



# The Relative Performance Record and Asset Allocation of Public Defined Benefit Plans

A Morningstar, Inc. project in conjunction  
with the National Conference on  
Public Employee Retirement Systems  
(NCPERS)



National Conference on Public  
Employee Retirement Systems

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## **Executive Summary**

Morningstar, Inc. and the National Conference on Public Employee Retirement Systems (NCPERS) are pleased to present this inaugural report on the unique roles, investment performance, and portfolio holdings of public sector defined benefit pension plans.

On balance, the NCPERS public plans that participated in this Morningstar analysis seem to have been allocating their capital well:

- On a 10-year time-weighted return basis, public plan investor returns outpaced retail mutual funds by 170 basis points.
- For any time period evaluated and whether measured by time-weighted or by investor returns, public plans outperformed retail mutual funds.
- This return pattern holds for every time period and for every group of public plans analyzed by Morningstar: states, counties, cities, and fire/police/teachers' funds.
- The 2006 year-end portfolios of the public plans are broadly diversified, with 41% of assets allocated to U.S. equity, 25% to fixed income, 20% to international or global equity and 8% to real estate and REITs.
- Besides real estate, the other common allocations Morningstar found to alternative investments were 3% to private equity and 1% to hedge funds. Cash holdings averaged 2%.
- In overview, it would appear that apart from encouraging and funding emerging managers, public plans are similar to other institutional investors in how they interact with alternative and traditional money managers.

Of the estimated 2,600 public plans in the U.S., approximately 500 are members of NCPERS. Among these 500 members, 62 responded to the request to provide information to Morningstar. This study is merely a starting point. Certainly, the data are incomplete. Public plan performance, holdings, and fee information are not centrally compiled, and are therefore not subject to relative comparison for the plans themselves and the general public, including taxpayers. It is for these purposes, among others, that Morningstar has formed a "Pension, Endowment, and Foundation (PEF)" database and is asking public plans, endowments, and foundations to participate.

Though corporate and public pension plans, endowments, and foundations in the United States manage trillions of dollars, it is still a challenge to find objective, comprehensive information on performance, expenses, risk, and holdings of these institutions. A comprehensive pension, endowment, and foundation database would provide valuable information to administrators, managers, trustees, consultants, plan participants, annuitants, taxpayers, shareholders, and donors.

## **Research Questions and Approach**

Morningstar addressed two main questions for this research initiative, each requiring different research methodologies – quantitative (numerical/number analysis) and qualitative (descriptive, non-numeric analysis).

First, Morningstar decided to analyze how public plans have performed from a risk-adjusted return and diversification perspective relative to mutual funds, for various time periods prior to year-end 2006. Through the cooperation of NCPERS, Morningstar contacted its substantial membership and asked NCPERS members to provide the necessary data for the analysis project.

Second, Morningstar wanted to determine if public plans play any unique roles in the economy that the private sector does not otherwise fulfill. For this question, Morningstar conducted a number of telephone interviews with traditional and alternative asset money managers. Among the firms that participated were Brandes, BGI, Great Lakes Advisors, Investcorp, and Ivy.

The public sector return data were compared against mutual funds because mutual funds are still the predominant vehicle used in defined contribution retirement plans. This relative comparison is relevant for understanding how public sector investors might fare if they were in defined contribution plans, and largely in control of their own destiny.

Information was received from 62 public plans in total: four states, eight counties, 32 cities and 18 fire/police/teacher retirement plans. The complete list is in Appendix A.

## **Section I: Quantitative Results** **Investment Performance and Portfolio Allocations**

One of Morningstar, Inc.'s core specialties is gathering and analyzing performance and portfolio data from investment vehicles, such as mutual funds, hedge funds, ETFs, and separate accounts/collective investment trusts.

In conjunction with NCPERS, Morningstar gathered historical returns of the public plans, analyzing time-weighted and investor returns, and the holdings within their portfolios.

Time-weighted rate of return, or the geometric mean return, is a measure of the compound rate of growth in a portfolio. When calculating, the effect of varying cash inflows is eliminated by assuming a single investment at the beginning of a period and measuring the growth or loss of market value to the end of that period.

Morningstar Investor Return™ (also known as dollar-weighted return) measures how the average investor in a fund or plan fared over a period of time. In capturing the average<sub>3</sub>

investor experience, investor return incorporates the impact of cash inflows and outflows from purchases and sales and the growth in plan assets. Investor Return is not one specific beneficiary's experience, but rather a measure of the return earned collectively by all the beneficiaries in a plan.

### 1) Time-Weighted and Investor Returns

Our main research approach was to compare public plans as a group against retail mutual funds. In a broad sense, public plans can be viewed as another form of investment vehicle. As such, comparing public plan performance against the largest investment universe provides meaningful comparative data.

Also, retail mutual funds are a significant component of defined contribution plans. Comparing public plans to retail mutual funds also goes some way towards examining whether participants in public defined benefit plans are better or worse off than investors in defined contribution plans. This is a relevant and topical question as the subject of whether public employees and taxpayers would benefit in a 401(k) style retirement plan.

For mutual funds, investor returns tend to be lower than total returns. This implies that individual investors tend to get into funds at the wrong time. Morningstar hypothesized at the onset of the project that the percentage difference between total and investor returns would be smaller for public defined benefit plans than for mutual funds. In fact, the difference was significantly better for public plans in every time period examined – three, five, and 10 years.

Whereas retail mutual fund investors always experienced a lower investor return than time-weighted return, public plan investors always benefited from higher investor returns than time-weighted returns. For example, between 2004 and 2006 all retail mutual funds averaged an investor return of 9.48%, 26 basis points lower than the time-weighted average return of 9.74%. For public plans, investor returns were 68 basis points higher than the average time-weighted return of 10.52%.

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## Three Year ('04 -'06) Time-weighted Returns and Investor Returns

### Monthly, Equally Weighted

	Time-weighted Returns	Investor Returns	Difference
All U.S. retail mutual funds	9.74%	9.48%	-.26%
NCPERS' Public Funds	10.52%	11.20%	+0.68%

Source: Morningstar, Inc.

+0.78%

+1.72%

Hypothesis: Total return/investor return difference will be tighter for public defined benefit plans than for mutual funds

On a 10-year basis, which includes the bear market of 2000-2002, public plan investor returns outpaced retail mutual funds by 322 basis points. For any time period evaluated and whether measured by time-weighted or by investor returns, public plans outperformed retail mutual funds.

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### Ten Year ('97 -'06) Time-weighted Returns and Investor Returns

#### Monthly, Equally Weighted

	Time-weighted Returns	Investor Returns	Difference
All U.S. retail mutual funds	7.02%	6.07%	-.95%
NCPERS' Public Funds	8.72%	9.29%	+0.57%

Source: Morningstar, Inc.

+1.70%

+3.22%



As shown below, what is equally impressive is how this time-weighted or investor return outperformance over retail mutual funds holds for all of the entities examined in the analysis: states, counties, cities, and fire/police/teachers' funds.

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### Ten Year ('97 -'06) Time-weighted Returns and Investor Returns

#### Monthly, Equally Weighted

	Time-weighted Returns	Investor Returns	Difference
All U.S. retail mutual funds	7.02%	6.07%	-.95%
NCPERS Public Funds	8.72%	9.29%	+0.57%
States	8.53%	10.31%	+1.78%
Counties	8.69%	9.63%	+0.94%
Cities	6.38%	6.48%	+0.1%
Fire/Police/Teachers	9.38%	9.85%	+0.47%

Source: Morningstar, Inc.



## 2) Morningstar Risk-Adjusted Returns and Ratings

The theoretical foundation for Morningstar risk-adjusted returns (MRAR) is relatively straightforward: the typical investor is risk averse. Morningstar adjusts for risk by calculating a risk penalty for each fund based on that risk aversion. The risk penalty is the difference between a fund's raw return and its risk-adjusted return based on "expected utility theory," a commonly used method of economic analysis.

Although the math is complex, the assumption is that investors prefer higher returns to lower returns, and--more importantly--prefer a more certain outcome to a less certain outcome. In other words, investors are willing to forego a small portion of a fund's expected return in exchange for greater certainty. Essentially, the utility function states that investors are more concerned about a probable loss than an unexpectedly high gain.

The public plans that provided data had higher MRAR, on the order of 224 basis points, than the average moderate allocation mutual funds over the three years from 2004-2006.

Morningstar is known for its star rating, a shorthand method to summarize a fund's performance over the previous three years. The Morningstar Rating™ for funds, often called the "Star Rating," is a quantitative assessment of a fund's past performance—both return and risk or MRAR—as measured from one (lowest) to five stars (highest). By this method of evaluation, the public plans that provided data for this study, also had superior performance.

While the universe chosen for this comparison could be debated, it is reasonable to propose that public plans are best evaluated relative to moderate allocation mutual funds, which seek to provide both capital appreciation and income by investing in three major areas: stocks, bonds, and cash. These types of investment portfolios typically have 50% to 70% of assets in equities and the remainder in fixed income and cash.

By default, the average star rating for any Morningstar category is three stars. With five stars as the maximum, the normal or bell curve underlies this logic.

Given the incremental MRAR they generated, it follows that the average star rating for public plans that responded to the Morningstar/NCPERS request for data was four stars.

**Three Year ('04 - '06) Morningstar Risk-Adjusted Returns (MRAR)  
Monthly, Equally Weighted**

	MRAR	Average Star Rating
Moderate Allocation mutual funds	4.73%	★★★
NCPERS' Public Funds	6.97%	★★★★★

Source: Morningstar, Inc.



Looking at the results by type of government entity, the superior performance by star rating methodology is uniformly distributed.

**Star Rating Distribution for Public Defined Benefit Plans**

	★	★★	★★★	★★★★	★★★★★
NCPERS' Public Funds			2	10	13
States				3	1
Counties			1	2	1
Cities			1	1	5
Fire/Police/Teachers				4	6

Source: Morningstar, Inc.

- ▶ Moderate allocation category mutual funds as point of comparison. Assumed to be appropriate peer group for most public plans.
- ▶ Returns/performance may be inflated by selection bias and liquidation (underperformance) bias.



### 3) Portfolio Allocation Analysis

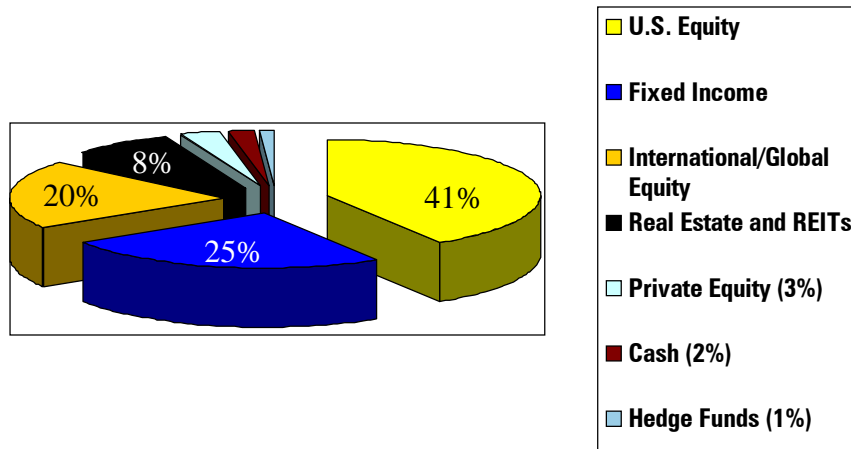
Morningstar also places importance on receiving portfolios of holdings from money managers, to evaluate how the funds' performances were generated. Over the past 20 years, Morningstar has accumulated close to one and a half million portfolios. For this project, Morningstar requested portfolio holdings of public plans and 23 plans provided current and historical portfolios of holdings.

The 2006 year-end portfolios of the public plans that participated are well diversified, with 41% of assets allocated to U.S. equity, 25% to fixed income, 20% to international or global equity and 8% to real estate and REITs.

Besides real estate, the other common allocations Morningstar found to alternatives were 3% to private equity and 1% to hedge funds. Cash holdings averaged 2%. The seemingly low allocation to hedge funds is consistent with overall institutional policy. The Financial Times reported in April 2007 that the U.S.'s 50 largest pension funds had placed 2% of their aggregate assets in hedge funds.<sup>1</sup>

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#### Portfolio Allocation Analysis Year-end 2006 Averages



<sup>1</sup> Reuters/Financial Times, April 5, 2007

#### 4) Morningstar Style Box

The Morningstar Style Box™ was introduced to help investors determine the investment style of the underlying investment vehicle. Different investment styles often have different levels of risk and lead to differences in returns.

In this study, Morningstar applied the Style Box to public plans that supplied their portfolios of holdings as being large-cap, mid-cap, or small-cap based on the market capitalization of the plan's stock holdings and as value, blend, or growth based on the value-growth orientation of the stock holdings. The nine possible combinations of these characteristics correspond to the nine squares of the Morningstar Style Box – size is displayed along the vertical axis and style is displayed along the horizontal axis.

The management style that most of the public plans exhibit is as might be expected: large-capital stocks with a blend or mixture of growth and value. The second most predominant style seems equally logical: large-cap growth.

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#### Plotting NCPERS' Public Funds: The Equity Style Box as Graph Paper

	Value	Blend	Growth
Large	2	10	5
Mid		4	1
Small	1		

## **Section II: Qualitative Data**

### **Are there Unique Roles for Investors that are Public Defined Benefit Plans?**

#### 1) Patient Capital

Morningstar interviewed money managers and investment consultants on the topic of whether public plans are unique from their private sector brethren in being a source of patient capital for money managers and therefore more willing to experiment and more tolerant of alternative investing, with reduced liquidity requirements.

In general, the interview findings, as shown by the summarized quotes below, do not agree with the hypothesis that, generally speaking, public investors have a longer time horizon and a different perspective than do private investors:

- “Small number of public investors is genuinely patient...”
- “Not pioneering in asset allocation or investment strategies in general, with the exception of the 800 LB gorilla: CalPERS (or Yale/Harvard on the endowment side)”
- “Definitely longer-term in their considerations and approvals before moving ahead. Slower decision-makers – more deliberative.”
- “Can stomach underperformance but can’t stomach headline risk.”
- “Public funds were late to the party for globalization.”
- “Then they pile in and obtain market-like returns.”

#### 2) Legitimizing Asset Classes and Implicit Endorsement of Money Managers

Morningstar then asked if the investment firms and consultants were of the opinion that public institutional investors are on the vanguard in “legitimizing” asset classes and investment vehicles, as well as new talent or money managers without extensive track records or actual assets under management.

- “Pioneering and funding more emerging managers...”
- “Private sector may be more constrained by the real or perceived restrictions of ERISA...”
- “Private sector investors have capacity constraints to find/supervise good managers and don’t need as many...”
- “Private sector not convinced it’s worth the extra risk...(to be early adopters of unproven asset classes or new managers)”

On the one hand, money managers did not necessarily agree that public sector investors were as a rule pioneers in alternative investment forms, such as timber or infrastructure.

However, it was agreed that public sector investors have tended to be the most active participants in supporting emerging managers. However, the definition of “emerging” can vary greatly and include some aspects of specifically encouraging women- and minority-owned money management firms.

### 3) Institutionalization

It's often stated that institutional investors tend to "institutionalize" investment vehicles and managers associated with those vehicles. Institutionalization may be defined as: transparency of the investment strategy and portfolio; the articulation and documentation of a well-defined investment process; and the use of benchmarks to review a manager's performance based on relative as opposed to total returns.<sup>2</sup> The interviews of consultants and money managers yielded the following quotes:

- "It's double-edged sword. Transparency can backfire."
- "Can limit their opportunities if they are too much on a public benefit mission..."
- "There is a balance to be struck and most have found it – recent laws clarifying FOIA (Freedom of Information Act) (requests) and Private Equity Portfolio Information."
- "Trustees/administrators should have enough information to perform regular due diligence, so as to not invest in a blind pool."
- "They should do more about excessive fees – what is "fair price?"
- Public funds tend to screen out third party marketers. Otherwise, difficult to shine light on improprieties."

The underlying impression left by the investment managers is that while some public plans are usually the drivers of "institutionalization," not that many public plans have been adapting their investment process to gain access to alternatives. Demand is such, perhaps that asset management firms can force investors to change their approach – that it has been a "seller's market," with the money managers having the leverage.

### 4) Corporate Governance

Morningstar also wanted to know if alternative money managers perceived public plan institutional investors as leading advocates on corporate governance of investment or money management firms.

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<sup>2</sup> Handbook of Alternative Assets, Mark J.P. Anson, John Wiley & Sons, 2002.

While there was agreement from consultants and money managers that public plans are active, generally they were not seen as more active than private sector investors. Moreover, it was pointed out that any public plan's activist role in corporate governance may be heavily influenced by outside representatives, such as legislators. Corporate governance might be described best as a reluctant role for most public plans.

- "Private sector investors pursue corporate governance from a returns point of view. Hedge funds, for example."
- "Public funds lead the charge for other influences, like divestment from certain countries (Sudan, Iran)."
- "More proactive in voting proxies."
- "Role that does not arise within public funds (from administrators). Unique in roles for public funds - role assumed because of outside, legislative (political) influence."

#### 5) Socially Responsible Investing

Finally, Morningstar tried to determine if public plans are seen as leaders in socially responsible investing (SRI) or by bringing the issue of sustainability to the forefront during investment screening.

- "Not exclusively, but predominantly public funds."
- "SRI is North American. Sustainability is the equivalent in Europe."

Again, public plan investors were not perceived by alternative money managers as having sole domain, nor even a pre-eminent role in screening for or investment decision-making on the basis of SRI/sustainability.

In overview, it would appear that apart from encouraging and funding emerging managers, alternative and traditional money managers perceive that public plans are very similar in their behavior/roles in the economy to other (private sector, endowment and foundation) institutional investors.

#### **Summary**

The preliminary analysis of public defined benefit plans suggests that they may have a good story to tell, although further analysis and larger sample sizes over consecutive time periods are required.

In this study, public plans over the long term generated returns at a significantly higher rate than retail mutual funds: 170 basis points over the 10 year period from 1997 to 2006. For any of the time periods evaluated, public funds outperformed retail mutual funds.

Their investor returns, which take into account the timing of cash inflows and outflows from a plan, were even higher on a relative basis.

Public funds also can be drivers of change in institutional investment, but that role is primarily limited to encouraging and funding emerging managers.

Finally, Morningstar concludes that a database with full and ongoing performance data from defined benefit and endowment funds and foundations nationwide would lead to more confidence in subsequent analysis and would be a valuable resource to compare and benchmark performance of plans and nonprofits to their peers and to other institutional investors and portfolios.

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### **About Morningstar, Inc.**

Morningstar, Inc. is a leading provider of independent investment research in the United States and in major international markets. The company offers an extensive line of Internet, software, and print-based products and services for individuals, financial advisors, and institutional clients. The company has operations in 18 countries and minority ownership interests in companies in three additional countries.

Morningstar provides data on more than 260,000 investment offerings, including nearly 130,000 managed products such as mutual funds, exchange-traded funds (ETFs), insurance and pension funds, separate accounts/collective investment trusts, and hedge funds. The company has more than 180 analysts around the world and provides independent research and analysis on more than 2,000 mutual funds and ETFs as well as 2,000 stocks. Morningstar provides quantitative star ratings on more than 25,000 distinct mutual fund portfolios and ETFs globally.

### **About the National Conference on Public Employee Retirement Systems (NCPERS)**

National Conference on Public Employee Retirement Systems (NCPERS) is the largest trade association for public sector pension funds, representing more than 500 public funds throughout the United States. We are a unique network of public trustees, administrators, public officials and investment professionals who collectively oversee nearly \$3 trillion in retirement funds managed on behalf of six million retirees and 14 million active public servants.

## Appendix A: Participating Public Plans (NCPERS members)

### **States**

Maine State Retirement System  
Nevada PERS  
South Carolina Retirement System  
South Dakota Retirement System

### **Counties**

Hampden County Retirement Board  
Los Angeles County Employees Retirement Association  
San Diego County Total Fund  
Sonoma County Employees' Retirement Association  
Washtenaw County Employees' Retirement System  
Wayne County  
Worcester County Retirement Board

### **Cities/Towns**

Amesbury Retirement Board  
Andover Retirement Board  
Barnstable County Retirement Board  
Cambridge Retirement Board  
Chicopee Retirement Board  
City Of Attleboro retirement Board  
City of Baltimore - Employees Retirement System  
City of Baltimore - Elected Officials Retirement System  
City Of Holyoke Retirement Board  
City of Philadelphia Board of Pensions and Retirement  
City of St. Louis Employees Retirement System  
City Of Taunton Retirement Board  
Essex Regional Retirement System  
Fitchburg Retirement Board  
Fort Lauderdale GERS  
Greenfield Retirement Board  
Lynn Retirement Board  
Melrose Retirement Board  
Methuen Contributory Retirement System  
Minneapolis Employee Retirement Fund  
Natick Retirement Board  
New Bedford Retirement Board  
Newton Retirement Board  
New York City Retirement System  
Pittsfield Retirement Board

Plymouth Retirement Board  
Salem Retirement Board  
Swampscott Retirement Board  
Town of Southbridge Retirement Board  
Weymouth Retirement Board

**Fire/Police/Teacher Retirement Plans**

Chicago Policemen's Annuity and Benefit Fund  
Chicago Public School Teachers' Pension and Retirement Fund  
City of Knoxville  
City of Pembroke Pines Fire & Police CMN5  
City of Pembroke Pines Fire & Police ZVA6  
City of Saginaw  
Dallas Police & Fire Pension System  
Kansas City Employee Retirement System Retirement Plan  
Kansas City Firefighters Pension  
L80/L81  
Lincoln NE PF Pension  
Los Angeles Fire and Police Pension System  
OCERS L90  
OK Fire L77  
Pembroke Pines Fire Police Pension Fund  
Pembroke Pines Firefighters' & Police Officers' Pension Fund  
Pennsylvania Public School Employees Retirement System  
Police Retirement System of Kansas City, Missouri  
St. Louis Police Retirement System  
Stanislaus County Employees' Retirement Association

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