Vesting Requirements and Key Benefit-Formula Features of State and Local Government Pension Plans

by Glenn R. Springstead*

State and local governments provide pensions to their employees instead of or along with Social Security coverage. The Great Recession and other events have adversely affected some state and local budgets, leading to pension reforms that aim to lower benefits and bolster funding levels. Using data for 2016–2019 from fund financial reports and independent research center databases, this article examines three key components of standard pension benefit formulas: vesting periods, final-average-salary computation periods, and benefit multipliers. This analysis is the first to examine those characteristics at the level of individual benefit tiers in state and local pension systems, and more significantly, to weight the statistics by the number of active members within each tier. Results are shown for tiers grouped by Social Security coverage status, worker occupation group, and whether the tier is open or closed to new hires.

Introduction

Many state and local government employees are covered by pension plans instead of Social Security coverage and payroll tax withholding. Social Security's Windfall Elimination Provision (WEP) and Government Pension Offset (GPO) apply to beneficiaries who collect both Social Security benefits and pension benefits from employment not covered by Social Security. In 2019, about 1.9 million Social Security beneficiaries were affected by the WEP, and about 708,000 beneficiaries were affected by the GPO (Li 2020). The WEP modifies the formula for calculating an individual's monthly Social Security retired- or disabled-worker benefit, and can reduce that benefit by as much as one-half of the monthly pension benefit from noncovered employment. The GPO, meanwhile, applies to the benefit of the individual's spouse or survivor, and reduces that monthly Social Security benefit by two-thirds of the monthly pension amount from noncovered employment.

Given the numbers of beneficiaries affected, and the connection between the pension amount received and the degree of WEP or GPO adjustment, the structure of (and changes to) state and local pensions for noncovered workers (hereafter, "noncovered pensions") is of research and administrative interest to the Social Security Administration (SSA). This interest is heightened by recent reforms initiated by states and localities, especially in the aftermath of the financial crisis of 2008 and the resulting Great Recession (Aubry and Crawford 2017; Brainard and Brown 2018; Schmidt 2019). Those reforms, which include restrictions on pension eligibility and reductions of pension benefits, can have significant "spillover" effects on the Social

Selected Abbreviations

COLA	cost-of-living adjustment
DB	defined benefit
DC	defined contribution
FAS	final average salary
GPO	Government Pension Offset
PPD	*Public Plans Database*

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Selected Abbreviations—*Continued*

SLEPP	State and Local Employee Pension Plan (database)
SSA	Social Security Administration
WEP	Windfall Elimination Provision

Security benefit calculation for individual workers and on the finances of the Social Security system as a whole.

The implications of possible spillovers from changes to noncovered pensions spurred the analysis reported in this article. Although the potential scope of research on these changes is broad, this article focuses on the traditional defined benefit (DB) pensions offered by most state and local governments in 14 states that employ a majority of the U.S. noncovered workforce.

This article provides summary statistics on three central pension plan components: the vesting requirement, the benefit formula multiplier, and the number of years used to calculate a worker's final average salary (FAS). The statistics are broken down by benefit tier and weighted by the size of the tier's active membership, with the benefit tiers for workers who are not covered by Social Security being of primary interest. Cross-tabulations compare tiers with and without Social Security coverage, for different occupation groups, and by whether membership is open to new hires.

This article's focus on differences among benefit tiers, as opposed to broader comparisons between entire pension plans or systems, contributes a key dimension to the existing literature. A plan or system may comprise two or more benefit tiers, in which each tier encompasses "a group whose benefit formulas are different from those of other pension plan members. For example, a new benefit tier may apply to workers hired after a specific date, while those hired previously receive different benefits" (Government Finance Officers Association 2020). In the aftermath of the Great Recession, many states reduced benefits or tightened eligibility requirements for workers hired after a specified date. Benefit tiers may also represent different occupation groups within a plan. For example, a state's pension plan may include workers in general government occupations as well as public safety personnel, yet these two groups may be subject to different benefit formulas and eligibility requirements.

Although workers in some benefit tiers are covered by Social Security, the statistics shown in this article for those tiers are not representative of the plans or benefit tiers for all covered state and local government workers across the United States. Producing such statistics would require the compilation of much more data than was attempted for this project. Future research could add to the present effort by including more covered pension systems and accounting both for additional benefit determinants and the increasing use of defined contribution (DC) plans in the public sector.

This introduction is followed by a section that provides background information on the development of Social Security coverage in state and local government pension systems. It also discusses the ongoing Social Security exemption of pension plans and benefit tiers in some states, the establishment of Social Security's WEP and GPO provisions, and recent reforms to state and local pensions, especially those initiated in the aftermath of the Great Recession. That section is followed by sections that successively outline the article's scope, data, and methods; then, by a section that shows the results and discusses key findings. The article concludes by summarizing the findings and suggesting additional research steps.

Background

This section is divided into two parts. The first part describes how some state and local workers have remained outside the Social Security system, and how Social Security rules have been adjusted to account for workers having both covered and noncovered earning histories. The second part highlights reforms in state and local pension plans. It describes the benefit designs used by states and localities and discusses how the nonfederal public sector has adjusted benefits and eligibility, especially since the 2008 financial crisis and Great Recession.

Noncovered Workers and Social Security

Although Social Security covers nearly all workers in the United States, about one-quarter of state and local government employees do not pay into Social Security or receive Social Security credit for their earnings, according to internal administrative records from SSA.[1] These workers reside disproportionately in a few states, such as California, Colorado, Louisiana, Massachusetts, Nevada, and Ohio. Some state and local government occupations, such as teachers, police, and firefighters, are less likely to receive Social Security coverage from their employment. These noncovered workers may nonetheless become entitled to Social Security benefits either via the covered earnings of

a spouse or by attaining insured status by accruing periods of covered employment during their careers.

The WEP and the GPO can affect Social Security beneficiaries who have worked in noncovered employment. The idea behind both provisions is to avoid treating noncovered earnings, on which the employee paid no payroll taxes, as equivalent to payroll-taxed covered earnings when calculating the worker's (or his or her dependent's) Social Security benefit. The WEP reduces the benefit of an insured worker by applying a modified benefit-calculation formula to the worker's earnings history. The GPO reduces a spouse or survivor benefit that is based on the record of a covered worker by two-thirds of the monthly noncovered pension amount. Beneficiaries who are entitled to both worker and spousal benefits can be subject to both provisions.

Table 1 compares the WEP benefit formulas with the formula SSA applies to workers with only covered employment.

The WEP formula adjusts the first percentage factor, depending on the worker's number of years of Social Security coverage. For workers with 20 or fewer years of coverage (YOCs), the standard formula's factor of 90 percent is reduced to 40 percent. Each YOC above 20 increases the first percentage factor by 5 percentage points, such that workers with 30 or more YOCs are exempt from the WEP. The dollar amount by which the WEP formula in Table 1 reduces the benefit cannot exceed one-half of the worker's monthly noncovered pension benefit.[2] This cap on the reduction, called the WEP "guarantee," is designed to minimize the WEP's effect for workers with relatively low income from noncovered employment.

To illustrate how the GPO affects benefits, consider the spouse of a Social Security–covered worker who would be entitled to a monthly spousal benefit of $1,000 based on the worker's covered earnings. If the worker also has a noncovered pension with a monthly benefit of $1,000, the GPO reduces the Social Security spousal benefit by two-thirds of the monthly pension benefit amount ($667), resulting in an adjusted monthly spousal benefit of $333. If two-thirds of the worker's monthly noncovered pension amount is greater than the spousal benefit, the spousal benefit is reduced to $0.

Table 1.
Social Security retired-worker benefit formula for a fully insured worker with and without the WEP adjustment (2020 bend points)

Criterion	Percentage of average indexed monthly earnings— Up to $960	From $961 to $5,785	Above $5,785
	If WEP does not apply		
All earnings are Social Security–covered	90	32	15
	If WEP applies		
Years with substantial Social Security–covered earnings			
30 or more	90	32	15
29	85	32	15
28	80	32	15
27	75	32	15
26	70	32	15
25	65	32	15
24	60	32	15
23	55	32	15
22	50	32	15
21	45	32	15
20 or fewer	40	32	15

SOURCE: SSA.

NOTES: Average indexed monthly earnings are a measure of lifetime earnings adjusted for annual changes in the national average wage.

A worker's benefit is based on a computation that begins by applying a formula to the worker's average indexed monthly earnings. For example: Consider a worker who is subject to the WEP, with 20 years of Social Security coverage and average indexed monthly earnings of $6,000. The calculation is 40 percent of $960 plus 32 percent of $4,825 ($5,785 minus $960) plus 15 percent of $215 ($6,000 minus $5,785); thus, $384 + $1,544 + $32.25 = $1,960.25. For an otherwise identical worker who is not subject to the WEP, the calculation is 90 percent of $960 plus 32 percent of $4,825 plus 15 percent of $215; thus, $864 + $1,544 + $32.25 = $2,440.25.

This brief summary shows how the receipt (and the amount) of a noncovered pension benefit can influence the application and scale of any Social Security benefit reductions for workers with noncovered earnings. Consequently, the benefit levels of state and local government pensions for noncovered workers, and changes to those amounts and eligibility parameters, play a critical role in determining the level of Social Security benefits available to recipients.

The Structure and Organization of State and Local Pensions and Recent Reforms

The pension plan or system is the primary organizational and administrative unit for public sector retirement. The terms "system" and "plan" are sometimes used interchangeably (Munnell and others 2008), although data from the *Public Plans Database* (PPD), maintained by the Center for Retirement Research at Boston College, identifies a pension *system* as a larger unit that may contain one or more pension *plans.* For example, the Nevada Public Employees Retirement System includes the Nevada Police Officer and Firefighter plan as well as the Nevada Regular Employee plan. The number and structure of public pension plans in a state can vary considerably (Munnell and others 2008). Typically, a state will maintain one system to cover general government employees and a separate system for teachers. Public safety workers such as police and firefighters can be covered by either the state pension system, the local government's system, or a stand-alone system. Larger cities and counties typically maintain separate pension systems, as occurs in California, Texas, and Illinois.

Benefit design is also a key feature of public pension systems. Although DC pensions now dominate in the private sector (Munnell, Haverstick, and Soto 2007), most state and local workers remain covered by a traditional DB pension (Munnell, Aubry, and Cafarelli 2014). In a DB design, the benefit is determined through a formula, usually the product of the worker's years of service, FAS, and a benefit multiplier. For example, a worker with 25 years of service, a FAS of $75,000 in the 3 years prior to retirement, and a plan with a multiplier of 2 percent would receive an annual pension of $37,500 ($3,125 per month).

Munnell, Haverstick, and Soto (2007) attribute the durability of DB plan usage in the public sector to several factors. First, the public-sector workforce tends to be older, more risk averse, and unionized. Second, compared with private-sector entities, state and local governments are more permanent.[3] Third, because market fluctuations generally impose greater pressure on private-sector employers, state and local governments are better able to increase plan contributions and sustain their funding. Lastly, public-sector pensions have fewer regulatory restrictions than private-sector plans, which reduces their administrative costs.

Although DB pensions are the norm in most state and local governments, Michigan, Alaska, and Oklahoma require some or all of their public workforce to enroll in a DC plan. Of these three states, only Alaska does not provide Social Security coverage to most of its state and local government employees. Other states, such as Ohio and Florida, offer their employees the option of selecting a DC plan as their primary pension, but still offer a traditional DB plan. Like Alaska, Ohio does not extend Social Security coverage to most of its public workforce. Most of Florida's state and local workers are covered by Social Security.

In addition to DB and DC designs, some state and local governments provide a hybrid-style pension along with or in place of the traditional DB plan. A hybrid pension can take two main forms. The first is a cash balance design, which pays a benefit based on the worker's (and, where applicable, the employer's) contributions, usually adjusted for the age at which the worker claims the benefit. Although it appears to closely resemble a DC plan, the cash balance design is in fact more of a DB plan because the interest rate accruing to the contributions is guaranteed, and as a result, so is the pension payment. For this reason, a cash balance plan is sometimes called a notional account. The second form, known as a DB+DC design, combines a DB plan (with a benefit formula that is less generous than a typical DB plan) and a small DC account (National Association of State Retirement Administrators 2020).

Although the WEP and GPO provisions have not changed since 1983, states and localities have adjusted their pension benefits in both minor and substantial ways, generally in response to economic and demographic changes. The potential spillover effects from these changes, especially from plans that do not also provide Social Security coverage and whose workers may eventually be affected by Social Security's WEP and GPO, is important for policymakers to understand. The frequency and scope of these pension changes also affect the nature of the pension plan data that are available for research, and which inform the present study.

The subsection below briefly addresses the causes of recent and ongoing changes in nonfederal public-sector pension plans and the three subsections that follow it summarize pension reforms that have emerged in response to those changes.

Causes of Public-Sector Pension Changes

Although a full investigation of the causes of systematic pension changes is beyond the scope of this article, the primary contributing element is plan underfunding. Before 2001, nearly all public-sector pension plans were fully funded, according to the Governmental Accounting Standards Board (GASB).[4] Specifically, nearly all plans were projected to have sufficient assets to cover plan liabilities, assuming an 8 percent investment return. By 2013, however, almost every plan reported significant underfunding. Two key factors drove the underfunding. The first affected the economy as a whole: Financial crises occurred in 2001 and from 2007 to 2009, with the latter especially significant. The second factor was intrinsic to the plans themselves: insufficient contributions and overly optimistic actuarial assumptions (Munnell, Aubry, and Cafarelli 2015).[5]

Tightening Pension Eligibility by Extending the Vesting Period

Most pension systems require employees to work a certain minimum period known as a "vesting period" to be eligible for a future retirement benefit. Once vested, employees retain the right to a pension benefit even if they do not remain employed by the pension provider (Schmidt 2019). Employees who leave public-sector employment prior to becoming vested are typically eligible to receive only a refund of their contributions (Munnell and others 2012). Since 2009, nine states have passed laws to increase the vesting period from 5 years to 10 years for new employees (Brainard and Brown 2018). In a study of 87 of the largest pension plans, Schmidt (2019) found that 42 plans had vesting periods of 4 or 5 years, 7 plans had vesting periods of 7 or 8 years, and 28 plans required 10 years or more.

The vesting period of a pension plan (or benefit tier) is of unique importance when applying the WEP and GPO because it determines whether a worker in noncovered employment will receive a pension. Pension receipt, in turn, determines whether the WEP or GPO applies to a Social Security beneficiary. According to SSA's Office of the Chief Actuary, of the 18 million Social Security beneficiaries in 2018 who had noncovered earnings but were not affected by the WEP, more than 75 percent had fewer than 5 years of noncovered earnings (Goss 2018). Given the prevalence of 5-year (or longer) vesting periods in state and local pensions, this suggests that a high percentage of beneficiaries with noncovered earnings have not worked in noncovered employment long enough to become vested in the pension and are thereby not affected by the WEP. A trend toward longer vesting periods in noncovered pensions would lead to fewer vested workers, and thus fewer noncovered workers affected by the WEP or GPO.

Reducing Pension Benefits by Decreasing the Benefit Multiplier and Increasing the FAS Computation Period

In addition to tightening eligibility requirements by lengthening the vesting period, some states took steps to reduce the pension benefit. Two common strategies were to reduce the benefit multiplier or to extend the FAS computation period (hereafter, simply the "FAS period").

In a traditional DB plan, the benefit multiplier is a percentage applied to the product of the FAS and the years of service—in effect, providing a premium for longer service (Brainard and Brown 2018). For example, consider a person with 20 years of service, average annual earnings of $50,000 in the final 3 years of employment, and a 2.0 percent benefit multiplier. That person's annual pension benefit would equal 20 × $50,000 × 0.02, or $20,000. Although Brainard and Brown reported that recent reforms enacted to lower benefit levels have included reductions to the benefit multiplier, Schmidt (2019) observed that the multiplier has generally remained relatively stable.

Other Reforms

Among the most common of the pension reforms passed by state legislatures is to increase the employee contribution. Brainard and Brown (2018) found that from 2009 through 2018, 39 states passed legislation increasing employee contributions. The authors also found that employee contributions in plans that excluded Social Security coverage tended to be higher on average—at about 8 percent—than were contributions in plans that did provide Social Security coverage (5–6 percent).

Once vested, employees need to reach a second threshold to be eligible to receive their pensions (Brainard and Brown 2018). This second threshold can be a given age, a given length of service, or a combination of age and tenure (Schmidt 2019). In the case of an age threshold, the plan may offer either

"early" or "normal" retirement benefits. As with Social Security, early retirement benefits are actuarially reduced, whereas the normal retirement benefit represents the full or maximum amount payable. In contrast with Social Security's early retirement age of 62, many state and local pensions offer early retirement at ages as young as 55 (or younger for police and firefighters) if the worker meets a minimum years-of-service requirement.

Brainard and Brown (2018) found that 33 states increased the age of early or normal retirement, the minimum service requirement, or both during 2009–2018. These increases generally applied only prospectively to new hires, but some also affected current workers. The authors found that most of the retirement-age increases were by about 2 years, and that the service-years requirements increased by 5 years. Schmidt (2019) reported that the trend toward increasing retirement ages reversed a 2000–2008 trend among some plans of decreasing retirement-age thresholds.

Finally, states and localities may reduce pension benefits by lowering or pausing the annual post-retirement cost-of-living adjustment (COLA). Unlike Social Security, which by statute provides an automatic COLA (determined by the consumer price index [CPI]) to postentitlement benefits, public-sector plans do not all provide automatic COLAs. Munnell, Aubry, and Cafarelli (2014) identified four main types of COLAs in state and local pensions: (1) an automatic increase based on the CPI; (2) an automatic percentage or dollar-amount increase that is not tied to the CPI; (3) an unscheduled increase, awarded as needed; and (4) an increase based on investment returns or some other financial metric.

Schmidt (2019) reported that only 50 of 87 large public-sector plans included an automatic COLA, whether based on the CPI or not. Another 22 plans provided COLAs as needed. Four plans provided no COLA and 11 provided an unspecified alternative COLA.

Scope of Research

This article focuses primarily on pension systems for noncovered workers in the United States, although it also includes some data on covered pension systems for comparison. Thirteen states—California, Colorado, Connecticut, Georgia, Illinois, Kentucky, Louisiana, Massachusetts, Missouri, Nevada, New Jersey, Ohio, and Texas—employ 80 percent of the U.S. noncovered state and local government payroll (Quinby, Aubry, and Munnell 2020; Government Accountability Office 2010). Databases developed and maintained by the Urban Institute and the Center for Retirement Research at Boston College indicate that Maine also employs many noncovered public-sector workers. This article is based on analysis of data for those 14 states.

This study explores the types of pension benefit designs available to workers in state and local governments. As discussed earlier, most state and local governments offer a traditional DB plan to their employees. This appears to apply in particular to selected states and a large majority of the pensions in this study. Specifically, of the 6.1 million active plan participants studied in this analysis, more than 5.5 million have traditional DB pensions. Approximately 380,000 active members have a cash-balance hybrid design and the remainder have a DB+DC hybrid. Appendix Table A-1 shows the numbers of benefit tiers and active members in each pension system studied in this article. As more states and localities begin to incorporate DC and hybrid pensions as alternatives to, or replacements of, the traditional DB design, researchers may devote more attention to those plans. Shifts from DB to DC and hybrid structures will be especially important for noncovered workers.

Although states and localities have taken many approaches to pension reform in recent years, this article confines its examination to three design parameters commonly featured in those reforms: the vesting requirement, the FAS period, and the benefit formula multiplier. Future research, however, should also investigate reforms involving early or normal retirement ages, COLAs, employee and employer contributions, and other design aspects.

Finally, the research scope affects the level of detail needed in the input data. As noted earlier, state and local pensions are organized at the system or plan level. To assess pension funding, the system or plan level can be an appropriate unit of analysis; but in an age of widespread public pension reforms, it can mask a great deal of variance in benefit formulas and payment amounts. For this reason, data by benefit tier are necessary to accurately summarize and quantify vesting periods and other benefit determinants. Furthermore, even at the benefit tier level, data can be misleading if each tier is weighted equally, without regard to the number of workers or active members it contains. For these reasons, this article links benefit tier information to active member counts. Results are therefore shown both unweighted (that is, by benefit tier) and weighted by the tier's active membership.

Data Sources

This article relies on three main data sources. Data from the Urban Institute's State and Local Employee Pension Plan (SLEPP) database provide much of the organizational approach used in this study. In particular, the SLEPP database, as updated in 2018, provides information on vesting and benefit formula parameters (such as the FAS period and the multiplier) at the plan level. SLEPP data enable quantitative analysis on vesting, FAS, benefit multipliers, COLAs, employee and employer contributions, Social Security coverage, and whether a benefit tier applies to new hires or previous hires. The SLEPP database also includes data on early and normal retirement ages and terms. It includes benefit tier-level data for statewide pensions, including separate plans for teachers and public safety personnel.

However, the SLEPP database does not provide information on active-member enrollment by benefit tier. Therefore, this article also uses data from Boston College's PPD, which is continually updated as new data become available. Of interest for this study, the PPD includes the number of active members for each of the largest pension systems it covers. Further, the PPD website (https://publicplansdata.org/) provides links to graphs and data for each state, and to the financial reports and plan websites that host the primary data. The PPD thereby allowed quick access to most of the financial reports I needed to obtain the number of active members by benefit tier.

In some instances, supplemental or alternative financial reports were obtained online.[6] Appendix Table A-1 lists each pension system included in this study, by state, with the system's number of benefit tiers and active members. These data mostly cover the years 2018–2019, although some reports are based on older data, indicated in Table A-1.

Methodology and Data Organization

Using SLEPP data on benefit tiers and active membership figures from each plan's financial reports, I have created a database of 339 benefit tiers representing almost 6.2 million workers in 14 states. Most (3.5 million) of the active plan members are not covered by Social Security. This database captures between one-half and two-thirds of the noncovered state and local government workers in the United States.[7] Table 2 shows the distribution of benefit tiers and active members in this study by Social Security coverage status, employee occupation, and whether new hires have access to the benefit tier.

The Benefit Tier

The benefit tier consists of the membership's unique occupational, eligibility, or benefit-design grouping within a pension plan. For example, the Texas Teachers Retirement System constitutes one pension plan, but it has three benefit tiers: one for teachers hired before 1980, a second for those hired 1980–2007, and a third for those hired after 2007.

Table 2.
State and local government pension plan benefit tiers and active membership, by Social Security coverage status, occupation group, and tier accessibility to new hires, 2016

	Benefit tiers		Active members	
Category	Number	Percent	Number	Percent
All	339	100.0	6,186,461	100.0
Social Security status				
Covered	168	49.6	2,049,113	33.1
Not covered	163	48.1	3,501,600	56.6
Some coverage	8	2.4	635,748	10.3
Occupation group				
Teachers	58	17.1	3,357,193	54.3
General government				
State level	53	15.6	1,018,286	16.5
Local level	111	32.7	1,443,485	23.3
Public safety	117	34.5	367,497	5.9
Accessibility to new hires				
Open	131	38.6	2,806,230	45.4
Closed	208	61.4	3,380,231	54.6

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Rounded components of percentage distributions do not necessarily sum to 100.0.

Active Membership

The documentation in most pension systems' actuarial valuations and comprehensive annual financial reports includes the numbers of active members and beneficiaries. Some reports also indicate the number of inactive members. Inactive members comprise those who are eligible for a future pension (vested) and those due only a refund of their contributions. Because active members most directly reflect the current workforce, and the data presented for them in actuarial valuations and comprehensive annual financial reports are highly consistent, this article uses active membership as its population weight.

For some pension plans, the actuarial valuations and the comprehensive annual financial reports provide the count of active members in each tier. For most plans, however, the number of active members belonging to a particular benefit tier must be estimated based on their distribution by age and years of service. Appendix Table B-1 shows an illustrative example of the distribution of active members by age and years of service, using teachers in the California Public Employees' Retirement System (CalPERS) in 2018. Because the most recently introduced CalPERS benefit tier began to apply to newly hired workers in 2013, I have assigned all active members with 0–4 years of service to that benefit tier. In this example, the year in which the benefit tier was changed aligns closely with the age and years of service data in the comprehensive annual financial report, but the data for some pension systems and financial reports do not match up as well. Therefore, the active-member populations used to represent each tier should not be understood to reflect those provided directly by the plans. I have, however, attempted to ensure as close an alignment between tier and active membership as possible.

Social Security Coverage

The SLEPP database classifies benefit tiers by whether their members are also covered by Social Security: yes, no, and various other categories indicating coverage for some but not all members.[8] The Boston College PPD uses a binomial variable to indicate Social Security coverage in 2010, with "1" designating plans that cover 50 percent or more of their workers and "0" designating those that cover less than 50 percent. I have adopted the SLEPP categorizations for the benefit tiers included in its database. For the other tiers, I have followed the PPD categorization scheme. I identify two broad coverage categories, labeled simply "covered" and "noncovered" benefit tiers. I generally exclude the benefit tiers described as having "some" or mixed coverage, because both the number of those tiers and the number of their active members are few relative to the covered and noncovered tiers. Statistics for active members of these mixed-coverage tiers are included in Table 2, which shows summary data for all plans, but not in subsequent tables, which distinguish only between covered and noncovered benefit tiers. Finally, as noted earlier, the results for the covered benefit tiers reflect the covered systems only in the 14 sampled states and are not necessarily representative of covered benefit tiers nationwide.

Employee Occupation

The SLEPP database includes a variable indicating the occupation type covered by the benefit tier. The most common occupation types in the SLEPP database are teachers, state-level general government employees, local-level general government employees, and various levels of police and firefighters. I have combined state and local police and firefighters, as well as individuals identified in the SLEPP database and in plan documents as working in "hazardous" or "corrections" occupations, in a "public safety" category.

Notably, Table 2 shows that the distribution of the benefit tiers can differ widely from that of the active membership. For example, teachers are represented by only 17 percent of the tiers (58 of 339), but they account for more than half of the active members in this study (54.3 percent). Conversely, public safety workers are represented by more than one-third of the tiers (117 of 339), but they account for less than 6 percent of the active members among the state and local workers analyzed in this study.

Not all states have distinct benefit tiers for each occupation group. Further, not all states report active membership data for each occupation group. Except for Nevada, all of the 14 states report distinct active membership totals for teachers. However, several states do not report active member numbers for local-level general government and public safety workers.

Benefit Tiers Open or Closed to New Hires

One key distinguishing feature of a given benefit tier is whether it applies to new hires. For pension plans having more than one tier, the most recently introduced tier will typically be open or applicable only to new hires. Other tiers within the same plan may apply only to workers who were hired before the new tier's effective date, and are closed to workers hired on or after that date. A benefit tier typically is closed to

new hires when a requirement or feature of the plan changes, such as increasing the vesting requirement from 5 years to 10, or expanding the FAS period from 3 years to 5. Employees hired after the date of change will belong to the tier with the longer vesting or FAS period, while workers employed at the time of the change will belong to the tier with the shorter vesting or FAS period. Note that a benefit tier categorized as open to new hires should not be assumed to include only newly hired workers. Rather, a tier so designated may include long-tenured employees as well as new hires, as some pension systems have not made recent changes in vesting or benefit design.

The SLEPP database contains a binary variable indicating whether the benefit tier is open to new hires, with a value of "1" if it is open and "0" if it is closed. For tiers in this study that are not in the SLEPP database, I assigned open or closed status based on information found on the plan's web page, or from its actuarial valuation or other documentation. Table 2 shows that a majority of the tiers in this study are closed to new hires. Tiers that are closed to new hires also account for a majority of the active members in this study.

Data Weighting

Prior studies have reported helpful information on state and local pension plan design (for example, Brainard and Brown 2018; Schmidt 2019; and Quinby, Aubry, and Munnell 2020). However, those studies reported information at the plan level, without accounting for the number of plan participants (that is, the studies do not link to or weight the summary statistics by the plan's number of participants). Because weighting the statistics would increase our understanding of state and local pension design in the United States, this article introduces a weighting mechanism based on the number of active members for each benefit tier. This approach will provide a more accurate, population-based estimate of state and local pension features and trends.

The linkage between a benefit tier and that tier's active membership is not necessarily direct or clear. As noted earlier, the best sources for such information are the pension plan financial reports, such as the actuarial valuations and comprehensive annual financial reports. Not all of these reports provide participant numbers for each benefit tier; however, many of them provide participant numbers by age and years of service, which I have used to approximate the number of participants, or active members, for most pension tiers. I have drawn the closest connection I can between the benefit tier's active membership and the pension requirements and formulas that pertain to that population, yet I caution that these linkages can be imprecise.

Analysis

The following subsections discuss the vesting periods, FAS periods, and benefit multipliers for the benefit tiers in the 14 states reviewed for this study. Table 3 compares the mean and median values of those factors, both on a per-tier (unweighted) basis and when weighted to account for active members in each tier. The lower panel of Table 3 shows that the mean vesting and FAS periods are longer for members of the benefit tiers open to new hires, and the mean benefit multiplier is lower for members in those tiers. These three observations all suggest a trend toward less generous benefit designs in state and local government pensions. The median values are less variable: The vesting and FAS periods are constant, at 5.0 and 3.0, respectively, across all tier groupings; only the median benefit multiplier varies by group.

The upper panel of Table 3 reveals a more complicated per-tier picture. The mean FAS period is longer, and the mean benefit multiplier is lower, for members of tiers that are open to new hires, as expected. However, the average vesting period is shorter in open tiers. This counterintuitive result will reappear in other pension elements and for particular groups. In general, the presence of unexpected results for some groups indicates the unique distributions of some populations. This article's study population may not be particularly representative of covered workers nationwide, a possibility I explore later.

Each of the following subsections focuses on one of three pension benefit features. The first subsection reports findings for vesting requirements. The second subsection reports findings for the FAS period, which is a key element of most DB designs. The third subsection analyzes the benefit formula multiplier.

Each subsection provides a summary table showing the unweighted and weighted mean and median values by tier category, followed by tables that show detailed weighted-only statistics. These detailed tables include cross-tabulations to show distributions by tier category. Although the detailed tables and the discussion below focus on the statistics weighted by the number of active members in each tier, Appendix C presents detailed tables showing the corresponding unweighted statistics.

Table 3.
Mean and median vesting periods, FAS periods, and benefit multipliers in state and local government pension plan benefit tiers: Unweighted and weighted, by Social Security coverage status, occupation group, and tier accessibility to new hires

	Mean			Median		
Category	Vesting period (years)	FAS period (years)	Benefit multiplier (%)	Vesting period (years)	FAS period (years)	Benefit multiplier (%)
			Unweighted (per tier)			
All	8.0	3.2	2.36	7.0	3.0	2.50
Social Security status						
Covered	8.0	3.0	2.24	7.0	3.0	2.35
Not covered	8.1	3.5	2.47	5.0	3.0	2.50
Occupation group						
Teachers	6.7	3.6	2.29	5.0	3.0	2.40
General government						
State level	7.2	3.4	2.04	5.0	3.0	2.00
Local level	7.8	3.3	2.32	10.0	3.0	2.42
Public safety	9.2	3.0	2.58	10.0	3.0	2.62
Accessibility to new hires						
Open	7.6	4.1	2.29	5.0	3.0	2.42
Closed	8.3	2.7	2.40	10.0	3.0	2.50
			Weighted by number of active members in tier			
All	6.6	3.3	2.27	5.0	3.0	2.30
Social Security status						
Covered	7.2	3.2	2.11	5.0	3.0	2.30
Not covered	6.1	3.6	2.36	5.0	3.0	2.30
Occupation group						
Teachers	6.1	3.4	2.29	5.0	3.0	2.30
General government						
State level	6.8	3.2	2.21	5.0	3.0	2.30
Local level	7.0	3.4	2.18	5.0	3.0	2.20
Public safety	8.3	2.4	2.66	5.0	3.0	2.70
Accessibility to new hires						
Open	6.9	3.9	2.21	5.0	3.0	2.20
Closed	6.2	2.9	2.32	5.0	3.0	2.40

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Vesting Requirement

Tables 4–7 show statistics for the vesting requirements. Table 4 is a summary table that compares the weighted and unweighted mean and median vesting periods by tier category. Tables 5–7 provide a closer look, with weighted mean, median, maximum, and selected percentile values and cross-tabulations by Social Security coverage, employee occupation, and new hire accessibility status, respectively.

Table 4 shows that the weighted median vesting period is 5.0 years for active members overall and in each tier category. The weighted mean period is 6.6 years among active members overall, and it varies across subgroups. The weighted mean vesting periods are higher for active members in benefit tiers open to new hires (6.9 years), public safety workers (8.3 years), and covered workers (7.2 years).

The key finding from Table 5 is that average vesting requirements appear to be shortening for covered workers but appear to be lengthening for noncovered workers. Specifically, for covered workers, the mean vesting period is 7.4 years in benefit tiers that are closed to new hires and 7.0 years in benefit tiers that are open to new hires. The median vesting period is 8.0 years in benefit tiers that are closed to new hires and 5.0 years in benefit tiers that are open to new hires. Meanwhile, the vesting trend for noncovered workers appears to be more in line with recent pension reforms, which include longer vesting periods. The mean vesting period is 5.8 years in benefit tiers

Table 4.

Mean and median vesting periods in state and local government pension plan benefit tiers: Unweighted and weighted, by Social Security coverage status, occupation group, and tier accessibility to new hires (in years)

	Unweighted (per tier)		Weighted by number of active members in tier	
Category	Mean	Median	Mean	Median
All	8.0	7.0	6.6	5.0
Social Security status				
Covered	8.0	7.0	7.2	5.0
Not covered	8.1	5.0	6.1	5.0
Occupation group				
Teachers	6.7	5.0	6.1	5.0
General government				
State level	7.2	5.0	6.8	5.0
Local level	7.8	10.0	7.0	5.0
Public safety	9.2	10.0	8.3	5.0
Accessibility to new hires				
Open	7.6	5.0	6.9	5.0
Closed	8.3	10.0	6.2	5.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table 5.

Weighted vesting periods in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in years)

				Percentile			
Category	Mean	Median	Maximum	10th	25th	75th	90th
All	6.6	5.0	20.0	5.0	5.0	10.0	10.0
Covered by Social Security							
Total	7.2	5.0	20.0	5.0	5.0	10.0	10.0
Occupation group							
Teachers	6.1	5.0	10.0	5.0	5.0	5.0	10.0
General government							
State level	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Local level	8.1	8.0	10.0	5.0	8.0	10.0	10.0
Public safety	8.6	5.0	20.0	5.0	5.0	10.0	14.0
Accessibility to new hires							
Open	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Closed	7.4	8.0	20.0	5.0	5.0	10.0	10.0
Not covered by Social Security							
Total	6.1	5.0	20.0	5.0	5.0	5.0	10.0
Occupation group							
Teachers	5.7	5.0	10.0	5.0	5.0	5.0	10.0
General government							
State level	6.3	5.0	10.0	5.0	5.0	8.8	10.0
Local level	6.4	5.0	10.0	5.0	5.0	9.3	10.0
Public safety	9.0	5.0	20.0	5.0	5.0	12.8	15.0
Accessibility to new hires							
Open	6.6	5.0	20.0	5.0	5.0	10.0	10.0
Closed	5.8	5.0	20.0	5.0	5.0	5.0	10.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

that are closed to new hires and 6.6 years in tiers that are open to new hires. The median vesting period for noncovered workers is 5.0 years whether or not their benefit tier is open to new hires.

The apparent trend toward shorter vesting periods for covered workers does not necessarily imply that most or even many covered pension systems are shortening their vesting requirements for newly hired workers. As noted earlier, many benefit tiers that are classified as being open to new hires may also include long-tenured workers, and these tiers simply have not changed their vesting requirements or benefit formulas recently. In other words, the contrasting trends in average vesting periods between covered and noncovered workers may be an artifact of the data. Researchers interested in capturing recent trends for specific pension features may therefore need to more narrowly define and classify certain data and categories.

Table 6 includes notable findings for teachers and local-level general government workers. For teachers,

Table 6.
Weighted vesting periods in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	6.6	5.0	20.0	5.0	5.0	10.0	10.0
Teachers							
Total	6.1	5.0	10.0	5.0	5.0	5.0	10.0
Social Security status							
Covered	6.1	5.0	10.0	5.0	5.0	5.0	10.0
Not covered	5.7	5.0	10.0	5.0	5.0	5.0	10.0
Accessibility to new hires							
Open	6.9	5.0	10.0	5.0	5.0	10.0	10.0
Closed	5.3	5.0	10.0	5.0	5.0	5.0	5.0
State-level general government							
Total	6.8	5.0	10.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Not covered	6.3	5.0	10.0	5.0	5.0	8.8	10.0
Accessibility to new hires							
Open	6.9	5.0	10.0	5.0	5.0	10.0	10.0
Closed	6.6	5.0	10.0	5.0	5.0	10.0	10.0
Local-level general government							
Total	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	8.1	8.0	10.0	5.0	8.0	10.0	10.0
Not covered	6.4	5.0	10.0	5.0	5.0	9.3	10.0
Accessibility to new hires							
Open	7.0	5.0	10.0	5.0	5.0	9.5	10.0
Closed	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Public safety							
Total	8.3	5.0	20.0	5.0	5.0	10.0	15.0
Social Security status							
Covered	8.6	5.0	20.0	5.0	5.0	10.0	14.0
Not covered	9.0	5.0	20.0	5.0	5.0	12.8	15.0
Accessibility to new hires							
Open	8.5	5.0	20.0	5.0	5.0	10.5	14.7
Closed	8.2	5.0	20.0	5.0	5.0	10.0	15.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

the mean vesting period is 1.6 years longer in benefit tiers open to new hires (6.9 years) than in tiers closed to new hires (5.3 years). For local-level general government employees in benefit tiers covered by Social Security, the mean vesting period is 8.1 years, which is 1.7 years longer than the mean vesting period for workers in tiers not covered by Social Security (6.4 years). Local-level general government is also the only occupation group for which the median vesting period differs between subgroups (8.0 years for noncovered workers and 5.0 years for covered workers).

The difference between covered and noncovered local-level general government workers in median vesting periods also highlights what is otherwise a pattern of occupational consistency. Within each of the other occupation groups, the median and maximum vesting periods do not vary, regardless of the benefit tier's coverage status and accessibility to new hires. For the vesting period, then, occupation may be the more meaningful measure of distinction.

A key finding from Table 7 is that the mean vesting period is longer for covered workers than for noncovered workers both in benefit tiers that are open to new hires and those that are closed. In tiers that are open to new hires, the mean vesting period is 7.0 years for covered workers and 6.6 years for noncovered workers. In tiers that are closed to new hires, the mean vesting period is 7.4 years for covered workers and 5.8 years for noncovered workers. The mean vesting period is also longer (or the same) for each occupation group in benefit tiers that are open to new hires. These data, weighted by the number of active members in the tier, represent the greatest contrast to the unweighted data summarized in Table 4.

Table 7.
Weighted vesting periods in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	6.6	5.0	20.0	5.0	5.0	10.0	10.0
Open to new hires							
Total	6.9	5.0	20.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Not covered	6.6	5.0	20.0	5.0	5.0	10.0	10.0
Occupation group							
Teachers	6.9	5.0	10.0	5.0	5.0	10.0	10.0
General government							
State level	6.9	5.0	10.0	5.0	5.0	10.0	10.0
Local level	7.0	5.0	10.0	5.0	5.0	9.5	10.0
Public safety	8.5	5.0	20.0	5.0	5.0	10.5	14.7
Closed to new hires							
Total	6.2	5.0	20.0	5.0	5.0	5.0	10.0
Social Security status							
Covered	7.4	8.0	20.0	5.0	5.0	10.0	10.0
Not covered	5.8	5.0	20.0	5.0	5.0	5.0	10.0
Occupation group							
Teachers	5.3	5.0	10.0	5.0	5.0	5.0	5.0
General government							
State level	6.6	5.0	10.0	5.0	5.0	10.0	10.0
Local level	7.0	5.0	10.0	5.0	5.0	10.0	10.0
Public safety	8.2	5.0	20.0	5.0	5.0	10.0	15.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

FAS Period

Tables 8–11 repeat Tables 4–7, substituting the FAS period for the vesting requirements. As mentioned earlier, a traditional DB formula typically looks like this:

Annual benefit = FAS × years of service × benefit multiplier

All else being equal, a longer FAS period will produce a lower benefit than a shorter FAS period. Therefore, changing the FAS period from 3 years to 5 years, as some pensions have done, tends to decrease benefit amounts and plan costs.

A key finding from Table 8 is that, generally, the mean FAS period is longer among non-Social Security–covered workers than for covered workers. The unweighted (per tier) mean FAS period is 3.5 years for noncovered workers and 3.0 years for covered workers. The mean FAS period, when weighted to account for the number of active members in each tier, is 3.6 years for noncovered workers and 3.2 years for covered workers. All else being equal, benefits for noncovered workers should be more generous than those for covered workers because the pension has to compensate the worker for the lack of Social Security coverage. However, the mean FAS period for noncovered workers is longer than that of covered workers, leading—to the extent that the FAS period influences the overall benefit formula—to a less generous benefit for noncovered workers.

A secondary finding from Table 8 is that the mean FAS period appears to be increasing by a full year or more, as reflected in the benefit tiers that are open to new hires. That is, benefit tiers that are closed to new hires, and the active members in those tiers, have a shorter average FAS period than those in tiers that are open to new hires. In other words, at least in terms of the FAS period in the benefit formula, benefits for new hires are less generous. Specifically, in benefit tiers closed to new hires, the unweighted mean FAS period is 2.7 years, but in benefit tiers open to new hires, the unweighted mean FAS period is longer by about one-half, at 4.1 years. When weighted by active members in each tier, the mean FAS period increases from 2.9 years for tiers closed to new hires to 3.9 years for tiers that are open. At least initially, at this summary level, the lengthening FAS periods are consistent with reported trends in less generous pensions in the nonfederal public sector.

Although Table 8 indicates that the mean FAS period is longer (and the benefits therefore less generous) for noncovered workers than for covered workers, a key finding from Table 9 is that the longer FAS period for noncovered workers affects teachers and state-level general government employees but not the other occupation groups. Specifically, the mean FAS period for noncovered teachers is 3.8 years, compared with 2.6 years for covered teachers. Among state-level general government workers, noncovered members have a mean FAS period of 3.6 years and covered members have a mean FAS period of 3.0 years. By contrast, noncovered local employees and public safety workers have a shorter (more generous) mean FAS period than do their covered counterparts. For example, noncovered local-level general government employees have a mean FAS period of 3.3 years,

Table 8.
Mean and median FAS periods in state and local government pension plan benefit tiers: Unweighted and weighted, by Social Security coverage status, occupation group, and accessibility to new hires (in years)

	Unweighted (per tier)		Weighted by number of active members in tier	
Category	Mean	Median	Mean	Median
All	3.2	3.0	3.3	3.0
Social Security status				
Covered	3.0	3.0	3.2	3.0
Not covered	3.5	3.0	3.6	3.0
Occupation group				
Teachers	3.6	3.0	3.4	3.0
General government				
State level	3.4	3.0	3.2	3.0
Local level	3.3	3.0	3.4	3.0
Public safety	3.0	3.0	2.4	3.0
Accessibility to new hires				
Open	4.1	3.0	3.9	3.0
Closed	2.7	3.0	2.9	3.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table 9.
Weighted FAS periods in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.3	3.0	8.0	1.0	3.0	5.0	5.0
Covered by Social Security							
Total	3.2	3.0	8.0	1.0	3.0	4.0	5.0
Occupation group							
Teachers	2.6	3.0	5.0	1.0	1.0	3.0	3.0
General government							
State level	3.0	3.0	8.0	1.0	2.0	3.5	5.0
Local level	4.3	4.0	8.0	3.0	3.0	5.0	8.0
Public safety	3.0	3.0	5.0	2.0	3.0	3.0	4.0
Accessibility to new hires							
Open	4.0	3.0	8.0	3.0	3.0	5.0	8.0
Closed	2.6	3.0	5.0	1.0	1.0	3.0	4.0
Not covered by Social Security							
Total	3.6	3.0	8.0	1.0	3.0	5.0	5.0
Occupation group							
Teachers	3.8	4.0	8.0	1.0	3.0	5.0	5.0
General government							
State level	3.6	3.0	5.0	3.0	3.0	5.0	5.0
Local level	3.3	3.0	8.0	1.0	1.0	5.0	5.0
Public safety	2.4	3.0	8.0	1.0	1.0	3.0	3.7
Accessibility to new hires							
Open	4.3	5.0	8.0	3.0	3.0	5.0	5.0
Closed	3.2	3.0	8.0	1.0	1.0	5.0	5.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

exactly 1 year shorter than that of covered local-level general government employees. Similarly, noncovered public safety workers have a mean FAS period of 2.4 years, while covered public safety workers have a mean FAS period of 3.0 years. Table 9 thus provides some evidence to support the expectation of a more generous benefit for noncovered workers, even though it applies only to some occupation groups. As a result, a concern remains that for some occupation groups, the typical noncovered benefit formula may be producing less generous outcomes than are intended by tax law (Quinby, Aubry, and Munnell 2020).

A key finding from Table 10 is that the mean FAS period among workers in benefit tiers open to new hires is longer than that for workers in closed tiers, regardless of occupation group. That the finding applies to all occupations suggests a trend toward longer FAS periods for many newly hired workers. In benefit tiers open to new hires, the mean FAS period is longer than that in closed tiers by 2 years or more for local-level general government workers (5.1 years versus 2.6 years) and public safety workers (3.8 years versus 1.8 years). The corresponding differences in median FAS periods are 8.0 years versus 3.0 years for local-level general government workers and 3.0 years versus 1.0 year for public safety workers. The mean FAS period in benefit tiers open to new hires is longer than that in closed tiers by more than 1 year for state-level general government workers (3.9 years versus 2.7 years) and by almost half a year for teachers (3.7 years versus 3.2 years). However, for both of those occupation groups, the median FAS periods are the same in the open and closed benefit tiers.

A key finding from Table 11 (also apparent in Table 9) is that noncovered workers in benefit tiers that are open to new hires have a higher median FAS period (5.0 years) than do covered workers (3.0 years). This is a noticeable difference from the tiers that are closed to new hires, in which covered and noncovered workers have the same median FAS period (3.0 years).

Table 10.
Weighted FAS periods in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.3	3.0	8.0	1.0	3.0	5.0	5.0
Teachers							
Total	3.4	3.0	8.0	1.0	3.0	5.0	5.0
Social Security status							
Covered	2.6	3.0	5.0	1.0	1.0	3.0	3.0
Not covered	3.8	4.0	8.0	1.0	3.0	5.0	5.0
Accessibility to new hires							
Open	3.7	3.0	8.0	2.0	3.0	5.0	5.0
Closed	3.2	3.0	5.0	1.0	1.0	5.0	5.0
State-level general government							
Total	3.2	3.0	8.0	1.0	3.0	4.0	5.0
Social Security status							
Covered	3.0	3.0	8.0	1.0	2.0	3.5	5.0
Not covered	3.6	3.0	5.0	3.0	3.0	5.0	5.0
Accessibility to new hires							
Open	3.9	3.0	8.0	3.0	3.0	5.0	5.0
Closed	2.7	3.0	5.0	1.0	2.0	3.0	4.0
Local-level general government							
Total	3.4	3.0	8.0	1.0	1.0	5.0	5.0
Social Security status							
Covered	4.3	4.0	8.0	3.0	3.0	5.0	8.0
Not covered	3.3	3.0	8.0	1.0	1.0	5.0	5.0
Accessibility to new hires							
Open	5.1	8.0	8.0	3.0	3.0	5.0	8.0
Closed	2.6	3.0	8.0	1.0	1.0	3.8	4.0
Public safety							
Total	2.4	3.0	8.0	1.0	1.0	3.0	4.5
Social Security status							
Covered	3.0	3.0	5.0	2.0	3.0	3.0	4.0
Not covered	2.4	3.0	8.0	1.0	1.0	3.0	3.7
Accessibility to new hires							
Open	3.8	3.0	8.0	3.0	3.0	4.0	5.0
Closed	1.8	1.0	4.0	1.0	1.0	3.0	3.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

Benefit Multiplier

The final parameter analyzed is the benefit multiplier. A typical benefit formula multiplies the worker's FAS by years of service and by the benefit multiplier to yield the pension benefit amount. The benefit multiplier is a percentage factor, usually ranging from 1 percent to 3 percent or more, with the multipliers in most traditional DB plans ranging from 2 percent to 3 percent.

Some benefit tiers employ more than one multiplier, with the values varying depending on the worker's years of service or retirement age. For example, a tier may apply a 2.0 percent multiplier in the first 20 years of service and a 2.25 percent multiplier for years of service above 20. On the other hand, a tier may apply a multiplier of 2.5 percent to calculate benefits claimed at the normal retirement age, but reduce the multiplier by 0.1 percent per year if the worker retires and claims the pension benefit before the normal retirement age.

Table 11.
Weighted FAS periods in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.3	3.0	8.0	1.0	3.0	5.0	5.0
Open to new hires							
Total	3.9	3.0	8.0	2.0	3.0	5.0	5.0
Social Security status							
Covered	4.0	3.0	8.0	3.0	3.0	5.0	8.0
Not covered	4.3	5.0	8.0	3.0	3.0	5.0	5.0
Occupation group							
Teachers	3.7	3.0	8.0	2.0	3.0	5.0	5.0
General government							
State level	3.9	3.0	8.0	3.0	3.0	5.0	5.0
Local level	5.1	8.0	8.0	3.0	3.0	5.0	8.0
Public safety	3.8	3.0	8.0	3.0	3.0	4.0	5.0
Closed to new hires							
Total	2.9	3.0	8.0	1.0	1.0	4.0	5.0
Social Security status							
Covered	2.6	3.0	5.0	1.0	1.0	3.0	4.0
Not covered	3.2	3.0	8.0	1.0	1.0	5.0	5.0
Occupation group							
Teachers	3.2	3.0	5.0	1.0	1.0	5.0	5.0
General government							
State level	2.7	3.0	5.0	1.0	2.0	3.0	4.0
Local level	2.6	3.0	8.0	1.0	1.0	3.8	4.0
Public safety	1.8	1.0	4.0	1.0	1.0	3.0	3.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

More than half of the benefit tiers in this study use only one multiplier. For calculations involving benefit tiers that feature multipliers that vary relative to the normal retirement age, I have used the multiplier applicable at the normal retirement age. For benefit tiers that vary the multiplier depending on the worker's years of service, I have assigned a value based on the multiplier that seemed most representative, or which captured the most common lengths of service. For example, if the tier's formula assigns a multiplier of 2.0 percent for a worker with up to 20 years of service and a multiplier of 2.5 percent for a worker with more than 20 years of service, I assumed a 2.0 percent multiplier because a majority of workers accrue 20 or fewer years of service. Appendix Table D-1 presents a summary statistical comparison of the one-multiplier and two-or-more-multiplier formulas.

Tables 12–15 show the statistics for the benefit multipliers. Table 12 summarizes the weighted and unweighted mean and median benefit multipliers for the benefit tiers in this study. Tables 13–15 show the weighted statistics with detailed cross-tabulations by Social Security coverage (Table 13), by employee occupation (Table 14), and by whether the benefit tier is open or closed to new hires (Table 15).

A key finding from Table 12 is that the median multiplier, weighted for the number of active members in the tiers, is the same for covered and noncovered workers (2.30). Although the unweighted mean and median multipliers and the weighted mean multiplier are higher for noncovered workers (as expected), the equality of the weighted medians conflicts with the expectation of more generous benefits for noncovered workers. A secondary finding from Table 12 is that the multiplier is uniformly higher for public safety workers than for those in other occupations, and for workers in benefit tiers closed to new hires than for those in the open tiers.

A notable finding from Table 13 is that the median multiplier for covered workers is higher in benefit tiers that are open to new hires (2.30) than it is in tiers

Table 12.
Mean and median benefit multipliers in state and local government pension plan benefit tiers: Unweighted and weighted, by Social Security coverage status, occupation group, and accessibility to new hires (in percent)

	Unweighted (per tier)		Weighted by number of active members in tier	
Category	Mean	Median	Mean	Median
All	2.36	2.50	2.27	2.30
Social Security status				
Covered	2.24	2.35	2.11	2.30
Not covered	2.47	2.50	2.36	2.30
Occupation group				
Teachers	2.29	2.40	2.29	2.30
General government				
State level	2.04	2.00	2.21	2.30
Local level	2.32	2.42	2.18	2.20
Public safety	2.58	2.62	2.66	2.70
Accessibility to new hires				
Open	2.29	2.42	2.21	2.20
Closed	2.40	2.50	2.32	2.40

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table 13.
Weighted benefit multipliers in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in percent)

				Percentile			
Category	Mean	Median	Maximum	10th	25th	75th	90th
All	2.27	2.30	3.33	1.82	2.20	2.50	2.50
Covered by Social Security							
Total	2.11	2.30	3.00	1.67	1.67	2.50	2.50
Occupation group							
Teachers	2.27	2.50	2.50	1.67	1.82	2.50	2.50
General government							
State level	2.09	2.30	2.50	1.40	1.67	2.50	2.50
Local level	1.91	1.82	3.00	1.67	1.67	2.05	2.42
Public safety	2.39	2.50	3.00	1.88	2.00	2.75	3.00
Accessibility to new hires							
Open	2.12	2.30	2.50	1.62	1.67	2.50	2.50
Closed	2.11	2.00	3.00	1.67	1.82	2.50	2.50
Not covered by Social Security							
Total	2.36	2.30	3.33	2.20	2.20	2.50	2.50
Occupation group							
Teachers	2.32	2.30	2.50	2.20	2.20	2.40	2.50
General government							
State level	2.40	2.50	2.67	2.20	2.20	2.50	2.55
Local level	2.36	2.20	3.00	2.20	2.20	2.58	2.61
Public safety	2.67	2.69	3.33	2.00	2.50	3.00	3.00
Accessibility to new hires							
Open	2.28	2.20	3.33	2.00	2.20	2.40	2.50
Closed	2.40	2.40	3.33	2.20	2.30	2.50	2.61

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

Table 14.
Weighted benefit multipliers in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	2.27	2.30	3.33	1.82	2.20	2.50	2.50
Teachers							
Total	2.29	2.30	2.50	2.00	2.20	2.50	2.50
Social Security status							
Covered	2.27	2.50	2.50	1.67	1.82	2.50	2.50
Not covered	2.32	2.30	2.50	2.20	2.20	2.40	2.50
Accessibility to new hires							
Open	2.23	2.20	2.50	2.00	2.00	2.50	2.50
Closed	2.33	2.30	2.50	2.20	2.30	2.50	2.50
State-level general government							
Total	2.21	2.30	2.67	1.67	2.00	2.50	2.50
Social Security status							
Covered	2.09	2.30	2.50	1.40	1.67	2.50	2.50
Not covered	2.40	2.50	2.67	2.20	2.20	2.50	2.55
Accessibility to new hires							
Open	2.18	2.30	2.50	1.67	2.20	2.40	2.50
Closed	2.23	2.50	2.67	1.67	2.00	2.50	2.50
Local-level general government							
Total	2.18	2.20	3.00	1.67	1.82	2.42	2.61
Social Security status							
Covered	1.91	1.82	3.00	1.67	1.67	2.05	2.42
Not covered	2.36	2.20	3.00	2.20	2.20	2.58	2.61
Accessibility to new hires							
Open	2.06	2.20	3.00	1.67	1.67	2.30	2.50
Closed	2.23	2.40	3.00	1.67	1.82	2.42	2.61
Public safety							
Total	2.66	2.70	3.33	2.00	2.50	3.00	3.00
Social Security status							
Covered	2.39	2.50	3.00	1.88	2.00	2.75	3.00
Not covered	2.67	2.69	3.33	2.00	2.50	3.00	3.00
Accessibility to new hires							
Open	2.61	2.70	3.33	2.00	2.50	2.70	3.03
Closed	2.72	3.00	3.00	2.15	2.50	3.00	3.00

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

that are closed to new hires (2.00). By contrast, for noncovered workers, the median multiplier is lower in tiers open to new hires (2.20) than it is in tiers closed to new hires (2.40). The results for noncovered workers are consistent with the expectation that pensions have become less generous since the Great Recession. However, as Table 5 also shows for vesting periods, the results for covered workers can be contrary to expectations for state and local pensions overall and in contrast with noncovered workers in particular.

The unexpected findings for covered workers in this study, especially in benefit tiers open to new hires, have several potential explanations. First, as noted earlier, this article's population of Social Security–covered benefit tiers and their active members is less than fully representative of covered workers as a whole. As a result, the findings may reflect a disproportionate influence from states or systems with more benefit tiers or active members or both. The cross-tabulations by occupation in Table 13 lend credence to

Table 15.
Weighted benefit multipliers in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	2.27	2.30	3.33	1.82	2.20	2.50	2.50
Open to new hires							
Total	2.21	2.20	3.33	1.67	2.00	2.50	2.50
Social Security status							
Covered	2.12	2.30	2.50	1.62	1.67	2.50	2.50
Not covered	2.28	2.20	3.33	2.00	2.20	2.40	2.50
Occupation group							
Teachers	2.23	2.20	2.50	2.00	2.00	2.50	2.50
General government							
State level	2.18	2.30	2.50	1.67	2.20	2.40	2.50
Local level	2.06	2.20	3.00	1.67	1.67	2.30	2.50
Public safety	2.61	2.70	3.33	2.00	2.50	2.70	3.03
Closed to new hires							
Total	2.32	2.40	3.33	1.82	2.20	2.50	2.50
Social Security status							
Covered	2.11	2.00	3.00	1.67	1.82	2.50	2.50
Not covered	2.40	2.40	3.33	2.20	2.30	2.50	2.61
Occupation group							
Teachers	2.33	2.30	2.50	2.20	2.30	2.50	2.50
General government							
State level	2.23	2.50	2.67	1.67	2.00	2.50	2.50
Local level	2.23	2.40	3.00	1.67	1.82	2.42	2.61
Public safety	2.72	3.00	3.00	2.15	2.50	3.00	3.00

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: Data are weighted by number of active members in the tier.

this conclusion. Second, as has also been mentioned, the new-hire tier-accessibility classification is itself not without some qualification. In particular, the designation of "open to new hires" does not necessarily mean that only recently hired workers are included or that a benefit formula has recently changed. Finally, this article presents summary statistics for all benefit tiers and active members in the study population. An alternative research approach might measure changes in benefit formula factors only for tiers and members in which a change in vesting period, FAS period, or benefit multiplier occurred.

The primary finding from Table 14 is that for all occupation groups, the median multiplier is higher in benefit tiers that are closed to new hires than it is in open tiers. To the degree that benefit tiers open to new hires reflect more recent changes in the benefit formula, the benefit multiplier is therefore declining across all occupation groups. The widest difference arises among public safety workers, for whom the median multiplier is 3.00 in closed tiers and 2.70 in open tiers. Among local-level general government workers, the multiplier is 2.40 in closed tiers and 2.20 in open tiers. For state-level general government employees, the multiplier is 2.50 in closed tiers and 2.30 in open tiers, and for teachers, the multipliers are 2.30 and 2.20, respectively. This finding suggests that the contrast in Table 12 between closed and open tiers is most likely due to the unique distribution of the covered tiers and workers in the study population.

The results in Table 15 complement those of Table 13, showing that the median multiplier declines for all occupation groups if measured by the difference between closed and open benefit tiers. Like Table 13, Table 15 highlights a distinct difference between covered and noncovered workers among benefit tiers that are open to new hires. In tiers closed to new hires, the median multiplier is considerably higher for noncovered workers (2.40) than for covered workers (2.00). This conforms to the expectation

that benefit designs for noncovered workers will be more generous than those for covered workers. However, among benefit tiers that are open to new hires, the finding is reversed, in that the median multiplier is higher among covered workers (2.30) than noncovered workers (2.20). As noted earlier, this article's covered benefit tiers and the covered worker population reflect a narrower and more distinct distribution than its noncovered population. Future research may therefore pursue alternative strategies to highlight changes in benefit design and eligibility among covered workers.

Conclusion

This article provides a quantitative analysis of some key features of state and local pensions, including vesting requirements, the FAS period, and the benefit formula multiplier. This analysis focuses on public pensions in states that account for large numbers of noncovered public-sector workers. Among its unique contributions is the weighting of the summary statistics by population—in this instance, by the active membership in each benefit tier. This weighting mechanism is of special importance for occupation groups such as teachers, whose number of benefit tiers are underrepresented relative to active members, and public safety workers, whose tiers are overrepresented relative to active membership.

The findings in this article provide supporting evidence of a benefit retrenchment across state and local pensions, at least in states where noncovered employment is most common. Benefit tiers that are not open to new hires tend to have shorter vesting periods, shorter FAS periods (resulting in higher FASs), and higher benefit multipliers. As states have sought to reduce pension expenses, they have tightened eligibility requirements by increasing vesting periods, and have lowered benefits by increasing the FAS period and reducing the benefit formula's multiplier.

This is not particularly surprising, given the recent economic conditions and plan funding levels that have led to pension reforms. However, the analysis shows that those changes have not affected all types of state and local workers equally. Changes in the FAS period, for example, affect public safety workers and local-level general government employees more than they affect teachers.

Further research can expand the number of states, pension systems, and benefit tiers studied, as well as the number of variables and pension features analyzed. For example, the relative generosity or restrictiveness of a pension system's benefit tiers can be understood better in the context of the amounts that those systems and their members contribute to them. Therefore, future research should compare and analyze employee and employer contributions. Future studies should also analyze the parameters of early and normal retirement, as well as COLAs. New research can also analyze a greater number of covered pension systems and assess the benefit tiers that are more representative of the covered systems. The differences between occupation groups, especially the distinctive findings for teachers and public safety workers, suggest additional avenues for investigation.

Finally, the onset of COVID-19 and the spread of the coronavirus in the United States may affect state and local revenues and put more pressure on financially strained governments. Although the long-term impact of the pandemic is uncertain, the reduction in employment and in the projected national average wage is estimated to surpass the changes wrought by the Great Recession. As the Great Recession led to changes in pension eligibility and benefit generosity, it is likely that COVID-19 and the year 2020 will prove to be another inflection point for state and local pensions.

Appendix A. Pension Systems Reviewed for This Analysis

Table A-1.
State and local government pension systems analyzed in this study

State and system	Last year of data	Social Security coverage [a]	Primary benefit design [b]	Vesting period (years)	FAS period (years)	Multiplier (%)	Benefit tiers	Active members
All	. . .	. . .	. . .	. . .	. . .	. . .	339	6,186,461
California	. . .	. . .	. . .	. . .	. . .	. . .	106	1,681,738
State level								
California Public Employees' Retirement System (CalPERS)	2018	Some	DB	c	c	c	21	855,538
California Teachers' Retirement Fund	2018	No	DB	5	3	2.4	2	449,595
University of California Retirement Plan	2019	Yes	DB	5	3	2.5	1	127,927
Local level								
Los Angeles County Employee Retirement System	2018	No	DB	5	3	c	9	98,474
San Francisco City & County Retirement System	2018	Yes	DB	c	c	c	12	33,946
Los Angeles City Employee Retirement System (LACERS)	2019	No	DB	10	3	1.5	2	26,632
San Diego County Employee Retirement Association	2018	Yes	DB	5	3	c	8	17,869
City of Los Angeles Fire and Police Pension Plan	2018	No	DB	20	2	3.0	5	13,263
Sacramento County Employee Retirement System	2019	Yes	DB	5	3	c	9	12,678
Alameda County Employee Retirement System	2018	Yes	DB	5	3	c	9	11,349
City of Los Angeles Water & Power	2019	No	DB	5	3	2.1	2	10,114
Contra County Employee Retirement Association	2018	Yes	DB	5	3	c	12	10,021
Kern County Employee Retirement Association	2018	Yes	DB	10	3	c	6	8,789
San Diego City Employee Retirement System	2019	Yes	DB	10	3	c	8	5,543
Colorado	. . .	. . .	. . .	. . .	. . .	. . .	23	216,531
State level								
Colorado Public Employees Retirement Association	2018	No	DB	5	5	2.5	21	207,437
Local level								
Denver Employees Retirement Plan	2018	Yes	DB	5	3	1.5	2	9,094
Connecticut	. . .	. . .	. . .	. . .	. . .	. . .	16	107,602
State level								
Connecticut Teachers	2018	No	DB	10	3	2.0	1	50,594
Connecticut State Employees' Retirement System	2018	Yes	DB	c	c	c	11	46,912
Connecticut Municipal Employees' Retirement System	2018	Some	DB	5	3	c	4	10,096

(Continued)

Table A-1.
State and local government pension systems analyzed in this study—*Continued*

State and system	Last year of data	Social Security coverage [a]	Primary benefit design [b]	Vesting period (years)	FAS period (years)	Multiplier (%)	Benefit tiers	Active members
Georgia	. . .	. . .	. . .	. . .	. . .	. . .	11	328,030
State level								
Teachers Retirement System of Georgia (TRS)	2018	Some	DB	10	2	2.0	1	226,039
Employees' Retirement System of Georgia (ERS)	2018	Yes	Hybrid	10	2	1.0	3	60,906
Georgia Public School Employees Retirement System	2017	Some	[d] DB	10	...	...	1	35,509
Local level								
Atlanta General Employees Pension Fund/Employee Retirement System	2018	No	DB	15	6	1.0	3	3,830
Atlanta Police Fund/Atlanta Police	2018	No	DB	15	6	1.0	3	1,746
Illinois	. . .	. . .	. . .	. . .	. . .	. . .	18	555,171
State level								
Illinois Municipal Retirement Fund	2018	Yes	DB	10	8	1.667	2	172,335
Illinois Teachers Retirement System	2018	No	DB	10	8	2.2	2	160,425
Illinois State Universities Retirement System	2018	No	DB	10	8	2.2	2	62,844
Illinois State Employee Retirement System	2018	Yes	DB	10	8	1.67	2	61,397
Local level								
Municipal Employees’ Annuity and Benefit Fund of Chicago	2018	No	DB	10	8	2.4	3	31,285
Public School Teachers’ Pension and Retirement Fund of Chicago	2019	No	DB	5	4	2.2	1	29,295
Cook County Employees' Annuity Benefit Fund	2018	Yes	DB	10	8	2.4	2	19,671
Policemen’s Annuity and Benefit Fund of Chicago	2018	No	DB	20	8	2.5	2	13,438
Firemen’s Annuity and Benefit Fund of Chicago	2018	No	DB	10	8	2.5	2	4,481
Kentucky	. . .	. . .	. . .	. . .	. . .	. . .	20	203,682
State level								
Kentucky County Employees Retirement System	2018	Yes	Cash balance	5	...	...	7	91,081
Kentucky Teachers Retirement System	2019	No	DB	5	3	2.0	4	72,647
Kentucky Employees’ Retirement System	2018	Yes	Cash balance	5	...	...	9	39,954

(Continued)

Table A-1.
State and local government pension systems analyzed in this study—*Continued*

State and system	Last year of data	Social Security coverage [a]	Primary benefit design [b]	Vesting period (years)	FAS period (years)	Multiplier (%)	Benefit tiers	Active members
Louisiana	. . .	. . .	. . .	. . .	. . .	. . .	37	173,268
State level								
Louisiana Teachers Retirement System	2019	No	DB	5	5	2.5	4	83,786
Louisiana State Employees' Retirement System	2019	No	DB	c	c	c	7	38,239
Louisiana Parochial Employees Retirement System	2018	Some	DB	7	c	c	4	16,456
Louisiana School Employees Retirement System	2019	No	DB	5	5	2.5	3	11,920
Municipal Employees Retirement System of Louisiana	2019	Some	DB	7	5	c	6	6,858
Louisiana Municipal Police Employees Retirement System	2019	No	DB	12	5	3.0	2	5,729
Louisiana Firefighters Retirement System	2019	No	DB	12	3	3.33	1	4,446
Local level								
Baton Rouge City Parish Retirement System	2018	No	DB	10	5	3.0	8	2,961
New Orleans Employee Retirement System	2018	Yes	DB	5	5	1.9	2	2,873
Maine	. . .	. . .	. . .	. . .	. . .	. . .	8	39,876
State level								
Maine Public Employees Retirement System/Maine State & Teachers	2019	No	DB	5	3	2.0	8	39,876
Massachusetts	. . .	. . .	. . .	. . .	. . .	. . .	19	227,669
State level								
Massachusetts Teachers' Retirement System	2019	No	DB	10	5	2.5	5	94,103
Massachusetts State Employees' Retirement System	2019	No	DB	10	5	2.5	4	87,969
Local level								
Boston Retirement Board	2018	No	DB	10	5	2.5	2	20,995
Middlesex Regional Retirement Board	2018	No	DB	10	5	2.5	2	9,168
Worcester Regional Retirement Board	2018	No	DB	10	5	2.5	2	6,773
Plymouth County Retirement Board	2019	No	DB	10	5	2.5	2	5,670
Cambridge Retirement System	2018	No	DB	10	5	2.5	2	2,991

(Continued)

Table A-1.
State and local government pension systems analyzed in this study—*Continued*

State and system	Last year of data	Social Security coverage [a]	Primary benefit design [b]	Vesting period (years)	FAS period (years)	Multiplier (%)	Benefit tiers	Active members
Missouri	. . .	. . .	. . .	. . .	. . .	. . .	25	226,211
State level								
Missouri Public Schools Retirement System	2018	No	DB	5	3	2.5	2	78,700
Missouri Public Education Employers Retirement System	2018	Yes	DB	5	3	1.61	1	48,549
Missouri State Employees Retirement System	2019	Yes	DB	10	3	2.5	4	46,864
Missouri Local Government Employees Retirement System (LAGERS)	2019	Yes	DB	5	5	c	6	34,523
Missouri Department of Transportation & Patrol/Missouri DOT & Highway	2019	Yes	DB	5	3	1.7	7	7,421
Local level								
Kansas City Missouri Employee Retirement System/Kansas City ERS	2019	Yes	DB	10	...	c	4	5,104
St. Louis Public School Retirement System/St. Louis School Employees	2018	Yes	DB	5	3	2.0	1	5,050
Nevada	. . .	. . .	. . .	. . .	. . .	. . .	6	107,506
State level								
Nevada Public Employees Retirement System	2018	No	DB	5	3	2.25	6	107,506
New Jersey	. . .	. . .	. . .	. . .	. . .	. . .	21	397,156
State level								
New Jersey Public Employees' Retirement System (PERS)	2018	Yes	DB	10	5	1.67	10	215,208
New Jersey Teachers' Pension and Annuity Fund	2018	Yes	DB	10	5	1.67	5	141,128
New Jersey Police and Firemen's Retirement System (PFRS)	2018	Some	DB	10	3	2.0	6	40,820
Ohio	. . .	. . .	. . .	. . .	. . .	. . .	15	635,023
State level								
Ohio Public Employees Retirement System	2018	No	DB	c	c	c	9	284,297
State Teachers Retirement System of Ohio	2019	No	DB	5	5	2.2	2	163,479
School Employees Retirement System of Ohio	2018	No	DB	10	3	2.2	2	158,343
Ohio Police and Fire Pension Fund	2018	No	DB	15	3	2.5	2	28,904

(Continued)

Table A-1.
State and local government pension systems analyzed in this study—*Continued*

State and system	Last year of data	Social Security cover-age [a]	Primary benefit design [b]	Vesting period (years)	FAS period (years)	Multiplier (%)	Benefit tiers	Active members
Texas	. . .	. . .	. . .	. . .	. . .	. . .	14	1,286,998
State level								
Teacher Retirement System of Texas	2019	No	DB	5	5	2.3	3	872,978
Employees Retirement System of Texas	2018	Yes	DB	10	4	2.3	2	141,535
Texas County and District Retirement System	2018	Yes	Cash balance	8	c	c	1	137,528
Texas Municipal Retirement System (TMRS)	2018	Some	Cash balance	c	c	c	2	116,786
Local level								
City of Austin Employees Retirement System	2018	Yes	DB	5	3	2.5	2	9,838
Dallas Police and Fire Pension System	2018	Yes	DB	5	5	2.5	2	5,012
Houston Firefighters Relief and Retirement Fund	2016	No	DB	10	6.5	2.25	2	3,321

SOURCES: Author's tabulations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

NOTE: . . . = not applicable.

a. "Yes" means that 90 percent or more of members are covered, "no" means that less than 10 percent of members are covered.

b. California, Colorado, Connecticut, and Ohio offer hybrid and DC pension options to some employees. This analysis omits those options.

c. Varies from tier to tier.

d. Provides a base-rate flat monthly benefit equal to $15 times the years of service.

Appendix B. Example of Pension Report of Active Members by Age and Years of Service

Table B-1.
Illustrative example of pension plan active-member distribution, by age and years of service: Teachers in the California Public Employees' Retirement System (CalPERS), 2018

Age	Total	Years of service					
		0–4	5–9	10–14	15–19	20–24	25 or more
All	323,707	144,753	57,728	51,030	36,623	18,516	15,057
15–24	12,038	12,010	28	. . .	. . .	. . .	. . .
25–29	28,633	26,756	1,824	53	. . .	. . .	. . .
30–34	31,273	22,314	6,769	2,146	44	. . .	. . .
35–39	34,376	18,779	7,410	6,218	1,912	55	2
40–44	35,880	16,171	7,044	6,643	4,753	1,244	25
45–49	41,350	16,052	8,317	7,310	5,841	2,949	881
50–54	45,924	13,539	9,265	8,859	6,922	3,942	3,397
55–59	47,009	10,569	8,543	9,711	8,278	4,745	5,163
60–64	32,367	5,751	5,682	6,914	6,230	3,903	3,887
65 or older	14,857	2,812	2,846	3,176	2,643	1,678	1,702

SOURCE: CalPERS *Comprehensive Annual Financial Report, 2018–2019* (https://publicplansdata.org/reports/CA_CA-CALPERS_CAFR_2019_9.pdf).

NOTE: . . . = not applicable.

Appendix C. Unweighted Statistics

Table C-1.
Unweighted vesting periods in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	8.0	7.0	25.0	5.0	5.0	10.0	10.0
Covered by Social Security							
Total	8.0	7.0	25.0	5.0	5.0	10.0	10.0
Occupation group							
Teachers	7.5	7.5	10.0	5.0	5.0	10.0	10.0
General government							
State level	7.7	10.0	10.0	5.0	5.0	10.0	10.0
Local level	7.7	9.0	10.0	5.0	5.0	10.0	10.0
Public safety	8.5	5.0	25.0	5.0	5.0	10.0	16.0
Accessibility to new hires							
Open	6.9	5.0	25.0	5.0	5.0	10.0	10.0
Closed	8.6	10.0	25.0	5.0	5.0	10.0	10.0
Not covered by Social Security							
Total	8.1	5.0	20.0	5.0	5.0	10.0	12.0
Occupation group							
Teachers	6.4	5.0	10.0	5.0	5.0	10.0	10.0
General government							
State level	6.6	5.0	10.0	5.0	5.0	10.0	10.0
Local level	8.1	10.0	15.0	5.0	5.0	10.0	10.0
Public safety	10.4	10.0	20.0	5.0	5.0	14.3	20.0
Accessibility to new hires							
Open	8.3	8.5	20.0	5.0	5.0	10.0	12.0
Closed	8.0	5.0	20.0	5.0	5.0	10.0	12.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-2.
Unweighted vesting periods in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	8.0	7.0	25.0	5.0	5.0	10.0	10.0
Teachers							
Total	6.7	5.0	10.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	7.5	7.5	10.0	5.0	5.0	10.0	10.0
Not covered	6.4	5.0	10.0	5.0	5.0	10.0	10.0
Accessibility to new hires							
Open	6.6	5.0	10.0	5.0	5.0	10.0	10.0
Closed	6.8	5.0	10.0	5.0	5.0	10.0	10.0
State-level general government							
Total	7.2	5.0	10.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	7.7	10.0	10.0	5.0	5.0	10.0	10.0
Not covered	6.6	5.0	10.0	5.0	5.0	10.0	10.0
Accessibility to new hires							
Open	7.5	7.5	10.0	5.0	5.0	10.0	10.0
Closed	7.1	5.0	10.0	5.0	5.0	10.0	10.0
Local-level general government							
Total	7.8	10.0	15.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	7.7	9.0	10.0	5.0	5.0	10.0	10.0
Not covered	8.1	10.0	15.0	5.0	5.0	10.0	10.0
Accessibility to new hires							
Open	7.2	5.0	15.0	5.0	5.0	10.0	10.0
Closed	8.2	10.0	15.0	5.0	5.0	10.0	10.0
Public safety							
Total	9.2	10.0	25.0	5.0	5.0	10.0	20.0
Social Security status							
Covered	8.5	5.0	25.0	5.0	5.0	10.0	16.0
Not covered	10.4	10.0	20.0	5.0	5.0	14.3	20.0
Accessibility to new hires							
Open	8.6	5.0	25.0	5.0	5.0	10.0	15.0
Closed	9.6	10.0	25.0	5.0	5.0	10.0	20.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-3.
Unweighted vesting periods in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	8.0	7.0	25.0	5.0	5.0	10.0	10.0
Open to new hires							
Total	7.6	5.0	25.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	6.9	5.0	25.0	5.0	5.0	10.0	10.0
Not covered	8.3	8.5	20.0	5.0	5.0	10.0	12.0
Occupation group							
Teachers	6.6	5.0	10.0	5.0	5.0	10.0	10.0
General government							
State level	7.5	7.5	10.0	5.0	5.0	10.0	10.0
Local level	7.2	5.0	15.0	5.0	5.0	10.0	10.0
Public safety	8.6	5.0	25.0	5.0	5.0	10.0	15.0
Closed to new hires							
Total	8.3	10.0	25.0	5.0	5.0	10.0	10.0
Social Security status							
Covered	8.6	10.0	25.0	5.0	5.0	10.0	10.0
Not covered	8.0	5.0	20.0	5.0	5.0	10.0	12.0
Occupation group							
Teachers	6.8	5.0	10.0	5.0	5.0	10.0	10.0
General government							
State level	7.1	5.0	10.0	5.0	5.0	10.0	10.0
Local level	8.2	10.0	15.0	5.0	5.0	10.0	10.0
Public safety	9.6	10.0	25.0	5.0	5.0	10.0	20.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-4.
Unweighted FAS periods in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.2	3.0	8.0	1.0	3.0	4.0	5.0
Covered by Social Security							
Total	3.0	3.0	8.0	1.0	3.0	3.0	5.0
Occupation group							
Teachers	3.2	3.0	5.0	2.8	3.0	3.0	5.0
General government							
State level	3.4	3.0	8.0	2.0	3.0	4.0	5.0
Local level	3.1	3.0	8.0	1.0	2.3	4.0	5.0
Public safety	2.7	3.0	5.0	1.0	2.0	3.0	3.2
Accessibility to new hires							
Open	3.8	3.0	8.0	3.0	3.0	5.0	5.0
Closed	2.6	3.0	5.0	1.0	1.0	3.0	4.6
Not covered by Social Security							
Total	3.5	3.0	8.0	1.0	3.0	5.0	5.0
Occupation group							
Teachers	3.7	3.0	8.0	3.0	3.0	5.0	5.0
General government							
State level	3.4	3.0	5.0	3.0	3.0	3.0	5.0
Local level	3.6	3.0	8.0	1.0	3.0	5.0	5.0
Public safety	3.3	3.0	8.0	1.0	3.0	4.8	5.1
Accessibility to new hires							
Open	4.4	5.0	8.0	3.0	3.0	5.0	6.0
Closed	2.9	3.0	8.0	1.0	3.0	3.0	4.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-5.
Unweighted FAS periods in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.2	3.0	8.0	1.0	3.0	4.0	5.0
Teachers							
Total	3.6	3.0	8.0	3.0	3.0	5.0	5.0
Social Security status							
Covered	3.2	3.0	5.0	2.8	3.0	3.0	5.0
Not covered	3.7	3.0	8.0	3.0	3.0	5.0	5.0
Accessibility to new hires							
Open	4.1	3.0	8.0	3.0	3.0	5.0	5.0
Closed	3.2	3.0	5.0	3.0	3.0	3.0	5.0
State-level general government							
Total	3.4	3.0	8.0	3.0	3.0	3.3	5.0
Social Security status							
Covered	3.4	3.0	8.0	2.0	3.0	4.0	5.0
Not covered	3.4	3.0	5.0	3.0	3.0	3.0	5.0
Accessibility to new hires							
Open	4.1	4.0	8.0	3.0	3.0	5.0	5.0
Closed	3.1	3.0	5.0	2.6	3.0	3.0	4.4
Local-level general government							
Total	3.3	3.0	8.0	1.0	3.0	5.0	5.0
Social Security status							
Covered	3.1	3.0	8.0	1.0	2.3	4.0	5.0
Not covered	3.6	3.0	8.0	1.0	3.0	5.0	5.0
Accessibility to new hires							
Open	4.4	5.0	8.0	3.0	3.0	5.0	5.1
Closed	2.6	3.0	8.0	1.0	1.0	3.0	4.6
Public safety							
Total	3.0	3.0	8.0	1.0	2.0	3.0	5.0
Social Security status							
Covered	2.7	3.0	5.0	1.0	2.0	3.0	3.2
Not covered	3.3	3.0	8.0	1.0	3.0	4.8	5.1
Accessibility to new hires							
Open	4.0	3.0	8.0	3.0	3.0	5.0	5.0
Closed	2.4	3.0	6.5	1.0	1.0	3.0	3.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-6.
Unweighted FAS periods in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in years)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	3.2	3.0	8.0	1.0	3.0	4.0	5.0
Open to new hires							
Total	4.1	3.0	8.0	3.0	3.0	5.0	5.0
Social Security status							
Covered	3.8	3.0	8.0	3.0	3.0	5.0	5.0
Not covered	4.4	5.0	8.0	3.0	3.0	5.0	6.0
Occupation group							
Teachers	4.1	3.0	8.0	3.0	3.0	5.0	5.0
General government							
State level	4.1	4.0	8.0	3.0	3.0	5.0	5.0
Local level	4.4	5.0	8.0	3.0	3.0	5.0	5.1
Public safety	4.0	3.0	8.0	3.0	3.0	5.0	5.0
Closed to new hires							
Total	2.7	3.0	8.0	1.0	2.0	3.0	4.0
Social Security status							
Covered	2.6	3.0	5.0	1.0	1.0	3.0	4.6
Not covered	2.9	3.0	8.0	1.0	3.0	3.0	4.0
Occupation group							
Teachers	3.2	3.0	5.0	3.0	3.0	3.0	5.0
General government							
State level	3.1	3.0	5.0	2.6	3.0	3.0	4.4
Local level	2.6	3.0	8.0	1.0	1.0	3.0	4.6
Public safety	2.4	3.0	6.5	1.0	1.0	3.0	3.0

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-7.
Unweighted benefit multipliers in state and local government pension plan benefit tiers by Social Security coverage status, cross-tabulated by occupation group and tier accessibility to new hires (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	2.36	2.50	3.33	1.67	2.00	2.61	3.00
Covered by Social Security							
Total	2.24	2.35	3.00	1.51	1.82	2.62	3.00
Occupation group							
Teachers	1.99	1.82	2.50	1.66	1.71	2.38	2.50
General government							
State level	1.80	1.75	2.50	1.25	1.40	2.00	2.50
Local level	2.20	2.30	3.00	1.62	1.82	2.50	2.62
Public safety	2.53	2.62	3.00	1.70	2.03	3.00	3.00
Accessibility to new hires							
Open	2.12	2.00	3.00	1.50	1.67	2.50	2.70
Closed	2.30	2.42	3.00	1.60	1.82	2.71	3.00
Not covered by Social Security							
Total	2.47	2.50	3.33	2.00	2.20	2.50	3.00
Occupation group							
Teachers	2.37	2.50	3.33	2.00	2.20	2.50	2.50
General government							
State level	2.36	2.50	2.67	2.00	2.20	2.50	2.50
Local level	2.46	2.50	3.00	2.04	2.40	2.50	3.00
Public safety	2.63	2.62	3.33	2.00	2.50	3.00	3.00
Accessibility to new hires							
Open	2.43	2.50	3.33	2.00	2.20	2.50	3.00
Closed	2.50	2.50	3.33	2.00	2.35	2.50	3.00

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-8.
Unweighted benefit multipliers in state and local government pension plan benefit tiers by occupation group, cross-tabulated by Social Security coverage status and tier accessibility to new hires (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	2.36	2.50	3.33	1.67	2.00	2.61	3.00
Teachers							
Total	2.29	2.40	3.33	1.93	2.00	2.50	2.50
Social Security status							
Covered	1.99	1.82	2.50	1.66	1.71	2.38	2.50
Not covered	2.37	2.50	3.33	2.00	2.20	2.50	2.50
Accessibility to new hires							
Open	2.23	2.20	2.50	2.00	2.00	2.50	2.50
Closed	2.34	2.50	3.33	1.86	2.20	2.50	2.50
State-level general government							
Total	2.04	2.00	2.67	1.31	1.67	2.50	2.50
Social Security status							
Covered	1.80	1.75	2.50	1.25	1.40	2.00	2.50
Not covered	2.36	2.50	2.67	2.00	2.20	2.50	2.50
Accessibility to new hires							
Open	2.03	2.25	2.50	1.27	1.67	2.50	2.50
Closed	2.04	2.00	2.67	1.40	1.67	2.50	2.50
Local-level general government							
Total	2.32	2.42	3.00	1.67	2.00	2.50	3.00
Social Security status							
Covered	2.20	2.30	3.00	1.62	1.82	2.50	2.62
Not covered	2.46	2.50	3.00	2.04	2.40	2.50	3.00
Accessibility to new hires							
Open	2.20	2.40	3.00	1.50	1.75	2.50	2.50
Closed	2.39	2.47	3.00	1.91	2.17	2.61	3.00
Public safety							
Total	2.58	2.62	3.33	2.00	2.49	3.00	3.00
Social Security status							
Covered	2.53	2.62	3.00	1.70	2.03	3.00	3.00
Not covered	2.63	2.62	3.33	2.00	2.50	3.00	3.00
Accessibility to new hires							
Open	2.51	2.56	3.33	2.00	2.25	2.70	3.00
Closed	2.62	2.65	3.33	2.00	2.50	3.00	3.00

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Table C-9.
Unweighted benefit multipliers in state and local government pension plan benefit tiers by tier accessibility to new hires, cross-tabulated by Social Security coverage status and occupation group (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
All	2.36	2.50	3.33	1.67	2.00	2.61	3.00
Open to new hires							
Total	2.29	2.42	3.33	1.62	2.00	2.50	3.00
Social Security status							
Covered	2.12	2.00	3.00	1.50	1.67	2.50	2.70
Not covered	2.43	2.50	3.33	2.00	2.20	2.50	3.00
Occupation group							
Teachers	2.23	2.20	2.50	2.00	2.00	2.50	2.50
General government							
State level	2.03	2.25	2.50	1.27	1.67	2.50	2.50
Local level	2.20	2.40	3.00	1.50	1.75	2.50	2.50
Public safety	2.51	2.56	3.33	2.00	2.25	2.70	3.00
Closed to new hires							
Total	2.40	2.50	3.33	1.78	2.00	2.62	3.00
Social Security status							
Covered	2.30	2.42	3.00	1.60	1.82	2.71	3.00
Not covered	2.50	2.50	3.33	2.00	2.35	2.50	3.00
Occupation group							
Teachers	2.34	2.50	3.33	1.86	2.20	2.50	2.50
General government							
State level	2.04	2.00	2.67	1.40	1.67	2.50	2.50
Local level	2.39	2.47	3.00	1.91	2.17	2.61	3.00
Public safety	2.62	2.65	3.33	2.00	2.50	3.00	3.00

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Appendix D. Comparing One-Multiplier and Two-or-More Multiplier Formulas

Table D-1.
Benefit multipliers in state and local government pension plan benefit tiers using one multiplier for all benefit formulas or different multipliers for workers in different circumstances (in percent)

Category	Mean	Median	Maximum	Percentile			
				10th	25th	75th	90th
			Unweighted (per tier)				
Number of multipliers							
One	2.27	2.40	3.33	1.67	2.00	2.50	3.00
Two or more	2.46	2.50	3.00	2.00	2.20	2.70	3.00
			Weighted by number of active members in tier				
Number of multipliers							
One	2.22	2.30	3.33	1.67	2.00	2.42	2.50
Two or more	2.36	2.40	3.00	2.20	2.20	2.50	2.50

SOURCES: Author's calculations using data from SLEPP database, PPD, and plan actuarial-valuation and comprehensive annual financial reports.

Notes

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[1] The data, current to 2016, are from the Employee-Employer File of the 1% Continuous Work History Sample.

[2] For noncovered pensions that are not paid monthly, such as a lump-sum DC account balance, SSA converts the amount into a monthly equivalent for use in the WEP and GPO calculations.

[3] Not all public-sector entities are permanent, however. In Virginia, for example, the number of municipal governments declined from 231 in 1997 to 228 in 2017 (Census Bureau 2020).

[4] Studies such as Biggs (2011) and Brown and Wilcox (2009) have questioned the soundness of some GASB guidelines.

[5] Furthermore, state and local pensions are not regulated under the Employee Retirement Income Security Act (ERISA) of 1974, which sets minimum standards for participation, vesting, and funding (Munnell, Haverstick, and Soto 2007).

[6] I also relied on Quinby, Aubry, and Munnell (2020) for information on several county government plans in Massachusetts.

[7] The total number of noncovered state and local workers is uncertain. Government Accountability Office (2005) estimated the number of noncovered state and local workers as nearly 5 million in 2004, and Brown and Weisbenner (2013) cited the figure as 5.25 million. Data from SSA's Continuous Work History Sample (CWHS) suggest that noncovered workers numbered approximately 6.5 million in 2016. In the past, the U.S. House of Representatives used CWHS data to report basic statistics on Social Security, including the number of noncovered state and local government workers, in *Background Material and Data on the Programs within the Jurisdiction of the Committee on Ways and Means* (the "Green Book"). The most recent estimate I could find appeared in the 2004 Green Book, which reported that the number of noncovered state and local government workers nationwide (including U.S. territories) was 6.7 million in 2001.

[8] Examples of the other SLEPP database categories include "depends," "generally," "generally not," and "varies by jurisdiction." Appendix Table A-1 applies the catch-all designation "some" for these categories.

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