# How Do Public Pensions Invest? A Primer


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# Agenda

- Welcome and Introductions
- Primer Overview
- Detailed Findings
- Conclusions
- Q&A

# Report Authors

- Ronnie G. Jung, CPA
  Principal, RJungConsulting
  Former Executive Director, TRS of Texas

- Nari Rhee, PhD
  Manager of Research, NIRS

# Why We Created This Primer

- Investment returns from pooled, professionally managed defined benefit (DB) pensions deliver value by lowering public employee retirement benefit cost.
- Increasing debate on public pension investment, but process not widely understood.
- Need for educational tool on public pension investing basics for policymakers, journalists, and other stakeholders.

# Educational Tool on Public Pension Investing

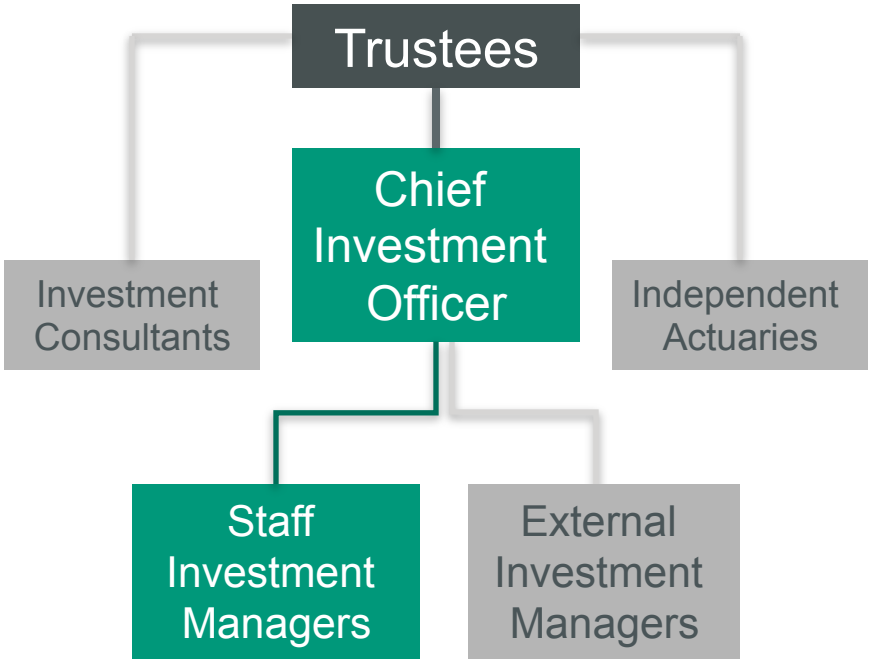
- Roles of trustees, staff, and consultants
- Basic principles of asset allocation/diversification (distributing investments across stocks, bonds, and other asset classes)
- Institutionalized practices through which plan trustees set investment policies and evaluate performance
- Public pension risk exposure in context
- Investment return assumptions compared to historical performance, and future outlook

# Presentation Outline

- Investment practices
- Risk
- Investment returns, assumptions

# Key Roles in Public Pension Investing

- Trustees
- Investment staff
- Consultants
- Actuaries
- All are held to **fiduciary** standard



# Overview of Public Pension Investment Process

**Determination of Liabilities**

- Goal is to generate enough returns, combined with contributions, to pay promised benefits over long term
- Each plan has unique liabilities

**Investment Policy Statement (IPS)**

- Board determines acceptable level of risk
- Investment consultants and staff update capital market assumptions
- Actuaries model risks/returns for different asset mixes
- Board selects target asset allocation and sets performance benchmarks for the fund and each portfolio
- Actuaries estimate fund returns based on asset mix

**Investment Management**

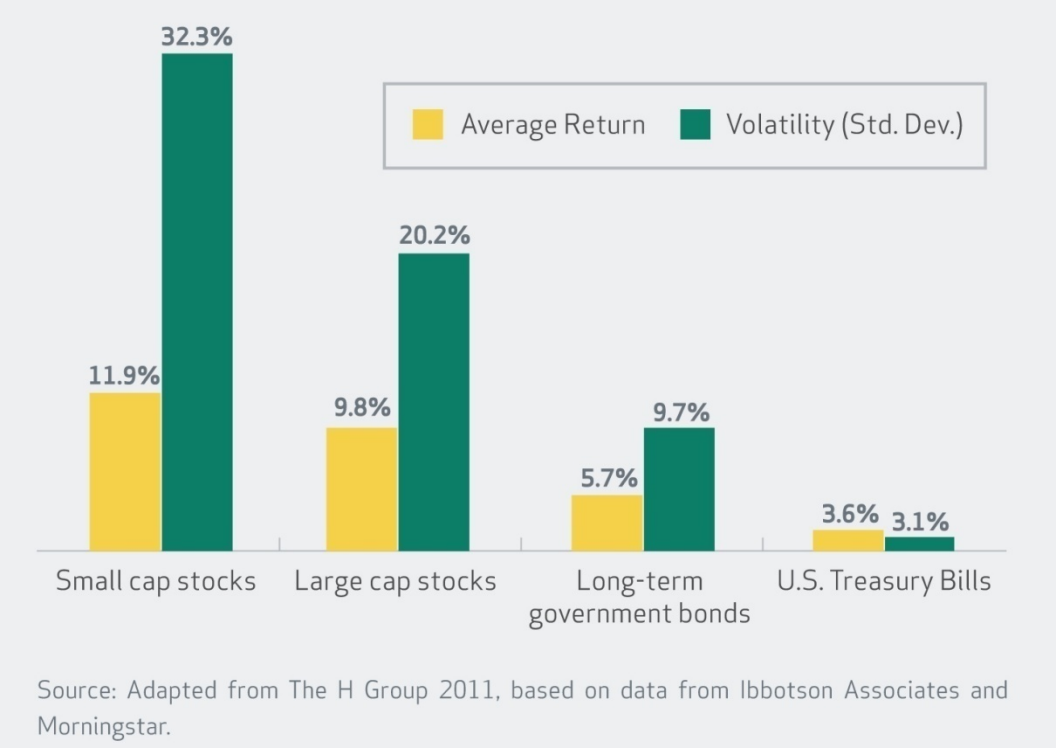
- Staff and/or external money managers buy and sell securities and monitor performance

**Evaluation**

- Investment managers report short-and long-term returns
- Board evaluates the returns and risk incurred

# Risks vs. Returns

**Average Nominal Return and Volatility in Key Asset Classes, 1926-2011**




Source: Adapted from The H Group 2011, based on data from Ibbotson Associates and Morningstar.

**Key statistical measures of risk used by pension funds:**

***Standard Deviation***

measure of volatility (deviation from mean)

***Value-at-Risk (VaR)***

measure of the worst-case potential loss within a time period at a given level of probability

# Diversification & Modern Portfolio Theory

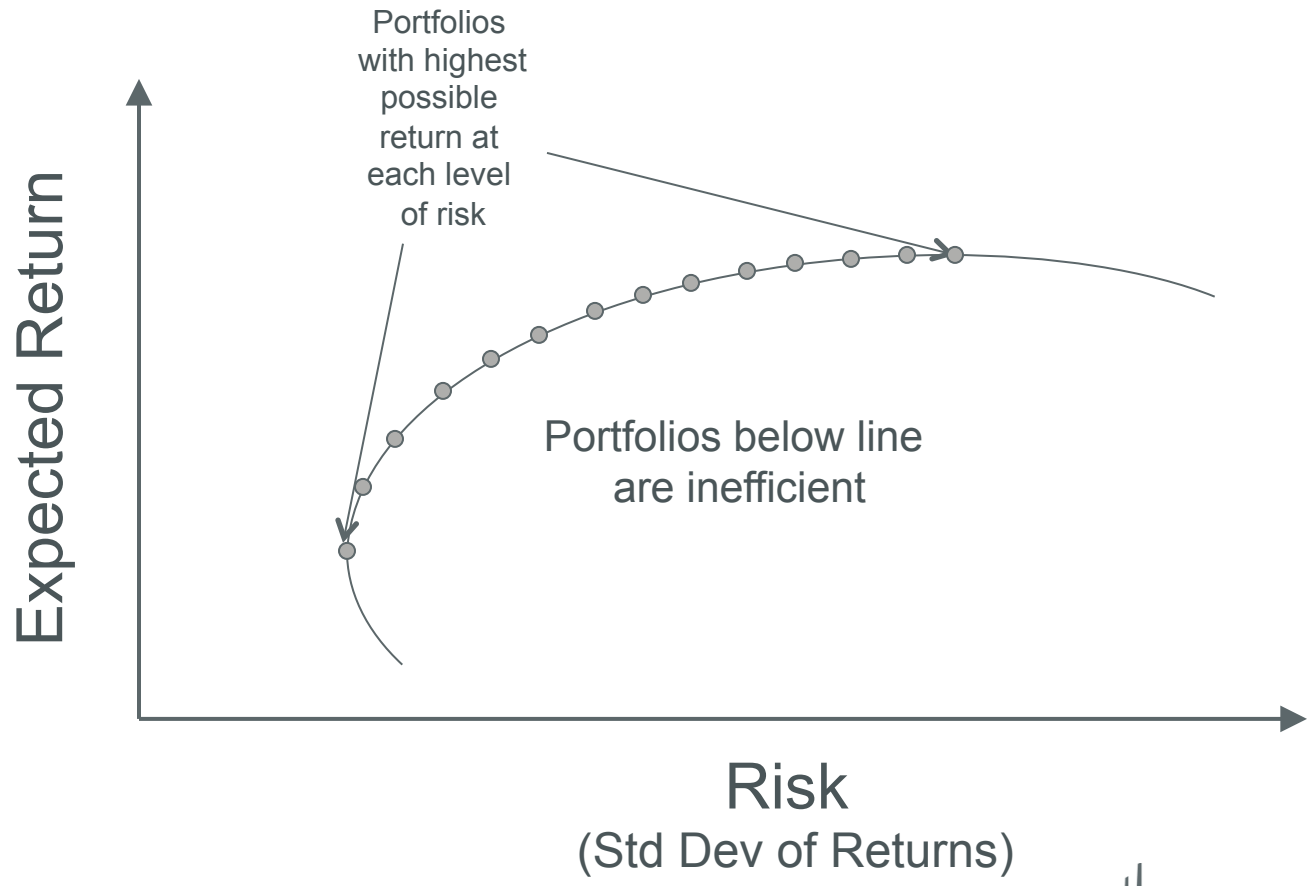
- Diversifying investments reduces risk for a given expected return.
- Why? The values of stocks, bonds, real estate, commodities, and other asset classes do not move together in tandem.
- An "efficient" portfolio delivers maximum expected return for a given level of risk.

Table 1. **Historical Correlations between Asset Classes, 1971-2011**

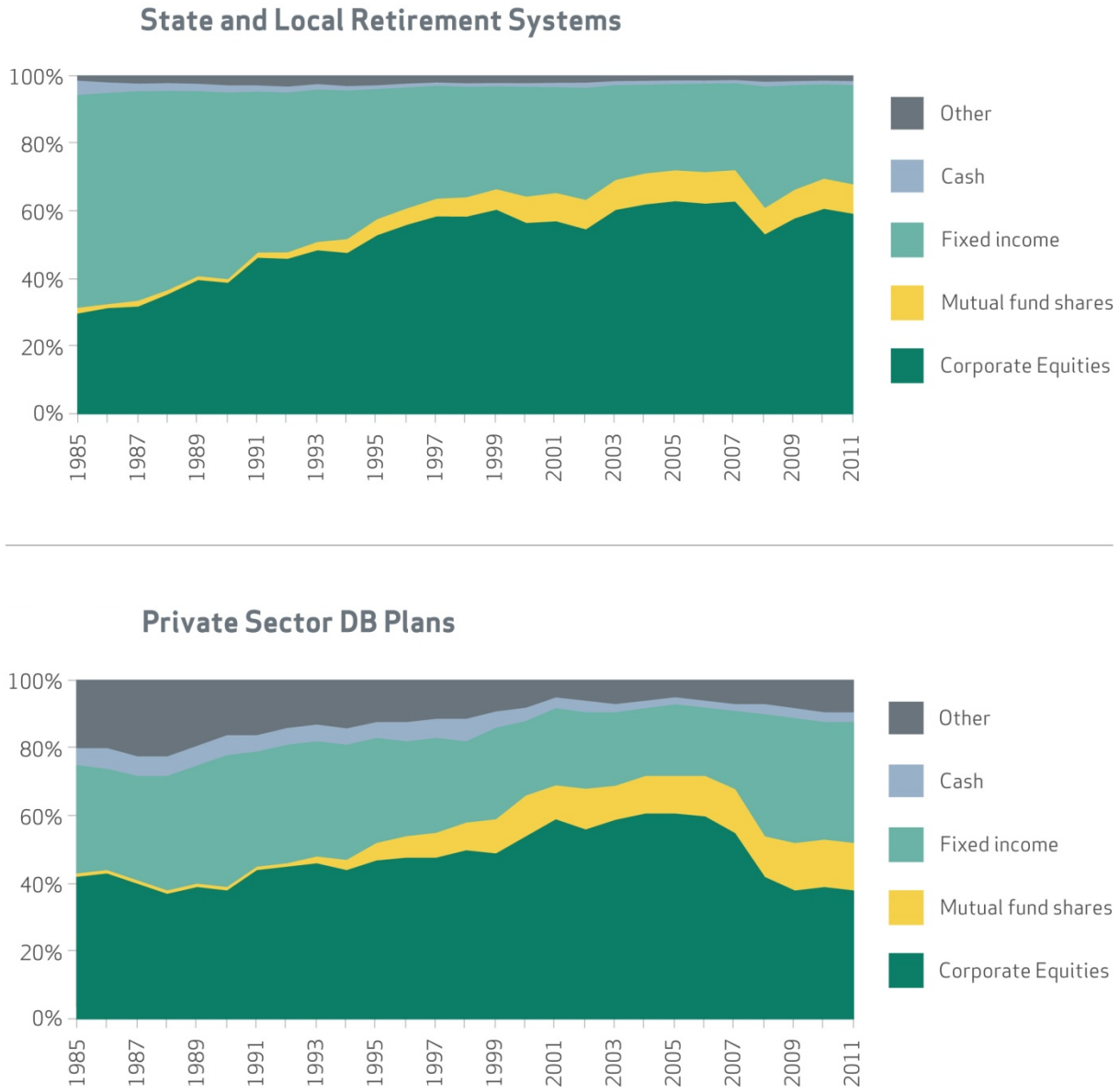
| | Bonds | Large cap stocks | Small cap stocks | Foreign stocks | Real Estate | Commodities |
|---|---|---|---|---|---|---|
| Bonds | 100% | | | | | |
| Large cap stocks | 28% | 100% | | | | |
| Small cap stocks | 13% | 78% | 100% | | | |
| Foreign stocks | 8% | 67% | 54% | 100% | | |
| Real Estate | 16% | 57% | 42% | 42% | 100% | |
| Commodities | -16% | -7% | -14% | 0% | -4% | 100% |

Source: The H Group 2011, based on Ibbotson Associates and Morningstar data.

# Efficient Frontier for Diversified Portfolios



# Public and Private Funds Similar in Risk until 2006




Source: Federal Reserve Flow of Funds Accounts, 1985-2011

# Change in Average Asset Allocation among State Pension Plans

| | | | | Percentage Point Change | |
|---|---|---|---|---|---|
| Values are percentages | 2001 | 2006 | 2011 | 2001-2011 | 2006-2011 |
| **Public Equity** | **56.3** | **59.4** | **51.0** | **-5.3** | **-8.4** |
| U.S. public equity | 43.8 | 42.3 | 31.1 | -12.7 | -11.2 |
| Non-U.S. public equity | 12.5 | 17.1 | 19.9 | 7.4 | 2.8 |
| **Private Equity** | **3.9** | **4.4** | **8.2** | **4.3** | **3.8** |
| **Fixed Income** | **36.2** | **28.1** | **25.0** | **-11.2** | **-3.1** |
| U.S. Fixed | 34.6 | 27.2 | 23.3 | -11.3 | -3.9 |
| Non-U.S. Fixed | 1.6 | 0.9 | 1.7 | 0.1 | 0.8 |
| **Real Estate** | **3.4** | **4.8** | **6.4** | **3.0** | **1.6** |
| **Other** | **0.2** | **3.3** | **9.5** | **9.3** | **6.2** |
| **Total** | **100.0** | **100.0** | **100.0** | | |

Source: Adapted from Wilshire Consulting 2012. Public Equity and Fixed Income subtotals are authors' calculations. "Other" category includes cash and alternative non-equity assets.

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# Comparison to Prudent Individual Retirement Investing

- "Lifecycle" strategy balances risk and reward by decreasing risk as the investment horizon shortens
  - 80-100% equities early career
  - 60-70% equities mid-career
  - 40% equities near retirement
- ~60% equities allocation among public pensions is consistent with this approach
  - aggregates young, mid-career, and older workers
  - longer investment horizon than individuals
  - professionally managed; more diversified than 401(k)s

# Findings on Public Pension Investment Behavior

- **Prudent investors**; hold onto assets for long periods, change asset allocation slowly (Boivie & Almeida)
- **Flight from risk** rather than rush toward risk in response to asset value declines (Weller & Wenger)
- **Increasing diversification** after 2001 & 2008 financial crises

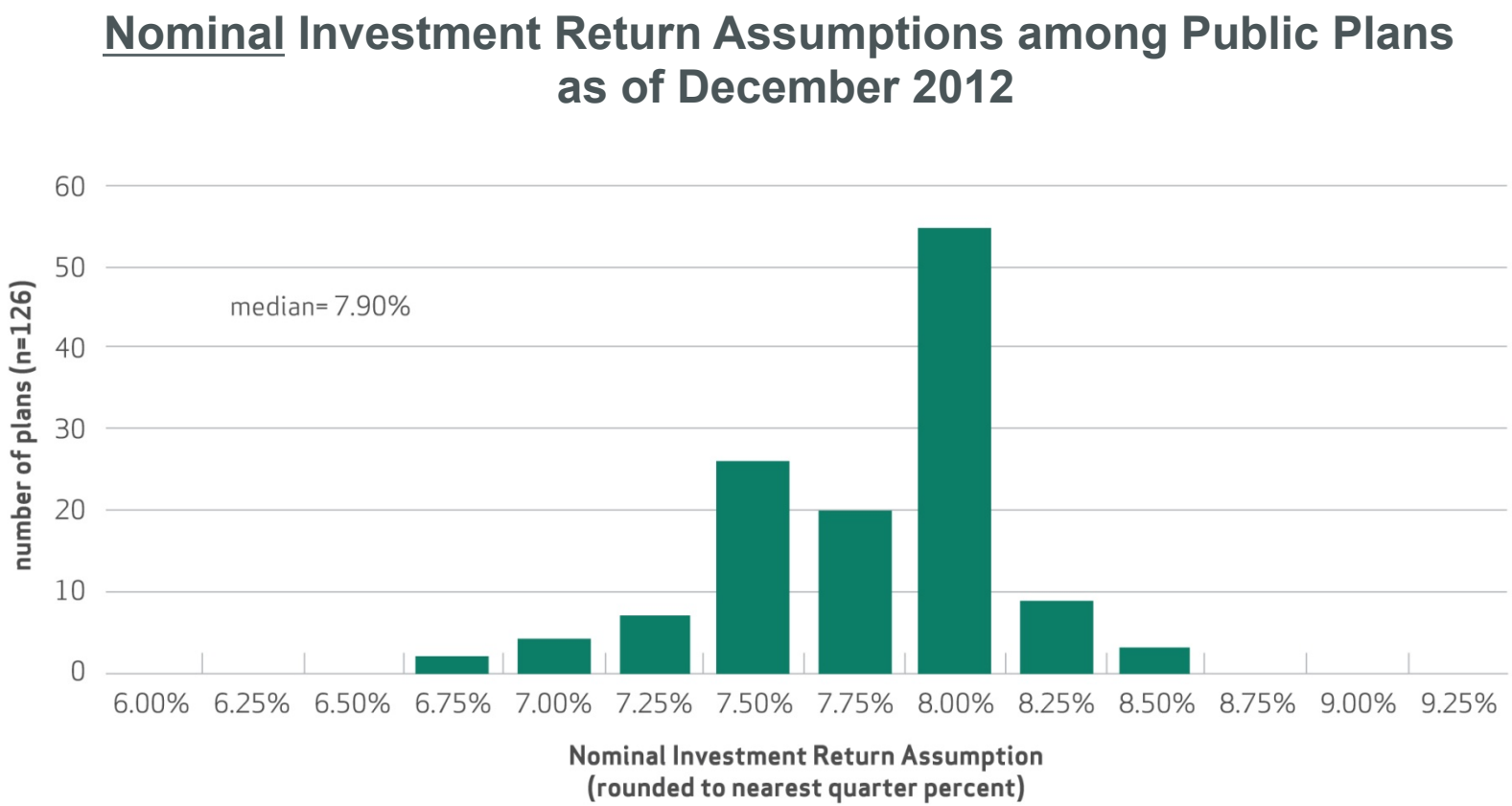
# Investment returns/assumptions: "nominal" vs. "real" returns

- **Nominal** = current dollar terms. Investment returns typically reported this way.
- **Real** = constant purchasing power terms after controlling for inflation
- Example:

  8% nominal return
  — 3% inflation .
  = 5% real return

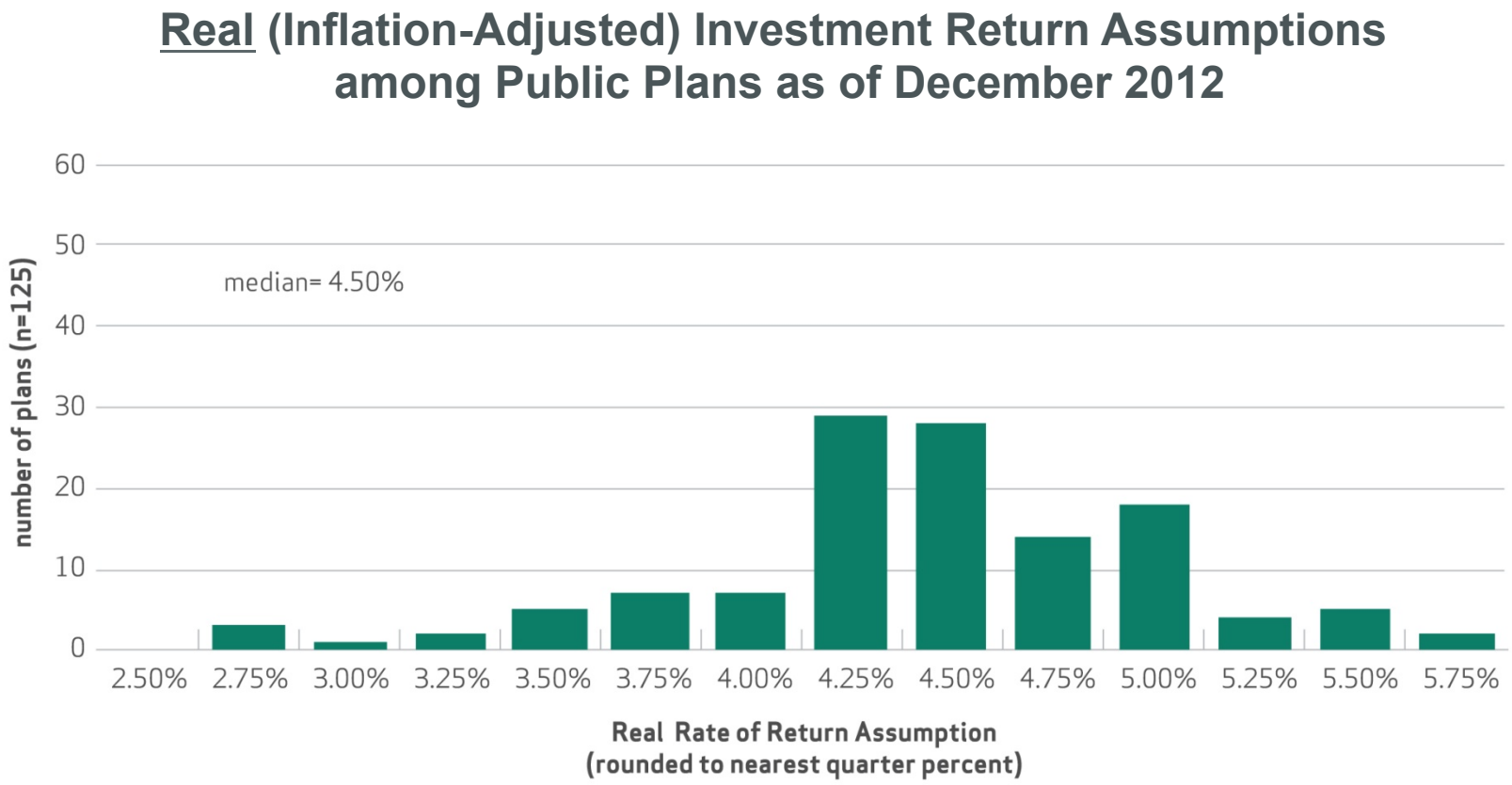
- Because inflation affects both liabilities and investment returns, the real return assumption matters most

# Median Return Assumption Shifted from 8.0% in FY 2008 to 7.9% in Dec. 2012




Source: Authors' analysis of NASRA/NCTR Public Fund Survey data.

# Real Return Assumptions Broadly Distributed around 4.5% Median




Source: Authors' analysis of NASRA/NCTR Public Fund Survey and authors' research.

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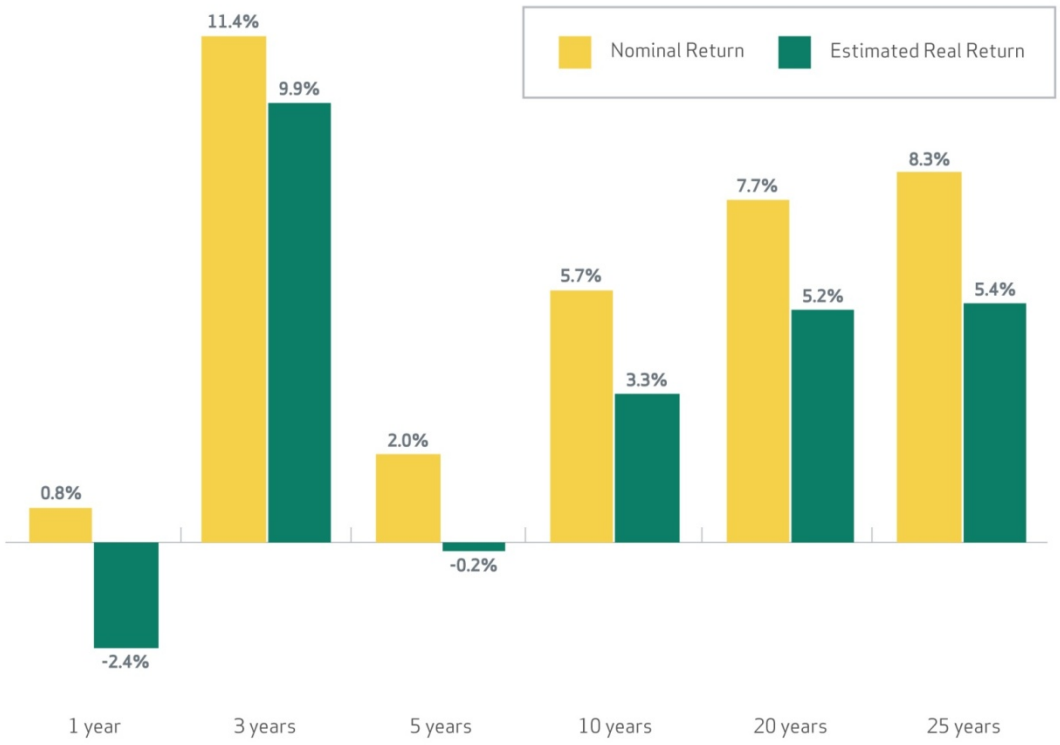
# Still Climbing Out of 2008-2009, but Long-Term Returns Exceed Target

**Public Pension Median Annualized Investment Returns for Periods Ended 12/31/2011**




Source: Nominal assumptions from Callan Associates in NASRA 2012. Estimated real returns calculated by authors using CPI-U.

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# Higher Returns in 2012

- Public pension nominal return data as of Q3 2012:

| Source | 1-yr | 3-yr | 5-yr | 10-yr | 20-yr | 30-yr |
|---|---|---|---|---|---|---|
| Callan Assoc. (net) | 16.7% | 9.5% | 2.3% | 7.7% | na | na |
| Wilshire TUCS (gross) | 17.1% | 9.4% | 2.4% | 7.6% | 8.0% | 10.0% |

- Just released: CalPERS and Wisconsin Investment Board posted 13%+ for year ended 12/31/12

# >5% Real Return over Past 20-30 Years Not Exceptional

**Real Returns on a Hypothetical Pension Portfolio**
**58% Equity/42% Fixed Income**
**Rolling Periods, 1926-2010**

| | | Compound Annual Real Returns | |
|---|---|---|---|
| Time Frame (Years) | Number of Periods | Average (Mean) | Worst Observed Outcome |
| 1 | 85 | 6.28% | -24.60% |
| 5 | 80 | 7.30% | -4.56% |
| 10 | 75 | 6.59% | -1.47% |
| 20 | 65 | 6.14% | 1.24% |
| **30** | **55** | **5.71%** | **3.76%** |
| 40 | 45 | 5.42% | 3.91% |
| 50 | 35 | 5.47% | 4.02% |

Source: Adapted from Stubbs 2012, p. 19, Table 3.

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# Are Investment Return Assumptions Realistic Going Forward?

- 7.8% mean nominal assumption among public pensions is within range of estimates based on independent capital market assumptions (Milliman)
- CBO projects long-term real return on risk-free Treasury bonds to be 2.7%-3.0%, less than 2 percentage points lower than 4.5% median real return assumption.

# Conclusion

- In general, public pensions have sound investment management practices based on accepted principles of portfolio diversification.
- Average public pension investment risk is consistent with other institutional investors and prudent individual investing for retirement.
- Average 7.8-7.9% nominal return/4.5% real return assumption is consistent with historical returns and long-term capital market forecasts.

# Questions?

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