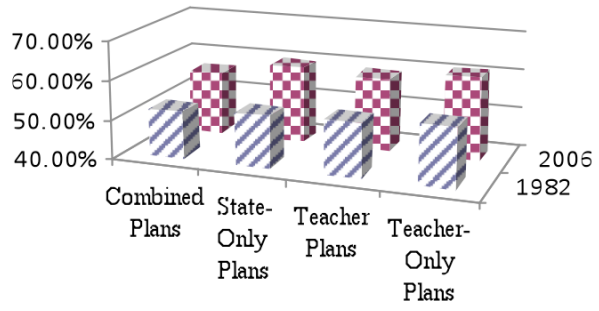
Finally, we have explained the variation in benefits across teacher retirement plans and how these differences have changed during the last 25 years. Several important findings dominate the analysis. First, population growth, perhaps a proxy for economic development more broadly defined, has led states to be more generous with their teacher pension plans. States that have seen their populations grow dramatically have tended to increase teacher replacement ratios. We suspect that this is due to a greater demand for teachers in a growing economy.

Second, the impact of public sector unionization on the generosity of the states' public sector pension plans has changed over time. In the early 1980s, unionization had a positive impact on pension replacement rates, presumably reflecting the greater bargaining power associated with a greater incidence of unionism in the public sector. Swings in unionization of only a few percentage points had relatively large implications for the differences in plan generosity. However, by 2006, the union effect had changed its sign. Today, the extent of unionization among public sector workers has a negative impact on the state's replacement rate, though the coefficient is not statistically significantly different from zero, indicating that there is essentially no union effect on teacher retirement plans in the twenty-first century.

Third, teachers received a premium in the form of higher replacement rates from being in plans that did not contain other state employees. This finding is consistent with the public choice literature, which in general finds that smaller well-defined bargaining groups tend to be better able to extract rents from the public sector than larger and broader groups, *ceteris paribus*, of course.

Finally, we find that participation in Social Security reduced the typical worker's replacement rate from their state retirement plan by around ten percentage points. In statistical sense, this impact was strong, as when the Social Security variable was included, it dominated all other effects. However, in an economic sense, whether the results indicate a large or small cost for participation in Social Security depends on any reduction in employee contributions to the state plan for those workers covered by Social Security and the overall benefits associated with Social Security coverage relative to the size of the payroll tax, a subject which the authors are currently investigating..

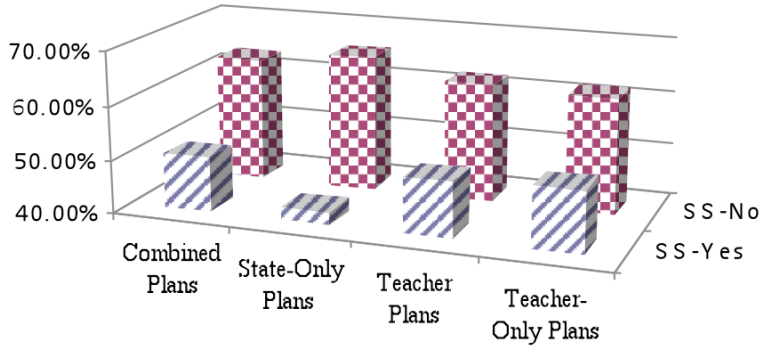
**Figure 1 - Mean Income Replacement Rates, Teacher and Other State Pension Plans, 30 Years of Service, 1982 and 2006**




Note: Figures are the mean annual replacement rates of teacher and state employee pensions for workers retiring in 1982 or 2006, with 30 years of service.

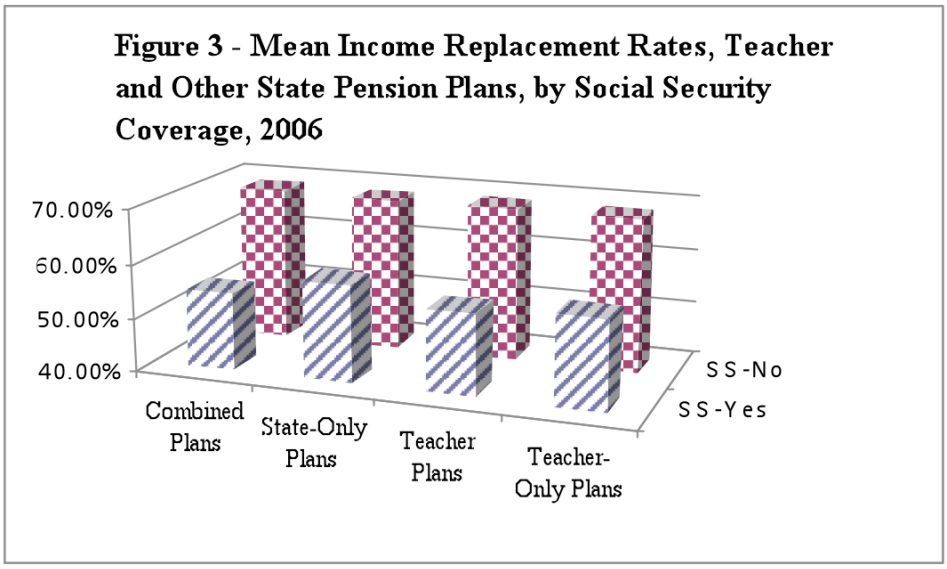
Sources: Wisconsin Legislative Council (1982 and 2006); and author's calculations from websites of state retirement plans.

**Figure 2 - Mean Income Replacement Rates, Teacher and Other State Pension Plans, by Social Security Coverage, 1982**




Note: Figures are the mean annual replacement rates of teacher and state employee pensions for workers (with and without Social Security coverage) retiring in 1982, with 30 years of service.

Sources: Wisconsin Legislative Council (1982 and 2006); and author's calculations from websites of state retirement plans.




Note: Figures are the mean annual replacement rates of teacher and state employee pensions for workers (with and without Social Security coverage) retiring in 2006, with 30 years of service.

Sources: Wisconsin Legislative Council (1982 and 2006); and author's calculations from websites of state retirement plans.

**Table 1: Year State Retirement Plans Established and Merged**

| State | Teacher Plan Established | State Employee Plan Established | Plans Merged |
|---|---|---|---|
| Alabama | 1939 | 1945 | separate plans |
| Alaska | | | separate plans |
| Arizona | 1943 | 1953 | plans merged in 1954 |
| Arkansas | 1937 | 1957 | 1989 |
| California | 1913 | 1931 | separate plans |
| Colorado | 1943 | 1931 | one plan |
| Connecticut | | | separate plans |
| Delaware | | | one plan |
| Florida | 1939 | 1945 | plans merged in 1970 |
| Georgia | 1943 | 1950 | separate plans |
| Hawaii | 1926 | 1926 | when first established |
| Idaho | | 1963 | plans merged in1967 |
| Illinois | 1939 | 1944 | separate plans |
| Indiana | 1921 | 1945 | separate plans |
| Iowa | 1953 | 1953 | when first established |
| Kansas | 1962 | 1962 | when first established |
| Kentucky | 1938 | 1956 | separate plans |
| Louisiana | 1936 | 1946 | separate plans |
| Maine | 1942 | 1942 | when first established |
| Maryland | 1927 | added to system | single plan |
| Massachusetts | | | separate plans |
| Michigan | 1945 | 1943 | separate plans |
| Minnesota | 1931 | 1931 | separate plans |
| Mississippi | 1944 | 1952 | plans merged in1952 |
| Missouri | 1945 | 1957 | separate plans |
| Montana | 1937 | 1945 | separate plans |
| Nebraska | 1945 | | separate plans |
| New Hampshire | | | plans merged in 1967 |
| New Jersey | 1919 | 1955 | separate plans |
| New Mexico | 1933 | 1947 | separate plans |
| New York | 1921 | 1921 | separate plans |
| North Carolina | 1941 | 1941 | when first established |
| North Dakota | 1913 | 1966 | separate plans |
| Ohio | 1920 | 1935 | separate plans |
| Oklahoma | 1943 | 1964 | separate plans |
| Oregon | | | single plan |
| Pennsylvania | 1917 | | separate plans |
| Rhode Island | | | single plan |
| South Carolina | 1945 | 1945 | when first established |
| South Dakota | 1939 | 1967 | single plan |
| Tennessee | | | plans merged in 1972 |
| Texas | 1936 | 1947 | separate plans |

| | | | |
|---|---|---|---|
| Utah | 1937 | 1947 | 1963 |
| Vermont | 1947 | 1944 | separate plans |
| Virginia | 1908 | 1942 | 1942 |
| Washington | | | separate plans |
| West Virginia | 1941 | 1961 | separate plans |
| Wisconsin | 1911 | | 1975 |
| Wyoming | 1943 | 1953 | when state plan was established |

Source: Histories provided by state retirement systems and retirement plan websites.

**Table 2 - Retirement Benefit Replacement Ratio in percent with 30 Years of Service, for State Teacher Pension Plans and Other Public Employees, by State, 1982 and 2006**

| | Teachers | | Other State Employees | |
|---|---|---|---|---|
| State | c. 1982 | c. 2006 | c. 1982 | c. 2006 |
| Alabama[a] | 58.63 | 58.63 | 58.63 | 58.63 |
| Alaska[a] | 58.27 | 63.13 | 58.27 | 63.68 |
| Arizona[b] | 56.61 | 61.91 | Combined Plan | |
| Arkansas[a] | 45.00 | 60.00 | 45.99 | 58.27 |
| California[a] | 58.27 | 72.00 | 70.45 | 75.00 |
| Colorado[b] | 58.27 | 72.84 | Combined Plan | |
| Connecticut[c] | 58.27 | 58.27 | 58.27 | 58.27 |
| Delaware[e] | 45.28 | 53.90 | Combined Plan | |
| Florida[b] | 47.55 | 45.28 | Combined Plan | |
| Georgia[c] | 56.76 | 59.13 | 44.34 | 59.13 |
| Hawaii[b] | 56.61 | 58.27 | Combined Plan | |
| Idaho[b] | 57.79 | 57.79 | Combined Plan | |
| Illinois[d] | 56.86 | 63.17 | 34.46 | 47.95 |
| Indiana[a,*] | - | - | N.A. | N.A. |
| Iowa[b] | 47.27 | 58.27 | Combined Plan | |
| Kansas[b] | 35.38 | 50.99 | Combined Plan | |
| Kentucky[a] | 56.61 | 72.84 | 45.28 | 55.76 |
| Louisiana[c] | 72.84 | 72.84 | 72.84 | 72.84 |
| Maine[b] | 58.27 | 58.27 | Combined Plan | |
| Maryland[b] | 52.44 | 52.44 | Combined Plan | |
| Massachusetts[c] | 80.00 | 80.00 | 72.84 | 72.84 |
| Michigan[d] | 42.45 | 43.70 | 42.45 | 43.70 |
| Minnesota[d] | 37.74 | 48.11 | 37.74 | 48.11 |
| Mississippi[b] | 48.96 | 59.82 | Combined Plan | |
| Missouri[c] | 56.61 | 72.84 | 33.96 | 46.62 |

**Table 2(cont.) - Retirement Benefit Replacement Ratio(%) with 30 Years of Service, for State Teacher Pension Plans and Other Public Employees, by State, c. 1982 and c. 2006**

| | Teachers | | Other State Employees | |
|---|---|---|---|---|
| State | c. 1982 | c. 2006 | c. 1982 | c. 2006 |
| Montana[a] | 48.66 | 48.66 | 48.66 | 58.27 |
| Nebraska[c,*] | 35.38 | 58.27 | N.A. | N.A. |
| Nevada[b] | 72.84 | 75.00 | Combined Plan | |
| New Hampshire[b] | 48.66 | 48.66 | Combined Plan | |
| New Jersey[a] | 48.66 | 53.03 | 48.66 | 53.03 |
| New Mexico[a] | 56.61 | 66.51 | 58.27 | 80.00 |
| New York[a] | 58.27 | 58.27 | 58.27 | 58.27 |
| North Carolina[f] | 45.08 | 52.26 | Combined Plan | |
| North Dakota[a,*] | - | 58.27 | - | 58.27 |
| Ohio[a] | 58.27 | 64.10 | 58.27 | 64.10 |
| Oklahoma[a] | 56.61 | 56.61 | 56.61 | 58.27 |
| Oregon[b,*] | - | - | Combined Plan | |
| Pennsylvania[c] | 58.27 | 72.84 | 58.27 | 72.84 |
| Rhode Island[e] | 58.27 | 64.10 | Combined Plan | |
| South Carolina[b] | 47.05 | 53.03 | Combined Plan | |
| South Dakota[b] | 58.27 | 47.20 | Combined Plan | |
| Tennessee[b,*] | - | 43.69 | Combined Plan | |
| Texas[d] | 58.27 | 67.01 | 53.41 | 67.01 |
| Utah[b] | 56.61 | 58.27 | Combined Plan. | |
| Vermont[c] | 47.27 | 48.66 | 47.27 | 48.66 |
| Virginia[b] | 47.02 | 49.53 | Combined Plan | |
| Washington[a] | 56.61 | 56.61 | 56.61 | 56.61 |
| West Virginia[a] | 56.61 | 56.61 | 58.27 | 58.27 |
| Wisconsin[b] | 37.88 | 46.62 | Combined Plan | |
| Wyoming[b] | 56.61 | 65.45 | Combined Plan | |

**Table 2(cont.) - Retirement Benefit Replacement Ratio(%) with 30 Years of Service, for State Teacher Pension Plans and Other Public Employees, by State, c. 1982 and c. 2006**

| | Teachers | | Other State Employees | |
|---|---|---|---|---|
| State | c. 1982 | c. 2006 | c. 1982 | c. 2006 |
| Means | 53.71 | 58.83 | 52.68 | 58.13 |
| Standard Deviations | 8.98 | 9.03 | 9.60 | 8.99 |
| N | 46 | 48 | 45 | 47 |

Notes: [a]Other state employees' plan includes local workers; [b]teacher plan includes other state employees and local workers; [c]other state employees' plan includes state workers only; [d]state maintains separate plans for other state employees and local workers; [e]teachers and other state employees are in one plan, and the state does not maintain a separate plan for local workers; [f]teachers and other state employees are in one plan, while local workers are in another. [*]The structure of the following plans do not permit comparisons with the other plans in the sample: Indiana teachers and other state employees, 1982 and 2006; Oregon teachers, other state, and local employees, 1982 and 2006; Nebraska, other state workers, 1982 and 2006; Tennessee teachers, 1982; and North Dakota teachers, 1982.

**Table 3: Descriptive statistics: Means and Standard Deviations in percent**

| Variable | 1982 | 2006 |
|---|---|---|
| **Dependent variables = Replacement Ratios for retirees with 30 years of service:** | | |
| Teachers | 53.71 | 58.83 |
| | (8.98) | (9.03) |
| Other State Employees | 52.68 | 58.13 |
| | (9.60) | (8.99) |
| **Independent variables:** | | |
| Population Growth | 1.44 | 1.06 |
| | (1.20) | (0.90) |
| Percent of Government Labor Force Unionized | 32.23 | 32. 01 |
| | (16.56) | (17.13) |
| Teacher's Plan Includes Other State Workers | 45.65 | 45.83 |
| | (50.36) | (50.35) |
| Other State Workers' Plan Includes Teachers | 46.67 | 46.81 |
| | (50.45) | (50.44) |
| Teacher Plans in Social Security | 73.91 | 72.92 |
| | (44.40) | (44.91) |
| Other State Workers' Plans in Social Security(%) | 84.44 | 85.11 |
| | (36.65) | (35.99) |

Source: Clark et al.(2009 forthcoming).

**Table 4: Multivariate Models of Replacement Ratios for Teachers' Plans, with 30 Years of Service, 1982 and 2006**

| Independent Variable: | c. 1982 | | c. 2006 | | Pooled with 2006 interactions | |
|---|---|---|---|---|---|---|
| Intercept | 0.4696*** | 0.5595*** | 0.6052*** | 0.7107*** | 0.5096*** | 0.6104*** |
| | (0.0392) | (0.0408) | (0.0366) | (0.0348) | (0.0289) | (0.0283) |
| Population Growth | 3.0752*** | 2.4582** | 2.2954 | 0.6618 | 2.5548*** | 1.5999** |
| | (1.2033) | (1.0489) | (1.5039) | (1.2175) | (0.9330) | (0.0275) |
| Percent of Government Labor Force Unionized | 0.1410* | 0.0883 | -0.0319 | -0.0697 | 0.0490 | 0.0008 |
| | (0.0829) | (0.0727) | (0.0784) | (0.0619) | (0.0561) | (0.0468) |
| Plan Includes Other State Workers (Workers Dummy = 1; zero otherwise) | -0.0487* | -0.0243 | -0.0679*** | -0.0305 | -0.0551*** | -0.0254* |
| | (0.0266) | (0.0238) | (0.0277) | (0.0228) | (0.0276) | (0.0162) |
| Employees Covered by Social Security (SS Dummy = 1; zero otherwise) | - | -0.1017*** | - | -0.1277*** | - | -0.1149*** |
| | | (0.0258) | | (0.0238) | | (0.0275) |
| 2006 Dummy | - | - | - | - | 0.0610*** | 0.0561*** |
| | | | | | (0.0179) | (1.7261) |
| $R^2$(adj) | 0.1127 | 0.3408 | 0.0736 | 0.4309 | 0.1583 | 0.4301 |
| F | 2.9044** | 6.8155*** | 2.2440* | 9.8981*** | 5.3744*** | 15.0403*** |
| N | 46 | 46 | 48 | 48 | 94 | 94 |

Notes: Standard errors are in parentheses. ***-The probability of obtaining the resulting test statistic this large when the null hypothesis of $\beta=0$ is true, is less than 0.01; **-less than 0.05; and *-0.10.

**Appendix Table 1 - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Alabama | | | |
| 1982 | 60(10); 30 yrs | 3 | 2.0125 |
| 2006 | 60(10); 25 yrs | 3 | 2.0125 |
| Alaska[niss] | | | |
| 1982 | 55(8); 20 yrs | 3 | 2.0 |
| 2006 | 60(8); 20 yrs | 3 | 2.0 1st 20 yrs; 2.5 over 20 yrs |
| Arizona[d] | | | |
| 1982 | 65; 62(10); 60(25) | 5 | 2.0 |
| 2006 | 65; 62(10); R80 | 3 | 2.1 1st 20 yrs; 2.15 next 5 yrs; 2.2 next 5 yrs; 2.3 over 30 yrs |
| Arkansas | | | |
| 1982 | 60(10); 35 yrs | 5 | 1.59 |
| 2006 | 65(5); 28 yrs | 3 | 2.15 |
| California[niss] | | | |
| 1982 | 60(5) | 3 | 2.0 |
| 2006 | 55(5); 30 yrs | 1 | 2.0 at 60; 2.4 at 63; limit 100% FAS |
| Colorado[d,niss] | | | |
| 1982 | 60(20); 55(30); 65(5) | 3 | 2.5 1st 20 yrs; 1.0 over 20 yrs; limit 70% FAS |
| 2006 | 65(5); 50(30); 55; R80 | 3 | 2.5; limit 100% FAS |
| Connecticut[niss] | | | |
| 1982 | 60(20); 35 yrs | 3 | 2.0; limit 75% FAS |
| 2006 | 60(20); 35 yrs | 3 | 2.0; limit 75% FAS |
| Delaware[d] | | | |
| 1982 | 62(10); 60(15); 30 yrs | 5 | 1.6; limit 75% FAS, including SS |
| 2006 | 62(5); 60(15); 30 yrs | 3 | 1.85 |
| Florida[d] | | | |
| 1982 | 62(10); 30 yrs | 5 | 1.68 |
| 2006 | 62(6); 30 yrs | 5 | 1.60 – 1.68, age & years related; limit 100% FAS |

**Appendix Table 1(cont.) - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Georgia | | | |
| 1982 | 62(10); 30 yrs | 2 | 1.92; limit 40 yrs max |
| 2006 | 60(10); 25 yrs | 2 | 2.0; limit 40 yrs max |
| Hawaii[d] | | | |
| 1982 | 55(5) | 5 | 2.0 |
| 2006 | 62(5); 55(30) | 3 | 2.0 |
| Idaho[d] | | | |
| 1982 | 65(5); 60(30) | 5 | 1.67 |
| 2006 | 65(5); R90 | 3.5 | 2.0; limit 100% FAS |
| Illinois[niss] | | | |
| 1982 | 62(5); 60(10); 55(35) | 4 | 1.67 1st 10 yrs increasing to 2.3 after 30 yrs; limit 75% FAS |
| 2006 | 62(5); 60(10); 55(35) | 4 | 2.2; limit 75% FAS |
| Indiana[*] | | | |
| 1982 | 65(10) | 5 | 1.1 + money purchase annuity |
| 2006 | 65(10); 60(15); 55; R85 | 5 | 1.1 + money purchase annuity |
| Iowa[d] | | | |
| 1982 | 65 | 5 | 1.67; 30 yrs + $20,000 salary max |
| 2006 | 65; 62(20); R88 | 3 | 2.0 1st 30 yrs; 1.0 next 5 yrs; limit 65% FAS |
| Kansas[d] | | | |
| 1982 | 65 | 5 | 1.25 |
| 2006 | 65; 62(10); R85 | 3 | 1.75 |
| Kentucky[niss] | | | |
| 1982 | 60(5); 30 yrs | 5 | 2.0 |
| 2006 | 60(5); 27 yrs | 3 | 2.5; limit 100% FAS |
| Louisiana[niss] | | | |
| 1982 | 60(10); 55(25); 30 yrs | 3 | 2.5; limit 100% FAS |
| 2006 | 60(5); 55(25); 30 yrs | 3 | 2.5; limit 100% FAS |

**Appendix Table 1(cont.) - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Maine[d,niss] | | | |
| 1982 | 60 | 3 | 2.0 |
| 2006 | 60(5) | 3 | 2.0 |
| Maryland[d] | | | |
| 1982 | 62(5); 30 yrs | 3 | 0.8 x SS + 1.5% over SS |
| 2006 | 60(5); 30 yrs | 3 | 1.8; limit 100% FAS |
| Massachusetts[niss] | | | |
| 1982 | 65(10) | 3 | 2.5; limit 85% FAS |
| 2006 | 55(10); 20 yrs | 3 | 0.1 - 2.5, age related, + 2.0 for each yr over 24; limit 80% FAS |
| Michigan | | | |
| 1982 | 60(10); 55(30) | 5 | 1.5 |
| 2006 | 60(5); 30 yrs | 3 | 1.5 |
| Minnesota | | | |
| 1982 | 65(10); 62(30) | 5 | 1.0 1st 10 yrs; 1.5 over 10 yrs; limit 40 yrs max |
| 2006 | SS NRA | 5 | 1.7 |
| Mississippi[d] | | | |
| 1982 | 65; 30 yrs | 5 | 1.63 1st 20 yrs; increasing to 2.0 after 30 yrs |
| 2006 | 60(4); 25 yrs | 4 | 2.0 1st 25 yrs; 2.5 over 25 yrs; limit 100% FAS |
| Missouri[niss] | | | |
| 1982 | 60(5); 30 yrs | 5 | 2.0; limit 80% FAS |
| 2006 | 65(5); 30 yrs; R80 | 3 | 2.5 1st 30 yrs; 2.55 over 30 yrs; limit 100% FAS |
| Montana | | | |
| 1982 | 60(5); 30 yrs | 3 | 1.67 |
| 2006 | 60(5); 25 yrs | 3 | 1.67 |
| Nebraska | | | |
| 1982 | 65(5); 35 yrs | 5 | 1.25 |
| 2006 | 65(5); 55 w/R85 | 3 | 2.0 |

**Appendix Table 1(cont.) - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Nevada[d,diss] | | | |
| 1982 | 60(10); 55(30) | 3 | 2.5; limit 75% FAS |
| 2006 | 65(5); 60(10); 30 yrs | 3 | 2.67; limit 75% FAS |
| New Hampshire[d] | | | |
| 1982 | 60 | 3 | 1.67 with SS offset |
| 2006 | 60 | 3 | 1.67 to age 65; 1.515 after 65 |
| New Jersey | | | |
| 1982 | 60; 55(25); | 3 | 1.67 |
| 2006 | 60 | 3 | 1.82 |
| New Mexico | | | |
| 1982 | 65(5); 60(15); 35 yrs | 5 | 2.0 |
| 2006 | 65(5); 25 yrs; 60 w/R75 | 5 | 2.35 |
| New York | | | |
| 1982 | 62(20); 55(30) | 3 | 2.0 with SS offset; limit 75% FAS |
| 2006 | 62(5); 55(30) | 3 | 1.67 1st 20 yrs; 2.0 20-29 yrs; 3.5 over 30 yrs |
| North Carolina[d] | | | |
| 1982 | 65; 30 yrs | 4 | 1.57 |
| 2006 | 65(5); 60(25); 30 yrs | 4 | 1.82 |
| North Dakota[*] | | | |
| 1982 | 65(10); 60(35) | 5 | 1.0 |
| 2006 | 65 (35); R85 | 3 | 2.0 |
| Ohio[niss] | | | |
| 1982 | 60(5); 30 yrs | 3 | 2.0; limit 90% FAS |
| 2006 | 60(5); 30 yrs | 3 | 2.2 1st 30 yrs; 2.5 over 30 yrs; limit 100% FAS |
| Oklahoma | | | |
| 1982 | 62(10); 55(30) | 5 | 2.0 |
| 2006 | 62(5); R90 | 5 | 2.0 |

**Appendix Table 1(cont.) - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Oregond[d,*] | | | |
| 1982 | 58; 55(30) | 3 | 1.67 |
| 2006 | 65; 58(30) | 3 | 1.5 + money purchase annuity |
| Pennsylvania | | | |
| 1982 | 62; 60(30); 35 yrs | 3 | 2.0 |
| 2006 | 62; 60(30); 35 yrs | 3 | 2.5 |
| Rhode Island[d] | | | |
| 1982 | 55(30); 60(10); 35 yrs | 3 | 1.7 1st 10 yrs; increasing to 2.4 after 20 yrs; limit 80 FAS |
| 2006 | 60(10); 28 yrs | 3 | 1.7 1st 10 yrs; 1.9 2nd 10 yrs; 3.0 21-34 yrs; 2.0 over 34 yrs; limit 80% FAS |
| South Carolina[d] | | | |
| 1982 | 65; 30 yrs | 3 | 1.25 x $4,800 + 1.65% of >$4,800 |
| 2006 | 65; 28 yrs | 3 | 1.82 |
| South Dakota[d] | | | |
| 1982 | 65(5) | 3 | 2.0 with SS offset |
| 2006 | 65(3); 55 w/R85 | 3 | 1.625 yrs prior to 7/1/02<br>1.55 yrs after 7/1/02 |
| Tennessee[d,*] | | | |
| 1982 | 60; 30 yrs | 5 | From Table; limit 75% FAS |
| 2006 | 60(5); 30 yrs | 5 | 1.5 below SS cap; 1.75 over SS; limit 94.5% FAS |
| Texas[niss] | | | |
| 1982 | 65(10); 60(20) | 3 | 2.0 |
| 2006 | 60(5); R80 | 3 | 2.3 |
| Utah[d] | | | |
| 1982 | 65(4); 30 yrs | 5 | 2.0; limit 100% FAS including SS |
| 2006 | 65(4); 30 yrs | 3 | 2.0 |
| Vermont | | | |
| 1982 | 60; 30 yrs | 5 | 1.67; limit 30 years max |
| 2006 | 62; 30 yrs | 3 | 1.67; limit 50% FAS |

**Appendix Table 1(cont.) - Benefit Formulas and Retirement Ages for State Teacher Pension Plans, by State, 1982 and 2006**

| State | Normal Retirement Age[a] | Averaging Period[b] | Benefit Formula[c] |
|---|---|---|---|
| Virginia[d] | | | |
| 1982 | 65; 60(30) | 3 | 1.67 (– $1,200), with SS offset |
| 2006 | 65(5); 50(30) | 3 | 1.7; limit 100% FAS |
| Washington | | | |
| 1982 | 65(5) | 5 | 2.0 |
| 2006 | 65(5) | 5 | 1.0 + money purchase annuity |
| West Virginia | | | |
| 1982 | 60(5) | 3 | 2.0 |
| 2006 | 60(5); R80 | 3 | 2.0 |
| Wisconsin[d] | | | |
| 1982 | 65 | 3 | 1.3; limit 85% FAS including SS |
| 2006 | 65; 57(30) | 3 | 1.6; limit 70% FAS |
| Wyoming[d] | | | |
| 1982 | 60(4) | 3 | 2.0 |
| 2006 | 60; R85 | 3 | 2.125 1st 15 yrs; 2.25 over 15 yrs |

Notes:

[a]NRA indicates the normal retirement age for the plan. States often have several criteria that employees can satisfy and thus qualify for unreduced pension benefits. The numbers presented in the table indicate the age and service needed to qualify for an unreduced pension benefit. For example, an entry of 60(10) indicates that a worker reaching age 60 with 10 years of service has reached the normal retirement age. Some states allow workers to qualify for unreduced benefits with a minimum number of years of service. These requirements are shown by an entry like 30 years. Finally some states allow workers to reach the normal retirement age with a combination of age and years of service equal to some number such as 80. An entry of R80 indicates the NRA is reached when the worker's age plus years of service equal 80.

[b]Entries in this column indicate the number of years used to determine a worker's final average salary(FAS). In some states, the formula is based on the highest consecutive years of earnings

while other states include the highest years of earnings but these years must be in the last 5 or 10 years of employment.

[c]The states with defined benefit plans calculate retirement benefits by multiplying a generosity parameter times the FAS times the number of years of service. Values in this column indicate the generosity parameter in percent. Some states have formulas that are integrated with Social Security and other states place a limit or cap on benefits, typically specified as a percent of the final average salary.

[d]Teacher plan includes other state employees and/or local workers.

[niss]State teachers are not in Social Security.

[*]The structure of the following teacher plans do not permit comparisons with the other plans in the sample: Indiana, 1982 and 2006; Oregon, 1982 and 2006; Tennessee, 1982; and North Dakota, 1982.

Sources: Wisconsin Legislative Council(1982 and 2006); and authors' derivations from websites of state retirement plans.

**Appendix Table 2 - Teacher Plan Contributions and Vesting Requirements, by State, 1984 and2006**

| State | Employee Contribution Rate | Employer Contribution Rate | Vesting Requirement |
|---|---|---|---|
| Alabama | | | |
| 1984 | 5.0 | 13.73 | 10 |
| 2006 | 5.0 | 9.36 | 10 |
| Alaska[niss] | | | |
| 1984 | 7.0 | 17.96 | 8 |
| 2006 | 8.65 | 13.76 | 8 |
| Arizona[a] | | | |
| 1984 | 7.0 | 7.0 | 5 |
| 2006 | 9.1 | 9.1 | immediate |
| Arkansas | | | |
| 1984 | 6.0 | 12.29 | 10 |
| 2006 | 6.0 | 13.26 | 5 |
| California[niss] | | | |
| 1984 | 8.0 | 8.0 + state supplement | 5 |
| 2006 | 8.0 | 8.25 | 5 |
| Colorado[a,niss] | | | |
| 1984 | 8.0 | 10.2-12.5 | 5 |
| 2006 | 8.0 | 10.15 | 5 |
| Connecticut[niss] | | | |
| 1984 | 6.0 | N.A. | 10 |
| 2006 | 6.0 | 3.01 | 10 |
| Delaware[a] | | | |
| 1984 | 3.0-5.0 | 14.4 | 10 |
| 2006 | 3.0 above $6,000 | 6.1 | 5 |
| Florida[a] | | | |
| 1984 | noncontributory | 10.93 | 10 |
| 2006 | noncontributory | 6.28 | 6 |
| Georgia | | | |
| 1984 | 6.0 | 12.55-12.67 | 10 |
| 2006 | 5.0 | 9.24 | 10 |

**Appendix Table 2 (cont.) - Teacher Plan Contributions and Vesting Requirements, by State, 1984 and 2006**

| State | Employee Contribution Rate | Employer Contribution Rate | Vesting Requirement |
|---|---|---|---|
| Hawaii[a] | | | |
| 1984 | 7.8 | 23.47 | 5 |
| 2006 | 6.0 | 13.75 | 5 |
| Idaho[a] | | | |
| 1984 | 5.3 | 8.82 | 5 |
| 2006 | 6.23 | 10.39 | 5 |
| Illinois[niss] | | | |
| 1984 | 8.0 | N.A. | 5 |
| 2006 | 9.4 | 7.64 | 5 |
| Indiana[*] | | | |
| 1984 | 3.0 | pay-as-you-go | 10 |
| 2006 | 3.0 | 19.25 | 10 |
| Iowa[a] | | | |
| 1984 | 3.75 up to $20,000 | 5.75 up to $20,000 | 4 |
| 2006 | 3.7 | 5.75 | 4 |
| Kansas[a] | | | |
| 1984 | 4.0 | 4.8 | 10 |
| 2006 | 4.0 | 5.27 | 10 |
| Kentucky[niss] | | | |
| 1984 | 7.45-8.931 | 10.65-12.18 | 5 |
| 2006 | 9.855 | 13.105 | 5 |
| Louisiana[niss] | | | |
| 1984 | 7.0 | 9.3 | 10 |
| 2006 | 8.0 | 15.9 | 5 |
| Maine[a,niss] | | | |
| 1984 | 6.5 | 15.47-15.90 | 10 |
| 2006 | 7.65 | 15.09 | 5 |
| Maryland[a] | | | |
| 1984 | 5.0 over SS | 4.60-6.25 | 5 |
| 2006 | 2.0 | 9.18 | 5 |

**Appendix Table 2 (cont.) - Teacher Plan Contributions and Vesting Requirements, by State, 1984 and 2006**

| State | Employee Contribution Rate | Employer Contribution Rate | Vesting Requirement |
|---|---|---|---|
| Massachusetts[niss] | | | |
| 1984 | 7.0 | pay-as-you-go | 10 |
| 2006 | 11.0 | 15.4 | 10 |
| Michigan | | | |
| 1984 | noncontributory | 5.0 + state supplement | 10 |
| 2006 | 3.0-4.3 | 7.6 | 10 |
| Minnesota | | | |
| 1984 | 4.5 | 7.55 | 10 |
| 2006 | 5.0 | 9.05 | 3 |
| Mississippi[a] | | | |
| 1984 | 6.0 | 8.75 | 10 |
| 2006 | 7.25 | 10.75 | 4 |
| Missouri[niss] | | | |
| 1984 | 9.5 | 9.5 | 10 |
| 2006 | 5.5 | 5.5 | 5 |
| Montana | | | |
| 1984 | 7.044 | 7.320 | 5 |
| 2006 | 7.15 | 7.58 | 5 |
| Nebraska | | | |
| 1984 | 3.6-4.8 | N.A. | 5 |
| 2006 | 7.98 | 101% of employee rate + 0.7% | 5 |
| Nevada[a,niss] | | | |
| 1984 | noncontributory | 15 | 10 |
| 2006 | 10.5 | 10.5 | 5 |
| New Hampshire[a] | | | |
| 1984 | 4.6-9.2 | N.A. | 10 |
| 2006 | 6.3 | 6.7 | 10 |
| New Jersey | | | |
| 1984 | varies with age | varies | 10 |
| 2006 | 5.0 | $93.83 state appropriation | 10 |

**Appendix Table 2 (cont.) - Teacher Plan Contributions and Vesting Requirements, by State, 1984 and 2006**

| State | Employee Contribution Rate | Employer Contribution Rate | Vesting Requirement |
|---|---|---|---|
| New Mexico | | | |
| 1984 | 6.8 | 6.8 | 5 |
| 2006 | 7.825 | 10.9 | 5 |
| New York | | | |
| 1984 | 3.0 | N.A. | 10 |
| 2006 | 3.0 | 7.97 | 5 |
| North Carolina[a] | | | |
| 1984 | 6.0 | 10.03 | 5 |
| 2006 | 6.0 | 2.66 | 5 |
| North Dakota[a] | | | |
| 1984 | 6.25 | 6.2 | 10 |
| 2006 | 7.75 | 7.75 | 3 |
| Ohio[niss] | | | |
| 1984 | 8.75 | 14.0 | 5 |
| 2006 | 9.0 | 13.7 | 5 |
| Oklahoma | | | |
| 1984 | 5.0 up to $25,000 | N.A. | 10 |
| 2006 | 7.0 | 13.43 | 5 |
| Oregon[a,*] | | | |
| 1984 | 6.0 | 11.01-11.67 | 5 |
| 2006 | 6.0 | 8.04 | 5 |
| Pennsylvania | | | |
| 1984 | 6.25 | 18.06 | 10 |
| 2006 | 7.16 | 4.0 | 5 |
| Rhode Island[a] | | | |
| 1984 | 6.0-7.0 | 6.6-10.4 | 10 |
| 2006 | 9.5 | 14.84 | 10 |
| South Carolina[a] | | | |
| 1984 | 4.0-6.0 | 7.0 | 5 |
| 2006 | 6.25 | 7.55 | 5 |

**Appendix Table 2 (cont.) - Teacher Plan Contributions and Vesting Requirements, by State, 1984 and 2006**

| State | Employee Contribution Rate | Employer Contribution Rate | Vesting Requirement |
|---|---|---|---|
| South Dakota[a] | | | |
| 1984 | 5.0 | 5.0 | 5 |
| 2006 | 6.0 | 6.0 | 3 |
| Tennessee | | | |
| 1984 | 5.0[†] | 11.07-15.01 | 10 |
| 2006 | noncontributory | 7.3 | 5 |
| Texas[niss] | | | |
| 1984 | 6.65 | 8.5 | 10 |
| 2006 | 6.0 | 6.4 | 5 |
| Utah[a] | | | |
| 1984 | 8.95[†] | 8.95 | N.A. |
| 2006 | noncontributory | 11.59-14.52 | 4 |
| Vermont | | | |
| 1984 | 5.0 | 6.15-8.86 | 10 |
| 2006 | 3.4 | 5.09 | 5 |
| Virginia[a] | | | |
| 1984 | 5.0 | 6.15-8.86 | 5 |
| 2006 | 5.0 | 6.62 | 5 |
| Washington | | | |
| 1984 | 6.0 | N.A. | 5 |
| 2006 | 5.0-15.0 | 2.92 | 5 |
| West Virginia | | | |
| 1984 | 6.0 | 6.0 | 20 |
| 2006 | 6.0 | 15.0 | 5 |
| Wisconsin[a] | | | |
| 1984 | 5.0[†] | 6.5 | immediate |
| 2006 | 5.0 | 4.5 | immediate |
| Wyoming[a] | | | |
| 1984 | 5.57 | 5.68 | 4 |
| 2006 | 5.57 | 5.68 | 4 |

Notes:

[a]Teacher plan includes other state employees and/or local workers.

[niss]State teachers are not in Social Security.

[*]The structure of the following teacher plans do not permit comparisons with the other plans in the sample: Indiana, 1982 and 2006; Oregon, 1982 and 2006; Tennessee, 1982; and North Dakota, 1982.

[†]Employer has the option of making the employees' contribution.

Sources: Wisconsin Legislative Council (1984 and 2006); and authors' derivations from websites of state retirement plans.

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## ENDNOTES

[1] Clark et al. (2009) provide a detailed history of the development of state retirement plans throughout the twentieth century.

[2] Two States, Indiana and Oregon, have annuity purchase plans that make strict comparisons with the other forty-eight teacher plans difficult.

[3] Typically, "teacher" plans cover all "certified" staff. In some states they cover a broader set of employees.

[4] Almost three quarters of the public employees who remain outside the Social Security system reside in just seven states: California, Ohio, Texas, Massachusetts, Illinois, Colorado, and Louisiana.

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

[6] In 1999, the U.S. GAO (1999) reported that 21 of the 48 states with defined benefit plans had considered terminating their defined benefit plan and replacing it with a defined contribution plan. However, eight years later, the GAO (2007) still found only two states with defined contribution plans.

[7] A 2006 survey by the National Association of Government Defined Contribution Administrators found that on average only 21.6 percent of eligible state employees made voluntary contributions into in these plans (GAO 2007). Likely causes of this low level of participation are the absence of matching employer contributions and the more generous benefits provided by primary pension plans in the public sector.

[8] For various reasons, not every state-run plan in the United States is included in either the Wisconsin *Study* or our data set. For example, the Wisconsin *Study* includes plans that cover

workers other than state employees. Some states maintain separate plans for teachers or local government workers, and there are dozens of state-run plans that represent small, well-defined groups, such as state judges or legislators, that are excluded (see Mitchell et al. 2000, Table 2 for a complete tabulation of systems.) In addition, in 1982 the following plans were omitted: Indiana (PERF and TRF) had a hybrid, 1.1% contribution rate combined with a "money purchase" annuity component; Nebraska (SERS) had a money purchase plan; and Oregon (PERS) has 1.5% plus a money purchase plan. Also, Tennessee (CRS) had an "integrated table" plan, and Tennessee had some information missing; thus so we used the 1984 formula. For 2006, the deleted plans include: Indiana (PERF and TRF) has hybrid, "money purchase" option; Nebraska (SERS) has a money purchase plan; and Oregon (PERS) has 1.5% plus a money purchase plan. For Arkansas, we used 2%; and for Massachusetts, we used 2.5% instead of 0.1-2.5% age-related state formula.

[9] All data are available from the authors on request.

[10] Some of the nation's largest cities, including New York, Chicago, Denver, St. Louis, and Kansas City, maintain teacher plans separate from the statewide plans included in our dataset. Some of the nation's more powerful teacher unions represent teachers in these cities; thus it is likely that for the nation as a whole, are union variable understates the positive impact of collective bargaining on replacement rates.

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