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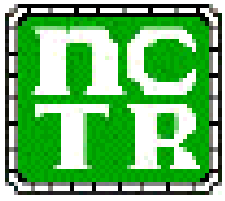


GFOA

PUBLIC PENSION SYSTEMS

Statements of Key Investment Risks and Common Practices to Address Those Risks

July 2000

TABLE OF CONTENTS

FOREWORD

Recently, risk management has become a greatly debated topic in the investment community primarily due to the well-publicized errors and losses incurred by various investment funds. In order to prevent the recurrence of such errors and losses, several organizations have developed various investment risk management guidelines or standards. Most of these standards and guidelines, however, are not specifically oriented to the unique perspective of public pension systems. Because of this, a group of public pension system chief investment officers (CIOs) became concerned that their funds would, over time, start to be measured against these newly developed standards or guidelines by auditors or other external parties even though many of the practices were not applicable to them as public pension fund fiduciaries.

As a result of their concerns, the CIOs asked the Association of Public Pension Fund Auditors (APPFA) to consider participating in a joint project with them to develop a risk document specifically with the intent of identifying common risks faced by public pension systems and the practices being utilized to address those risks. APPFA supported the project and appointed a committee to work with the CIOs.

The APPFA committee members involved in this effort were:

Stuart Cagle	Teachers' Retirement System of Louisiana
Shannon Davidson	Missouri State Employees' Retirement System
Ken Kasper	New York State Teachers' Retirement System
David Maurek	Public Employees' Retirement Association of Colorado
Brad Wakeman	Massachusetts Pension Reserves Investment Management Board

The original CIO's involved in this effort were:

Rick Dahl	Missouri State Employees' Retirement System
Bob Maynard	Idaho Public Employees' Retirement System
Joe Vet	New York State Teachers' Retirement System
Bob Storer	State of Alaska Department of Revenue (currently Executive Director - Alaska Permanent Fund)

Nancy Everett (CIO) and Curt Mattson (Manager of Investment Operations) of the Virginia Retirement System, as well as Dennis Anderson (Investment Auditor) of the Public Employees Retirement Association of Colorado and Sally Dungan, formerly of the Massachusetts Pension Reserves Investment Management Board, also participated significantly in the project.

After several telephone conference calls and group e-mails, the committee met in Denver, CO, on January 13 –14, 2000 to discuss the overall goals of the project and to create an outline for the document. At the meeting two primary goals were set for the document:

1. Develop an inclusive document that would be applicable and useful to as many public pension plans, large and small, as possible.

2. Develop a document that would take a "top down" approach to addressing investment risk. In other words, the document should identify the broadest and most significant risk first and then identify subordinate risks in order of decreasing magnitude until there was a consensus that some level of immateriality had been reached or that the risk was too specific and, therefore, not applicable to the majority of public pension systems

This brainstorming meeting resulted in an outline for the document. After the meeting, text was added to the outline. Numerous drafts of the new risk document were developed, modified and exchanged via e-mail and conference calls among the combined group until a final draft was agreed upon in early May 2000. The draft was immediately distributed to the entire APPFA membership, as well as an extensive list of CIOs and other individuals within the investment community, for comment. Agreed upon comments and changes were incorporated into the document and the final version was completed in July 2000.

Since its completion, the document has been officially endorsed by the APPFA membership, the National Association of State Retirement Administrators (NASRA) and The National Council on Teacher Retirement (NCTR). In addition, CIOs from various public pension systems have also endorsed the document. These endorsements should not be construed to suggest that every public pension system should implement every practice identified within the risk document or that by addressing all the risks within the document, a public pension system is guaranteed to avoid any problems associated with its investment program. Instead, these endorsements should be interpreted to suggest that the document is a good starting point and provides general guidance to the public pension system community in identifying key investment risks and common practices and procedures used to address those risks.

INTRODUCTION

Public pension systems (Systems) face a number of risks in undertaking necessary investment activities. Some risks, such as normal market volatility, are generally unavoidable. Some risks, such as investing in emerging markets, are knowingly assumed and are necessary to implement certain investment policies. Other risks, such as legal exposure to some forms of liability, are unnecessary and avoidable.

Controlling or eliminating these risks has become a topic of great interest as well-publicized errors by investment funds have captured public and professional attention. In response, a number of organizations have discussed or promulgated risk principles, guidelines, standards, and other directives for various professional organizations. Very few, however, have been specifically oriented to the public pension system community or have approached the problem from the perspective of the basic disciplines and purposes of public pension systems.

This document is intended to provide general guidance for Systems, or auditors of those Systems, in addressing issues of risk and the practices and procedures used to address those risks. In other words, this document is intended as a template for analyzing and addressing the particular risks that are faced by individual public pension systems. Accordingly, it identifies the key investment risks associated with large public pension systems and common practices to address, manage, and, to the extent possible, control those risks. While common practices may be appropriate for most Systems, in many instances a particular fund's posture or resources might require lesser or greater actions given that fund's particular analysis of the potential impact of a particular risk and the cost (including time and complexity) of fully addressing that particular risk. Common practices only address common situations – to the extent that each fund has unique situations that distinguish it from others, the examples used in this document would be inapplicable.

It should also be understood this document is not intended to be an exhaustive list of all risks that public pension systems may potentially encounter. Nor is it intended to be a comprehensive checklist of all the procedures a public pension system should incorporate to address the identified risks. The practices listed in this document are simply common and proven approaches that may help Systems assess their approach to addressing similar issues. They are termed "points of focus for action." They are things that can be done to mitigate risk; but there may be numerous alternative methods and procedures to address the identified risks effectively. Consequently, the description of the key risks and possible actions are intended as examples, not as standards or prescriptions.

It is recognized that this document might be used as a resource during periodic audits of the risk controls of public pension systems. If so, the auditor should keep in mind that this document only describes existing common practices, not necessarily best practices. There are usually many ways and, in the context of specific Systems, there might be better ways, to address the risks described. *The primary question is whether the actions taken by the pension*

fund effectively mitigate the risk and not whether they follow the examples published in this report. An auditor must also be mindful of the concepts of materiality of the risk being addressed and cost/benefit analysis in determining the adequacy of the actions taken.

To further assist an audit or evaluation, references to other documents and publications are included that provide supplemental, and in some cases more specific, information regarding actions that can be taken to address risk. This is not a blanket endorsement of everything contained in those references, although they are largely relevant. Consequently, the same cautions should be exercised when using the references. Professional judgment must be used to extract only what is relevant to the entity being examined.

ASSUMPTIONS

The content of this document is based on the following assumptions regarding public pension systems:

1. Public pension systems use common basic investment approaches – primarily, the core discipline of developing a long-term asset allocation and adhering to that asset allocation over long periods of time.

2. Public pension systems are long-term investors, not short-term traders and are, therefore, able to commit to their asset allocations and ride out fluctuations in the financial markets.

3. Public pension systems rarely have substantial short or leveraged positions and typically hold "long" positions in public securities and private investments.

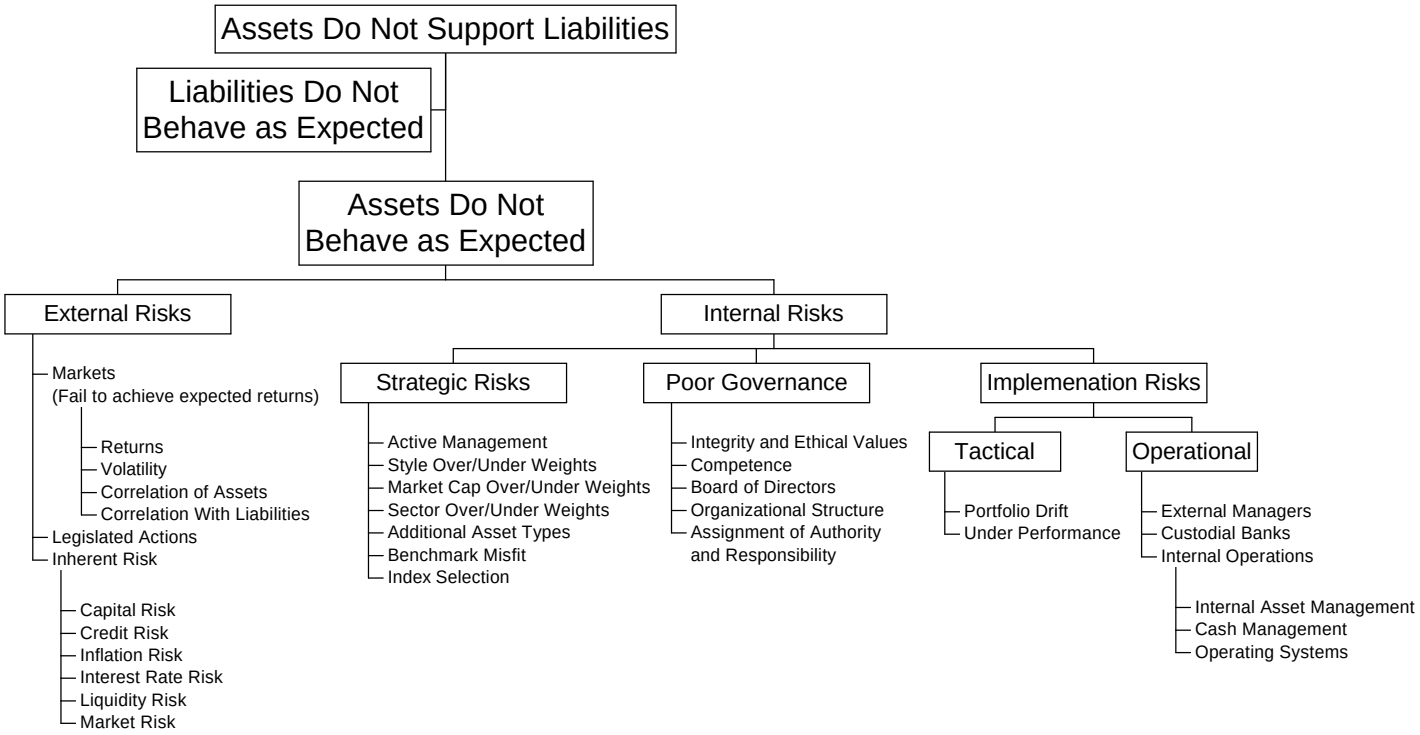
4. Public pension systems diversify by using a number of asset classes, styles, managers, and approaches.

5. Public pension systems generally attempt to maximize investment return while minimizing or eliminating exposure to unintended or uncompensated risk.

To the extent that a particular organization's structure and/or operations result in these assumptions being inappropriate, the risks and common practices identified in this document may not be applicable.

The organization of this document takes a "top down" or tiered approach to identifying investment risks within public pension systems. The broadest and most significant risk (or primary risk) is stated first and then the subordinate risks are identified in order of decreasing importance until some level of immateriality is reached. The risks identified at the top "tier" are universal within the public pension system universe and, as we work our way down, become less common. The following chart outlines the key risks identified in this document:

KEY RISK FRAMEWORK



ASSETS DO NOT SUPPORT LIABILITIES

The primary risk to a defined benefit public pension system is that the assets will not support the liabilities. After all, *the underlying purpose of any defined benefit pension system is to pay current and future benefits to its members.* These benefit obligations cannot be met without the appropriate level of available assets. All other investment risks associated with a public pension system are ultimately just a sub-category of this primary risk.

Two major sub-categories of risk fall directly below the primary risk identified above. The first is that the liabilities of the pension fund will not behave as expected, and the second is that the assets will not behave as expected. Numerous factors, ranging from market volatility to demographic changes to policy changes that increase benefits, can cause the assets and liabilities of a pension system to behave unexpectedly. Without proper planning and management, these unexpected behaviors may ultimately affect whether or not the system's assets will support the liabilities.

POINTS OF FOCUS FOR ACTION

Public pension plans commonly use three basic procedures at the highest level to address and manage the risk of assets not supporting liabilities.

- **Actuarial review:** Reviews periodically performed by an actuary mainly to evaluate the trends of the liability components of the system and their relationship to existing assets. It should be noted that while not yet a common practice, it is becoming increasingly more common for public pension systems to hire an additional independent actuary to review or audit the work performed by the original actuary (actuarial audits).
- **Asset/liability studies:** Studies generally performed periodically to identify changes in the relationships between the assets and liabilities of a pension fund.
- **Asset allocation models:** Models generally constructed by the System's investment staff and/or investment consultant and approved by the Board of Trustees to achieve diversification among asset classes in the most appropriate way to provide the best opportunity for producing sufficient returns to meet the expected liabilities. In many instances, the asset allocation exercise is part of a comprehensive asset/liability study.

Numerous risks are potential contributors to the liabilities of a public pension system not behaving as expected, and there are numerous common practices for managing those risks. The purpose of this document, however, is to focus on the *investment* risks associated with the assets of a public pension system. Therefore, risk management concerns and actions associated with the liabilities of a pension system are not discussed in detail. *It must be understood, however, that the risks associated with liabilities can be as detrimental to a public pension system as the risks associated with assets, and Systems should manage these risks accordingly.*

ASSETS DO NOT BEHAVE AS EXPECTED

Simply stated, this is the risk that the return needed to meet the liabilities is not produced due to unexpected behavior of the investments chosen. This unexpected behavior could result from a wide variety of factors, ranging from internal operational issues to external market forces.

In fact, all the investment risks that could have a material effect on a public pension system stem from assets not behaving as expected or planned. Therefore, all the risks identified in the remainder of this document focus on risks that can cause assets not to behave as expected.

The specific risk that may ultimately cause assets to not behave as expected can be placed into two general categories: external and internal influences.

[See COSO Internal Control Integrated Framework (1992), Evaluation Tools - Risks, p. 23]

EXTERNAL RISKS

Markets Fail to Achieve Expected Returns

With the assumption that public pension systems are long-term investors and employ some sort of asset allocation mechanism to diversify assets, this risk is not that the actual annual returns of any given asset class will not meet the expected annual returns. This particular risk is intrinsic to the assets themselves and mitigated by using such factors as expected volatility and correlation in diversifying the portfolio. In fact, it is assumed that all classes of assets will perform significantly differently than expectations over particular periods of time.

Instead, this is the risk that the long-term behavior of one or more of the asset types turns out to be significantly different than expected due to unforeseen market, economic, or political factors. These deviations from expectations may result from any or all of the following:

- The long term returns of the asset type.
- The long term volatility of the asset type.
- The asset type's correlation or behavior in relation to other asset types.
- The behavior of the entire asset allocation in relation to the liabilities of the plan.

Failures in base assumptions could, over time, result in a significant under funding of the system.

POINTS OF FOCUS FOR ACTION

Most public pension systems use three primary vehicles to address these risks.

Asset Allocation Reviews: Periodic asset allocation reviews take a prospective approach to managing market risk by examining the appropriateness of the set of assumptions that are being used in the allocation model.

Long-term Performance Measurement: This is conducted for each asset type and the portfolio as a whole. Performance measurement can be referred to as a retrospective approach to managing the risk because it evaluates the historical returns and volatility of each asset type, as well as the historical correlation among the asset types. By evaluating the historical performance numbers, market trends may be identified which could help the plan sponsor avoid long-term unexpected market behavior.

Periodic Actuarial Reviews: These studies track the actual behavior of the assets as matched against the actual behavior of the liabilities and quantify the ongoing difference of the impact of any unexpected behavior. If unfavorable trends develop, then the asset allocation or other factors affecting the future behavior of the system (e.g., contribution rates) can be adjusted.

Legislated Actions

A public pension system is predicated on assumptions regarding long-term rates of return and the application of present value concepts to promised future benefits. Any change to the realization or fulfillment of these assumptions by virtue of legislated action may substantially impact the financial health and economic viability of the system. Examples include laws that limit what asset types public pension systems may own and legislation that increases benefit formulas without considering available assets.

Another example that could seriously affect the assets of a System is legislation that artificially increases the interest rate assumption, with the intended effect of a reduced contribution from the employer. A shortage in the expected contributions can obviously upset the balance between assets and liabilities and ultimately cause a System to be under funded. The added risk of this type of legislation is that it would most likely require a higher level of investment risk be taken in order to support the new assumptions.

The key risk in any of these examples is that a radical change is made without understanding the effects on the program being changed, with the attendant risks of trend chasing, confusion, and lack of long-term focus.

POINTS OF FOCUS FOR ACTION

Sudden adverse legislative changes are sometimes unavoidable for public pension systems; however, Systems can take certain steps to minimize the likelihood that such situations will occur.

Investment Policy: A well-organized and documented investment policy that has been approved by an appropriate governing body is key to avoiding sudden and frequent overhauls of the investment program by various political bodies. An unorganized and haphazardly executed investment program will likely find itself subject to periodic overhauls initiated by outside sources as it experiences intermittent periods of poor performance.

Education: Educating legislative members and constituents about the system is also an effective mechanism for managing this risk. The more knowledgeable these groups are about the key investment concepts employed by a public pension system the less likely they are to pursue adverse changes that may negatively affect the investment plan. This education is often accomplished through regular communications from the System. In addition, other educational materials, such as the investment policy and strategy of the system, are often made available.

Legislative Liaison: Most public pension systems have some sort of monitoring and communication process in place to keep in touch with proposed legislation or other actions that may affect the System's assets. Early awareness and effective communication enables the System to educate the public and lawmakers on the potential effects of the legislation before its passage.

[See Public Pension Plan Operations and Administration, Government Finance Officers Association (1992), Relations with the Legislature, p. 59]

Inherent Risks

All investments are subject to one or more types of inherent risk. It is expected and necessary to assume some level of risk in order to achieve needed returns. For example, some inherent risks present in common investment vehicles follows:

- Capital Risk - The risk of losing the original investment.
- Credit Risk - The risk that the issuer will not make scheduled payments.
- Inflation Risk - The risk that the investment will return below the rate of inflation.
- Interest Rate Risk - The risk that changes in interest rates will decrease values.
- Liquidity Risk - The risk that the investment cannot be readily converted to cash at prevailing or assumed prices.
- Market Risk - The risk that adverse market shifts will cause losses.

POINTS OF FOCUS FOR ACTION

As indicated, these risks are inherently present and are usually knowingly assumed when investing. Usually, they cannot be avoided; however, one way to mitigate these risks is by utilizing the principle of diversification. This way, for example, if one company or industry falters, the threat to the overall fund will be minimized.

Asset Allocation and Diversification: An asset allocation policy sets targets and ranges for asset classes, thereby diversifying the portfolio among unrelated investments. The asset allocation process considers three major factors: expected return, expected risk, and correlation. From there, a fund may require diversification within those asset classes for management styles (e.g., active v. passive) and sectors or industries. Within sectors or styles, a fund may further diversify and set limits by company, issuer, manager, or counter-party. See Table 1 for an example.

Table 1 Asset Allocation Example

Asset Class	Target	Range	Further Diversification
Domestic Equity	**44.0%**	**40-48%**	
U.S. Stocks			Diversify by size (capitalization) or by style (e.g., growth vs. value). Diversify by sector (e.g., capital goods, transportation, energy, financial, technology, utilities, etc.). Diversify by company (e.g., Not more than a fixed percentage of total assets in any one company).
Passive: S & P 500 Index Russell 3000 Index Russell 1000 Value	34.0%		
Active: Large Cap Small Cap	10.0%		Diversify by manager (e.g., Not more than a fixed percentage of total assets with any one manager).
International Equity	**15.0%**	**10-20%**	
Passive EAFE Index	9.0%		
Active	5.0%		Diversify by country and currency (e.g., Not more than a fixed percentage of assets may be invested in certain countries).
Emerging Market Equity	1.0%	0-2%	Diversify by country and currency.
Fixed Income	**35.0%**	**30-40%**	
Domestic Fixed Income	25.0%	17-32%	Diversify among US Treasury, federal agencies, corporate, etc.
Mortgages	7.0%	3-10%	Diversify by geographic region.
International Fixed Income	3.0%	2-5%	Diversify by country and currency.
Real Estate	**5.0%**	**3-9%**	Diversify by geographic region and property type (e.g., residential, retail, office, industrial, etc.).
Alternative Investment	**1.0%**	**0-2%**	Diversify by early, mid and late stage ventures and diversify over time.

This table is for illustrative purposes only to show varying levels of possible diversification.

It is important to examine diversification from a total portfolio perspective. The total portfolio must be diversified but each program or individual portfolio may not have to be. In fact, some types of diversification within parts of the portfolio may be counterproductive in the context of the entire portfolio. Diversifying a real estate portfolio into energy producing regions, for example, would be counterproductive if the public equity portfolio was overloaded with energy stocks. Similarly, the benefits of diversification may be practically non-existent after a certain level. For example, as illustrated in Table 1, a fund may have a large passive equity portfolio and several external active equity managers, each managing a relatively small portion of the total portfolio. Because these externally managed portfolios are so small, diversification within them may not be necessary. In fact, pension system's often hire managers to focus on specific areas (e.g., small cap, growth stocks, value, emerging markets, etc.). This is fine, as long as all individual portfolios blend into the total portfolio to form a well-diversified fund. It should be noted, however, that many public pension systems' diversification options may be highly restricted by governing laws.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #8: Setting Risk Limits]
[See Pension CAFR's, Government Finance Officers Association (1996), Investment Summary, p. 32]
[See Pension Fund Investing, Government Finance Officers Association (1987), Diversification and Portfolio Balance, p. 19]

INTERNAL RISKS

Strategic Risks

Strategic decisions, as they pertain to public pension investment plans, can be defined as decisions, usually made by the board, to move away from underlying policy benchmarks. For example, assume a pension fund employs a simplified asset allocation model of 50% domestic equities, 35% fixed income, and 15% international equities and adopts the Russell 3000, Lehman Bond Aggregate, and EAFE, respectively, as the policy benchmarks for this base allocation. This fund could meet its asset allocation objective and policy benchmarks by simply indexing the appropriate percentage of all its funds into the Russell 3000, the Lehman Bond Aggregate, and EAFE.

Using this strategy, the risk of not achieving the policy benchmark returns less transaction costs, would be minimal, almost non-existent. However, any decision to move away from this strategy increases the risk that returns will not meet the returns of the policy benchmark, which may ultimately result in assets not meeting the expected long-term performance assumptions. Examples include decisions to overweight or underweight particular styles (e.g., a bias toward a value or growth style in U.S. equities), and overweight or underweight to market capitalization (e.g., overweighting small capitalization stocks) and sectors or regions (e.g., underweight a particular country in an international equity portfolio). Despite the risk involved in moving away from policy benchmarks, most Systems do take actions to deviate from the policy for the simple reason that they believe the rewards of achieving incremental return exceed the incremental risk of performing below benchmark returns.

Another issue is a potential flaw in the underlying benchmarks themselves. No benchmark is a perfect reflection of the underlying general market. Even the S&P 500, often used as a reflection of large cap U.S. stocks, has substantial international exposure. The choice of a particular small cap U.S. index can result in widely different returns over periods of time, such as differences in the performance of the S&P 600 and the Russell 2000 (common small capitalization U.S. benchmarks). Potential problems in this area are magnified as the indices being used to replicate markets which are less liquid and more inefficient (such as international emerging markets) are utilized. While over longer periods of time these differences in performance may become less significant; they are an area of potential concern over shorter time periods.

POINTS OF FOCUS FOR ACTION

Manage the Risk: Ultimately, most Systems do not choose to avoid the risk associated with strategic decisions. Instead, they elect to manage the risk. Managing the risk begins with clearly defining the policy benchmarks established for the fund and the acceptable level of deviation from these established benchmarks. Some Systems establish benchmarks at the strategic level as well as the policy level. Again, using the Russell 3000 as a policy benchmark, a fund may strategically decide to own a disproportionate number of value stocks in their portfolio and therefore, decide to incorporate a tailor-made benchmark to reflect their decision to be overweight with value stocks. Benchmarks may be further defined at the specific manager level. Regardless of the number of benchmarks established on different levels, they normally are clearly defined and should ultimately roll up into the overall policy benchmarks.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #7: Identification and Understanding of Key Risks]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #19: Independent Review of Methodologies, Models and Systems]

Long-term Performance: Monitoring the long-term performance of the strategic decisions is another way Systems manage the risk that the strategies will not provide the anticipated returns for the System. The impact of strategic decisions usually only becomes apparent over a period of years. Individual annual returns for strategies may be volatile when compared to the returns of the underlying asset class or policy benchmarks. For example, a decision to overweight small cap equities may under perform the general equity market for several years in a row. A long-term performance measurement system can monitor these return variances or risks by simply tracking the impact of these particular strategies over time and comparing them to the alternative of investing in the broad asset class or policy benchmark. Performance measurement is usually conducted by a pension fund's outside consultants and/or staff in formal periodic reports to the board.

[See Application for Public Pension Principles Achievement Award, Public Pension Coordinating Council, (1998), Investment Principle C: Investment Performance Evaluation Principle]
[See Pension CAFR's, Government Finance Officers Association (1996), Investment Results, p. 29]

Poor Governance

Governance risk, in this context, refers to the risk that the board, staff, or agents of a public pension system will, either intentionally or unintentionally through their management actions or lack thereof, cause the assets of the System to under perform expectations. Agents of a public pension system include external consultants, money managers, auditors, actuaries, and legal counsel.

Characteristics of poor governance may include incompetence, poorly or improperly defined roles, poor communications, failure to meet fiduciary responsibilities, lack of ethical standards, and inconsistency.

POINTS OF FOCUS FOR ACTION

The focus here is the control environment, which is the foundation for the entire internal control system within the organization. The control environment defines the character of the organization and affects the attitudes of all individuals towards governance and control. It consists of several elements including: integrity and ethical values, competence, a qualified board of directors and executive staff, a rational organizational structure, and proper assignment of authority and responsibility. Without this foundation, other components of the control system often fail.

Integrity and Ethical Values

Code of Ethics: Public pension systems often develop and adopt their own code of ethics to address the need for ethical standards within the organization. Others may recognize a more general set of ethics from their state government or other organization. Some Systems may not officially "adopt" a code of ethics but may address many of the ethical issues in personnel manuals, trustee handbooks, and other internal policies and documents.

[See COSO Internal Control Integrated Framework (1992), Evaluation Tools - Control Environment: Integrity and Ethical Values, p. 5]

Fiduciary Responsibility: Good governance of public pension systems also includes the understanding of fiduciary responsibilities by boards, staff, and agents of the system. For most boards, fiduciary responsibilities are defined and imposed through state laws and regulations pertaining to the system (including direct of indirect references to trust law). Mission statements, plan documents, and other internal documents may further define the fiduciary responsibility of the board. Many times the fiduciary responsibility of staff members and agents are also defined and imposed in state laws and regulations and other methods similar to the boards'. Staff's fiduciary responsibilities may also be defined through written policies and guidelines approved by the board. In the case of agents to the system, their fiduciary responsibilities are normally defined and acknowledged in writing. This is usually accomplished through contracts and written agreements between the system and its agents.

[See Application for Public Pension Principles Achievement Award, Public Pension Coordinating Council (1998), Investment Principle B: Fiduciary Standards Principle]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #1: Acknowledgement of Fiduciary Responsibility]
[See Pension Fund Investing, Government Finance Officers Association (1987), Fiduciary Responsibility, p. 7]

Competence

Hiring Practices: Methods used to help ensure a competent staff include establishing good hiring practices, conducting effective periodic evaluations, and providing an attractive working environment. Most public pension systems operate under public rules and personnel policies or have their own defined standards and procedures.

[See COSO Internal Control Integrated Framework (1992), Evaluation Tools - Control Environment: Human Resource Policies and Practices, p.16]
[See Application for Public Pension Principles Achievement Award, Public Pension Coordinating Council (1998), Investment Principle D: Minimum Qualifications Principle]

Training: Another method to help ensure the competency of staff and trustees is to provide an appropriate orientation for new board members and staff and continuing education for all board members and staff. New board members are often initially educated through an orientation process and receive on-going education by attending appropriate conferences and seminars. In addition, the investment staff and agents of the system may use portions of board meetings to further educate the board on investment related issues.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #6: Adequate Education, Systems and Resources, Back-up and Disaster Recovery Plans]
[See Pension Fund Investing Government Finance Officers Association (1987), Keep Up with the Investment Industry, p. 30]

Outside Experts: Another method of managing the risk of poor governance is by hiring outside experts. Most Systems rely on outside experts such as actuaries, attorneys, auditors, authorities on governance issues, and consultants, when necessary.

A structured and methodical evaluation process, often involving the advice of consultants, is often used to ensure the competency of agents hired by public pension systems. In addition, other agents of the same profession may be hired to periodically review the work of the agent retained by the public pension system.

[See Public Pension Plan Operation and Administration, Government Finance Officers Association (1992), Consultants to the System, p. 17]
[See Pension Fund Investing, Government Finance Officers Association (1987), Retain Professional Expertise, p. 2]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #19: Independent Review of Methodologies, Models and Systems]
[See Statement on Internal Auditing Standards No. 18, The Institute of Internal Auditors (1997), Use of Outside Service Providers]

Board of Directors

Good governance of a public pension system usually begins with a competent governing board. The criteria for the selection of most public pension boards are usually set by the governing statute or other authority establishing the public pension system.

[See COSO Internal Control Integrated Framework (1992), Evaluation Tools - Control Environment: Board of Directors or Audit Committee, p. 8]
[See Public Pension Plan Operations and Administration, Government Finance Officers Association (1992), The Retirement Board, p. 5]
[See Pension Fund Investing, Government Finance Officers Association (1987), Trustees' Investment Responsibilities, p. 1]

Organizational Structures

Organizational structures will vary among public pension systems, depending upon their approach (e.g., whether investments are managed externally, internally or a combination of both). Regardless of the approach, the structure should be clearly defined and key positions identified.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #4: Clearly Defined Organizational Structure and Key Roles]
[See COSO Internal Control Integrated Framework (1992), Evaluation Tools - Control Environment: Organizational Structure, p. 13]

Assignment of Authority and Responsibility

Written Policy: Another practice used to reduce the risk of poor governance is the development and adoption of written policy statements. For example, investment policy statements often address some or all of the following issues:

Legal and Statutory Framework
Sole Interest of Beneficiaries, Prudence Standards, Fiduciary Duty

Investment Goals
General Return Goals, Specific Risk and Return Objectives, Risk Tolerance, Identification of Liabilities, Asset Allocation Procedures and Principles, Allocations, Limits, and Rebalancing

Investment Structure
Overall Standards, Direct Board Responsibilities, Delegated Board Functions, Employees, Consultants, Advisors, Asset Managers, Custodians and other Support Groups, Standards for Selection, Fees, Procedure for Selection, Monitoring and Review Procedures, Risk Controls, Policies, and Procedures

Asset Class Policies
Objectives, Allowable Investments, Prohibited Activities, Styles**,** Benchmarks, Derivatives

Other Policies
Proxy Voting, Corporate Governance Policies, Ethics, Disclosures, Soft Dollar, Securities Lending, Personnel, etc.

Written and approved policy statements serve as an educational tool for new investment staff and board members and help ensure seamless transitions during staff and board turnover. In addition, having written and approved policy statements in place helps prevent sudden inappropriate changes to the investment plan in reaction to temporary or transient events.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #2: Approved Written Policies, Definitions, Guidelines and Investment Documentation]
[See Application for Public Pension Principles Achievement Award, Public Pension Coordinating Council (1998), Investment Principle A: Investment Objectives and Policies Principle]
[See Pension Fund Investing, Government Finance Officers Association (1987), Investment Policies, p. 4]

Implementation Risk

This is the risk that policies and procedures may not be implemented properly. Public pension systems may develop and adopt the ideal asset/liability mix, asset allocation model, and investment policies and strategies, but if staff or agents of the system do not effectively implement the mix and strategies, then assets may ultimately not support the liabilities generated by the System. Causes of ineffective implementation fall into two general categories: *tactical failure* and *operational failure*. Implementation risk and common practices to address the risk are discussed below in terms of these two general categories.

Tactical Failure

Two general sources of tactical failure may prevent a public pension system from achieving the benefits that would accrue from following its long-term investment strategy. First is the risk that the actual allocation of assets does not conform to the asset allocation strategy. Second is the risk that the actual return experienced through investment in specific assets does not meet the returns of the asset classes of which they are a part.

Portfolio Drift

For various reasons, a public pension system may not follow the underlying asset allocation defined in its investment plan. For example, a typical policy asset allocation may be 50% U.S. equities, 15% international equities, and 35% fixed income. Due to market movements (for example, a significant stock market decline), the assets may shift to 40% U.S. equities, 10% international equities, and 50% fixed income. Particularly after a significant change in the market, a fund may remain in this overweight to fixed income position for a prolonged period of time and, as a result, realize returns far below that expected from the policy asset allocation. As discussed below, the primary discipline used to address this concern is the process of *rebalancing*.

POINTS OF FOCUS FOR ACTION

The primary discipline used here is an expressed rebalancing procedure. For example, many Systems incorporate ranges around an expressed policy asset allocation that, when violated, will trigger either a direct reallocation of assets to more closely align with the policy asset allocation or trigger a review of conditions to determine whether a rebalancing of assets should occur. As part of this process, most Systems will include a direct comparison of the actual allocation with the policy allocation, with associated ranges, in the formal board reports.

Under Performance

Three types of tactical decisions may cause the actual returns of specific assets to under perform the asset class of which they are a part. First, as discussed above, strategic decisions may be undertaken; second, the actual allocation of assets to managers or accounts may not reflect the strategic allocations, which creates a misfit between the individual account benchmarks and the overall strategic objective, and third, the managers may under perform the asset class.

Strategic Decisions: The risks associated with strategic decisions discussed above may be the result of decisions to:

- Add asset types not included in the underlying asset classes (e.g., private equity, private debt, or emerging markets).
- Tilt the characteristics of an asset class (e.g., more or less small capitalization stocks).
- Take actions to try to reduce risk (e.g., hedging international currency risk).

Manager Misfit: The System may hire the wrong manager or type of manager to fulfill a particular segment of the asset allocation strategy. For example, a manager is hired to implement a strategic decision of overweighting small value stocks and the manager turns out to be a small growth manager. Another example would be where a manager is given a particular benchmark and that benchmarks does not reflect the segment of the asset allocation strategy for which it was intended (Benchmark Misfit).

Manager Under Performance: The external or internal managers hired by a public pension system to actively attempt to gain returns higher than those available by passively investing in the markets themselves may under perform the asset class. The actual returns could be significantly different, and lower, than those in the general market due to the manager's investment decisions.

A public pension system may hire three general types of managers to manage funds: managers of publicly traded securities, managers of private equity and debt, and managers of derivative securities.

✍ *Managers of Publicly Traded Securities*

Public pension systems often hire active managers (both on-staff and outside institutions) to manage public and private investments. These managers are hired to outperform the alternative passive investment. This adds another level of potential disparity, and risk, in achieving the desired long-term returns: the difference in performance and results of the active managers from that achieved by the passive alternative investment in that asset type. In particular, it could lead to substantial under performance over a period of time from that contemplated by the underlying investment strategy.

This risk could arise in four ways: First, the active managers could be true to their style or discipline, but the results of that style or discipline could have unintended consequences (such as performance significantly different than the benchmark used for that manager). Second, the actual benchmark used, when combined with other similar managers or accounts, does not fit the profile of the overall strategic objective or benchmark for that portion of the fund. Third, managers could drift from their particular style when making individual investment decisions and thereby, achieve returns that are different, and lower, than that of the benchmark they were assigned. A fourth way is through operational failure and is discussed later.

Unlike the long-term nature of the asset allocation and strategic policy risks, the impact on the value of the portfolio as a result of adverse events due to an individual manager's investment activities can occur relatively quickly, sometimes in a matter of days or weeks. Unusual market conditions could invalidate a manager's underlying assumptions by which they choose stocks, bonds, or other individual investments. This "quicker" pace of adverse valuation consequences usually affects only those managers who deal in the public markets, with its liquidity and daily pricing. Private investment portfolios usually have a more leisurely time frame for recognizing changes in valuation, as discussed in the next section.

✍ *Managers of Private Equity and Debt*

Investments in private equities, private real estate, and private commercial mortgages will most likely go awry at a slower pace. This usually happens over periods of months, not days, since the underlying investments in companies or properties are not valued as frequently.

✍ *Managers of Derivative Securities*

Typically, public pension systems do not have significant exposure to derivative instruments that could swiftly change the risk profile of the fund. Many derivative exposures are simple and direct substitutes for the underlying instrument. For example, the use of certain futures and forwards markets, such as the S&P 500 Futures Market, is practically interchangeable for holdings in the underlying security or securities. As a result, the risk management procedures for managers with publicly traded portfolios would suffice for tracking those positions if they could materially impact the portfolio.

The concern is with exotic instruments that have express or hidden leverage features or significant elements of optionality. These features could make the standard characteristic measurements (such as duration, beta, etc.) inapplicable for large market moves or, through express or implied leverage, result in a cascading effect from relatively small or marginal market moves. The task for a public pension system is to determine if those types of

instruments are in the portfolio and, if they are, whether the aggregate exposure to the overall portfolio is such that additional and more detailed tracking mechanisms and other risk control measures are required.

POINTS OF FOCUS FOR ACTION

Concentrate on hiring quality managers and then monitoring three factors: people, process, and performance. Monitoring should occur on an ongoing basis or through separate periodic evaluations.

Due Diligence in Hiring: As it relates to portfolio managers, risk management begins with the good hiring practices. Most public pension systems have a formalized due diligence process in place to determine external manager candidates that will incorporate the desired investment styles and disciplines to meet the objectives of the System's strategies. This process often includes the use of an independent investment consultant to assist in the search for managers that meet the criteria established by the system. The same prudence is usually exercised by public pension systems when hiring staff to internally manage funds.

The hiring process also usually includes the development of a contract that includes guidelines for the management of the specific portfolio. The guidelines usually include language that addresses:

- The objective of the portfolio;
- The benchmark the portfolio will be measured against;
- The desired characteristics of the portfolio; and
- The allowable, and possibly prohibited investments for the portfolio.

Guidelines help to further ensure that the managers adhere to the strategy and discipline for which they were hired. For internally managed portfolios, while there may not be a written contract involved, guidelines are usually documented and approved by members of the management team or the board.

[See Application for Public Pension Principles Achievement Award, Public Pension Coordinating Council (1998), Investment Principle E: Manager Performance Objectives Principle]
[See Pension Fund Investing, Government Finance Officers Association (1987), Managing the Managers, p. 24]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #5: Consistent Application of Risk Policies]

People: Many Systems also meet face-to-face on a periodic basis with the external management team. These meetings are generally conducted by internal staff, the external asset consultant or both. These meetings provide the System with a better understanding of the day-to-day operations of the external manager and the manager's business continuity, including resources and staff turnover. In addition, portfolio theory is often discussed to reassure the system that the manager is still a proper fit for the management niche for which they were originally hired.

Monitoring the Process: Once the hiring process is complete, a key risk management practice is to ensure that a manager is performing in accordance with a desired style or discipline (the reason they were hired in the first place). Also, Systems will normally put measurement systems in place to assure that the style or discipline is having the expected result (performance in relationship to a benchmark or passive investment alternative).

A public pension system's investment consultant or staff, independent of the portfolio management function, usually tracks a manager's adherence to the guidelines on a periodic basis. Further, they may provide the board with a formal report identifying discrepancies in the portfolios and reasons for, or actions relating to, those discrepancies. The compliance monitoring can be accomplished with special software designed to generate exception reports when a portfolio violates an established guideline or manually by periodically examining portfolio characteristics and trading activity for compliance with guidelines.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #17: Due Diligence, Policy Compliance and Guideline Monitoring]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #9: Routine Reporting, Exception Reporting and Escalation Procedures]

Monitoring Performance: Even if a manager's portfolio adheres to the guidelines and style expected, the individual securities chosen could under perform the market or sector for which manager was hired. This risk is typically tracked separately, and reasons for under performance are monitored, identified, and discussed with corrective action taken if necessary. This is usually done prospectively (the manager anticipates future events that could impact the style or discipline) and retroactively (analyzes reasons for present and past under performance to determine if the manager is still competent in implementing that discipline).

The retroactive check is accomplished through performance monitoring. In addition to the performance reports generated by the manager, on a regular basis staff and/or the asset consultant may produce their own set of reports for monitoring performance to aid in determining the reasons for over performance or under performance. Formal reports to the board may include such items as performance compared to market benchmarks, the analysis of the performance (attribution analysis), and a comparison to similar managers (peer analysis).

These types of reports should help the board guard against terminating managers simply because their style was "out of favor."

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #12: Risk Measurement and Risk/Return Attribution Analysis]

Tactical Failure Summary

Sound hiring practices, periodic compliance monitoring, and continuous performance analysis are usually sufficient to prevent actions by individual managers that may cause material impacts to the overall risk profile of the portfolio. In combination, these practices collectively ensure that the characteristics and performance of the overall portfolio, both as a

whole and in its individual parts, will perform in a manner that comports with that expected by the strategic policies adopted by the board.

Thus, for those Systems performing these types of checks, it is unlikely that portfolio performance will drift too far from what would be generated by the strategic allocation without the deviation being identified by one of the independent checks in place. Such a variation must be reflected in one or all of the following: the characteristics of the holdings, the reaction of those holdings to market movements, or deviations from peers with similar mandates.

The practices mentioned above are generally tailored for the management of publicly traded securities; however, they may also be applied to the management of private debt and equity as well as derivatives. In the case of private debt and equity, the monitoring, reporting and due diligence process is more difficult in that no publicly traded exchange exists to set prices and create performance comparatives. In addition, the effect of a longer lifecycle associated with many private investments requires a separate timeline for performance considerations. To address these issues, some Systems have considered placing a greater emphasis on up-front due diligence, structure, and the strategic nature of private investments. In addition, in some cases, a specialist is utilized to help in the design and monitoring of these programs. Most Systems address the risk associated with derivatives by establishing guidelines that prevent individual managers from investing in the exotic or leveraged types that carry risk that is not understood or is too difficult to monitor. If a system chooses to include the riskier types of derivatives in their investment strategy in any material amount, then specific risk management procedures are normally developed to address the additional risk.

Operational Failure

The risk of operational failure is not primarily concerned with investment strategy or tactics, but management and operational issues used in the implementation process of the strategy or tactic. Operational failures often result from a breakdown in systems, procedures, personnel, or processes. One common approach to avoiding potential operational failure is for the management of public pension systems to implement procedures that ensure achievement of the following control objectives (as identified by General Standard 300, *Standards for the Professional Practice of Internal Auditing*):

1) The reliability and integrity of information.
2) Compliance with established policies, procedures, laws, and regulations.
3) The safeguarding of assets.
4) The economical and efficient use of resources.
5) The accomplishment of established objectives and goals for operations and programs.

Operational failure can occur in three major areas within a public pension system: external managers, custodial banks, and internal operations. Pension system management usually takes a consistent approach to managing and monitoring each of these relationships. They do not assume, for example, that internal managers generate less risk simply because they

are part of the organization. On the other hand, they do not assume that external managers and custodians pose less risk because they are reputable industry experts. Things can go wrong in any environment, and, as a result, most public pension systems address risk through a systematic and steady approach.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #5: Consistent Application of Risk Policies]

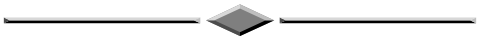
External Managers

The management of operational risk associated with external managers focuses on activities by the manager that change the assets held in their account, primarily buying or selling securities. Assuming the controls of the custodial bank are functioning properly (an assumption addressed later), then the operational failure of the external manager can basically only be the result of three actions:

- A security is inappropriately sold;
- A security is inappropriately purchased; or
- An intended sale or purchase of a security is not accomplished.

These actions are all the result of the manager not complying with the guidelines and strategies set forth by the public pension system.

The possibility always exists that an external manager, either intentionally or unintentionally, will not adhere to the guidelines or strategy for which they were hired. As discussed above, an adequate monitoring process should mitigate the risk of noncompliance by the manager; however, for the monitoring process to be effective, the data monitored must be timely, available, and accurate. Therefore, an operational risk associated with external managers is that timely and reliable information is not available or that the information is inaccurate. Obviously, if a System is monitoring inaccurate or dated holdings and trade data, then the risk of not detecting the noncompliance features of the actual portfolio increases. Generally, the longer a portfolio is allowed to be out of compliance with the established guidelines and strategies, then the more likely the returns of the portfolio will not live up to expectations.



POINTS OF FOCUS FOR ACTION

Separation of Authority from Custody: The legal custody of a public pension system's assets is usually maintained through a custodial bank. Securities are held at the custodial bank in the custodian's name on the public pension system's behalf. Managers do not have direct control over those assets and must perform their activities through the custodial accounts. When a security is purchased or sold, the custodian must receive instructions from the manager to receive or deliver the security (usually on a "delivery vs. payment" basis).

Therefore, it is very difficult for the manager to obtain more funds than authorized by the System. Consequently, each external manager creates a limited amount of operational risk with regard to the overall public pension system because they only have access to the funds assigned them by the System.

If, for example, an external manager's building is destroyed and all records and capabilities are lost, the public pension system still has all of its securities under separate control. In addition, public pension systems can, at any time, "freeze" an external manager's account and prevent future access by the manager, which is often done upon termination of a manager. All that is lost is the opportunity cost of the added value that may have come from future decisions by the manager. Opportunity cost concerns can be limited by immediately transferring the securities to another manager's account, which is also frequently done upon the termination of a manager.

Finally, an external manager does not have the ability to move cash and securities out of the pension system's account to another destination, either within that custodian's system or outside the system. A manager only has control over the movement of securities and cash within the account. An attempt or request for this unauthorized type of movement should automatically trigger a request by the custodian for independent authorization from both the external manager's and public pension system's staff.

Reconciliation: The accuracy of the holdings and transactions is usually assured through a monthly reconciliation of the data by the external manager and custodian or by the pension system from data provided from the external manager and the custodian. The reconciliation process helps to ensure the integrity and timeliness of the data used by the System during the monitoring process.

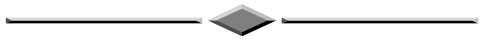
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #11: Valuation Reconciliation, Bid/Offer Adjustments and Overrides]

Due Diligence: Public pension systems also manage the risk of external manager operational failure by incorporating good hiring practices and conducting periodic due diligence reviews as discussed above. During the hiring process the System should take steps to ensure the external manager has adequate resources and qualified personnel to enable them to disseminate timely and accurate information. The on-going due diligence reviews help the System identify significant changes in the manager's organizational structure, ownership, personnel, or available resources that may affect future operational performance.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #17: Due Diligence, Policy Compliance and guideline monitoring]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #18: Comparison of Manager Strategies to Compensation and Investment Activity]
[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #20: Review Process for New Activities]

Custodial Banks

A system must be in place to ensure that the assets of a public pension system are maintained safely, securely, and with the appropriate legal protection. This task falls primarily to custodial banks. Therefore, a key component of managing operational risk by public pension systems is the quality of the custodial system. The custodial system needs to be accurate and provide staff the ability to access holdings, pricing, and transaction information on a regular and timely basis.



POINTS OF FOCUS FOR ACTION

Again, a key to obtaining quality reliable service from a custodial bank begins with the hiring process. While there are noted exceptions, the majority of public pension systems control the selection of their custodian. In those cases, most employ some sort of structured due diligence process when selecting their custodial bank, which could include the use of an independent external consultant. The process, in many cases will be similar to that used to select external managers.

In essence, public pension systems rely on three basic mechanisms to assure the continued viability of the custodial operation once the hiring process is complete. The first is a comprehensive annual financial examination of the custodial records conducted by an independent accounting and/or auditing firm. The second is thorough process of monthly reconciliation that generally takes place between the individual portfolio managers and the custodian. The third is through the periodic use of the System and its key components by internal staff.

Independent Audit: The financial statements of virtually all public pension systems are audited annually by an independent auditor. These audits are usually either conducted by a state government's audit agency or an independent certified public accounting firm hired by the system. Because the custodial bank plays such a material role in the operations of the System, the auditors must obtain a certain level of assurance that custodial operations are sufficient. The auditor can obtain this level of assurance by physically reviewing and testing the controls and procedures of the custodian's operations or by obtaining an independent report. The independent report should be prepared in accordance with the Auditing Standards Board Statements on Auditing Standards No. 70, "Reports on the Processing of Transactions by Service Organizations" (SAS 70 report).

Because of the expense involved with physically reviewing and testing the controls and procedures of the custodian's operations, most auditors opt to obtain a SAS 70 report for the custodian. It is important to note that a SAS 70 report that only contains descriptions of the policies and procedures at the custodial bank and the auditor's assessment as to whether such policies and procedures are suitably designed is not sufficient to reduce the pension system auditor's assessment of control risk. However, a SAS 70 report that also states that

the policies and procedures were tested, and that they were operating effectively to achieve the related control objectives during the period is expressly designed to reduce the assessment of control risk by users of the custodial system. The external auditors of a public pension system are allowed to use this latter type of SAS 70 report as a substitute for performing their own evaluation of the reliability of a custodian's operating system.

[See Statements on Auditing Standards No. 70, Auditing Standards Board (1992), Reports on the Processing of Transactions by Service Organizations]

Reconciliation: The second ongoing check of the reliability of the custodial systems is the requirement that each portfolio manager and custodian reconcile the account positions on a monthly basis. This procedure involves the comparison of the custodian's security positions, prices, and valuations with the same information as recorded by each manager. Any discrepancies are duly noted and resolved on a timely basis. Differences in pricing sources may sometimes be allowed once identified, but there is usually no tolerance for any difference in the size of the position (or units held). Many public pension systems often withhold payment for asset managers or custodial services if either party fails to perform its reconciliation function on a timely basis. This monthly reconciliation function is usually monitored independently by the public pension system's internal staff.

The reconciliation process helps to assure that any material breakdown in the custodial system between annual audits will be identified on a timely basis. Corporate governance actions (stock splits, dividends, interest, warrants, etc.) will also be monitored through the valuation and unit holding comparisons.

Periodic Reviews: In many cases, where sufficient internal staff are available, many public pension systems also perform periodic reviews of the portfolios and transactions on a periodic basis. The potential benefit of this is to serve as a third check on the reliability and accuracy of the custodial system. These reviews often validate the accuracy of account valuations, currency positions, and periodic transactions. A significant breakdown in the custodial system should be revealed in this type of review and most significant errors in record keeping, corporate governance, and pricing should also be captured. To accomplish the periodic reviews, the data provided by the custodian should possess certain qualities to enable pension staff to perform their operating, reporting, and compliance functions. The necessary qualities include:

- The data must be relevant to the needs of the pension system staff.
- The data must be current, timely, and accessible to pension system staff.
- The data must be compete and accurate.

[See COSO Internal Control Integrated Framework (1992), Evaluation Tools – Information and Communication, p. 31]

Internal Operations

Thus far, we have addressed the operational risks associated with external agents, but the internal operations of the System are also exposed to operational risk. Such operational risk is present in areas of internal asset management, cash management, and operating systems to protect data integrity.

Internal Asset Management: In many public pension systems, internal staffs serve as asset managers. Most of the operational risks of internal management are the same as if the assets were being managed externally. These risks include cash movements in and out of the portfolios and compliance with the portfolio's intended strategy. However, some additional concerns are brought about by the practice of internal management. First, the monthly reconciliation process between external managers and the custodian is no longer naturally present and, thus, a process to help ensure data integrity is lost. Second, a layer of oversight may be eliminated with internal management since the investment officers who were responsible for monitoring the compliance of the external managers may now be managing internal portfolios and obviously cannot monitor the compliance of their own portfolio. A public pension system needs to address these additional concerns when implementing procedures to internally manage assets.

Cash Management: Another internal operational risk involves cash management. Cash management involves the movement of cash between accounts, or into and out of the portfolio either for distribution to beneficiaries or to fund external asset managers at the appropriate level. The risk is that unauthorized movements of cash will be made or that inappropriate amounts of cash will be distributed.

Operating Systems: Finally, there is the risk that the internal operating systems necessary to support the investment activity, for both internally and externally managed assets, will fail. For example, a communication link often exists between the pension system and custodian, which allows the pension system instant access to portfolio data. Internal computer systems may go down or the building in which the public pension system is located may suffer a catastrophe.

POINTS OF FOCUS FOR ACTION

As stated above, the operational risks of internal asset management are similar to the risks of external management; therefore, many of the risk management practices are similar. Hiring practices are again important. The pension system must diligently pursue competent individuals to ensure the fund is managed in accordance with the intended strategy. In addition, operational guidelines are usually put in place for each individual internally managed portfolio.

[The following points of focus address major areas of concern. For more specific information, see Trading Control, The Institute of Internal Auditors (1998); and Auditing Investments Handbook, The Institute of Internal Auditors (1999)]

Accounting System: A public pension system with internal asset management usually implements its own investment accounting system to accomplish the task of reconciling monthly investment data with the custodial bank. The investment accounting software tracks all positions and transactions of an internally managed portfolio and the data can be reconciled with the monthly activity reported by the custodial bank. In addition, standard reports should be issued pursuant to a fixed distribution list to facilitate ongoing monitoring.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #9: Routine Reporting, Exception Reporting and Escalation Procedures]

[See Public Pension Plan Operation and Administration, Government Finance Officers Association, (1992), Financial Management of the System, p. 35.]

Segregation of Duties: To successfully implement the investment accounting process, the pension system normally segregates duties between the management of the portfolio and the record keeping or accounting function associated with the portfolio. Basically, this means that the individual responsible for making trading decisions for the portfolio is not responsible for affirming the trades or entering the trade data into the accounting system. In addition, the portfolio manager under this approach is not involved in the monthly reconciliation process between the internal investment accounting system and the custodial system.

The separation of duties can also reduce the risk associated with cash management. The individual responsible for managing an internal portfolio typically does not also have the authority to transfer funds from the custodial accounts. Often two signatures (one from fiscal services and one from non-asset manager investment staff) are required to initiate cash movement from the custodian. In addition, the custodian will often be required to contact an additional staff member, perhaps the chief investment officer or chief financial officer, before completing the cash movement request.

[See Risk Standards for Institutional Investment Managers and Institutional Investors (1996), Risk Standard #3: Independent Risk Oversight, Checks and Balances, Written Procedures and Controls]

Independent Oversight: To address the potential lack of independent oversight, public pension systems often assign individuals who are independent of the portfolio management function to monitor the portfolio for compliance with established guidelines. An external investment consultant, an internal audit group, other staff (e.g., compliance officer), or a combination can perform the monitoring function.

[See Risk Standards for Institutional Investment Managers and Institutional Investors, Risk Standard #3: Independent Risk Oversight, Checks and Balances, Written Procedures and Controls]

Business Continuity Plan: The risk associated with the internal operating systems of a public pension system may be limited because the "official" holdings and books of records are usually maintained off site at custodial banks. Nonetheless, public pension systems usually take steps to minimize the chances of failed internal operating systems. Regular back-ups of important internal data are usually performed and stored off site to preserve the data. In addition, a back-up connection line to the custodial bank and other essential communication links are often installed to ensure reliable data is available at all times. Finally, most pension plans develop some sort of disaster recovery plan to ensure the operating systems can be up and running as soon as possible in the unlikely event of a total breakdown in computer systems, building malfunctions, and other catastrophes.

[See Control Objectives for Information and Related Technology (COBIT), Information Systems Audit and Control Foundation (1996). DS 4: Ensure Continuous Service]

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