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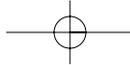
**MANAGING INVESTMENT  
FUNDS EFFICIENTLY***Arun S. Muralidhar*

The key investment issues that institutional investors must focus on are introduced in this chapter. These issues include (1) the need for knowledgeable and experienced personnel, (2) selection and implementation of the correct asset mix for the portfolio, and (3) monitoring performance and risks of the portfolio. Fund administrators have to set a long-term investment policy benchmark that enables them to meet future obligations (manage asset-liability risk) and they must ensure efficient implementation of the investment policy (manage implementation risks). To achieve these objectives, an appropriate organizational structure is required.

**OVERVIEW**

Global institutional investors include a broad brush of organizations, such as pension funds (both corporate and governmental systems), endowments, life and casualty insurance companies, and central banks. Investment professionals responsible for implementing asset portfolios in any of these organizations face several challenges. On the one hand, there is a paucity of resources—monetary and human capital/head count—due to internal budgetary constraints, yet on the other hand these organizations control vast sums of money.

A number of organizations have sought to leverage their relationships with large investment management companies or consulting companies. The most

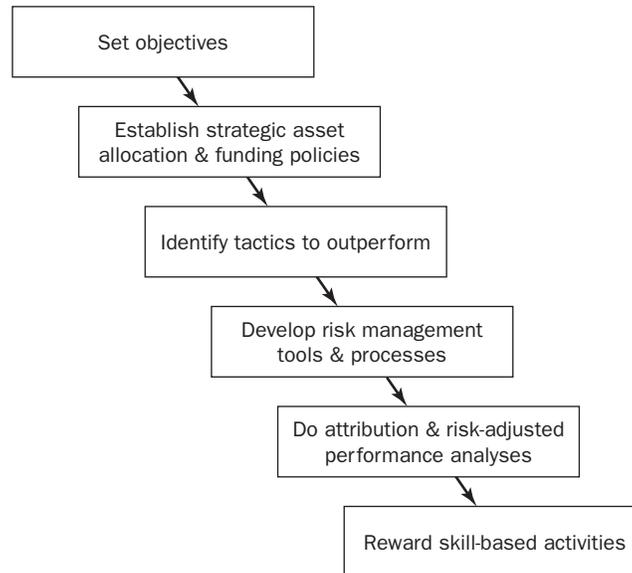


notable example is GTE Corporation (currently Verizon), which institutionalized its arrangement with four major investment management “strategic partners.”<sup>1</sup> However, sponsors of such investment pools face the problem that only a few individuals in investment management companies have the expertise to deal with different types of institutional investors as well as the ability to resolve various investment issues encountered by sponsors. These issues include strategic asset allocation, risk management, portfolio construction, and performance measurement and attribution. Investment management companies also struggle as they face increasing demands from institutional investors, and may be forced into an activity in which they have no comparative advantage in an attempt to satisfy large investors.

This book attempts to take on this challenge by sharing my experience, and those of my colleagues, in managing pension portfolios. The analysis in this book is developed largely in the context of pension funds, as the theoretical aspects of pension fund management are clearly articulated. It attempts to show the similarity of various investment management principles adopted by different types of institutional investors. The book highlights critical fund management issues and provides innovative solutions to problems faced by fund administrators. It provides innovative, yet simple, models that institutional investors can develop for themselves to measure, monitor, and manage risks and performance, and thereby enable effective decision making on asset allocation, manager selection, and manager retention.

Regardless of the type of investment fund, there are three keys to success: (1) experienced and knowledgeable personnel, (2) selection and implementation of the correct asset mix for the portfolio, and (3) effective monitoring of risk and performance of various investment decisions. In a recent survey of 80 pension fund CEOs, 98 percent cited poor process as a barrier to excellence, 48 percent indicated they were affected by inadequate resources, 43 percent cited lack of focus or poor mission, and 35 percent cited insufficient skills (Ambachtsheer, Capelle, Scheibelhut 1998). The same survey concluded that improved organization design, effective governance, and clarity of goals and strategic positions would improve pension fund performance.

For any institutional investor, an efficient investment program is critical, as marginal improvements in asset performance can prove to be a much more



**Figure 1.1** Keys to Success

politically viable alternative to increasing contributions or reducing benefits (in a pensions context), increasing government contributions to reserves (central banks), or reducing transfers to university or charitable organizations' budgets (endowments). Efficiency can be viewed from two perspectives: (1) incurring the lowest cost for performing the various functions and (2) reducing the economic cost of the overall organization through surpluses generated in these funds. These two are interlinked, but this chapter focuses on the latter.

The key steps are summarized in Figure 1.1. This book considers innovative approaches to each of these steps, and for simplicity, it assumes that external managers are selected to implement portfolios. To achieve these objectives, however, an appropriate organization structure is required.

#### GOVERNANCE AND ORGANIZATION STRUCTURE

To ensure effective management of assets, it is crucial that the organization vested with the authority to oversee these assets has the appropriate governance and internal structure. With regard to governance, the structure highlighted

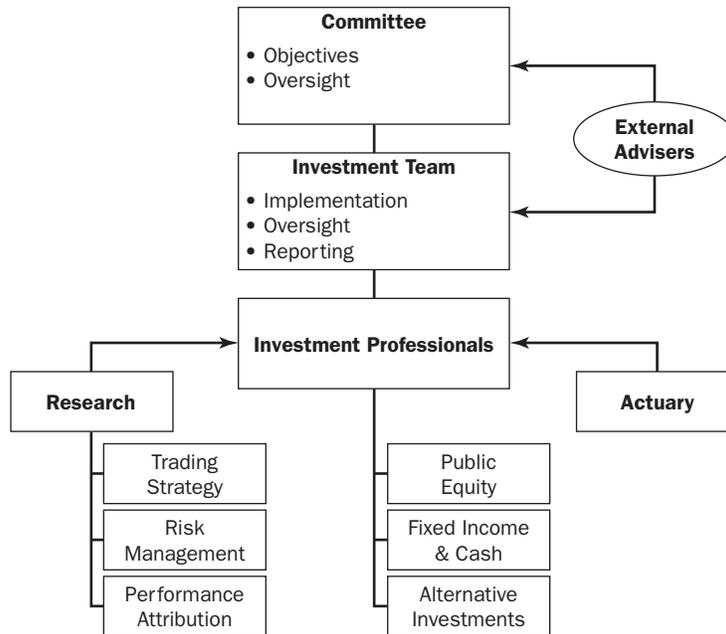


Figure 1.2 A Model for Organization Structure

in Figure 1.2 is a useful model. Ambachtsheer (1997) suggests that the critical aspects to effective governance are knowledgeable trustees, clarity of mission, and a visible, accountable chief investment officer (CIO).

The overall responsibility for developing the long-term asset mix, providing guidelines for investment strategy, and reviewing performance of the fund is that of a board or an oversight committee. It is the responsibility of the investment team to manage the funds to the long-term benchmark within these guidelines. External experts who serve in an advisory group can advise both the oversight committee and investment staff on investment issues. The investment team should include a research group to measure risk and performance and to generate and evaluate trade ideas to assist investment professionals.

This separation of the governance function from actual implementation of the investment function helps to ensure that personal agendas of members of the governing committee are not implemented without acceptable testing of

<p><b>Composition</b></p> <ul style="list-style-type: none"><li>• Internal (Labor, Employers)</li><li>• External (Academics, Researchers, Government)</li></ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"><li>• Clarify Objectives</li><li>• Set Investment Policy</li><li>• Approve Funding Amounts</li><li>• Monitor Investment Performance</li></ul>
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**Figure 1.3** Oversight Committee: Composition and Responsibilities

potential returns from such investments. In government organizations, an appropriate structure and the use of external advisory groups could insulate investment decisions from political agendas. These issues are discussed in more detail in Ambachtsheer and Ezra (1998). In addition, the Canadian Pension Plan Board, responsible for investing Canada's pension monies, has developed a very interesting structure. It ensures representation of appropriate groups, selection of competent individuals, and delegation of duties that other country pension systems could learn from.

#### Composition and Responsibility of Oversight Committee

Clearly, the composition and responsibilities of this group are critical to the success of any pension fund. It is important to make sure all interested parties are represented on the oversight committee (Figure 1.3). In the case of a pension fund, this would include labor, retirees, and employers, and have scope to include other individuals, such as academics or researchers, with expertise in asset management or pension finance. It is difficult to form an oversight committee in which every member has the same degree of financial sophistication; however, past financial experience of members is important in setting objectives and evaluating the quality of work performed by investment staff. If it is not possible to include external experts in the committee, these individuals could serve on an advisory board.

The major responsibility of the oversight committee is to articulate the objectives of the fund and ensure that the long-term asset mix is selected so as to achieve the objectives of the fund. In the case of a pension fund, this could

include minimizing the funding shortfall (i.e., assets insufficient to cover liabilities) or providing acceptable annuities. In addition, the committee should periodically review this policy. The benchmark should be articulated clearly and, at a minimum, should specify the target allocation to each asset class, the underlying market indices for measuring asset performance (e.g., Standard and Poor's [S&P] 500 index for U.S. equities), and the maximum permissible deviations from the target weight. In addition to setting policy, the committee is responsible for laying down broad investment guidelines by which assets are to be managed to this benchmark, reviewing the performance of the investment team in implementing these guidelines, and assessing the risks taken to achieve these results. An example of an effective benchmark is provided later in Table 1.2.

#### Composition and Responsibility of Investment Team

Ideally, the investment (and research) team is composed of individuals with either an advanced degree or training in economics, finance, or accounting. As indicated earlier, a visible, accountable CIO with vision complements such a team. However, these qualifications are not always necessary as is borne out by investment management companies in which some of the most successful investors have liberal arts backgrounds in history or languages. It is, nevertheless, useful to have at least a few individuals who have quantitative skills, which are required<sup>2</sup> for the analysis of benchmarks, risk, and performance. Finally, in the case of a pension fund, it is useful, but not critical, to have an actuary closely aligned to the investment function. In many pension funds, the actuary reports to the benefits administrator, but as demonstrated later in the book, it is crucial that the actuary ensure that the investment benchmark chosen covers the critical liability risks.<sup>3</sup>

The key responsibility of the investment group is to implement the portfolio as per the guidelines of the oversight committee and to outperform the investment benchmark (Figure 1.4). Equally important, though more mundane, is the task of periodic reporting to the committee on the performance and risks of the fund and achievement of investment objectives. This team also serves the oversight committee by making recommendations on the long-term benchmark, funding policy, investment in new strategies (e.g., private

<p><b>Composition</b></p> <ul style="list-style-type: none"><li>• Finance Professionals</li><li>• Accountant</li><li>• Quantitative Specialists</li><li>• Actuaries</li></ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"><li>• Funding &amp; Investment Recommendations</li><li>• Investment Management</li><li>• Investment Research &amp; Risk Management</li><li>• Performance Evaluation &amp; Reporting</li></ul>
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**Figure 1.4** Investment Team: Composition and Responsibilities

equities or hedge funds), and development of innovative investment products (e.g., derivative strategies); by measuring and monitoring the risks of the investment portfolio; and by evaluating the performance of various investment decisions.

Many institutions complement the work of internal staff by maintaining a formal or informal external advisory group composed of finance experts. This group could include individuals in charge of research or strategic partnerships at investment management firms with whom business is conducted. This advisory group could perform useful functions for the advisory committee and the investment team. Where the financial sophistication of the oversight committee members is not adequate, training for the committee and the expertise of the external advisory group could be very useful.<sup>4</sup> Finally, this advisory group could prove invaluable in directing the investment team to other organizations with state-of-the-art risk management or performance evaluation practices. A relatively underutilized resource available to any investment team is the vast community of other institutional investors. The difficulty is to identify institutions sophisticated enough to have implemented innovative solutions for various investment problems. This is where investment management firms and external advisers are extremely helpful.

The presence of high-level investment professionals is critical for this group to outperform the long-term benchmark. The difficulty that organizations face is competitive salaries offered by financial institutions that attract the brightest minds away from typical salary scales of pension funds and the

public sector. There are positive and negative aspects to this brain drain. The negative is that some of the best professionals are lost to the industry, but on the flip side, an alumni roll that suggests an institution is able to select and train people who become successful can be an attractive recruiting tool. The World Bank's Treasury faces a similar situation: it has been fortunate to hire excellent staff from around the world who realize that success at the bank can translate into better opportunities on Wall Street. More importantly, the bank has been able to retain top talent by delegating substantial responsibility to bright junior staff, who would not get such opportunities elsewhere.

#### SETTING APPROPRIATE INVESTMENT AND FUNDING POLICY

In some countries, even developed countries like Japan, a number of privately managed corporate pensions do not have a clearly specified benchmark or investment policy. This has led to poor investments and potentially severe underfunding problems.

There is no dearth of research in support of the fact that investment policy contributes over 80–90 percent of total investment returns.<sup>5</sup> In the United Kingdom, Blake (2000) finds the contribution to total return (from strategic asset allocation) is as high as 99.5 percent. Unfortunately, most funds spend less than 10 percent of their time and effort in determining the benchmark. More importantly, it is critical to set the investment asset mix to ensure that the long-term objectives of the institutional investor are met. One aspect that has been relatively ignored in previous research is the importance of the simultaneous establishment of funding and investment policy. Ambachtsheer and Ezra (1998) emphasize both policies, but many others have only focused on investment policy. Chapters 3, 4, and 5 cover the key aspects of setting an appropriate investment and funding policy and discuss how some innovative extensions allow for significant benefits to investors.

Essentially, the liabilities of any institutional investor may be regarded as the obligations or *raison d'être* of the organization. In the context of pensions, a pension fund exists to be able to pay retirees their benefits. Moreover, key variables such as inflation and interest rates affect not only liabilities but also asset returns.

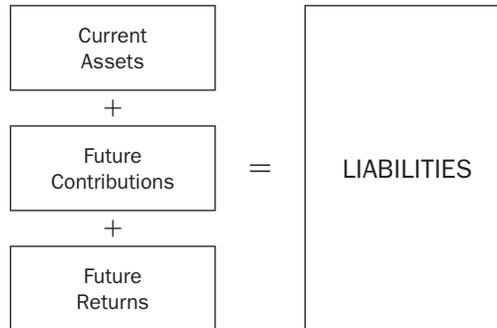


Figure 1.5 The Pension Fund Balance Sheet

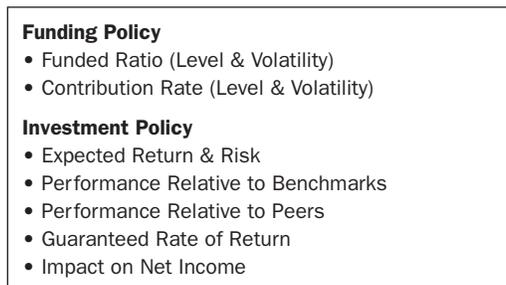


Figure 1.6 Pension Fund Objectives

There are two ways to finance future benefits: through future contributions or a *funding/contribution policy* and through future asset returns or *investment policy*. Since these two are so closely interconnected, it is important to understand the implications of any investment policy decision for present and future contributions and vice versa. Figure 1.5 highlights this interplay among liabilities, investment policy, and contribution policy. This chart motivates the recommendation to align the actuary closely with the investment team.

The objectives of a pension fund need to be clearly specified to ensure that they are met over the short- and long-term (Figure 1.6). Chapter 3 addresses these in more detail and demonstrates how oversight committees can be assisted in setting objectives.

On the funding policy side, the two critical objectives for the pension fund would be to maintain an appropriate funded ratio (i.e., the ratio of assets to

liabilities), and to maintain a conservative funding policy (i.e., having a stable and preferably declining contribution rate). The reason these are important is that large changes in either the funded status or contributions could lead to a political outcry that no organization would want. Therefore, it is important to measure and monitor the funded ratio in both the short- and long-term. This ratio is affected by changes in liabilities, either from changes in demographics or changes in wage or price inflation, and asset performance. The risk of being severely underfunded because of either poor contribution policy or asset performance is termed asset-liability risk. An additional objective for the sponsor of the fund (e.g., a corporate entity) might be to ensure that pension income (or expense) is at reasonable levels and has minimal volatility. For example, a sudden reduction in pension earnings could affect corporate earnings, thereby affecting the stock price. However, these outcomes depend largely on funding and investment policies.

Pure investment policy objectives could include a targeted rate of return, a targeted level of risk, and performance relative to either peers or the investment benchmark. Hence, it is important to ensure that expected return objectives are also achieved. The key is to select a portfolio of assets that not only achieve these targets but simultaneously minimize the risk of a shortfall between assets and liabilities.

Researchers have evaluated objectives through a different categorization, but essentially with the same goal of highlighting the complexity of articulating and ranking objectives. Mennis and Clark (1983) distinguish between absolute return strategies (stabilize contributions, cover vested liabilities with assets at the end of some time period, exceed inflation by some target percentage) and relative return objectives (exceed a risk-free rate by a specified amount, exceed some composite market index, exceed the performance of peers). They also highlight investment risk objectives (desirable probability of a low rate of return, desirable probability of stabilizing contributions, acceptable volatility of portfolio, and tolerable decline in asset value for a particular period).

In summary, an investigation into setting a long-term asset allocation involves articulating objectives, understanding the liabilities—which in the case of a pension fund are pension benefits or replacement rates (i.e., the ratio of

**Table 1.1**  
Objective identification and ranking by oversight committee

<i>Objective</i>	<i>Relative Importance to Committee</i>	<i>Targets</i>
Maximize expected return	First	10%
<b>Other Objectives:</b>		
<b>Asset-Liability Management</b>		
Funded ratio	Second	100%
Contribution rate and volatility	Third	10%
Pension income	Fourth	Maintain
Real rate of return	Fifth	4%
<b>Performance</b>		
Relative to peers	Sixth	±2%
Relative to the benchmark	Seventh	±3%

retirement annuity to a measure of salary or a measure of what fraction of income is replaced at retirement)—and identifying asset classes in which investments can be made. Table 1.1 provides an example of how objectives can be articulated and ranked, and Chapter 3 demonstrates how these objectives can be specified.

This hypothetical committee aims to achieve a 10 percent expected return, which in turn will raise the funded ratio if the probability can be minimized that in intermediate years the funded ratio declines below 100 percent. The committee would also like to ensure that the probability the funded ratio declines below 100 percent is minimized. Further, the contribution rate of the sponsor should not rise above 10 percent of salaries, and the real rate of return should be in excess of 4 percent. Pension income should be maintained at current levels. Such performance should ideally be achieved with an average tracking error (standard deviation of excess returns versus any benchmark) not exceeding 2 percent per annum vis-à-vis a prespecified peer group and an annualized 3 percent tracking error relative to the asset benchmark. The last item specifies the range for tactical asset allocation that the committee is willing to permit. This is clearly a more complicated list of objectives than plans have traditionally articulated, but it attempts to crystallize and rank objectives and place quantitative targets against which the achievement of these goals can

be measured. (Chapter 3 discusses the selection of optimal portfolios based on such complex objectives.)

The end result of this process should be a clearly specified asset portfolio that minimizes the risk of not achieving these objectives. In addition, it should provide broad investment guidelines for the investment team to implement.<sup>6</sup> The foregoing discussion may make it appear that the selection of an overall investment benchmark is a fairly easy procedure. This is not so. It usually requires a fairly sophisticated group of individuals to work with the oversight committee to specify, rank, and understand various objectives. For example, another committee could rank outperformance of peers higher than achievement of a real return objective. This need for sophisticated perspectives can be met by soliciting the advice of outside experts.

#### Constraints and Benchmark Specification

A major issue to be highlighted is investment restrictions that must condition a strategic asset allocation exercise. Four constraints normally affect the average institutional investor: (a) limits to investing in equities; (b) limits to investing in international assets; (c) forced investment in government debt securities; and (d) no leverage. It should be noted that more than one constraint can apply to an investor. For example, for a long time Japanese pension investors were governed by the 5:3:2 rule that required a minimum of 50 percent in government debt, no more than 30 percent in equities, and no more than 20 percent invested abroad.

Even in developed countries (e.g., France and Germany), there may be objections to investing pension fund monies in equity markets; at an aggregate country level, the U.S. Social Security system is one such example. The risk of using only one type of security to manage the risk of volatile liabilities is that unless these assets have characteristics identical to those of the liabilities, the pension funds are exposed to extreme asset-liability risk. In other words, if future cash flows are known, then appropriate bonds can be purchased to immunize liabilities. However, if these cash flows are uncertain, especially because of changes in salary, price, and asset inflation or demographics, fixed income securities or government bonds would be a poor hedge. As finance

theory has shown, a more diversified pool of assets may have better properties to meet future liabilities than portfolios invested in just one asset.<sup>7</sup>

With regard to investing abroad, capital or investment controls can often preclude such investment alternatives (e.g., Canada, Switzerland, and Japan). Why is investing abroad so important? Investors are aware that investing abroad is likely to pay off in the long run because of the diversification benefits of investing in opportunities not perfectly correlated to the domestic market. In addition, where local markets are small and illiquid, changes in investment policy will have an enormous impact on local markets. For example, investing in the Canadian equity was effectively a view on just one stock—Nortel, Inc. Hence investing abroad would take some pressure off local markets. However, investing abroad requires foreign exchange, which may be a scarce commodity, and initial purchases of foreign currency could put pressure on the local currency if these capital outflows are not offset by compensating inflows. It is not an enviable position to be in, having to decide whether pension funds can invest abroad, but clearly a gradualist approach would be the best way to tackle this issue. Chapter 5 examines the impact of constraints on international investing for Canadian investors and demonstrates the cost of such constraints.

The combination of constraints on equity investment and international investing is implicitly or explicitly a means by which regulators ensure that funds invest in government securities. Currently, a number of countries are relaxing these rules, but for a long time it was the practice for government bonds to be the only investment vehicle for pension funds because of the perceived safety from default risk, with less regard to the achievement of a retirement wealth objective.

Another common constraint is the lack of leverage either in strategic asset allocation or in the implementation of specific portfolios. Laws, or perceptions that leverage is risky, often preclude it. However, recent research has demonstrated that leverage can actually reduce risk both on a strategic and on a tactical basis. Chapters 4 and 9 cover this in greater detail.

At the end of the day, regardless of whether constraints are internal (i.e., created by the oversight committee) or external and imposed by regulators, it is important to arrive at some estimate of the impact of such constraints on

**Table 1.2**  
An example of a good benchmark

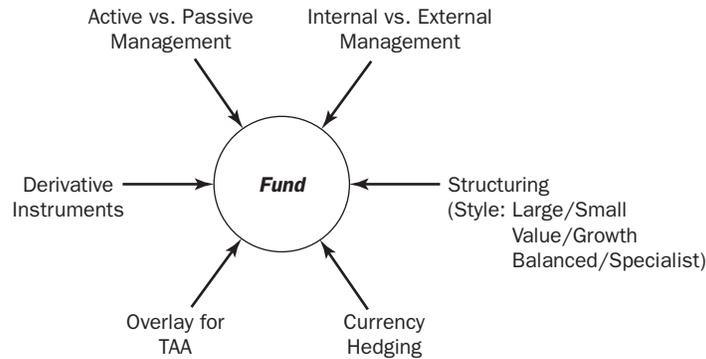
<i>Asset Class</i>	<i>Benchmark</i>	<i>Target (%)</i>	<i>Range (%)</i>
U.S. equities	Wilshire 5000	50	40–60
Non-U.S. equities	EAFE	20	10–30
U.S. fixed income	Salomon BIG	10	5–15
Non-U.S. fixed income	Salomon World	5	0–10
Private equities	Brinson Partners	6	2–8
Real estate	NCREIF Property	6	3–10
Cash	6-month LIBOR	3	0–5

the optimal portfolio. It is also beneficial to ensure that when such regulatory, legislative, economic, or political controls are lifted, the long-term benchmark is adjusted to take advantage of such opportunities.

Assuming that the pension plan has been able to identify a long-term asset mix, with clearly articulated target investment levels, it is critical to specify ranges around these levels.<sup>8</sup> Ranges are important for two reasons: (1) to prevent constant rebalancing to the benchmark arising from market movements, and (2) to facilitate tactical asset allocation. These can be viewed either negatively as constraints or positively as guidance from the committee as to the desirability of minimizing cost while creating opportunities for returns. More important, the market indices by which performance of a specific asset class are measured need to be clearly articulated. Fund administrators have some discretion in this area, and the discussion in Chapter 6 covers some interesting innovations that can be considered for more cost-effective implementation. Table 1.2 provides an example of a clearly articulated investment benchmark for a typical U.S.-based pension plan.

#### EFFICIENT IMPLEMENTATION OF INVESTMENT POLICY

One of the most important, yet least attractive, steps in effective implementation of investment policy is to ensure reliable custodianship of all assets purchased on behalf of the fund, rather than angling for fancy asset allocation models or financial experts. The reason is that good custody arrangements, whether through a local or global custodian, ensure the security of the assets



**Figure 1.7** Implementation of Investment Policy

purchased on behalf of the fund. Once assets are safeguarded from fraud and theft, a good custodian can be very useful in ensuring that basic accounting and reporting is performed. At a higher level of sophistication, the custodian can be used to ensure guideline compliance, performance attribution, and risk management reporting.

Knowing that assets are secure, the investment team next needs to develop tactics to implement the investment policy. These tactics, depicted in Figure 1.7, range from the choice between active and passive management and the choice between internal and external management, to style and sector biases, the choice between balanced and specialist mandates, currency hedging, use of futures overlays for tactical asset allocation (TAA), and the use of derivatives (e.g., surplus options; derivatives are discussed in Chapters 4 and 6).<sup>9</sup>

The next two subsections focus on the decision between active and passive management, and on the decision between investing internally and using external managers.

### Active Versus Passive Management

What is meant by active versus passive investment and how does one decide between these alternatives? In a nutshell, passive investment is the process by which an investor creates a portfolio that exactly replicates a market index. For example, to replicate the S&P 500 U.S. equity index, the investor would buy all 500 securities in the S&P index in the exact proportion of the index. An active

investor, on the other hand, could choose to select securities not included in the index and weight them by any proportion. The passive portfolio, if maintained accurately, would produce returns largely identical to that of the benchmark, whereas one would expect the active portfolio to outperform the index over the long term.

There are different degrees of active and passive management, and combinations of the two are feasible and desirable. Most managers charge meager fees for passive investments and much higher fees for active investments. The risk of an active portfolio is that there are periods when it underperforms the benchmark and other periods when excess returns are quite volatile. Philips (1999) indicates that the active decision should be based on inefficiencies in markets, and that the cost of active management should be low enough to warrant trying and depends on whether it is possible to find competent active managers. In many asset classes it is difficult to find competent and consistent managers. In such asset classes, sponsors may prefer passive or enhanced index managers. Alternatively, they may choose to rotate managers based on some tactical analysis. This choice between active and passive management has been hotly debated by various product providers and academicians. Chapter 12 covers this in greater detail.

### Internal Versus External Management

The choice between internal and external management is another critical issue that is not mutually exclusive. In internal management, all investment decisions are made in-house, whereas in external management, in-house staff select the portfolio and investment managers. The advantage of internal management is that investment returns can be achieved at a lower cost and with greater control (Ward 1999). However, in public sector enterprises, managers who perform well are often recruited into the private sector. Investing passive portfolios can be handled internally and it is a good way to develop investment skills in-house.

Several institutional investors in the United States that have the resources to compensate their staff adequately have found that internal managers often outperform external managers at a lower cost. However, it is useful to use external managers as a benchmark for internal staff. It could be valuable to

expose internal staff to alternative investment strategies. This model is followed by large institutions and central banks.

Another benefit of using external managers is to leverage the research capabilities of external managers in the areas of asset allocation and risk management. Chapters 9–12 focus largely on tools to help investors evaluate the performance of external managers, though the principle is largely the same for internal managers. From an implementation point of view, it tends to be easier to track internal managers on a daily basis and more difficult to track external managers due to lack of proximity.

Finally, either choice has agency problems: namely, the objectives of the agent chosen to manage assets on behalf of a principal should be appropriately aligned with those of the principal.

#### MONITORING PERFORMANCE AND RISKS OF INVESTMENT DECISIONS

A pension plan is exposed to two broad risks; namely, (1) asset-liability risk, the risk that the portfolio selected by the oversight committee does not meet funding policy and investment policy targets, and (2) implementation risks, the risks that internal staff and external managers underperform their respective benchmarks. Gibson (1997) refers to these risks as Level I and Level II risks, respectively. For funds that hire external managers, the implementation risk can be subdivided into tactical and active risk as demonstrated in Figure 1.8.

	<b>Asset-Liability Risk</b> (Committee)	<b>Tactical Risk</b> (Staff)	<b>Active Risk</b> (Managers)
<b>Measure</b>	Funded Ratio/ Contribution Rate	Attribution & Value-at-Risk Models	Tracking Error & Value-at-Risk Models
<b>Monitor</b>	Annually	Monthly	Monthly
<b>Manage</b>	Strategic Allocation	Tactical Allocations	Manager Allocations

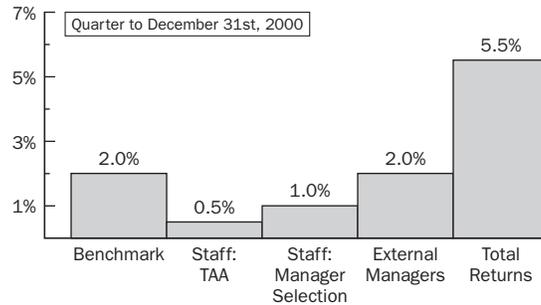
Figure 1.8 Pension Fund Risks

Asset-liability risk should be monitored annually by reviewing the funded status and implications for funding policy. If the risks are too high, the committee must review whether the investment policy benchmark is still appropriate. Chapter 3 discusses models to measure, monitor, and manage this risk. Implementation risks should be monitored more frequently and managed through tactical shifts. Models to measure these risks are provided in Chapters 7 and 8, and techniques to manage them form the backbone of this book.

Monitoring performance is as important a function as any other and is dealt with in greater depth in Chapter 9. It diagnoses the success and failure of investment strategies implemented to determine the action that needs to be taken in the future. Performance needs to be monitored frequently, at least monthly (in some cases daily), by the investment team and reported at least quarterly to the oversight committee. Performance reports should include the performance of the actual portfolio versus the benchmark over short and long periods (say 3 to 5 years), on a before- and after-fee basis. In addition, performance should be measured on an absolute and risk-adjusted basis. Chapters 10 and 11 extend this framework and discuss how the performance of multiple manager portfolios can be evaluated. These chapters provide innovative approaches for manager selection and retention based on the skill of the managers.

Staff can develop the format for reports, with the actual production of the reports delegated to the custodian. Reports to the oversight committee should be simple and concise, whereas internal reports can be more detailed. The second aspect of these reports is performance attribution or analysis to understand sources of value added relative to the benchmark.

For example, a pension fund could have a quarterly return of 5.5 percent and could be ranked the top-performing pension fund for similar size. What accounts for this good performance? The quick analysis in Figure 1.9 reveals the following. The benchmark returned 2.0 percent, internal staff added another 0.5 percent through tactical asset allocation and other strategies, internal staff added another 1.0 percent by picking the correct managers, and the external managers beat their benchmarks by 2.0 percent, for a total return of



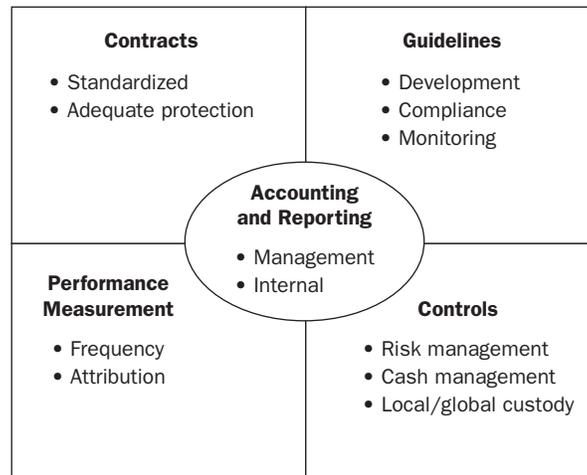
**Figure 1.9** Performance Attribution: A Simple Example

5.5 percent during the quarter. The sponsor must perform this analysis down to the level of individual managers and accordingly rectify negative factors by changing strategies or terminating managers.

A record of good asset performance should enable a sponsor to reduce the contributions or offer higher replacement rates. Hence, monitoring performance is a critical function. For those funds in which peer comparison is important, Chapter 14 discusses the shortcomings of current methodologies. It proposes a new methodology that ensures that the peer universe is appropriate and that there is some information contact in the analysis.

#### OTHER IMPLEMENTATION ISSUES

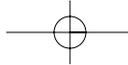
Other important implementation issues include reviewing the contracts and guidelines for managers. It should be emphasized that the development of contracts and guidelines has been an area where staff must put considerable effort. The contract and guidelines are the legally sound way to ensure that the mandates implemented by external managers are in line with the risk tolerance of the oversight committee and that adequate indemnification is provided should there be fraud or negligence by the external manager. In addition, these contracts should specify requirements for risk management, accounting reports, and most important, the performance reporting to staff



**Figure 1.10** Implementation Issues for Each Manager and for Entire Portfolio

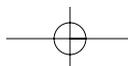
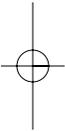
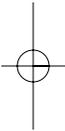
(Figure 1.10). Mashayekhi and Muralidhar (1996) highlight these issues and introduce innovative approaches to risk control and performance attribution in the context of currency programs.

In reviewing one fund, an advisory group discovered that the oversight committee received performance reports only once a quarter. Typically, external managers have to report the performance of the fund and reasons for both under- or outperformance within a few business days of the end of each month. If performance lags behind benchmarks either for the entire portfolio or for specific managers, then corrective measures can be taken by changing allocations or replacing managers. An important point is that risk monitoring requires fairly sophisticated computer software. Given the importance of risk management and performance evaluation to the overall stability of the pension program, at least one staff member should be designated and trained to be able to perform this function effectively. Chapters 7 and 8 demonstrate how risk should be evaluated at an overall fund level and then provide tools to allow sponsors to decompose risks from various investment decisions. This decomposition can be conducted at any level—asset class, manager, or even security.



## SUMMARY

By highlighting issues encountered by fund administrators, this chapter lays the foundation for the rest of the book. To recapitulate, fund administrators must ensure that governance and organization structures separate the oversight committee from the implementation function and set clear responsibilities and goals for each group. The oversight committee must then frame a long-term investment policy based on an explicit statement of objectives. This policy must be reviewed periodically to ensure that balance sheet risks are managed. The investment staff should implement the portfolio by using an appropriate mix of tactics. Finally, the investment staff should monitor performance and risks to ensure that the funds are managed efficiently.<sup>10</sup> Clearly, all these functions require competent staff and regular training as the state of the art is evolving daily. However, following these simple steps is likely to lead to the achievement of objectives and significant gains for the institutional investor or plan sponsor.



## APPENDIX

## 1.1

**CENTRAL BANK RESERVES MANAGEMENT—  
A SIMILAR PERSPECTIVE**

The management of central bank reserves is very similar in principle to the pension fund—though more interesting and less researched. The reserves of the central bank are maintained to defend the domestic currency or provide valuable foreign exchange to pay for imports or service debt. Therefore, the objective for the reserve management team is to ensure that the assets are invested in safe and liquid instruments. However, if the level of reserves falls below a particular level, the reserves should be topped up, which may or may not be expensive for the country depending on its credit status. In addition, central banks in emerging markets may like to borrow long-term so that they do not need to return to the market frequently and at a time that is disadvantageous. This, in turn, creates a host of problems as they then incur negative carry between the borrowing rate and the investment rate (credit spread), and a duration mismatch between long-term borrowing and short-term investing.

Therefore, although a higher level of reserves may appear to provide greater credibility in terms of being able to defend a currency, it is expensive to do so. Hence central banks need to optimize the timing, size, and duration of borrowings and simultaneously optimize the size and investment strategy of the reserves pool. The endowment problem is not very different: administrators have to simultaneously optimize multiple, competing objectives. These competing objectives for a central bank are highlighted in Figure A1.1.1.

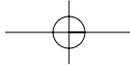
**Return and Cost**

- Maximize Expected Return
- Minimize Volatility of Returns (Capital Preservation)
- Minimize Cost of Reserves
- Minimize Volatility of Cost of Reserves
- Cover Central Bank Expenses

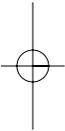
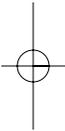
**Uses**

- Guarantee Debt Coverage
- Guarantee Import Coverage
- Ability to Intervene in Currency Markets

**Figure A1.1.1** Objectives for Management of Central Bank Reserves



Central banks also have unusual constraints—most notably the forced holding of gold, even for developed countries, and no investment in equities (with the exception of the Hong Kong Monetary Authority). This makes the job of reserves management and optimal benchmark selection extremely challenging and interesting. However, the implementation of these mandates is largely similar for central banks and pension funds, especially as central banks increasingly hire investment firms to manage reserves.



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NOTES

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1. For further details see the three Harvard Business School case studies entitled “GTE Corporation (A), (B), (C),” listed in the References at the end of the book.
2. See Logue and Rader (1997), Chapter 14.
3. For other key functions of the actuary see Mennis and Clark (1983).
4. See Ambachtsheer and Ezra (1998), Chapters 4–7.
5. See Brinson, Singer, Beebower (1991).
6. Some authors (Bailey 1997) would go as far as to suggest that the investment policy should not only specify mission, risk tolerance, investment objectives, and policy asset mix, but also specify investment management structure and performance evaluation.
7. See Logue and Rader (1997), Chapter 3.
8. Tsumagari (1998) presents a very interesting model to establish ranges around the long-term allocation.
9. See Logue and Rader (1997), Chapter 11 on the internal versus external debate; Ambachtsheer and Ezra (1998), Chapter 10 on the active versus passive, internal versus external, and specialist versus balanced debates; Kehrer (1991) on active versus passive and TAA; and Nakovick (1999) on TAA, global multiasset managers, and derivatives.
10. See also Logue and Rader (1997), Chapter 14.