



NCRS Asset Liability Study Overview

December 16, 2013

Goals for IAC Asset Liability Study Process

- December 16, 2013 IAC Meeting
 - Review updated assumptions and methodology
 - Model strategic asset allocation policy, actual allocation, and policy alternatives
 - Obtain feedback on risk positioning of potential policy alternatives
- February 2014 IAC Meeting
 - Provide the IAC with recommended final strategic asset allocation changes, transitional approach, and total plan risk management strategies (e.g., hedging)
 - Recommend updated Investment Policy Statement, including performance benchmarks
 - Provide updated analysis on individual plans that are recommended for customized investment policies

Context for Asset Liability Study

- Baseline focus on 10-, 20-, and 30-year economic and financial environment
 - Initially very low interest rates moderately rising over intermediate term
 - Moderately rising inflation
 - Modest public equity market returns by long-term historical standards for intermediate term
 - Some benefits to diversification, but all investments approaches are impacted by low return environment
- Risk Scenarios: Fragility due to continued high reliance on global policy makers in face of unprecedented interventions, cyclical headwinds, and structural imbalances
 - U.S. economy has less momentum than expected; emerging market BOP issues and delayed European normalization; systemic shock
 - Inflation rises more than expected; global growth surprises on upside; supply shocks

Asset Liability Study Metrics Reflect Mission

- Employer contribution cost of pension obligations
 - Inflation adjusted long-term cost
 - Uncertainty of contribution rates
- Funded ratio
- Asset risks relevant to managing the investment program
 - Equity beta
 - Bond beta
 - Inflation beta
 - Relationships between expected returns and range of possible returns

Focus of Buck Policy Modeling

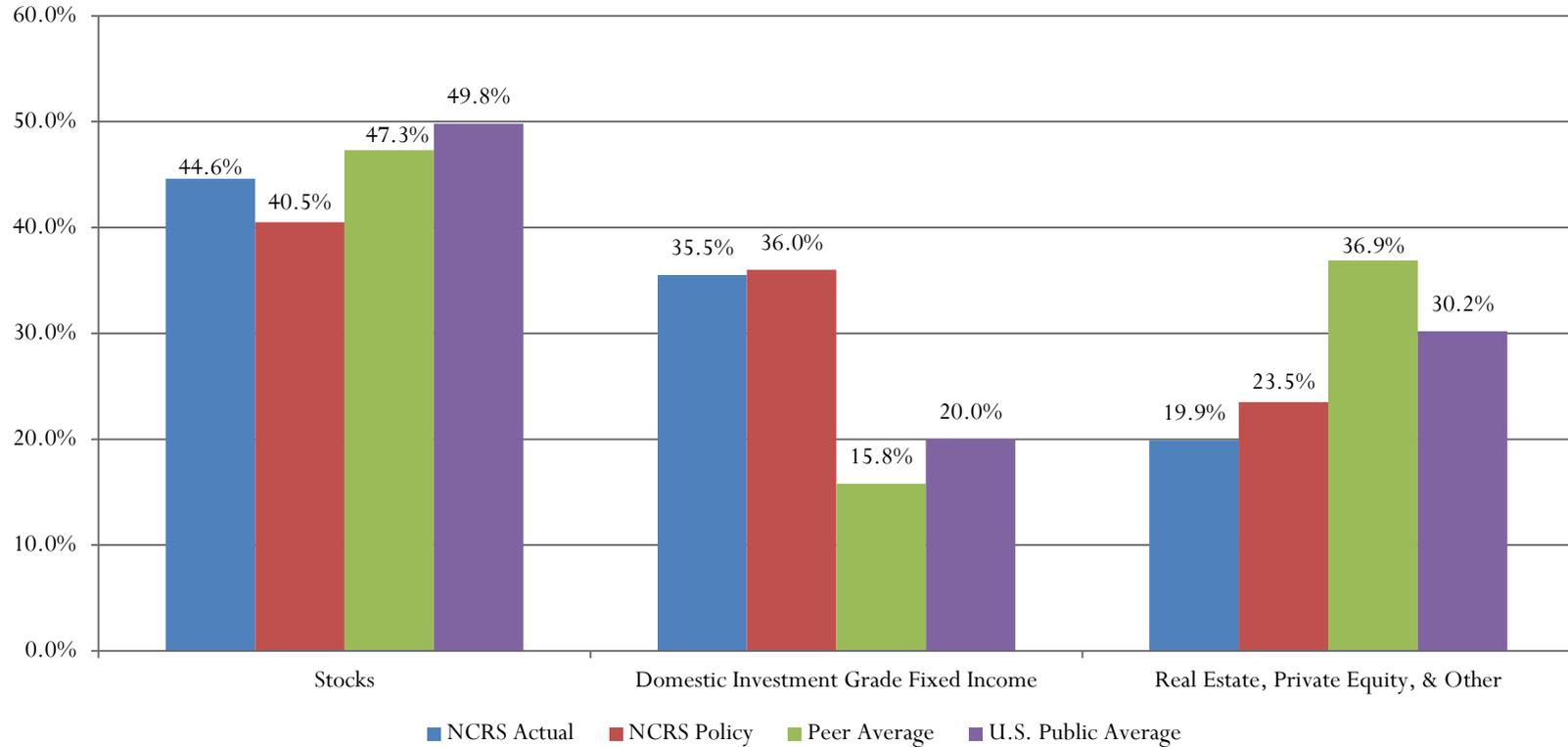
- Status quo
 - Strategic asset allocation policy
 - Actual asset allocation
- Changing the fixed income structure
 - Lowering long duration (~8 years) to holding only 1- to 5-year bonds (~3 years)
 - Quasi-barbell and reallocation between subsectors
- Three alternative policy formulations
 - Enhanced status quo (more diversified and new fixed income structure)...”Sample B”
 - De-risking (new fixed income structure)...”Sample C”
 - Return-seeking...”Sample D”

“Role in the Portfolio” Investment Strategy Modeling

- Growth-Oriented
 - Global public equity (long-only and hedged equity)
 - Private equity
 - Public/Private non investment grade credit (distressed, mezzanine, and long/short)
 - Non-core real estate
- Rates and Liquidity
 - Treasury bonds, mortgage agency bonds, and investment grade credit
 - Cash/short duration
- Inflation Sensitive and Diversifiers
 - Short duration TIPS and/or global ILB
 - Core real estate (public and private)
 - Public/Private natural resources (commodities, energy, timberland, agriculture, etc.)
- Multi-Strategy

Appendix: Peer Comparisons

Asset Allocation Policy Comparison (CEM: U.S. Public Funds) As of 12/31/2012



CEM Peer Group for NCRS:

- 16 U.S. public sponsors
- Fund sizes range from \$38 billion to \$249 billion
- Median size of \$71 billion

Appendix: Peer Comparisons

Ten Largest U.S. Pension Plan Asset Allocation Policy Comparison

Plan	Assets (MM)*	Public Equities	Fixed Income	Real Estate, Private Equity, & Other	Assumed Rate of Return	Funded Status
CalPERS	\$243,227	49.0%	20.0%	31.0%	7.50%	73.6%
CalSTRS	\$155,360	51.0%	17.0%	32.0%	7.50%	69.0%
NY State Common	\$150,110	43.0%	22.0%	35.0%	7.50%	90.2%
Florida SBA	\$126,890	52.0%	25.0%	23.0%	7.75%	86.9%
NYC RS	\$122,071	49.5%	24.0%	26.5%	7.00%	64.2%
Teacher RS of Texas	\$112,443	45.0%	14.0%	41.0%	8.00%	82.7%
General Motors	\$101,913	27.4%	45.8%	26.8%	6.20%	82.9%
NY State Teachers' RS	\$88,561	55.0%	28.0%	17.0%	8.00%	96.7%
State of WI Inv. Board	\$83,410	49.0%	26.0%	25.0%	7.20%	99.9%
Ohio Public ERS	\$78,968	42.5%	23.5%	34.0%	8.00%	77.4%
NCRS	\$77,130	40.5%	36.0%	23.5%	7.25%	94.2%

*Listed in order of largest pension plans in the U.S. as reported by P&I Research Center as of 9/30/2012
 Fixed Income allocations for some funds include non U.S. and non investment grade bonds
 NCRS funded status is TSERS