# Portfolio Risk Discussion

## Investment Advisory Committee

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# Portfolio Risks Defined*

- **Absolute Risk**
  - Captures the total amount of money gained or lost on an individual investment or whole portfolio
  - Typically measured by calculating the volatility of returns (standard deviation of returns)
  - NCRS targeting a volatility of returns of 10% or less on the total plan over sufficiently long time intervals
- **Active Risk**
  - Describes the total amount of money gained versus the return on the applicable benchmark
  - Typically measured by calculating the volatility of excess returns (standard deviation of portfolio returns less benchmark returns)
  - NCRS is targeting a volatility of excess returns of between 1.0% and 2.0% on the total plan
- **Tail Risk**
  - Term used to describe the total amount of money gained or lost on an individual investment or whole portfolio during times of extreme market movements
  - Tail Risk is considered to be losses or gains which are more than three standard deviations away from the expected return (relatively low probability of occurring, but painful when extremely negative)
- **Operational Risk**
  - Risk of loss resulting from inadequate or failed internal processes, people, and systems, or from external events
  - Primary example for pension systems would be poor or failed ability to perform adequate due diligence on external investment managers



* Please reference IAC materials from September 2010 (Risk Management Overview Presentation) for a more complete description of Absolute, Active, and Tail Risks.

# Role of the Director – Risk Management and Asset Allocation

- Risk Management — *"Building better portfolios through an understanding of the various embedded risks and ensuring that we are being properly compensated for the risks we are taking"*

  - Develop a process for utilizing ex-ante* and ex-post** portfolio analytics in a thoughtful and systematic way, which will strengthen the investment process and achieve better investment results
  - Responsible for absolute, relative, tail and operational risk management
  - Be a valuable internal resource to the Treasurer, CIO and individual investment teams

- Asset Allocation

  - Help generate and refine explicit sub-asset class expectations and capital allocations
  - Evaluate alternative approaches to asset allocation including methodologies and capital market assumptions
  - Include macroeconomic and geopolitical considerations, and liabilities into asset allocation analysis

* ex-ante: based on anticipated activity in economy
** ex-post: based on analysis of past performance

# Absolute Risk Management

- Today
  - Absolute risk is managed through asset allocation at the total plan level
  - The process of absolute risk management currently includes: Mean-Variance optimization; qualitative consideration of macro factors; limited consideration of liabilities in asset allocation decisions
- Future
  - Absolute risk will be managed at the total plan level and sub-asset class level where explicit expectations for sub-asset class portfolios will be utilized in portfolio construction
  - The absolute risk management process will include: measurement of ex-ante and ex-post risk utilizing a holdings and returns-based third-party risk analytics system; both a qualitative and quantitative analysis of macro risk factors; focus on asset-liability management
  - Develop and employ a disciplined Tactical Asset Allocation process (example: rebalancing)

# Relative Risk Management

- Today
  - Portfolio structural analyses performed, but not on a set schedule; no systematic way to break tracking error into its component parts (structural/misfit risk and active risk)
  - Risk budgeting completed through an informal process (spreadsheet based)
  - Limited ability to decompose return and risk into component factors (return and risk attribution)

- Future
  - Portfolio structural analyses will be performed on a scheduled basis; will implement a systematic way to break tracking error down into its component parts
  - Risk budgeting will be accomplished through a formalized process (3$^{rd}$ party software)
  - Greater ability to delineate the sources of portfolio return and risk attribution into component factors
  - Develop and employ a disciplined Tactical Asset Allocation process (example: rebalancing)

# Tail Risk Management

- Today
  - Tail risk management considered in portfolio management on an informal basis
  - Currently, overlays are not utilized

- Future
  - Discuss the idea of managing to a maximum drawdown
  - Incorporate the liabilities into the tail-risk analysis
  - Develop the ability to measure the implied impact of various macroeconomic and geopolitical risks portfolio wide
  - Evaluate and discuss alternative approaches, including portfolio overlays, to mitigate unwanted investment risks

# Operational Risk Management

- Today
  - Operational due diligence and risk assessment completed by individual asset class teams
  - Certain asset class teams may rely heavily on specialty consultants

- Future
  - Develop an operational due diligence team and a standardized process for ops due diligence
  - Utilize specialty consultants where needed (insourcing/outsourcing decision)
  - Understanding of regulatory implications for pension funds – Dodd-Frank Bill

# Summary

- Risk Management
  - Our philosophical view of risk management will be reflected through thoughtful and explicit portfolio construction
  - Risk will be evaluated and managed in four dimensions – absolute, relative, tail and operational
  - While a good amount of analysis and work has already been completed, we still have a great deal of work to complete before reaching full implementation
  - With the use of a third-party portfolio risk analytics system, we will complete the portfolio structure analysis, implement a formal risk budgeting process and empower the various investment teams with detailed portfolio analytics
  - Evaluate and open the discussion of Tactical Asset Allocation and portfolio overlays

- Asset Allocation
  - Generate explicit expectations for the sub-asset class portfolios and allocate capital accordingly
  - Evaluate alternative approaches to asset allocation including various methodologies and capital market assumptions
  - Incorporate macroeconomic and geopolitical considerations, and liabilities into the asset allocation analysis