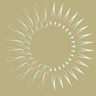
A report from  THE PEW CHARITABLE TRUSTS | April 2017

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State Public Pension Funds Increase Use of Complex Investments

Heavier reliance on alternatives yields mixed results, highlights need for increased transparency

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The Pew Charitable Trusts

Susan K. Urahn, *executive vice president*
Greg Mennis, *director, strengthening public sector retirement systems*
Susan Banta, *project director, strengthening public sector retirement systems*
David Draine, *senior officer, research, strengthening public sector retirement systems*
Aleena Oberthur, *officer, research, strengthening public sector retirement systems*
Keith Sliwa, *senior associate, research, strengthening public sector retirement systems*
David Frazier, *senior associate, research, strengthening public sector retirement systems*
Jonathan Jackson, *associate, strengthening public sector retirement systems*

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Contact: Ken Willis, communications officer
Email: kwillis@pewtrusts.org
Project website: pewtrusts.org

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Overview

State and locally run retirement systems currently manage over $3.6 trillion in public pension fund investments, most of which are held by states.[1] Broadly, half of these assets are invested in stocks; a quarter in bonds and cash; and another quarter in what are known as alternative investments, such as private equity, hedge funds, real estate, and commodities.

Although governments and employees contribute to pension funds, investment earnings on plan assets are expected to pay for about 60 percent of promised benefits. In a bid to boost investment returns and diversify investment portfolios, public pension plans in recent decades have shifted funds away from low-risk, fixed-income investments such as government and high-grade corporate bonds. During the 1980s and 1990s, plans significantly increased their reliance on stocks, also known as equities. And over the past decade, funds have increasingly turned to alternative investments to achieve investment return targets.

Greater investment in equities and alternatives can provide higher financial returns but also bring heightened volatility and risk of shortfalls. Most funds exceeded their investment return targets during the bull market of the 1990s but then suffered losses during the volatile financial markets of the 2000s—leading to higher pension costs for state and local budgets. The volatility inherent in public funds' investment strategies can be seen in more recent results as well, with large funds posting fiscal year gains of over 12 percent in 2013 and 17 percent in 2014, but only 2 percent in 2012, 4 percent in 2015, and 1 percent in 2016.[2]

The shift toward more complex investment vehicles has also brought higher investment fees. State funds reported paying more than $10 billion in fees and investment-related costs in 2014, which amounted to their largest expense. Those fees, as a percentage of assets, have increased by about 30 percent over the past decade, a boost closely correlated with the rising use of alternative assets, which has more than doubled since 2006. Additionally, state funds are paying billions of dollars in unreported performance fees associated with these alternative investments.

Accounting and disclosure practices also vary widely among pension plans and have not kept pace with increasingly complex investments and fee structures, underscoring the need for additional public information on plan performance and attention to the effects of investment fees on plan health. Full and accurate reporting of asset allocation, performance, and fee details is essential to determining public pension plans' ability to pay promised retirement benefits. With more than $3.6 trillion in assets—and the retirement security of 19 million current and former state and local employees at stake—sound and transparent investment strategies are critical.[3]

Research on U.S. public pension investments published in 2014 by The Pew Charitable Trusts highlighted the long-term shift toward stocks and more recent increases in the use of alternative investments. This report provides updated information on asset allocation, performance, and reporting practices for all 50 states and looks deeper at the use of alternative investments by public pension funds. Specifically, this report finds:

- Government sponsors should consider investment performance both in terms of long-term returns and cost predictability. From this perspective, many fund portfolios are highly correlated with the up-and-down swings of the stock market, and expose state budgets to considerable risk and uncertainty.
- Investment performance varies widely among public pension funds, with only two of the funds examined exceeding investment return targets over the past 10 years. Although these results reflect the losses that occurred at the onset of the Great Recession, more recent performance, low interest rates, and forward-looking economic forecasts point to the need to closely examine long-term investment return targets.

- The use of alternative investments varies widely—from none to over half of fund portfolios. While examples exist of top performers with long-standing alternative investment programs, the funds with recent and rapid entries into alternative markets—including significant allocations to hedge funds—reported the weakest 10-year returns. Although longer time horizons will allow better evaluation of these investment strategies, funds and policymakers should carefully examine risks, returns, and fees in the meantime.
- The data do not reveal a best or one-size-fits-all approach to successful investing, but there is a uniform need for full disclosure on investment performance and fees. In 2014, more than a third of state-sponsored funds reported performance figures before deducting the costs of investment management. In addition, unreported investment fees—primarily performance payments made to private equity managers—totaled more than $4 billion in 2014, or about 40 percent above the $10 billion in reported investment expenses for that year.

Data sources

To examine these changing investment practices across the 50 states, The Pew Charitable Trusts used three sources covering the 73 largest state-sponsored pension funds, which collectively have assets under management of over $2.8 trillion (about 95 percent of all state pension fund investments):[4]

- Data collected from state-sponsored plans' Comprehensive Annual Financial Reports, pension plan actuarial valuations, and other relevant documents published by individual public pension plans from 1992 to 2014, with a primary focus on asset allocation, performance, and fees from 2006 to 2014. In addition, performance data from 2015 were collected from plan documents.
- The U.S. Federal Reserve Financial Accounts of the United States data, which include aggregate economic and investment data on public pensions from 1952 to 2015.
- The Wilshire Trust Universe Comparison Service (TUCS) performance comparison data, reported quarterly from 1991 to 2016.[5]

Together, these data sets provide a 60-year picture of aggregate investment trends and a detailed look at investment practices from 2006 to 2014 across the vast majority of state public pension funds.

Important terms

Three main types of investments are discussed in this report:

- **Fixed-income investments.** Can include domestic or international bonds issued by governments or corporations. Because they generate predictable streams of income paid at designated times, fixed-income investments are generally considered lower-risk than other investments.
- **Equities.** Stocks, held by investors, that represent partial ownership of a company; can be domestic or international. Equities do not guarantee a return and generally have the potential for both higher returns and greater losses than bonds, making them typically riskier than fixed-income investments.
- **Alternative investments.** Generally include private equity, hedge funds, real estate, and commodities, and typically lack an established public exchange, have low liquidity, and can be more difficult to value than stocks or bonds. Alternative investments typically carry higher fees than fixed-income investments or equities and can be used to diversify investment portfolios or to achieve higher rates of return—although often at higher levels of risk.

The glossary at the end of the report includes a more complete list of definitions; the appendix includes a detailed explanation of the common types of alternative investments.

Pension fund investments: 50 states at a glance

State-sponsored pension plans use a wide range of investment strategies and report significantly different results and investment costs. Using comprehensive investment data for the 73 largest public funds, Table 1 illustrates the differences across the 50 states. The use of alternative investments ranges from zero to over 50 percent of fund portfolios.

Performance, too, varies widely. For the 41 largest state funds that can be clearly compared against target returns—those reporting performance after accounting for management fees and on a fiscal year basis—the average annual target return in 2015 was 7.7 percent. Actual annualized returns over 10 years, however, averaged 6.6 percent and ranged from 4.7 percent to 8.1 percent a year. Only one of the 41 (and two of all 73 funds) exceeded their target return in 2015.

These figures include losses seen at the onset of the Great Recession as well as the high returns that immediately followed. However, recent performance has been flat, and the outlook going forward, while uncertain, is widely expected to remain lower than historic levels.[6]

States also interpret reporting standards differently, a factor reflected in Table 1. For example, the majority of funds report on the basis of a fiscal year ending June 30 and include 10-year performance returns minus the fees paid to investment managers, or "net of fees." However, 12 funds report on a different time period, and more than a third provide 10-year returns only "gross of fees"—without deducting manager fees.

States also vary in whether they include performance-based fees for certain investments, known as carried interest, for private equity. Generally, states that disclose the cost of carried interest report higher fees than states that do not.

These differences can make direct comparisons across and between funds difficult. However, the level of detail provided in Table 1 is sufficient to draw some critical insights on the strategies and outcomes of public pension plans. The limitations posed by a lack of standardized reporting standards are addressed later in this report with recommendations for improved transparency.

Table 1

Public Pension Investment Metrics Across the 50 States, 2014

Wide variations in allocations, performance, and fees for 73 largest funds

	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015[*]				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other[†]	Invest-ment expense[‡]	External man-agement fees	Target rate of return, 2015[§]	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Retirement Systems of Alabama (Employees)	$10.8	62%	15%	23%	0%	0.03%	N/A	8.00%	5.16%	9.37%	1.05%	Gross of fees	30-Sep
Retirement Systems of Alabama (Teachers)	$22.2	65%	14%	22%	0%	0.03%	N/A	8.00%	5.41%	9.42%	1.04%	Gross of fees	30-Sep
Alaska Public Employees Retirement System	$7.5	56%	15%	29%	0%	0.40%	0.38%	8.00%	6.69%	10.89%	3.29%	Net of fees	30-Jun
Alaska Teachers Retirement System	$3.6	56%	15%	29%	0%	0.34%	0.32%	8.00%	6.73%	10.96%	3.30%	Net of fees	30-Jun
Arizona State Retirement System	$33.7	53%	19%	28%	0%	0.43%	0.40%	8.00%	6.90%	11.80%	3.20%	Net of fees	30-Jun
Arizona Public Safety Personnel Retirement System	$5.7	30%	13%	56%	0%	2.00%	2.00%	7.85%	5.22%	8.69%	3.68%	Net of fees	30-Jun
Arkansas Public Employees Retirement System	$7.3	67%	16%	16%	1%	0.39%	0.38%	7.50%	7.17%	12.25%	2.45%	Gross of fees	30-Jun
Arkansas Teachers Retirement System	$14.6	61%	17%	19%	3%	0.27%	N/A	8.00%	7.60%	11.70%	5.20%	Net of fees	30-Jun
California Public Employees Retirement System	$301.5	52%	27%	21%	0%	0.48%	0.38%	7.50%	6.20%	10.70%	2.40%	Net of fees	30-Jun

Continued on next page

	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015*				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other†	Invest-ment expense‡	External man-agement fees	Target rate of return, 2015§	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
California State Teachers Retirement System	$214.2	57%	19%	24%	0%	0.14%	0.09%	7.50%	7.02%	12.14%	4.77%	Gross of fees	30-Jun
Colorado Public Employees Retirement Association	$43.2	57%	25%	18%	0%	0.36%	0.32%	7.50%	6.00%	7.30%	1.50%	Net of fees	31-Dec
Connecticut State Employees Retirement System	$10.5	56%	25%	19%	0%	0.30%	0.25%	8.00%	6.18%	9.82%	2.84%	Net of fees	30-Jun
Connecticut Teachers Retirement Board	$16.2	55%	25%	20%	0%	0.31%	0.25%	8.50%	6.30%	9.72%	2.79%	Net of fees	30-Jun
Delaware Public Employees Retirement System	$8.6	47%	35%	19%	0%	0.26%	0.26%	7.20%	7.90%	11.40%	3.90%	Gross of fees	30-Jun
Florida Retirement System	$152.9	60%	22%	18%	0%	0.34%	0.31%	7.65%	6.86%	11.01%	3.67%	Net of fees	30-Jun
Georgia Employees Retirement System	$15.9	67%	26%	0%	7%	0.07%	0.05%	7.50%	6.86%	11.32%	3.74%	Gross of fees	30-Jun
Georgia Teachers Retirement System	$64.6	73%	27%	0%	0%	0.06%	0.04%	7.50%	6.82%	11.27%	3.70%	Net of fees	30-Jun
Hawaii Employees Retirement System	$14.2	62%	17%	15%	7%	0.24%	0.23%	7.65%	7.00%	10.84%	4.23%	Gross of fees	30-Jun
Idaho Public Employee Retirement System	$14.2	64%	26%	10%	0%	0.34%	0.30%	7.00%	7.00%	10.10%	3.00%	Gross of fees	30-Jun
Illinois State Universities Retirement System	$16.7	63%	24%	14%	-1%	0.30%	0.28%	7.25%	7.08%	11.20%	2.85%	Net of fees	30-Jun

Continued on next page

	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015*				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other†	Invest-ment expense‡	External man-agement fees	Target rate of return, 2015§	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Illinois State Employees Retirement System	$12.5	46%	17%	32%	5%	0.28%	0.27%	7.25%	6.20%	11.40%	4.70%	Net of fees	30-Jun
Illinois Teachers Retirement System	$45.4	43%	19%	38%	0%	0.66%	0.54%	7.50%	6.62%	11.39%	3.95%	Net of fees	30-Jun
Indiana Public Retirement System	$32.7	24%	32%	35%	10%	0.62%	0.57%	6.75%	4.73%	7.68%	0.00%	Net of fees	30-Jun
Iowa Public Employees Retirement System	$27.8	42%	37%	20%	0%	0.22%	0.19%	7.50%	7.21%	10.55%	3.96%	Net of fees	30-Jun
Kansas Public Employees Retirement System	$16.5	58%	22%	19%	0%	0.31%	0.19%	8.00%	7.40%	11.70%	3.70%	Gross of fees	30-Jun
Kentucky Retirement Systems	$11.4	44%	22%	35%	0%	0.39%	0.36%	7.50%	6.05%	9.18%	2.01%	Net of fees	30-Jun
Kentucky Teachers Retirement System	$17.9	63%	22%	15%	0%	0.21%	0.19%	7.50%	7.00%	12.00%	5.10%	Gross of fees	30-Jun
Louisiana State Employees Retirement System	$11.5	55%	17%	29%	0%	0.64%	0.64%	7.75%	7.40%	11.10%	1.70%	Gross of fees	30-Jun
Louisiana Teachers Retirement System	$17.5	51%	25%	25%	0%	0.48%	0.47%	7.75%	7.40%	12.30%	3.10%	Gross of fees	30-Jun
Maine Public Employees Retirement System	$12.9	58%	24%	19%	0%	0.32%	0.29%	7.13%	5.90%	10.20%	2.00%	Net of fees	30-Jun
Maryland State Retirement and Pension System	$46.3	35%	27%	37%	1%	0.73%	0.70%	7.55%	5.77%	9.36%	2.68%	Net of fees	30-Jun

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	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015*				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other†	Invest-ment expense‡	External man-agement fees	Target rate of return, 2015§	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Massachusetts Pension Reserves Investment Management Board	$62.5	43%	22%	35%	0%	0.14%	0.11%	7.50%	6.98%	10.95%	3.86%	Gross of fees	30-Jun
Michigan Public School Employees Retirement System	$43.5	45%	19%	37%	0%	0.30%	0.28%	8.00%	6.70%	10.00%	2.60%	Gross of fees	30-Sep
Michigan State Employees Retirement System	$10.8	45%	18%	37%	0%	0.30%	0.28%	8.00%	6.60%	10.00%	2.60%	Gross of fees	30-Sep
Minnesota (MSRS, TRA, and PERA)	$59.5	61%	26%	13%	0%	0.14%	0.14%	8.14%	7.80%	12.30%	4.40%	Net of fees	30-Jun
Mississippi Public Employees Retirement System	$24.6	66%	21%	13%	0%	0.33%	0.33%	7.75%	6.90%	11.90%	3.40%	Gross of fees	30-Jun
Missouri State Employees Retirement System	$9.2	10%	39%	51%	0%	1.70%	1.64%	8.00%	7.00%	9.60%	-2.60%	Net of fees	30-Jun
Missouri Public Schools Retirement System	$37.0	48%	23%	29%	0%	1.49%	1.46%	8.00%	6.60%	11.30%	4.50%	Net of fees	30-Jun
Montana Public Employees Retirement Board	$6.1	57%	24%	19%	0%	0.54%	0.54%	7.75%	6.59%	11.55%	4.58%	Net of fees	30-Jun
Montana Teachers Retirement System	$3.7	57%	24%	19%	0%	0.55%	0.44%	7.75%	6.59%	11.57%	4.60%	Net of fees	30-Jun
Nebraska Retirement Systems	$12.9	64%	28%	8%	0%	0.21%	0.21%	7.97%	6.90%	11.50%	3.90%	Net of fees	30-Jun

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	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015*				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other†	Invest-ment expense‡	External man-agement fees	Target rate of return, 2015§	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Nevada Public Employees Retirement System	$33.2	62%	31%	7%	0%	0.13%	0.13%	8.00%	6.90%	11.40%	4.20%	Gross of fees	30-Jun
New Hampshire Retirement System	$7.3	63%	22%	16%	0%	0.33%	0.30%	7.75%	6.90%	11.60%	3.50%	Net of fees	30-Jun
New Jersey Division of Pension and Benefits	$81.8	45%	28%	27%	0%	0.32%	0.28%	7.90%	7.05%	10.49%	4.16%	Net of fees	30-Jun
New Mexico Educational Retirement Board	$11.0	38%	34%	28%	0%	0.12%	0.12%	7.75%	6.90%	10.10%	4.00%	Gross of fees	30-Jun
New Mexico Public Employees Retirement Association	$14.3	55%	26%	18%	1%	0.22%	0.20%	7.75%	5.72%	10.40%	1.87%	Net of fees	30-Jun
New York State and Local Retirement Systems	$176.8	53%	28%	20%	0%	0.32%	0.30%	7.50%	7.12%	10.17%	7.16%	Gross of fees	31-Mar
New York State Teachers Retirement System	$105.4	59%	22%	19%	0%	0.21%	0.20%	8.00%	7.20%	12.40%	5.20%	Net of fees	30-Jun
North Carolina Retirement Systems	$90.1	47%	31%	22%	0%	0.55%	0.55%	7.25%	6.20%	9.50%	2.30%	Net of fees	30-Jun
North Dakota Public Employees Retirement System (PERS & Highway)	$2.3	53%	24%	23%	0%	0.67%	0.64%	8.00%	5.98%	10.61%	3.53%	Net of fees	30-Jun
North Dakota Teachers Fund for Retirement	$2.1	53%	24%	23%	0%	0.66%	0.64%	7.75%	5.87%	10.94%	3.52%	Net of fees	30-Jun

Continued on next page

	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015*				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other†	Invest-ment expense‡	External man-agement fees	Target rate of return, 2015§	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Ohio Public Employees Retirement System	$74.3	39%	23%	38%	0%	0.45%	0.41%	8.00%	5.74%	7.13%	0.33%	Net of fees	31-Dec
Ohio State Teachers Retirement System	$70.0	54%	23%	23%	0%	0.27%	0.23%	7.75%	7.33%	11.93%	5.45%	Gross of fees	30-Jun
Oklahoma Public Employees Retirement System	$9.2	70%	30%	0%	0%	0.10%	0.10%	7.50%	6.99%	11.13%	3.23%	Gross of fees	30-Jun
Oklahoma Teachers Retirement System	$13.9	62%	20%	17%	0%	0.34%	0.34%	8.00%	8.30%	13.40%	3.50%	Gross of fees	30-Jun
Oregon Employees Retirement System	$62.7	41%	26%	34%	0%	0.69%	0.55%	7.50%	7.34%	11.20%	4.30%	Net of fees	30-Jun
Pennsylvania Public School Employees Retirement System	$52.7	20%	24%	53%	4%	0.91%	0.87%	7.50%	6.31%	9.73%	3.04%	Net of fees	30-Jun
Pennsylvania State Employees Retirement System	$27.4	37%	22%	42%	0%	0.68%	0.65%	7.50%	5.20%	6.90%	0.40%	Net of fees	31-Dec
Rhode Island Employees Retirement System	$8.2	50%	26%	24%	0%	0.96%	0.88%	7.49%	6.10%	9.80%	2.20%	Net of fees	30-Jun
South Carolina Retirement System	$26.8	31%	30%	39%	0%	1.56%	1.52%	7.50%	5.06%	8.87%	1.60%	Net of fees	30-Jun
South Dakota Retirement System	$10.6	44%	32%	24%	0%	0.32%	0.32%	7.25%	8.10%	13.40%	4.20%	Net of fees	30-Jun
Tennessee Consolidated Retirement System	$42.4	58%	34%	8%	0%	0.10%	0.07%	7.50%	6.45%	10.85%	3.33%	Gross of fees	30-Jun

Continued on next page

	Assets (billions)	Asset allocation				Fees as a percentage of Investments			Investment Performance Through 2015[*]				
State pension funds	Total invest-ments	Equities	Fixed income	Alter-natives	Other[†]	Invest-ment expense[‡]	External man-agement fees	Target rate of return, 2015[§]	10-yr inv return, 2015	5-yr inv return, 2015	1-yr inv return, 2015	Returns net or gross of fees	Report-ing date
Texas Employees Retirement System	$25.5	52%	24%	22%	2%	0.14%	0.33%	8.00%	6.18%	9.10%	0.49%	Gross of fees	31-Aug
Teacher Retirement System of Texas	$132.2	49%	15%	36%	0%	0.15%	0.12%	8.00%	6.76%	10.86%	4.15%	Net of fees	30-Jun
Utah Retirement Systems	$27.0	36%	22%	43%	0%	0.17%	0.14%	7.50%	6.02%	7.89%	1.92%	Gross of fees	31-Dec
Vermont Teachers Retirement System	$1.7	32%	32%	36%	0%	0.42%	0.42%	7.95%	5.77%	8.90%	-0.16%	Gross of fees	30-Jun
Vermont State Employees Retirement System	$1.6	33%	33%	34%	0%	0.41%	0.41%	7.95%	6.01%	9.05%	0.10%	Gross of fees	30-Jun
Virginia Retirement Systems	$65.5	44%	23%	33%	0%	0.55%	0.51%	7.00%	6.66%	10.30%	4.70%	Net of fees	30-Jun
Washington Department of Retirement Systems	$88.2	38%	25%	36%	0%	0.30%	0.35%	7.67%	7.55%	11.13%	4.93%	Net of fees	30-Jun
West Virginia Consolidated Public Retirement Board (PERS)	$5.6	55%	15%	29%	0%	N/A	N/A	7.50%	7.10%	11.10%	3.90%	Net of fees	30-Jun
West Virginia Consolidated Public Retirement Board (TRS)	$6.7	54%	17%	29%	0%	N/A	N/A	7.50%	6.80%	11.00%	4.00%	Net of fees	30-Jun
Wisconsin Retirement System (Core)	$91.1	49%	32%	19%	5%	0.39%	0.39%	7.20%	5.83%	6.66%	-0.38%	Gross of fees	31-Dec
Wyoming Retirement System	$7.9	58%	19%	23%	0%	0.64%	0.63%	7.75%	4.50%	5.90%	-0.30%	Net of fees	31-Dec

Continued on next page

Notes:

* Performance metrics reported through 2015, the most recent results available. Differences in performance reporting may limit comparability between certain funds.

† Other assets include reported investments that combine different asset classes.

‡ Investment expense taken from Statement of Changes in Fiduciary Net Position and Schedule of Investment Expenses as reported in plan Comprehensive Annual Financial Reports.

§ Where a retirement system consisted of multiple plans, Pew used a weighted average of the stated plan investment rates of return.

State-sponsored pension plans in a number of states have recently lowered or announced plans to lower their rate of return (including California, Connecticut, Hawaii, Maine, and South Carolina).

"Other" for the Illinois State Universities Retirement System is negative because of pooling of self-managed defined contribution plan forfeiture and disability reserves with defined-benefit portfolio investments.

Sources: Comprehensive Annual Financial Reports, 2014 and 2015; quarterly investment reports, and plan responses to data inquiries

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Increasingly complex and volatile pension fund portfolios

Over the past three decades, public pension funds have increasingly relied on more complex investments in an effort to diversify portfolios and boost annual returns. Current investment strategies rely heavily on equities and alternatives, such as private equity, hedge funds, real estate, and commodities, to achieve target returns and provide payments to beneficiaries.[7]

Increased allocations to stocks and alternatives can result in greater financial returns but also can heighten volatility and the risk of losses. As Figure 1 illustrates, pension fund yields are highly correlated with the volatile swings in stock returns; even relatively small differences can have a major effect on asset values. Looking at the big picture, a difference of just 1 percentage point in annual returns on $3.6 trillion equates to a $36 billion impact on pension assets.

Figure 1

Average Annual Stock Market and Pension Fund Returns, 2005-16

Equity investments and pension fund yields track closely and are highly volatile

Source: Wilshire Trust Universe Comparison Service®

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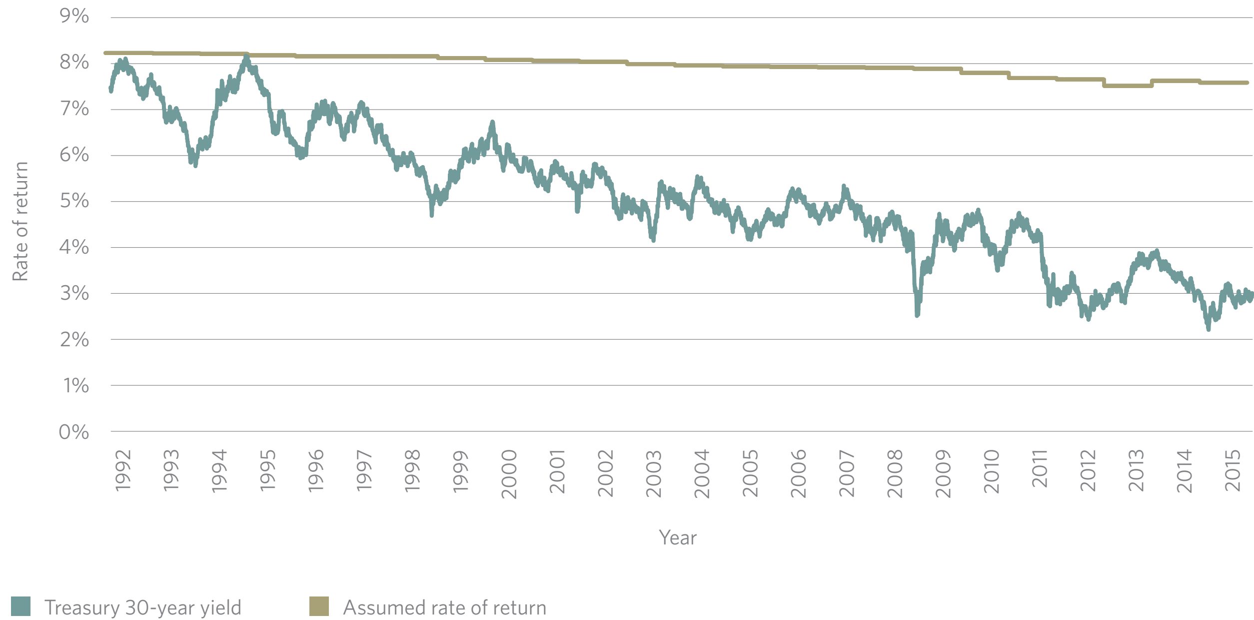
Looking at one common measure—equity risk premium—shows that U.S. public pension plans' exposure to financial market uncertainty has increased dramatically over the past 25 years. The equity risk premium is the difference between targeted rates of return and the yield on what are considered risk-free investments, most commonly long-term U.S. government bonds. As Figure 2 shows, between 1992 and 2015, the expected equity risk premium for public funds—the difference between U.S. bond yields and the average plan assumed return—increased from less than 1 percent to more than 4 percent, as bond yields declined and the assumed rates of return remained relatively stable. In other words, plans' equity premium has grown by over 3 percentage points—more than fourfold over the period.

Research by investment experts shows that the asset allocation required to yield target returns today is more than twice as volatile as the allocations used 20 years ago—as measured by the standard deviation of returns.[8] Measures of volatility in investment returns are important to consider because that volatility creates budget uncertainty for state and local governments sponsoring plans. Between 2003 and 2013, for example, actuarially required pension contributions increased from 4 percent to 8 percent of state revenue to adjust for investment losses from the dot-com crash and the onset of the Great Recession.

Figure 2

Increasing Risk Premium for U.S. Public Pension Funds

Plans' average assumed rate of return remains relatively stable, while bond yields have declined



Sources: Analysis by The Pew Charitable Trusts of Comprehensive Annual Financial Reports, actuarial valuations, and related reports from states; U.S. Treasury data; and Center for Retirement Research at Boston College, Center for State and Local Government Excellence, and National Association of State Retirement Administrators, Public Plans Data

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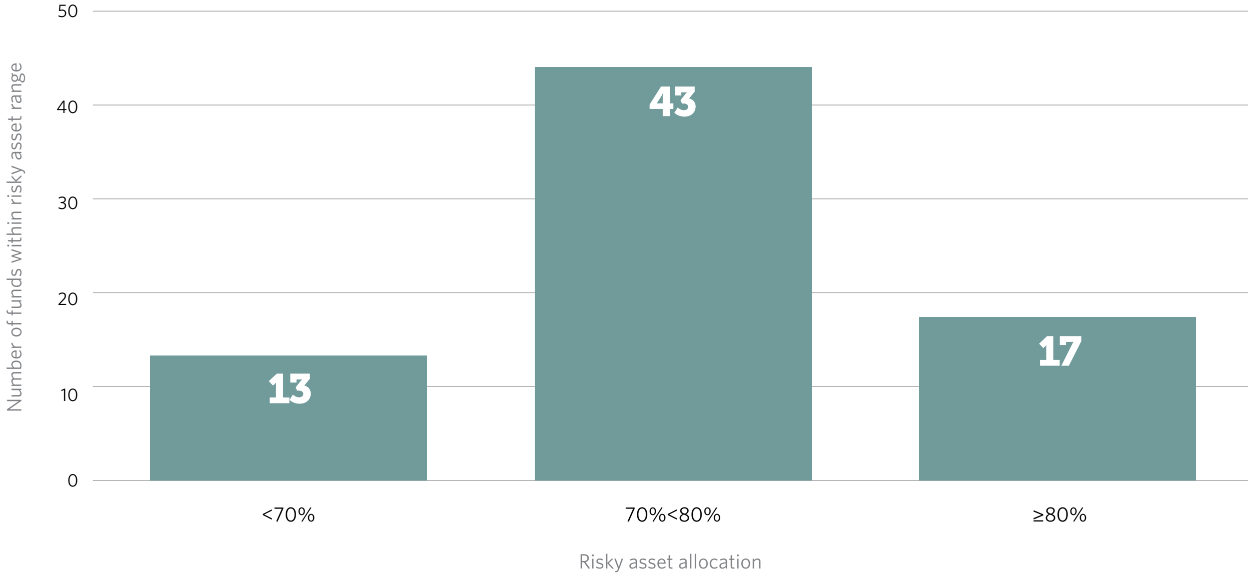
These changes are also reflected in the makeup of funds' portfolios. Public pension plan data for 2014 collected from the largest state-sponsored pension funds reveal that most state retirement systems allocated between 70 and 80 percent of their portfolios to equities and alternative investments that historically have been more volatile than fixed-income investment assets.[9] The percentage of these assets held by public pension funds ranged from about 60 percent for several systems - including the Iowa Public Employees and the Missouri State Employees Retirement Systems - to over 87 percent for the Arizona Public Safety Personnel Retirement System. Research shows that these levels are significantly higher than the amounts in private and non-U.S. public funds.[10]

Figure 3

State Pension Fund Allocations to Equities and Alternatives

Most of the plans have between 70% and 80% of investments in risky assets



Sources: Comprehensive Annual Financial Reports, 2014; quarterly investment reports; and plan responses to data inquiries

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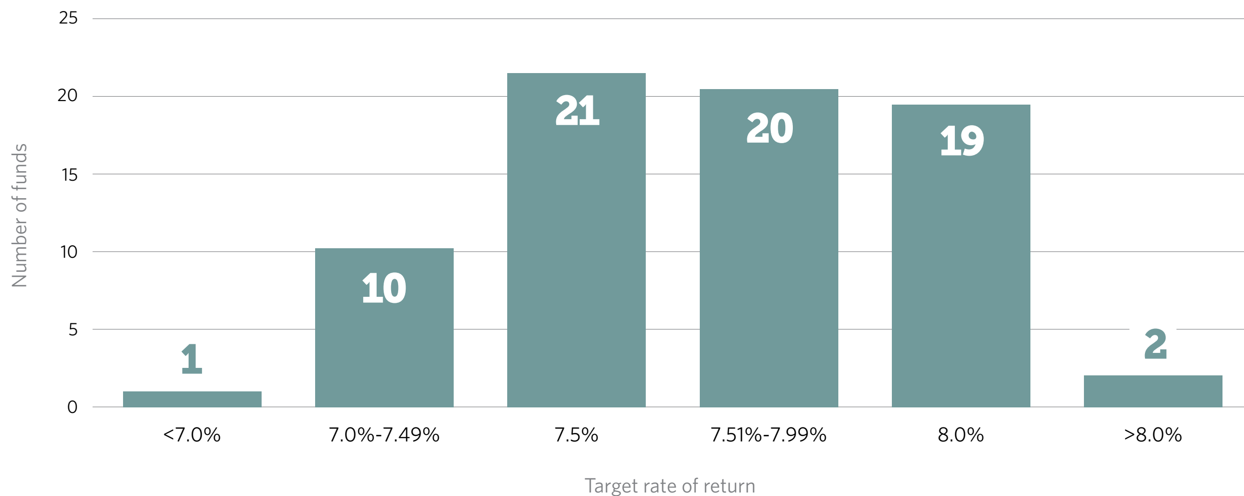
The high number of funds with comparable allocations to stocks and alternatives is also reflected in the narrow range of investment return targets. The majority of funds target a long-term rate of return of 7 to 8 percent, with only three falling outside that range.[11] Given the low expected yields on safe fixed-income investments, equity and alternative investments can help funds achieve these return targets.[12]

These investment strategies and return targets indicate that funds employ total return strategies typified by diverse portfolios that seek both income and long-term growth, with relatively small differences in risk tolerance among funds. In contrast, private sector pension funds and pension funds in other countries typically target lower returns and follow strategies that more directly time cash flow from investments with the payments associated with pension liabilities.[13] Maintaining high expected rates of return reduces the size of annual payments into the plan from governments' budgets, but it also brings an increased risk of missing the assumed rate of return. Unfunded liabilities grow when investment returns fall short of the targets, meaning that state or local government sponsors of public pensions must make up for shortfalls.

Figure 4
State Pension Fund Expected Rates of Return
Most target a long-term rate of between 7-8%



Note: State-sponsored plans in Connecticut and Maine have lowered their expected rate of return below 7% since 2015.

Sources: Comprehensive Annual Financial Reports, 2015; quarterly investment reports; and plan responses to data inquiries

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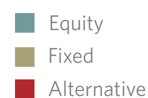
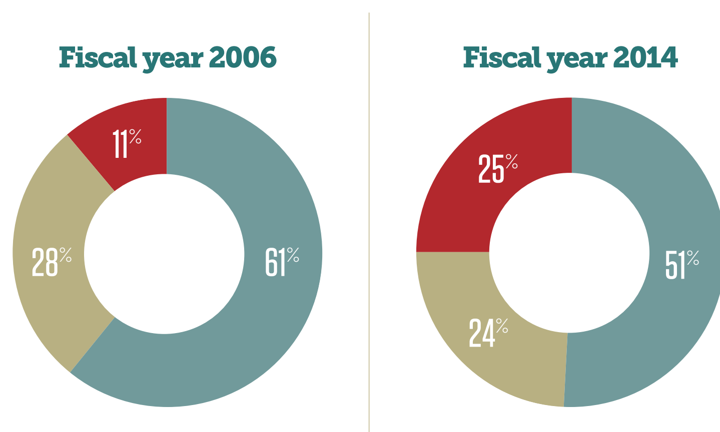
Increasing alternative investments and higher fees

Public pension funds have more than doubled their allocations to alternative investments in the past decade—from an average of 11 percent of assets in 2006 to 25 percent in 2014. The expected investment return on these assets has allowed pension funds to keep return assumptions relatively constant even as the returns on less risky bond investments declined.

Figure 5
Average Public Pension Asset Allocation, 2006 and 2014
Funds have more than doubled their allocation to alternative investments





Sources: Comprehensive Annual Financial Reports, 2006 and 2014; quarterly investment reports; and plan responses to data inquiries

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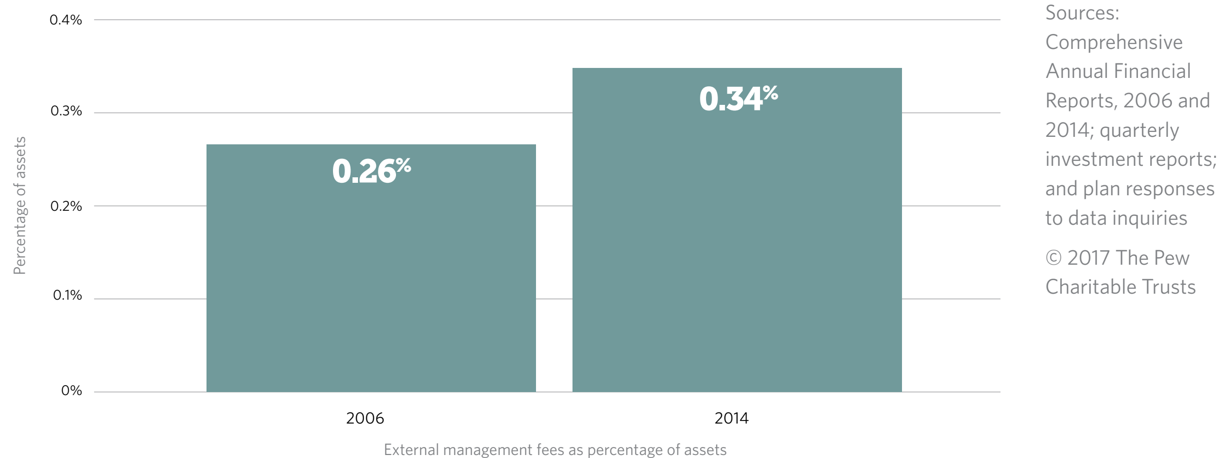
But the shift to alternative investments has coincided with a substantial increase in fees as well as uncertainty about future realized returns, both of which could have significant implications for public pension funds' costs and long-term sustainability. State pension funds reported investment fees equal to approximately 0.34 percent of assets in 2014, up from an estimated 0.26 percent in 2006. Although the increase may seem small, it equates to over $2 billion in total annual investment fees for the 73 plans examined.

Figure 6

External Management Fees as a Percent of Assets

Reported fees increased by 30% as percentage of assets from 2006 to 2014



Sources: Comprehensive Annual Financial Reports, 2006 and 2014; quarterly investment reports; and plan responses to data inquiries

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Some may suggest that net returns—those left after accounting for fees, regardless of their size—are all that should matter when evaluating investment strategies. However, while past performance is no guarantee of future returns, the high fee structures for alternative investments remain stable and fairly certain, though sometimes opaque. And given that investment experts project market returns to stay low for a sustained period, a clear understanding of fee levels is imperative in assessing the potential for future net returns.[14]

The increase in fees has prompted concern among retirement system stakeholders and in some cases shifts in fund investment strategies. For example, the state retirement board in Illinois recently acted to reduce fees by converting most of the plan's investments in stocks and bonds from actively to passively managed funds, or index funds.[15] And in Montgomery County, Pennsylvania, the entire portfolio has been moved to an index-based strategy.[16]

Similarly, fees in Pennsylvania's state public pension funds—reported at nearly $600 million in 2015—have drawn attention from policymakers who have recently proposed legislation to lower fees through consolidation.[17] The state's two pension plans—the Public School Employees Retirement System (PSERS) and the State Employees Retirement System (SERS)—together manage $80 billion in pension assets. The combined funds' allocation to alternatives increased rapidly from 18 percent in 2006 to 49 percent in 2014. This has driven reported annual fees to more than 0.8 percent of assets, one of the highest levels across the 50 states. When accounting for the funds' unreported carried interest for private equity (which PSERS and SERS, like most funds, do not disclose in annual reports), fee levels are estimated to be over 0.9 percent of assets—or more than $700 million annually.[18]

Pennsylvania is not alone in excluding carried interest from reported investment expenses: most of the 73 funds do not report comprehensive accruals of carried interest, monitoring costs, or portfolio company fees. There are two apparent reasons for this. The first is a standard practice: private equity and other limited partnerships traditionally retain 20 percent of a predetermined increase in value. Some investors consider this carried interest as partnership profit rather than an investment fee.[19]

The second reason stems from standards set by the Governmental Accounting Standards Board (GASB), which state that "investment-related costs should be reported as investment expense if they are separable from (a) investment income and (b) the administrative expense of the pension plan." Given opaque reporting on the part of general partners, many plans find carried interest to be a non-separable expense. But that results in underreported fees on the part of pension plans invested in private equity and other limited partnerships. A recent report by CEM Benchmarking Inc., an independent global provider of comparative analysis for institutional investors, estimates that the average value of undisclosed private equity fees can equal 1.5 percent or more of assets each year, or about half of total private equity management costs.[20] Most funds do not report these fees in a comprehensive manner.[21]

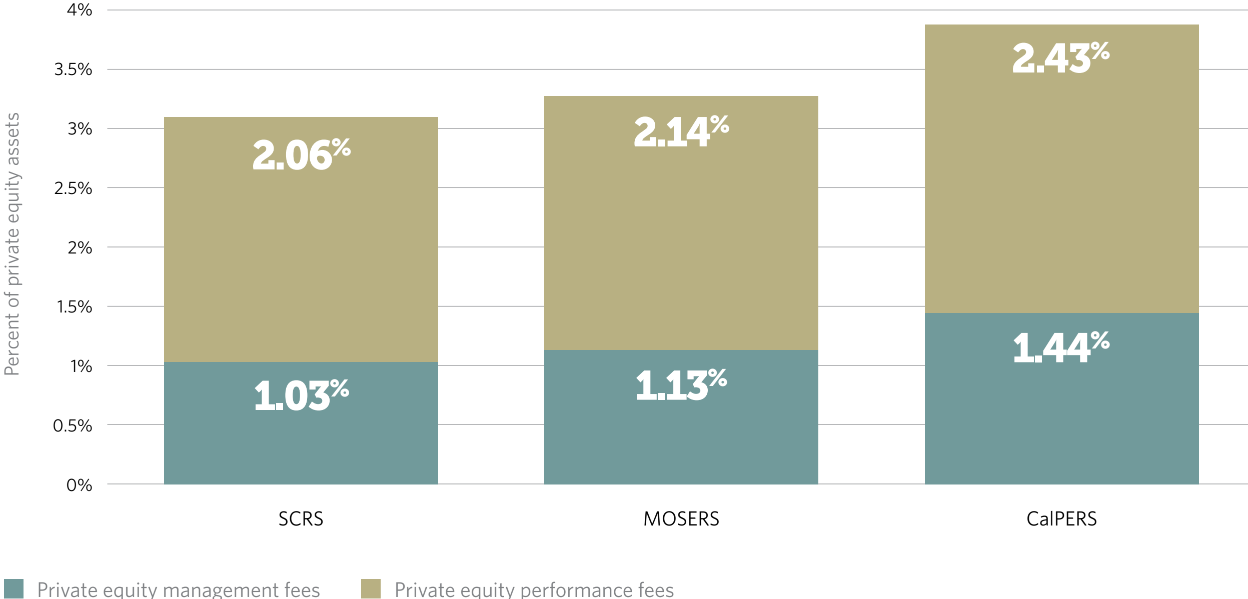
This may be changing. The Institutional Limited Partners Association recently released a widely supported reporting template that would establish comprehensive standards for fee and expense reporting among institutional investors and fund managers.[22] And the California Public Employees' Retirement System (CalPERS), the nation's largest public retirement plan, decided in 2014 to begin disclosing the full amount it pays to invest in private equity, including carried interest and fees. In late 2015, CalPERS disclosed that external investment partners realized $700 million from profit-sharing agreements in fiscal 2015 in addition to the $1.06 billion in investment expenses reported in that fiscal year's Comprehensive Annual Financial Report. Also, the California Teachers Retirement System (CalSTRS) followed suit in 2016 with a similar supplemental report on performance and portfolio fees, and other states, such as North Carolina, have included incentive fees in annual public reporting.

Comprehensive fee disclosure in annual financial reports is still uncommon, but a few other states have also adopted the practice. The South Carolina Retirement System (SCRS) collects detailed information on portfolio company fees, other fund-level fees, and accrued carried interest in addition to details provided by external managers' standard invoices. Likewise, the Missouri State Employees' Retirement System (MOSERS) is particularly thorough in collecting and reporting these fees, not only by asset class but also for each external manager. Both states reported performance fees of over 2 percent of private equity assets for fiscal 2014 in addition to about 1 percent in invoiced management fees.

> "Unreported fees could total over $4 billion annually on the $255 billion in private equity assets held by state retirement systems. That's more than 40 percent over currently reported total investment expenses, which topped $10 billion in 2014."

If the relative size of traditionally unreported investment costs demonstrated by CalPERS, MOSERS, and the SCRS holds true for public pension plans generally, unreported fees could total over $4 billion annually on the $255 billion in private equity assets held by state retirement systems. That's more than 40 percent over currently reported total investment expenses, which topped $10 billion in 2014. Policymakers, stakeholders, and the public need full disclosure on investment performance and fees to ensure that risks, returns, and costs are balanced to meet funds' policy goals. Such assessments are unlikely when billions of dollars in fees are not reported.

Figure 7
Reported Private Equity Fees by State Pension Funds
Performance fees substantially higher than invoiced management fees



Sources: Comprehensive Annual Financial Reports, 2014; supplemental investment reporting; and plan responses to data inquiries

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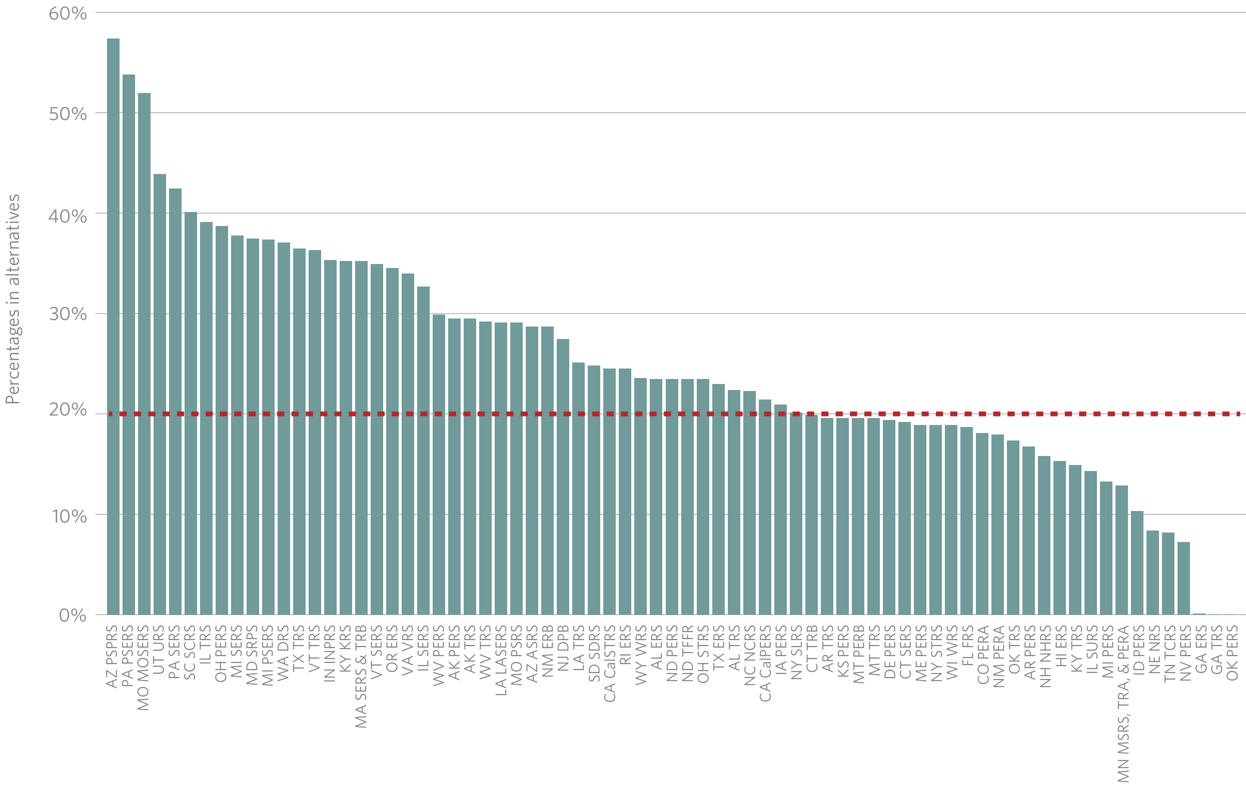
Diverse strategies with mixed results

State retirement system data reveal significant variations in investment strategies and performance across the 50 states, including wide variation in allocations to alternative investments that range from zero to over 50 percent of assets. While most of the 73 funds have more than 70 percent in a mix of equities and alternatives, some put a much greater emphasis on alternatives than others. Of the funds examined, two had no alternative investments at all, 21 had at least 30 percent of their portfolio in alternatives, and five had over 40 percent.

Figure 8

Alternative Investment Allocations for 73 Public Pension Funds

44 invest more than 20% of assets to alternatives



Note: Figure illustrates the percentage of assets invested in alternatives for each of the 73 funds examined.

Sources: Comprehensive Annual Financial Reports, 2014; quarterly investment reports; and plan responses to data inquiries

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Plan performance also varied. Ten-year returns in 2015 ranged from 8.3 percent (Oklahoma Teachers Retirement System) to 4.5 percent (Wyoming Retirement System).[23]

In addition to rising and unreported fees, the shift to alternative investments has broad implications for public pension plan administrators. First, managing these types of investments requires sophisticated expertise that may differ from what is required for managing stocks and bonds. That brings new challenges in investment governance, manager selection, and strategic allocation decisions. Research shows that U.S. public pension fund boards—particularly those with limited financial expertise—can be ill-equipped to make complex investment decisions, a factor that can hinder fund performance.[24]

Alternatives also have fundamentally different valuation and reporting norms from fixed-income and equity investments, making evaluating performance in volatile markets more difficult for fiduciaries and stakeholders. Specifically, alternative investments are typically not traded on an open market, require external valuations to determine prices and performance, and often are more lightly regulated than publicly traded securities.

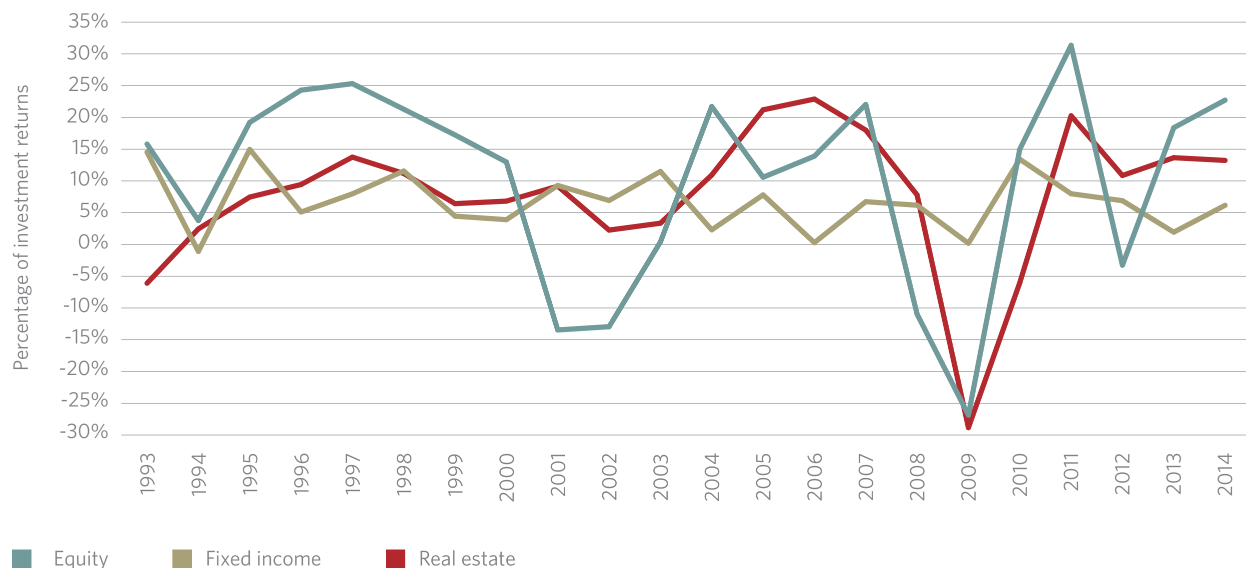
Despite these general commonalities, there are substantial differences among the various types of alternative investments. For example, higher-yield alternatives such as private equity have similar risk and expected return characteristics as publicly traded stocks and are attractive during periods of strong equity returns. Private equity also takes advantage of pension funds' long investment horizons and helps leverage the "illiquidity premium" that comes with a willingness to forgo immediate or short-term returns.

Yield chasing is not the sole reason for alternative investments, however. Real estate and other real asset investments help diversify portfolios and generally provide returns and bring risks that are higher than bonds but lower than stocks. Real estate also can provide some protection against inflation as asset values tend to capture changes in the price of goods and services throughout the economy.

Figure 9

Annual Investment Returns by Asset Class, 1993-2014

Real estate can be used to provide market diversification



Source: Wilshire Trust Universe Comparison Service®

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Hedge funds deploy a variety of strategies that are designed to provide higher yields, lower total portfolio volatility, or a combination of both. However, the effectiveness of these higher-cost strategies remains uncertain. Additionally, complex fee structures are widely used, often making it difficult to judge total costs.

Hedge funds over the past 10 years have underperformed significantly compared with the Standard & Poor's 500 index and commonly used benchmarks, after accounting for fees.[25] In addition, risk-managed hedge fund strategies employed by some funds have not yet proved successful in providing returns during equity market downturns. Studies have also shown that high fee levels—which can exceed 2 percent annually—are a critical factor that explains why these investments have not met their benchmarks.[26]

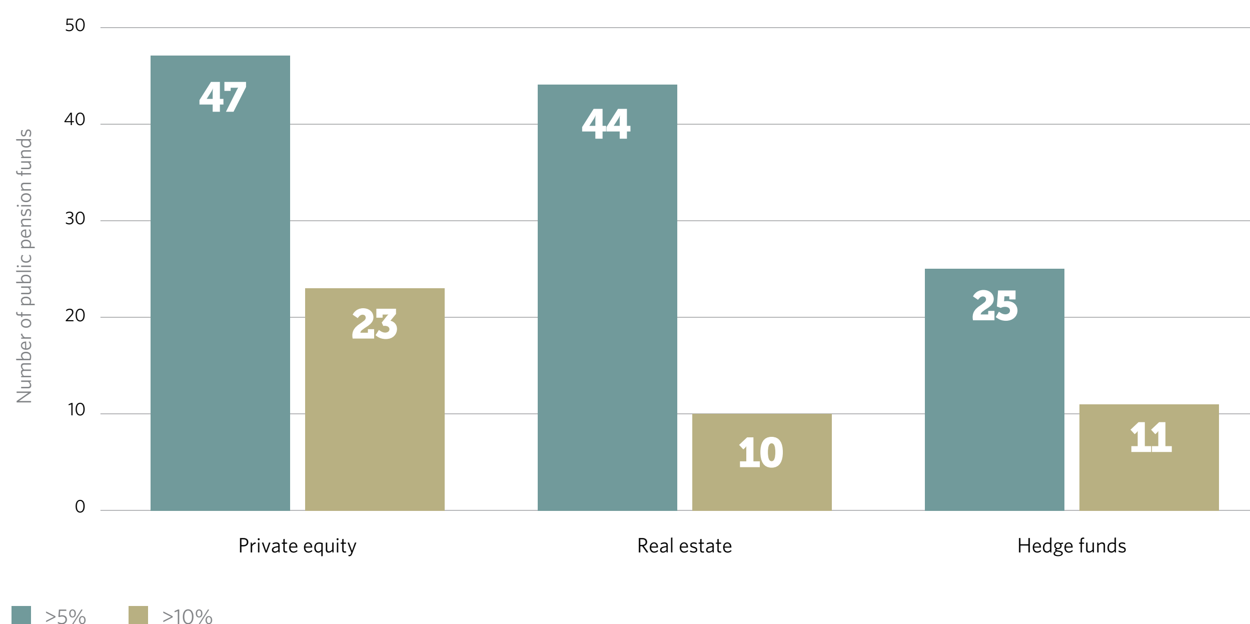
While the allocation to hedge funds has increased in the aggregate, the rise in hedge fund investing by pension funds is slowing overall, and some funds are exiting these investments altogether.[27] In 2014, for example, CalPERS eliminated its $4 billion hedge fund investment program, citing high costs.[28] Likewise, the board of the New York City Employees' Retirement System voted in April 2016 to withdraw from all hedge fund investments due to underperformance and cost.[29]

Plans also vary widely in their investment choices within the alternatives class. For example, plans are more likely to invest significantly (more than 5 percent of assets) in private equity or real estate than in hedge funds. Nearly a third of the funds had more than 10 percent of assets in private equity, while 15 percent of funds had more than 10 percent in hedge funds.

Figure 10

Use of Alternative Investments by Public Pension Funds, 2014

Plans vary in their investment choices within the alternative asset class



Sources: Comprehensive Annual Financial Reports, 2014; quarterly investment reports; and plan responses to data inquiries

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No one-size-fits-all approach

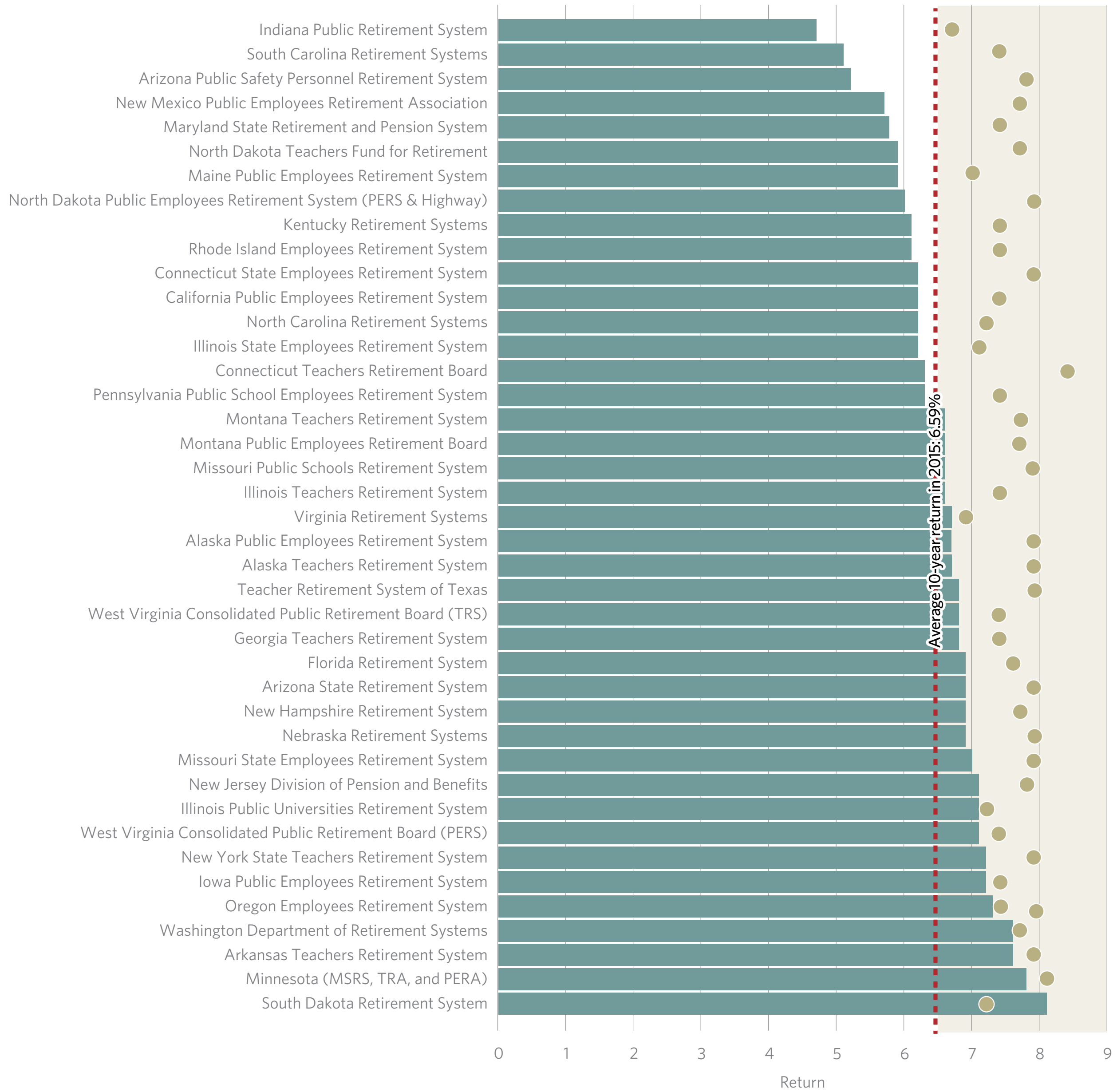
Despite the difference in investment strategies, the data do not reveal a best or one-size-fits-all investment approach. Indeed, high performers can be found among plans with large investments in alternatives as well as those with none.[30]

Ten-year total investment returns for the 41 funds reporting net of fees as of June 30, 2015, ranged from 4.7 percent to 8.1 percent, with a average yield of 6.6 percent. Given that the average target return for these plans was 7.7 percent, the long-term variability is significant. Notably, only one of these plans met or exceeded investment return targets over the 10-year period ending in 2015.

Figure 11

10-Year Returns for Plans Reporting Net of Fees on a June 30 Fiscal Year Basis, 2015

Returns ranged from 4.7 percent to 8.1 percent



Sources: Comprehensive Annual Financial Reports, 2015; quarterly investment reports; and plan responses to data inquiries

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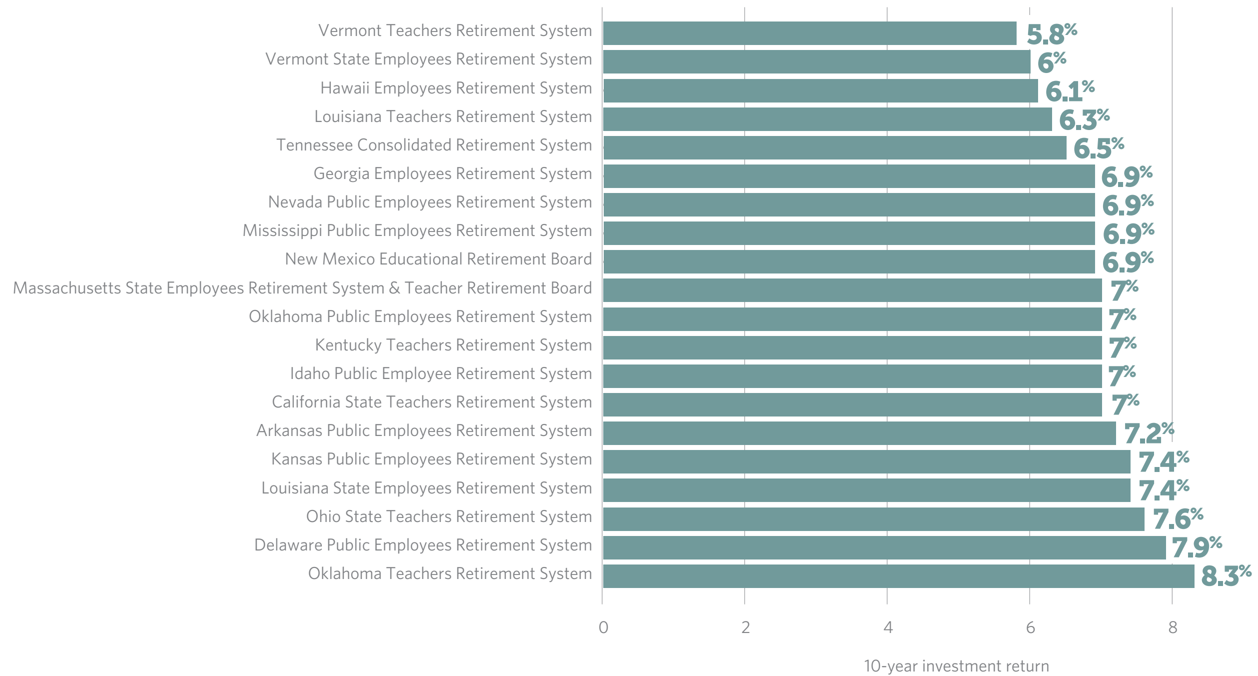
Figure 12

10-Year Returns for Plans Reporting Gross of Fees on a June 30 Fiscal Year Basis, 2015

Assessing bottom-line performance for these plans requires adjustments for fees



Note: Performance of gross of fees reporters is provided for reference; however, average performance and target rates of return are absent given the lack of standardization and comparability arising from missing fee adjustments in plan performance reporting.

Sources: Comprehensive Annual Financial Reports, 2015; quarterly investment reports; and plan responses to data inquiries

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Alternative investment strategies, experience, and performance vary

Although no clear relationship exists between the use of alternatives and total fund performance, there are examples of top-performing funds with long-standing alternative investment programs. Conversely, funds with recent and rapid entries into alternative markets—including significant allocations to hedge funds—were among those with the weakest 10-year yields.

For example, the Washington Department of Retirement Systems (WDRS) is among the highest-performing public funds and has had a private equities program since 1981, making it one of the earliest adopters of alternative investments. In 2014, the WDRS had 36.3 percent of total investments in alternative asset classes, including 22.3 percent in private equity, 12.4 percent in real estate, and 1.6 percent in other alternatives. Hedge funds were notably absent from the mix. The fund's long-term experience with the complexities of alternatives is reflected in its performance metrics: The WDRS has one of the highest 10-year returns of plans examined here, at 7.6 percent in 2015, buoyed in large part by the performance of its private equity and real estate holdings.

Table 2

10-Year Performance of Washington Department of Retirement Systems, 2015

Alternative investments have been a significant factor in high fund yields

	Asset allocation	10-year return
Total fund		7.55%
Passive benchmark		6.25%
Wilshire TUCS median		6.73%
Performance by asset class		
Fixed income	23.76%	5.32%
Tangible	1.95%	
Real estate	14.45%	8.76%
Public equity	37.27%	6.71%
Private equity	22.04%	12.15%
Innovation	0.32%	
Cash	0.21%	1.56%

Sources: WDRS Comprehensive Annual Financial Report, June 30, 2015; Wilshire Trust Universe Comparison Service®

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Similarly, the South Dakota Retirement System began its private equity and real estate programs in the mid-1990s and realized 10-year returns of over 8 percent in 2015. The fund held nearly 25 percent of assets in alternative investments in 2014, but lowered this to less than 20 percent in 2015, comparable to the 18.3 percent held in alternatives in 2006. The 2015 allocation includes over 10 percent in real estate, 8 percent in private equity, and 1 percent in hedge funds. The fund reports net since-inception internal rates of return of 9 percent for private equity and 21.4 percent for real estate, in comparison to the S&P 500 index of 5.8 percent for the same period.[31]

Conversely, plans with more recent shifts into alternatives—especially those with significant investment in hedge funds—are among those that exhibit the lowest returns. For example, the three funds with the weakest 10-year performance among net fiscal year reporters—the Indiana Public Retirement System, the South Carolina Retirement System, and the Arizona Public Safety Personnel Retirement System—are also among the half dozen funds with the largest recent shifts to alternative investments. All three have increased their allocations to alternatives by more than 30 percentage points since 2006. Significantly, these funds also have hedge fund allocations above the median fund, and all three rank in the top quartile for reported fees.

For example, in contrast with the WDRS and South Dakota's early diversification, South Carolina shifted into alternatives precipitously in 2007 when the state enacted legislation to establish a new retirement system investment commission and provide the needed statutory authority to invest in high-yield, diversified nontraditional assets.[32] Within a year, over 31 percent of plan assets were invested in alternatives, and by 2014 those assets made up nearly 40 percent of the fund's total.[33]

As detailed in an independent audit, rapid diversification into alternative investments proved difficult for a newly founded, under-resourced investment commission: The South Carolina Retirement System's 10-year return of only 5 percent in 2015 is among the lowest of the plans studied.[34] Given the long-term, illiquid nature of these investments, correcting misjudgments or realigning investments made quickly during the commission's first years may prove challenging.[35]

This correlation between lower returns and rapid shifts into alternatives does not necessarily demonstrate causation. The timing of changes in asset allocation—in many cases executed during the Great Recession—likely played a role in the comparative underperformance of this and other funds; a longer time horizon may be needed to adequately evaluate new investment strategies. However, these results draw attention to the need for funds to carefully consider and measure the results of shifting into hedge funds and other more complex and higher-fee asset classes.[36]

Many alternative investment strategies also include real estate. Public funds have been investing in this class for decades, but there is evidence that funds with high concentrations of local real estate investments underperform commonly used benchmarks. The Retirement System of Alabama (RSA) provides one example. The system has 5 percent of its more than $30 billion in assets invested in local real estate, including 26 golf courses, hotels, resorts, and office buildings in the state. Ten-year returns on the RSA's real estate portfolio were only 2.8 percent in 2015, well below the plan's overall expected return of 8 percent or national real estate benchmarks of 6.4 percent. Poor returns on real estate also contributed significantly to the deep financial distress facing the Dallas Police and Fire Pension Plan, which was 45 percent funded in 2016, with more than $3.3 billion in unfunded liabilities.[37]

In summary, some funds have demonstrated that private equity can be an appropriate strategy to improve long-term returns. Still, although top-quartile private equity investments historically yield higher upside returns, the results of poor performers fall below those of average returns on stocks.[38] In addition, recent evidence on hedge funds suggests that after accounting for fees, they do not, on average, provide excess returns in the long term—or a defense against market downturns.[39] These findings highlight the importance of using skilled plan managers with the capacity for rigorous alternative fund assessment and selection, and who pay attention to measuring and managing fees.

Some states realize high net returns with limited or no exposure to alternatives

Many states have consistently achieved relatively high returns without a heavy reliance on alternatives. Plans in Oklahoma exemplify this approach. Both of the Oklahoma state-sponsored retirement systems examined have lower-than-average allocations to alternatives; one holds no alternatives. Both, however, have 10-year earnings that outpace the median.

The Oklahoma Teachers Retirement System (OTRS) stands out in terms of performance among state-sponsored pension funds. It ranked near the top percentile of all public funds in the United States with a 10-year return of 8.3 percent gross of fees in 2015. The OTRS holds 17 percent of its assets in alternatives—below the fund average of 25 percent—with the bulk of its investments in public equities (62 percent) and fixed income (20 percent). Diversifying within the equity portfolio, employing low-fee strategies, and cutting operating costs are explicitly part of the fund's overall strategy.[40]

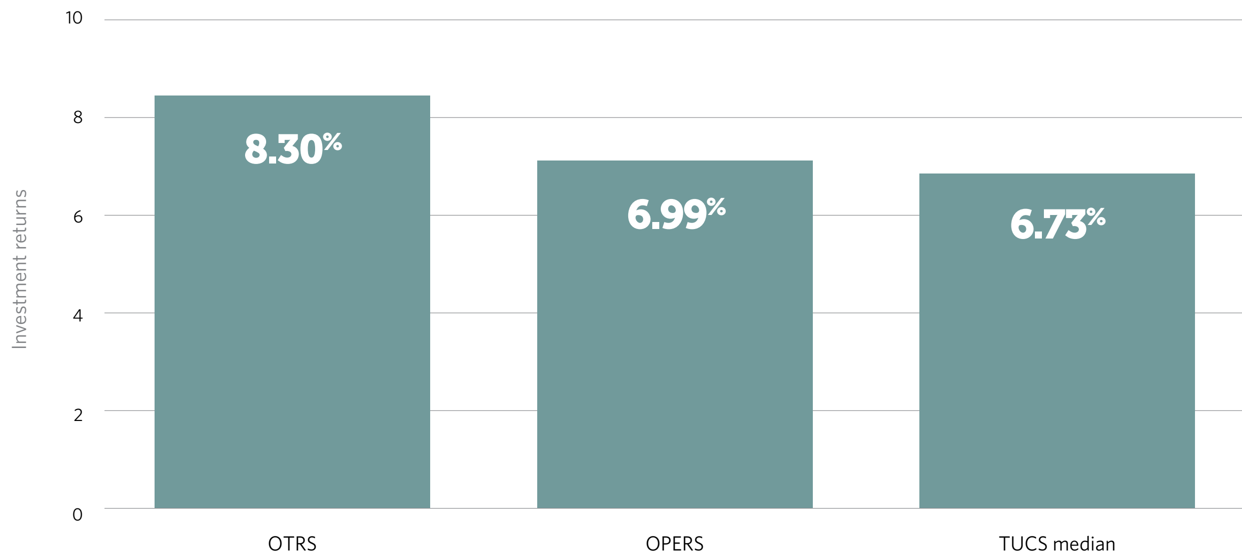
The Oklahoma Public Employees Retirement System (OPERS) takes this approach even further, with 70.2 percent of its investments in equity and 29.5 percent in fixed income. The fund holds no alternative investments. OPERS' investment philosophy is guided by the belief that a pension fund has the longest of investment horizons and, therefore, focuses on factors that affect long-term results.[41] These factors include diversification within and across asset classes as the most effective tool for controlling risk, as well as the use of passive investment management. Still, the fund does employ active investment strategies in less efficient markets.[42]

Although the fund's 10-year returns are lower than those of the OTRS, OPERS' performance remains higher than the TUCS median over that time frame. The OTRS and OPERS report returns gross of fees, so they are directly comparable to the TUCS benchmarks. The OTRS' reported investment expenses totaled 0.34 percent in 2014 while OPERS' were a relatively low 0.10 percent.

Figure 13

Returns of Oklahoma Public Retirement Systems

Outpaced median with low or no alternative investments allocation



Sources: Comprehensive Annual Financial Reports, 2015; WilshireTrust Universe Comparison Service®

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Standardized reporting needed for greater transparency

Public retirement systems' financial reports are guided by GASB standards, in addition to those of the Government Finance Officers Association (GFOA) and the CFA Institute. Collectively, these guidelines are widely recognized as the minimum standards for responsible accounting and financial reporting practices. For example, both GASB and the CFA Institute require a minimum of 10 years of annual performance reporting; the CFA suggests that plans present more than 10 years of data. The GFOA recommends reporting annualized returns for the preceding 3- and 5-year periods as well.

However, funds apply these standards differently. And because the performance and costs of managing pension investments can significantly affect the long-term costs of providing retirement benefits to public workers, boosting transparency is essential.

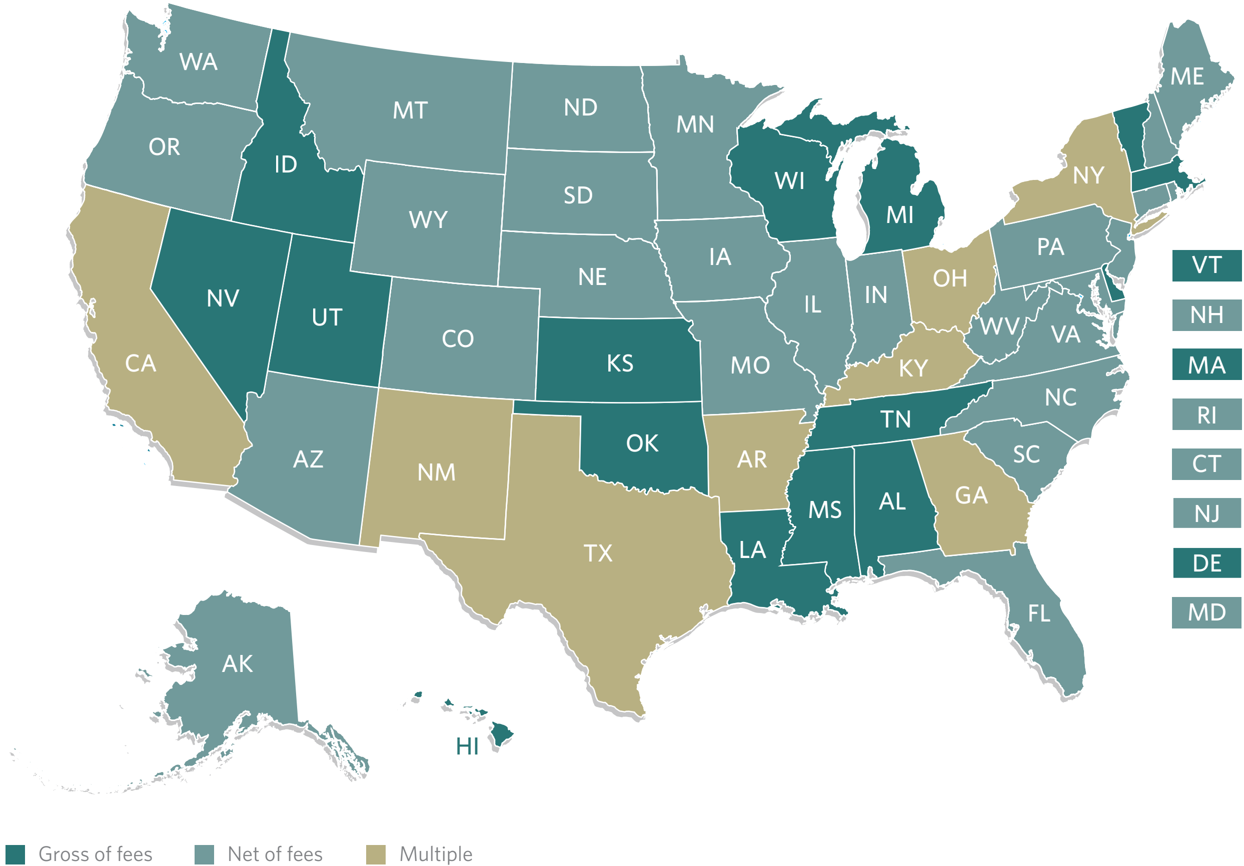
In a recent brief on state pension investment reporting, Pew reviewed the disclosure practices of plans across the 50 states and highlighted the need for greater and more consistent transparency on alternative investments. State funds paid more than $10 billion in fees and investment expenses in 2014, their largest expenditure and one that has increased by about 30 percent over the past decade as allocation to alternatives has grown.

However, over one-third of the funds in the study report 10-year performance results before deducting the cost of investment management—referred to as "gross of fees reporting."

Figure 14

Most States Report Pension Investment Performance After Fees

In some states, reporting practices differ by plans



Notes: South Dakota discloses performance as both net and gross of fees. The states marked as having multiple reporting methods have two funds included in the list of 73 that report performance differently from each other. Pew's classification for Ohio has changed from a previous publication from "net of fees" to "Multiple." Ohio's State Teachers Retirement System reports returns net of fees for its alternative and real estate investments, but gross of fees for all other assets.

Sources: State Comprehensive Annual Financial Reports, 2013 and 2014; state treasury reports; quarterly investment reports; and state responses to data inquiries

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The analysis showed wide variation in the disclosure practices of public funds, and in many cases found policies that make it difficult for policymakers, stakeholders, and the public to gauge actual fund performance. Implementing the practices recommended by Pew to strengthen investment reporting, summarized in Table 3, would help provide policymakers and stakeholders with transparent information on funds' investment philosophy and bottom-line results on all strategies. Having these practices in place nationwide would result in the disclosure of over $4 billion in currently unreported fees.

Table 3

Pension Investments Have Become Increasingly Complex

Disclosure standards and guidelines need to be updated to keep pace

Issue	Pew's recommendation	Current standard	Current state/examples
Pension investments have become increasingly complex: Over 25% of state plan assets are invested in alternatives, more than double the amount a decade ago.	**Make investment policy statements available online—** provides stakeholders with accessible information on investment strategies.	**GFOA:** Recommends concrete statement of investment goals that describe plan's investment and risk tolerance.	Of the 73 largest state-sponsored pension funds, 59, or 81 percent, made statements available online.
Performance reporting is inconsistent across funds: Over one-third of funds report 10-year returns "gross of fees"—without deducting manager fees.	**Disclose performance both net and gross of fees—** provides bottom line results and cost of implementing investment policy.	**CFA Institute:** Provides disclosure rules for both net and gross reporting, and states that reports "should present gross-of-fees returns." **GASB:** Requires disclosure of the rate of return net of pension plan investment expenses for current year reporting.	Most plans disclose 10-year returns minus the fees paid to managers, or "net of fees."
Unreported fees: Funds do not report comprehensive accruals of carried interest, monitoring costs, or portfolio company fees. Value of unreported fees estimated to be $4 billion annually.	**Adopt comprehensive fee reporting such as the Institutional Limited Partners Association (ILPA) fee reporting template, including a line itemization of fees paid to individual investment managers—**raises the bar on transparency, allows trustees to better measure and manage costs.	**GASB:** Requires reporting investment-related costs only if "separable from (a) investment income and (b) the administrative expense of the pension plan." **GFOA:** Management fees "should be reported separately from rebated amounts." **CFA Institute:** "Firms must disclose the fee schedule."	The South Carolina Retirement System and Missouri State Employees' Retirement System collect detailed information on portfolio company fees, other fund-level fees, and accrued carried interest in addition to external managers' standard invoices. They include schedules of these fees in their annual reports.
Performance reporting does not reflect long-term nature of pension liabilities: Most plans report returns on a 5- or 10-year time horizon despite the longer-term nature of plan liabilities.	**Expand performance reporting to include 20-year results—**provides stakeholders with long-term results that are more aligned with the long-term investment strategies that funds follow.	**GASB:** Requires disclosure of net-of-fee returns on pension plan investments for each of the past 10 years. **GFOA:** Recommends "rate of return for latest 12 months and annualized rates of return for preceding 3- and 5-year periods." **CFA Institute:** Recommends reporting "more than 10 years of annual performance."	Georgia, Kentucky, Louisiana, Missouri, and New York release comprehensive 20-year data on performance returns by asset class. But only Georgia Teachers' Retirement System, Missouri State Employees' Retirement System, and the New York Teachers Retirement System make that information available net of fees.
Information on results of different investment strategies is limited: Fifteen percent of plans examined do not report performance by asset class.	**Include performance results by asset class, both net and gross of fees—**provides stakeholders with the results and cost of different investment strategies.	**CFA Institute:** Recommends reporting rate of return "for each major category of investments and for the portfolio as a whole."	Pennsylvania Public School Employees' Retirement System reports performance and benchmarks by detailed asset classes for one, three, five and 10 years.

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Conclusion

State and local public pension funds have significantly changed investment strategies in recent decades. They have shifted a large percentage of fund assets away from fixed-income securities, such as government and corporate bonds, toward equities and alternative investments, including hedge funds and private equity funds. This shift has increased the complexity of pension portfolios and brought significantly higher investment fees.

Despite the common trend toward more complex investments, public pension fund investment strategies vary widely across states. The data, however, reveal no best or one-size-fits-all approach to successful investing.

There is, however, a uniform need for full disclosure on investment performance and fees. While many state pension fund investment strategies now rely on more complex investments with higher fees, disclosure standards have not kept pace.

The increased investment risk, complexity, and volatility require greater vigilance on the part of administrators, government officials, and board members to safeguard the plans' long-term sustainability. Effectively managing risk and volatility is critical when funds are heavily invested in equities and alternatives. In addition, evaluating costs is vital because such complex investment products can charge high fees. Moreover, the skill requirements for fund administrators and board trustees alike are significantly higher for funds that employ these investment strategies.

The findings presented in this report—particularly the significant unreported fees—point to the need for disclosure of additional public information on plan performance, attention to the full impact of investment costs on plan health, and examination of board responsibilities in light of more sophisticated investment practices.

Greater transparency by public pension plans can help ensure that the plans accurately disclose fees paid and that risks, returns, and costs are balanced in ways that follow best practices.

Appendix

Despite some commonalities, there are substantial differences among the major investment subcategories of alternative investments. For example, higher-yield alternatives such as private equity are attractive during periods of strong equity valuations, especially for pension funds that use relatively high assumed rates of return.

Conversely, other alternatives—particularly real estate or other real assets—add diversification to pension portfolios and can provide some protection against inflation. Hedge funds, meanwhile, can both lower portfolio volatility and help meet absolute return targets.

As pension funds consider allocating portions of their portfolios within alternatives to deliver potentially higher and more stable returns, managers must consider the unique aspects of each major subclass within the category.

Private equity

Private equity (PE) funds are investment vehicles funded by outside investors that buy, restructure, and sell companies over an extended (5-plus years) investment horizon. Returns are realized through capital gains on the eventual sale or public offering of the investment companies. Private equity can provide return premiums to investors, such as public pension funds, that are able to hold illiquid assets with longer-term investment needs. However, there is wide variability in the performance of PE investments, making fund selection a crucial element of investment success. Public pension funds may not have access to the highest-return funds, and most PE

partnerships operate with substantially less transparency than other investments.

For example, PE fund managers (or general partners) have complete management control and command high fees, typically including an annual management fee of 1 to 3 percent and a performance fee, or carried interest, of 20 to 30 percent of returns over the life of the investment.[43] As discussed above, the average value of carried interest and other netted fees, often not disclosed by private equity managers, is estimated to represent over half of total private equity costs.[44]

Real estate

The real estate asset class encompasses different property types (e.g., residential, commercial), investment routes (e.g., direct investment, private real estate equity), and portfolio allocation strategies (core, value-add).[45] Real estate investments can provide higher risk-adjusted returns than traditional assets and can serve as a hedge against inflation.[46] Public pension plans typically focus on "core" real estate products, such as multifamily or office buildings in a cluster of cities and business districts, rather than more opportunistic investments such as distressed properties in secondary cities. Pensions may also invest in real estate through publicly traded real estate investment trusts. The real estate asset class typically refers to both direct real estate investments and those managed by private management groups.

Analyzing risk-adjusted returns for real estate investments, like other alternative investments, is not as straightforward as traditional asset classes. Real estate relies on appraisal pricing procedures, which may not accurately reflect market value if the asset class does not trade actively.

Direct real estate investments can be managed internally or outsourced, and in some instances can be used as a tool for economic development. For example, some states use pension fund assets to make economically targeted investments. Research indicates that public pension funds exhibit home state bias in real estate investments that overweight in-state real estate properties by about 19 percent.[47] The Retirement System of Alabama provides one example, with 5 percent of its more than $30 billion in assets invested in local real estate, including 26 golf courses, in addition to hotels, resorts, and office buildings within Alabama. Ten-year returns on the RSA's real estate portfolio were only 2.8 percent in 2015, well below the plan's overall expected return of 8 percent, as well as national real estate benchmarks of 6.4 percent.

Hedge funds

Hedge funds are relatively new investment vehicles, and public pension funds only started funneling significant allocations to them in the early to mid-2000s.[48] Like private equity, hedge funds are almost all privately owned and managed, relatively unregulated, and use a performance fee structure. Hedge funds deploy a variety of strategies that can be broadly classified as "absolute return" or "directional," and invest in multiple asset classes and/or regions. Absolute return hedge funds work to reduce (or fully hedge) market risk and provide steady returns regardless of broader market movements. Directional hedge funds seek to add market risk exposure. Hedge funds that are meant to provide returns in a down market have low correlations to traditional ("long only") investments. Thus, public pension funds' "hedge fund strategies" may encompass investments that decrease portfolio volatility, as well as those that amplify equity and fixed-income market movements.[49]

Hedge funds generally have high, sometimes contentious fees structures, as well as greater complexity than lower-fee investments. During strong markets, directional hedge fund strategies typically underperform index funds. During weak markets, absolute return strategies can outperform low-cost investments, but at a scale too small to make a significant difference for large pension funds' overall returns. Investing enough capital to

meaningfully protect the portfolio during downturns is difficult to do cost-effectively.

Like PE funds, hedge funds use a fixed management fee and performance fee structure. Hedge fund fees have reportedly declined since the financial crises of the 2000s and currently average about 1.5 percent for management fees and 18 percent for performance fees.[50] Roughly half of public plans invest in "funds of hedge funds," which strategically invest in other hedge funds. This can help pension funds alleviate some of the complexity of fund selection and diversify their hedge fund strategies and manager exposure. Funds-of-funds are also attractive because they can perform due diligence and monitoring that may be beyond the expertise level of public pension funds. Funds-of-funds were less popular following the financial crisis in 2008-09, as their high fees and questionable due diligence turned off investors, but public pension funds continue to invest. These upsides come at the price of an added layer of management and performance fees of about 0.5 to 1 percent and 5 to 10 percent, respectively.[51]

Public pension investments in hedge funds have been particularly fluid in recent years. Many funds are increasing their hedge fund allocations, although there is a fair amount of movement between hedge fund strategies and in the ways that funds categorize or pool hedge fund investments. At the other extreme, CalPERS announced in 2014 that it would be exiting its hedge fund investments, citing high fees, complexity, and performance as its primary concerns. Since CalPERS was an early and experienced investor in alternatives, this was a significant development. Its relatively small allocation to hedge funds was underperforming equity index funds while costing over $100 million in fees every year. Because CalPERS has huge assets, even its small hedge fund allocation required investments in over a dozen funds, with constant attention to manager monitoring and selection. A discernible market hedge would have required a far larger allocation to hedge funds.

Commodities

Commodities are real assets with intrinsic economic value for end-use consumption (for agricultural or livestock goods) or manufacturing (metals, energy). Their financial value is a result of market dynamics: supply, demand, investor patience, durability, seasonality, speculation, and other factors. Commodities generally have low correlation with traditional asset classes and are highly correlated with inflation (and thus offer a hedge against rising price levels). Public pension funds began adding commodities to their portfolios in the early 2000s and typically invest through indexes.

Commodities did not uniformly provide hedge or "safe haven" investments during the 2007-08 financial crisis. Ironically, increased institutional investment such as public pension funds seems to have mitigated commodities' counter business cycle movements, as many commodities increasingly behave like financial assets rather than consumption goods.[52]

Glossary

Alternative investments. Although there is no fixed definition for alternative investments, they are generally agreed to include private equity, hedge funds, real estate, and some commodities. These investments typically lack an established public exchange, have low liquidity, and can be more difficult to value. Alternative investments usually carry higher fees and can be used to diversify investment portfolios or to achieve higher rates of return, although often at higher levels of risk.

Assumed rate of return. The assumed, or expected, rate of return is the investment return target and the result that a pension plan estimates its investment allocation mix will deliver.

Basis point. A commonly used unit of measure (one one-hundredth of one percentage point) of the change in the value of a financial instrument.

Bonds. An instrument of indebtedness of the bond issuer to the holders. It is a debt security, under which the issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay them interest (the coupon) and/or to repay the principal at a later date, termed the maturity date.

Carried interest. A share of the profits of an investment or investment fund—typically private equity or hedge funds—that is paid as a performance fee to the general partner or investment manager in excess of any annual management fee. These fees are typically netted out of a fund's annual estimated return and are separate from management fees charged annually.

Cash equivalents and short-term investments. Financial investments of relatively short duration that generally present low risk and lower returns but are more liquid than other investments. For pension plans, these can be notes or certificates of deposit.

Commodities. Physical commodities are assets that include agricultural products or natural resources such as timber.

Equities. Stocks held by investors that represent ownership in a piece of a company. They can be domestic or international. Equities do not guarantee a specific rate of return and thus are generally riskier than fixed-income investments. But equities also have the potential for higher returns, and shareholders' investments may grow rapidly with the market.

Fixed income. Investments in which returns are predictable and paid at designated times. These can include domestic or international bonds. Because fixed-income investments generate predictable streams of income, they are generally considered low-risk.

General partner. An owner of a partnership who has unlimited liability and is also commonly a managing partner, or active in the day-to-day operations of the business. In private equity investments, for example, the private equity firm is the general partner.

Hedge fund. A relatively unregulated private investment fund or pool that trades and invests in various risky assets such as securities, commodities, currency, and derivatives. Available only to sophisticated investors with significant assets, hedge funds employ a number of different strategies in order to earn high returns (either in an absolute sense or over a specified market benchmark) for investors and may be used to diversify a portfolio.

Investment fees. Any fees that a pension plan pays to professionals to allocate its assets. These can be administrative or money management fees. Generally, more traditional investment types have lower investment

fees than more complex investments.

Limited partner. A partner whose liability is limited to the partner's share of ownership. Limited partners generally do not have management responsibility in the partnership in which they invest and are not responsible for its debt obligations. For private equity investments, for example, the pension investor is the limited partner.

Liquidity premium. The premium demanded by investors when a security is not something that can be easily traded in open markets, for example, a stock exchange.

Private equity. An asset class consisting of equity securities and debt in operating companies that are not publicly traded on a stock exchange.

Real assets. Physical or tangible assets, such as precious metals, commodities, or oil, as opposed to financial assets.

Risk premium. The amount the return on a risky asset is expected to exceed the risk-free rate. This premium can be thought of as compensation for the investor taking on risk.

Standard deviation. A statistical measure of the dispersion of a set of data from its mean that, for investments, sheds light on historical volatility. For example, a volatile stock has a high standard deviation, while the deviation of a fixed-income bond is lower. A large dispersion indicates how much the return on the fund is deviating from the expected normal returns.

Total return strategy. An investment strategy that balances asset allocations in a traditionally diversified portfolio with the goal of seeking both income (via interest and dividends) and asset appreciation. In contrast, income investing is a strategy that focuses on stable, income-producing investments—such as bonds and equities with healthy dividends—and places less emphasis on asset appreciation and capital gains.

Volatility. Investment volatility measures how much the value of a particular asset class or a portfolio in total moves up and down with financial markets and the economy. It is the standard measure of risk that is based on historical results and also used as a forward-looking indicator of risk. A higher volatility indicates the potential for larger fluctuations in value or price.

Yield. The return on an investment. In securities, it is the dividends or interest received, usually expressed as an annual percentage of either the current market value or the cost of the investment.

Endnotes

1 Board of Governors of the Federal Reserve System, "Z.1 Financial Accounts of the United States: Flow of Funds, Balance Sheets, and Integrated Macroeconomic Accounts," Third Quarter 2016, Federal Reserve Statistical Release, Dec. 8, 2016, https://www.federalreserve.gov/releases/z1/20161208/z1.pdf.

2 Wilshire Trust Universe Comparison Service, "Public Plans Report," June 30, 2012–2016.

3 U.S. Bureau of Labor Statistics, "Current Employment Statistics, Establishment Data," Table B-1a, http://www.bls.gov/web/empsit/ceseeb1a.htm.

4 U.S. Census Bureau, "Survey of Public Pensions: State- and Locally Administered Defined Benefit Data" (June 2016), https://www.census.gov/govs/retire.

5 Wilshire Trust Universe Comparison Service® and Wilshire TUCS® are service marks of Wilshire Associates Inc. ("Wilshire") and have been licensed for use by The Pew Charitable Trusts. All content of TUCS is © 2017 Wilshire Associates Inc., all rights reserved.

6 See, for example, Christine Benz, "What Market Experts Are Saying About Future Returns," *Morningstar*, Jan. 14, 2016, http://news.morningstar.com/articlenet/article.aspx?id=736083.

7 The Pew Charitable Trusts, "State Public Pension Investments Shift Over Past 30 Years," June 3, 2014, http://www.pewtrusts.org/en/research-and-analysis/reports/2014/06/03/state-public-pension-investments-shift-over-past-30-years.

8 James A. Callahan, "Welcome and Introduction: Investment Industry Overview," Callan Investments Institute, see also Andrew Biggs, "The Public Pension Quadrilemma: The Intersection of Investment Risk and Contribution Risk," *Journal of Retirement* 2, no. 1 (2014): 115–27, doi:10.3905/jor.2014.2.1.115.

9 The Federal Reserve defines "safe assets" as fixed-income investments, cash, and other cash equivalents (e.g., certificates of deposit). For a definition of "risky assets," see Aleksandar Andonov, Rob Bauer, and Martijn Cremers, "Pension Fund Asset Allocation and Liability Discount Rates: Camouflage and Reckless Risk Taking by U.S. Public Plans?" *Review of Financial Studies* (forthcoming), http://dx.doi.org/10.2139/ssrn.2070054.

10 Milliman, "Corporate Pension Funding Study" (2016), http://us.milliman.com/PFS; and OECD, "Annual Survey of Large Pension Funds and Public Pension Reserve Funds: Report on Pension Funds' Long-Term Investments " (2015), http://www.oecd.org/daf/fin/private-pensions/2015-Large-Pension-Funds-Survey.pdf.

11 These plans include the Connecticut Teachers' Retirement Board (8.50%), the Indiana Public Retirement System (6.75%), and Minnesota (Minnesota State Retirement System, Teachers Retirement Association, and Public Employees Retirement Association) (8.14%).

12 For example, AA corporate bond index rates ranged from 2 to 3 percent since fiscal year 2012. See Federal Reserve Bank of St. Louis, "Bank of America Merrill Lynch US Corporate AA Effective Yield©," https://fred.stlouisfed.org/series/BAMLC0A2CAAEY.

13 Andonov, Bauer, and Cremers, "Pension Fund Asset Allocation."

14 Wilshire Trust Universe Comparison Service, "2015 Report on State Retirement Systems: Funding Levels and Asset Allocation," Feb. 25, 2015.

15 Marc Levine, "Fees That Sickly Public-Pension Funds Can't Afford," *The Wall Street Journal*, May 13, 2016, http://www.wsj.com/articles/fees-that-sickly-public-pension-funds-cant-afford-1463177963.

16 Randall Smith, "Pension Funds Trail Individuals in Embracing Index Funds," *The New York Times*, March 3, 2015, http://www.nytimes.com/2015/03/04/business/pension-funds-trail-individuals-in-embracing-index-funds.html?_r=0.

17 See, for example, Joseph N. DiStefano, "PhillyDeals: Public Pension Plans Pay Hedge-Fund Fees With Little Gain," *Philly.com*, Oct. 6, 2014, http://articles.philly.com/2014-10-06/business/54657571_1_hedge-fund-fees-psers-hedge-funds; see also Katie Meyer, "Wolf Angling to Change How PA's Two Biggest Funds Are Managed," *witf.org*, Feb. 14, 2017, http://www.witf.org/state-house-sound-bites/2017/02/wolf-angling-to-change-how-pas-two-biggest-funds-are-managed.php.

18 Commonwealth of Pennsylvania State Employees' Retirement System and Public School Employees' Retirement System, *Comprehensive Annual Financial Report* (2006, 2014, and 2015).

19 Whereas U.S. Generally Accepted Accounting Principles permit the presentation of carried interest as a reallocation of profit between a limited partner and the general partner (private equity or hedge fund manager), International Financial Reporting Standards and International Accounting Standards require carried interest to be reported as an expense.

20 Andrea Dang, David Dupont, and Mike Heale, "The Time Has Come for Standardized Total Cost Disclosure for Private Equity," CEM Benchmarking Inc., April 2015, http://www.cembenchmarking.com/Files/Documents/CEM_article_-_The_time_has_come_for_standardized_total_cost_disclosure_for_private_equity.pdf.

21 For details on the prevalence and impact of portfolio company fees in private equity management services agreements, see Ludovic Phalippou, Christian Rauch, and Marc Umber, "Private Equity Portfolio Company Fees" (April 2016), http://www.icpmnetwork.com/wp-content/uploads/2016/09/7_Ludovic-Phalippou_Full-Paper_suggested.pdf.

22 Institutional Limited Partners Association, "Quarterly Reporting Standards Best Practices" (October 2011), https://ilpa.org/wp-content/uploads/2016/09/ILPA-Best-Practices-Quarterly-Reporting-Standards_Version-1.1.pdf.

23 Note that these returns need to be interpreted with care. Smoothing of losses or gains over time can understate volatility, and valuation practices in the absence of a regulated market can also yield misleading performance metrics.

24 Andonov, Bauer, and Cremers, "Pension Fund Asset Allocation."

25 BarclayHedge, "Barclay Hedge Fund Index," http://www.barclayhedge.com/research/indices/ghs/Hedge_Fund_Index.html; also see New York University Stern School of Business, "Annual Returns on Stock, T.Bonds and T.Bills: 1928—Current," http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html.

26 Mike Heale and Alexander D. Beath, "Hedge Fund Reality Check," CEM Benchmarking Inc., May 2016.

27 Christine Williamson, "Hedge Fund Investments Up 5.5% in Challenging Year," *Pensions & Investments*, Jan. 11, 2016, http://www.pionline.com/article/20160111/PRINT/301119973/hedge-fund-investments-up-55-in-challenging-year.

28 California Public Employees' Retirement System, "CalPERS Eliminates Hedge Fund Program in Effort to Reduce Complexity and Costs in Investment Portfolio," Sept. 15, 2014, https://www.calpers.ca.gov/page/newsroom/calpers-news/2014/eliminate-hedge-fund.

29 Edward Krudy, "'Let Them Sell Their Summer Homes': NYC Pension Dumps Hedge Fund," Reuters, April 14, 2016, http://www.reuters.com/article/us-new-york-pensions-idUSKCN0XB1TE.

30 Research has found that funds with significant holdings in private equity between 1990 and 2009 earned greater returns than funds with small holdings during that period; however, it is not clear that these findings hold for more recent entrants into alternatives. See I.J. Alexander Dyck and Lukasz Pomorski, "Investor Scale and Performance in Private Equity Investments," *Review of Finance* (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2192619.

31 All cited figures reported by the South Dakota Retirement System, *Comprehensive Annual Financial Report* (2014), http://www.sdrs.sd.gov/docs/CAFR2014.pdf.

32 See, for example, Julie Creswell, "South Carolina's Pension Push Into High-Octane Investments," *The New York Times*, June 9, 2012, http://www.nytimes.com/2012/06/10/business/south-carolinas-pension-push-into-high-octane-investments.html.

33 South Carolina Retirement System, *Comprehensive Annual Financial Report*, 2007, 2008, and 2014.

34 See Funston Advisory Services LLC, "Final Report: Fiduciary Performance Audit of the South Carolina Retirement System Investment Commission" (April 18, 2014), 27, http://oig.sc.gov/Documents/FAS%20Final%20RSIC%20Fiduciary%20Audit%20Report%20April%2018%202014.pdf.

35 Although South Carolina's initial experience with alternatives may be a cautionary tale, the investment commission is undertaking operational, governance, and policy reforms to correct course. Funston Advisory Services LLC, the South Carolina Retirement System's fiduciary auditor, concludes that the investment commission "is in the midst of a major cultural evolution. It has largely moved from a 'get money out the door' deal culture designed to rapidly diversify asset classes and risk exposures … to a more strategic, risk-controlled portfolio culture." This may impact future asset allocation, as the investment commission moves from its initial strategy of employing external partnerships that "deploy assets quickly' and 'overcome limitations of internal staff" to one of in-house investment in indexed equities. See Funston Advisory Services LLC, "Final Report," 27.

36 See, for example, Paul Bosse, "Pension Derisking: Diversity or Hedge?" Vanguard (September 2012), https://personal.vanguard.com/pdf/s326.pdf. Bosse concludes that, for pension plans, "diversifying a portfolio away from bonds and into alternatives can actually raise pension risk. Diversifying away from equities reduces risk only modestly, and the benefits should be weighed against the hurdles of implementation."

37 Mary Williams Walsh, "Dallas Stares Down a Texas-Size Threat of Bankruptcy," *The New York Times*, Nov. 20, 2016, http://www.nytimes.com/2016/11/21/business/dealbook/dallas-pension-debt-threat-of-bankruptcy.html.

38 Steve Kaplan and Antoinette Schoar, "Private Equity Performance: Returns, Persistence and Capital Flows," https://www.chicagobooth.edu/news/2004-11-12kaplan/pereturns-1.pdf.

39 See, for example, KPA Advisory Services, "The 'Risk Parity' Phenomenon: An Interpretation," *The Ambachtsheer Letter*, Nov. 1, 2015, http://kpa-advisory.com/the-ambachtsheer-letter/view/the-risk-parity-phenomenon-an-interpretation; see also Vincent Bouvatier and Sandra Rigot, "Pension Funds' Allocations to Hedge Funds: An Empirical Analysis of U.S. and Canadian Defined Benefit Plans," *Social Science Research Network* (2012), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1916686&download=yes; and Elizabeth Parisian and Saqib Bhatti, "All That Glitters Is Not Gold: An Analysis of U.S. Public Pension Investments in Hedge Funds," Roosevelt Institute, Nov, 6, 2015, http://rooseveltinstitute.org/all-glitters-not-gold-analysis-u-s-public-pension-investments-hedge-funds/.

40 Oklahoma Teachers Retirement System, “Teachers Retirement System Ranks in First Percentile of All Public Funds in United States,” June 26, 2013, https://www.ok.gov/TRS/documents/Pension%20Commission%20Report%202013%2006%2026%20Q1.pdf.

41 Oklahoma Public Employees Retirement System, *Comprehensive Annual Financial Report* (2013), 51, http://www.opers.ok.gov/Websites/opers/images/pdfs/CAFR-2013-OPERS.pdf.

42 Oklahoma Public Employees Retirement System, *Statement of investment Policy* (July 16, 2015).

43 Christian Rauch, and Mark Wahrenburg, “Buyout Funds,” in *Alternative Investments: Instruments, Performance, Benchmarks, and Strategies*, eds. H. Kent Baker and Greg Filbeck (Hoboken, NJ: John Wiley, 2013), 281–302.

44 Dang et al., “The Time Has Come.”

45 Real estate “debt” investments via mortgages or mortgage-backed securities are included in fixed-income investments.

46 Note that returns can come from property income and appreciation.

47 Yael Hochberg and Joshua Rauh, “Local Overweighting and Underperformance: Evidence From Limited Partner Private Equity Investments,” *Review of Financial Studies* 26, no. 2 (2013): 403–51, doi:10.1093/rfs/hhs128. Note that real estate investment is limited to real estate private equity funds and that other private equity categories also exhibit home state bias. The real estate portion is significant because it has the biggest impact (combined allocation and bias).

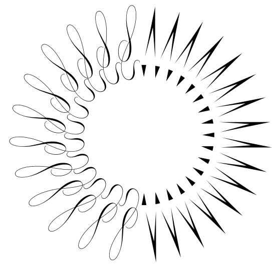
48 CalPERS announced a direct investment of $1 billion in hedge funds in 2000, and most public pension funds followed suit.

49 For example, the Missouri State Employees’ Retirement System splits its hedge fund investments into equity beta and nondirectional strategies.

50 Kelly Bit, “Hedge Fund Profits Declined 30% Last year, Citigroup Says,” *Bloomberg*, Jan. 29, 2015, http://www.bloomberg.com/news/articles/2015-01-29/hedge-fund-profits-declined-30-last-year-citigroup-says.

51 Amy Whyte, “Public Pensions Double Down on Hedge Funds,” *Chief Investment Officer*, Sept. 9, 2015, http://www.ai-cio.com/channel/ASSET-ALLOCATION/Public-Pensions-Double-Down-on-Hedge-Funds/; and Kartik Patel, “Fund-of-Funds: A Tale of Two Fees,” in *Alternative Investments: Instruments, Performance, Benchmarks, and Strategies*, eds. H. Kent Baker and Greg Filbeck (Hoboken, NJ: John Wiley, 2013), 567–86.

52 Claudio Boido, “Investing in Commodities,” in *Alternative Investments: Instruments, Performance, Benchmarks, and Strategies*, eds. H. Kent Baker and Greg Filbeck (Hoboken, NJ: John Wiley, 2013), 363–80.



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