



Yanni Partners
A Division of GBS Investment Consulting, LLC

MEASURING UP

DELIVERING
THE PROMISE

Volume 22 | Number 2 | Spring 2010

IN THIS ISSUE

Tilting
portfolios in
favor of asset
classes that are
attractively
valued.

Dynamic Asset Allocation: *A Valuable Tool to Mitigate Market Volatility?*

While most investment strategies faltered in late 2008, a number of dynamic asset allocation strategies performed well. Naturally, dynamic asset allocation strategies have attracted considerable attention as institutions search for ways to protect their portfolios from future crises.

In this edition we will explore the basics of dynamic asset allocation strategies and present an objective evaluation of their strengths and weaknesses.

Dynamic Asset Allocation: The Basics

The phrase “dynamic asset allocation,” or DAA, refers to a vast universe of different investment strategies and managers that share a common objective: to tilt a portfolio toward asset classes that are attractively valued and away from asset classes that are overpriced. These strategies began gaining popularity in the 1970s as a custom add-on to large pension portfolios. These institutional investors hired dedicated managers that would tweak portfolios’ long-term strategic asset allocations. A pension plan could invest 60% of its assets in stocks, but the DAA manager could shift that allocation to 70% or 50%, depending on performance expectations for equities. Each manager would create a custom portfolio overlay to complement the long-term exposures.

Most DAA managers traded in stocks, bonds and currencies. The managers would have the authority to shift the portfolios’ exposure to various assets, taking advantage of opportunities and avoiding potential risks.

Dynamic asset allocation strategies have evolved considerably since that time, as illustrated in the timeline on page 2. Today they come in various forms (mutual funds, hedge funds, custom separate accounts) and with various styles (long-only vs. long/short, with and without leverage). The intent of the strategies, however, remains true to its customized roots. DAA managers attempt to exploit short-term market mispricings and tilt their portfolios toward the most attractive assets around the world. Today’s managers typically trade at the market level rather than at the individual security level. For example, they make calls such as preferring German stocks to German bonds, or preferring British bonds to Australian stocks. The potential combinations are almost limitless.

DAA strategies rely on management firms being able to process a vast amount of information and quickly identify and act on short-term opportunities. Because the universe of potential investments and combinations is so broad, most DAA managers use a quantitative process to identify and rank potential investment options. A quantitative process, relying on computerized analysis of thousands of potential trading ideas, is more comprehensive than a team of fundamental investment analysts researching trades one-by-one.

DAA implementation methods are almost as diverse as the universe itself. The most basic strategies offered are often mutual funds. These funds typically invest in securities (such as ETFs [exchange traded funds] and other mutual funds) rather than derivatives, and most are long-only rather than taking both long and short positions. (A short position is a bet that the price of an asset will decline.) In addition, most mutual funds do not use leverage.

One Specific DAA Strategy: GTAA (Global Tactical Asset Allocation) and managed futures strategies have increased complexity and flexibility. Managers utilizing these strategies trade almost exclusively in derivatives markets, and most take both long and short positions. Many GTAA and managed futures managers also use leverage. The additional flexibility to bet that prices will go up (long positions) and down (short positions) allows these managers to capture relative mispricings between paired asset classes. If the manager determines that U.S. bonds are underpriced relative to Japanese bonds, the manager can go long in the U.S. market and short in the Japanese market. The long and short positions help to focus the portfolio on the relative mispricing between the two markets.

Another DAA Strategy: Global macro hedge fund strategies operate at yet another layer of complexity. These managers can use all the tools of the simpler strategies, and can also buy less liquid assets, such as physical commodities and individual

Dynamic asset allocation strategies have evolved considerably over the years. Today they come in various forms, and with various styles.

FIGURE ONE

DAA Timeline

1970s

Dynamic Asset Allocation (DAA) strategies first developed. DAA was first introduced as an “overlay” service, which made reference to a client’s existing asset allocation and currency exposures as a starting point in formulating and sizing appropriate risk positions.

Early '80s

Enthusiasm for the strategy caused assets managed under a DAA mandate to balloon. Strategies focused primarily on adding value by forecasting relative returns between stocks and bonds or cash only.

1986

Brinson, Hood, and Beebower study of Strategic Asset Allocation. Study showed that 90% of variability of a fund’s return over time is a function of strategic asset allocation, suggesting little opportunity to add value through active management. Study supported idea of DAA.

1987

October stock market crash. Many DAA managers had an underweight position in stocks before the market crash and had excellent performance, leading to an explosive growth of interest in DAA strategies.

1990s

Poor DAA performance due to secular declines in volatility, along with an increased reluctance to make meaningful asset allocation shifts, contributed to the demise of multi-asset mandates and a widespread restructuring of mandates into specialist, single asset components.

2000s

Global aspect is widely accepted into DAA strategies, and Global Tactical Asset Allocation (GTAA) became the predominant strategy in the tactical asset allocation investment space.

stocks and bonds. Investors should consider the fact that more complicated strategies require more comprehensive due diligence and ongoing monitoring procedures.

Some investors might resist the notion of DAA because it represents a new philosophy as opposed to the asset allocation approach: adhering to the fund's policy targets within narrow bands by relying on rebalancing. The traditional approach of adhering closely to policy targets stems from academic work and practical experience, which demonstrate the difficulty of "timing" markets. Market timing involves judgment calls about potential near-term swings in markets. We believe that the traditional fixed-allocation approach has generally served investors well over the long term. Recent academic work, along with the relative success of several DAA strategies, warrants further consideration of DAA strategies in certain cases. A well-designed and disciplined DAA approach offers the potential to improve a portfolio's overall ratio of expected return to risk. It is important to recognize, however, that the potential success of a DAA approach requires the selection of a suitable vehicle. Moreover, the investor must understand the unique risks of DAA before considering it. DAA can serve as another potential tool in the investor's quest for capital growth and protection.

Strengths: Why Consider Dynamic Asset Allocation?

Dynamic asset allocation strategies can provide an opportunistic tilt to a portfolio's long-term strategic asset allocation. Asset allocation accounts for more than 90% of long-term returns, and DAA strategies offer a tactical way to potentially enhance that performance. Most dynamic managers focus on short-term opportunities with a one- to three-month lifetime (and in some cases, even shorter). These opportunities arise and dissipate much too quickly for a typical institutional investment committee to take advantage of the return

potential. A dedicated DAA manager has the tools and procedures in place to both identify and act on short-term market opportunities. Global markets are relatively efficient, so the ability to act quickly is critical. A dedicated DAA manager also allows investment committees to focus on selecting the long-term, strategic asset allocation that is appropriate for the portfolio at all times, rather than worrying about short-term opportunities.

Dynamic asset allocation strategies also offer the potential to improve the diversification and reduce the risk of the overall portfolio. DAA strategies are generally uncorrelated with other major asset classes, including stocks and bonds. Uncorrelated assets typically rise and fall independently of one another, which improves diversification since DAA portfolios might preserve capital when stock or bond prices are declining. In fact, some DAA strategies have demonstrated their best performance during some of stocks' most difficult periods. *Figure Two* examines different asset class returns when equities have performed well (best 10 months) and when equities have performed poorly (worst 10 months). Managed futures strategies, represented by the Barclays Commodity Trading Advisor (CTA) Index, performed best when stocks were at their worst. Managed futures also provided better protection for the portfolio than bonds could (shown by the Barclays Capital Aggregate Index). The average monthly return shows that managed futures generated equity-like returns over long periods.

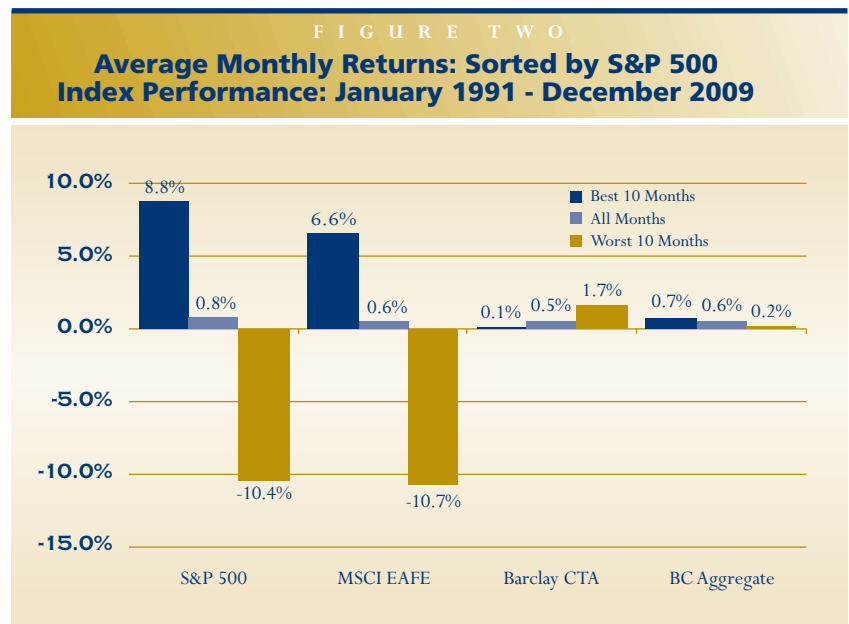
Weaknesses: What Can Go Wrong?

Unfortunately, the vast universe of investment options and the complex nature of many DAA strategies mean that investors need to worry about a number of different issues when considering such a strategy. First, the quantitative nature of the investment process relies heavily on processing a large and diverse array of data on a daily basis. Number-crunching complexities aside, quantitative

processes are naturally backward-looking. The numbers can show definitively what happened yesterday, but they are far less clear in forecasting what will happen tomorrow. Quantitative strategies can falter when markets change abruptly, such as the time oil peaked at more than \$140 a barrel in July 2008, and when stocks bottomed out in March 2009. Quantitative strategies typically underperform when market trends change. Quantitative models are also constantly evolving. This can be a positive development, representing a commitment to continuous improvement, but it requires closer scrutiny from investors. The DAA manager hired today will very likely look quite a bit different a year from now, and that manager's investors must be comfortable with the evolution of the strategy in order to remain invested.

GTAA, managed futures and global macro strategies involve additional risks. Managers that use short sales need to protect against extreme losses. When an investor takes a long position, such as buying a stock, the most the investor can lose on the position is the original purchase price (if the stock price falls to \$0). When an investor shorts an asset, however, it is possible to lose several times the original investment price (if the asset triples in price, for example, the investor would lose 200% of the original investment). The use of derivatives also introduces new risks. Some derivatives involve counter-party risk, which is the risk that your trading partner cannot pay what is owed; all derivatives require an advanced understanding of capital markets and a higher degree of monitoring than traditional investments generally require. The use of derivatives can also introduce leverage into the portfolio, so investors must carefully monitor the total risk exposure of their portfolios. Derivatives can be a highly effective and low cost investment tool, but they are not appropriate for all portfolios and all institutions.

Another risk of DAA strategies lies in the evolution of the strategy itself. Originally developed as a



customized investment strategy tailored to fit the goals and risk tolerance of a single portfolio or institution, many DAA strategies are now offered in a one-size-fits-all fund structure. Investors considering a fund (mutual, hedge or other) should be careful to select one that invests in a manner consistent with their unique goals and objectives.

Dynamic Asset Allocation: Not For Everyone

Despite the appealing track record and potential to protect portfolios from losses, DAA strategies are not appropriate for all institutional investors. There are, however, a wide variety of methods and investments that can be used to incorporate the concept into portfolios. Institutions interested in DAA strategies should first carefully consider the goals and risk tolerance of their organization. Are derivatives acceptable? Should the institution allow short sales? Leverage? How will investment managers be selected and monitored? Institutions that address these questions and determine that a DAA strategy is appropriate may find they are able to enhance their portfolios' diversification and help protect against the next market crash – without significantly sacrificing returns.



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RISK MANAGEMENT REVISITED



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Yanni Partners has embarked on a relentless quest to advance each client's mission. This quest emanates from the Firm's credo to serve as a "trusted advisor." The trusted advisor model impels the service provider to pursue two endeavors:

- ❑ Engage in an intensive dialogue with each client to understand the organization's key needs.
- ❑ Develop effective solutions to those needs.

The trusted advisor model helps the service provider to build "stakeholder" value by resolving key needs. As an investment consultant, Yanni Partners strives to add value by structuring successful investment portfolios. A successful portfolio will deliver a high expected return at an appropriate level of risk. The specification of the appropriate risk level requires the intelligent design and execution of a risk management program. Yanni Partners has therefore focused on risk management as a key strategic initiative for many years.

Introduction

In 2002, Yanni Partners wrote a research paper *Managing Investment Risk: The Path to Achieving Objectives*. The 2002 paper presented a framework to measure and manage investment risk. The paper defined risk as the failure to meet investment objectives.

The 2002 paper offered the following conclusions:

- ❑ Effective risk management guides an organization to intelligent use of resources. An organization's failure to meet investment objectives might jeopardize its viability and therefore its core mission.
- ❑ Successful risk management strategies require robust techniques to measure risks. Robust techniques must surmount limitations inherent in many conventional approaches. One such conventional limitation rests on the assumption that capital market returns follow a normal (bell-shaped) distribution. In reality, capital markets have displayed non-normal characteristics. The markets have tended to sustain large losses (so-called negative outliers) with greater frequencies than a normal distribution would suggest. Rigorous quantitative techniques can model such "left tail risk" with greater precision than such conventional approaches.
- ❑ Correlations of returns among certain risky assets have tended to surge during market crises. The expected benefits from broad diversification have not fully materialized during market shocks. An asset allocation model must account for this phenomenon to develop an effective investment strategy.
- ❑ The investment industry has developed a set of "best practices" for reporting and planning. A sound operations infrastructure will strengthen the investor's capacity to manage risks. Such a discipline will also help an institutional investor to fulfill its fiduciary obligations.

This current paper updates the 2002 paper. We describe insights that we have gleaned from our risk management practices since 2002. These insights have provided the foundation to build investment portfolios to incorporate effective risk management techniques. We therefore describe the analytical models that we have built in response to the quantitative techniques that our 2002 paper introduced. This paper also discusses an emerging concept in finance literature, *Enterprise Risk Management (ERM)*. ERM encompasses an analytical framework that links the management of the investment portfolios to the overall management of the enterprise, and it serves as a holistic risk management framework. ERM provides a rigorous analytical framework for investment management because it focuses the formulation of investment strategy toward the organization's core mission.

Yanni Partners responded to the 2002 paper by building a new asset allocation modeling platform to address shortcomings in certain conventional approaches. We included the following features in our current platform.

- ❑ *Statistical techniques that account for markets' tendencies to sustain large negative losses with greater frequencies than a normal distribution would predict.*
- ❑ *Statistical techniques that account for the tendencies of risky markets' return correlations to increase during periods of market stress.*
- ❑ *The ability to incorporate an institution's cash flows in the projections of portfolio values to account for the complex dynamics between the timing of cash flows and fluctuations in the markets' environments.¹ The timing and magnitude of cash flows affect a portfolio's potential growth and risks. We have concluded that an effective asset allocation model must account for cash flows in a rigorous manner. Moreover, the inclusion of cash flows in the planning process enhances the utility of the output for the client.*
- ❑ *Output measures that respond to the client's needs. We developed versions of the models for different types of entities: pension plans, endowments, foundations, healthcare institutions, trust funds, among others. The pension plan model projects assets, liabilities and funded ratios. The endowment model projects asset values, spending amounts and the probability of achieving inflation-adjusted growth.*

Enterprise Risk Management

Background

Our 2002 risk paper described specific management techniques to control investment risks:

- ☐ Establishing a sound investment “infrastructure” and
- ☐ Implementing “best practices” as advanced by the current thinking in the investment management community.

Our 2002 paper described a sound investment infrastructure as “...an understanding of the investor’s capacity to bear risks, clear and realistic objectives, a policy statement, a management process that links the investment strategy to the objectives, and rigorous performance measurement techniques.”²

The best practices described in the 2002 paper emanated from a 1996 report written by the Risk Standards Working Group.³ Eleven representatives from the institutional investment community formed the Group to advance a rigorous and practical set of industry standards. The 20 standards include several of the following principles:

- ☐ Acknowledgment of fiduciary responsibility
- ☐ Written policies and guidelines
- ☐ Independent risk oversight
- ☐ Clearly defined organizational structure and roles
- ☐ Identification and understanding of key risks
- ☐ Setting risk limits
- ☐ Stress testing
- ☐ Review process for new activities

Yanni Partners believes that these 20 Risk Standards have served the industry well. These Standards have provided a solid foundation for the advancement of risk management techniques. ERM represents an evolution of the risk management principles promulgated by the Working Group.

Evolution of ERM

Many factors have prompted managements of organizations to strengthen the organizations' risk management practices. Several jarring financial failures such as Enron and the hedge fund Long-Term Capital Management have shaken investors' confidence in the viability of the financial markets. Furthermore, Boards of Directors and Trustees have developed a deeper sensitivity to the importance of good corporate governance. The Sarbanes-Oxley Act of 2002 has codified additional corporate governance obligations.⁴

One industry source, the Committee of Sponsoring Organizations of the Treadway Commission (COSO), has defined ERM in the following way:⁵

“Enterprise risk management is a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”

This definition re-enforces the notion of risk as the entity’s potential failure to meet its investment objectives.

According to COSO, the following management steps constitute ERM:

- ❑ *Internal Environment* – Management articulates the organization’s values, tone, philosophy and “appetite” for risk.
- ❑ *Objectives Setting* – Management must define objectives that support the mission, consistent with the organization’s risk appetite.
- ❑ *Event Identification* – When the entity identifies internal and external events, it must distinguish between threats and opportunities.
- ❑ *Risk Assessment* – The entity must assess the likelihood of each key risk and its probability of occurrence.
- ❑ *Risk Response* – Management needs to decide whether to avoid, accept, reduce or share each potential major risk.
- ❑ *Control Activities* – Management implements policies and procedures to manage the risks effectively.
- ❑ *Information and Communication* – Management disseminates pertinent information to execute the critical risk management functions.
- ❑ *Monitoring* – The entity monitors the full dimensions of Enterprise Risk Management. The entity modifies the risk management activities as needed.

Application of ERM to Investment Management

COSO has developed the above framework in a general way to apply to a broad range of organizations. Despite the general nature of this ERM framework, it provides a robust application to the investment management process. An organization integrates investment management functions into its ERM paradigm through the following actions:

- ❑ *Implement Governance Procedures* – The potential success of an investment management program hinges on good governance practices. Management must understand the needs and characteristics of the organization's stakeholders, regardless of whether the entity is a for-profit or not-for-profit organization. Management must acknowledge its applicable legal and fiduciary obligations. The appointment of an oversight body (often a committee of board members), comprised of committed and knowledgeable people, facilitates effective governance.

Management must ensure that the organization possesses the requisite analytical and administrative expertise, either through the hiring of internal experts and/or the engagement of capable external service providers. The organization should document key policies and procedures, and it should record minutes of the oversight committee meetings. Implementing regular educational sessions for the board and staff will strengthen the efficacy of the governance process.

- ❑ *Determine Objectives* – Management specifies the key objectives for the portfolio and establishes benchmarks. This step requires management to articulate the portfolio's key mission. The following examples of a pension plan and endowment explain how the entity's unique purpose affects the investment objectives.

For a pension plan, the fund's objective is to cover benefit payments over the life of the plan. Pension plans specify the funded ratio (ratio of assets to liabilities) as a key benchmark. The plan sponsor endeavors to keep the funded ratio above 100% and to minimize fluctuations in this ratio over time.

For an endowment, the institution bears a fiduciary obligation to preserve (and enhance) the value of a donor's gift, net of investment returns, spending and inflation. The organization also seeks consistent growth in the spending from the gift. An endowed institution specifies appropriate objectives: growth in the endowment's purchasing power and stability in the spending stream over time.

The process of defining objectives helps to link portfolio management with the management of the overall enterprise. Management documents the objectives in the investment policy statement.

- ❑ *Develop Investment Strategy* – Management formulates an investment strategy to achieve the objectives. The term “asset allocation” constitutes the key strategy decision. The asset allocation refers to the fund’s policy weights for the major asset types such as domestic equities, international equities, fixed income, real estate, private equities, commodities and the like. Studies have documented the power of the asset allocation decision. One such study has concluded that the asset allocation decision has accounted for roughly 90% of an institutional fund’s risk and return over time.⁶

Management specifies an asset allocation strategy based on its assessment that the strategy will provide a high probability of achieving the key investment objectives. This step requires a rigorous analytical process. A rigorous process must project the likelihood that a given investment strategy will achieve the specific investment objectives. An effective process requires four features:

- (i) *Reasonable capital market assumptions – estimates of the markets’ future returns and risks.* Reasonable estimates stem from forward-looking assessments of the key economic drivers of risks and returns.
- (ii) *Accurate measurement and modeling of the markets’ risk characteristics.* This feature must incorporate risky markets’ tendencies to decline in tandem during periods of stress. It must also reflect markets’ actual tendencies to sustain large losses to a much greater extent than certain traditional approaches assume.
- (iii) *The ability to translate the portfolio’s performance into measures specified in the organization’s objectives.* For a pension plan, for example, the model would compute how changes in the portfolio will affect the funded ratio. For endowments, the model would compute the probabilities that the fund’s value will grow net of inflation and spending.
- (iv) *The ability to integrate projected cash flows into projections of future portfolio values.* Portfolios typically experience cash inflows and outflows. For example, a pension fund receives contributions from the sponsor, and it disburses benefits to retirees. An endowment receives gifts from donors, and it transfers payments to the organization’s operating budget. The magnitude and timing of cash flows affect the fund’s potential growth and its capacity to bear investment risk. An effective modeling process must therefore accommodate cash flow projections.

A rigorous model will perform stress tests. It will quantify worst case outcomes for each assumed investment strategy. Management can use the model to eliminate certain investment strategies with unacceptable worst case outcomes. The model will help management to identify an investment strategy with a risk profile that appears suitable for the organization.

- ❑ *Construct the Portfolio* – After management determines the fund’s policy weights, management must establish a mechanism to buy and sell individual securities within each asset type. A professional investment advisor (manager) typically serves this role. Management selects a market benchmark for each asset type to monitor the manager’s performance and to control risk. The following traits characterize an effective investment manager:
 - (i) Stable organization.
 - (ii) Qualified staff.
 - (iii) Cogent and compelling investment thesis.
 - (iv) Commitment to best practices.
 - (v) Culture of continuous improvement.
 - (vi) Sound investment process.
 - (vii) Rigorous risk controls.
 - (viii) Effective operational procedures.
- ❑ *Establish Monitoring Process* – Management must install a set of procedures to monitor the portfolio on an ongoing basis. These procedures must also track the pertinent measures embedded in the entity’s objectives. In the case of a pension fund, for example, the monitoring procedures must include ongoing measures of the plan’s funded ratio. The portions of the monitoring framework that track the portfolio must measure the fund’s compliance with investment objectives such as the fund’s policy targets, sector limits, issuer limits, quality guidelines, among others.

When the program’s results deviate from the objectives, management must determine the need for potential remedial action.

Applications of Risk Management Techniques for Different Entities

The following sections explain how different organizations can apply an ERM framework to build a holistic approach to sound risk management.

Pension Plans

Numerous types of organizations sponsor defined benefit pension plans. Sponsors include corporations, non-profit entities, state/local governments, among others. The sponsor grants pension benefits based on service (and sometimes salary). The sponsor establishes a trust to hold the sponsor's contributions and accumulated investment earnings. The trust disburses pension benefit payments to eligible plan participants. The trust typically holds a mix of marketable securities such as equities and fixed income; in some cases the trust might hold alternative investments.⁷

The actuary computes the plan's liability. The liability represents the present value of projected benefits over the life of the plan. The discount rate is based on the yield of a high quality fixed income portfolio with duration similar to the duration of the liability. The process of discounting the liability, based on prevailing interest rates, illustrates a key characteristic of the liability: its market sensitivity. Just as the pension fund fluctuates over time, in response to changes in the capital markets, so too does the liability. The sponsor can legally settle the plan's liability by purchasing annuity contracts from an insurance company. The cost of the annuity cost will typically approximate the actuary's computed liability. The liability value varies inversely with changes in interest rates, all other factors held constant. A potential drop in interest rates poses a significant risk to plan sponsors.

The plan sponsor manages the trust to ensure full funding of the liability over time. The sponsor focuses on the plan's funded ratio (assets/liabilities) as the key management objective. Potential variability in this funded ratio constitutes the key risk for the sponsor. Inadequate funding might jeopardize the financial viability of the sponsor and imperil the benefit security of plan participants.

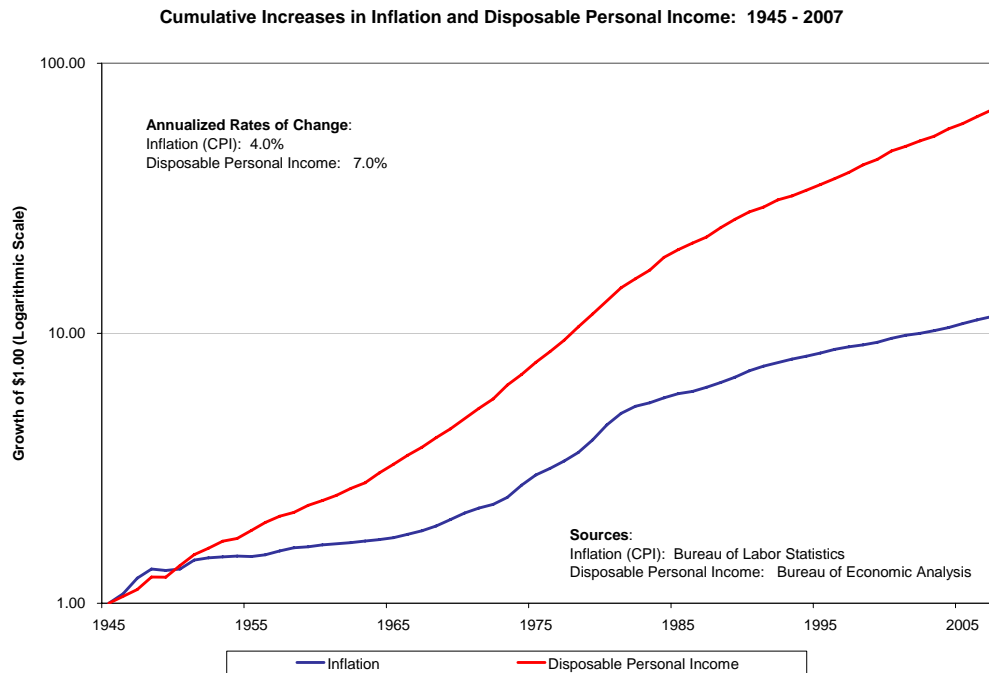
An inadequate funded status will require an increase in the sponsor's contributions over time.

The sponsor bears all of the economic and demographic risks of the pension plan. The sponsor must therefore account for these risks when developing a comprehensive risk management plan for the enterprise.

The following factors affect the plan's funded ratio and the ultimate costs to the sponsor:

- Benefit Payments.** The plan document specifies the benefit formula. Two features of the benefit formula will affect the plan's funded status: the level of payments and the payments' sensitivities to economic variables such as inflation and productivity. Benefit provisions peg pensions to years of service and another crediting factor based on a flat dollar amount or the employee's salary. Collective bargaining agreement frequently use a flat dollar amount, yet this amount can increase over time in response to inflation. An employee's salary responds to both inflation and a merit factor based on productivity. Chart 1 displays long-term trends in inflation and disposable personal income since 1945. The performance of the economy exerts a significant effect on a plan's benefit levels and hence its ultimate cost to the plan sponsor.

Chart 1



The plan sponsor can control the plan's cost over time by changing the benefit formula. The sponsor can curtail the level of benefits to improve the plan's funded ratio. The sponsor can also reduce the benefit formula's sensitivity to inflation and wage growth to reduce sponsor's risks.

- ❑ *Capital Market Experience.* The capital markets affect the economics of the plan in two ways: the sponsor's cash contributions and the liability value.

The fund's investment returns determine the level and variability of the sponsor's cash contributions to the plan. High returns will reduce the sponsor's contributions and will strengthen the funded ratio. Low returns have the opposite effects.

The level of interest rates exerts a powerful effect on the plan's funded position. Most ongoing plans will pay retirees' benefits over many decades. The actuary computes the plan's liability by discounting future benefits using the current yield of a high-quality, fixed-income portfolio with a duration (interest rate sensitivity) comparable to that of the liability. Most ongoing plans have a liability that bears a high degree of interest rate sensitivity, similar to a very long duration fixed-income portfolio. Even modest changes in interest rates will cause large swings in the value of the liability. A plan sponsor that is considering a termination of the plan bears the risk of a potential decline in interest rates. Such a decline could raise the liability value significantly, thereby raising the costs of purchasing annuities from an insurance company to settle the liability.

The following charts illustrate how capital market performance affects the economic characteristics of a typical pension plan.

Chart 2 displays 50 years of projected benefit payments for a typical pension plan; it shows the future and present value for each year. The example assumes a 20-year US Treasury yield (4.6% as of December 2007) as the liability discount rate. This rate approximates the rates available from high quality insurance companies that could settle the liability for the sponsor. The current liability value of \$721 million displays a long duration of 19 years, indicating a high degree of interest rate sensitivity.

Chart 2

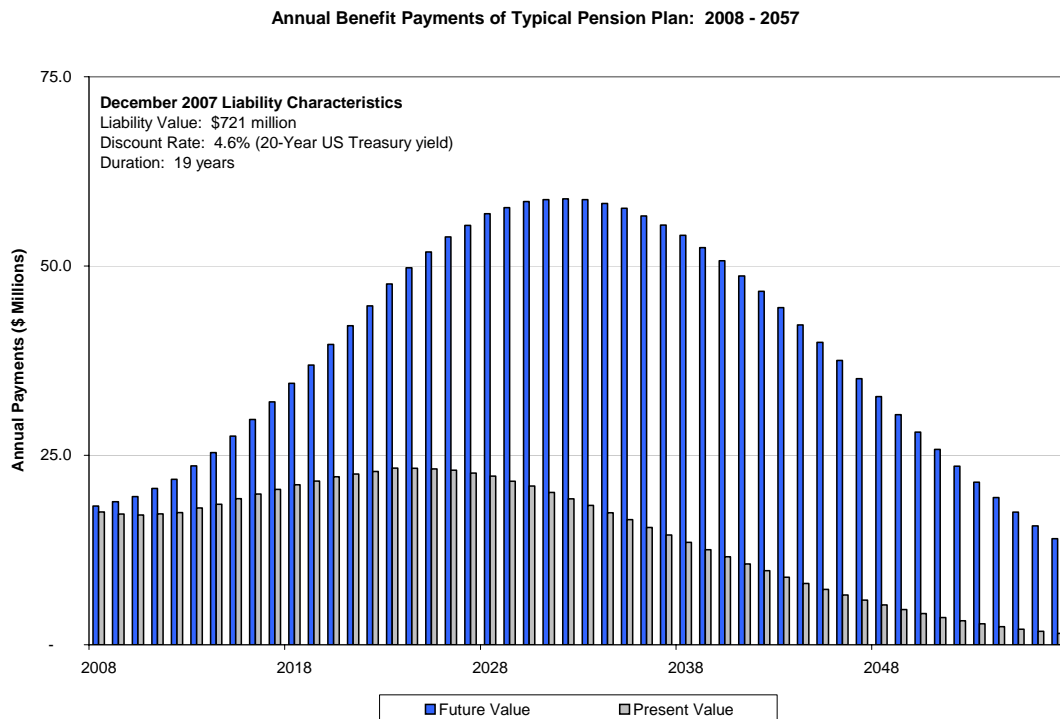
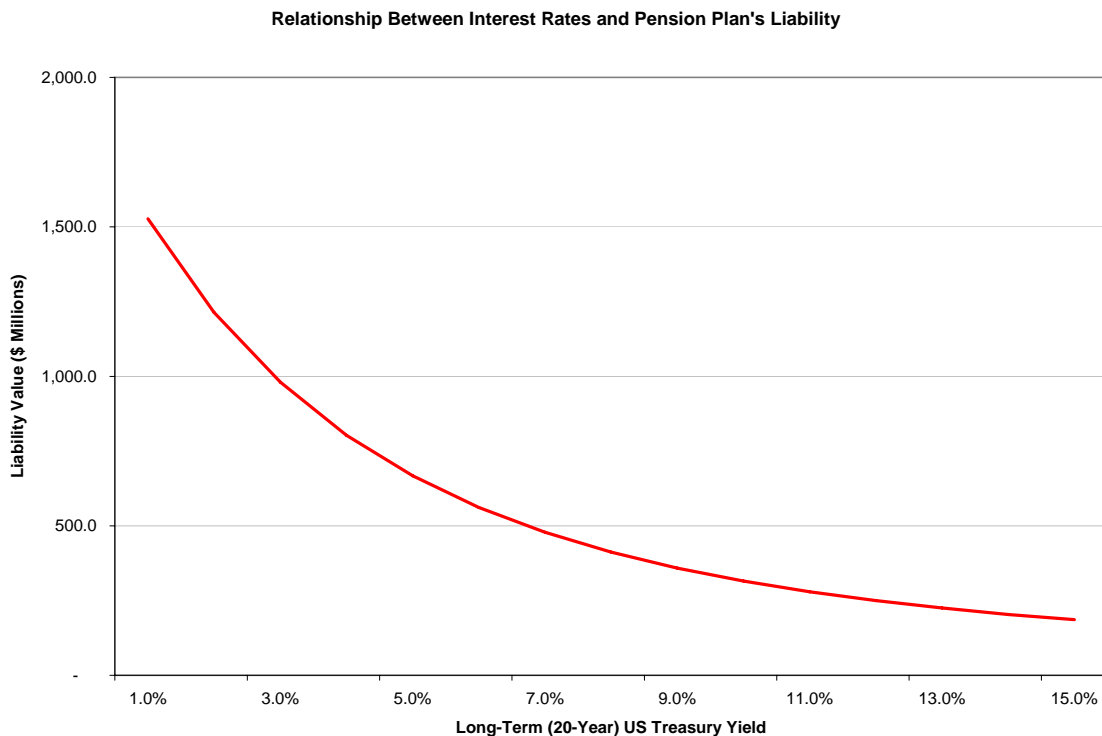


Chart 3 illustrates the high degree of interest rate sensitivity of the liability. This example uses the annual benefit payments from Chart 2. Chart 3 reveals liability values across a broad range of interest rates. A potential decline in interest rates from the December 2007 level of 4.6% will raise the value of the liability. This relationship poses an acute risk for a plan sponsor that contemplates a potential termination of the plan. An investment in high quality, long duration fixed income will help to remedy this interest rate risk for the plan.

Chart 3



Interest rates have displayed the propensity to vary widely over time. Chart 4 plots 20-year US Treasury yields from April 1953 to December 2007. Over this period, rates have ranged from 2.6% to 15.1%.

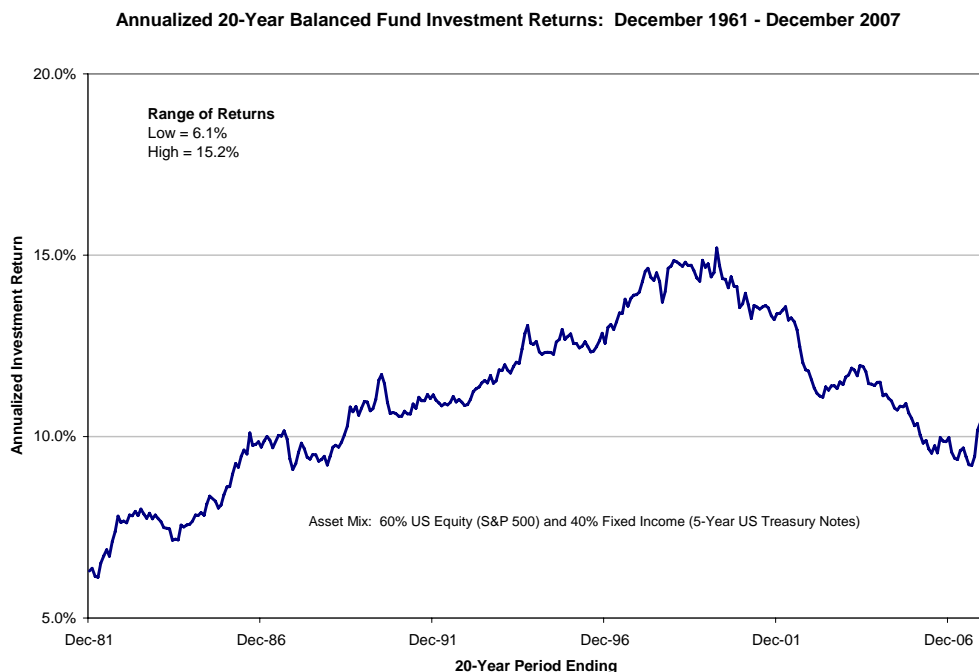
Chart 4

**History of 20-Year US Treasury Bond Yield
April 1953 - December 2007**



The pension fund's long-term investment return also affects the ultimate economic cost to the sponsor. For ongoing plans, sponsors typically invest in a blend of equities and fixed income. Sponsors rely on equities to achieve capital growth and to hedge the characteristics of the liability that respond to economic growth such as inflation and productivity. Fixed income helps to stabilize returns and neutralize the liability's interest rate sensitivity. A typical balanced portfolio exhibits a high degree of variability. From December 1961 to December 2007, rolling 20-year annualized holding period returns of a 60% equity and 40% fixed-income strategy have ranged from 6.1% to 15.2%. Chart 5 illustrates the variability of this balanced fund's investment returns over 20-year periods

Chart 5



The magnitude of the realized investment return exerts a major effect on the sponsor's required cash contributions. If the pension fund earned an annualized return of 6.1% over 20 years, the sponsor would have incurred \$349 million in required contributions (in present value terms) to fund the first 20 years of benefits displayed in Chart 2. In contrast, if the fund earned an annualized return of 15.2% over 20 years, the contribution requirement would drop by more than half to only \$162 million in present value terms to fund the same schedule of benefits.

- ☐ **Contribution Policy.** The plan sponsor can improve the plan's funded status by voluntarily increasing the level of contributions and/or accelerating the schedule.
- ☐ **Demographic Experience.** Improvements in mortality from continued advances in medicine will raise the liability and therefore diminish the funded ratio.

A plan sponsor can test how changes in contributions, investment strategy, benefit levels and demographic experience might affect the funded ratio. A rigorous risk management technique will test the effects of these “policy levers” in stochastic (probabilistic) terms. Chart 6 displays the results of such a test. Chart 6 shows how changes in investment strategy, contributions and benefits will affect the funded ratio in stochastic terms. This framework can help the sponsor reach informed management decisions regarding the potential advantages and risks of pension plan policy decisions.

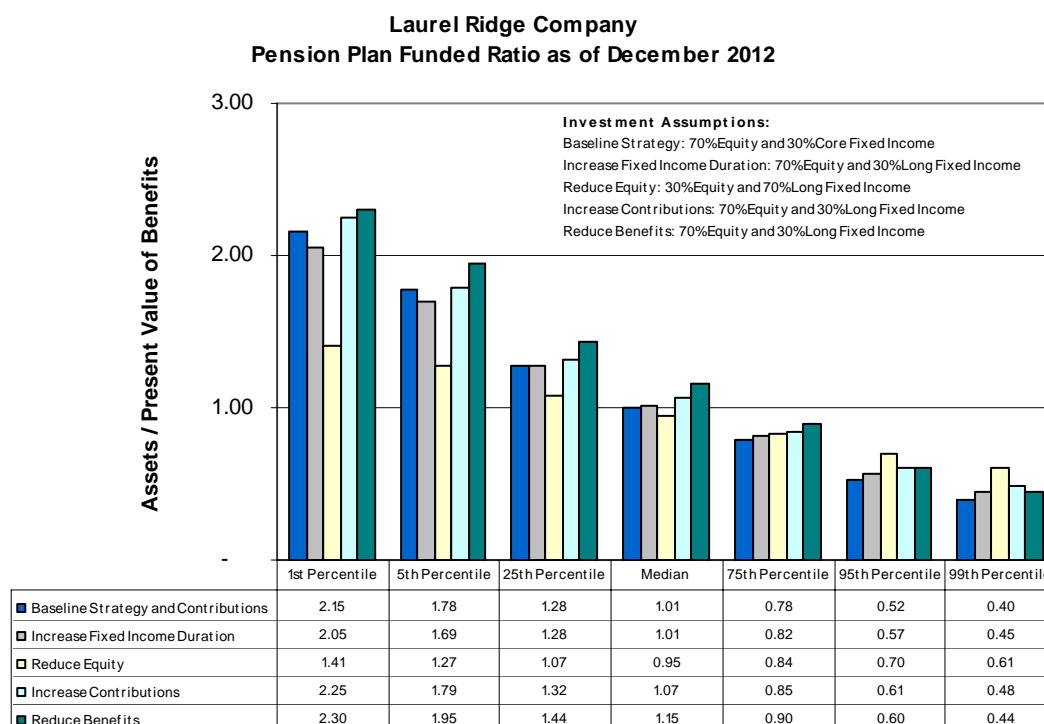
The simulations in Chart 6 reflect the benefit schedule of a typical plan, assumed contributions and Yanni Partners’ projections of the capital markets’ risks and returns. Chart 6 conveys the risks of different scenarios by showing seven points from the distribution of potential outcomes: the 1st, 5th, 25th, 50th, 75th, 95th and 99th percentiles. For example, the 95th percentile measures downside risks; it means that 95% of the results are likely to be more favorable. Chart 6 displays the following scenarios:

- ☐ Baseline investment strategy and annual contributions – investment strategy of 70% US and international equities and 30% core fixed income.
- ☐ Increase fixed-income duration – investment strategy of 70% US and international equities and 30% long duration fixed income. (The strategy has lengthened fixed-income duration to help neutralize the interest rate risks inherent in the liability.)
- ☐ Reduce equity – investment strategy of 30% US and international equity and 70% long duration fixed income.
- ☐ Increase contributions – investment strategy of 70% US and international equity with higher contributions compared to other scenarios.
- ☐ Reduce benefits – investment strategy of 70% US and international equity with benefit reductions compared to other scenarios.

The simulations reveal the following conclusions:

- ☐ An increase in the fixed-income portfolio’s duration will help to stabilize the plan’s funded ratio without a significant change in the expected ratio.
- ☐ A reduction in the fund’s equity allocation is likely to reduce the expected funded ratio and reduce the variability in this ratio.
- ☐ An increase in contributions will increase funded ratios. Likewise, a reduction in benefits will also increase funded ratios.

Chart 6



A pension plan constitutes a distinct legal entity separate from the plan sponsor. Nonetheless, the plan affects the economic characteristics and risks of the plan sponsor in a profound way. In concept, the plan's liability acts as another liability of the sponsor because the plan's liability exerts a claim on corporate assets in the form of future cash contributions to the plan. One can also view the pension fund as an extension of the sponsor's assets because favorable (unfavorable) investment experience strengthens (weakens) the sponsor's financial position by reducing (increasing) contributions to the pension fund. A comprehensive approach to risk management will help the sponsor to link pension plan management with financial management of the overall enterprise. For example, if the sponsor is a corporation that is engaged in the production of raw materials such as metals and minerals, the corporation might possess a natural hedge against inflation from its corporate assets. The corporation should assess the pension plan's potential exposure to inflation. It might not be necessary for the sponsor to build inflation protection into the pension fund using "real return" assets such as US Treasury Inflation Protected Securities, commodities and real estate.

As previously noted, many plans bear sensitivity to changes in interest rates due to the long duration of the plan's liability. The sponsor should evaluate the corporation's overall exposure to changes in interest rates. An integrated view of the corporation's and pension plan's overall interest rate exposure will facilitate a more holistic approach to risk management.

ERISA requires the plan sponsor to manage the plan for the exclusive benefit of plan participants.

This fiduciary responsibility does not preclude a holistic approach to enterprise risk management. A close linking of pension plan and corporate management will help to strengthen the sponsor, thereby improving its ability to support the plan through potential benefit improvements and increased contributions.

Two recent developments have re-enforced the importance of integrating the plan's management with the overall financial management of the sponsor's enterprise: the Pension Protection Act (PPA) of 2006 and FAS 158. The PPA has strengthened mandatory funding requirements under ERISA. FAS 158, issued in 2006, requires the plan sponsor to record the plan's unfunded liability in its financial statements. In our opinion, PPA and FAS 158 do not diminish the plan sponsor's "control" over the pension plan. Both developments represent the financial community's recognition of economic reality.

Regarding PPA, we note that a plan sponsor bears the obligation to fund all future benefits. PPA simply accelerates previous funding rules that have enabled some plans to accumulate large unfunded liabilities. In the absence of rigorous funding requirements, a sponsor that has a plan with a deteriorating funding position will ultimately lose control over the plan. FAS 158 also embraces a sharper sense of economic realism. In the most fundamental economic terms, the sponsor bears the full risks and liability of an unfunded pension plan. FAS 158 explicitly recognizes this relationship by requiring the sponsor to record the unfunded plan in its financial statements.

Finance literature offers provocative insights into ways that corporations can further integrate pension plan management with enterprise-wide financial management. Robert Merton describes a holistic analytical framework:

*"...an important step...is to extend [pension] ALM [asset-liability management] to assets and liabilities of the whole corporation. The pension fund for a corporation that is not planning to go bankrupt is an encumbered asset of the shareholders. No matter how it is institutionally walled off with separate trustees, if the pension fund does well, incrementally the shareholders are the beneficiaries because the pension liabilities for the most part are fixed-rate debt..."*⁸

Several authors have described how pension plan management can influence overall corporate financial management:

- ❑ Zvi Bodie, Li Jin and Robert Merton have found evidence that some companies do not accurately estimate the cost of capital because companies fail to account for the financial effect of the pension plan on the cost of capital.⁹ Therefore, companies that underestimate the cost of capital take on some uneconomical capital projects. Companies that over estimate the cost of capital erroneously reject potentially profitable investments. Bodie, Jin and Merton concluded that the market risk characteristics of companies appear to reflect the financial characteristics of the companies' pension assets and liabilities. This relationship reflects "market efficiency." Unfortunately, some corporate management have not integrated pension plan financial characteristics in these firms' computations of the cost of capital for capital budgeting purposes.

- ❑ The observation that the firms' equity market risks reflect the pension plans' financial characteristics has profound implications. An increase in the pension plan's equity exposure will increase the fund's expected return and therefore lower the firm's expected contributions to the plan. However, this increase in the pension fund's expected return will also increase the variability in future corporate earnings (through a more volatile pattern of future contributions), thereby increasing the overall risk of the firm. In concept, the firm's cost of capital will increase, thereby offsetting the increase in future earnings in present value terms. Therefore, if the plan sponsor raises the pension fund's future return simply by an increase in the fund's equity allocation, there will be no material immediate benefit to shareholders.¹⁰
- ❑ Some researchers contend that a reduction in a pension fund's equity exposure offers benefits. By reducing pension fund risk, the corporation improves its ability to assume additional operating risks at the corporate level where it can exploit its core competencies. Corporations are in a better position to add value through the pursuit of fundamental business operating risks than by assuming passive equity risks in their pension funds.¹¹
- ❑ Robert Merton also concludes that rating agencies and regulators focus too much on a plan's funded ratio instead of examining the potential financial mismatch of pension assets and liabilities. For example, a fully funded plan with 100% duration matched fixed income is much less risky than 105% funded plan with 85% invested in equities.¹²

Endowments

Background

Endowed institutions include colleges, universities, museums, hospitals and other non-profit entities such as medical research organizations. Such institutions typically maintain a tax-exempt status. The endowment constitutes an asset of the organization. The organization spends a portion of the endowment each year to support the operating budget. The organization can build its endowment over time through effective investment management, moderate spending and the accumulation of gifts from donors. Income from the endowment represents a very desirable form of revenues for the organization. For example, tuition and research revenues for a university might vary based on factors such as demographic changes and government policies. Income from the endowment represents a "permanent" source of income.

Governance Framework

Two pivotal sets of legal guidelines underpin the investment and spending practices of endowments: the Uniform Prudent Management of Institutional Funds Act (UPMIFA) and the Uniform Prudent Investor Act (UPIA). The National Conference of Commissioners on Uniform State Laws (NCCUSL) approved the UPMIFA in 2006 and the UPIA in 1994. Various states have adopted these Acts.

UPMIFA encompasses the following key provisions:

- ☐ *Investment Flexibility.* Portfolio managers are not subject to limits regarding the potential types of investments thought would be suitable for the portfolio.
- ☐ *Investment Expenses.* Trustees bear an obligation to control the fund management expenses given the institution's purpose and the opportunities that are available to the institution.
- ☐ *Distribution of Funds.* UPMIFA acknowledges the concept of a total return spending formula, within the context of the institution as a whole, as an acceptable approach to endowment distributions.
- ☐ *Elimination of Historical Dollar Value Limitation.* UPMIFA eliminates the previous prohibition against spending if the current gift value falls below historical cost.
- ☐ *Guidance Regarding Spending Limits.* States can approve an optional guideline that would characterize a spending rate greater than 7% of the endowment's value to be imprudent.

The UPIA codifies standards of prudence. UPIA traces the roots of these standards to several sources: *Harvard College v. Amory* case (1830), the Model Prudent Man Rule Statute (1942), which the American Bankers Association sponsored, and the Employee Retirement Income Security Act (1974). UPIA advances the following principles:

- ☐ *Standard of Care.* The trustee should exercise "care, skill and caution" and should manage assets within the context of a cohesive investment strategy. The trustee should consider pertinent circumstances such as inflation or deflation, the beneficiary's needs and liquidity considerations.
- ☐ *Diversification.* The trustee should diversify the assets unless compelling reasons suggest otherwise.
- ☐ *Loyalty.* The trustee should manage the assets for the exclusive benefit of the beneficiary.
- ☐ *Impartiality.* If the trustee has two or more beneficiaries, the trustee should manage the assets in a manner to balance the competing interests.
- ☐ *Investment Costs.* The trustee should incur only "appropriate and reasonable" investment and administrative expenses.
- ☐ *Delegation.* The trustee may delegate investment and management functions if the trustee exercises "care, skill and caution."

UPIA supports “modern portfolio theory” as the analytical framework for investment planning. UPIA removes restrictions on types of investments due to the focus on the portfolio as a whole. Any single investment might appear risky on a stand-alone basis, yet it might prove counter-cyclical to other investments, thereby providing valuable diversification benefits.

Financial Management Framework

Just as the endowed institution exists in perpetuity, so does its endowment. The typical endowed institution therefore manages the fund with a very long planning horizon. Many endowment oversight investment committees maintain the view that the endowment can bear a reasonably high degree of investment risk in pursuit of significant capital growth. For this reason, endowments have typically maintained high allocations to equities. As of June 2007, endowments have maintained an average allocation to equities (including alternative investments) of 77%, on an equal-weighted basis, according to the NACUBO 2007 Endowment Study of 785 institutions. On a dollar-weighted basis, the endowments’ June 2007 allocation to equities and alternatives averaged 85%, reflecting the larger endowments’ propensities to pursue opportunistic strategies.¹³

Endowments have invested in alternative investments for several decades. Endowments have pioneered opportunistic investment strategies encompassing private equity, hedge funds, real estate, commodities and other natural resource investments. Alternative investments bear certain drawbacks such as complexity, requirement for extensive due diligence, limited liquidity and high fees. Endowment committees have concluded that the perpetual nature of the endowments supports their abilities to assume these risks.

The principle of “intergenerational endowment equity” guides the management of endowments. According to this notion, the institution bears a fiduciary obligation to each endowment donor to preserve the purchasing power of the donor’s gift. The institution must balance investment and spending strategies to ensure that the gift will, at a minimum, maintain its value after the effects of spending and inflation. Some institutions seek the long-term growth in gifts’ purchasing power over time.

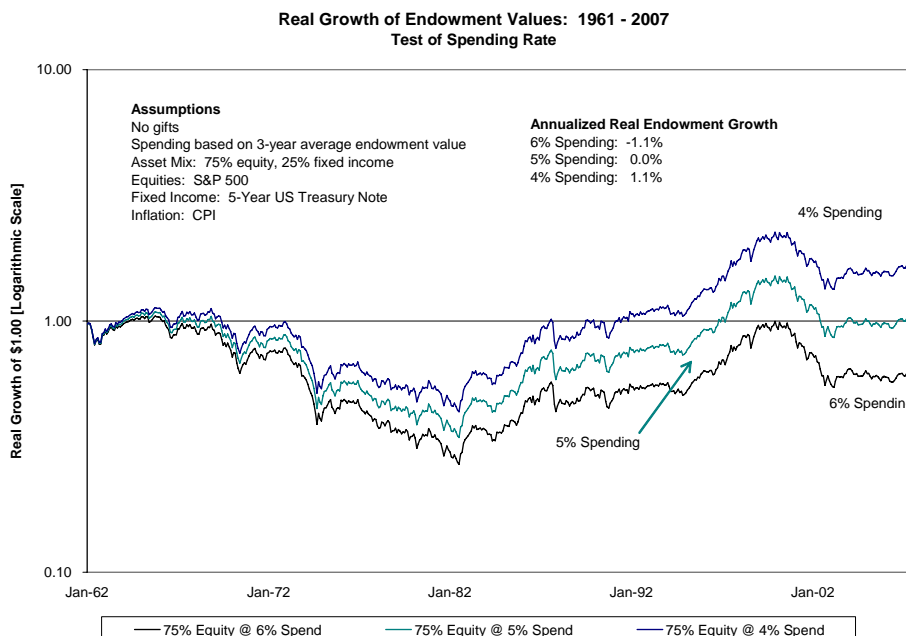
The protection of a gift’s long-term purchasing power requires the institution to limit spending to the endowment’s real (inflation adjusted) investment return. Institutions generally limit spending policies to 3% to 5% of the endowment’s recent value. A three-year moving average is often used as the basis for computing current spending. According to Yanni Partners’ capital market assumptions, a fairly aggressive investment strategy of 70% equity and 30% fixed income would generate an annualized expected return of approximately 6.5%. Given our annualized inflation assumption of 2.3%, a prudent spending policy would limit the annual withdraw rate to 4.2% or less.

A historical perspective illustrates the powerful impact of the spending policy on the endowment's long-term growth. We have performed historical simulations to illustrate the concept of intergenerational equity. We have computed hypothetical endowment and spending values in real terms based on different investment and spending strategies. The time horizon spanned 46 years to include multiple generations as well as diverse economic and market cycles. We assumed no gifts because the principal of intergenerational equity applies on a donor by donor basis. The analysis assumed an initial endowment investment from a donor's gift of \$1.00 on December 31, 1961.

These simulations convey a salient message. The capital markets experience highly variable results in real terms. Spending can aggravate a portfolio's losses. A mix of investment and spending strategies might produce favorable long-term performance, yet the endowment might suffer extended periods of real losses during interim periods. Yanni Partners evaluated the topic of instability in the price level and the capital markets to provide further perspectives. We documented our research in a paper titled *The Quest for Growth*. This paper evaluated the effects of inflation and deflation on the capital markets.

Chart 7 shows how changes in the spending policy affect an endowment's real growth. The analysis assumes three different spending rates of 6%, 5% and 4% (based on a three-year moving endowment value) with the same investment strategy of 75% equity. The analysis isolates the effects of changing a single policy variable: the spending rate. Changes in spending exert a significant effect on the endowment's real growth. A 6% spending subjected the endowment to a cumulative 40% loss in purchasing power over the entire 46-year period. A 5% spending rate enabled the endowment to preserve purchasing power, albeit with significant interim variability. A 4% spending formula promoted cumulative growth of 63% over the entire period.

Chart 7



The structure of a spending formula affects the growth pattern of the fund and the spending stream. The previous example assumed a spending formula based on the three-year moving average of the endowment. An endowed institution can vary the percentage rate that it applies to a three-year moving average as the asset base, or it can alter the formula structure such as changing the length of the endowment value averaging window. During recent decades, endowed institutions have moved from an income based formula to an asset based formula. Institutions have endeavored to transmit asset growth into corresponding growth in the income stream to support the institutions' growing budget needs. State governing laws have sanctioned this shift to asset-based spending. Despite the industry's acceptance of an asset-based formula, some institutions have implemented alternative spending approaches. Some institutions have pegged spending increases to inflation. An inflation-based formula could subject the institution to severe risks in the event of accelerating inflation when financial assets might sustain real losses.¹⁴

Some analysts urge endowed institutions to link current spending to prevailing conditions in the market. One such approach would tie spending to current yields for all asset types: equities, fixed income, real estate, etc.¹⁵ Chart 8 extends the historical analysis depicted in Chart 7 to display the simulated effect of an income-based spending formula. Chart 8 compares historical endowment values stemming from a 4% three-year moving average formula to endowment values that assume that the endowment spends all dividend and interest income each year, assuming 75% equity and 25% income in both cases. Both spending approaches would have given rise to roughly equivalent terminal endowment values; both values reflect real annualized growth rates of approximately 1%.

Chart 8

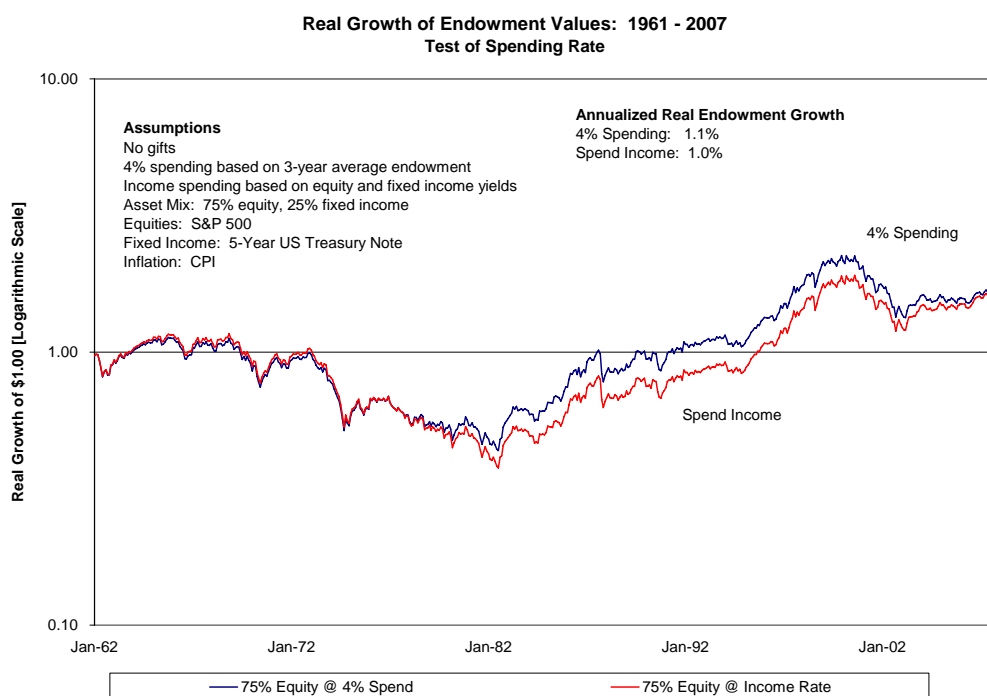
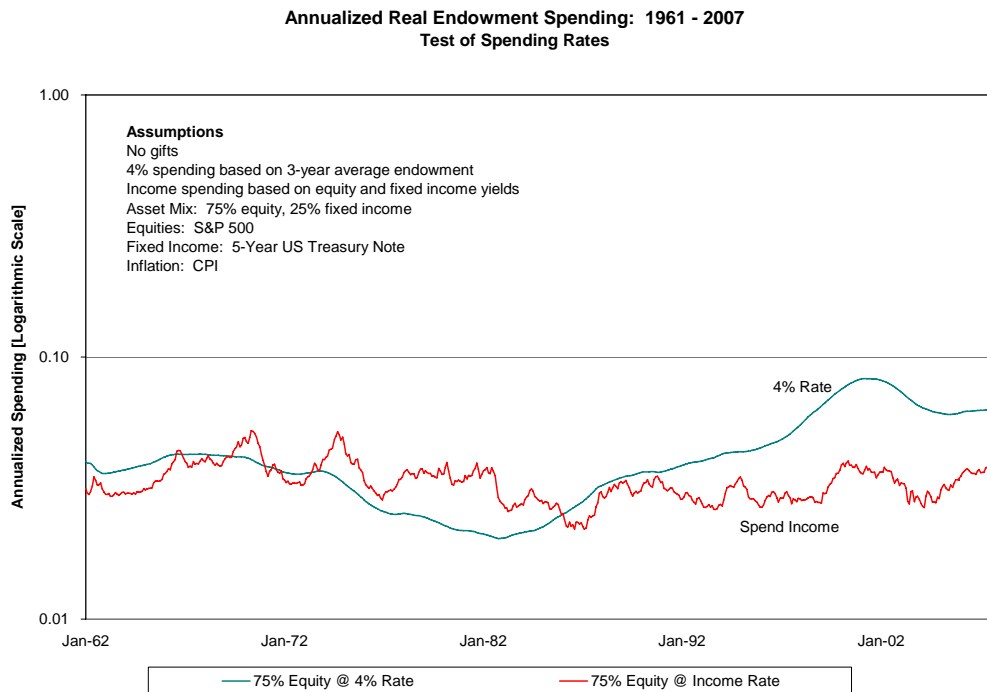


Chart 9 plots the corresponding spending streams from the above analysis. The income-based spending formula has given risen to a more stable spending stream than the 4% asset-based formula.

Chart 9



The more volatile spending pattern from the asset-based formula reflects the erratic patterns of capital market values. Both formulas produced roughly comparable spending amounts from 1962 to 1973. Spending from the asset-based formula declined relative to spending from the yield-based formula from 1973 to 1982. In 1982, spending from the 4% formula began to rise relative to spending from the yield-based formula. Since 1986, the asset-based spending has exceeded income-based spending. Income values have displayed greater stability than asset values in the capital markets. Although the industry practice has shifted from an income-based to an asset-based spending approach, the historical analysis demonstrates that a formula pegged to prevailing market conditions (such as current yield) offers potential benefits under certain conditions.

How can an endowed institution determine the mix of investment and spending strategies that serves the unique needs of the institution? The institution can employ an analytical framework that tests how different investment and spending strategies are likely to affect the following variables: future endowment values, spending stream and the endowment's prospects for growth in purchasing power. Such a framework can help the institution to select investment and spending strategies that reconcile the competing demands for current budget support and the endowment's long-term growth in purchasing power. Charts 10, 11 and 12 show sample output from a stochastic based analysis that tests different investment and spending strategies based on assumed risk and return characteristics of the capital markets. Charts 10, 11 and 12 display future endowment, spending and growth rate values in stochastic terms.¹⁶

Chart 10

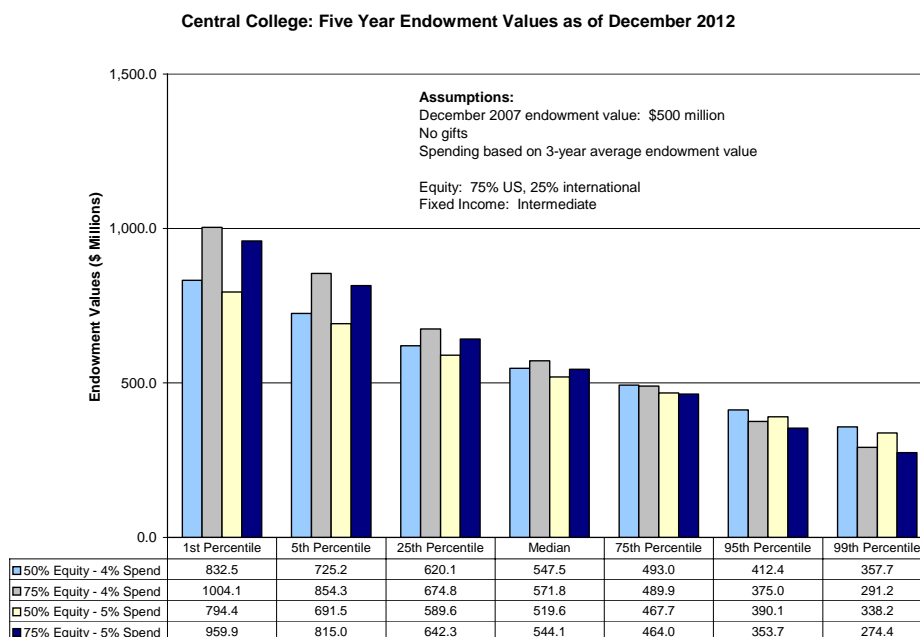


Chart 11

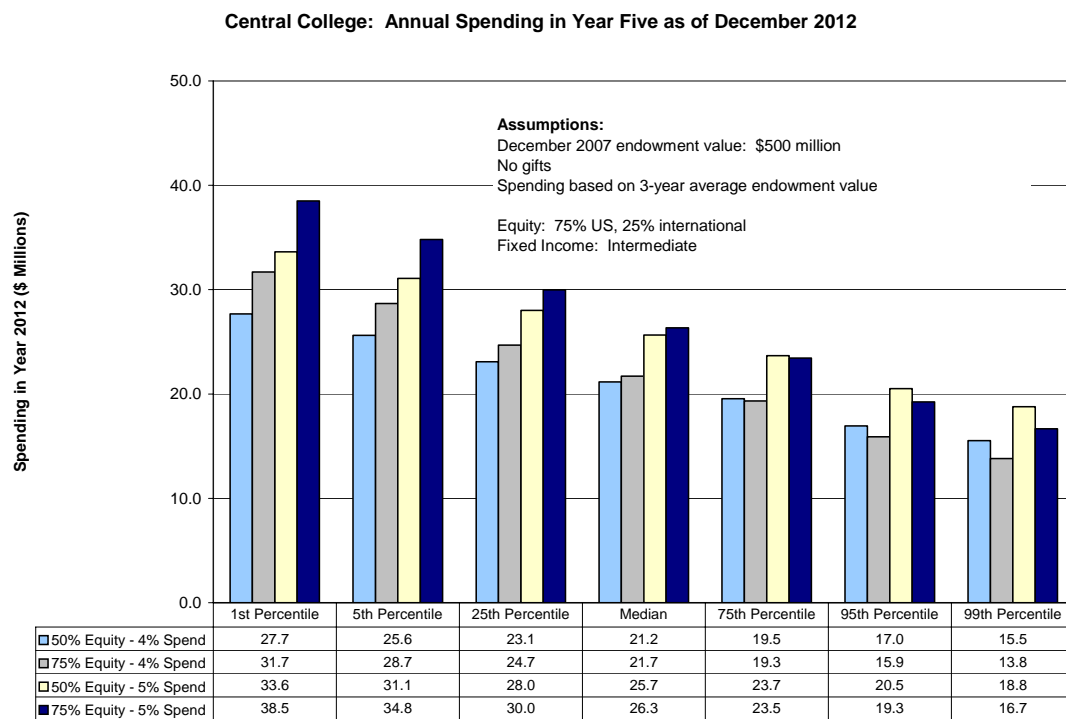
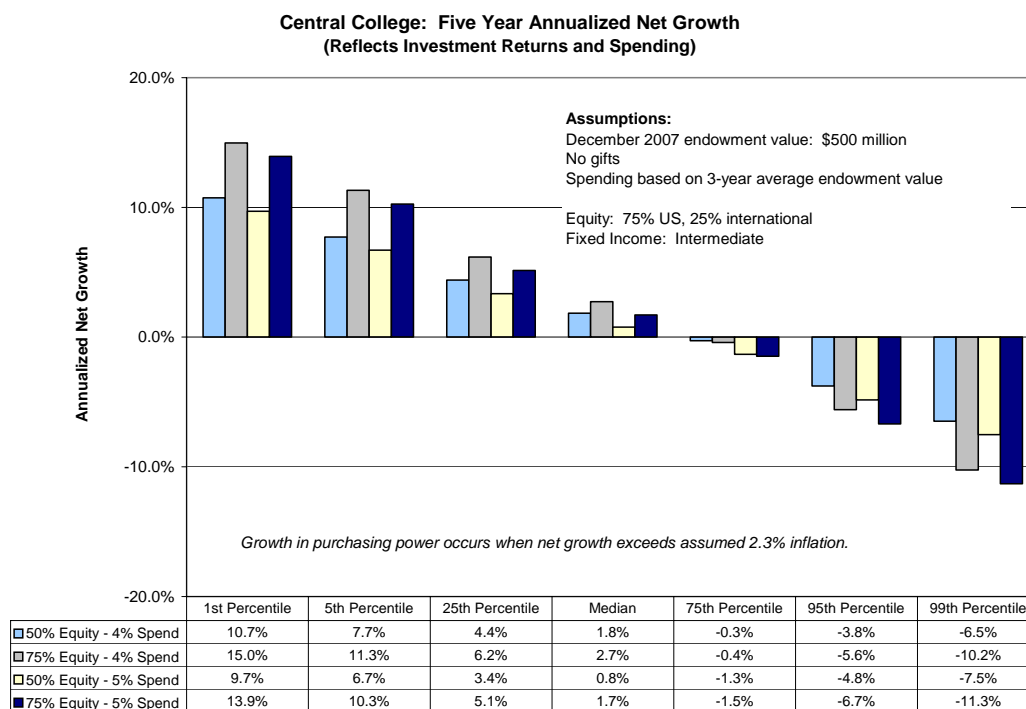


Chart 12



On Chart 12, the only scenario that provides more than a 50% probability of growth in purchasing power is a combination of an investment mix with 75% equity and a 4% spending formula. This combination provides a median (expected) net annualized growth rate in excess of assumed inflation of 2.3%.

The above analytical framework provides the flexibility to test additional policy variables in addition to the investment and spending strategies. Additional variables include:

- ☐ **Gifts.** The institution can assume different gifts scenarios (in terms of amounts and timing) to test the potential benefits of capital campaigns.
- ☐ **Debt Policy.** The institution can test the effects of changes in the amount and structure of outstanding debt. An example of a change in debt structure would be a conversion of fixed rate debt to variable rate.
- ☐ **Operating Ratios.** The above framework can quantify how changes in investment, spending, gift and debt strategies can affect operating ratios such as primary reserve, net income, return on net assets and viability.¹⁷

This analytical framework illustrates how an endowment institution can integrate investment planning within the context of the institution's overall financial management. We believe that this holistic approach will help to advance the institution's mission through better use of its financial resources.

Healthcare Organizations

An enterprise risk management approach can help a healthcare organization to integrate management of investment assets with the organization's balance sheet and operating requirements. Such a framework can quantify how the capital market performance will affect a healthcare entity's capacity to improve the quality and economics of the healthcare services to patients.

An integrated healthcare financial planning model will show how the performance of the capital markets affects an institution's overall financial position, including measures of profitability, liquidity and leverage. The capital markets impact several components of an institution's financial structure: short-term reserves, funded depreciation pools, restricted assets, outstanding debt and the defined benefit pension plan. The model quantifies how changes in the capital markets flow through to these components to affect the entity's financial position.

The model has several applications. It can help the institution to determine key elements of financial policy:

- ☐ Investment strategy for on-balance sheet assets such as operating reserves, funded depreciation pool and restricted assets (trust, foundation and endowment pools).
- ☐ Debt management – amount and structure of outstanding debt.
- ☐ Compliance with debt covenants.
- ☐ Physical infrastructure – timing and magnitude of capital expenditures.
- ☐ Investment strategy for pension plans.

The model's "decision variables" are the investment strategies of the investment pools and the amount and structure of outstanding debt. The model enables management to evaluate how changes in the asset allocation strategies of the investment pools and changes in debt, amount and structure, are likely to affect the institution's profitability, liquidity, net assets and leverage. The model can help the institution to address key questions, such as:

- ☐ What is the institution's net exposure to changes in interest rates? Will an increase in interest rates strengthen or weaken its financial position? Should the institution change its net exposure given its views?
- ☐ How would changes in the equity/fixed-income allocation of the funded depreciation pool affect the institution's ability to service debt, remain in compliance with debt covenants and expand physical plant?

This approach will compute measures and ratios that a particular organization finds meaningful. The categories of ratios are for liquidity, profitability, operating efficiency and capital structure.

Following are examples of key ratios:

- ❑ Liquidity – days cash on hand, days in accounts receivable
- ❑ Profitability – operating margin, return on total assets, return on net assets
- ❑ Capital Structure – long-term debt to net assets, debt service coverage ratio

The following charts illustrate tests of an investment strategy on an organization's liquidity, profitability and capital structure. These examples assume that the organization has a board-designated pool and an endowment. The board-designated pool maintains a 45% allocation to equities; the endowment has a 65% commitment to equities.

Chart 13 measures liquidity. The liquidity measure is Days Cash on Hand: the ratio of unrestricted investments to daily cash expenses. The ratio indicates how long the unrestricted investments can support operations absent other sources of revenues. Chart 13 shows how potential fluctuations in the investment portfolio flow through to variability in the organization's liquidity. This framework will enable the organization to test how a change in the investment strategy will affect the level and risks of its liquidity position.

Chart 13

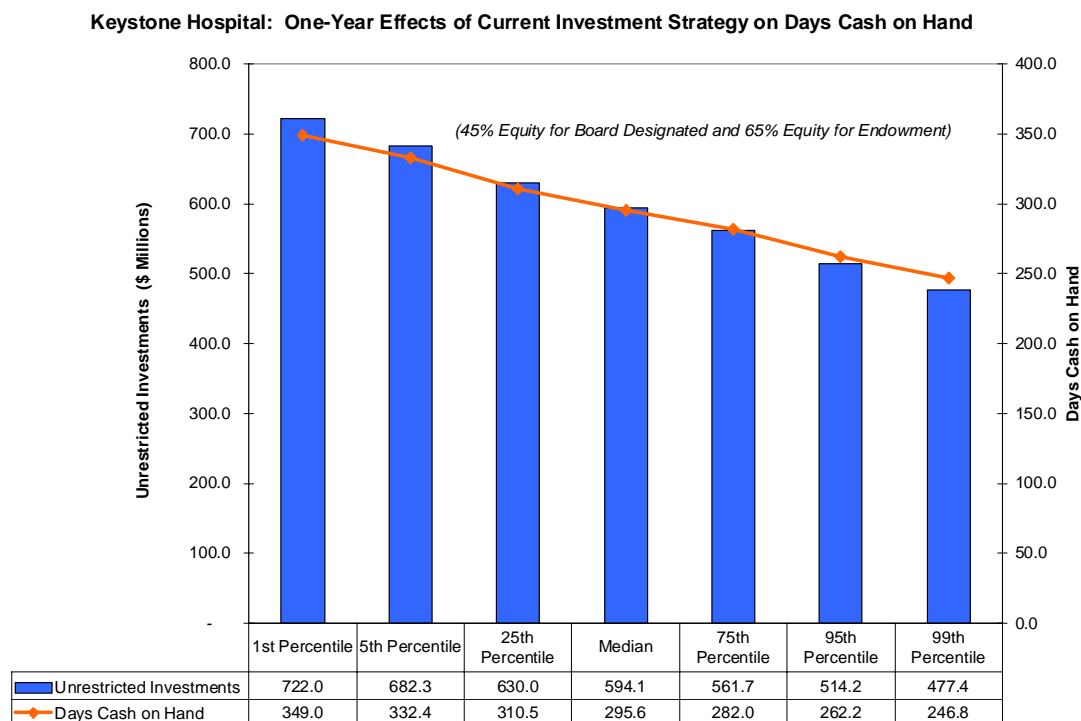


Chart 14 measures profitability. The profitability indicator in this example is the Excess Margin Ratio: the excess of revenues over expenses divided by the sum of operating and non-operating revenues. Chart 14 illustrates how the current investment strategy might affect the organization's profitability in probabilistic terms. This framework enables the organization to compare how different investment strategies might affect profitability.

Chart 14

Keystone Hospital: One-Year Effects of Current Investment Strategy on Excess Margin Ratio

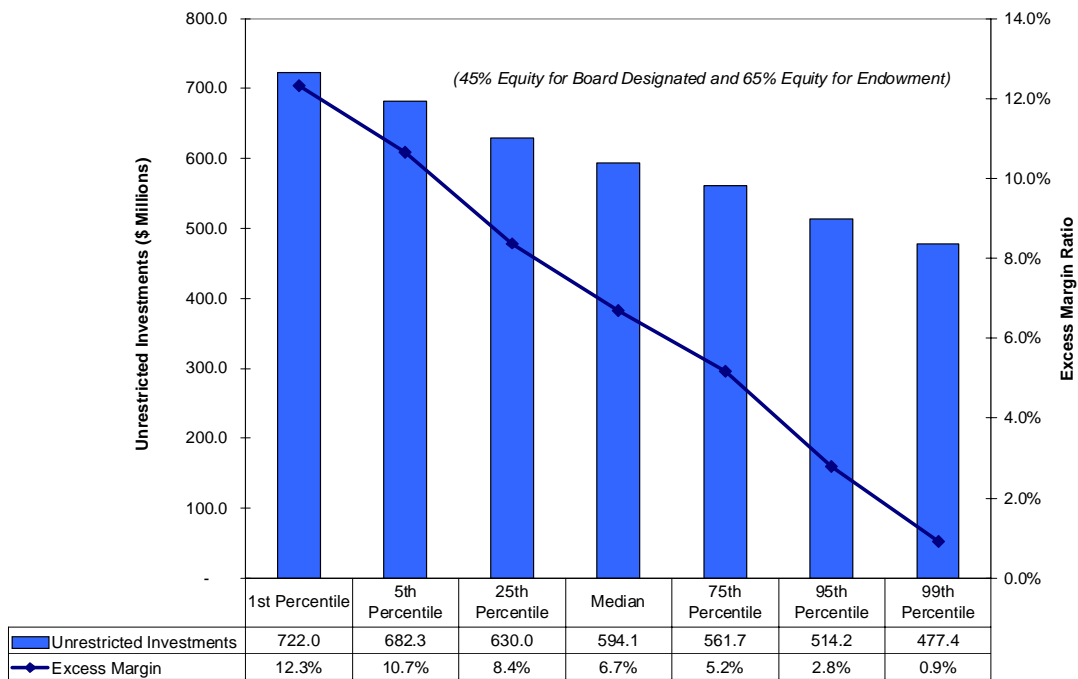
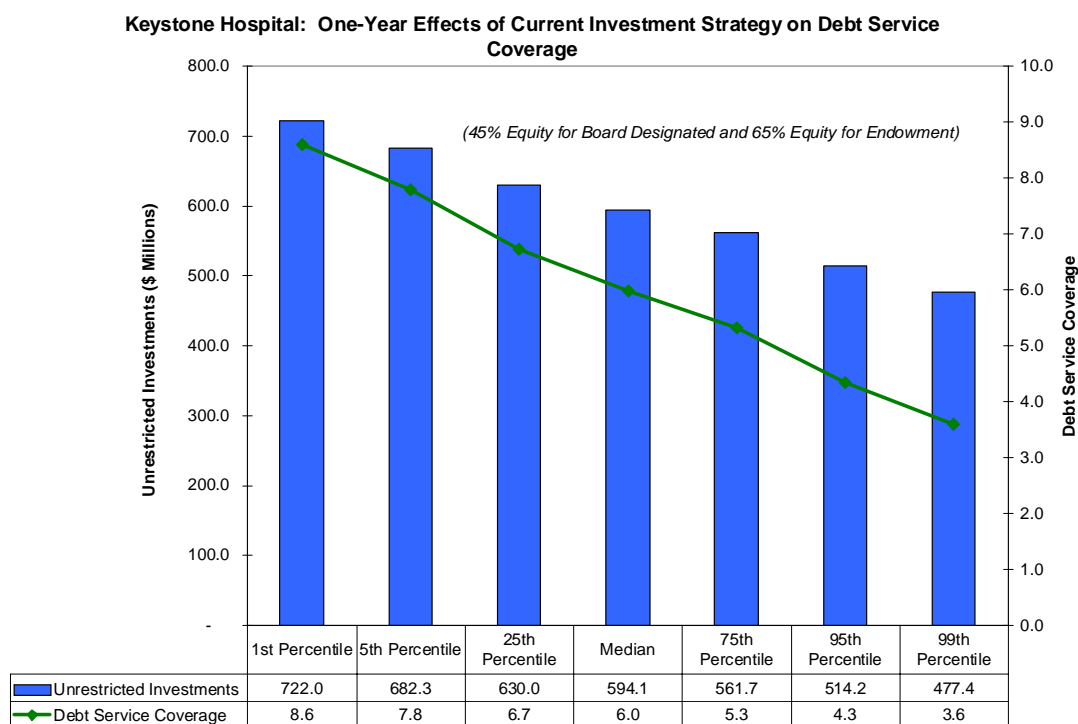


Chart 15 evaluates the organization's capital structure. The specific measure is Debt Service Coverage Ratio: the sum of excess of revenues over expenses, plus interest expense, plus depreciation expense divided by the sum of interest expense, plus principal payments. This measure indicates the capacity of the organization's operating budget to support debt service. The model quantifies the degree to which capital market performance flows through to the operating performance, thereby affecting the organization's ability to support debt obligations. The model helps the organization to test how changes in investment strategy might affect its debt capacity and financial strength.

Chart 15



The following tables list several financial ratios for healthcare entities. These measures provide a framework for testing how changes in the organization's investment strategy might affect its overall financial position.

Healthcare Liquidity Ratios

$$\text{Days Cash on Hand} = \frac{\text{Unrestricted Investments}}{\text{Daily Cash Expenses}}$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Healthcare Profitability Ratios

$$\text{Excess Margin Ratio} = \frac{\text{Excess of Revenues over Expenses}}{\text{Operating + Non-operating Revenues}}$$

$$\text{Return on Total Assets} = \frac{\text{Excess of Revenues over Expenses}}{\text{Total Assets}}$$

Healthcare Capital Structure Ratios

$$\text{Debt Service Coverage Ratio} = \frac{\text{Excess of Revenues over Expenses} + \text{Interest Expense} + \text{Depreciation}}{\text{Interest Expense} + \text{Principal Payments}}$$

$$\text{Long-Term Debt to Net Assets Ratio} = \frac{\text{Long-Term Debt}}{\text{Net Assets}}$$

A comprehensive financial management approach provides healthcare organizations with a deeper understanding of the effects of the capital markets, leading to more effective strategies for investment and debt management, financial leverage and capital spending.

Insurance Companies

An insurance company provides a good example of a type of entity that needs to link its investment strategy closely to the nature of its liabilities. Insurance companies accumulate assets through the underwriting of policies to protect policyholders against risks. The liabilities arise from the company's guarantees against these risks. The types of risks that companies guarantee affect the characteristics of the liabilities. Life insurance offers reasonably stable risk characteristics given the fairly predictable nature of mortality experience. Property and casualty insurance subjects companies to more volatile risks given the unpredictable nature of catastrophes such as terrorism and natural disasters such as hurricanes, floods, droughts and tornados.

The insurance industry has developed rigorous methods to measure and manage extreme downside risks. Moreover, the concept of Enterprise Risk Management has gained traction in the insurance industry.¹⁸ Key insurance industry financial measures include:

- ❑ *Economic capital* – assets minus liabilities. The capital must be adequate to prevent the “probability of ruin.”
- ❑ *Risk-Adjusted Return on Risk-Adjusted Capital* – net income divided by economic capital. The numerator is adjusted for risk based on factors such as the volatility of net income. The denominator is also adjusted based on the risk of the investments and/or the project.
- ❑ *Risk-Based Capital* – the National Association of Insurance Commissioners has formulated a standard for minimum capital to establish a threshold for regulatory response.

Insurance companies need to assume risks to generate adequate returns on capital. The key challenges for insurance companies are to:

- ❑ Price risks appropriately.
- ❑ Understand the risks inherent in their liabilities (including a careful monitoring of changes in liability risk characteristics over time).
- ❑ Manage assets together with liabilities to provide the company with the potential to earn an adequate risk-adjusted return on capital.

Conclusion

Every organization relies on financial resources. An organization's ability to generate additional resources will advance the organization's mission. An organization can generate additional resources by increasing the economic return on its assets. The pursuit of capital growth requires the intelligent design and execution of a risk management program. Modern risk management practices have embraced a comprehensive integration of asset and liability management. This holistic approach to managing the risks of an enterprise will continue to build value for stakeholders.

Appendix

Limitations of Conventional Risk Management Approaches

Our 2002 paper cautioned against the reliance on certain traditional risk management measures. The following sections illustrate how some traditional techniques might yield erroneous results. An understanding of the limitations of traditional techniques will help an organization to install effective risk management practices.

Reliance on Historical Returns to Derive Estimates for Future

A successful investment management plan depends on realistic assessments of the capital markets' returns. Some organizations rely on historical returns to extrapolate future performance. Historical returns do not always forecast future results because the economic conditions that gave rise to past results might not prevail today. Charts A and B compare historical results to future results for two markets: US equities and US fixed income. Both Charts compare historical five-year returns to future five-year returns each month from January 1962 to December 2007. The charts display erratic results – past performance fails to predict future results with any consistency or precision. For some periods, the data actually display an inverse relationship between past and future returns.

Chart A

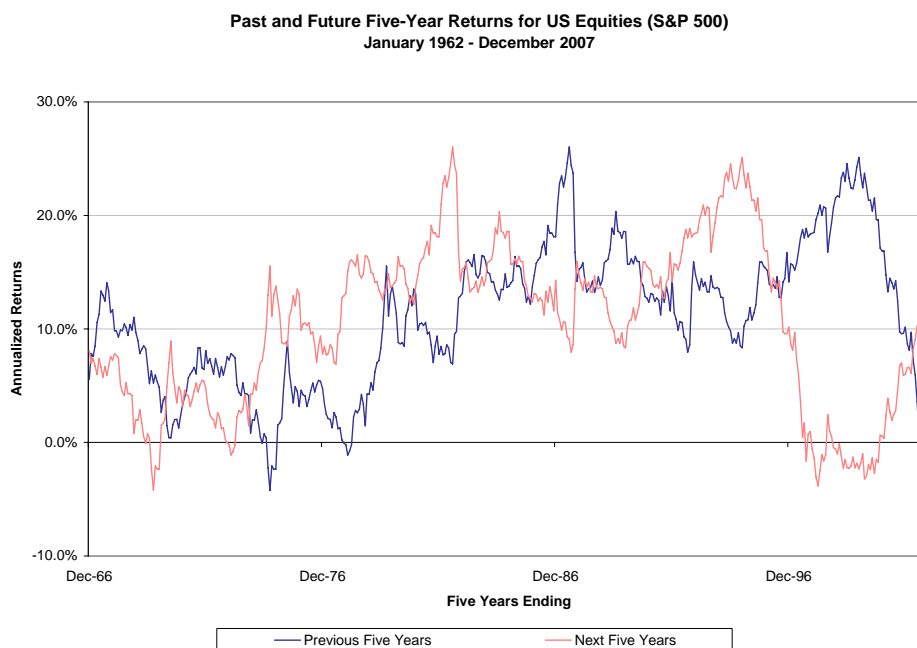
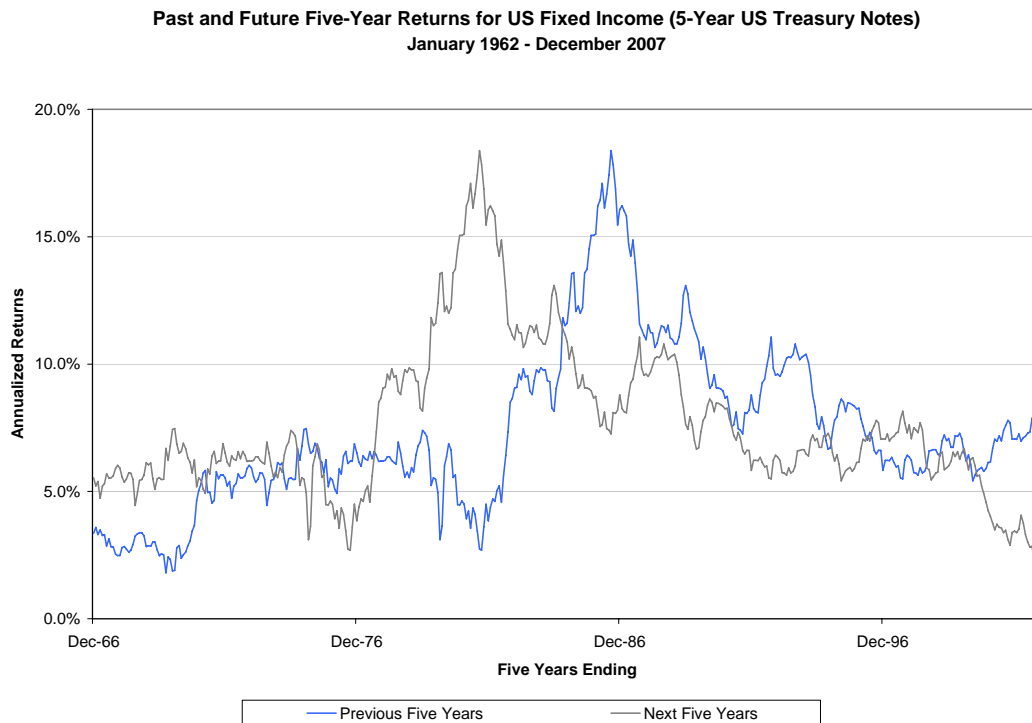
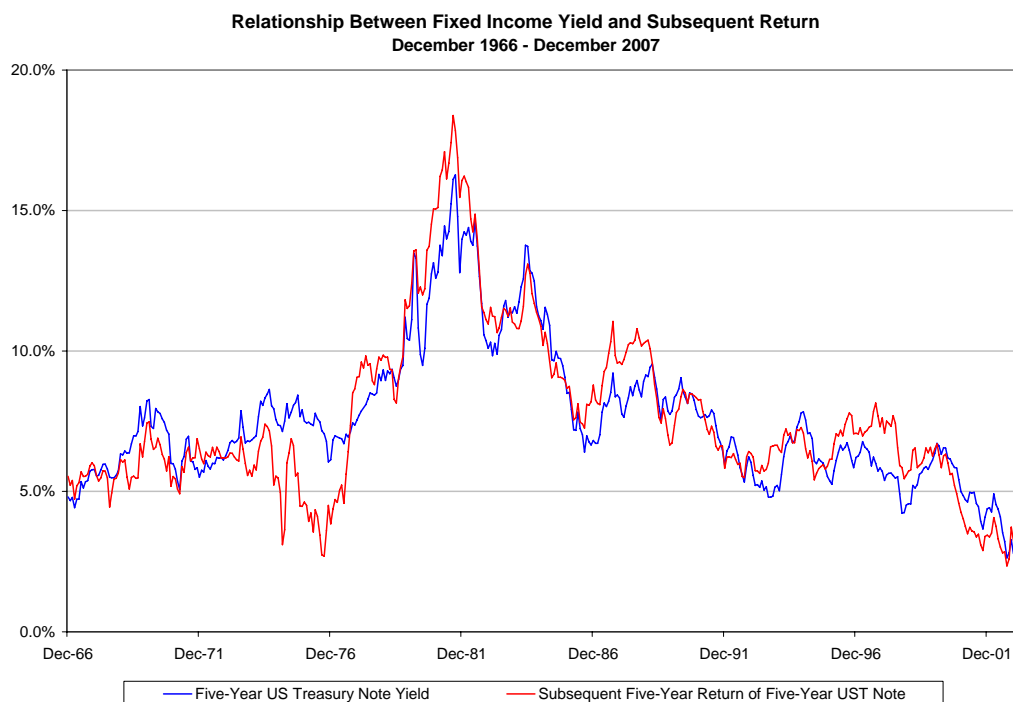


Chart B



A realistic forecast of a market's future return requires the identification of the economic determinants of that return and an understanding of the relationship between those factors and the market's subsequent performance. For example, for equities, the growth of corporate earnings and current market valuation levels exert strong influences on the market's performance. In fixed income, a bond's current yield determines a significant portion of its performance over the life of the bond. Chart C illustrates the close relationship between the current yield to maturity and the subsequent five-year return for five-year US Treasury notes. The current yield to maturity predicts future performance much more effectively than past performance.

Chart C



Assumption of Normal Distribution for Capital Market Returns

One conventional approach to investment strategy modeling relies on a “mean variance” optimization tool. A common approach assumes that capital market returns follow a normal distribution – a symmetrical bell-shaped curve. In practice, distributions of market returns have deviated from a normal distribution. Actual distributions have frequently displayed skewed results (asymmetrical patterns) and kurtosis (fat tails). Negative skewness and kurtosis indicate that severe losses have occurred with greater frequency than a normal distribution would predict.

Charts D and E plot distributions of monthly returns for US equities and US fixed income, respectively. Each Chart illustrates two distributions: the actual one and a theoretical Normal Distribution based on the same degree of variance that the actual distribution reflects. For both markets, the actual distributions deviate from the Normal Distribution model; large negative outliers have occurred more frequently than the Normal Distribution model would predict.

For US equities, the month of October 1987 illustrates an outlier. That month, the S&P 500 Index fell 24.2%.¹⁹ If the market returns conformed to a Normal Distribution, the likelihood of such an occurrence would be roughly one in two billion. Such a monthly loss would occur roughly every 157 million years! If one had assumed that the US market follows a Normal Distribution, one would have underestimated the likelihood of a 24.2% monthly loss.

Chart D

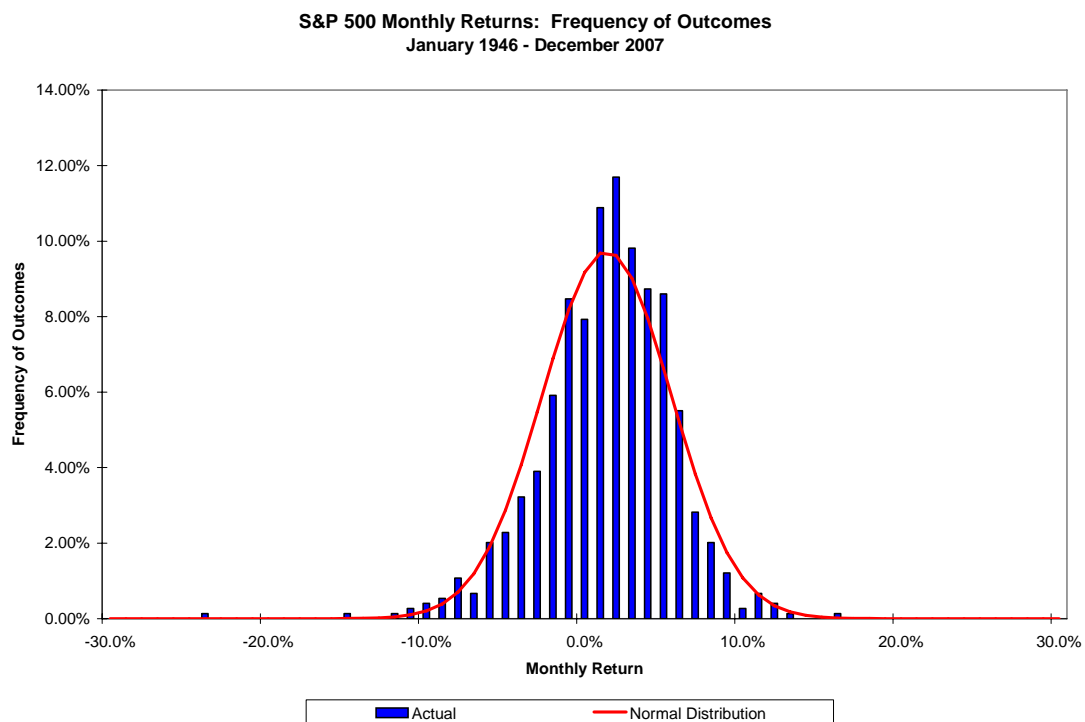
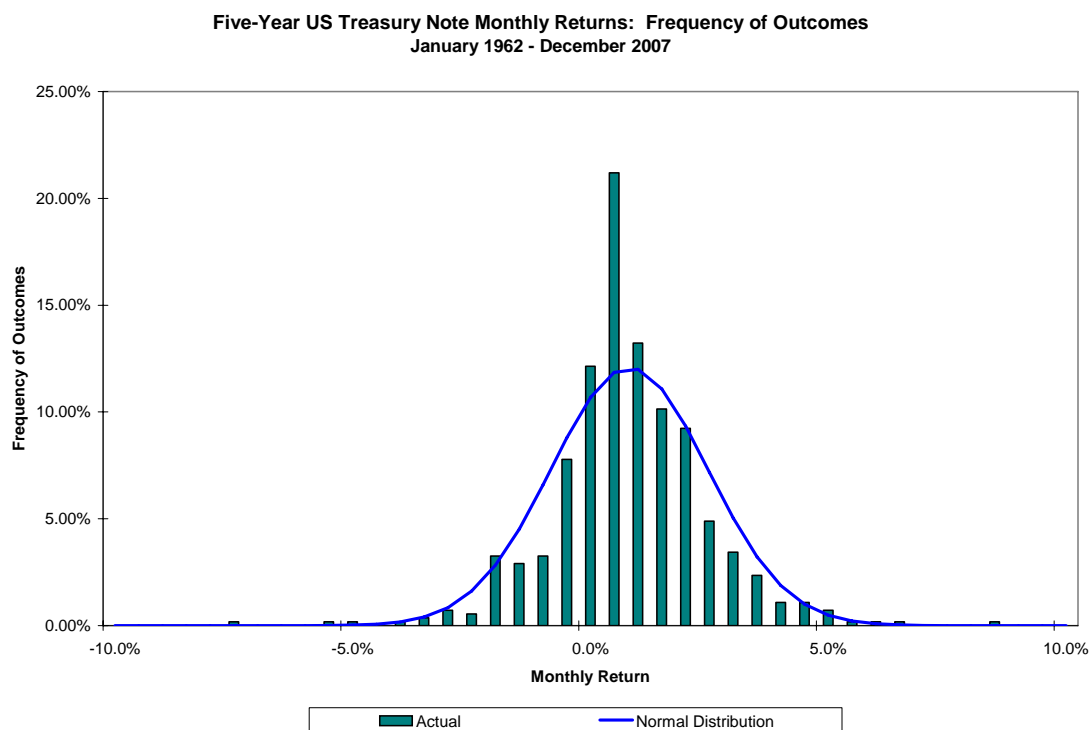


Chart E



Analytical advances in the fields of finance and statistics have sharpened investors' tools for measuring markets' downside risks. Extreme Value Theory (EVT) represents one such technique.²⁰ EVT helps the investor to describe a series' extreme negative values separate from the rest of the distribution that conveys little information about the distribution's negative outliers (the so-called "left tail" of the distribution). For example, standard deviation as a single measure of risk of a distribution conveys very little information about the left tail if the many data points (and hence outliers) do not conform to a Normal Distribution model.

Charts F and G illustrate the limitations of a Normal Distribution as a model to describe the left tails of US equities and US fixed income. These examples measure the distributions' left tails as 1% of all returns that constitute the worst monthly outcomes during the entire measurement period. For US equities, the worst 1% includes seven months; for US fixed income, the left tail contains six months due to a shorter measurement period. Charts F and G display the worst monthly returns, and they show the monthly returns that a Normal Distribution model would predict given the other parameters of the distribution: the mean and the standard deviation.

Chart F

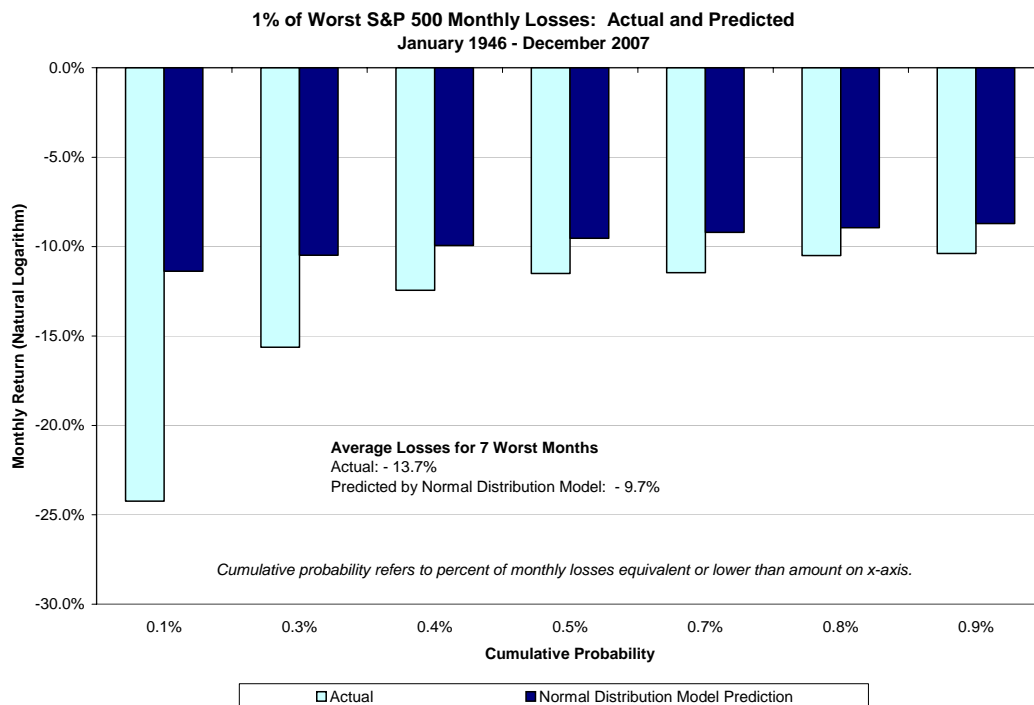
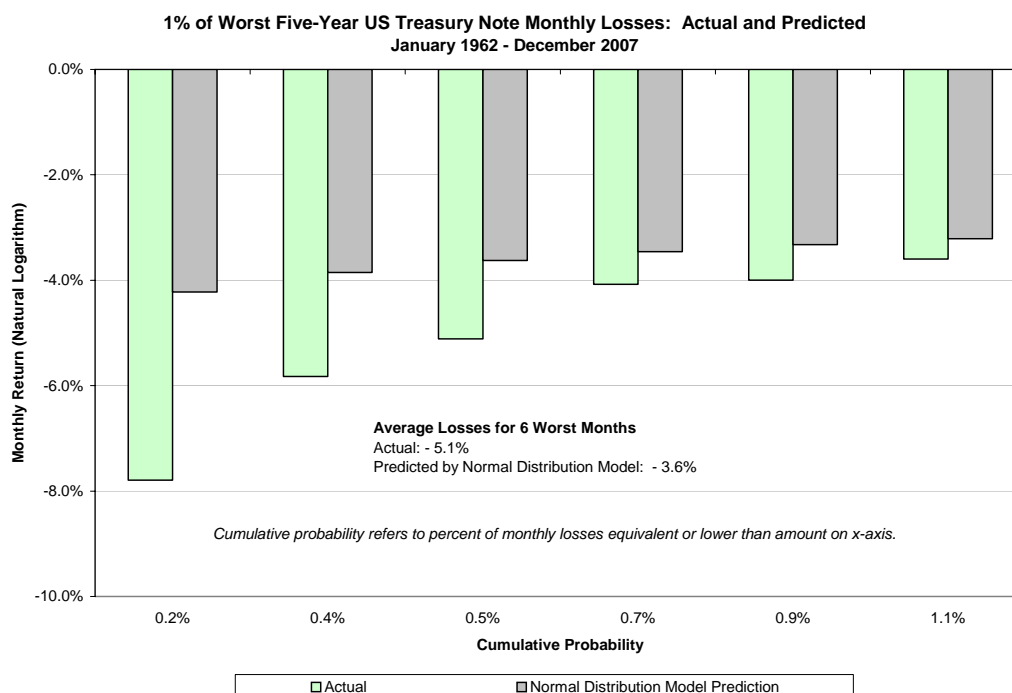


Chart G

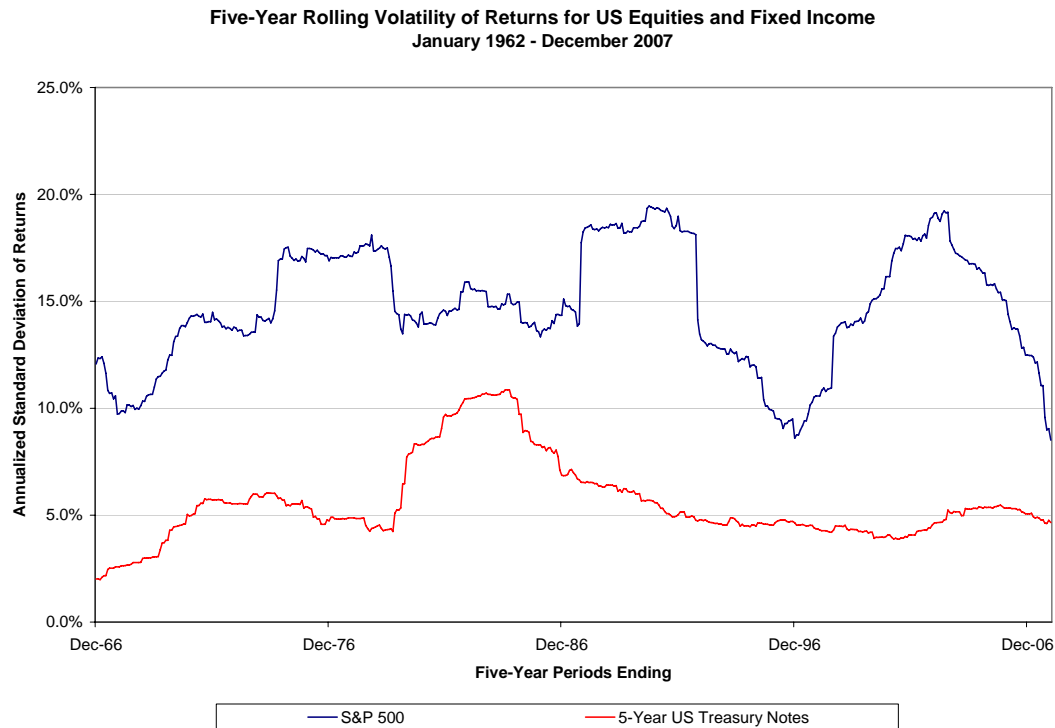


The Normal Distribution model significantly underestimates the downside risks of both US equities and US fixed income. For US equities, the worst monthly losses averaged 13.7%, whereas the model predicted an average of only 9.7%. Moreover, the worst month (October 1987) sustained a loss of 24.2%, whereas the model predicted a loss of only 11.4%. A similar pattern emerges for US fixed income. The worst monthly losses averaged 5.1%, well above the model's average of 3.6%. In fixed income, the worst monthly loss of 7.8% surpassed the model's prediction of 4.2%.

Assumption of Constant Volatility

Some traditional investment planning models assume that markets' volatility characteristics remain constant over the investment horizon. The data contradict this assumption. Market volatility expands and contracts over time. Chart H illustrates significant fluctuations in volatility for US equities and US fixed income for rolling five-year periods.

Chart H

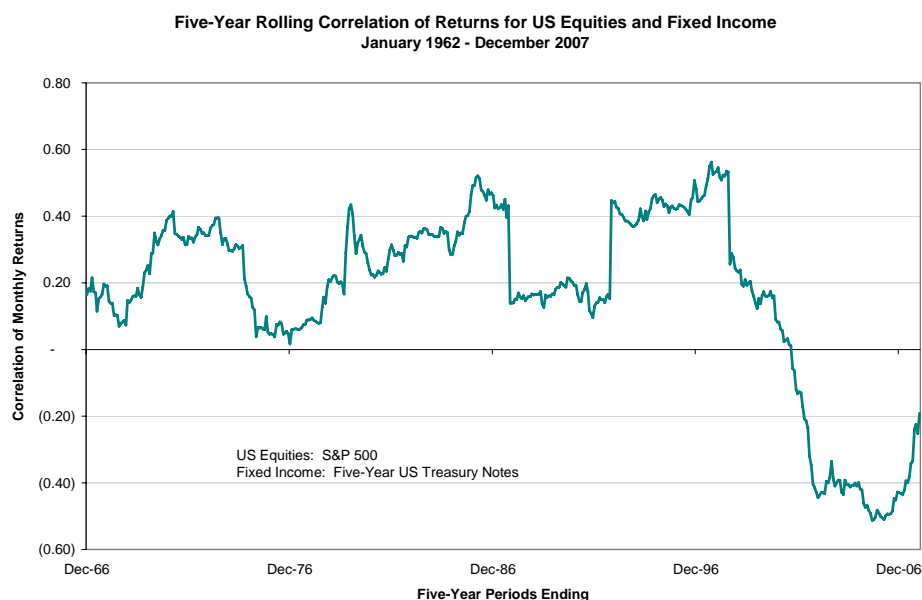


Assumption of Constant Correlations

Some traditional models assume that correlations among market returns remain constant over the investment horizon. Correlation measures the extent to which returns for two markets move together. This measure ranges between + 1.00 and – 1.00. The absolute value connotes the strength of the relationship, whereas the sign indicates the direction. For example, a correlation of + 0.80 reveals a reasonably strong positive relationship.

Chart I plots the rolling five-year correlation between US equities and US fixed income. The correlation has varied significantly over time. Not only has the absolute value fluctuated, but the sign has changed from positive to negative.

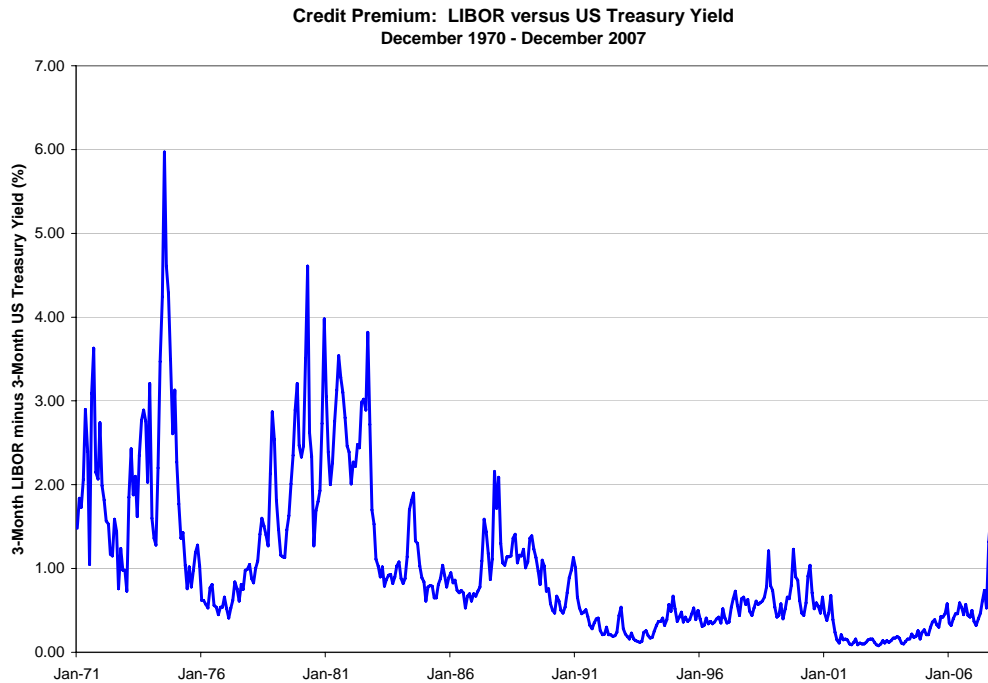
Chart I



Assumption of Constant Credit Premium

Some asset allocation models assume that corporate bonds will earn a constant credit premium over US Treasury bonds. In fact, the data reveal a highly erratic pattern of credit spreads. Chart J plots credit spreads from December 1970 through December 2007. Chart J measures credit spreads with the US Treasury/Eurodollar spread (TED spread). Periods of financial stress and liquidity pressures manifest themselves with occasional spikes in yield spreads. The credit markets' dislocations in the Summer 2007 culminated in a sharp rise in the TED spread beginning in August 2007. The August 2007 TED spread reached an 18-year high in response to investors' credit and liquidity concerns as exemplified by losses in the sub-prime mortgage market. This August 2007 jump in the credit premium followed several years of unusually low spreads. Robust risk modeling should account for credit spreads to vary over time.

Chart J



Analytical Remedies for Model Misspecifications

The aforementioned limitations of certain conventional analytical approaches can lead to an unsuitable investment plan for an investor. The plan might subject the investor to losses that jeopardize its solvency.

The field of statistics offers analytical remedies. A parametric approach relies on simplifying assumptions of means, volatilities and correlations among asset types.²¹ Mathematical formulas compute the expected return and risks for each investment mix that the user specifies. A parametric approach offers computation ease. Yet this approach can distort key dimensions of risk due to the simplicity of the inputs. Moreover, the parametric approach does not lend itself to cash flow assumptions in a realistic manner, making it difficult to model portfolio values.

Various non-parametric techniques can perform simulations that can accommodate cash flows as well as the complex risk characteristics of the markets. Non-parametric techniques avoid simplifying assumptions regarding the characteristics of the market data in the modeling process. Non-parametric techniques are computationally intensive yet they can help institutions to make more informed investment judgments.

Yanni Partners has incorporated such non-parametric techniques into its asset allocation modeling platform.

¹ The analytical framework can model cash flows as simple “point estimates” or as variable amounts on a stochastic basis to reflect unique risks and characteristics of the stream of flows.

² Yanni Partners, “Managing Investment Risk: The Path to Achieving Objectives,” 2002, page 17.

³ Risk Standards Working Group. 1996. “Risk Standards for Institutional Investment Managers and Institutional Investors.”

⁴ See the following website for the full text of the Act:
<http://fl1.findlaw.com/news.findlaw.com/hdocs/docs/gwbush/sarbanesoxley072302.pdf>

⁵ Committee of Sponsoring Organizations of the Treadway Commission, “Enterprise Risk Management – Integrated Framework, Executive Summary.” September 2004.

⁶ Brinson, Gary P., Brian D. Singer, and Gilbert L. Beebower. 1991. “Determinants of Portfolio Performance II: An Update.” *Financial Analysts Journal*, (May–June): 40–48.

⁷ Alternative investments include private equity, hedge funds, real estate, and commodities, among other types.

⁸ Merton, Robert C. “Observations on Innovation in Pension Fund Management in the Impending Future.” *PREA Quarterly* (Winter 2006): 61-67

⁹ Jin, Li, Robert C. Merton, and Zvi Bodie. “Do a Firm’s Equity returns Reflect the Risks of its Pension Plan?” *Journal of Financial Economics* 81, no. 1 (July 2006): 1- 26.

¹⁰ Bader, Lawrence N. 2004. “Pension Deficits: An Unnecessary Evil.” *Financial Analysts Journal*, (May/June): 15 – 21.

¹¹ Chernoff, Joel. December 11, 2006. “CFOs: Don’t Forget Pension Funds.” *Pensions & Investments*.
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¹² Bader, Lawrence N. 2004. “Pension Deficits: An Unnecessary Evil.” *Financial Analysts Journal*, (May/June): 15 – 21.

¹³ Summary results of the NACUBO Endowment Studies are available at: <http://www.nacubo.org/x2376.xml>

¹⁴ See Yanni Partners’ paper *The Quest for Growth* for a discussion of the relationship between inflation/ deflation and capital market performance.

¹⁵ Garland, James P. September 15, 2004. “The Fecundity of Endowments and Long-Duration Trusts.” *Economic and Portfolio Strategy*, Peter L. Bernstein, Inc., pages 1 – 8.

¹⁶ It is possible to extend this analysis to tests the effects additional policy variables.

¹⁷ KPMG LLP, Prager, Sealy and Co. and BearingPoint. 2002. “Strategic Financial Analysis for Higher Education.” 6th Edition. Following are brief definitions of these ratios. Primary reserve – level of financial flexibility. Net income – operating performance. Return on Net Assets - overall asset return and performance. -Viability - institution’s ability to cover debt with available resources

¹⁸ Casualty Actuarial Society, Enterprise Risk Management Committee. 2003. “Overview of Enterprise Risk Management.”

¹⁹ Expressed as a natural logarithm for computational purposes.

²⁰ McNeil, Alexander J. 1999. “Extreme Value Theory for Risk Managers.” ETH Zentrum.

²¹ Rogachev, Andrey. 2002. “Dynamic Value at Risk.” St. Gallen.

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ACKNOWLEDGEMENTS

We wish to thank the following individuals for their helpful comments and suggestions during the preparation of this paper:

Aaron Gurwitz, Co-Head of Portfolio Advisory, Managing Director/Chief Investment Strategist
Lehman Brothers

Simeon Hyman, Senior Vice President & Equity Strategist, Portfolio Advisory, Chief Investment Officer
Lehman Brothers Trust Company

Yogi Thambiah, Managing Director - Client Strategies and Solutions
Credit Suisse

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FEBRUARY 2008

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INVESTMENT OVERSIGHT COMMITTEES

REVIEW OF BEST PRACTICES



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Summary

This paper summarizes Yanni Partners' perspectives regarding the management of investment oversight committees for institutions. Yanni Partners has written this paper to help clients use their financial resources more effectively, thereby helping the institutions to fulfill their fiduciary obligations.

Yanni Partners has developed broad knowledge of investment oversight committees through our interaction with our clients, supporting numerous and diverse investment committees. Our recent work on Enterprise Risk Management has augmented our knowledge of investment oversight committees. Effective governance constitutes an important element of sound risk management.

This paper consists of four sections:

- Responsibilities of the full board

- Responsibilities of the investment oversight committee (the "committee")

- Composition and structure of the committee

- Operating procedures for the committee

Responsibilities of the Full Board

An organization's board maintains the ultimate authority and responsibility for the management of the organization. The full board must therefore determine the structure, authority and role for the investment oversight committee. This committee generally bears the responsibility for managing the institution's investment portfolio.

The board discharges its obligations through the following actions:

- Defines committee's responsibilities and reporting obligations.

- Ensures that committee members operate without conflicts of interests.

- Makes sure that committee members understand their fiduciary obligations.

The board must periodically review the committee's responsibilities to make sure they remain current and adequate. It also should document the committee's responsibilities to achieve clarity and monitor the committee's performance on a regular basis. The committee's reports to the board should address the portfolio's performance, strategy, structure, risk characteristics and operating expenses. The committee should also inform the board of pertinent investment management issues such as the performance of service providers and staff.

To make sure that the committee remains free of conflicts, the board should adopt a rigorous conflict of interest policy. The board should also implement a process to monitor and enforce the conflict of interest policy.

It is very important for the board to make sure that committee members understand the appropriate fiduciary obligations. Each organization's structure determines applicable fiduciary obligations. For example, the Employee Retirement Income Security Act of 1974 (ERISA) governs pension plans of corporate and not-for-profit entities. ERISA requires fiduciaries to manage the plans for the exclusive benefit of plan participants. ERISA imposes standards of prudence for managing pension plan assets.

Two pivotal sets of legal guidelines underpin the management of endowments and other investment pools of not-for-profit entities. These guidelines are the Uniform Prudent Management of Institutional Funds Act (UPMIFA) and the Uniform Prudent Investor Act (UPIA). The National Conference of Commissioners on Uniform State Laws (NCCUSL) approved the UPMIFA in 2006 and the UPIA in 1994. Various states have adopted these Acts. UPMIFA encompasses the following key provisions: investment suitability standards, investment expenses and distribution practices. The UPIA codifies standards of prudence.

Responsibilities of the Investment Committee

An investment committee typically bears the following responsibilities:

Ensure that the proper infrastructure is in place. The committee must ensure that the organization has the proper internal investment staff (with adequate budget) and service providers such as custodian, consultant, actuary, outside auditor, legal counsel and investment managers.

Establish policies and objectives. The committee must make sure that the fund maintains a current and comprehensive policy document that outlines key investment guidelines and benchmarks. The committee needs to ensure that policies and benchmarks help to align the management of the fund with the overall financial needs of the organization.

Approve investment strategy. A fund's overall investment strategy (the allocation among different asset types) constitutes the most important investment decision. The asset allocation is the key determinant of the fund's risk and return. The committee must designate the appropriate asset classes and specify the fund's allocation targets. The committee must make sure that the organization follows a rigorous process to enable the committee to reach an informed decision about the asset allocation strategy. The committee must therefore ensure that the organization formulates the investment strategy based on rigorous analysis from the staff and/or the investment consultant. The committee must determine the appropriate investment strategy within the context of the organization's unique needs such as its capacity to bear risks and its liquidity requirements. The committee must make sure that it integrates the approval of the investment strategy with a sound understanding of the organization's fundamental needs.

Approve portfolio construction. The committee must ensure that portfolio is constructed efficiently and effectively, in full alignment with policies and objectives. The selection of investment management firms constitutes a key step in portfolio construction. The committee needs to make sure that the organization has an effective process for selecting investment managers.

Monitor portfolio. The committee must install monitoring procedures to compare portfolio risks and returns to objectives. When results deviate from objectives, the committee must determine remedial actions.

The committee performs an essential oversight function. As noted above, the committee must ensure that it reaches decisions based on rigorous analytical work from the investment staff and service providers. The committee can delegate various analytical and administrative functions, yet the committee retains its fiduciary obligations. The committee must therefore evaluate the performance of the staff and service providers in a thorough manner. The following guidelines can help the committee to determine whether the staff and the investment consultant follow a rigorous investment process. Key elements of a sound process include:

Reasonable estimates of the capital markets risks and returns.

Accurate modeling of the capital markets' risks in the projections of portfolio results.

Ability to translate portfolio performance into measures specified in the investment objectives. (For example, how does capital market performance affect an endowment's likelihood of achieving growth in purchasing power?)

Integration of cash flows into portfolio projections.

Effective investment manager search and monitoring capabilities.

Composition and Structure of the Committee

Each committee should have sufficient expertise, commitment, independence and authority. Diversity contributes to a committee's success. The committee will typically benefit from a broad range of personal backgrounds, views and skill sets.

Each committee should have requisite skill sets, such as finance (including knowledge of the institutional investment management process), general management and law. The composition of members depends on the type of organization. A committee that oversees a pension plan will benefit from a member with human resources and benefits administration experience. For endowment committees, it is helpful to include members who are alumni and individuals knowledgeable about educational organizations. For healthcare entities, it is beneficial to have members who know the local community well.

In addition to being knowledgeable, committee members should also be committed to the organization's mission and core values. Commitment is particularly important for "outside" members (often representatives from the full Board) who volunteer their time. A committed member will display sensitivity to the organization's needs and act in the exclusive interests of the organization.

Some committees may include members who lack the appropriate investment background. These members may serve on the committee by virtue of their positions with the organization. Such committees must ensure that they receive sufficient education and adequate analytical support from the staff and service providers. It is particularly important that these committee members understand their fiduciary responsibilities.

The committee should operate with sufficient autonomy, free from political pressures. Generally, a committee that operates as a Board committee (consisting of board members) maintains autonomy. In some cases, the investment committee consists of internal members of management and staff. In the case of an internal committee, the organization should ensure an effective reporting relationship with the Board to enable the committee to operate effectively.

The organization's general counsel should periodically review the composition, structure and reporting relationship of the committee to ensure compliance with applicable laws and fiduciary responsibilities.

Operating Procedures for the Committee

The committee should ensure that it receives adequate education on an ongoing basis. The service providers can enhance the committee's education. For example, the investment consultant can explain the overall investment process, whereas the legal counsel can advise the committee of pertinent legal requirements. When a new member joins the committee, the staff and/or investment consultant should provide an orientation session to bring the new member "up to speed."

The committee should determine the frequency and duration of meetings as well as operating procedures, such as the process for distributing agenda materials to members and protocols for resolving certain issues "off line" outside of formal meetings. The committee also needs to define the chair's responsibilities.

The committee should clarify how the staff and external service providers should interact with the committee. Perceived inadequacies in the performance of the staff and service providers often stem from a lack of clarity in their responsibilities. Furthermore, service providers need to know their reporting obligations with respect to staff and the committee.

The committee should give clear guidance to the staff and consultant about its expectations for communications with the committee, such as extent of detail and technical content. The committee should work closely with staff and the consultant to specify how various reports and analyses should be structured to enable the committee to make informed decisions in a timely fashion.

The committee must monitor the performance and fees of outside service providers. The committee bears the ultimate responsibility for ensuring that the organization receives adequate investment administrative and analytical support.

There should be a procedure in place to provide the committee with market intelligence – practices of other institutional investors and indications of their current thinking. The investment consultant can help to provide such insights.

The committee should submit a formal report to the full Board at least annually. This report should address the fund's performance, structure, risk characteristics, new initiatives, as well as assessments of staff and service providers. This report will help the board to fulfill its fiduciary obligations.

The committee should perform periodic self-assessments in the pursuit of continuous improvement.

Conclusion

A successful investment committee will promote good governance. An engaged, educated and effective investment committee will help the organization to utilize its financial resources effectively. Effective investment management will enhance the organization's prospects of achieving its core mission.

DELIVERING THE PROMISE



Yanni Partners - A Division of GBS Investment Consulting, LLC provides a full range of consulting services vital to the management of various portfolios. Our ultimate goal is to offer a basis for improved investment monitoring and performance.

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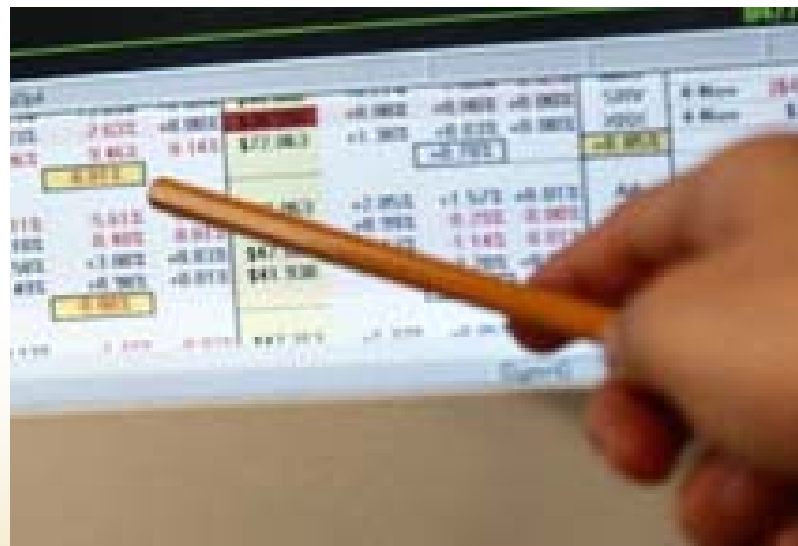
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HOW TO WITHSTAND SHORT-TERM LOSSES – IN THE PURSUIT OF LONG-TERM OBJECTIVES

Ryan Lennie, CFA

Senior Consulting Analyst

Quarterly Client Webinar
January 26, 2010



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January 26, 2010

Our discussion today will include...

- Short-Term Protection, Long-Term Perspective
- Assessing Risk Tolerance
- Measuring Investment Risk
- Constructing Portfolios

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Short-Term Protection

Long-Term Perspective

2009 proved to be a tale of two markets:
one dismal and one record-setting.

| | Dismal | Record-Setting |
|----------------------|---|---|
| Months | January-February | March-December |
| Duration | 2 months | 10 months |
| S&P 500 Index Return | -18.2% | +54.6% |
| Historical Rank | Among worst 2% of all 2-month periods (January 1926-December 2009) | Among best 1% of all 10-month periods (January 1926-December 2009) |



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Short-Term Protection Long-Term Perspective

It is reassuring that the equity market rebounded so strongly in 2009.

*The S&P 500 Index is up 67.8%
(as of December 31, 2009) since it
hit bottom on March 9, 2009.*

But investors should not forget the lessons of the credit crisis that raged between 2007 and early 2009. Think back to a year ago...

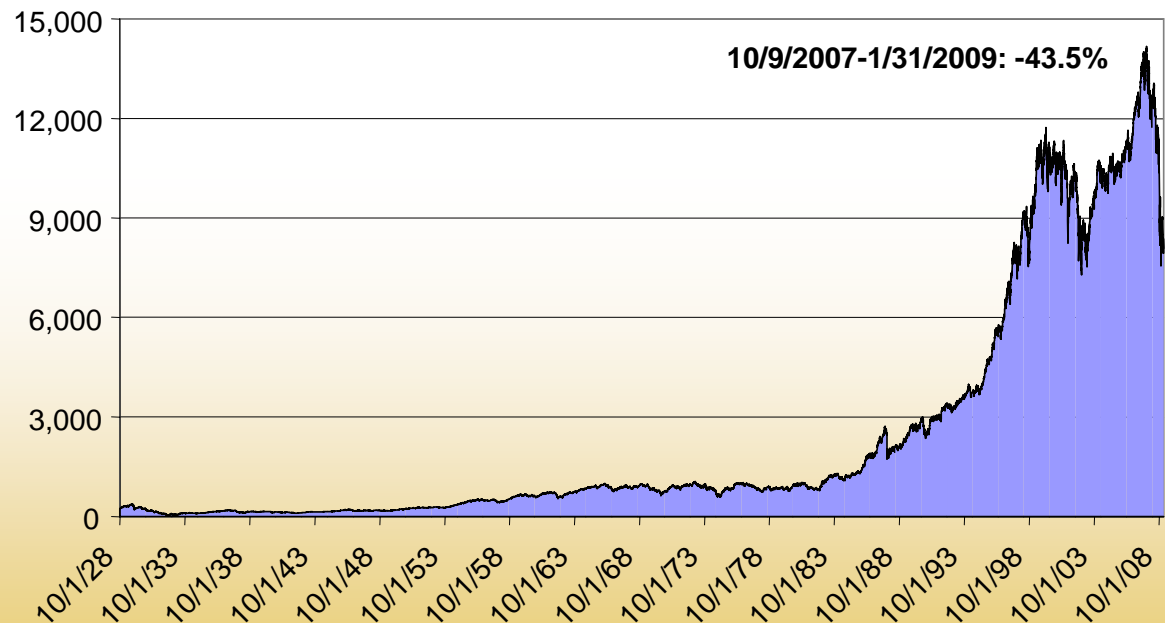


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Short-Term Protection Long-Term Perspective

Equities were in the midst of the most substantial decline since the Great Depression.

Dow Jones Industrial Average: Daily Closing Value
October 1, 1928-January 31, 2009





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Short-Term Protection Long-Term Perspective

Legendary Wall Street icons disappeared by the day, and others entered a state of permanent change.



Bear Stearns

Washington Mutual

Countrywide Financial

IndyMac

Lehman Brothers

Fannie Mae

Wachovia

Freddie Mac

AIG

Merrill Lynch

National City

plus government buying stake in 9 banks...

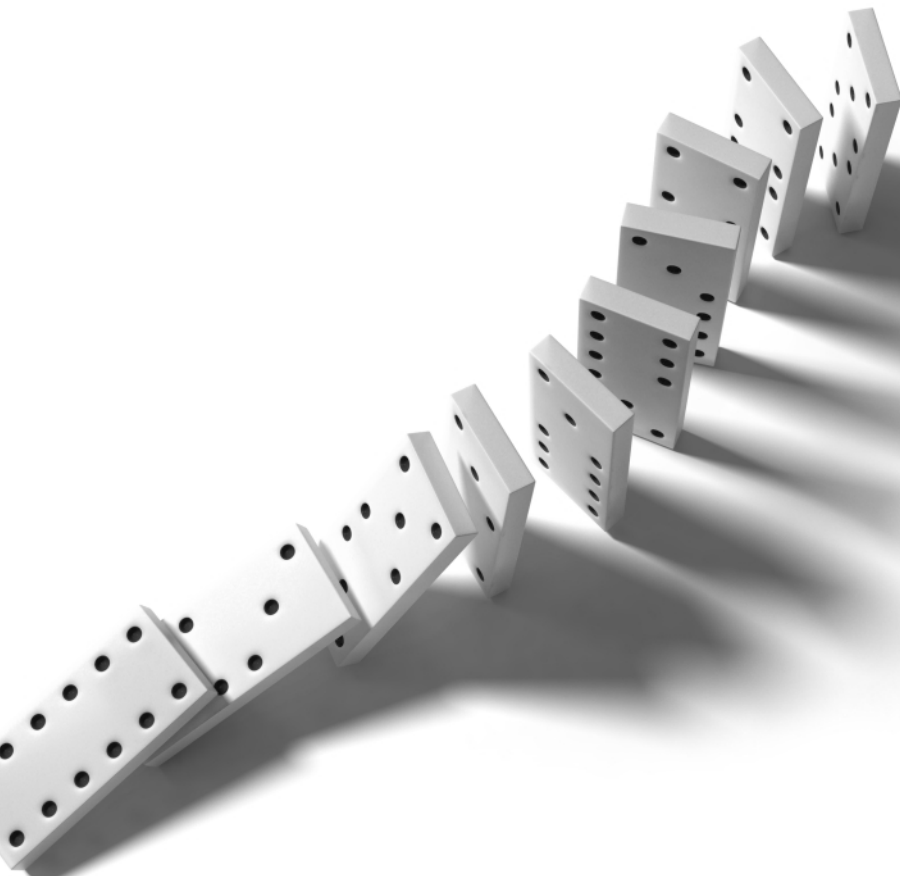


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Short-Term Protection

Long-Term Perspective



Businesses on Main Street also felt the wrath of the ongoing credit crisis.

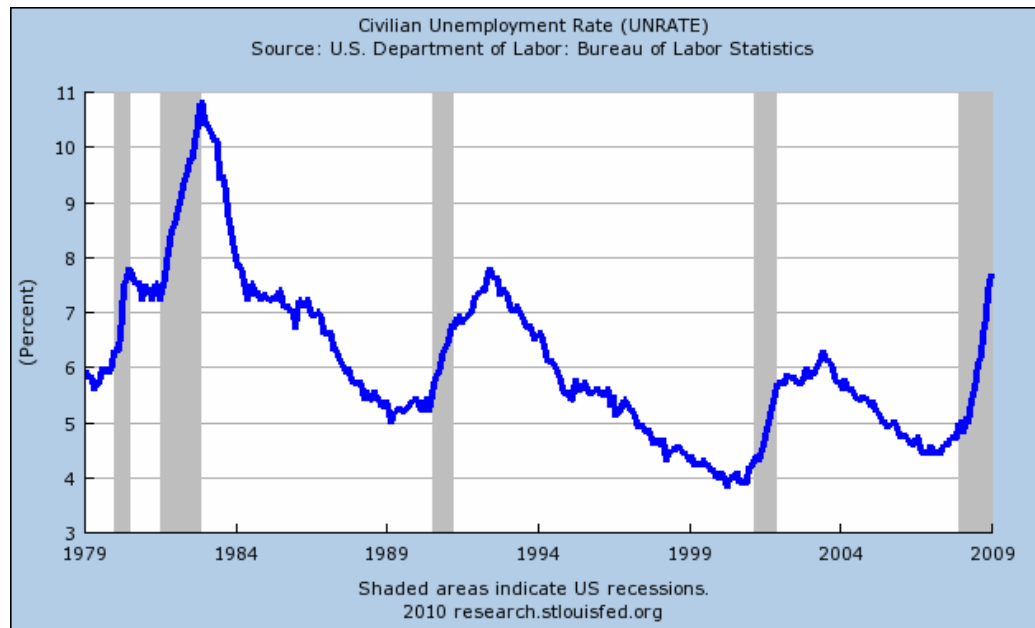
Short-term financing became nearly impossible, and regional banks began to fail in increasing numbers.



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Short-Term Protection

Long-Term Perspective



The unemployment rate began a rapid ascent toward the post-1948 peak of 10.8% (set in November and December of 1982).

Source: Federal Reserve Bank of St. Louis



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Short-Term Protection Long-Term Perspective

Amid the struggling economy and plummeting equity markets, institutional investors everywhere faced a critical question:

What action should I take with this portfolio?

- Would markets eventually stabilize, and possibly rebound?
- How much could the portfolio afford to lose?
- How were investment losses affecting operations?
- Could investment committees separate emotion from the decision-making process?



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Short-Term Protection Long-Term Perspective

The crisis reinforced one of the fundamental principles we have emphasized for years:

Portfolio risk must be considered in the context of the organization's mission.



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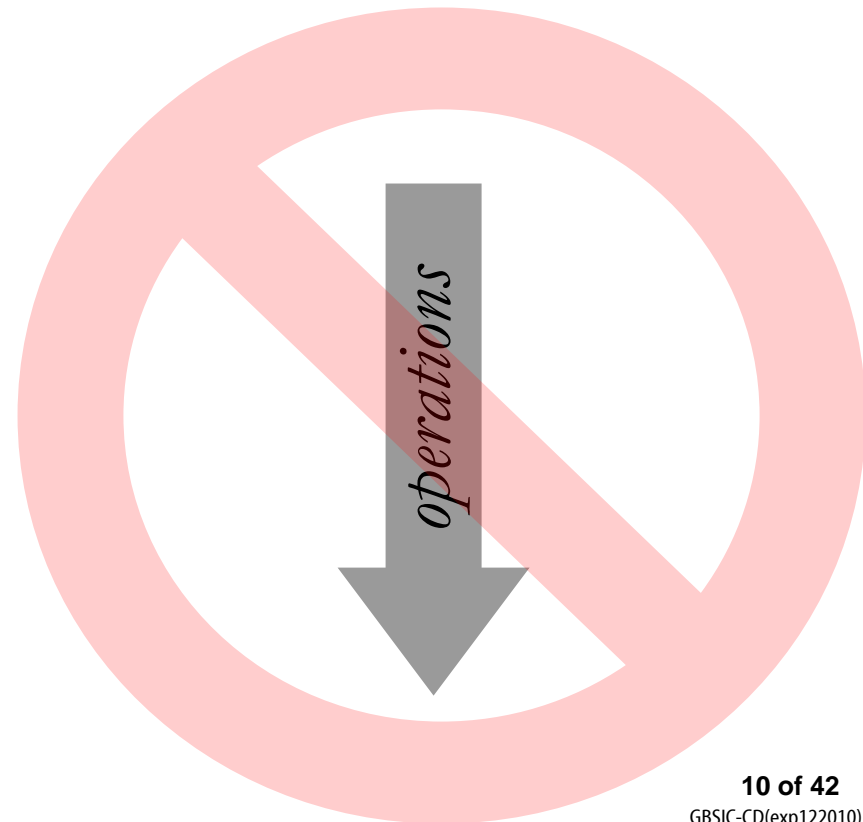
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Short-Term Protection

Long-Term Perspective

The key tenets of our philosophy are detailed as follows...

1. Investment losses that jeopardize the institution's ability to operate effectively are **unacceptable**.





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Short-Term Protection Long-Term Perspective

2. Institutions should consider their ability to operate in worst-case scenario market conditions – before that scenario occurs.





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Short-Term Protection Long-Term Perspective

3. Investors should understand the extent of their reliance on investment returns... and what they will do if those returns are negative.

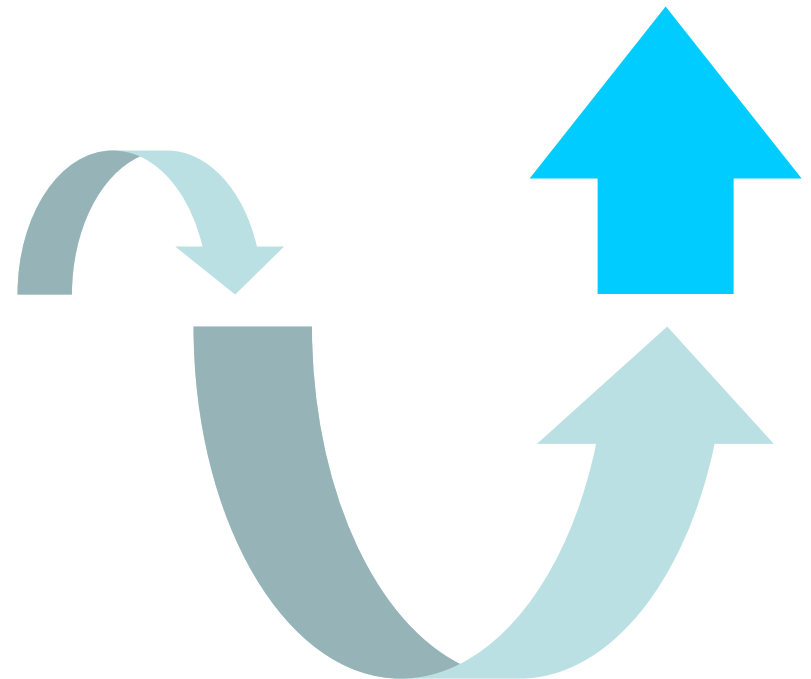




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Short-Term Protection Long-Term Perspective

4. Institutions should construct portfolios that can withstand short-term losses – in the pursuit of their long-term goals.





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Short-Term Protection

Long-Term Perspective

To effectively manage risk on an organizational level, fiduciaries must fully understand each portfolio's purpose and the potential impact of portfolio returns on operations.

Portfolios are not stand-alone entities, but instead serve a well-defined purpose for an institution...



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Short-Term Protection

Long-Term Perspective

Pension portfolios exist solely to help meet the future benefit payments promised to a group of workers.

Board-designated assets help provide the financial means to pursue projects that can enhance the capabilities of the institution.

Endowments exist to help provide ongoing budgetary support to an institution.

Defined contribution portfolios help provide an efficient vehicle for employees to save for retirement, often taking advantage of beneficial tax status and employer contributions.



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Short-Term Protection

Long-Term Perspective

Fiduciaries should utilize these three key concepts to help manage the potential risk of their investment portfolios – within the broader context of their organization's mission...

1. Assessing Risk Tolerance

Our risk management assessment tool helps investment committees to quantify risk tolerance – the amount of risk the organization can sustain given its expenditures and inflation. The tool helps to shed light on how risk can impact the organization's ability to achieve its mission.



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Short-Term Protection

Long-Term Perspective

2. Measuring Investment Risk

Drawdowns are more useful in measuring investment risk than volatility. Understanding potential drawdowns enables investment committees to help ensure portfolio losses will not jeopardize critical projects or operations.



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Short-Term Protection

Long-Term Perspective

3. Constructing Portfolios

Investors should consider both short-term risks and long-term returns to help establish the appropriate portfolio strategy. Organizations should select investments that align their portfolios with their capacity to withstand risk.



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Assessing Risk Tolerance

Risk tolerance is a concept that is often discussed – but rarely quantified.

Most investors can give a general description of their risk tolerance, but how can they be SURE that their portfolio reflects their stated appetite for risk?



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Assessing Risk Tolerance

Conservative?
Moderate?
Aggressive?

*What do these terms
really mean?*



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Assessing Risk Tolerance

Conservative, moderate and aggressive portfolios make conceptual sense in the traditional risk vs. return relationship...

But these descriptions reveal nothing about what assets make up each portfolio!

And they reveal nothing about how much each portfolio might lose when markets decline.



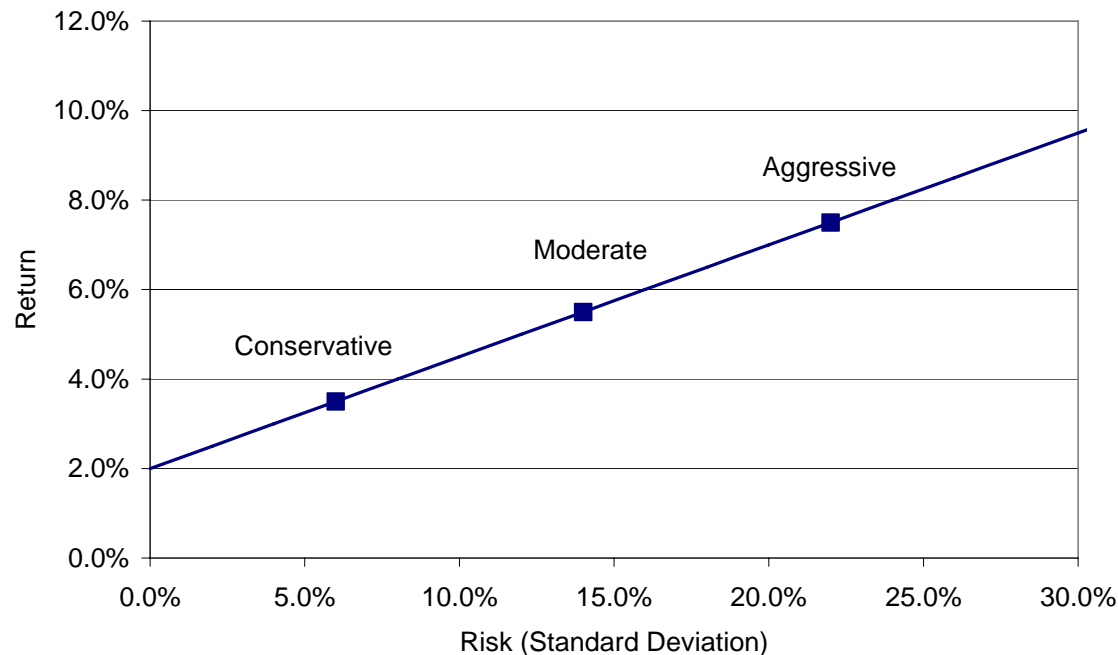


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Assessing Risk Tolerance

Investment Risk and Return



Institutions must define risk in real-world terms to determine what is appropriate for their portfolios. Our new risk assessment tool is designed to help meet this need.



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Assessing Risk Tolerance

| The Risk Assessment Tool... | Benefits the Committee by... |
|--|---|
| ... allows each committee member to consider how risk affects the portfolio. | ... engaging each member in an evaluation of the appropriate level of risk for the portfolio. |
| ... establishes a framework to determine the organization's ability to bear investment risk. | ... providing an outline for a candid discussion of investment and organizational risk factors. |
| ... identifies areas of consensus and disagreement among committee members. | ... allowing the committee to conduct more productive and focused meetings. |
| ... introduces and quantifies the portfolio's maximum loss threshold (the maximum amount the organization can afford to lose). | ... determining how investment losses might impact the organization. |



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Assessing Risk Tolerance

The risk assessment tool helps investment committees to analyze the **magnitude** of investment losses that could hinder their ability to achieve their mission.





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Assessing Risk Tolerance

In the wake of the credit crisis, some institutions were forced to curtail operations and postpone key projects.

With our risk assessment tool, we have a practical method to help avoid such outcomes for our clients...



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Measuring Investment Risk

Drawdown may provide a more appropriate measure of risk.

Drawdown measures the path taken to achieve the objective: What is the difference between the high point and the low point?

Ask yourself: Can that decline be tolerated? What impact would it have on your organization?

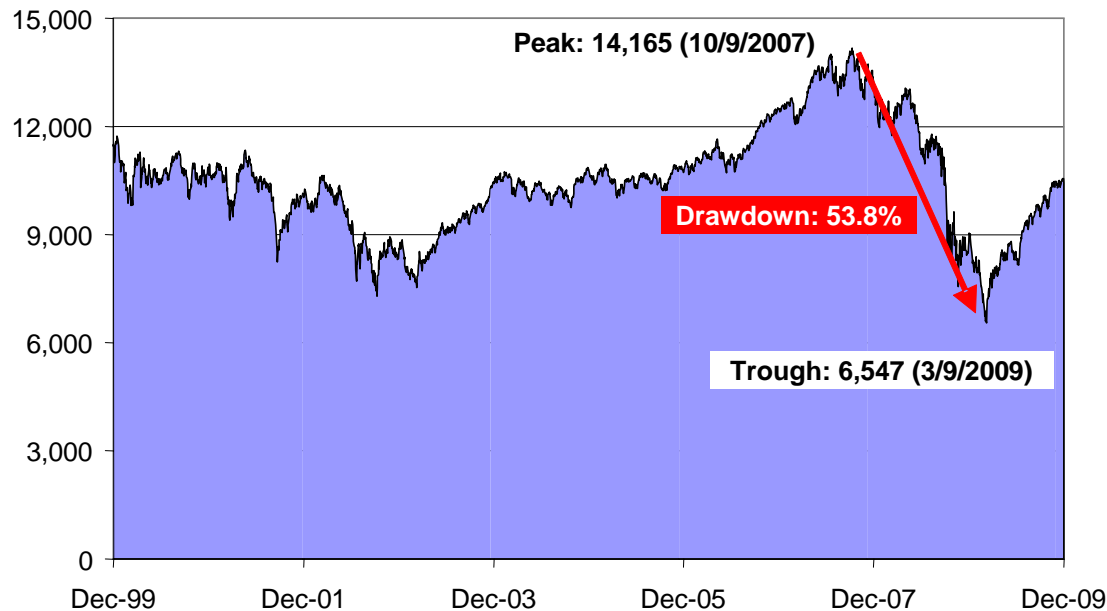


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Measuring Investment Risk

Dow Jones Industrial Average: Daily Closing Value
December 31, 1999-December 31, 2009



If we extend the Dow Jones Industrial Average graph through the full year of 2009, the full drawdown is apparent.



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Measuring Investment Risk

Key features of drawdowns:

- Not bound by a specific time period. The most recent drawdown lasted 17 months, from October 2007 until March 2009.
- Quantifies both the percentage loss and the dollar loss from the peak portfolio value.
- Helps illustrate the path risk of a given investment strategy.
- Can help identify critical decision points for investors.



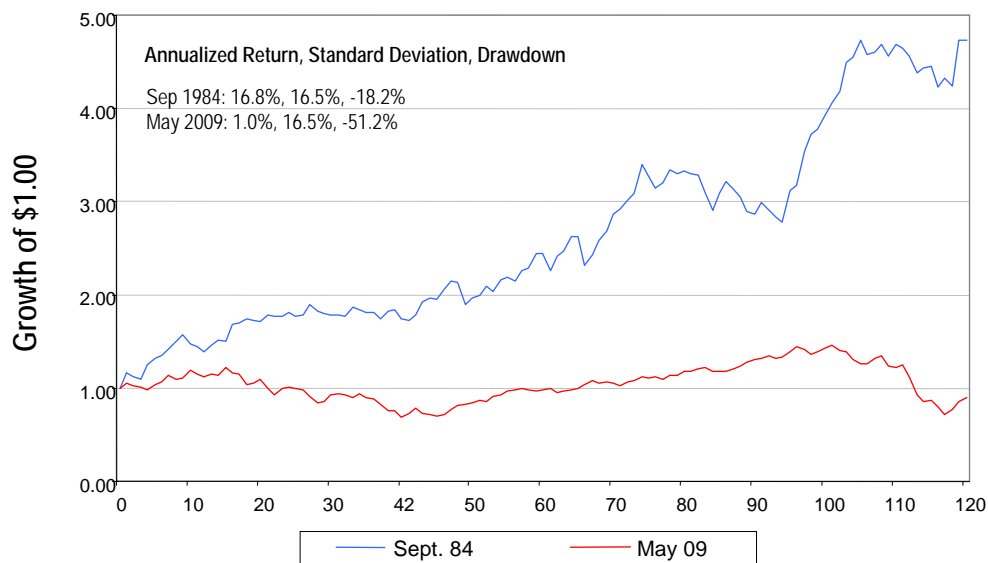
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Measuring Investment Risk

Volatility, or standard deviation, does not capture the path risk of an investment. This graph shows two 10-year holding periods with the same standard deviation of 16.5%.

Comparison of Risk Measures for U.S. Equities: 10-Year Holding Periods



Same standard deviations...

But, very different paths and drawdowns.

Standard deviation is a statistical measurement of dispersion about an average, which, for a mutual fund, depicts how widely the returns varied over a certain period of time. Investors use the standard deviation of historical performance to try to predict the range of returns that are most likely for a given fund. When a fund has a high standard deviation, the predicted range of performance is wide, implying greater volatility.



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Measuring Investment Risk

How should an organization use drawdowns?

By establishing a **maximum loss threshold** – the maximum amount the portfolio could lose without jeopardizing the mission of the organization.



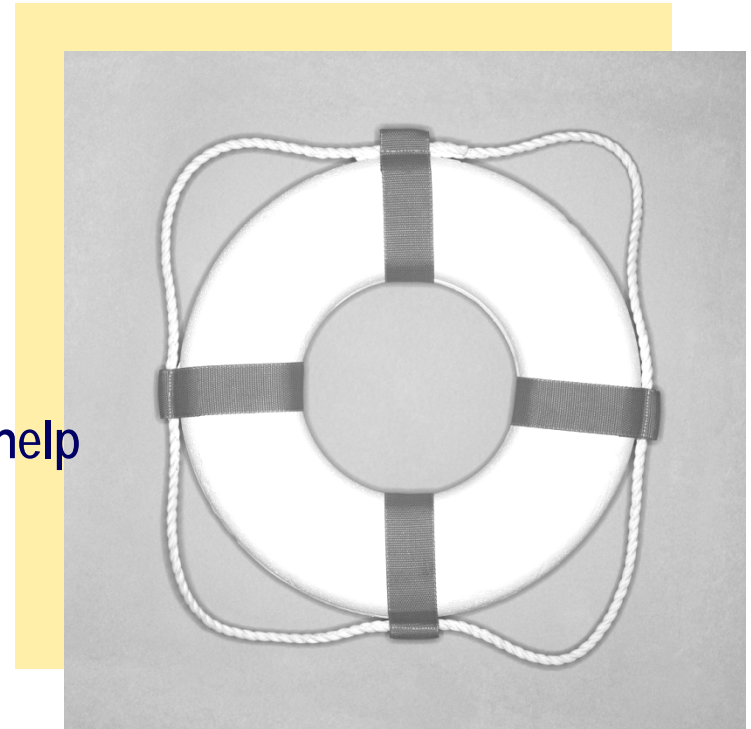
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Constructing Portfolios

Our proprietary asset allocation models provide
**a practical tool for
potential protection
from debilitating loss**

Specifically, we have enhanced our model to help
forecast the maximum drawdown over
any future time period.





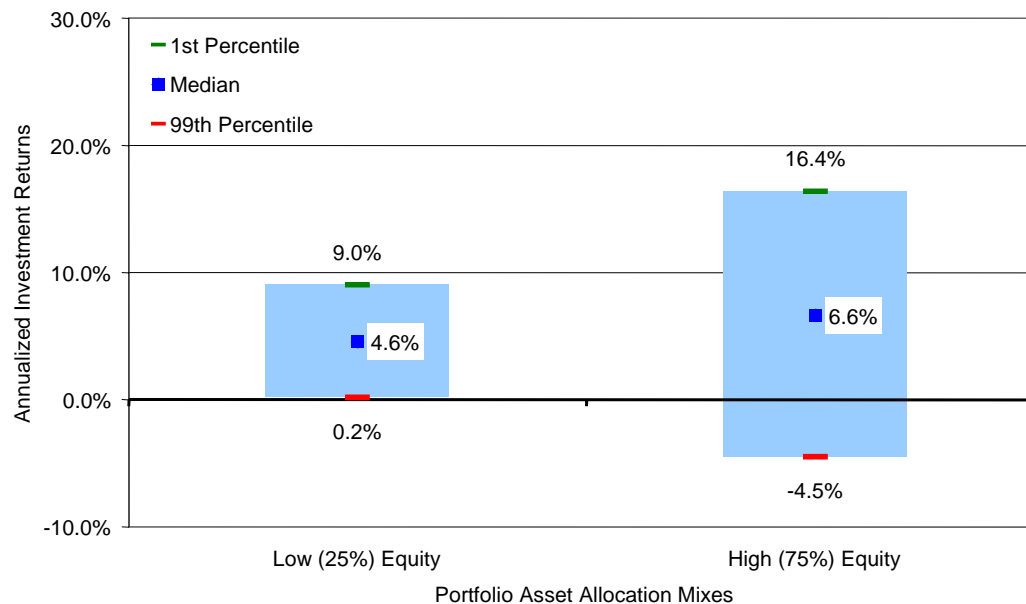
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Constructing Portfolios

Projected Investment Performance

10-Year Annualized Returns



Consider two portfolios:

A conservative mix of
25% equity and
75% fixed income

versus

an aggressive mix of
75% equity and
25% fixed income

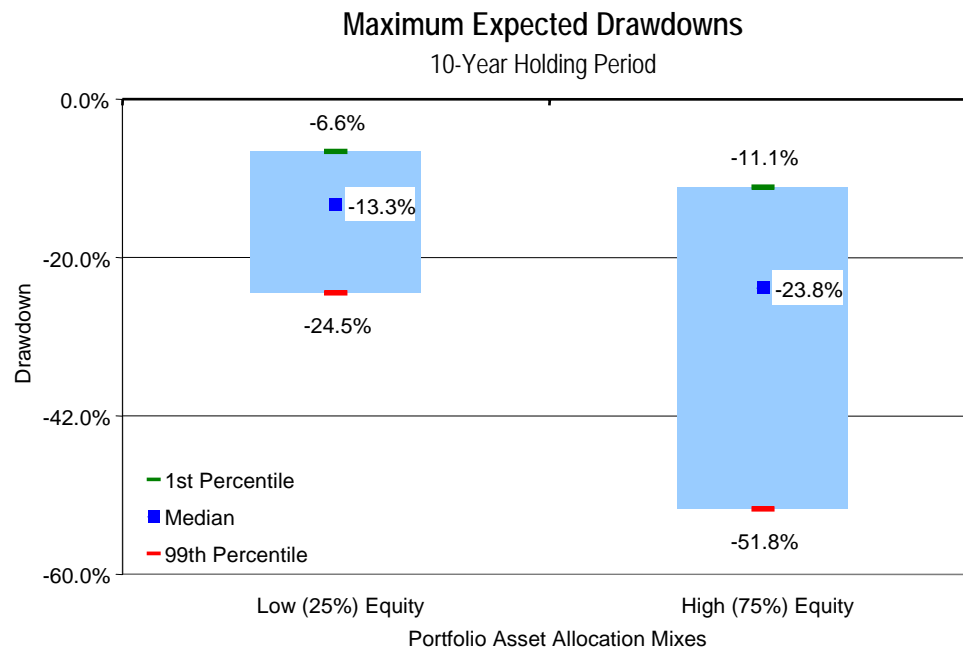
Not surprisingly, the aggressive mix has a higher expected return with a larger range of possible outcomes.



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Constructing Portfolios



The aggressive portfolio also has a greater expected drawdown (shown by the median value in the chart) and a more severe worst-case scenario drawdown (shown by the 99th percentile value).

1st percentile, a measure of best-case scenario, means that only 1% of potential outcomes are likely to be more favorable. 99th percentile, a measure of worst-case scenario, means that 99% of potential outcomes are likely to be more favorable.

Investors who choose the aggressive portfolio can expect it to suffer a median 23.8% peak-to-trough loss at some time during the next 10 years.



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Constructing Portfolios

Before deciding on an asset allocation – compare your maximum loss threshold with the expected drawdowns.

| | | Expected Drawdown | |
|---------------------|-----------------------------|-------------------|------------|
| | | Conservative | Aggressive |
| Best-Case Scenario | 1 st Percentile | -6.6% | -11.1% |
| Expected Scenario | Median | -13.3% | -23.8% |
| Worst-Case Scenario | 99 th Percentile | -24.5% | -51.8% |

1st percentile, a measure of best-case scenario, means that only 1% of potential outcomes are likely to be more favorable. 99th percentile, a measure of worst-case scenario, means that 99% of potential outcomes are likely to be more favorable.

The information provided, even if generally applicable, cannot possibly take into account all of the various factors that may affect you, your company, or your particular situation. Indexes are unmanaged. One cannot invest directly in an index. Past performance of any investment product or indexes mentioned does not indicate or guarantee future results. Your attorney and accountant should be consulted for legal and tax implications. GBS Investment Consulting, LLC, does not provide legal or tax advice.



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Constructing Portfolios

A committee that sets a maximum loss threshold of 42% should not use the aggressive portfolio mix, since there is a potential chance that the aggressive portfolio could lose more than 42% at some point during the next 10 years.

| | | Expected Drawdown | |
|---------------------|-----------------------------|-------------------|------------|
| | | Conservative | Aggressive |
| Best-Case Scenario | 1 st Percentile | -6.6% | -11.1% |
| Expected Scenario | Median | -13.3% | -23.8% |
| Worst-Case Scenario | 99 th Percentile | -24.5% | -51.8% |



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Constructing Portfolios

A 50% drawdown might seem surprising for a portfolio that includes both equity and fixed income...

But considering investment risk in terms of drawdown (instead of volatility) illustrates the past equity market declines.



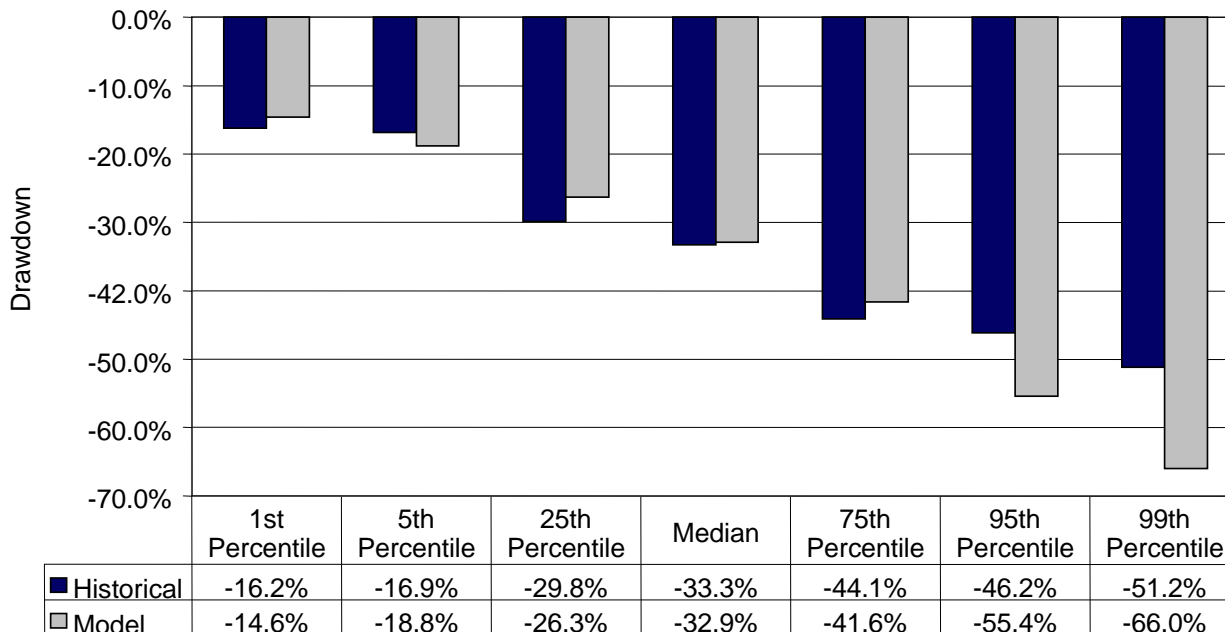
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Constructing Portfolios

U.S. Equity Drawdowns: 10-Year Holding Periods

History: Dec 61-Dec 09



This chart shows the severe equity drawdowns of the past 48 years.

The chart also demonstrates that our model provides the potential to help capture the real risk of equity losses.



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Constructing Portfolios

The model measures the portfolio's downside risks:
What is acceptable? What is unacceptable?

Our proprietary model helps our clients to identify potential pitfalls *before* building an investment strategy – eliminating the “oops” factor!



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In Conclusion...

Employing prudent risk management practices will help an organization to *withstand* short-term losses – and pursue its investment objectives:

- Better utilization of financial resources for a stronger organization
- Advancing mission-critical projects and endeavors
- Helping the Board and Management to meet fiduciary obligations
- Demonstrating good financial stewardship to stakeholders and donors



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In Conclusion...



Our comprehensive risk management solutions can help strengthen your organization – helping it to achieve its objectives.

Any Questions?



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Disclosures

- An index, such as but not limited to the S&P 500, is a portfolio of specific securities, the performance of which is often used as benchmark in judging the relative performance of certain asset classes. Indexes are unmanaged portfolios and investors cannot invest directly into an index. Past performance does not guarantee future results. The index returns are all "Total Return" with dividends reinvested, which means the returns include not only the change in price for the securities in the index, but any income generated by those securities. All data for any index prior to its launch date is an historical estimation using available data. Historical results should not and cannot be viewed as an indicator of future results.
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