How Do Public Pensions Invest? A Primer

January 23, 2013

NATIONAL INSTITUTE ON
Retirement Security

Reliable Research. Sensible Solutions.

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

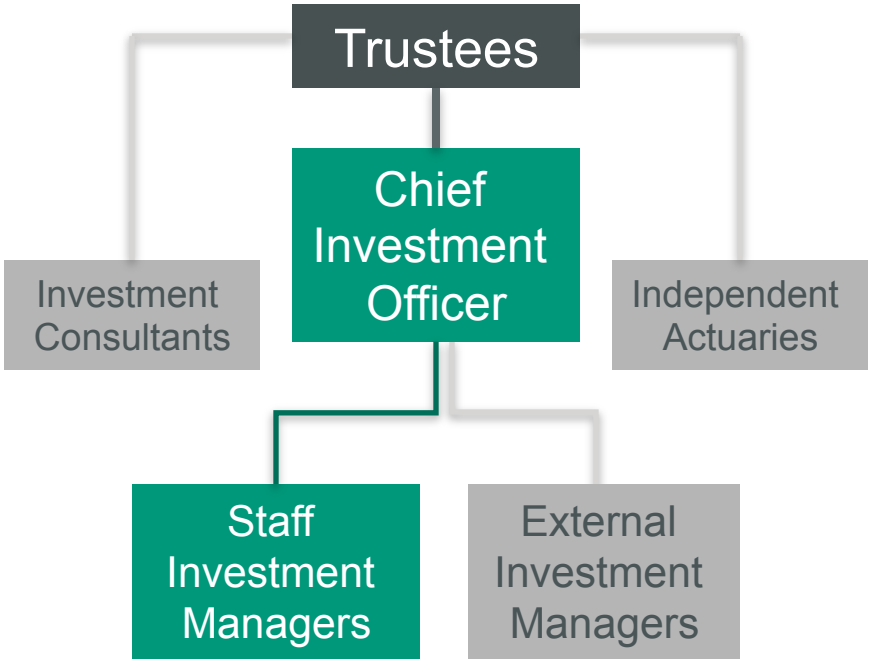
- Roles of trustees, staff, and consultants
- Basic principles of asset allocation/diversification (distributing investments across stocks, bonds, and other asset classes)
- Institutionalized practices through which plan trustees set investment policies and evaluate performance
- Public pension risk 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

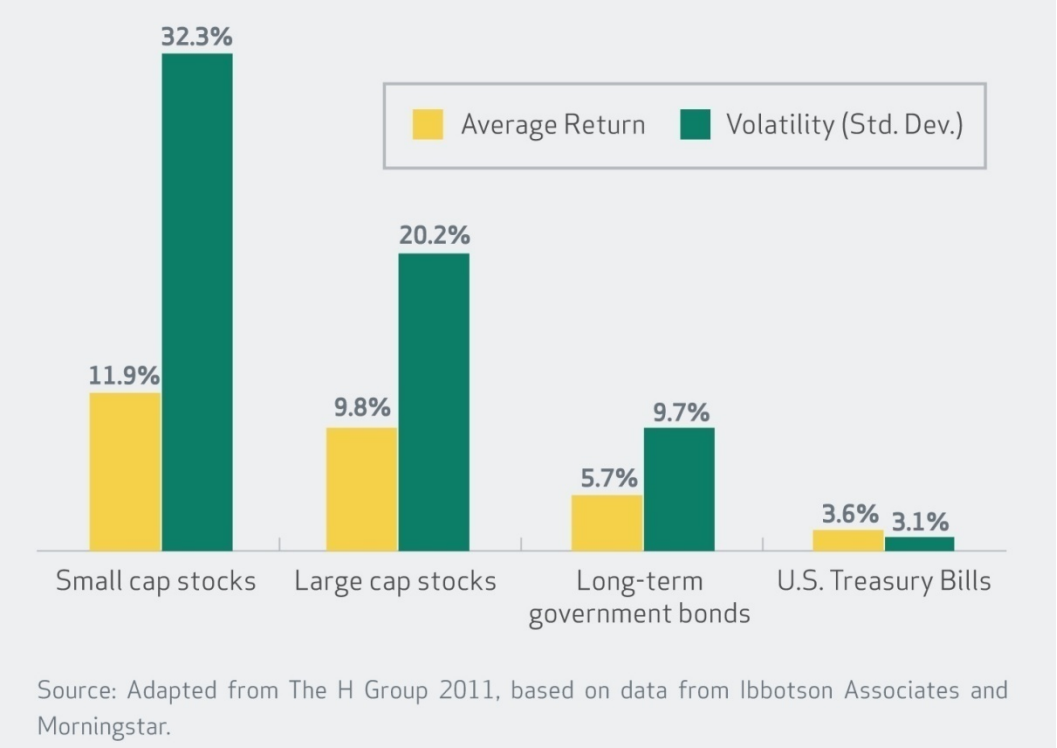
- Staff and/or external money managers buy and sell securities and monitor performance

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

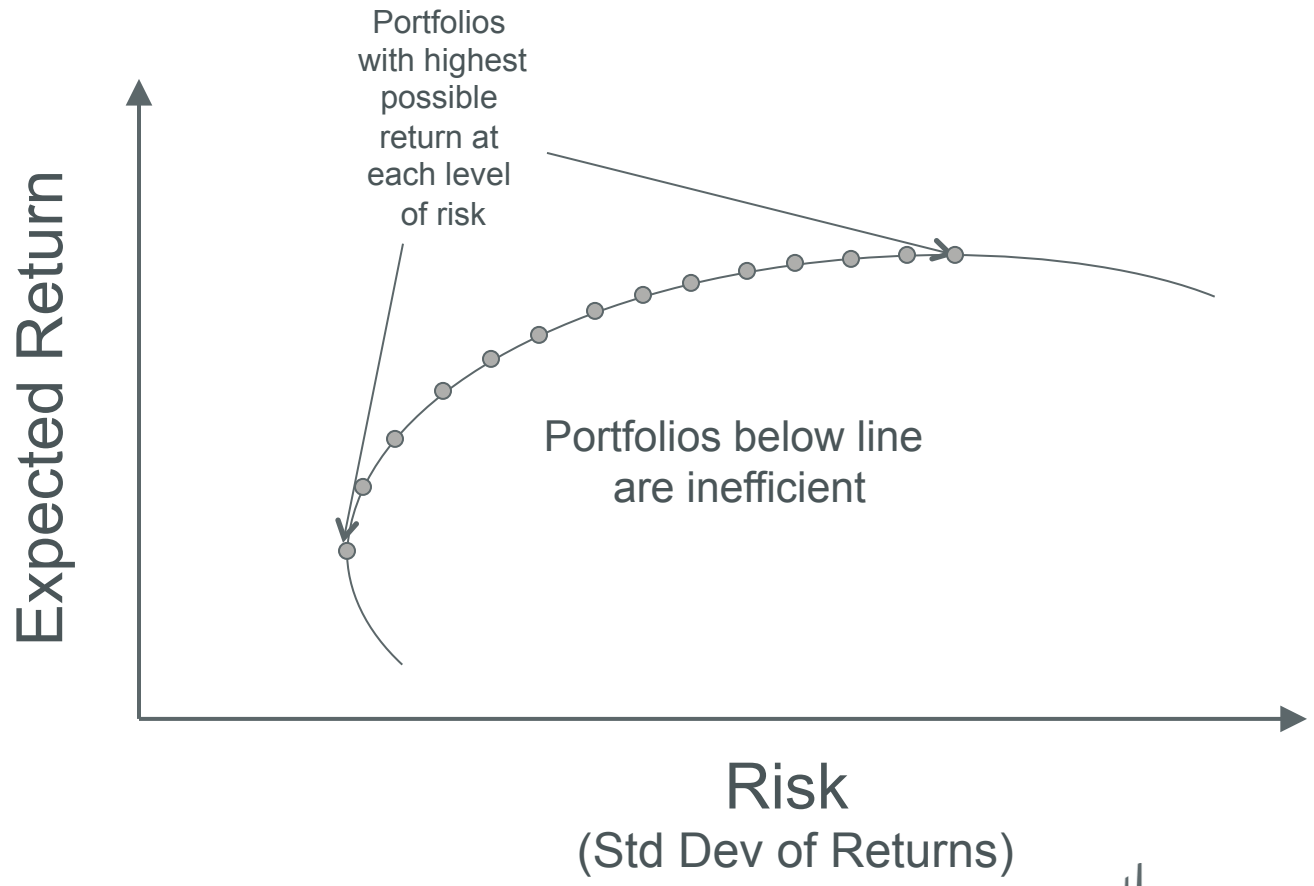
- Diversifying investments reduces risk for a given expected return.
- Why? The values of stocks, bonds, real estate, commodities, and other asset classes do not move together in tandem.
- An "efficient" portfolio delivers maximum expected return for a given level of risk.

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

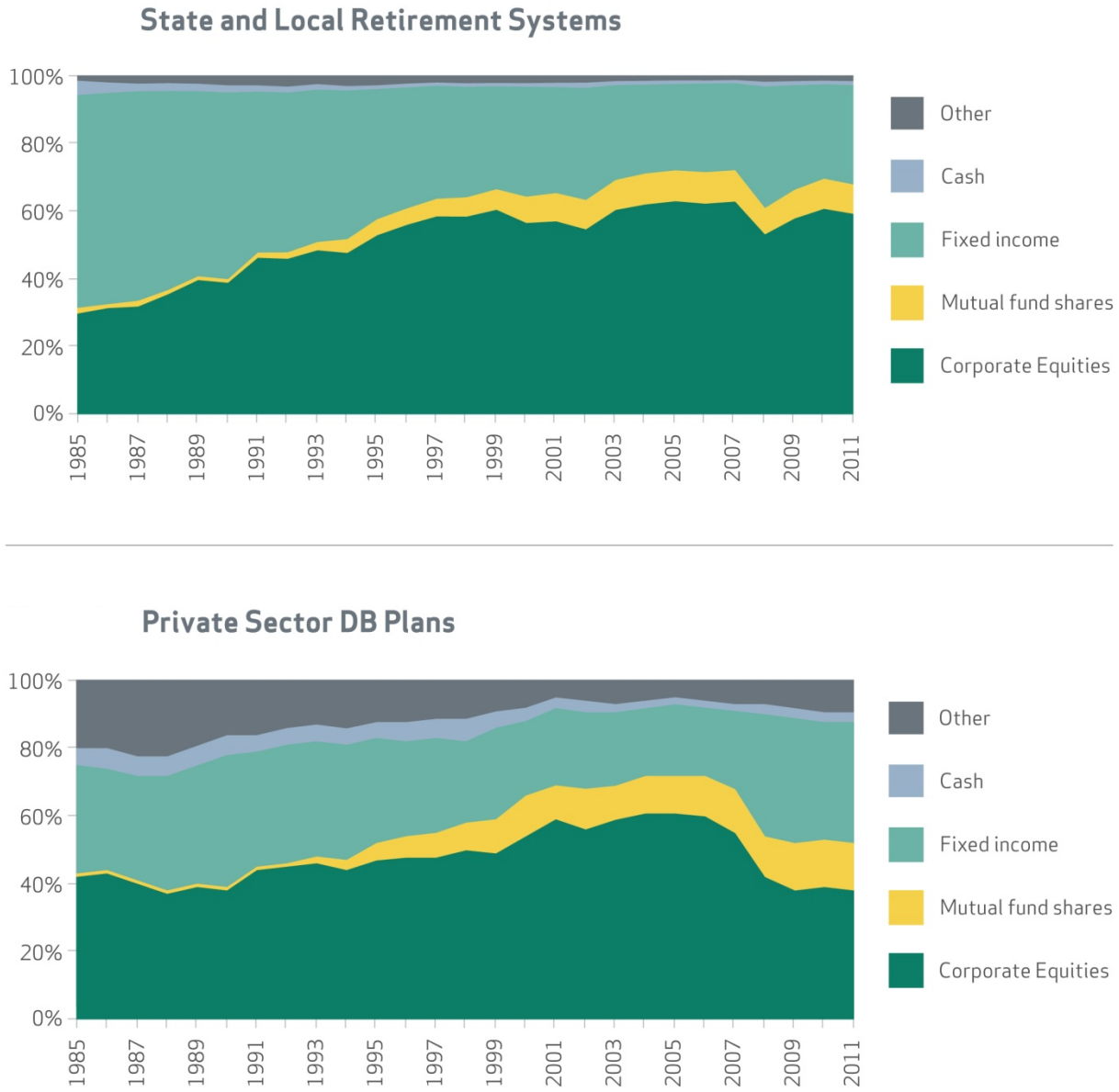
	Bonds	Large cap stocks	Small cap stocks	Foreign stocks	Real Estate	Commodities
Bonds	100%					
Large cap stocks	28%	100%				
Small cap stocks	13%	78%	100%			
Foreign stocks	8%	67%	54%	100%		
Real Estate	16%	57%	42%	42%	100%	
Commodities	-16%	-7%	-14%	0%	-4%	100%

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.

NATIONAL INSTITUTE ON Retirement Security

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

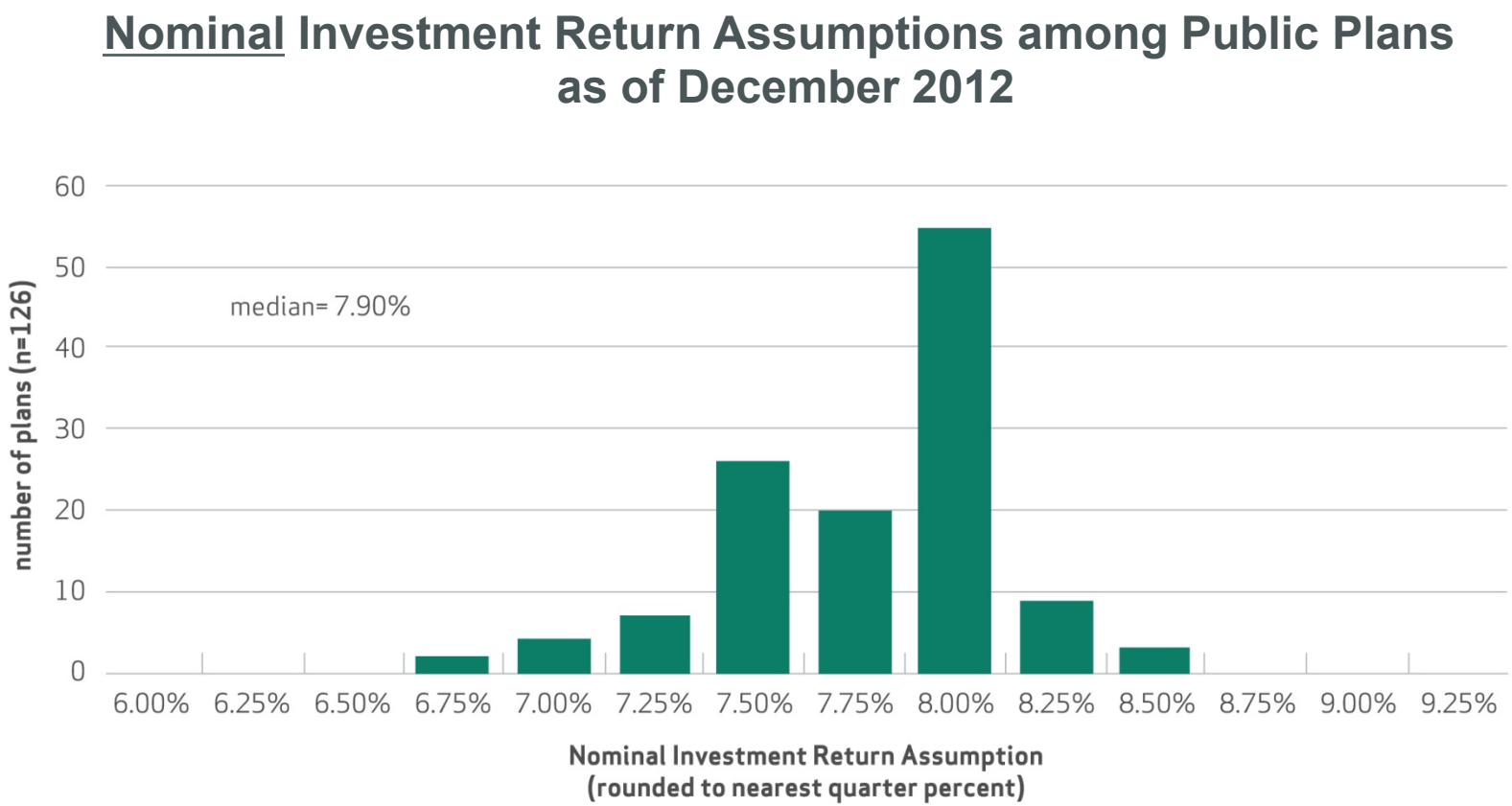
Investment returns/assumptions: "nominal" vs. "real" returns

- **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

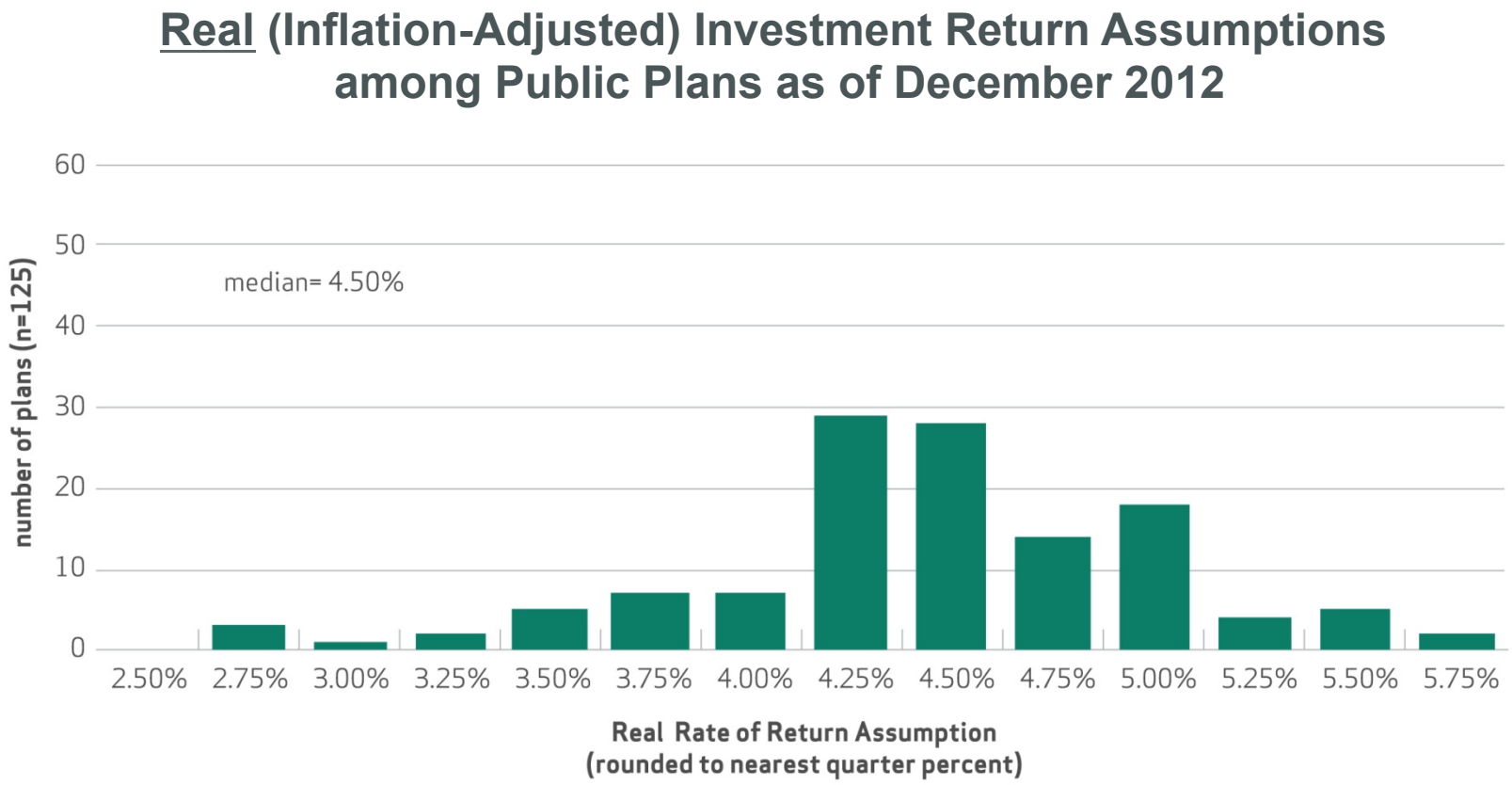
- Because inflation affects both liabilities and investment returns, the real return assumption matters most

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

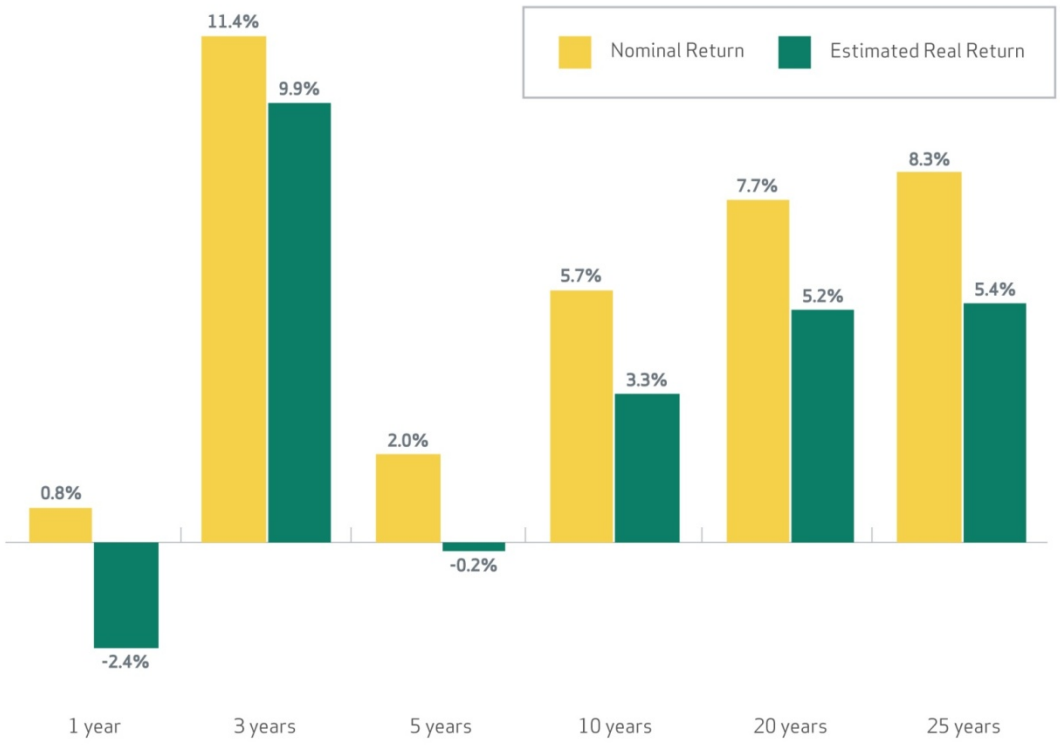


Source: Authors' analysis of NASRA/NCTR Public Fund Survey and authors' research.

NATIONAL INSTITUTE ON Retirement Security

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.

NATIONAL INSTITUTE ON Retirement Security

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.

NATIONAL INSTITUTE ON
Retirement Security

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?

National Institute on Retirement Security
www.nirsonline.org