



---

# **A Note on Pension Fund Investment Management**



# Road Map

---

- **Introduction**
- **Governance of Pension Plans**
- **Strategic Asset Allocation**
- **Middle Office Issues**
  - **Performance and Risk Measurement**



# Fund Governance

---

- **Macro Governance**
  - **Oversight Structure**
  - **Responsibilities**
  
- **Micro Governance**
  - **Delegation of Authority**
  - **Conflict of Interest**
  
- **Cost of Governance**
  
- **Governance of country systems**



# Governance

---

## ➤ Why Governance

- Owner of assets ⇒ Principal
- Manager of assets ⇒ Agent

***In a principal/agent relationship, principal has to ensure agent is acting in his best interests***



# Governance

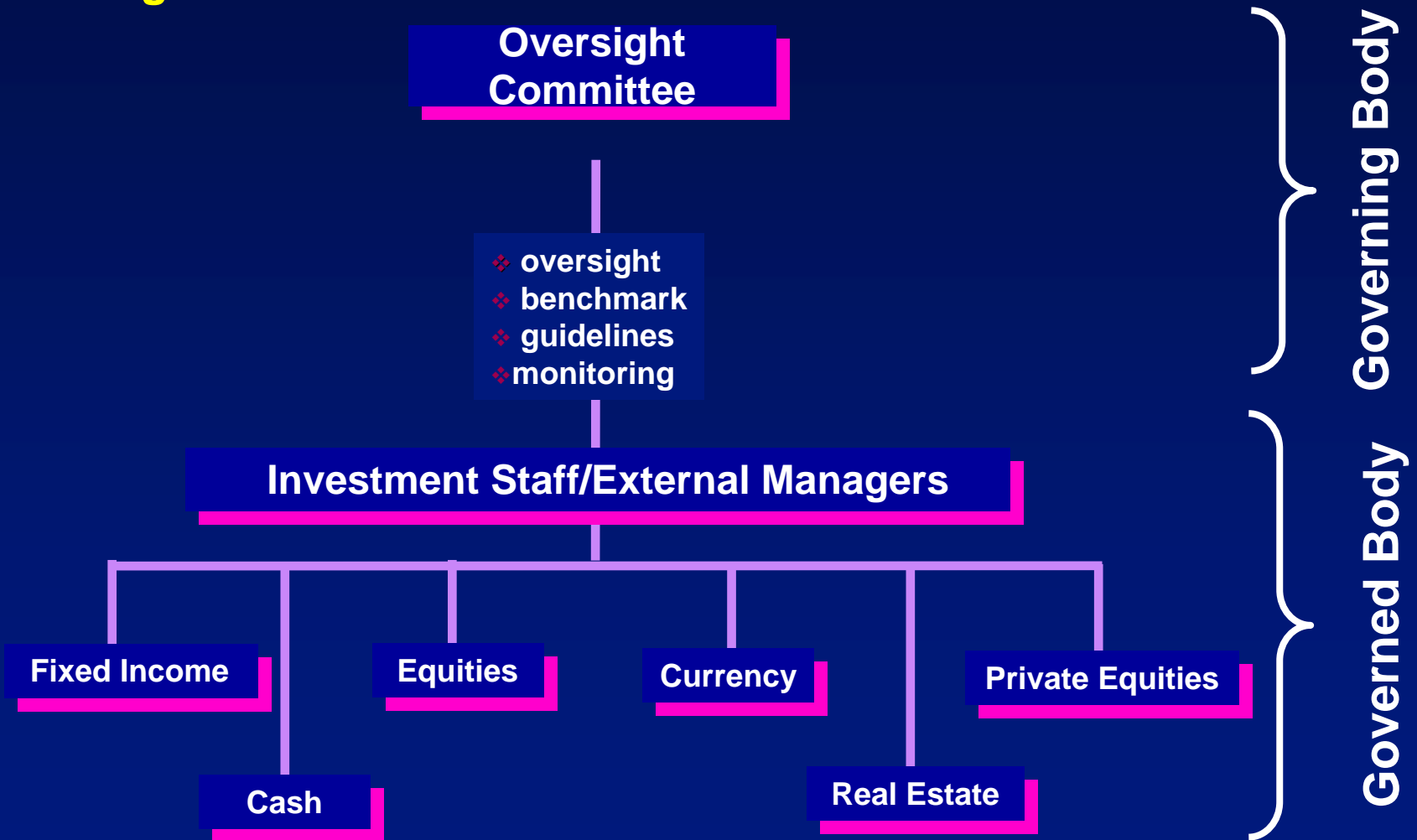
---

- **Who needs to be Governed**
  - Pension investment groups, fund managers
  
- **Who does the Governing**
  - Ideally, the principals or pension beneficiaries
  - Usually, a representative body like the oversight committee or regulators



# Governance

## Organization Structure





# Governance

---

## Macro Issues

- **Composition of Oversight Committee**
  - **Selection method**
  - **Size**
  - **Representation**
  - **Turnover**
  - **Frequency of meeting**
  
- **Responsibilities of Oversight Committee**
  - **Select investment staff and external managers**
  - **Set Investment Policy**
  - **Oversee Investment Policy Implementation**
  - **Monitor Investment Performance**
  - **Overall Fiduciary Responsibilities**



# Governance

---

## Macro Issues

- **Composition of Investment Staff**
  - **Finance Professionals**
  - **Accountants**
  - **Quantitative Specialists**
  - **Actuaries**
  
- **Responsibility of Investment Staff**
  - **Funding Recommendations**
  - **Investment Management**
  - **Risk Management**
  - **Reporting**





# Governance

---

## Micro Issues

- **Delegation of Authority**
  - **Explicit and written**
  - **Implementation of Investment Policy**
  
- **Conflict of Interest**
  - **Permissible and Non-permissible transaction**
  - **Disclosures**
  - **Code of Ethics**



# Governance

---

## Cost of governance

- **Delays**
- **False sense of comfort - especially if oversight committee is not paying attention.**
- **Cost of providing adequate information to oversight committee/regulators.**
- **Ensuring timely/appropriate feedback on decision to oversight committee/regulators.**



# Governance

## Country Systems

	<b>Defined Benefit (DB)</b>	<b>Defined Contribution (DC)</b>	<b>Provident Fund (PF)</b>
<b>Principal</b>	Government	Individual	Individual
<b>Agent</b>	Government	Fund Manager	Provident Fund
<b>Oversight</b>	Social Security Administration	Regulators	Oversight Committee
<b>Incentive compatible</b>	<b>YES</b>	<b>YES</b>	<b>NO</b>



# Investment Decisions

**Decision 1:**

**Determining asset  
allocation policy mix**  
*(Strategic Asset Allocation)*



**Decision 2:**

**Portfolio  
construction &  
manager selection**



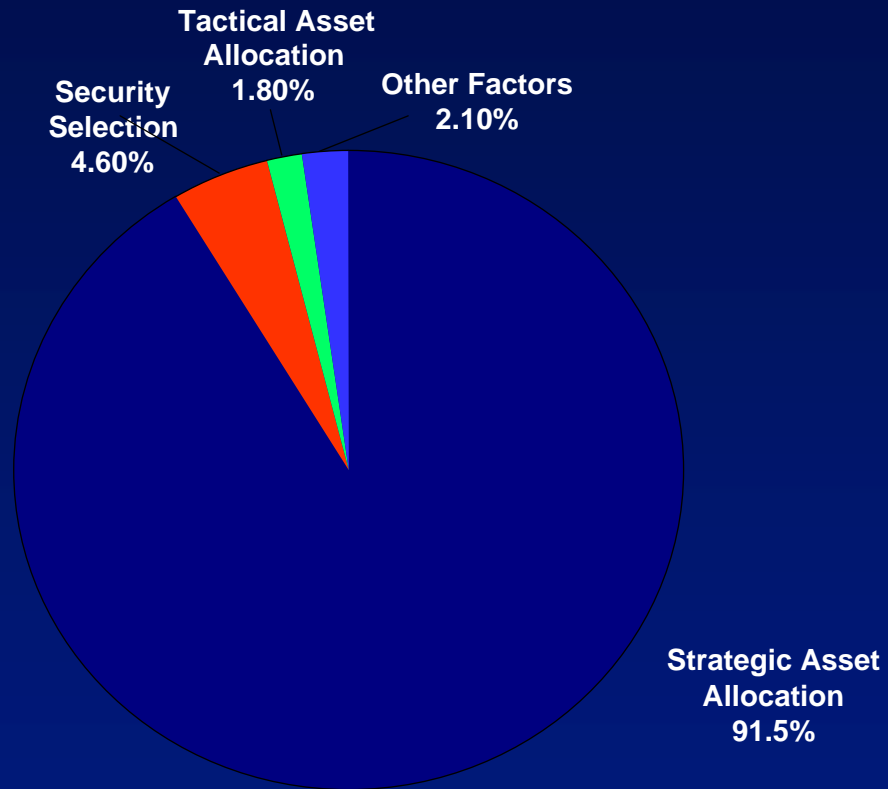
**Decision 3:**

**Tactical Asset  
Allocation**



# Importance Investment Decisions

## Sources of Long-Term Performance

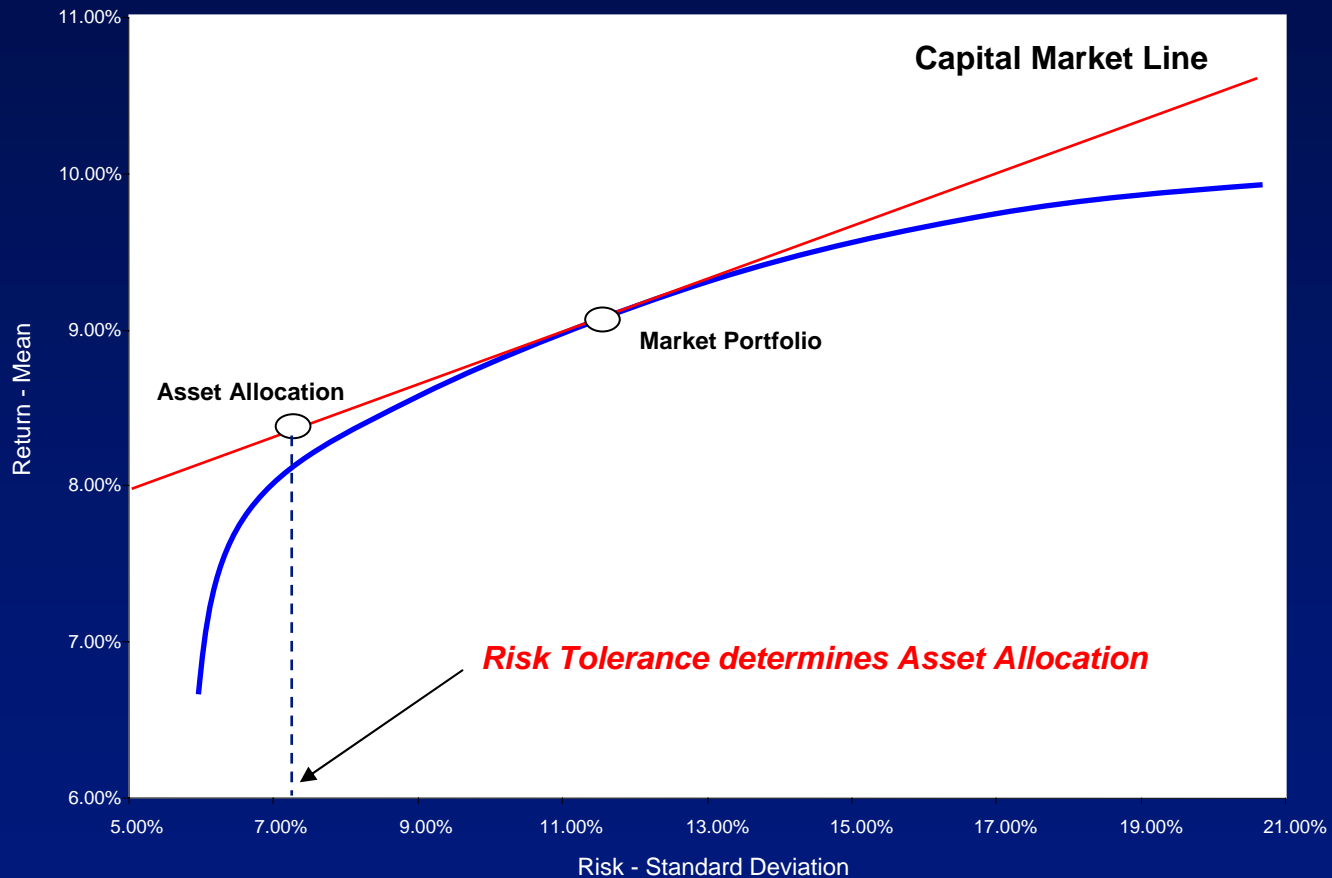


Source: Brinson, Hood & Beebower. "Determinants of Portfolio Performance" Financial Analysts Journal. May/June 1991.  
Note: Cross products account for 2.1% of the variance



# Mean - Variance Efficient Frontier

## Traditional approach to Strategic Asset Allocation





# The Pension Problem

**Asset and Liability matching problem-**

**Traditional asset allocation approach does not take liabilities into account**

## LIABILITIES

### Yearly Outflows

- Current retirees

### Future Outflows

- Future retirees

**=**

## ASSETS

### Yearly Inflows

- Contributions
  - Employees
  - Employer
- Return on Assets

### Current Assets



# Risk measures for Pension Plans

---

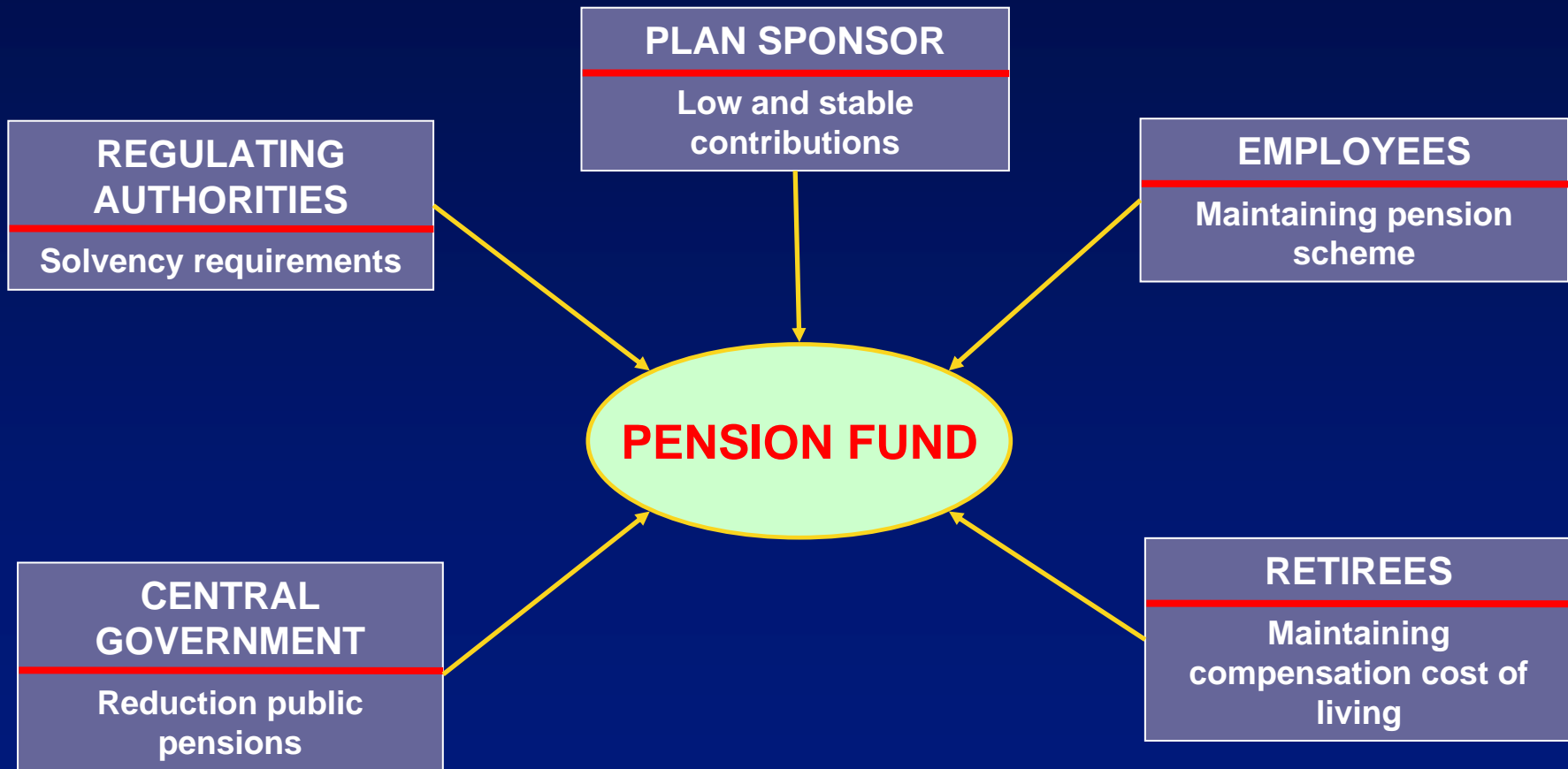
- Pension Plan investors have many other risk measures besides standard deviation of expected returns.
- The appropriate risk measures for pension plans depends on the parties that are involved in the decision making process.





# Different objectives

## Objectives of parties concerned with pension plans



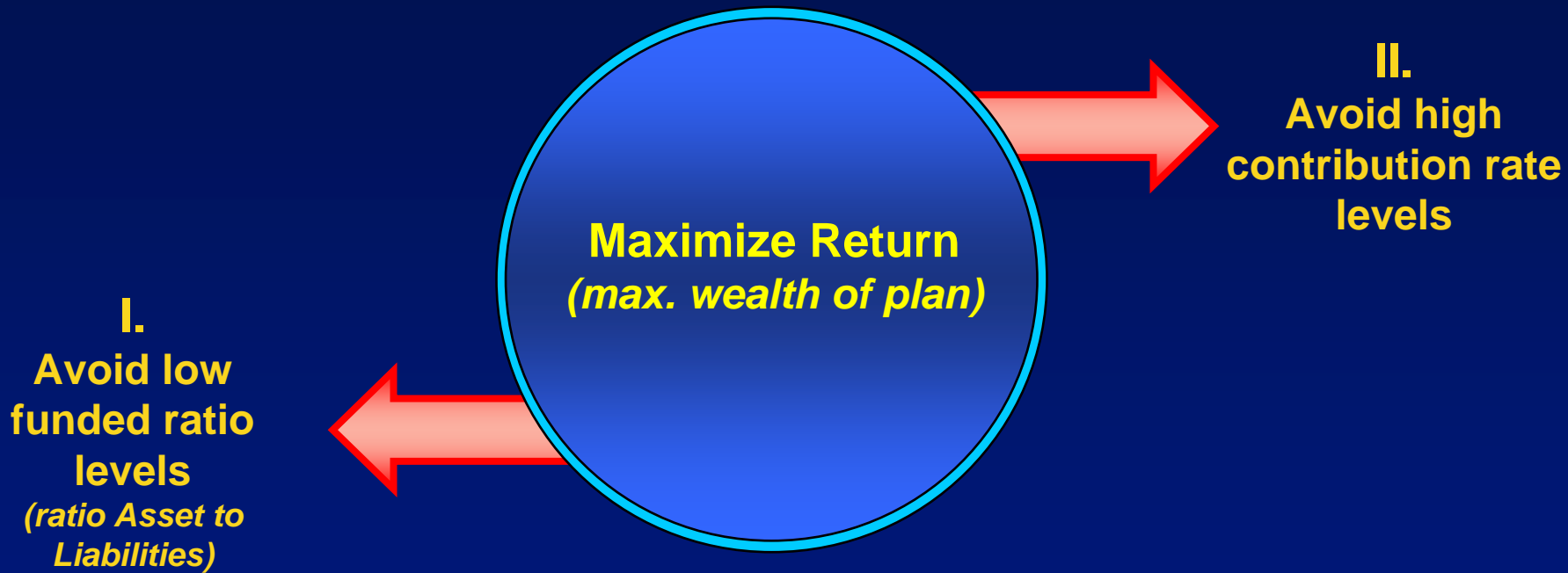
Source: Ortec Consultant BV



# Objectives and Risk Measures

Risks: I. Low funded ratios    II. High contribution rates

---

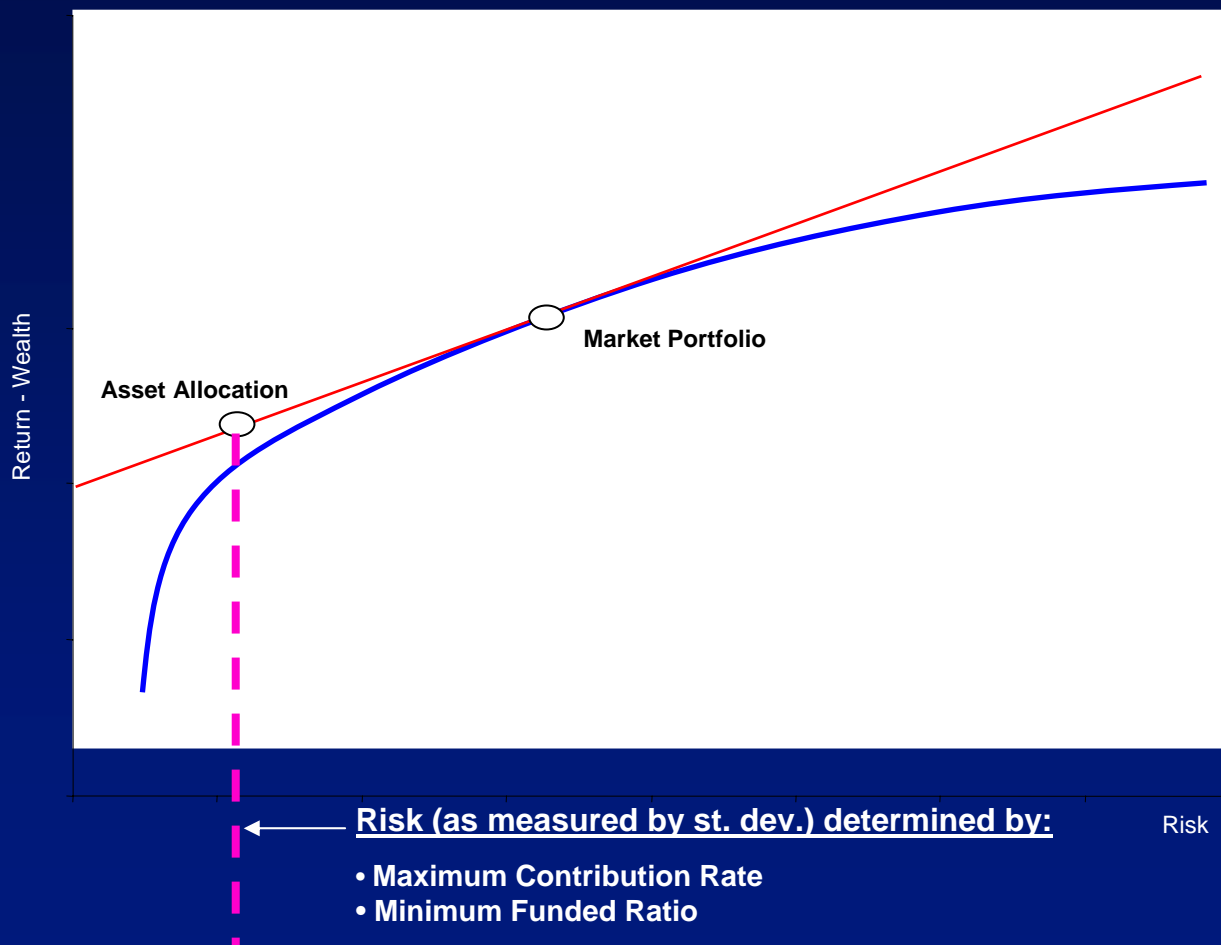




# Mean - Variance Efficient Frontier

## Asset Liability Management approach to Asset Allocation

Asset Allocation reflects risk bearing capacity of the pension plan





# Operationalize Risk Measures

## Variants of the value-at-risk concept

---

(Use multiple years for calculation of these risks- in this example 10 years)

### ➤ **5% Funded Ratio - at - Risk**

- **Minimum funded ratio that can occur in any year with a 5% probability**

### ➤ **5% Contribution Rate - at - Risk**

- **Maximum contribution rate that can occur in any year with a 5% probability**



# Investment Decision Matrix

## Total allocation to risky assets

(Risk budget to these value-at-risk measures determines investment policy)

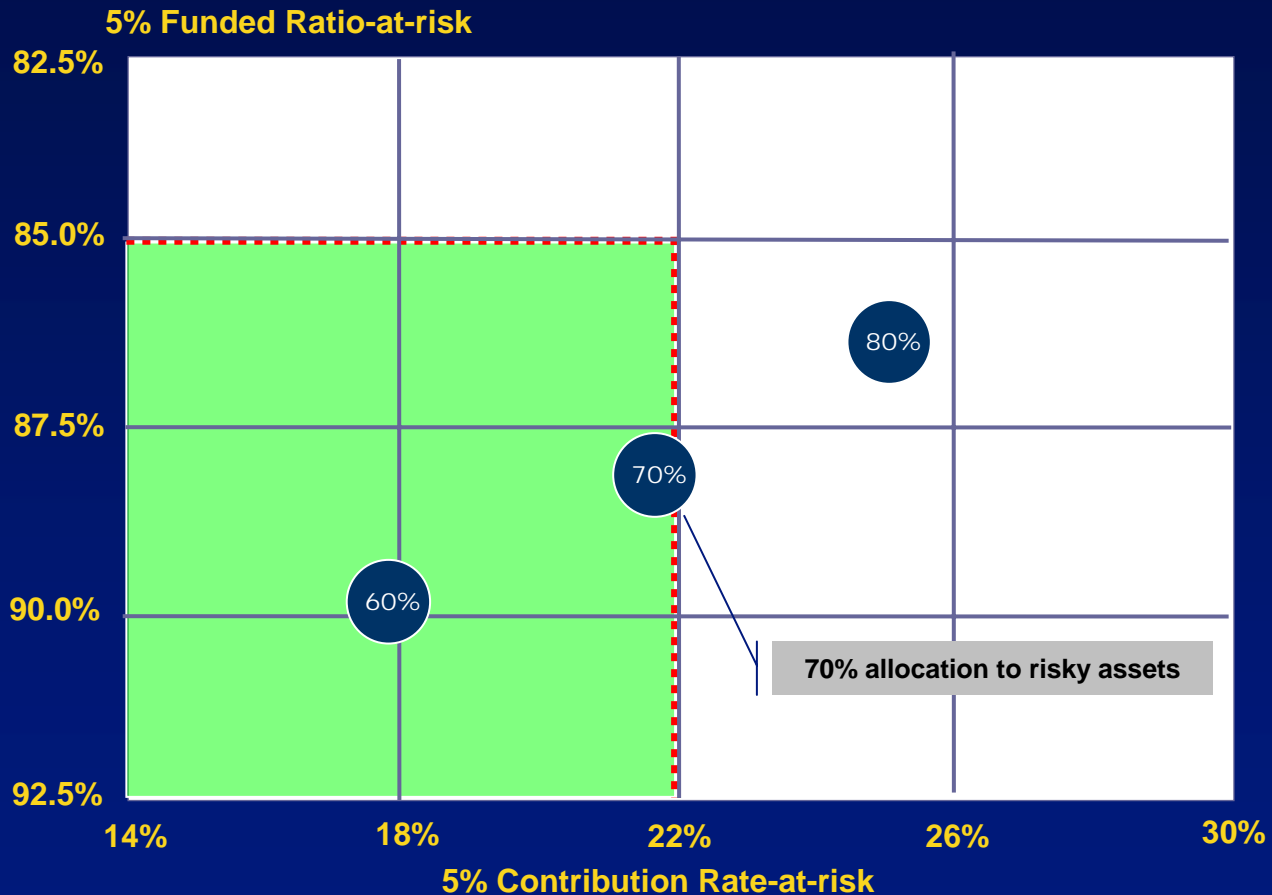
5% FUNDED RATIO - AT - RISK

	90%	85%	80%
<u>5% CONTRIBUTION RATE - AT - RISK</u> 19%	60%	60%	60%
22%	60%	70%	70%
25%	60%	80%	80%



# Investment Decision Example

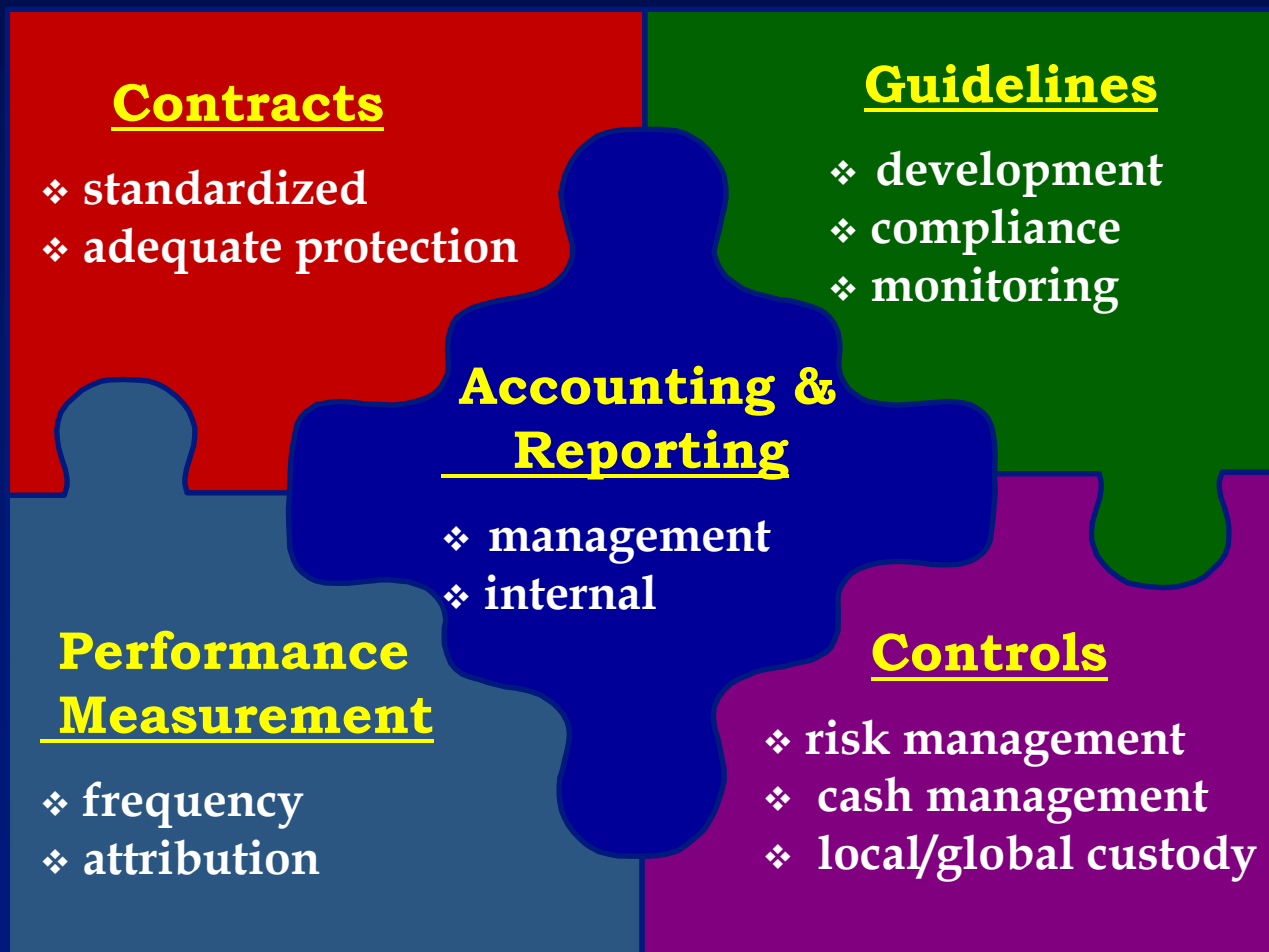
**Budget: Funded Ratio-at-risk = 85% and Contribution Rate-at-risk = 22%**  
(Shaded area shows investment policies which conform with risk budget)





# Middle Office Issues

For each external manager and entire portfolio





# Why Risk Management and Performance attribution

---

- **Identify unsustainable downside risk.**
- **Identify the sources of excess return**
- **Support asset allocation by trading off risk and return.**

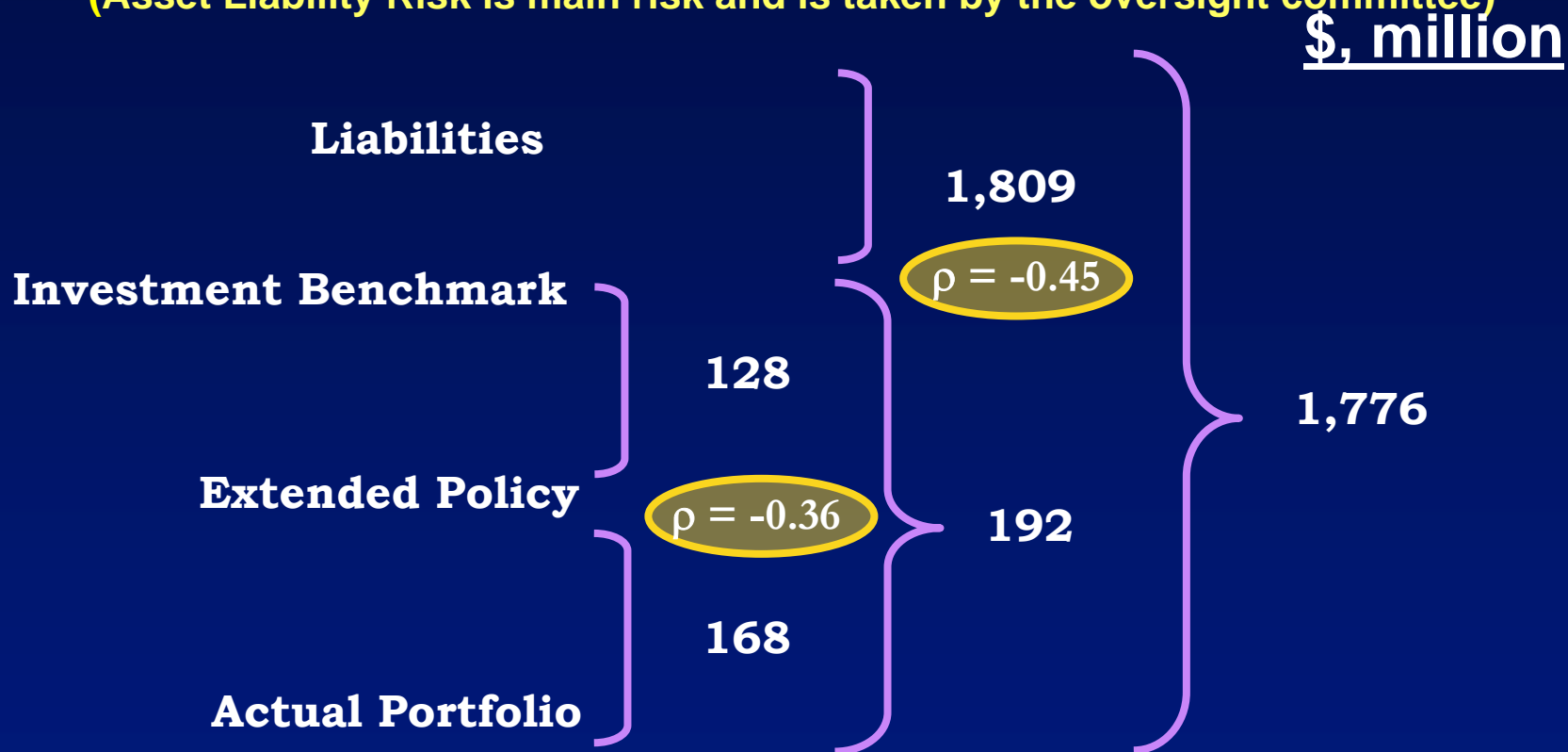




# Sizes of Risks

## Value - At - Risk Tree Example

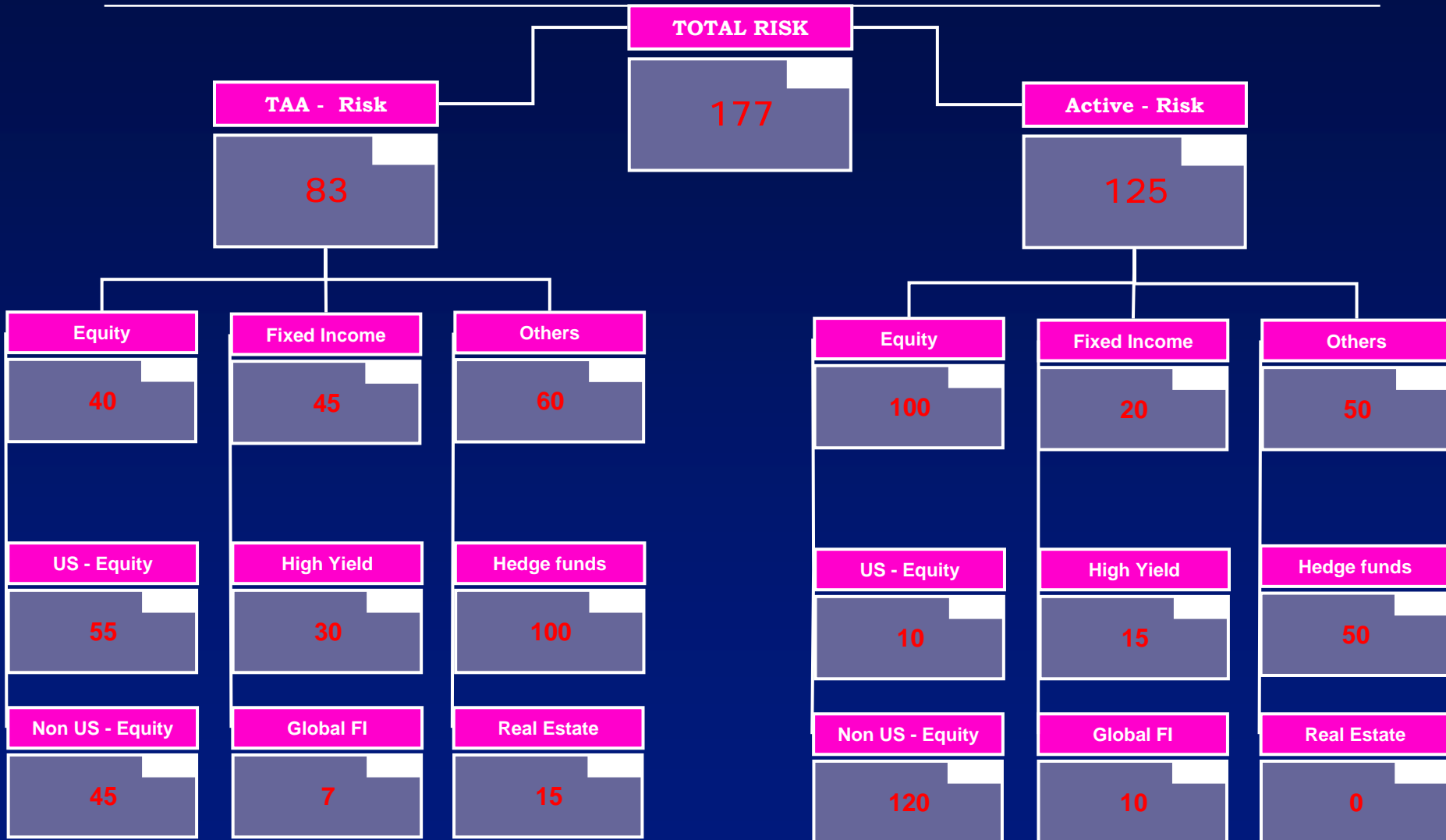
(Asset Liability Risk is main risk and is taken by the oversight committee)





# TAA and Active Risk

Risk measured as tracking error against the strategic benchmark





# Monthly Performance Attribution

## Risk-centric Performance evaluation of each investment decision

