TEACHERS' RETIREMENT BOARD

BOARD EDUCATION

SUBJECT: Unfunded Actuarial Obligation ITEM NUMBER: 2

CONSENT: ___ ATTACHMENT(S): 1

ACTION: ____ DATE OF MEETING: December 6, 2005

INFORMATION: X PRESENTER(S): Ed Derman

PURPOSE OF THE ITEM

This educational item will provide an overview of the unfunded actuarial obligation to provide context to the discussion at the Board meeting. For background, the latest public fund survey from the National Association of State Retirement Administrators is attached.

Public Fund Survey Summary of Findings for FY 2004

Prepared by Keith Brainard
Research Director
National Association of State Retirement Administrators
September 2005

Table of Contents

Background and Methodology	***i***
The Meaning and Implications of Actuarial Funding Ratios	**1**
Funding Levels and Changes from Prior Years	**2**
Changes in Membership	**6**
Prefunding, Public Pension Plans, and Social Security	**7**
Contributions, Benefit Payments, and Expenses	**7**
Retirement Multipliers	**8**
Contribution Rates	**9**
The Long Timeline of Changing Contribution Rates	**10**
Actuarial Assumptions	**11**
Asset Allocation	**14**
System Summary	**Appendix A**
Actuarial Funding Summary	**Appendix B**

Background and Methodology

The Public Fund Survey is an online compendium of key characteristics of 103 public retirement systems that administer pension and other benefits for a combined 12.6 million active public employees and 5.8 million retirees and other annuitants, and that hold more than $2.1 trillion in trust for these participants. The membership and assets of systems included in the survey are estimated to represent approximately 88% of the nation's total public retirement system community. The survey is sponsored by the National Association of State Retirement Administrators and the National Council on Teacher Retirement.

All survey data pertains to defined benefit plans, including several hybrid plans. More information on hybrid plans is discussed in the section of this report titled, *Retirement Multipliers*. According to the U.S. Bureau of Labor Statistics, 88 percent of state and local government employees have a defined benefit as their primary retirement benefit.

Most data in the survey is maintained on a fiscal year basis and is updated as new information, particularly system annual financial reports, becomes available. In addition to annual financial reports, survey data also is taken from actuarial valuations, benefits guides, system websites, and input from system staff.

The information presented in this report reflects the latest available information. For more than 90 percent of the systems in the survey, the data is updated through FY 04. Producing a retirement system annual report typically requires a minimum of five months following the end of a fiscal year. About three-fourths of the systems in this survey have a fiscal year-end date of June 30; most others have a fiscal year that ends December 31. Because FY 04 annual financial data for some systems is unavailable as of this writing, the data presented in this summary may change slightly.

All data collected in the survey is classified as either "system" data or "plan" data. Every system in the survey has at least one plan; some systems have more than one. In cases of systems with multiple plans, separate plans typically are established for different employee groups, such as local government employees, public safety personnel, judges, and elected officials. In some cases, retirement systems combine all employee groups into a single plan, but may provide different benefit levels for different groups. The survey covers 103 systems and 127 plans. Smaller plans for narrow employee groups, such as legislators and judges, typically are not included in the Public Fund Survey.

The Meaning and Implications of Actuarial Funding Ratios

Perhaps the most recognized measure of a public retirement plan's health is its actuarial funding level, the ratio of assets to liabilities for benefits accrued to-date. A pension plan whose assets equal its liabilities is funded at 100% and is considered *fully funded;* any shortfall of assets is an *unfunded liability*, and a plan with an unfunded liability is considered *underfunded.*

Underfunded normally does not mean that a plan is unable to pay the benefits for which it is presently obligated; in fact, substantially all underfunded public pension plans are able to meet their current obligations.

All plans, underfunded and fully funded alike, that are open to newly hired workers, rely on future contributions and investment returns. A key difference between underfunded and fully funded plans is that underfunded plans require contributions both to finance benefits currently being accrued as well as to eliminate the shortfall between their assets and their accrued liabilities. Because fully funded plans have no such shortfall, they require contributions only to finance benefits currently being accrued.

"Fully funded" can be mistakenly interpreted to mean that no future contributions to the plan will be required. In fact, "fully funded" means that the actuarial value of assets on hand equal the plan's actuarial accrued liabilities – contributions and investment earnings still will be required to cover the benefit obligations as they accrue going forward.

Although the actuarial funding level is a useful indicator of a plan's health, its utility and meaning should not be overstated: calculating an actuarial funding ratio involves many financial and demographic assumptions, of which most, if not all, will be incorrect to one degree or another in the short-term. Moreover, the actuarial calculation itself is only a snapshot of an arrangement of complex, long-term financial and demographic projections, based on the theoretical supposition that the plan's liabilities are subject to settlement as of the actuarial valuation date. Yet, except in the rare case of a plan termination, all of a plan's obligations do not come due at once. Rather, these obligations extend continuously many years into the future. This future period provides the plan, fully funded or not, with time to continue accruing assets (usually through a combination of contributions and investment earnings) needed to meet future obligations.

Attaining full funding of a pension plan has been likened to a mortgage, in which the homeowner has a long period, such as 30 years, to amortize the obligation. At the end of the thirty-year period, the mortgage would be considered fully funded. Although at any point during the thirty-year period, the outstanding mortgage may be considered an unfunded liability, more relevant considerations are a) whether the homeowner has the resources to continue to meet his or her mortgage payments until the obligation is resolved; and b) whether the obligation is being amortized.

Likewise, more pertinent considerations with regard to funding a public pension plan may be whether: a) the amount needed to fund the benefit and to amortize the unfunded liability is causing fiscal stress, and b) the plan's unfunded liability is diminishing, or there is a plan in place to reduce the unfunded liability. Public pension accounting standards require disclosure of trend data that reveal the current funding condition and the direction in which the plan appears to be headed.

Funding Levels and Changes from Prior Years

Figure A summarizes aggregate assets and liabilities for the 127 plans included in the Public Fund Survey for fiscal years 01 through 04. The combined funding level for these plans is 87.8%, down from last year's level of 91.2%. Actuarial liabilities grew to $2.399 trillion, up from 6.7 percent from the previous year's level of $2.248 trillion. Actuarial assets grew 2.7 percent, from $2.051 trillion to $2.106 trillion.

Figure A: Change in aggregate actuarial assets, liabilities, and funding levels, FY 01 to FY 04 (trillions)

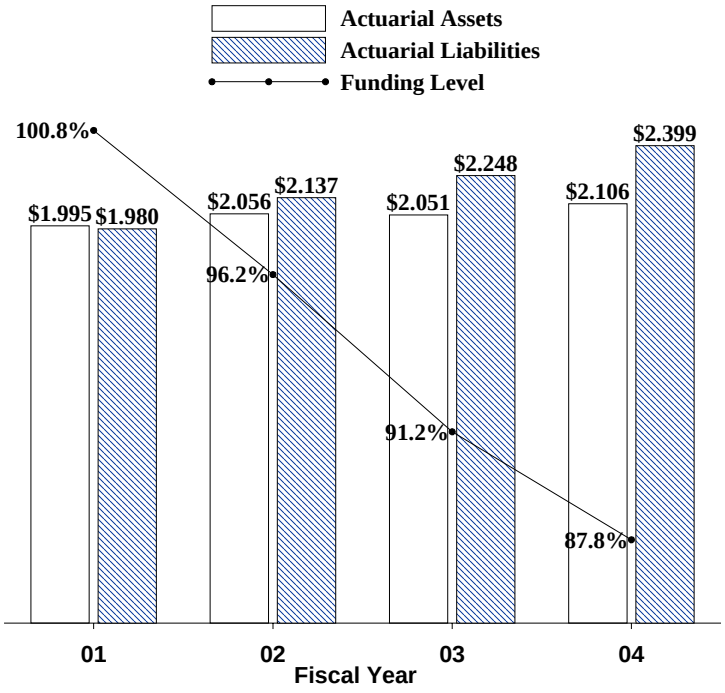
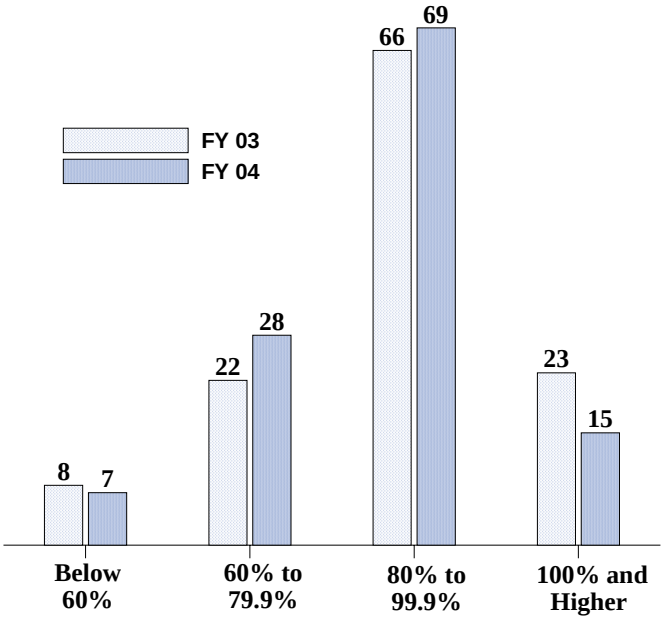


Figure B summarizes the change in the distribution of funding levels from FY 03 to FY 04. (Eight plans in the survey use the aggregate cost actuarial funding method, which does not identify an unfunded liability. These plans are not reflected in Figure B.)

Figure B: Change in Distribution of Actuarial Funding Levels, FY 03 to FY 04



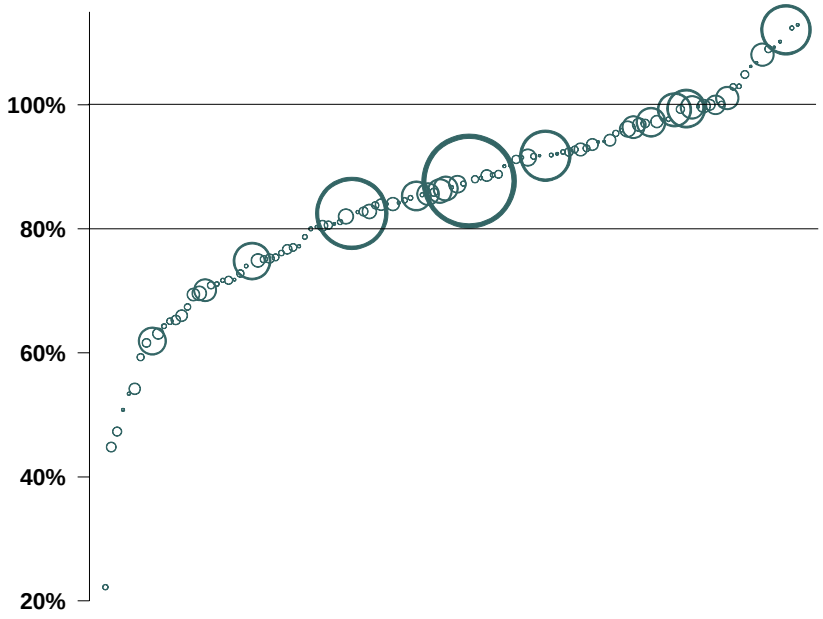
Despite the decline in funding levels, 84 of the 119 plans (71%) have an actuarial funding ratio of 80% or higher, a threshold often cited by actuaries as a benchmark of a pension plan's actuarial health. The average funding level of all plans in the survey is 85.2%; the median is 86.7%.

The number of plans with a funding level below 80 percent rose from 30 to 35, or 29 percent of all plans in the survey. The farther a plan's funding level is below 100 percent, the higher its cost will be to amortize its unfunded liability. While the fiscal and liability structure of every plan sponsor and pension plan are unique, a funding level below 80 percent may create fiscal stress for the plan sponsor(s) as a result of higher contribution rates needed to amortize the unfunded liability.

Four plans in the survey during FY 04 were recipients of pension bond proceeds. Three of these plans were in Illinois—the Teachers', State, and Universities plans—and the other was the San Diego County plan. The bond proceeds were enough to raise the funding level of the Illinois Teachers and Universities plans above the 60 percent threshold.

Figure C displays each plan's liabilities roughly proportionate to the size of the plan's circle. The larger the plan, the larger is its circle. For example, the largest circle, located near the middle of the chart, represents the California Public Employees' Retirement Fund plan, the nation's largest public pension plan. The large circle located at the upper right-hand corner is the Florida Retirement System, which currently is funded at 112.1 percent.

Figure C: Actuarial funding ratios for 119 public pension plans



Appendix B provides a listing of these plans and the eight not shown here that use the aggregate cost actuarial method.

As is evident in Figure C, most of the largest plans, which cover a significant percentage of the total liabilities included in the survey, are funded above 80 percent. The largest five plans in the survey—California PERF, California Teachers, Texas Teachers, the Florida Retirement System, and New York State Teachers—are funded above 80 percent. (The New York State & Local ERS plan is not counted because it uses the aggregate cost method, which does not identify an unfunded liability.) These five plans

by themselves comprise nearly one-fourth of all liabilities in the survey. Plans with a funding ratio above 90 percent have combined liabilities equaling 42 percent of the survey total.

Due chiefly to the continued actuarial recognition (through phasing-in of market gains and losses) of the decline in equity values from April 2000 through March 2003, the aggregate FY 04 actuarial funding level declined for the third consecutive fiscal year. Figure D summarizes the change in funding levels since FY 01 for the 107 plans for which four years of actuarial valuation data are available (this figure excludes plans that use the aggregate cost valuation method). The median decline from FY 01 to FY 04 is 12.6%.

Figure D: Change in actuarial funding ratios for 107 plans FY 01 to FY 04

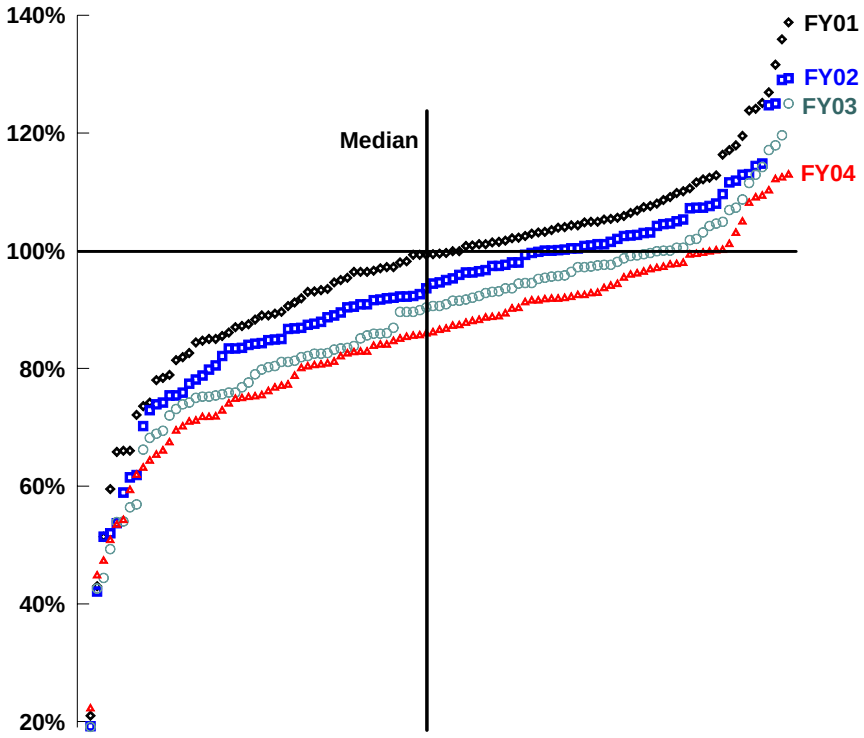
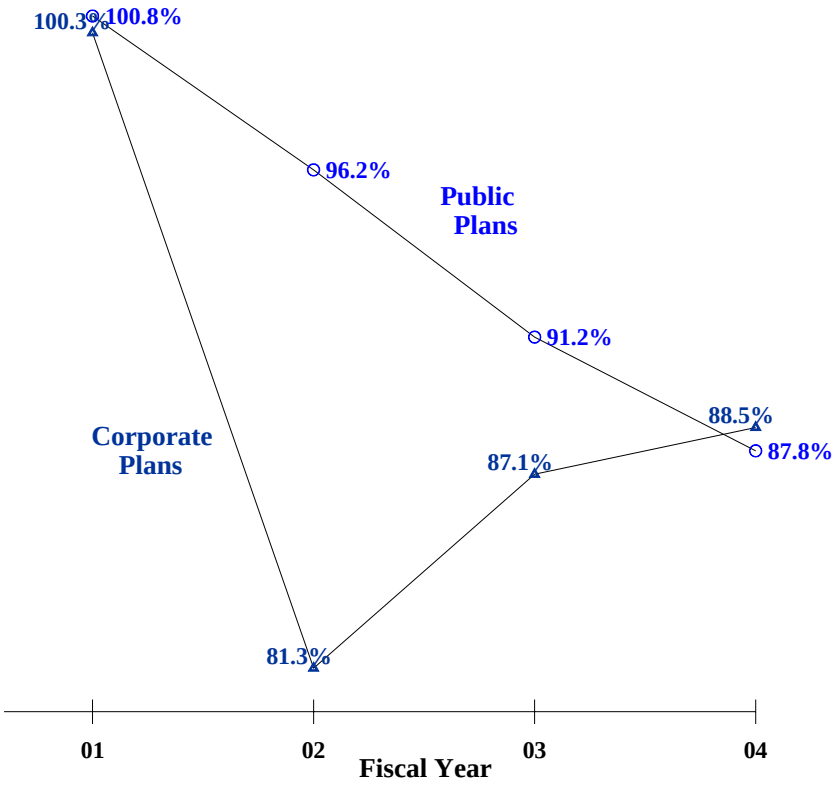


Figure E compares the change in aggregate funding ratios of corporate pension plans and state and local government plans for the period FY 01 to FY 04. The corporate plans shown are those of the 362 corporations in the S&P 500 that sponsor a defined benefit plan, as measured by Standard & Poor's. Corporate pension assets are measured on a market value basis, while most public pension plans use an actuarial valuation method that "smoothes" the value of their assets over a period of several years. (See Figure L.) Measuring assets by market value leads to greater volatility in the funding level than a method that phases in investment gains and losses.

Not all plans conduct an actuarial valuation every year. For the 108 plans that did report new valuation results in their FY 04 financial report, the annual median rate of growth in actuarial liabilities was 6.4 percent. This relatively slow rate of liability growth appears to be a result chiefly of a reduction in the number of new benefit enhancements in recent years. In the absence of investment returns that consistently exceed the predominant 8.0 percent rate of return assumption (see Figure M), or significant increases in contributions, restraining liability growth will be essential to improving actuarial funding levels.

Figure E: Comparison of public and corporate pension funding ratios FY 01 to FY 04

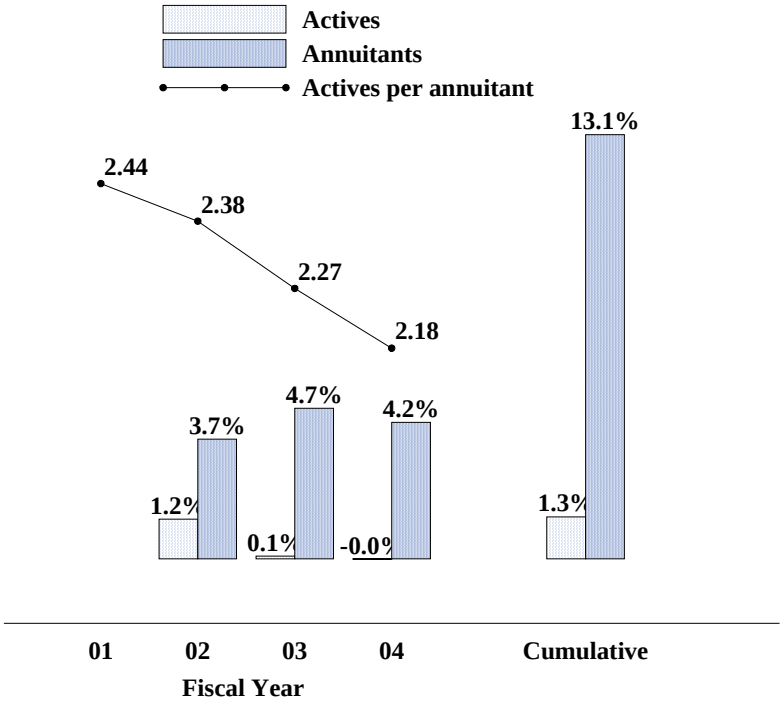


Changes in Membership

The survey measures two major classes of members: Actives, who are working and contributing (or their employer is contributing on their behalf); and Annuitants, which includes any member receiving a regular benefit from the system, chiefly retired members, beneficiaries and disabilitants.

Annual changes since FY 02 in membership for each group are shown in Figure F, along with the cumulative change during this period. For the 93 retirement systems for which FY 04 membership data is available, growth in the number of annuitants once again easily outpaced growth among actives. Since FY 01, the number of annuitants among plans in the survey has grown by a cumulative 13.1 percent, compared with an increase in actives of just 1.3 percent.

Figure F: Annual percentage change in active members and annuitants, and the number of actives per annuitant, FY 01 to FY 04



One result of the higher rate of growth among annuitants is a declining ratio of active participants to annuitants. While this change, by itself, does not necessarily present a problem for retirement systems, over time it can affect retirement system operations, the plan's actuarial condition, and a pension fund's asset allocation.

For example, compared with active participants, annuitants generally require a higher level of retirement system service and attention; annuitants tend to make more inquiries, require resolution or explanation of benefit issues, request adjustments, etc.

To the extent that a pension plan is underfunded, a declining ratio of actives to annuitants complicates the plan's ability to moving toward full funding. This is because fewer actives relative to annuitants usually translates into fewer contributions relative to benefit payments, contributions that are needed to help the plan reduce its unfunded liability.

Also, fewer contributions coupled with increasing benefit payments can require a more conservative asset allocation, as a higher percentage of plan assets are needed to meet immediate and near-term obligations.

Prefunding, Public Pension Plans and Social Security

Most public pension plans are designed to be prefunded. A prefunded plan accumulates during a participant's working years the assets needed for benefits, so that when the employee qualifies for retirement, the funds needed to pay those benefits, on an actuarial basis, are available. By contrast, a pay-as-you-go plan uses current receipts (typically from contributions made employers and working employees) to fund current benefits.

A plan that is fully funded or only slightly underfunded will be less affected by a declining ratio of actives to annuitants, primarily because the plan has the actuarial assets needed to pay its liabilities, and is less reliant on contributions from new working participants.

Policymakers, the media, and the public must recognize two key differences between the pay-as-you-go U.S. Social Security system and prefunded public pension plans. First, because public pension plans are prefunded, the declining ratio of actives to annuitants is much less important than in the pay-as-you-go Social Security plan. The cause of Social Security's projected shortfall is that the ratio of working (contributing) Americans to those receiving a benefit has been declining for many years, a rate projected to increase later in this decade, when Baby Boomers begin to retire. In 2017, the Social Security Administration projects that current receipts will no longer be sufficient to meet the plan's current obligations.

At that point, Social Security will begin to draw on the Social Security Trust Fund, a fund that has been accumulating the surplus of Social Security tax receipts since the mid-1980's. Unfortunately, this brings us to the second key difference between Social Security and public pension funds: the Social Security Trust Fund has been spent on other federal programs. By contrast, public pension funds have real assets of more than $2 trillion (see Figure M, detailing public pension funds' asset allocation).

As a result of these two differences, many comparisons between Social Security and public pensions are either invalid or irrelevant.

Contributions, Benefit Payments, and Administrative and Investment Expenses

For plans in the Public Fund Survey during FY 04:

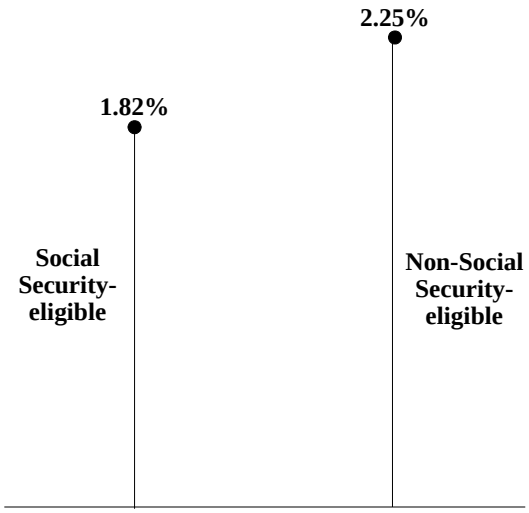
- Total contributions rose approximately 12.5 percent, from $62 billion to $70 billion. Much of this increase occurred among several large plans whose employer contribution rates had been unusually low in previous years, such as CalPERS, the New York State & Local ERS, and the New Jersey Division of Pensions and Benefits. Some of the increase in contributions is due to normal payroll growth, which typically is in the range of 4.0 percent to 4.5 percent; higher contribution rates comprise the bulk of the remaining growth. This increase in contributions does not include the approximately $7.5 billion in bond proceeds distributed to three Illinois systems and the San Diego County system.
- Total benefit payments rose by around 8 percent, from $104 billion to $112 billion. Primary sources of this increase include normal growth in the number of annuitants, especially retirees; and cost-of-living adjustments made to existing annuitants.
- Median investment expenses were 23 basis points, ranging from a low of less than one basis point to 94 basis points.
- Median administrative expenses (not including investment management expenses) were eight basis points. The combined median figures for investment and administrative expenses result in a median cost to administer the retirement systems in the survey of less than one-third of one percent of assets.

Retirement Multipliers

A retirement multiplier is a standard feature of a defined benefit plan, factored along with a participant's years of service and salary to calculate a retirement benefit. Figure G summarizes median retirement multipliers on the basis of Social Security eligibility, indicating a median multiplier for Social Security-eligible participants of 1.82% and 2.25% for those not eligible for Social Security. (Approximately 25% of public employees, including many school teachers and a majority of firefighters and police officers, do not participate in Social Security, making their public pension benefit their primary means of retirement income.)

These multipliers pertain to general employees and teachers; law enforcement personnel and firefighters generally have higher retirement multipliers because their jobs are higher-risk and their careers usually are shorter. These median figures are substantially unchanged from FY 03.

Figure G: Median Plan Retirement Multipliers



Several plans in the survey administer hybrid benefit structures. Hybrid pension plans in the public sector take of one of two forms. One resembles a cash balance plan, in which the pension benefit is based on combination of service credit (as in a defined benefit plan) and contributions and investment earnings (as in a defined contribution plan). Benefits administered by the Texas County & District Retirement System, the Texas Municipal Retirement System, and the Nebraska State Employees Retirement System fall into this category.

The other form of hybrid pension plan in the public sector melds a traditional, but more modest DB plan, with a defined contribution plan. Plans in Indiana, Washington state, and Oregon; and optional plans in Florida, Ohio, Wisconsin and South Dakota offer this type of hybrid.

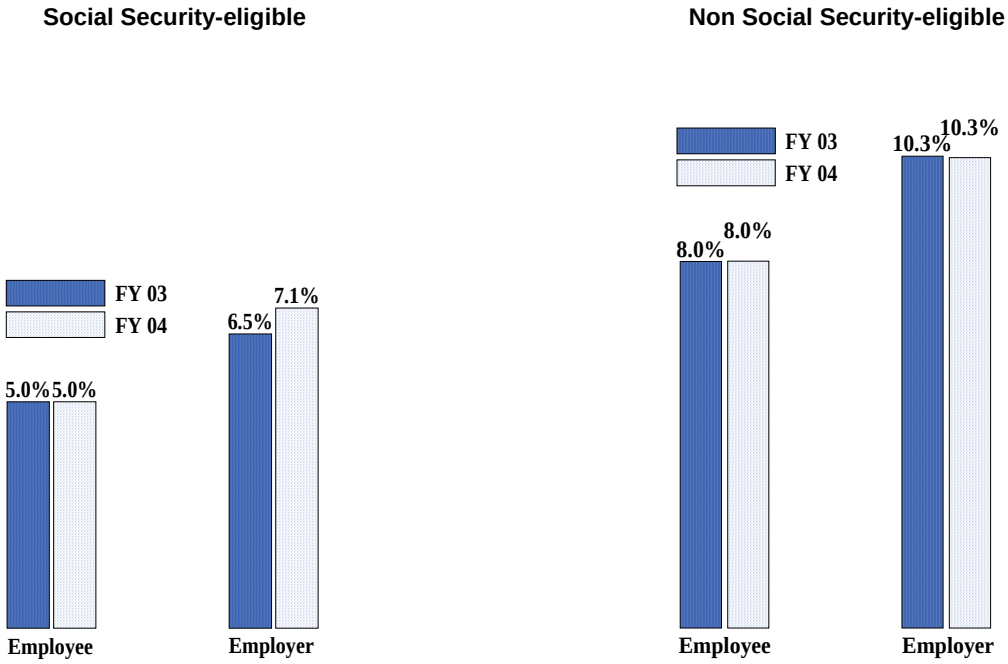
Each of these hybrid plans offer two key features of a DB plan: they provide a benefit that is assured for life; and the employer, not the employee, bears all or some of the investment risk. Multipliers for hybrid plans are not factored into the median figures depicted in the chart above.

Contribution Rates

Neatly characterizing contribution rates for the public pension plan community is difficult: there is no typical arrangement for contribution rates, with the possible exception that in most cases, employers and employees alike contribute to the pension plan. Many plans establish a fixed contribution rate for employees, and five percent of pay is a popular rate. Ten plans in the survey are non-contributory for employees. Contribution rates are variously determined by statute, actuarial requirements, or trustee or legislative fiat. Some rates change from year to year based on an actuarial valuation; others are fixed in statute. Some plans base contribution rates on the employee's age at their point of entry into the plan. Some plans hold employee contribution rates steady and allow employer rates to vary based on actuarial requirements. Agent plans usually have different rates for each of hundreds or even thousands of employers. Some rates are graduated based on the employee's salary.

Figure H identifies median contribution rates for employees and employers, for fiscal years 03 and 04, distinguished by participants' eligibility for Social Security. These rates pertain to general employees and teachers and do not include public safety personnel. Because most law enforcement officers and firefighters receive higher pension benefits than other employee groups, their contribution rates usually are substantially higher than those for other groups of public employees. Also, because pension benefits usually are higher for participants who are not eligible for Social Security, contribution rates for these participants are higher than for those who do participate in Social Security.

Figure H: Median contribution rates, FY 03 and FY 04



Although Figure H indicates little change from FY 03 to FY 04, rates have risen at some plans for both employees and employers, but not enough to change the median. Also, policymakers and trustees in some plans have expressed their intention to increase contribution rates in FY 05.

The Long Timeline of Changing Contribution Rates

For a number of reasons, the path from declining investment returns to lower funding levels to higher contribution rates is often surprisingly lengthy. Most plans phase in investment gains and losses over several years (see Figure L), which delays the effects of a market decline on a plan's funding condition. This delay is extended because retirement systems normally require at least six months following the end of a fiscal year to produce an annual financial report.

This lag can be extended further when a plan either has an actuarial valuation that lags their fiscal year (as many do), or they have an actuarial valuation conducted only every other year. Once the effect of a market decline begins to take its toll on a plan's funding level, and the extent of higher contribution rates is fully measured, the issue often enters the political arena, as state legislators and other policymakers become responsible for approving higher contribution rates.

To illustrate this timeline, while the median public pension fund experienced a negative investment return for the year-ended June 30, 2001, because of the use of actuarial smoothing methods, not only did the typical public fund experience a positive actuarial return that year, but, because of previous years' returns, the typical public pension fund experienced an actuarial return greater than the predominant actuarial assumption of 8.0 percent !

Thus, despite the fact that by June 30, 2001 (the end of FY 01 for most plans), domestic equity returns had been in decline for 15 months, actuarial investment returns remained well above assumed levels. It was not until after June 30, 2002, 27 months after the onset of the equity market slide, that the effect of negative investment returns began to be recognized actuarially by most public pension funds. This fact was first officially reported in FY 02 financial reports that were published in January 2003, nearly three years after the onset of the equity market decline. A legislature would have first learned of the need for higher contribution rates when it convened in January 2003. In this scenario, the earliest the legislature would have been able to effect higher contribution rates, would be for FY 04.

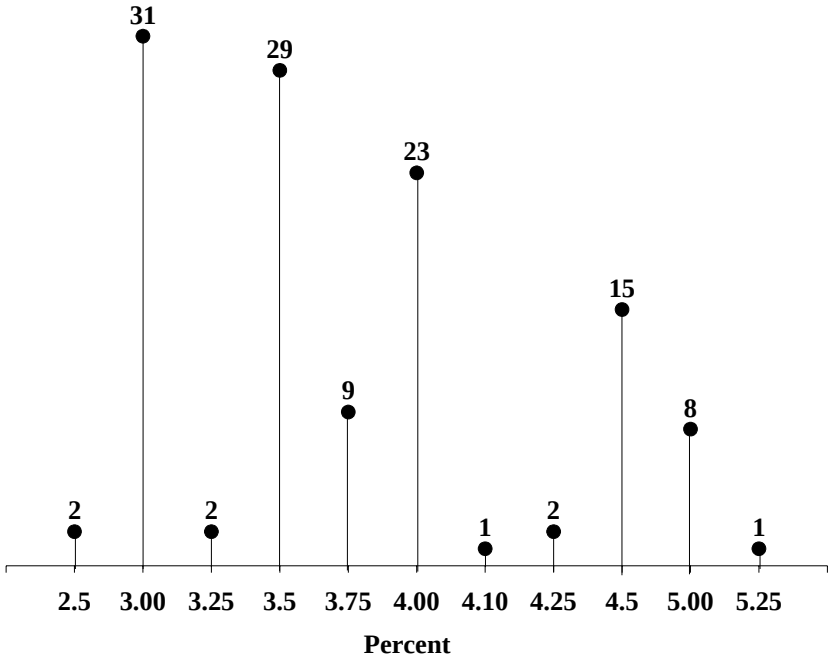
But in cases where plans' actuarial valuation date lags the fiscal year-end date, news of the need for higher returns will arrive even more slowly. When the political process of securing a consensus to raise contribution rates, incorporating them into the budget process, and giving political subdivisions (school districts, cities, etc.) notice of the higher rates into their budgets, are added to the timeline, the timeline from lower investment returns to higher contribution rates can take several years.

The FY 05 Summary of Findings report is likely to identify contribution rates higher than those shown here.

Actuarial Assumptions

An actuarial valuation contains dozens of assumptions, ranging from mortality rates to how long participants will continue working, to rates of payroll growth. Two of the more important assumptions affecting public pension funding levels and required contribution rates are the underlying rate of inflation and the rate of investment return. Figure I summarizes the distribution of inflation assumptions for the 123 plans in the survey that report an inflation actuarial assumption.

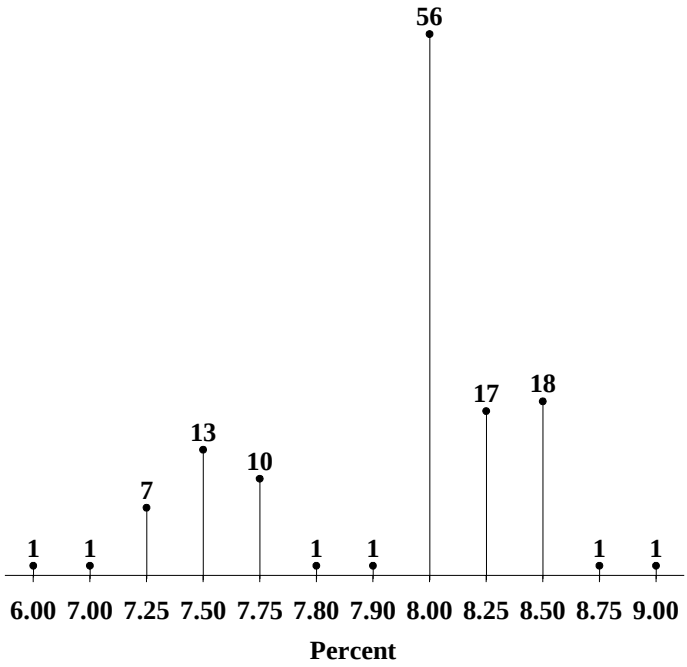
Figure I: Distribution of Assumed Rates of Underlying Inflation



Because several plans reduced their inflation assumption during FY 04, the median declined to 3.50 percent from 3.75 percent in FY 03.

The inflation assumption is important largely because it drives other actuarial assumptions, such as the real rate of investment return, salary growth, and cost-of-living adjustments.

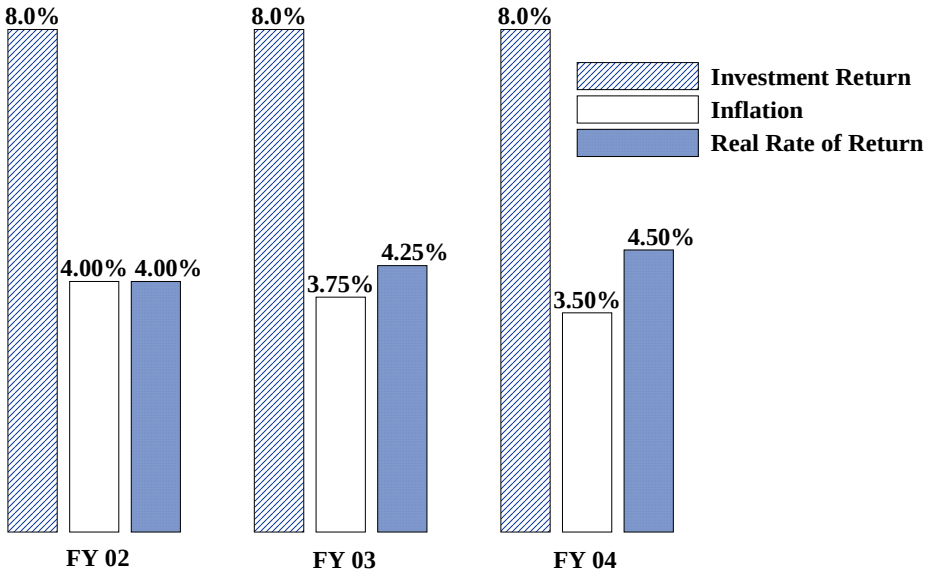
Figure J: Distribution of Assumed Rates of Investment Return, FY 03 and FY 04



As with the inflation assumption, several plans lowered their assumption for investment return, although 8.0 percent remains both the median assumption and by far the most popular.

The real rate of return is the difference between the assumption for investment return and the assumption for the underlying inflation rate. Figure K shows the result of lower assumed rates of inflation, resulting in a median real rate of return of 4.50 percent, up 0.25 percent from FY 03 and 0.50 percent from FY 02. It is perhaps ironic that the median assumption for the real rate of investment return has risen while interest rates are relatively low and many investment experts believe that returns on equities, at least in the near term, are likely to fall short of historic levels.

Figure K: Median Assumed Rates of Investment Return, Inflation, and Real Rate of Return

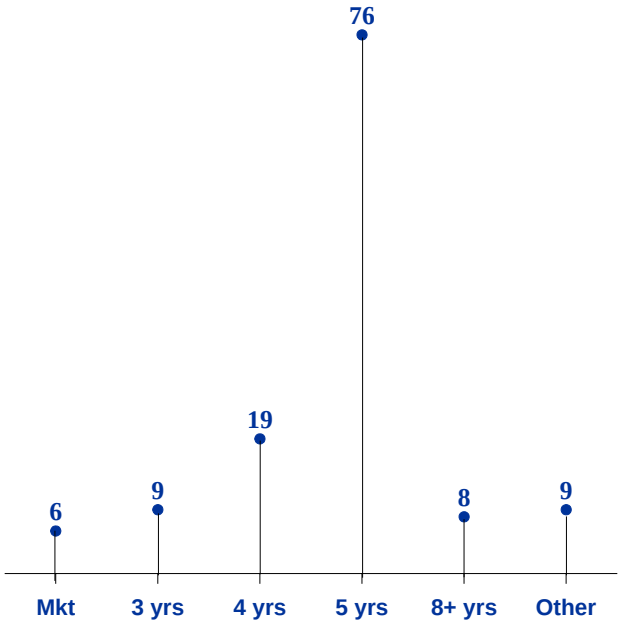


Actuarial Smoothing Periods

Figure L summarizes the use of actuarial smoothing periods used by plans in the Public Fund Survey. Plans use a smoothing period to reduce year-to-year volatility in funding levels and required contribution rates.

CalPERS earlier this year increased its actuarial smoothing period from three years to 15, and the Arizona State Retirement System increased its smoothing period from five years to 10. As Figure L indicates, five years remains the predominant method, six plans use the market value of assets, and eight plans use periods of eight years or longer.

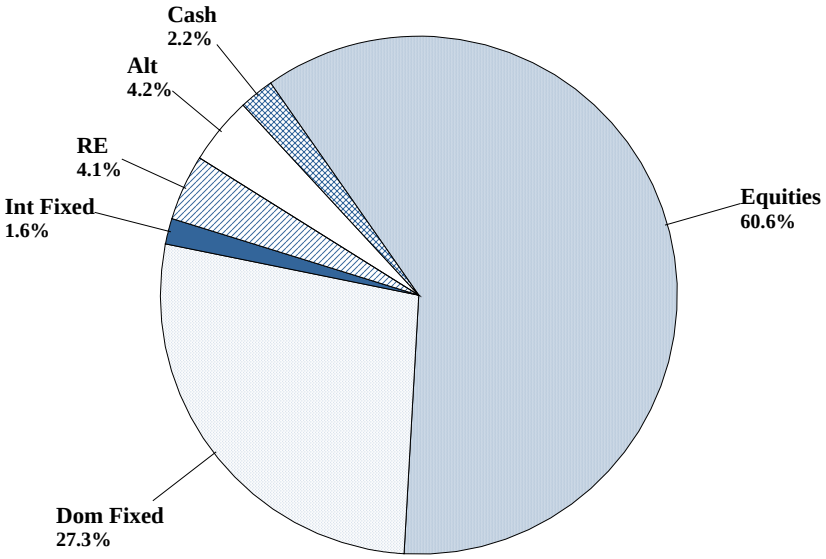
Figure L: Distribution of Periods Used to Smooth Asset Values



Asset Allocation

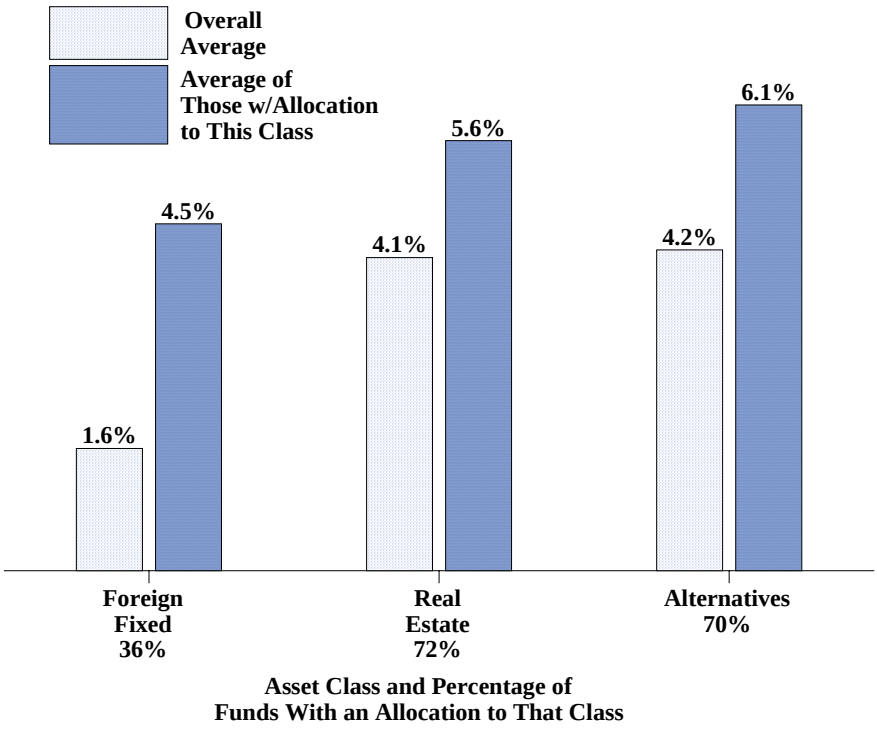
Figure M shows the FY 04 asset allocation for the 94 systems for which this data is available.

Figure M: Average Asset Allocations for 94 systems based on most recent annual financial report



Because not every fund is invested in every asset class, this pie chart does not fully reflect the reality of public funds' asset allocation. Figure M looks more closely at three asset classes—Foreign Fixed Income, Real Estate, and Alternatives—to compare the Public Fund Survey universe with the average allocation of only those funds that have allocated assets to the respective class. For example, 36 percent of funds in the Public Fund Survey have an allocation to Foreign Fixed Income. Of those, the average allocation to that class is 4.5 percent.

Figure N: Allocations to Targeted Asset Classes



Appendix A
System Summary

State	System Name	Asset Market Value ($000s)	Active Members	Annuitants	For Fiscal Year-Ended
AK	Alaska Public Employees Retirement System	8,177,306	34,065	18,431	6/30/2004
AK	Alaska Teachers Retirement System	3,911,515	9,873	8,312	6/30/2004
AL	Retirement Systems of Alabama	24,870,460	212,079	86,413	9/30/2004
AR	Arkansas Public Employees Retirement System	4,306,846	42,826	19,872	6/30/2004
AR	Arkansas Teachers Retirement System	8,122,004	71,462	22,320	6/30/2004
AZ	Arizona State Retirement System	21,431,099	205,573	75,563	6/30/2004
AZ	Phoenix Employees' Retirement System	1,444,743	8,960	3,743	6/30/2004
AZ	Arizona Public Safety Personnel Retirement System	4,309,735	15,852	7,663	6/30/2004
CA	California Public Employees Retirement System	168,436,158	806,644	415,178	6/30/2004
CA	California State Teachers Retirement System	116,158,454	444,680	193,245	6/30/2004
CA	San Francisco City and County Retirement System	11,907,358	32,121	18,490	6/30/2004
CA	San Diego County Employees Retirement Association	5,508,639	17,717	10,770	6/30/2004
CA	Los Angeles County Employees Retirement Association	29,481,183	86,237	48,595	6/30/2004
CA	Contra Costa County Employees' Retirement Association	3,718,616	9,358	6,118	12/31/2004
CO	Colorado Public Employees Retirement Association	32,481,423	176,840	67,900	12/31/2004
CO	Denver Public Schools Retirement System	2,555,931	7,223	5,869	12/31/2004
CT	Connecticut State Employees Retirement System	7,093,403	54,287	32,354	6/30/2002
CT	Connecticut Teachers Retirement Board	10,853,462	49,946	24,297	6/30/2004
DC	District of Columbia Retirement Board	2,613,375	10,750	2,774	9/30/2004
DE	Delaware Public Employees Retirement System	5,521,227	39,266	19,540	6/30/2004
FL	Florida Retirement System	102,409,371	633,642	226,424	6/30/2004
GA	Georgia Teachers Retirement System	42,588,078	208,927	61,590	6/30/2004
GA	Georgia Employees Retirement System	14,241,611	129,060	42,589	6/30/2004
HI	Hawaii Employees Retirement System	8,565,405	62,573	32,297	6/30/2004
IA	Iowa Public Employees Retirement System	17,249,917	160,034	76,961	6/30/2004
ID	Idaho Public Employee Retirement System	7,648,490	63,385	26,043	6/30/2004
IL	Illinois Teachers Retirement System	31,544,729	157,990	76,905	6/30/2004
IL	Illinois State Employees Retirement System	9,990,187	70,621	54,298	6/30/2004
IL	Illinois State Universities Retirement System	12,586,305	72,992	38,487	6/30/2004
IL	Chicago Public School Teachers Pension and Retirement Fur	10,321,555	37,362	19,266	6/30/2004
IL	Illinois Municipal Retirement Fund	18,299,304	168,536	79,628	12/31/2004
IN	Indiana State Teachers Retirement Fund	6,751,775	73,510	37,068	6/30/2004
IN	Indiana Public Employees Retirement Fund	12,290,352	154,624	58,750	6/30/2004
KS	Wichita Retirement Systems	772,718	1,023	1,061	12/31/2003
KS	Kansas Public Employees Retirement System	10,427,143	148,145	59,124	6/30/2004
KY	Kentucky Retirement Systems	13,581,473	142,883	64,567	6/30/2004
KY	Kentucky Teachers Retirement System	13,076,191	71,950	35,803	6/30/2004
LA	Louisiana Teachers Retirement System	11,893,397	84,308	52,900	6/30/2004
LA	Louisiana State Employees Retirement System	6,608,025	64,149	34,780	6/30/2004
MA	Massachusetts State Employees' Retirement System	14,834,328	80,122	51,418	12/31/2003
MA	Massachusetts Teachers Retirement Board	15,973,000	84,255	39,755	12/31/2003
MD	Maryland State Retirement and Pension System	30,166,724	185,861	94,880	6/30/2004
ME	Maine State Retirement System	8,093,522	52,029	31,460	6/30/2004
MI	Michigan Public School Employees Retirement System	36,772,485	321,263	145,588	9/30/2004
MI	Michigan State Employees Retirement System	9,462,368	34,776	45,619	9/30/2004
MI	Municipal Employees' Retirement System of Michigan	4,619,496	36,772	19,273	12/31/2004
MN	Minnesota Teachers Retirement Association	15,095,804	72,008	37,649	6/30/2004
MN	Minnesota Public Employees Retirement Association	14,209,066	151,470	61,190	6/30/2004
MN	Minnesota State Retirement System	8,065,589	51,440	25,228	6/30/2004
MN	Minneapolis Teachers Retirement Fund Association	763,089	5,023	3,764	6/30/2004
MN	St. Paul Teachers' Retirement Fund Association	871,903	4,568	2,361	6/30/2004
MN	Duluth Teachers Retirement Fund Association	258,832	1,178	1,137	6/30/2004

Appendix A
System Summary

State	System Name	Asset Market Value ($000s)	Active Members	Annuitants	For Fiscal Year-Ended
MN	Minneapolis Employees Retirement Fund	1,282,717	552	4,981	6/30/2004
MO	Missouri State Employees Retirement System	5,914,931	56,362	25,179	6/30/2004
MO	Missouri Public Schools Retirement System	24,038,650	119,677	49,675	6/30/2004
MO	Missouri Local Government Employees Retirement System	2,840,490	32,568	10,786	6/30/2004
MO	St. Louis Public School Retirement System	1,060,577	6,074	3,700	12/31/2004
MO	MoDOT & Patrol Employees' Retirement System	1,353,437	9,002	6,731	6/30/2004
MS	Mississippi Public Employees Retirement System	16,187,236	157,197	65,364	6/30/2004
MT	Montana Public Employees Retirement Board	3,649,645	33,520	17,579	6/30/2004
MT	Montana Teachers Retirement System	2,354,844	18,257	9,970	6/30/2004
NC	North Carolina Retirement Systems	59,294,798	423,523	157,938	6/30/2004
NC	Charlotte Firefighters' Retirement System	263,340	897	435	6/30/2004
ND	North Dakota Public Employees Retirement System	1,309,271	17,768	5,798	6/30/2004
ND	North Dakota Teachers Fund for Retirement	1,374,680	9,826	5,373	6/30/2004
NE	Nebraska Retirement Systems	5,564,386	45,149	12,348	6/30/2004
NH	New Hampshire Retirement System	4,391,286	50,420	17,790	6/30/2004
NJ	New Jersey Division of Pension and Benefits	71,648,847	492,231	205,468	6/30/2004
NM	New Mexico Public Employees Retirement Association	9,416,789	47,684	21,262	6/30/2004
NM	New Mexico Educational Retirement Board	6,911,545	62,901	24,947	6/30/2004
NV	Nevada Public Employees Retirement System	16,010,187	90,242	28,768	6/30/2004
NY	New York City Teachers Retirement System	26,077,990	97,986	58,133	6/30/2003
NY	New York State and Local Retirement Systems	120,799,006	539,600	313,597	3/31/2004
NY	New York State Teachers Retirement System	80,276,246	254,515	121,246	6/30/2004
NY	New York City Employees Retirement System	34,177,327	173,434	128,025	6/30/2004
OH	Ohio Police & Fire Pension Fund	7,441,072	28,328	23,413	12/31/2002
OH	Ohio State Teachers Retirement System	54,498,417	196,992	111,853	6/30/2004
OH	Ohio School Employees Retirement System	8,565,455	123,139	60,569	6/30/2004
OH	Ohio Public Employees Retirement System	65,206,891	353,584	145,263	12/31/2004
OK	Oklahoma Public Employees Retirement System	5,126,418	42,998	22,990	6/30/2004
OK	Oklahoma Teachers Retirement System	6,951,778	81,683	39,593	6/30/2004
OR	Oregon Employees Retirement System	45,156,981	160,808	98,686	6/30/2004
PA	Pennsylvania Public School Employees Retirement System	48,537,099	247,000	146,000	6/30/2004
PA	Pennsylvania State Employees Retirement System	26,641,399	108,405	98,727	12/31/2004
RI	Rhode Island Employees Retirement System	5,440,275	36,820	20,392	6/30/2003
SC	South Carolina Retirement Systems	23,782,739	209,479	93,217	6/30/2004
SD	South Dakota Retirement System	5,518,226	35,408	17,029	6/30/2004
TN	Tennessee Consolidated Retirement System	25,586,516	198,917	83,121	6/30/2004
TX	Teacher Retirement System of Texas	84,441,267	718,266	240,627	8/31/2004
TX	Texas Employees Retirement System	19,567,749	133,349	60,089	8/31/2004
TX	Houston Firefighters Relief and Retirement Fund	1,980,903	3,663	2,051	6/30/2004
TX	Texas County & District Retirement System	12,436,226	104,545	28,496	12/31/2004
TX	Texas Municipal Retirement System	11,934,597	92,154	27,273	12/31/2004
TX	Austin Employees' Retirement System	1,375,032	7,489	3,137	12/31/2004
UT	Utah Retirement Systems	16,084,094	97,404	34,577	12/31/2004
VA	Virginia Retirement System	40,041,757	317,203	113,717	6/30/2004
VA	Educational Employees' Supplementary Retirement System c	1,528,120	17,738	6,729	6/30/2004
VT	Vermont Teachers Retirement System	1,245,650	10,315	4,386	6/30/2004
VT	Vermont State Employees Retirement System	1,040,928	8,079	3,833	6/30/2004
WA	Washington Department of Retirement Systems	44,978,924	286,490	110,852	6/30/2004
WI	Wisconsin Retirement System	62,126,000	265,150	121,582	12/31/2003
WV	West Virginia Consolidated Public Retirement Board	4,784,380	56,679	45,809	6/30/2004
WY	Wyoming Retirement System	5,309,586	37,306	17,480	12/31/2004
	Totals	$2,116,461,873	12,641,014	5,801,894	

Appendix B
Plan Summary

State	Plan Name	Actuarial Funding Ratio (%)	Actuarial Values ($000s) Assets	Liabilities	Unfunded Liability (Surplus)	Actuarial Valuation Date	For FYE
AK	Alaska PERS	72.8	7,687,281	10,561,653	2,874,372	6/30/2003	6/30/2004
AK	Alaska Teachers	64.3	3,752,285	5,835,609	2,083,324	6/30/2003	6/30/2004
AL	Alabama Teachers	93.6	18,110,470	19,357,735	1,247,265	6/30/2003	9/30/2004
AL	Alabama ERS	95.4	8,100,846	8,493,369	392,523	9/30/2002	9/30/2004
AR	Arkansas Teachers	83.8	8,424,000	10,050,000	1,626,000	6/30/2004	6/30/2004
AR	Arkansas PERS	88.7	4,438,000	5,005,000	567,000	6/30/2004	6/30/2004
AZ	Arizona SRS	96.8	22,572,000	22,935,000	363,000	6/30/2003	6/30/2004
AZ	Arizona Public Safety Personnel	92.4	4,774,313	5,167,333	393,020	6/30/2004	6/30/2004
AZ	Phoenix ERS	84.2	1,417,774	1,684,795	267,021	6/30/2004	6/30/2004
CA	California PERF	87.7	158,596,000	180,922,000	22,326,000	6/30/2003	6/30/2004
CA	California Teachers	82.5	114,094,000	138,254,000	24,160,000	6/30/2004	6/30/2004
CA	LA County ERS	87.2	26,564,328	30,474,025	3,909,697	6/30/2003	6/30/2004
CA	San Francisco City & County	109.0	11,173,636	10,249,896	(923,740)	6/30/2003	6/30/2004
CA	San Diego County	81.1	5,166,759	6,369,490	1,202,731	6/30/2002	6/30/2004
CA	Contra Costa County	85.5	3,538,722	4,141,390	602,668	12/31/2003	12/31/2004
CO	Colorado State & School	70.1	28,594,699	40,783,531	12,188,832	12/31/2004	12/31/2004
CO	Colorado Municipal	77.2	1,990,652	2,576,988	586,336	12/31/2004	12/31/2004
CO	Denver Schools	88.2	2,611,524	2,960,990	349,466	1/1/2005	12/31/2004
CT	Connecticut SERS	61.6	7,893,700	12,806,100	4,912,400	6/30/2002	6/30/2002
CT	Connecticut Teachers	65.3	9,846,700	15,070,500	5,223,800	6/30/2004	6/30/2004
DC	DC Teachers*	100.0	917,800	917,800	0	10/1/2003	9/30/2004
DC	DC Police & Fire*	100.0	1,427,800	1,427,800	0	10/1/2002	9/30/2004
DE	Delaware State Employees	103.0	5,387,560	5,229,927	(157,633)	6/30/2004	6/30/2004
FL	Florida RS	112.1	106,707,426	95,185,433	(11,521,993)	7/1/2004	6/30/2004
GA	Georgia ERS	97.0	12,797,389	13,191,307	393,918	6/30/2004	6/30/2004
GA	Georgia Teachers	101.1	42,372,661	41,905,676	(466,985)	6/30/2003	6/30/2004
HI	Hawaii ERS	71.7	8,797,133	12,271,331	3,474,198	6/30/2004	6/30/2004
IA	Iowa PERS	88.6	16,951,943	19,128,411	2,176,468	6/30/2004	6/30/2004
ID	Idaho PERS	91.7	7,420,200	8,154,800	1,214,600	7/1/2003	6/30/2004
IL	Illinois Municipal	94.3	18,315,988	19,424,667	1,108,679	12/31/2004	12/31/2004
IL	Illinois SERS	54.2	9,990,187	18,442,665	8,452,478	6/30/2004	6/30/2004
IL	Illinois Teachers	61.9	31,544,729	50,947,451	19,402,722	7/1/2004	6/30/2004
IL	Chicago Teachers	85.9	10,392,193	12,105,680	1,713,487	6/30/2003	6/30/2004
IL	Illinois Universities	66.0	12,586,300	19,078,600	6,492,300	6/30/2004	6/30/2004
IN	Indiana PERF	102.9	9,293,952	9,034,573	(259,379)	7/1/2003	6/30/2004
IN	Indiana Teachers	44.8	6,804,395	15,197,926	8,393,531	6/30/2004	6/30/2004
KS	Kansas PERS	75.2	10,853,462	14,439,546	3,586,084	12/31/2003	6/30/2004
KS	Wichita Employees	106.8	374,171	350,444	(23,727)	12/31/2003	12/31/2003
KS	Wichita Fire & Police	106.2	361,687	340,524	(21,163)	12/31/2002	12/31/2003
KY	Kentucky ERS	70.9	7,167,473	10,112,600	2,945,127	6/30/2004	6/30/2004
KY	Kentucky County	75.1	7,541,441	10,041,709	2,500,268	6/30/2004	6/30/2004
KY	Kentucky Teachers	69.4	14,414,000	20,784,200	6,370,200	6/30/2004	6/30/2004
LA	Louisiana SERS	59.3	6,071,631	10,237,574	4,165,943	6/30/2004	6/30/2004
LA	Louisiana Teachers	63.1	11,409,404	18,067,486	6,658,082	6/30/2004	6/30/2004
MA	Massachusetts SERS	83.9	15,930,753	18,996,053	3,065,300	12/31/2003	12/31/2003
MA	Massachusetts Teachers	69.6	17,074,000	24,519,000	7,445,000	1/1/2002	12/31/2003
MD	Maryland PERS	91.2	11,514,655	12,621,578	1,106,923	6/30/2003	6/30/2004
MD	Maryland Teachers	92.8	20,155,415	21,724,178	1,568,763	6/30/2004	6/30/2004
ME	Maine State and Teacher	67.4	6,041,952	8,963,272	2,921,320	6/30/2002	6/30/2004
ME	Maine Local	110.2	1,551,943	1,407,729	(144,214)	6/30/2002	6/30/2004
MI	Michigan Municipal	78.7	4,459,500	5,667,700	1,208,200	12/31/2003	12/31/2004
MI	Michigan Public Schools	86.5	38,726,000	44,769,000	6,043,000	9/30/2003	9/30/2004
MI	Michigan SERS	88.8	10,441,000	11,761,000	1,320,000	9/30/2003	9/30/2004
MN	Minnesota State Employees	100.1	7,884,984	7,878,363	(6,621)	6/30/2004	6/30/2004
MN	Minnesota Teachers	100.0	17,519,909	17,518,784	(1,125)	6/30/2004	6/30/2004
MN	Minnesota PERF	76.7	11,477,961	14,959,465	3,481,504	6/30/2004	6/30/2004
MN	Minneapolis Teachers	50.8	877,764	1,729,551	715,069	7/1/2004	6/30/2004
MN	Duluth Teachers	91.8	276,949	301,704	12,642	7/1/2004	6/30/2004
MN	Minneapolis ERF	92.1	1,513,389	1,643,140	129,751	7/1/2004	6/30/2004
MN	St. Paul Teachers	71.8	898,860	1,251,460	352,600	6/30/2004	6/30/2004
MO	Missouri State Employees	84.6	6,118,214	7,230,011	1,111,797	6/30/2004	6/30/2004
MO	Missouri Teachers	82.0	21,501,572	26,225,259	4,723,687	6/30/2004	6/30/2004
MO	Missouri Non-Teachers	82.7	1,837,308	2,221,210	383,902	6/30/2004	6/30/2004
MO	Missouri Local	95.9	2,808,907	2,929,172	120,265	2/29/2004	6/30/2004
MO	Missouri DOT and Highway Patrol	53.4	1,331,588	2,492,919	1,161,331	6/30/2004	6/30/2004

Appendix B
Plan Summary

State	Plan Name	Actuarial Funding Ratio (%)	Actuarial Values ($000s) Assets	Liabilities	Unfunded Liability (Surplus)	Actuarial Valuation Date	For FYE
MO	St. Louis School Employees	84.0	902,000	1,074,300	172,300	1/1/2004	12/31/2004
MS	Mississippi PERS	74.9	17,103,285	22,847,260	5,743,975	6/30/2004	6/30/2004
MT	Montana PERS	86.7	3,047,287	3,514,085	466,798	6/30/2004	6/30/2004
MT	Montana Teachers	74.0	2,485,700	3,359,200	873,500	7/1/2004	6/30/2004
NC	North Carolina Teachers and State Employe	108.1	45,117,508	41,733,702	(3,383,806)	12/31/2003	6/30/2004
NC	North Carolina Local Government	99.3	12,364,380	12,455,504	91,124	12/31/2003	6/30/2004
NC	Charlotte Firefighters	94.1	274,948	292,341	17,393	7/1/2004	6/30/2004
ND	North Dakota PERS	94.0	1,272,900	1,196,500	(76,400)	6/30/2004	6/30/2004
ND	North Dakota Teachers	80.3	1,445,600	1,800,400	354,800	7/1/2004	6/30/2004
NE	Nebraska Schools	87.3	5,118,011	5,864,260	746,249	7/1/2004	6/30/2004
NH	New Hampshire Retirement System	71.1	3,901,151	5,355,387	1,454,236	6/30/2003	6/30/2004
NJ	New Jersey PERS	91.5	27,377,224	29,924,596	2,547,372	6/30/2004	6/30/2004
NJ	New Jersey Teachers	85.6	34,633,791	40,447,690	5,813,899	6/30/2004	6/30/2004
NJ	New Jersey Police & Fire	84.0	18,703,390	22,278,239	3,574,849	6/30/2004	6/30/2004
NM	New Mexico PERF	93.0	9,275,676	9,973,755	698,079	6/30/2004	6/30/2004
NM	New Mexico Teachers	75.4	7,488,000	9,927,100	2,439,100	6/30/2004	6/30/2004
NV	Nevada Regular Employees	80.5	13,670,516	16,977,008	3,306,492	6/30/2004	6/30/2004
NV	Nevada Police Officer and Firefighter	71.7	3,159,795	4,408,373	1,248,578	6/30/2004	6/30/2004
NY	NY State & Local ERS*	100.0	107,610,000	107,610,000	0	4/1/2002	3/31/2004
NY	NY State & Local Police & Fire*	100.0	19,412,000	19,412,000	0	4/1/2002	3/31/2004
NY	New York City Teachers	100.0	34,177,750	34,181,065	3,315	6/30/2002	6/30/2003
NY	New York City ERS	99.6	42,055,984	42,244,146	188,162	6/30/2003	6/30/2004
NY	New York State Teachers	99.4	71,780,400	72,209,400	429,000	6/30/2003	6/30/2004
OH	Ohio PERS	85.3	46,746,000	54,774,000	8,028,000	12/31/2003	12/31/2004
OH	Ohio School Employees	77.0	8,667,000	11,251,000	2,584,000	6/30/2003	6/30/2004
OH	Ohio Teachers	74.8	52,253,798	69,867,425	17,613,627	6/30/2004	6/30/2004
OH	Ohio Police & Fire	92.8	9,076,469	9,785,766	709,297	1/1/2002	12/31/2002
OK	Oklahoma PERS	76.1	5,412,167	7,114,778	1,702,611	7/1/2004	6/30/2004
OK	Oklahoma Teachers	47.3	6,660,900	14,080,100	7,419,200	6/30/2003	6/30/2004
OR	Oregon PERS	86.1	38,400,000	44,600,000	3,983,400	12/31/2003	6/30/2004
PA	Pennsylvania State ERS	96.1	26,900,000	27,999,000	1,099,000	12/31/2004	12/31/2004
PA	Pennsylvania School Employees	97.2	52,900,500	54,443,800	1,543,300	6/30/2003	6/30/2004
RI	Rhode Island ERS	65.1	5,695,359	8,746,641	3,051,282	6/30/2003	6/30/2003
RI	Rhode Island Municipal	99.7	1,527,847	1,532,471	4,624	6/30/2003	6/30/2003
SC	South Carolina RS	82.8	20,197,936	24,398,931	4,200,995	7/1/2003	6/30/2004
SC	South Carolina Police	91.5	2,511,369	2,744,849	233,480	7/1/2003	6/30/2004
SD	South Dakota PERS	97.7	4,937,500	5,051,700	114,200	6/30/2003	6/30/2004
TN	TN State and Teachers	99.8	22,099,252	22,151,745	52,493	7/1/2003	6/30/2004
TN	TN Political Subdivisions	91.9	3,605,529	3,923,475	317,946	7/1/2003	6/30/2004
TX	Texas Municipal	82.8	11,619,100	14,036,900	2,417,800	12/31/2004	12/31/2004
TX	Texas ERS	97.3	20,036,647	20,591,848	555,201	8/31/2004	8/31/2004
TX	Texas LECOS	109.3	679,243	621,457	(57,786)	8/31/2004	8/31/2004
TX	Texas Teachers	91.8	88,784,000	96,737,000	7,953,000	8/31/2004	8/31/2004
TX	Texas County & District	104.9	12,400,157	11,825,100	(575,057)	12/31/2004	12/31/2004
TX	Houston Firefighters	112.9	1,863,100	1,650,800	(212,300)	7/1/2001	6/30/2004
TX	City of Austin ERS	80.8	1,356,800	1,678,200	321,400	12/31/2004	12/31/2004
UT	Utah Noncontributory	92.4	12,233,337	13,237,071	1,003,734	12/31/2004	12/31/2004
VA	Virginia Retirement System	96.4	39,243,000	40,698,000	1,455,000	6/20/2003	6/30/2004
VA	Fairfax County Schools	90.1	1,597,459	1,772,418	174,959	6/30/2003	6/30/2004
VT	Vermont State Employees	97.6	1,081,359	1,107,634	26,275	6/30/2004	6/30/2004
VT	Vermont Teachers	90.2	1,284,833	1,424,662	139,829	6/30/2004	6/30/2004
WA	Washington PERS 1	80.6	10,227,000	12,692,000	2,465,000	9/30/2003	6/30/2004
WA	Washington PERS 2/3*	100.0	10,842,300	10,842,300	0	9/30/2003	6/30/2004
WA	Washington Teachers Plan 1	88.0	9,086,000	10,325,000	1,239,000	9/30/2003	6/30/2004
WA	Washington Teachers Plan 2/3*	100.0	3,949,000	3,949,000	0	9/30/2003	6/30/2004
WA	Washington LEOFF Plan 1	112.4	4,803,000	4,275,000	(528,000)	9/30/2003	6/30/2004
WA	Washington LEOFF Plan 2*	100.0	2,740,400	2,740,400	0	9/30/2003	6/30/2004
WA	Washington School Employees Plan 2/3*	100.0	1,546,000	1,546,000	0	9/30/2002	6/30/2004
WI	Wisconsin Retirement System	99.2	62,685,300	63,211,700	526,400	12/31/2003	12/31/2003
WV	West Virginia PERS	80.0	3,095,660	3,870,201	774,541	7/1/2003	6/30/2004
WV	West Virginia Teachers	22.2	1,427,475	6,440,738	5,013,263	6/30/2003	6/30/2004
WY	Wyoming Public Employees	85.0	4,704,299	5,536,192	831,893	1/1/2005	12/31/2004
	Totals	87.8	$2,106,445,628	$2,398,889,695	$290,558,636		

* Plans using the aggregate cost actuarial method, which does not identify an unfunded liability