Pensions in the Public Sector

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Pension Research Council
The Wharton School of the University of Pennsylvania

PENN

University of Pennsylvania Press
Philadelphia

Printed in the United States of America on acid-free paper

10 9 8 7 6 5 4 3 2 1

Published by
University of Pennsylvania Press
Philadelphia, Pennsylvania 19104-4011

Library of Congress Cataloging-in-Publication Data

Pensions in the public sector / edited by Olivia S. Mitchell and
Edwin C. Hustead
p. cm. "Pension Research Council Publications"
Includes bibliographical records and index
ISBN 0-8122-3578-9 (alk. paper)
1. State governments—Officials and employees—Pensions—
United States. 2. Local officials and employees—Pensions—
United States. 3. United States—Officials and employees—
Pensions. I. Mitchell, Olivia S. II. Hustead, Edwin C., 1942–.
III. Wharton School. Pension Research Council.
JK791 .P45 2000
331.24/29135173.—dc21 00-059384

Chapter 2
Developments in State and Local Pension Plans

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In this chapter we explore aspects of the history, financing, benefit structure, and governance of pension plans covering state and local government employees in the United States. State and local pension plans cover a wide range of employees including uniformed workers (firefighters and police), teachers, members of the judiciary, and other members of state governments and local municipalities. These plans are the subject of much interest because they are so large—they cover close to 13 million employees, pay benefits to more than 5 million beneficiaries, and control $2.4 trillion in invested plan assets.[1] And as we show in this chapter, these plans are extremely diverse in terms of design, investment policy, and governance, in large part because of their different histories and constituencies. Yet despite the differences across plans, they all face some similar challenges and opportunities in the years to come.

In order to understand how these state and local plans work, it is useful to recall that public sector pension plans in the United States tend to be of the defined benefit (DB) variety. This means that retiring vested employees receive a specified retirement benefit throughout the course of their retirement that depends on age, years of service, and salary.[2] In the case of DB plans, required contributions are typically based on actuarial valuations, and investments are managed by financial experts selected by the pension board. By contrast, in the private sector, many people are covered by defined contribution (DC) plans where the amounts contributed to the plan are specified, but not the benefit payouts.[3] In the DC case, plan participants generally decide where to direct their investments, given a set of options established by the employer. Retirement benefits are then paid from the contributions and investment income that accumulate in the participants'

accounts. If the funds in the accounts are not sufficient to pay benefits over the course of retirement, retirees must turn to other sources.[4]

Despite the large size and impact of public pensions, there remains much to learn about how these institutions function. Although the federal Employee Retirement Income Security Act of 1974 (ERISA) requires private pensions to furnish periodic and standardized reports to plan participants and the U.S. Department of Labor (McGill et al. 1997), state and local retirement plans are exempt from ERISA's reporting requirements. However, to comply with generally accepted accounting principles, state and local governments are bound to financial measurement and reporting requirements established by the Governmental Accounting Standards Board (GASB). For state and local retirement plans (and their sponsoring governments) the GASB's standards establish a uniform format for reporting financial information.

In order to explore key aspects of these pension systems for the present study, this chapter relies on several different sources including Bureau of Labor Statistics surveys on state and local pension plans (BLS, various years), Census of Government reports, and the PENDAT surveys conducted by the Public Pension Coordinating Council (hereafter PPCC; see Zorn 1997). These data, taken together, afford a useful set of insights into this important pension domain.

In the discussion that follows, we first offer a brief history of retirement systems in the public sector. We then proceed to describe and assess four aspects of public pension plan structure: their benefit provisions, their governance structure, how they are financed, and their investment behavior and performance. In doing so we seek to offer a better understanding of the way public pension plans work, and also to illuminate some of the challenges and opportunities facing public pension plans over the next several decades.

An Overview of State and Local Retirement Systems[5]

The first municipal retirement system in the United States was established in 1857, to provide lump sum benefits for New York City policemen injured in the line of duty. In 1878, this plan was revised to provide retirement benefits of one-half of final pay, for policemen completing twenty-one years of service. Over the next fifty years, numerous other state and local jurisdictions established retirement plans throughout the United States. But it was not until after the Social Security Act was passed in 1935 that public pension plan growth began in earnest.

The 1930–50 period. Between 1931 and 1950, half of the largest state and local plans in the country were established (U.S. Congress 1978). Initially, many of these plans provided two-part retirement benefits: one paid by the

employer, based on the employee's salary and years of service at retirement, and a second resulting from annuitizing the employee's accumulated contributions. Often the employee's contributions were determined so that the total cost of the retirement benefit was allocated evenly between the employee and the employer.

In some instances, the employer's portion of the benefit simply matched the annuity provided by the employee's accumulated contributions. However, in order for employees of different ages and genders to receive adequate benefits on retirement, different employee contribution rates were required, and the plans became quite complex to administer. Consequently, many plans later changed their designs to provide for a pension based solely on age and years of service at retirement. Although employee contributions were still required, the amount of the retirement benefit no longer depended on the employee's accumulated contributions (Bleakney 1972).

When social security was first enacted in 1935, this federal old-age program intentionally excluded state and local government employees from coverage. This was mainly due to constitutional issues concerning the federal government's right to tax state and local governments. In 1950, however, Congress amended the Social Security Act to allow states to voluntarily provide social security coverage for their employees, when a state entered into an agreement with the Social Security Administration. In 1986, Congress mandated Medicare coverage for state and local employees hired after March 31, 1986 (IRS 1997). More recently, Congress has discussed mandating social security coverage for all newly hired state and local workers; whether this will actually mitigate social security's long-run financial problems is subject to debate (SSAC 1996).

The 1950–80 period. Congress's decision to provide states with the option to become included in social security resulted in many changes to state and local plan design during the 1950s; in fact, during this period more than one-third of the nation's largest public sector pensions were changed (U.S. Congress 1978). Initially, many of the plans joining social security developed a split-benefit formula, with a lower unit benefit percentage applied to the first $4,200 of final average salary and a higher percentage applied to the amount over $4,200. (The figure of $4,200 represented the social security covered earnings ceiling at the time.) Nevertheless, many of these same plans returned to a single benefit percentage in the 1980s, after it became clear that the split-benefit formula was difficult to administer and resulted in lower proportional benefits to lower-paid workers.

The 1960s and 1970s saw substantial consolidation among public pensions in the U.S. This occurred as pensions sought to take advantage of scale economies and upgrade their technologies. During this period, many of the larger pension systems succeeded in bringing smaller plans under their coverage. Consolidation proved not to be a panacea, however, and it continued

TABLE 1. Changes in State and Local Pension Systems, 1986–97

	1986–87			*1996–97*		
	State	*Local*	*Total*	*State*	*Local*	*Total*
Number of systems[1]	201	2,213	2,414	212	2,052	2,264
Number of members[1]						
Active members (M)	9.2	1.5	10.7	11.2	1.6	12.8
Inactive members (M)	1.0	0.1	1.1	2.3	0.1	2.4
Retirees and beneficiaries (M)	3.0	0.7	3.7	4.3	1.0	5.3
Total members (M)	*13.2*	*2.3*	*15.5*	*17.8*	*2.7*	*20.5*
Ratio of active to retired members	3.1	2.1	2.9	2.6	1.6	2.4
Receipts[1]						
Employee contributions ($B)	9.4	1.8	11.2	17.4	3.4	20.8
Government contributions ($B)	23.3	7.1	30.4	37.1	7.8	44.9
Earnings on investment ($B)	45.0	12.7	57.7	133.9	25.1	159.0
Total receipts ($B)	*77.7*	*21.6*	*99.3*	*188.4*	*36.3*	*224.7*
% from employee contributions	12.1	8.3	11.3	9.2	9.4	9.3
% from government contributions	30.0	32.9	30.6	19.7	21.5	20.0
% from investment earnings	57.9	58.8	58.1	71.1	69.1	70.8
Total investments ($B)[2]			530.1			2,094.1

Sources:
[1]U.S. Bureau of the Census, Census of Governments (specified years).
[2]Board of Governors of the Federal Reserve System (1999).
Values for total investments are not comparable with the values for contributions and earnings on investment due to differences in the methods used to collect the data by the different sources.

to be complex to manage benefits for multiple and divergent employee groups that often had very distinct plan provisions and separate valuations (U.S. Congress 1978).

The period from 1980 to the present. The 1980s saw many state legislatures seeking to expand the investment options available to state and local retirement plans. One way this occurred was with the substitution of a general standard of prudence for more restrictive "legal lists." Prior to 1980, public plan investments were typically limited to certain types of securities, approved by the state legislature, from which public pension plans were allowed to choose. The movement to the prudence standard permitted the public funds to hold a larger percentage of assets in equities (usually in domestic stocks), and it positioned many systems to take advantage of the unprecedented stock market returns experienced over the next decade. The income from these investments, coupled with actuarially sound employer

and employee contributions, has resulted in strong funding levels for many state and local systems today.

To illustrate some of the dramatic changes experienced by state and local pension plans over the recent past, data on system membership, receipts, and total investments are provided in Table 1 for 1987 and 1997. One important change evidenced over this period pertains to the substantial increases in both system receipts and total investments. Across all state and local systems combined, total receipts more than doubled from $99B in 1987 to $225B in 1997. Most of this increase was attributable to investment earnings, which almost tripled from $58B to $159B over the period. These earnings, combined with employer and employee contributions, quadrupled total system assets and resulted in an aggregate public pension pool of over $2 trillion in 1997. In defined benefit plans, which are the majority of state and local pensions, investment earnings in excess of the actuarial funding assumptions generally reduce employer contributions (Hustead this volume).[6]

Other changes in state and local retirement systems in the last decade are also illustrated in Table 1. Although the overall number of systems declined slightly from 2,414 to 2,264, the total number of active members grew almost 20 percent, from 10.7M to 12.8M people. The retiree/beneficiary population grew even faster (some 43 percent), from 3.7M to 5.3M. Consequently, the ratio of active members to retirees fell from 2.9 to 2.4 for the combined systems (and from 2.1 to 1.6 in local systems alone). In the absence of substantial investment reserves, this decline would likely have put upward pressure on employer contributions, since retiree benefits were rising relative to active member payrolls.

Types of State and Local Retirement Systems

Public sector retirement systems can be categorized according to many dimensions including the type of benefit provided, the type of employees covered, the type of administrative jurisdiction, the number of contributing employers, the size of the plan, and the like. Here we have chosen to focus mainly on the differences and similarities among systems categorized by type of covered employees and administrative jurisdiction.

One reason why pension plans differ is that they cover employees with different employment characteristics. For instance, because police work and fire fighting are physically demanding occupations, retirement benefits for public safety workers typically allow retirement at earlier ages, in part to maintain a younger workforce. Consequently, the retirement benefits available to police and firefighters are usually different from those provided to teachers or to general employees. Social security coverage also affects benefit offerings. Plans whose workers are not covered by social security often provide higher retirement benefits to mitigate the lack of social security in-

come in retirement. Since fewer teachers and public safety workers are included in social security than other workers, this also affects the benefits they are provided.[7]

Retirement systems also differ by administrative jurisdiction, with large state-level plans often having different characteristics than plans offered by small localities. This is often the result of the different political environments in which the systems operate, as well as the number of members covered by the system. System size may affect the resources available to the system for operations. Larger systems tend to have larger staffs. Larger systems also tend to have a larger amount of assets to invest and greater potential for portfolio diversification, which in turn may afford them greater flexibility in selecting investments and greater leverage in negotiations with investment managers.

Membership and Coverage in State and Local Pensions

To better understand what groups of workers are covered by public plans, Table 2 indicates system membership by plan type.[8] These data are based on the PPCC's 1997 survey of state and local retirement plans covering 11 million active members, and 4 million retirees and beneficiaries. Most active members (6 million or 57 percent) were covered by state-administered retirement systems, approximately one-third (3 million or 29 percent) were in systems specifically for teachers or school employees, one-tenth (1 million) were in locally administered systems primarily serving general employees, and the remaining active members (327 thousand, or about 3 percent) were in systems specifically for public safety employees (i.e., police and firefighters). Similar breakdowns apply for the retiree/beneficiary breakdowns. Of the 4 million retirees and beneficiaries covered by plans surveyed, 2 million (56 percent) were in state-administered systems, 1 million (27 percent) were in systems for teachers and school employees, 466 thousand (11 percent) were in general local systems, and the remaining 168 thousand (4 percent) were in public safety systems. The ratio of active to retired members in Table 2 is lower, on average, for systems that cover only local employees (2.4 active/retired), than for statewide systems (2.7 active/retired). Furthermore, the active/retired ratio for teacher and school employees is somewhat higher than the average (3.0), and for public safety employees it is lower than average (1.9).

Eligibility and Benefit Provisions in Public Pension Plans

The primary goal of a retirement system is to provide retirement benefits in a cost-effective manner, which, when combined with social security (if available) and personal savings, result in benefits that sustain the retiree's

TABLE 2. State and Local Government Membership by Plan Type, 1996

	State employee systems	*Teacher and school employee systems*	*Police and firefighter systems*	*Local employee systems*	*All systems*
Number of systems	68	31	35	127	261
Number of plans	72	40	126	140	378
Number of participants					
Active members (M)	6.320	3.276	0.327	1.105	11.028
Retirees and beneficiaries (M)	2.349	1.109	0.168	0.466	4.092
Total (M)	*8.669*	*4.385*	*0.495*	*1.571*	*15.120*
Average active members per plan (000)	87.8	81.9	2.6	7.9	57.9
Ratio of active to retired members	2.7	3.0	1.9	2.4	2.7

Source: Authors' tabulations from PPCC, PENDAT Database, 1997.
Means weighted by number of members.

standard of living through retirement. As noted earlier, almost all state and local retirement plans are of the defined benefit variety (BLS 1994). Consequently, the differences in benefits paid by state and local government systems are mainly a function of the specific details of the defined benefit plans.

Eligibility. Several key design features of public pension plans are indicated in Table 3, along with comparable evidence, where available, for private sector pensions. Most public sector employees tend to be included in their pension plan at hire, whereas private sector employees must generally meet an age and/or service requirement in order to be covered by their plans. Becoming legally entitled to a benefit typically occurs at a discrete time after a specific period of service, with cliff vesting the norm in both public and private retirement systems. But public sector workers take longer on average to vest, with 43 percent having to work ten years before becoming legally entitled to a benefit. By contrast their private sector counterparts typically vest after five years (or at seven years if the employer uses a graded vesting rule).

There are, of course, important differences in eligibility rules for pensions covering teachers, police and firefighters, and general employees. Members of teacher retirement systems often vest in their benefits after five or ten years of service, although in a few instances the vesting period is as low as three years, and in two cases the consolidated state systems offer immediate vesting. Vesting requirements for police and firefighters vary widely, from a low of three years to a high of twenty. Among general plans covering all

TABLE 3. Comparing Public and Private Defined Benefit Pension Plan Design Features

	Public (1994)	*Private (1995)*
1. Participation: minimum age or service or both (%)	[1]	69
2. Cliff vesting (%)	100	96
At any age		
<5 years	5	[2]
5 years	47	87
6–9 years	5	[2]
10 years	43	6
>10 years	[2]	[2]
Other	[2]	3
3. Early retirement permitted (%)	87	96
Eligibility based on		
Service (S) alone	23	7
Age (A) alone	0	5
A55+S10	8	31
A+S other	61	53
4. Normal retirement (%)		
Service alone	43	6
S30	29	5
Age alone:	5	40
A62	[2]	3
Age+Service:	40	
A55+S30	11	3
A62+S10	5	9
5. Benefit formulas (%)		
Dollar amount basis	[2]	23
Earnings basis	99	69
Career	[2]	11
Terminal		58
Five years used	20	78
Three years used	61	17
Other	18	15
Other basis	[2]	2
Percent of pay per year of service	78	37
<1.25	6	12
1.25–1.74	24	18
1.75–2.00	6	3
2.00+	43	4
Other	0	[2]
6. Prevalence of postretirement increases (%)		
Automatic	45	3

Sources: Adapted from Mitchell and McCarthy (1999); uses BLS (1995) for 1994 public plan data and BLS (1996) for 1995 private plan data.
[1]Not reported in BLS (1995).
[2]Less than 0.5%.

state and local workers, vesting periods are five or ten years, although a few systems use intermediate periods (seven or eight years; Zorn 1999).

Many plans also permit "purchase of service" credit, a concept that refers to the opportunity for public employees to purchase credit for past service under the plan. Without these arrangements, an individual who frequently changes jobs might work under several retirement plans over the course of his or her career without becoming vested. These provisions differ widely from one state to another, however, with regard to the types and prices of service that can be purchased, maximum amounts, and the payment options available.

Retirement benefits. Turning to DB benefit formulas, Table 3 shows that final average earnings play a central role in the pension formulas of state and local pension plans. By contrast, almost a quarter of the private pension plans use a flat dollar formula, mainly found in manufacturing union-negotiated plans. Public sector pension benefit formulas often use the last three years of an employee's pay to determine the benefit amount (61 percent), while private plans more commonly use five years or an even longer period (such as career average) to determine the fraction of pay used in the benefit formula (78 percent).

Another aspect of public pension plans is that a higher benefit multiplier tends to be applied per year of service than in private plans. Table 3 shows that 43 percent of public plans use a benefit multiplier giving more than 2 percent of pay per year of service, while only 4 percent of private sector plans accumulate benefits at this rate. Other studies have also pointed to the relatively larger benefits paid by public plans. Comparisons based on income replacement rates furnished by the BLS indicate that, at the turn of the decade, lower-tenured public sector retirees received benefits about 50 percent greater than their private sector counterparts (BLS 1989, 1992). The same studies reported that higher-seniority workers in the public sector received a replacement rate half to two-thirds greater at the same pay and service levels than in the private sector. It is not known whether these relative benefit levels changed more recently, since BLS no longer provides these comparative tabulations.

However, these comparisons do not take into account the fact that state and local employees contribute approximately one-third of the total contributions made to their defined benefit plans, while private sector employees typically make no direct contributions to their DB plans. Given that public sector employees typically pay a significant portion of the cost of the DB benefits they receive, it is not unreasonable that their benefits would be higher than in the private sector, all else held equal.[9] Furthermore, the studies referenced above do not include benefits received from defined contribution plans. Since many private sector employers supplement DB benefits with benefits provided through defined contribution plans, a significant

TABLE 4. State and Local Government Benefits Design Features by Plan Type, 1996

	State employee systems	*Teacher and school employee systems*	*Police and firefighter systems*	*Local employee systems*	*All systems*
Average annual unit benefit (% of pay/year)					
Covered by social security	1.67	1.89	2.26	1.72	1.74
Not covered by social security	1.90	2.02	2.30	2.24	1.99
Average accrued 30-year benefit (% of final pay)					
Covered by social security	51.2	57.7	66.6	57.3	53.5
Not covered by social security	57.1	61.9	70.1	69.1	60.3
Form of benefit (% of plans providing)					
Straight-life annuity	87	95	67	78	78
Joint and survivor annuity	84	95	81	87	86
Joint and 50% survivor	79	95	64	80	76
Joint and 100% survivor	69	85	64	69	69
Joint and survivor "pop-up"	57	76	30	26	38

Source: Authors' tabulations from PPCC, PENDAT Database, 1997. See Zorn (1997). Means weighted by number of members.

portion of the private sector retirement benefit is not included in the comparison made from the BLS data (Zorn 1995).

Another explanation for the difference in benefit accrual levels between public and private pension plans is that approximately one-quarter of public employees are not covered by social security (U.S. House Ways and Means 1998).[10] As noted above, retirement plans whose employees are not covered by social security often provide higher retirement benefits to partially offset the lack of social security benefits. This pattern varies by employee groups, as indicated in Table 4.

Lack of social security coverage for some public sector workers may also explain why postretirement increases are more prevalent in the public than in the private sector; fully 45 percent of these plans offered a form of automatic indexation (although it appears that few had full inflation indexation). Automatic indexation is rare in the private sector, although augmentation of pensions at the discretion of the trustees is often seen.

Disability benefits. Among public plans, 91 percent had disability retirement provisions in 1994, as compared with only 73 percent of private plans in 1995. Almost half (42 percent) of public plans allowed workers to retire with unreduced normal benefits compared with fewer (29 percent) of private plans. Qualifying age and service conditions for disability retirement also

tend to be less restrictive in the public sector (BLS 1994, 1995). This may be because disability is often covered through long-term disability (LTD) plans in the private sector, rather than through the pension plan, which is more common in the public sector.

Retirement Benefits Provided to Employee Groups

There is substantial variation in the retirement benefits provided by plans to different employee groups. This variation is a result of a combination of factors, including the different types of work performed and changes in the overall environment in which the plans developed. As a result of this variation, it is difficult to define a "typical" retirement benefit. Nevertheless, it is instructive to compare the general features of these plans.

Teacher plans. Among teachers' plans, the retirement benefit formula is usually a single-rate unit benefit, that is, the same benefit multiplier is applied to all years of service under the plan. As shown in Table 4, the unit benefit multiplier averaged 1.89 percent for employees covered by social security and 2.02 percent for employees not covered by social security. The accrued benefit after thirty years of service averaged 57.7 percent of final average salary for employees covered by social security, and 61.9 percent for those not covered. Final average salary is usually based on the highest three or five years of service, with the highest three years being predominant.

Many of the teacher systems offer an early retirement option under which employees can retire before reaching the age and service requirements for unreduced benefits (Wisniewski 1999). Generally, this option is available after twenty years of service; many teacher systems allow retirement at age 55 after completion of twenty-five years of service. In almost all cases, the benefit is reduced to reflect the full actuarial cost of early retirement, although two-thirds allow unreduced benefits to be paid at age 60, once the employee has vested in the benefit. A large fraction of the teacher systems also offers automatic postretirement cost-of-living adjustments (COLAs) to protect retirement earnings from inflation, although COLA formulas vary. For example, the Wisconsin Retirement System provides supplemental cost-of-living increases when investment earnings exceed the actuarially assumed rate (Wisniewski 1999). In other cases, employees lacking social security coverage are more likely to have automatic cost-of-living adjustments.

Public safety plans. For police and firefighters, retirement benefit formulas also vary, often linked to the plan's vesting requirements. Typically systems that require twenty years of service for vesting purposes have benefit formulas that specify a flat percent of final average salary to be paid at retirement (often 50 percent). Systems that allow vesting after five or ten years have unit benefit formulas that use either a single-rate or variable-rate multipli-

ers for each year of service. Under a variable-rate formula, different benefit accumulation rates apply to different years of service. For example, under a variable rate formula, a member may accumulate a retirement benefit of 2.0 percent for the first ten years of service, and 1.75 percent thereafter (or vice versa). Variable-rate formulas are often used in situations where members are not covered under social security.

The unit benefit multiplier for police and firefighters covered by social security averages 2.26 percent, and 2.30 percent for those not covered. Accrued benefits after thirty years of service average 66.6 percent of final average salary for those covered by social security, and 70.1 percent for those not covered. Final average salary is often based on the highest three years of service; however, in some cases it is tied to the employee's final salary or the salary attached to a certain rank. Few of the systems offer an early retirement option, but unreduced retirement benefits are frequently available at age 50 or 55, after twenty years of service; in addition, unreduced benefits may be available at any age after twenty-five years of service. Most police and firefighter plans (80 percent) offer postretirement cost-of-living adjustments (Zorn 1999).

General employee plans. Turning to general public employee plans, age and service requirements for retirement are similar to those for teachers, with many systems offering unreduced retirement benefits at age 55, with twenty-five or thirty years of service, and retirement at age 60 or 62 upon vesting. As with teacher systems, single-rate benefit formulas are often used. Benefit formulas use a unit benefit multiplier averaging 1.72 percent for employees covered by social security and 2.24 percent for those not covered. The accrued benefit after thirty years of service averaged 57.3 percent of final average salary for those covered by social security, and 69.1 percent for those not covered. Final average salary is typically based on the highest three or five years of service (Zorn 1999). Many systems covering general local employees offer an early retirement option available at ages 50 or 55 with ten to twenty years of service. In almost all cases, the benefit is reduced for early retirement but, in some instances, does not reflect the full actuarial cost. Approximately 80 percent of the systems offer postretirement cost-of-living adjustments (Zorn 1999).

Changes over time. By comparing these pension characteristics with those reported in earlier studies, some changes can be discerned in the way pension plans have designed their benefit structures over time. First, there appears to be a significant movement away from integration of benefits with social security, a trend perceived among both public and private pensions. The proportion of public plans with a benefit formula integrated with social security decreased from 10 percent to 4 percent between 1992 and 1994; for private plans this proportion decreased from 63 percent to 51 percent between 1989 and 1995 (BLS 1989, 1995). While no single explanation for this

trend is available, it may be that increased uncertainty about the social security system has led employers to curtail the risk that might be associated with unanticipated changes in the old-age benefits provided by the government. Second, the prevalence of the "age 55/service 10" (A55/S10)combination for early retirement appears to have decreased over time, in favor of combinations with less service (in 1989, fully 43 percent of private plans used A55/S10 and 9 percent A55/S5, compared with 31 percent and 21 percent, respectively, in private plans for 1995; BLS 1989, 1995). Third, pensions in the public sector uniformly base benefits on earnings rather than on a flat dollar amount, whereas almost a fifth of the corporate plans use flat dollar formulas.

Paying for Public Pensions

The promise of paying a pension benefit establishes an obligation on the part of the employer, which is usually financed by employer and/or employee contributions as well as income earned on invested assets. Determining how much to contribute, and how to invest the assets, are key responsibilities of the pension plan's board and staff. To assist in carrying out these responsibilities, retirement plans often hire actuaries, investment consultants, and other specialized professionals.

Actuarial valuations and assumptions. In order to measure plan obligations and determine the contributions necessary to systematically prefund benefits over time, pension plans hire actuaries to conduct valuations of the plan. The actuaries combine information about past and anticipated age, service, and compensation of the plan's membership with demographic assumptions related to mortality, disability, and probabilities of retirement, and with economic assumptions regarding wage increases and long-term rates of return on plan investments (Hustead this volume). The resulting valuation gives employers a measure of the plan's long-term liabilities and the contributions required to fund those liabilities in a systematic manner over time. Actuarial assumptions regarding inflation, wage increases, and investment returns are key elements in the valuation of plan liabilities. For example, assumed rates of return that are higher than can be sustained over time will, all else held equal, result in higher long-term plan costs, since the calculated employer contributions (and related investment earnings) will be less than would otherwise be the case.

For plans surveyed by the PPCC (Zorn 1999), the average assumed rate of return was 7.8 percent, with marginally higher rates assumed by systems serving state employees and teachers (8.0 percent for both groups) and the same or slightly lower rates for systems serving public safety and general local employees (7.8 and 7.7 percent respectively; see Table 5). Assumptions related to wage increases (including inflation and step/merit increases)

TABLE 5. State and Local Government Retirement System Funding, 1996

	State employee systems	*Teacher and school employee systems*	*Police and firefighter systems*	*Local employee systems*	*All systems*
Assumptions					
Actuarial assumed rate of return	8.0	8.0	7.8	7.7	7.8
Actuarial assumed wage increase	5.9	6.4	5.9	5.7	5.9
Actuarial assumed rate of inflation	4.5	4.5	4.4	4.4	4.4
Valuations					
Actuarial accrued liability ($B)	605.8	436.6	85.6	117.6	1,245.6
Actuarial value of assets ($B)	545.8	358.0	74.9	113.5	1,092.2
Ratio of assets to liabilities (%)	90.1	82.0	87.5	96.5	88.2
Other magnitudes					
Amortization of unfunded liability (years)	25.4	26.1	22.1	20.9	22.9
Employer contributions as percentage of payroll*	9.16	9.30	16.02	9.54	9.52
Member contributions as percentage of payroll*	4.39	6.08	7.02	5.32	5.09
Total additions ($B)	109.4	68.7	3.2	14.1	195.4
Member contributions	8.7	6.2	0.2	1.4	16.5
Employer contributions	17.4	8.7	0.6	2.7	29.4
Investment income	83.3	53.8	2.4	10.0	149.5
Notes					
Member contributions (%)	8	9	6	10	8
Employer contributions (%)	16	13	19	19	15
Investment income (%)	76	78	75	71	77

Source: Authors' tabulations from PPCC, PENDAT Database, 1997. See Zorn (1997).
Means weighted by payroll.

varied more across groups. The average assumption for all respondents was 5.9 percent, compared with 6.4 percent for systems covering teachers and 5.7 percent for those covering general employees. However, the assumptions regarding inflation were very similar across the covered groups, averaging 4.4 percent overall and only marginally higher assumptions among systems serving state employees and teachers.

Assets, liabilities, and plan funding. Actuaries calculate the plan's accrued liability in order to measure the long-term cost of retirement benefits and

develop a systematic approach for funding the benefits over time. Different actuarial methods can be used to calculate the liability, depending on the funding pattern appropriate to the needs of the plan. Approximately two thirds of state and local plans surveyed by the PPCC use the entry age actuarial cost method, which calculates employer contributions as a level percent of payroll over time (McGill et al. 1997). This approach tends to stabilize pension contributions for long-term budgeting purposes.

Actuaries also determine the value of public pension assets accumulated to pay retiree benefits. The difference between the actuarial value of assets and the actuarial accrued liability is referred to as the "unfunded actuarial accrued liability," and it is amortized through contributions over time—typically twenty to thirty years. The actuarial value of assets is often determined in a manner that smoothes year-to-year market fluctuations over a three or five-year averaging period. This dampens the impact of short-term investment volatility on the measure of plan assets and tends to stabilize contributions.

Since actuarial methods and assumptions vary among the plans, so will the resulting asset/liability measures. This means that funding comparisons across plans are not strictly comparable (since all plans do not apply the same actuarial method and set of assumptions), but each plan's reported asset/liability measures reflect the methods and assumptions actually used to fund that plan.[11] With this caveat in mind, Table 5 shows that the actuarial accrued liability totaled close to $1.3 trillion across the entire set of plans responding to the PPCC survey in 1997, with approximately $1.1 trillion in assets available to fund the liability (Zorn 1999). Overall, the financial assets as well as liabilities of the systems serving state employees and teachers were substantially larger than those serving public safety and general local employees, since the state and teacher systems cover substantially more employees.

One measure that is often used to examine progress made in funding a retirement system is the "funding ratio," calculated by dividing the actuarial value of assets by actuarial accrued liabilities. Although this may be an imperfect measure of year-to-year progress made toward system funding, due to changes over time in the underlying assumptions and methods of measuring plan assets and/or plan liabilities, it is often used as a summary measure of funded status. Table 5 shows that the overall public plan funding ratio in 1996 was estimated at 88 percent for survey respondents; state and general local employee plans had somewhat higher funding ratios (90.1 percent and 96.5 percent, respectively) than did systems covering teachers and public safety employees (82.0 percent and 87.5 percent, respectively). Table 5 also indicates that the average period for amortizing the unfunded actuarial accrued liability was approximately twenty-three years.

TABLE 6. Changes in Average and Median Financial Status of State and Local Pension Plans, 1992–96

	1992		*1996*		*#Matched*
	Average	*Median*	*Average*	*Median*	*cases*
Assets and liabilities ($000)					
Pension plan assets[1]	3,043,038	381,348	4,318,185	562,873	222
Pension plan liabilities[2]	3,657,065	472,916	4,954,381	679,507	222
Total underfunding	614,027	36,862	636,196	39,533	222
Stock funding ratio (%)					
Assets/liabilities ($-wtd)	83	87	87	91	222
Contributions ($000)					
Req. employer contributions	99,420	13,115	105,168	14,580	211
Actual contributions	138,959	18,531	162,846	20,930	211
Employer	88,866	12,454	102,662	14,580	211
Employee	50,093	4,553	60,184	5,316	211
Flow funding ratio (%)					
Required/actual contributions	95	100	98	100	211
Benefit payments ($000)					
Total benefit payments	161,547	12,485	204,289	18,048	135
Retirement	141,363	10,540	177,823	12,623	135
Disability	11,884	954	16,047	1,333	135
Survivors	6,361	823	8,086	971	135
Lump sum	1,940	0	2,333	0	135
				$-wtd.	*Median*
Per active participant ($000)					
Actuarial value of assets				165	116
Actuarial accrued liability				211	148
Contributions				5.5	3.4

Source: Authors' tabulations from PPCC, PENDAT Database (1995 and 1997). See Zorn (1997).
[1]Measured as the actuarial value of plan assets.
[2]Measured as the actuarial accrued liability.

More detail on public pension plans' financial status appears in Table 6. Here we provide average and median information for the public pension plans responding to the PPCC surveys in both 1992 and 1996; these are the for "matched cases" in the two years, a comparison that facilitates an assessment of the direction of change.[12] The data show that median funding ratios went from 87 percent to 91 percent between 1992 and 1996, and a similar pattern applies to the mean. In 1996, the average public pension plan reported actuarially-based assets of $4.32 billion and an average reported lia-

bility of $4.95 billion, for an average actuarial unfunded liability of about $630 million per plan. On an active participant basis, the median dollar-weighted value of assets per participant in 1996 was $116,000 with $148,000 in accrued liabilities.

In addition to the stock funding measures, we also report a "flow" funding measure in Table 6. This gauges the extent to which employer contributions in a given year cover the amounts necessary to systematically fund the plan. It is interesting that the average flow funding rate in 1996 stood at 98 percent and the median at 100 percent, indicating that public employers typically met their new pension obligations as they arose. The 1996 figures are not strictly comparable with those from 1992, since the GASB changed the way in which required contributions were reported during this time. Also the actuarial value of assets is often determined in a manner that smoothes year-to-year fluctuations, so increases in market value over time might not be fully reflected in the 1996 reported actuarial value of assets controlled by these public pension plans. These changes probably account for some of the observed discrepancy between stock and flow finding patterns between 1992 and 1996.

Employer and employee contributions. Employer contributions to public sector DB pension plans are based on actuarial valuations: generally a portion of the contribution covers the "normal cost" of funding benefits accrued to members in the current year, and another portion amortizes the unfunded liability. In the PENDAT plans surveyed, this unfunded liability is usually amortized over periods from twenty to thirty years. As shown in Table 5, employer contributions, including both the normal cost and amortization of the unfunded accrued liability, average 9.5 percent of payroll for the PENDAT respondents, with public safety system contributions exceeding contributions for the other groups of employees (this reflects the earlier retirement ages among uniformed officers). On average, employer contributions to state systems are the lowest.

Public employee retirement systems are typically contributory, that is, they require contributions by their members. Often these contributions are "picked-up" under section 414(h)(2) of the Internal Revenue Code, effectively making them pretax contributions by the employees. In this instance, they are different from private-sector defined benefit plans, under which employee contributions are made after taxes. This may be one of the reasons why private sector defined benefit plans are typically noncontributory. In the PENDAT survey, employee contributions range from 4 to 6 percent of the employees pay, and average 5.09 percent. Employee contributions are generally higher for plans covering teachers and police and firefighters (6.08 percent and 7.02 percent, respectively). Employee contributions in plans covering state employees averaged the lowest at 4.39 percent.

Public Pension Plan Investments and Performance

Asset allocation policy plays a key role in determining investment returns in a pension system. Before the early 1980s, state and local retirement systems held most of their assets in fixed-income securities, earning relatively low rates of return. This was often because their asset allocation choices were restricted by "legal lists," which specified the general types of investments that could be made and the maximum percent of assets that could be held in certain types of securities. For example, many legal lists limited the maximum percent of assets held in common stock to 30 percent or less.

During the 1980s, many legal lists were replaced by "prudent person" rules allowing investments in a wide mix of securities, as long as standards of prudence and diversification were met. Although long established in common law, the prudent person concept was codified with the passage of the Employee Retirement Income Security Act of 1974. Earlier concern about risk, a reason often given for the legal list restrictions, yielded to a desire to participate in the higher rates of return from equities and other investments.

Public pension plan asset allocation. During the 1990s, equities came to play a much more important role in the portfolios of state and local retirement systems. Table 7 shows that over 40 percent of public plan portfolios is now invested in domestic equities, with systems covering teachers investing slightly more (45 percent) and systems covering public safety employees investing slightly less (42 percent; Zorn 1999). The major difference in asset allocation across the plans covering the different employee groups pertains to investments in real estate and international securities. While systems covering state employees and teachers invested 16 percent and 14 percent of their portfolios, respectively, in these two major classes of investments, systems covering public safety and general local employees invested, respectively, only 7 percent and 9 percent. System size may play a role in explaining this difference. Systems covering state employees and teachers tend to be large systems, with sufficient assets to diversify their portfolios and sufficient resources to monitor complex investments.

Our comparison of investment patterns across public and private pension plans indicates that these differences have narrowed over time, comparing the public and private pension arena (Table 8). Among the top 1,000 pension systems, around half of the total assets (or more) are held in equities today, over one-third in bonds, and the rest in real estate, cash, and other forms of investments (Anand 1999). Overall, public pensions still do tend to hold somewhat less equity (59 percent) than do private funds (64 percent), and slightly more bonds (35 percent versus 29 percent). The international equity exposure of public funds (11 percent) is also lower than that of private funds (14 percent). Other holdings (real estate, cash) prove relatively similar.

TABLE 7. State and Local Government Pension Investments, 1996

	State employee systems	*Teacher and school employee systems*	*Police and firefighter systems*	*Local employee systems*	*All systems*
Percentage of total investments					
Short term	3.1	3.1	7.3	4.6	4.4
Domestic stocks	41.7	44.5	42.0	43.0	42.7
Domestic bonds	35.9	34.1	41.8	40.9	38.8
Real estate mortgages	0.4	1.6	0.2	0.7	0.7
Real estate equities	2.4	2.1	1.3	1.5	1.8
International equities	10.0	8.1	4.8	5.3	6.9
International fixed-income	2.9	1.9	0.7	1.3	1.7
Other	3.6	4.6	1.9	2.7	3.0
Total investments ($B)	545.8	358.0	74.9	113.5	1,092.2
Investment returns					
Rate of return 1996	13.9	13.5	13.4	13.7	1376
Exp. 1-year return given allocation*	11.7	12.3	11.5	11.7	11.8
5 annualized rate of return (1991–96)	11.5	11.0	10.6	11.5	11.3

Source: Authors' tabulations from PPCC, PENDAT Database, 1997. See Zorn (1997).
*Calculated using benchmark investment returns for the various asset classes.

Despite these similarities, it remains the fact that some state and local pension system investments are constrained within certain investment categories, facing prohibitions against purchasing certain types of investments and enjoinders to invest in some specific holdings (Mitchell and McCarthy 1999). For instance, 19 percent of the funds in the PENDAT sample face constitutional restrictions on investments; and 12 percent are or have been prohibited from making certain investments (usually in South Africa, Northern Ireland, or countries that did not follow MacBride principles). Other times there are mandates *favoring* certain investments: for example, 4 percent of the plans must direct a certain percentage of their plan investments to in-state holdings. In addition, many other funds have internal policy limitations on asset allocations, or other statutory limits on asset allocations (see Table 9). The extent to which such asset restrictions influence investment policy and investment returns as well as investment risk is an extremely important and complex issue (Mitchell and Hsin 1997a, 1997b; Munnell and Sunden this volume; Useem and Hess this volume).

Investment income and return. Tables 7 and 8 indicate rates of return earned by state and local pension investments, as reflected by the PPCC survey respondents. On average, the investments earned a 13.66 percent return in 1996, higher than the 11.77 percent expected return calculated using the

TABLE 8. Pension Plan Assets and Investment Performance, various years

I. Public vs. private plan assets (%)	*Public systems*[1]	*Private plans*[1]
Equities	*58.6*	*63.7*
U.S.	46.7	46.7
Foreign	11.2	14.2
Other	0.7	2.8
Bonds	*34.8*	*28.9*
U.S.	31.9	27.1
Foreign	2.1	1.7
Other	0.8	0.1
Real Estate	3.3	3.3
Cash	2.1	2.1
Other	6.6	2.0

II. Trends in public plan asset mix[2] *(%)*	*Year*						
	1950	*1960*	*1970*	*1980*	*1989*	*1992*	*1996*
Corporate equities	0	3	17	22	40	42	50
Corporate bonds	12	36	58	48	27	21	21
U.S. government securities	51	30	11	20	27	28	16
Other	37	31	14	10	6	9	13

III. Public plan investment performance	*Year*	*Funds*[3]	*Index*[4]	*Number of plans*
Return on assets (%)	1996	13.7	21.3	200
	1995	19.6	35.0	200
	1994	1.5	-0.1	213
	1993	11.8	10.7	213
	1992	9.3	8.2	213

Source: Adapted from Mitchell and McCarthy (1999).
[1]Anand (1999).
[2]Authors' calculations based on Mitchell and Carr (1992) and Zorn (1997).
[3]Authors' calculations based on Zorn (1997).
[4]CRSP Value-weighted NYSE/NASDAQ stock index including all distributions.

systems' asset allocations and benchmark returns earned on the major security classes. However, another study (Nofsinger 1998) compared public pension plan returns to a composite market index and concluded that public plans tend to underperform the market. Further study of this issue would be fruitful, but in any event the fact that public pension investment income contributes substantially to plan funding is not in dispute.[13]

TABLE 9. Investment Restrictions among Public Pension Systems, 1996

	Percent having ($-wtd.)	*N*	*Percent having (plan-wtd.)*	*N*
Statutory asset limits by type[1]				
Cap on bonds	15	260	4	261
Cap on bonds as percentage of issuer	6	260	7	261
Cap on real estate	29	260	18	261
Cap on foreign invst.	29	260	16	261
Cap on stock	39	260	25	261
Asset caps for those with statutory limits[2]				
Bonds: max % of portfolio	46	11	40	11
Max bond as % of Issuer	6	17	6	17
Real estate: max % of portfolio	13	46	9	46
Foreign invst.: max % of portfolio	11	43	10	43
Stock: max % of portfolio	54	65	59	65

Source: Adapted from Mitchell and McCarthy (1999).
[1]Statutory limits given in state constitution or state regulation.
[2]Some plans subject to statutory investment limits do not report actual fractional limits.

One of the driving forces behind state and local governments' success in funding retirement benefits has been the high returns earned in financial markets, especially domestic equities. State and local plans have been able to capture these returns largely as a result of the changes made to their asset allocations over the past two decades. Table 8 indicates the dramatic time series change in public plans' asset mix: as recently as 1989, they held the majority of their portfolios in corporate and government bonds, and prior to 1960 they held virtually no equities at all.

Returns on U.S. equities are often thought to be more volatile than returns on bonds, so the fact that public plans hold a higher proportion of bonds would be seen as reducing the volatility of public sector pension fund investment returns. But because equities have historically performed better than bonds, holding more bonds produces lower returns for public plans. This is seen clearly in the last panel of Table 8, which reports public pension fund returns over the period 1993–96 (for the PENDAT sample), as compared with a value-weighted market index over the same time period.[14]

The evidence in Table 8 shows that public plan returns are less volatile than market returns, outperforming the stock market in poor years and underperforming it in good years. It should be noted that these two return patterns are not strictly comparable, inasmuch as the underlying risks in the two portfolios are different. That is, a market basket of stocks would be anticipated to perform significantly better than public portfolios in good equity years and worse in poor equity years, because public plans hold a sub-

TABLE 10. Public Pension Plan Reported Expenses and Turnover, 1997

	$-weighted	*System-weighted*	*Number of plans*
Administrative expenses[1]	$78	$211	221
Investment expenses[2]	0.27%	0.44%	155[4]
Stock turnover[3]	38%		67

Source: Adapted from Mitchell and McCarthy (1999).
[1]Calculated per member (including active, retired, and disabled members).
[2]Calculated as % of fair market value of system assets at 31 December 1996.
[3]Turnover defined as the smaller of annual stock purchases and sales divided by the average portfolio value over 1996. Authors' calculations based on PENDAT Database (Zorn 1997).
[4]Statistically significant differences were found between funds reporting investment expenses and those not reporting; those not reporting were smaller ($p < 0.05$) and earned lower returns ($p < 0.005$).

stantial fraction of assets in bonds. Unfortunately, the database we use does not report investment returns for specific assets held by public plans. To the extent that private pensions also hold more equity than do public funds, one could also anticipate that private pensions will experience higher returns and higher volatility. It is not entirely clear why corporate stockholders should be less risk-averse than state taxpayers, and indeed with the growth of stockholding in the U.S. economy, it is likely that these two groups will overlap more considerably in the future.

The final investment-related question we consider focuses on public plan expenses and turnover in plan portfolios. This is important because higher returns can be eroded over time by high expenses, and all public plan stakeholders would likely benefit from paying close attention to the administrative costs of managing the plans. Unfortunately it is difficult to obtain data on expenses for the entire range of public plans; there was substantial nonresponse among respondents surveyed by Zorn (1997) on this question, suggesting that those who did reply may be nonrepresentative in some way. Our analysis of the 221 systems offering information on administrative expenses shows that these reported costs averaged $211 per member per year on a per member basis but one-third of that level in the dollar-weighted computation; hence larger plans incur substantially lower expenses (Table 10). Turning to reported investment expenses, these are computed as a fraction of system assets (year-end), and here too, it must be noted that only 155 of the full set of 379 plans responded to this question in the survey. For those reporting, average investment expenses totaled 44 basis points in 1996, which falls to only 27 basis points if dollar-weighted. Again, the larger funds prove to have lower expense ratios than smaller funds. Both results are compatible with previous studies showing scale economies in pension fund administration (Mitchell 1998), and these investment charge figures are consistent with

the lower end of institutional money management fees charged by pension investment managers. Finally, Table 10 indicates how much turnover the public plans' stock portfolio experienced on an annual basis, for the sixty-seven funds that answered this question in the survey. Turnover is defined as the lesser of annual purchases or sales divided by the average amount in the portfolio over the year. This is an important number because some have argued that high turnover in pension fund stock portfolios result in high brokerage and investment commissions. These turnover figures (38 percent) are lower than reported by public funds in earlier years (McCarthy and Turner 1992) but the substantial nonreporting must lead one to question whether these results are generalizable.

Public Pension Governance and Structure

Over time policymakers have become increasingly interested in how public pension plans are governed, mainly because they are responsible for so many participants and such a large pool of investment funds. Generally, state and local retirement systems are overseen by a retirement board that has authority for making decisions related to investments, actuarial valuations, system operations, and in some instances the benefits provided by the plan. Day-to-day administration is usually conducted either by the retirement system's staff or by staff of the government sponsoring the system.

Governance and administration. A perusal of Tables 11 and 12 reveals that state and local pension plans in the United States are managed by a pension board of trustees, a group that typically bears responsibility for investment policy and often for asset allocation. The number of board members ranges from one to two dozen, but the typical board is usually formed by eight people, with most of the board members appointed by politicians or serving ex officio.[15] The average number of board members is higher for systems serving state employees and teachers (9.2 and 10, respectively) than for systems serving public safety and general local employees (7.5 and 7.6, respectively). It is interesting to note that board composition also varies with the type of covered employees. As shown in Table 12, systems serving teachers and public safety employees have a somewhat higher percent of elected members and lower percent of appointed members than do systems serving state or local general employees.

Typically, day-to-day system administration is done by staff under the supervision of the system's executive director or plan administrator. Many systems hire an executive who reports directly to the board. Some smaller systems established by a single governmental employer are administered by employees in the employer's finance or human resources department. Generally, staff sizes vary with the number of covered members and the services provided. Data provided by the PPCC survey shows staff sizes ranging from a

TABLE 11. Public Pension Plan Governance and Structure, 1996

	Mean	*Median*	*Number of Plans*
I. Board size and composition			
Number of board members	8.3	8	244
% appointed and ex officio	62	60	231
% elected by members	35	40	224
II. Board responsibilities (% responsible for)			
Investment	88		244
Benefits	71		244
Assumptions	89		244
Asset allocation	84		228
III. Constraints on board behavior (% subject to)			
Prudent Man limitation	88		236
Ethics standards written	66		233
State legal list	29		238
Constitutional restrictions on investment	19		225
Own investment prohibitions	12		235
In-state investment requirements	4		233
State insurance law	3		235
IV. Public pension board oversight (% requiring)			
Actuarial valuation annually	100		364
Annual audit	99		252
Independent investment performance audits	86		231

Source: Adapted from Mitchell and McCarthy (1999).

single individual working part time to administer a small local plan, to over 200 people for plans covering several hundred thousand members. While staff size averaged 53.6 for all respondents, systems covering state employees and teachers had much larger staffs on average (120.5 and 111.4 respectively) than systems covering public safety and general local employees (7.0 and 11.0 respectively). This is mainly due to the fact that systems serving state employees and teachers tend to have many more members than systems covering public safety and local employees.

When staff size is examined in relation to the number of active members served by the plan, the results suggest economies of scale in system administration. Table 12 shows that the typical public pension system has around 2.6 staff members per 1,000 active members, with systems covering state employees and teachers averaging 1.5 each, compared with systems covering public safety and local government employees (5.0 and 2.8, respectively). Since state and teacher systems have substantially more members than sys-

TABLE 12. Public Pension Plan Governance and Structure by Plan Type, 1996

	State employee systems	*Teacher and school employee systems*	*Police and firefighter systems*	*Local employee systems*	*All systems*
Average board size (*N*)	9.24	10.03	7.50	7.55	8.31
Appointed (%)	47	40	39	50	46
Elected (%)	31	43	45	32	35
Ex officio (%)	18	16	13	15	16
Other (%)	4	1	3	3	3
Staff size (*N*)	120.5	111.4	7.0	11.0	53.6
Staff per 1,000 active members	1.5	1.5	5.0	2.8	2.6

Source: Authors' tabulations from PPCC, PENDAT Database, 1997. See Zorn (1997).

tems covering public safety and local employees, it is likely that their lower staffing ratios reflect economies of scale.

The vast majority of retirement boards have the responsibility for overseeing pension investments. As such, board members are acting as fiduciaries and required to use their best judgment to ensure that future funds are available to pay plan benefits. In the private sector, corporate pension fiduciaries are regulated by the Employee Retirement Income Security Act of 1974; this law requires private pension funds to be invested using the "care, skill, and diligence" of a prudent individual acting "solely in the interest" of plan participants. While state and local pension plans are exempt from the fiduciary language of ERISA, it is interesting to that the same or very similar language has been adopted in most public plans (88 percent). Somewhat less prevalent are written ethical standards for public board members, with only two-thirds of all public plans requiring these. This approach seeks to limit potential conflicts of interest with regard to public pension boards, and has been championed by the California Public Employee Retirement System (CalPERS) in recent years. In addition virtually all reporting plans have annual actuarial valuations and are subject to annual actuarial audits, and some 86 percent are subject to independent investment audits. These reporting and disclosure requirements contribute to a more transparent public pension environment for all concerned stakeholders.

Conclusion

We conclude that state and local government pension plans have been generally successful in providing adequate and secure retirement benefits in ways that substantially reduce their long-term costs. Most benefits are provided through defined benefit plans, paid over the life of the retiree, that

do not vary with fluctuations in the financial markets. In many instances, the benefits are also indexed to inflation. In addition, most of the plans are well funded, with investment income accounting for over two-thirds of plan receipts, thereby reducing required contributions. We have also shown that public plan assets are relatively diversified, especially as compared to the past. And compared to the private sector, public plans tend to have relatively smoother investment performance patterns, mainly attributable to their larger share in bonds and smaller equity holdings.

These signs of pension system maturity are strongly positive predictors for the future. Nevertheless, state and local plans will face challenges over the next several decades. The baby boom aging process suggests that public employers will face a burst of retirements within the next ten to fifteen years. Another potential pressure results from fiscal stress, which can undermine efforts to fully fund accumulating promises (Mitchell and Smith 1994). As long as economic conditions remain favorable, there appears to be little to worry about, but an economic downturn can reduce funding in a variety of ways. Additionally, if capital market returns are highly correlated with state and local tax revenues, funding problems could be exacerbated in an economic downturn. More research is required on this potential linkage.

Another development pertains to public employee and employer interest in defined contribution plans. Some states have adopted defined contribution plans, including the State Employees Retirement System of Nebraska, the Teachers' Defined Contribution Plan of West Virginia, and Michigan's State Employee plan for workers newly hired in 1997 and thereafter (Fore this volume). Whether others will follow depends in large part on cost and political considerations, including how state and local budgets are faring, and whether employee unions see them with favor.

These factors suggest some pressures for change. For example, to protect public plans from political pressures resulting from fiscal stress, the National Conference of Commissioners on Uniform State Laws has recently proposed that all states adopt a uniform set of laws related to public pension plan investments. This Management of Public Employee Retirement Systems Act (MPERSA) is intended to modernize investment decisionmaking in public pensions (Wisniewski 1999). Whether it will eventually be adopted by state legislatures remains to be seen.

In addition, demographic and economic pressures are also affecting plan design. In order to keep experienced, long-term employees on staff, some public employers have modified their retirement plans in ways that encourage employees to remain in service beyond their normal retirement date. These deferred retirement option plans (DROPs) reward employees who postpone their retirement by providing a partial lump-sum distribution when they finally leave employment (Eitelberg this volume). Additionally, concern over pension portability arising from the debate over defined con-

tribution plans has lead some public retirement systems to adopt "hybrid plans" combining features from both defined benefit and defined contribution plans. Undoubtedly, plan design will continue to evolve over the next several decades, as state and local pension systems in the United States continue to evolve with the changing environment.

Notes

1. Active and retired participant data refer to 1997 and are taken from Zorn (1999); asset information for 1998 is from Anand (1999).

2. Some public sector plans are of the defined contribution variety as we note below.

3. For a discussion of pension plan types, see McGill et al. (1996)

4. For early discussion of public pension plans see Bleakney (1972), Inman (1982), and Phillips (1992); more recent analyses include Mitchell and Carr (1996), Hsin and Mitchell (1994, 1996, 1997), and Mitchell and Smith (1994).

5. This section draws on Zorn (1999).

6. Total investment earnings amounted to more then $780B over the entire 1987–97 period (not shown in Table 1).

7. For an analysis of teacher retirement systems see Wisniewski (1999).

8. These statistics are compiled from the Public Pension Coordinating Council's 1997 PENDAT Database (Zorn 1997). This survey covered plans employing more than 80 percent of active state and local system members.

9. The precise split between the employer and employee contribution amount is less consequential for eventual benefit amounts than is the overall cost of the plan. But here, too, it is difficult to compare public and private plan costs, since the rising value of private sector pensions due to good stock market performance has permitted many private employers to take "contribution holidays" from their pensions, for more than a decade. For further detail on employer costs for employee compensation see BLS (1999).

10. Perhaps as a result, only 4 percent of public plans have benefits "formally" integrated with social security payments; more than half of private plans do (many others have informal integration arrangements).

11. Prior to June 15, 1996, the Governmental Accounting Standards Board required public plans to disclose the pension benefit obligation (PBO), a measure of the actuarial accrued liability based on the projected unit credit actuarial method, in the notes to their financial statements. This was reported in addition to the actuarial accrued liability determined under the actuarial method actually used to calculate the plan's liabilities and required contributions. The purpose of disclosing the PBO was to provide a more consistent measure with which to compare funding progress across public plans. In 1996, GASB (1996) eliminated the PBO disclosure requirement after substantial debate, on the grounds that it did not substantially clarify funded status and was possibly responsible for a reduction in employer contributions for some plans. Currently, GASB provides for the use of any one of the following actuarial cost methods: entry age, frozen entry age, attained age, frozen attained age, projected unit credit, and aggregate actuarial cost. With the spread of GASB reporting among retirement systems, the PBO statistic has been deemphasized or dropped entirely from public employee pension system annual financial reports.

12. This is derived from the 1995 and 1997 PENDAT surveys (Zorn 1997).

13. See Munnell and Sunden (this volume) and Useem and Hess (this volume) for further discussion on this point.

14. In examining this table, readers should note that the comparison is between a group of funds (with a diversified asset mix, including stocks and bonds) and a stock index (including only stocks). Thus, the fact that the funds underperformed the index in 1995 and 1996 is not an indication of investment mismanagement but rather the result of holding a diversified portfolio.

15. Some systems, such as the Florida Retirement System and the Iowa Public Employee Retirement System operates without a board of trustees, relying instead on authority vested in a senior official of the sponsoring agency (Wisniewski 1999).

References

Anand, Vineeta. 1999. "Defined Benefit Assets Surge 20.3 percent." *Pensions and Investments* (March 22): 1.

Bleakney, Thomas P. 1972. *Retirement Systems for Public Employees.* Pension Research Council. Homewood, Ill.: Irwin.

Board of Governors of the Federal Reserve System. 1999. *Flow of Funds Accounts of the United States, Annual Flows and Outstandings, 1982–1990.* Washington, D.C.: Board of Governors.

Braden, Bradley R. and Stephanie Hyland. 1995. "Cost of Employee Compensation in the Public and Private Sectors." *Employee Benefits Survey: A BLS Reader.* U.S. Department of Labor, BLS, February.

Bureau of Labor Statistics (BLS), U.S. Department of Labor. 1989. *Employee Benefits in Medium and Large Firms, 1989.* Washington, D.C.: U.S. GPO.

———. 1992. *Employee Benefits in State and Local Governments, 1992.* Washington, D.C.: U.S. GPO.

———. 1994. *Employee Benefits in State and Local Governments, 1994.* Washington, D.C.: U.S. GPO.

———. 1995. *Employee Benefits in Medium and Large Private Establishments, 1995.* Washington, D.C.: U.S. GPO.

———. 1999. *Employer Costs for Employee Compensation Summary.* <www.bls.gov/news.release/ecec.news.html>

Eitelberg, Cathie. This volume. "Public Pensioin Design and Responses to a Changing Workforce."

Fore, Douglas. This volume. "Going Private in the Public Sector: The Transition from Defined Benefit to Defined Contribution Pension Plans."

Government Accounting Standards Board (GASB). 1996. *Statement No. 25: Financial Reporting for Defined Benefit Plans and Note Disclosures for Defined Contribution Plans.* Hartford, Conn.: GASB.

Greenwich Associates. 1998. "What Now?" *Greenwich Report* (Greenwich, Conn.), March.

Hsin, Ping-Lung and Olivia S. Mitchell. 1994. "The Political Economy of Public Sector Pensions: Pension Funding Patterns, Governance Structures, and Fiscal Stress." *Revista de Analysis Economico* (July).

———. 1996. "Managing Public Sector Pensions." In *Pensions for the Twenty-First Century,* ed. Sylvester J. Schieber and John Shoven. New York: Twentieth Century Fund.

———. 1997. "Public Pension Plan Efficiency." In *Positioning Pensions for the Twenty-*

First Century, ed. Michael S. Gordon, Olivia S. Mitchell, and Marc Twinney. Pension Research Council. Philadelphia: University of Pennsylvania Press. 187–208.

Hustead, Edwin C. This volume. "Determining the Cost of Public Pension Plans."

Inman, Robert P. 1982. "Public Employee Pensions and the Local Labor Budget." *Journal of Public Economics* 19: 49–71.

Internal Revenue Service (IRS), U.S. Department of the Treasury. 1997. *Federal-State Reference Guide: Social Security Coverage and FICA Reporting by State and Local Government Employers.* Washington, D.C.: Internal Revenue Service.

McCarthy, David M. and John A. Turner. 1992. "Stock Turnover and Private Pension Portfolios." *Trends in Pensions 1992.* U.S. Department of Labor. Washington, D.C.: U.S. GPO. 543–76

McGill, Dan M., Kyle N. Brown, John J. Haley, and Sylvester J. Schieber, eds. 1996. *Fundamentals of Private Pensions.* 7th ed. Pension Research Council. Philadelphia: University of Pennsylvania Press.

Mitchell, Olivia S. 1998. "Administrative Costs in Public and Private Pension Systems." In *Privatizing Social Security*, ed Martin Feldstein. NBER. Chicago: University of Chicago Press.

Mitchell, Olivia S. and Roderick M. Carr. 1996. "State and Local Pension Plans." In *Handbook of Employee Benefits*, ed. Jerry S. Rosenbloom. Chicago: Irwin. 1207–22.

Mitchell, Olivia S. and Ping-Lung Hsin. 1997a. "Managing Public Sector Pensions." In *Public Policy Toward Pensions*, ed. Sylvester J. Schieber and John B. Shoven. Twentieth Century Fund. Cambridge, Mass.: MIT Press. 247–266.

———. 1997b. "Public Sector Pension Governance and Performance." In *The Economics of Pensions: Principles, Policies, and International Experience*, ed. Salvador Valdés-Prieto. Cambridge: Cambridge University Press. 92–126.

Mitchell, Olivia S. and David McCarthy. 1999. "The Structure and Performance of State and Local Pension Plans." Pension Research Council Working Paper, Philadelphia: Wharton School.

Mitchell, Olivia S., Robert J. Myers, and Howard Young, eds. 1999. *Prospects for Social Security Reform.* Pension Research Council. Philadelphia: University of Pennsylvania Press.

Mitchell, Olivia S. and Robert S. Smith. 1994. "Pension Funding in the Public Sector." *Review of Economics and Statistics* 126, 2 (May): 278–90.

Munnell, Alicia H. and Annika Sundén. This volume. "Investment Practices of State and Local Pension Funds: Implications for Social Security Reform."

Nofsinger, John R. 1998. "Why Targeted Investing Does Not Make Sense." *Financial Management* 27, 3 (Autumn): 87–96.

Pensions and Investments. 1999. January 25: 74.

Phillips, Kristen. 1992. "State and Local Government Pension Benefits." In *Trends in Pensions 1992*, ed. John A. Turner and L. Dailey. Washington, D.C.: U.S. GPO. 341–492.

Social Security Advisory Council (SSAC). 1996. *Final Report.* <www.ssa.gov>.

U.S. Bureau of the Census, Census of Governments. 1987, 1992. *Employee Retirement Systems of State and Local Governments.* Washington, D.C.: U.S. Department of Commerce.

———. 1999. *Employee Retirement Systems of State and Local Governments.* <www.census.gov/govs/www/per.html>

U.S. Congress, House Committee on Education and Labor, 1978. *Pension Task Force Report on Public Employee Retirement Systems.* 95th Cong., 2d sess. Washington, D.C.: U.S. GPO.

U.S. Congress, House Ways and Means Committee. 1998. *Green Book.* Washington, D.C.: U.S. GPO.

Useem, Michael and David Hess. This volume. "Governance and Investment of Public Pensions."

Wisniewski, Stanley. 1999. "Salient Features of Large Public Employee Retirement Systems with a Focus on Education Employees." Pension Research Council Working Paper. Philadelphia: Wharton School.

Zorn, Paul. 1995. "Comparing Retirement Benefits Provided by Private Firms and State and Local Governments." *Research Bulletin* (Government Finance Officers Association), January.

———. 1999. "Local Government Employee Pension Plans." Pension Research Council Working Paper. Philadelphia: Wharton School.

———. 1997. *Survey of State and Local Government Employee Retirement Systems.* Chicago: Public Pension Coordinating Council, c/o Government Finance Officers Association.