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September 19, 2012

Mr. Darren Schulz, CFA
Interim Chief Investment Officer
North Dakota Retirement & Investment Office
1930 Burnt Boat Drive
Bismarck, ND 50501

Dear Darren,

Thank you for inviting Callan to submit a proposal to conduct an asset allocation and spending policy study for the North Dakota Legacy Fund ("Legacy Fund"). This letter outlines our suggested approach to conduct the study, as well as the study's objectives, deliverables, time frame, and pricing. We are open to modifying this proposal in order to meet the specific needs and objectives of the Legacy Fund Advisory Board and the North Dakota Retirement and Investment Office ("RIO").

A brief history of Callan Associates Inc.

Our company traces its origins to 1969 when Edwin C. Callan formed the investment measurement division of Mitchum, Jones and Templeton, a large West Coast brokerage firm. In 1973, Mr. Callan and others purchased the investment measurement division and formed Callan Associates Inc., a subchapter S Corporation incorporated in the State of California. Over the ensuing years, Callan expanded our staff and developed expertise in strategic planning, capital markets research and manager research, as well as formal programs to educate fiduciaries. Since our earliest days, Callan has devoted significant resources to strategic consulting and to addressing the increasingly complex needs of plan sponsors.

An overview of our consulting philosophy

Callan believes that it is our mission as investment consultants to deliver superior consulting solutions that help our clients achieve their investment and business objectives. We believe that fund sponsors should adopt well-defined procedures and methods to provide the best-managed assets for their needs and to protect the corpus from deterioration. Callan has developed our processes to help our clients dispense their duties in compliance with the highest fiduciary standards.

Callan believes in the development of customized solutions to fit each client's unique needs. To that end, we subscribe to a set of general beliefs that underpin our firm's investment advice to our clients:

- We are ardent believers in diversification at the total portfolio level and within each asset class.

- We believe very strongly that investors should develop a written, long-term strategic investment plan that addresses the investor's specific goals, objectives and the risk tolerance, taking into account the unique profile of the funds to which the investor has fiduciary responsibility.
- Once the strategic investment plan is adopted, we believe that each asset class should be structured with the goal of achieving returns in excess of the benchmark (assuming active management) while avoiding unintended and undesired risks by style, capitalization, duration, or other factors.
- We believe that passive investments can play an important role. We advocate use of passive or enhanced investment strategies in the areas of greatest market efficiency. We also believe that passive or enhanced investment strategies can be used to provide both low cost exposure and operational benefits in all public security markets, especially for large portfolios like the Legacy Fund.
- We believe in active management particularly in less efficient markets such as US small capitalization equities and non-US equities. We believe that a prudent manager selection process and a long-term view are both necessary to maximize the opportunities for success in manager selection.
- We attempt to achieve cost-effective solutions but understand that higher alpha opportunities and complex investment strategies generally demand higher fees.
- We generally believe in simple as opposed to complex portfolios. We strongly prefer fewer investment managers to more. We believe in leveraging relationships across multiple plans, where possible. We believe in written documentation of strategic decision such as asset allocation, manager structure, and manager selection document a prudent decision-making process.

We are mindful that there is no single perfect asset allocation solution that fits all endowment spending situations. Consequently, Callan commits that we will work closely with RIO staff and the State Investment Board to match the best investment practices with the Legacy Fund's unique objectives, risk tolerance, spending objectives, and its high public profile within the State of North Dakota.

Why a strategic asset allocation policy matters

The North Dakota Legacy Fund's strategic asset allocation will be the primary determinant of the future growth and volatility of the fund asset values. The primary goal of an asset allocation and spending study is to enhance the long-term security of the Legacy Fund by identifying an asset allocation policy that achieves three primary objectives:

1. The policy should reflect the appropriate level of risk for the Legacy Fund, based on a balanced consideration of expected contributions, principal preservation and spending requirements.

2. The policy should generate the maximum expected rate-of-return given its expected level of risk. An asset mix that meets this criterion will be deemed to be “efficient”.
3. The asset allocation policy ultimately selected for the Legacy Fund will ideally balance the needs and objectives of both near-term and long-term spending goals.

Our evaluation will comport with North Dakota law that specifies an initial asset accumulation phase that will be followed by a period that includes both contributions to and distributions from the Legacy Fund.

Overall Process

Callan has assigned a senior team of asset allocation specialists to work with the RIO investment staff to complete this strategic planning project. Paul Erlendson, Senior Vice President, will be responsible for oversight and execution of the project. Eugene (Gene) Podkaminer, Vice President and a member of Callan's Capital Markets Research Group, will be the project's lead investigator. In addition to Paul and Gene, we will employ professional resources from throughout the firm as needed including Jay Kloepper, Executive Vice President and Director of Callan's Capital Markets and Alternatives Research group.

The following table lists the members of our Capital Markets Research Group.

Name	Industry Focus	Industry Experience	Years w/ Firm	Degree/ Certifications
Jason Ellement	VP, Capital Markets Research	18	10	FSA, CFA, MAAA, BS
Karen Harris	VP, Capital Markets Research	24	12	ASA, CFA, BM
Jay Kloepper	Director of Capital Markets and Alternatives Research	25	14	MA, BS
Julia Moriarty	VP, Capital Markets Research	22	22	CFA, MBA
James Van Heuit	SVP, Capital Markets Research	23	19	MA, BS, BA
Eugene Podkaminer	VP, Capital Markets Research	15	3	MBA, CFA

Asset Spending Study Methodology

An endowment fund's strategic asset allocation is the primary determinant of investment return on the assets, as well as a major determinant of the volatility of the Fund asset values. The objective of Callan's asset allocation and spending study is to determine the appropriate asset allocation for the Legacy Fund.

Callan employs two standard quantitative tools: mean-variance optimization and Monte Carlo simulation to help determine which asset allocation policy best satisfies the two criteria above. Mean-variance optimization allows us to evaluate whether an asset mix is efficient. The Monte Carlo model allows us to understand how an asset mix might interact with the Legacy Fund's spending policy across many possible capital market environments.

The proposed asset spending policy study will be formally reviewed by a peer committee of senior Callan professionals – the Client Policy Review Committee. This group provides a qualitative overlay to the quantitative approach. The formal review limits the possibility that any bias might affect the analysis and is a distinguishing characteristic of Callan’s consulting practice when compared to those of other firms.

In order to determine which asset mix is most appropriate, the State Investment Board must establish an appropriate set of decision-making criteria. Callan will bring our experience consulting to funds with like objectives to the SIB’s attention during your deliberations of available alternative investment strategies.

The first step in establishing these criteria is to determine the mission or primary goal for the Legacy Fund. The primary objective governing the management of most endowments is the pursuit of intergenerational equity: that is, the real (i.e.—inflation-adjusted) purchasing power of the corpus is maintained over time. Successful programs maintain the purchasing power of the corpus by choosing an average level of spending that can be supported by the investment and contribution policies. If this goal is achieved, it should enable another objective: a relatively constant level of real spending.

The current fixed-income orientation of the Legacy Fund’s investments is unlikely to keep pace with inflation; our study will specifically evaluate the risk of inflation to each of the asset allocation alternatives.

Capital Market Projections

Callan develops projections of capital market performance at the start of each year. Projections are made for 5- and 10-year time periods. Callan integrates information on past capital market performance, key economic indicators, and the market insights of Callan professionals to develop projections that are sound, defensible, and consistent with financial theory. Individual asset classes are analyzed as part of a larger system, acknowledging both the interaction between asset classes and the influence of larger macroeconomic events such as inflation or recession on the entire structure of capital markets.

Capital market projections consist of projected returns and two risk measures—standard deviation and correlation—for all of the major asset classes and inflation. Callan uses broad asset classes in asset allocation work and to conduct manager structure analysis of capitalization, duration, and other stylistic variations within asset classes. Mean-variance optimization is very sensitive to inputs. We provide sub-asset class assumptions to satisfy specific needs. For example, we have capital market projections for emerging markets and high yield bonds and can develop modeling assumptions for others as need be.

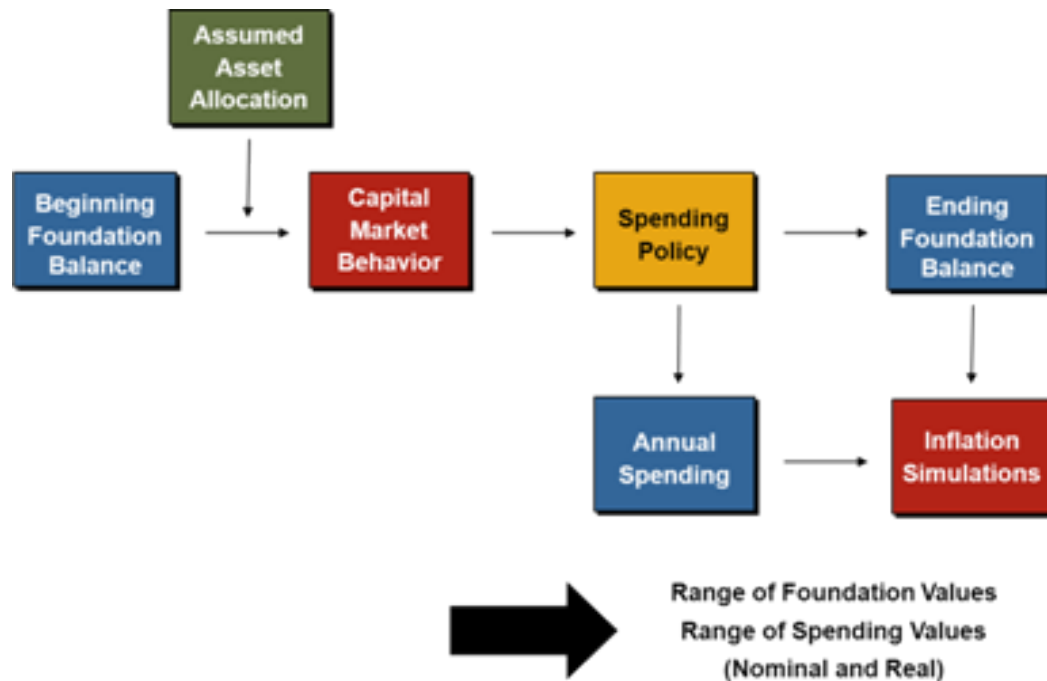
Mean-Variance Optimization and the Efficient Frontier

Mean-variance optimization allows us to evaluate whether an asset mix is efficient (whether it lies on the efficient frontier.) The Capital Market Projections are the input for Callan’s proprietary mean-variance optimization model. Mean-variance optimization is used to identify a series of asset mixes, ranging from lower risk to higher risk, that all satisfy the objective of being efficient.

This series of asset mixes is commonly referred to as the efficient frontier. The mixes along the frontier are deemed efficient because they generate the maximum expected return for their expected level of risk. They do this by taking optimal advantage of low correlations between the performance behavior of the different asset classes of which they are composed.

Fund Asset and Spending Model

It is absolutely essential that a thorough understanding of the Legacy Fund's assets and planned spending inform the determination of the appropriate asset allocation. Callan uses a proprietary simulation modeling system to construct a detailed model of the Legacy Fund's assets, potential spending policy alternatives, and contributions. We will project the interaction of spending and Fund assets under expected capital market outcomes, and then simulate the financial condition of the Fund and the potential level and range of spending by inserting capital market uncertainty. The model integrates projections of capital market performance, and through Monte Carlo simulation, tests the range of potential outcomes on the Legacy Fund assets and spending levels, in both nominal and real (i.e.—inflation adjusted) dollars. The schematic below describes the integrated modeling and simulation process.



Note: real values are determined by discounting nominal values by inflation. Real values show the future spending and asset amounts expressed in today's dollar equivalent.

Monte Carlo Simulation

Monte Carlo simulation is a modeling technique generally employed to solve problems where a variable of interest is dependent on the interaction of a number of other variables whose outcomes are uncertain.

We use Monte Carlo simulation to evaluate the expected behavior of each of the efficient mixes in the context of the Legacy Fund's future assets and spending. By simulating thousands of possible capital market outcomes and observing the interaction of assets and spending across many potential scenarios, we can begin to understand the effect that each asset mix might have on the future of the Legacy Fund.

The Legacy Fund's potential spending policy is tested across a range of potential market environments. We concurrently evaluate the current and alternative asset mixes within the same market environments. The combined analysis will portray the projected financial condition of the Legacy Fund over several time horizons (typically 5, 10 and 20 years) and across various capital market scenarios.

Callan's model is extremely flexible and can incorporate all types of spending policies seen among endowments and foundations, including income-derived, rolling percentage of Legacy Fund market value, percentage of previous years' spending, floors, corridors, and hybrids of these strategies. Planned spending for the current or future years can be explicitly incorporated. Expenses can be explicitly incorporated as well. We believe this type of analysis will be particularly useful to the Advisory Board as it seeks to determine both spending and investment policies.

We focus on four key variables in the asset allocation and spending policy simulation process:

1. Ending market value (nominal and real)
2. Annual spending (nominal and real)
3. Cumulative spending (nominal and real)
4. Ultimate real purchasing power ("URPP")

"URPP" is defined as the sum of the inflation-adjusted ending market value plus cumulative real spending. It serves as a powerful decision variable that incorporates the effects of inflation on the purchasing power of the Legacy Fund's future market value. Other endowment funds have found that URPP is a very reasonable decision variable for guiding an asset allocation decision. By searching for investment policies that optimize the URPP over a wide range of future capital market behavior, the Legacy Fund can balance the tradeoff between real spending and the future real value of assets.

Project Timing

In order to expedite the study, we propose that Callan professionals interact primarily with RIO investment staff on an ongoing basis during the conduct of the study. It is our experience that we speak at least weekly—if not more often—with investment staff as the study is being conducted.

We expect to meet with the State Investment Board at least twice. The first meeting will involve a discussion of the asset allocation process and potential decision variables that might be used by the Board to make the asset allocation decision. The second meeting will review the process, decision variables, and our findings. The Board may select an asset allocation policy at the conclusion of the second meeting. In the event the Board has questions, we may potentially have to follow up with supplemental information before a strategic allocation decision can be made.

Ideally, the study should take approximately eight weeks to complete. We recognize, however, that the proposed timeline is subject to the State Investment Board members' availability. Our goal is to provide the Board and RIO staff with the data and perspective needed to make informed, prudent decisions regarding the Legacy Fund's asset allocation and potential spending policies. At the conclusion of the asset/spending project, we will work with RIO investment staff to develop an investment policy statement for the Legacy Fund and a transition plan to implement the State Investment Board's allocation decision.

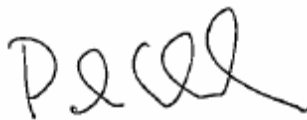
Project Fee

The project fee to complete the asset/spending study for the Legacy Fund as described above is \$64,000. Reasonable travel expenses incurred by Callan professionals to attend meetings with Advisory Board and RIO staff, as authorized in advance, will be billed outside of the project fee.

Under separate cover we previously sent copies of Callan's current forms ADV Part II-A and ADV Part II-B. They provide required background information about the firm and professionals who will be directly involved with the project. In that letter dated June 21, 2012 we also enclosed a list of managers with whom Callan does business. I will respond to any questions about this proposal. You can contact me at (303) 861-1851 or via email at erlendson@callan.com.

Please have this letter countersigned by an authorized individual and return a copy to me as authorization for Callan to conduct the asset allocation / spending project as described above.

Cordially,



Paul Erlendson

on behalf of the North Dakota Legacy Fund

enclosures

cc: Jay Kloepper, Callan

September 28, 2012



North Dakota State Investment Board

A Strategic Planning Process
for the Legacy Fund

Paul Erlendson

Senior Vice President, Fund Sponsor Consulting

Eugene Podkaminer, CFA

Vice President, Capital Markets Research

General Consulting

Primary Consulting Team



Paul Erlendson

- Fund Sponsor Field Consultant
- 26th year with Callan
- Works directly with 9 clients
- Clients include public DB, corporate DB and DC, Taft-Hartley DB / DC, Foundation, Nuclear Decommissioning Trust
- B.A. and M.A. – North Dakota State University



Eugene Podkaminer, CFA

- Capital Markets Research Consultant
- 14 years of industry experience
- 2nd year with Callan
- Former Chief Strategist of OCIO at Barclays
- B.A. Economics – University of San Francisco
- M.B.A. – Yale University
- CFA Charterholder

Consulting Team Clients

- North Dakota State Investment Board
- Sempra Energy
- Boilermaker National Annuity Trust National Annuity Trust
- Boilermaker-Blacksmith National Pension Trust
- Sempra Energy Nuclear Decommissioning Trusts
- Leggett & Platt DB
- University of Alaska – Foundation
- Alyeska Pipeline Service Company Savings and Investment
- Education Trust of Alaska 529 Tuition Savings Plan

The Legacy Fund: Challenge and Opportunity

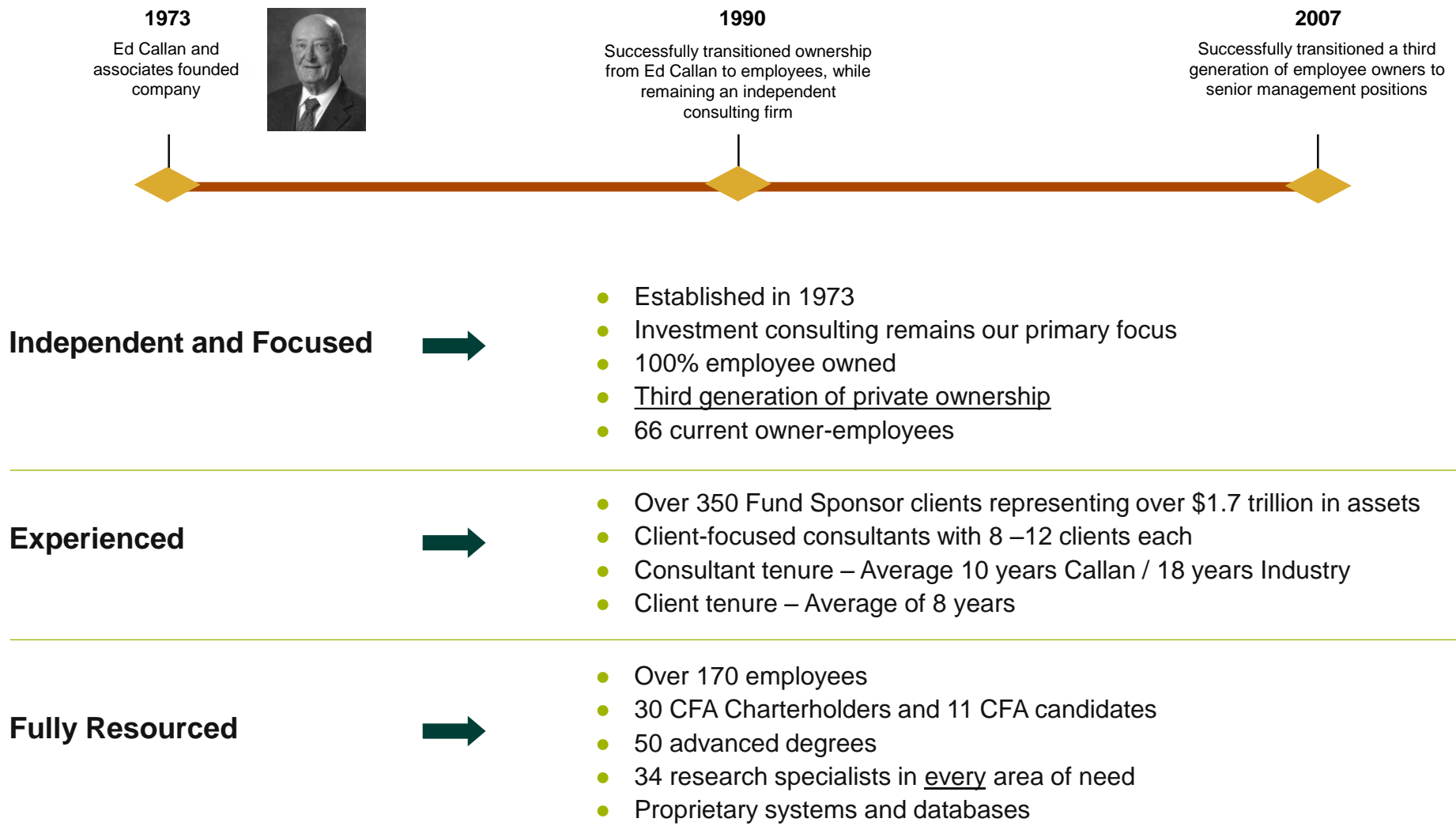
- The Legacy Fund is accumulating contributions at a rapid rate – over \$500M in the first year of existence
- The Fund lacks both a formally articulated spending policy and a corresponding long-term investment policy to support those (as of yet) undefined spending objectives
- Investments in short-term fixed-income produces a return which is below the rate of inflation, impairing the future purchasing power of Fund assets

Key questions:

- What are the Legacy Fund's spending objectives?
- What is the “right” investment policy to support those objectives?

Callan's Organizational and Consultant History

Exceptional Client Service Backed by Deep Resources and Unmatched Collective Experience



Experience with Endowments and Foundations

- Callan is one of the largest investment consulting firms in the industry*
- Callan advises to over 30 endowment and foundation clients, representing over \$50B

Representative Endowment and Foundation Clients

Alaska Permanent Fund	Jewish Foundation of Cincinnati
California Institute of Technology Endowment	Luckyday Foundation
Clayton Foundation for Research	Marley Foundation
Connelly Foundation	Orlando Health Foundation Inc.
David and Lucile Packard Foundation	Philadelphia Orchestra Association
DMNS Foundation	Research Corp. for Science Advancement Foundation
Foundation for Medical Research Inc.	Tobacco Settlement Investment Board
Georgia Higher Education Savings Plan	University of Alaska Foundation
Good Shepherd Rehabilitation Network	University of California, Irvine Foundation
Guide Dogs for the Blind	University of Cincinnati Foundation
Hotchkiss Foundation	University of Colorado
Helios Education Foundation	University of Nevada, Las Vegas Foundation
Idaho Endowment Fund Investment Board	University of Western Ontario
Indiana University	United Methodist Foundation of Western North Carolina
Inter American University of Puerto Rico	Upstate Medical University Foundation
James Irvine Foundation	Utah Permanent State School and Institutional Trust

* Source: *Pensions & Investments*.

Callan's Philosophical Beliefs

- Direct, open, and candid communication with Foundations' key decision makers – we believe that our clients are best served by our unbiased and experienced advice even when that advice differs from the client's point of view
- Taking a strategic, long-term approach to planning and implementation with documented due diligence is the most prudent way to manage institutional assets
- Customized solutions for each client's particular needs – not a one size fits all approach
- Diversification at the total fund level and within each asset class
- Proven strategies over ones considered “cutting edge” – a conservative approach to risk management in which we perform in-depth due diligence research to ensure that investments are managed by firms with experience, expertise, and established track records

A Sound Fiduciary Process is Our Goal

Callan's Consulting Process

We believe that every large investor has a distinct set of circumstances. We approach each client with an open mind. We strive to build off of the strengths already embedded in a client's program. We do not impose a "one-size-fits-all" policy position onto our clients.

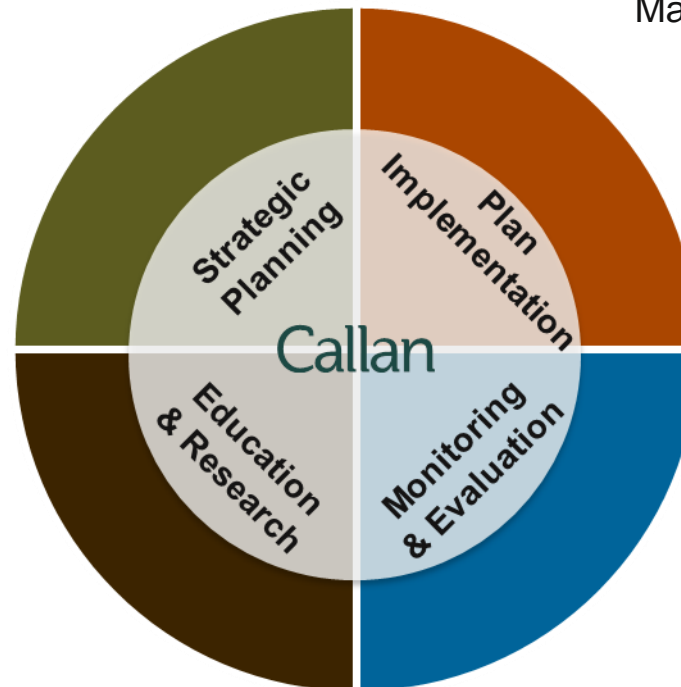
Asset Allocation/Liability Study
Investment Policy Development
Investment Structure Evaluation
Manager Portfolio Guidelines

Callan Investments Institute

- Conferences
- Research Papers
- Surveys

"Callan College"

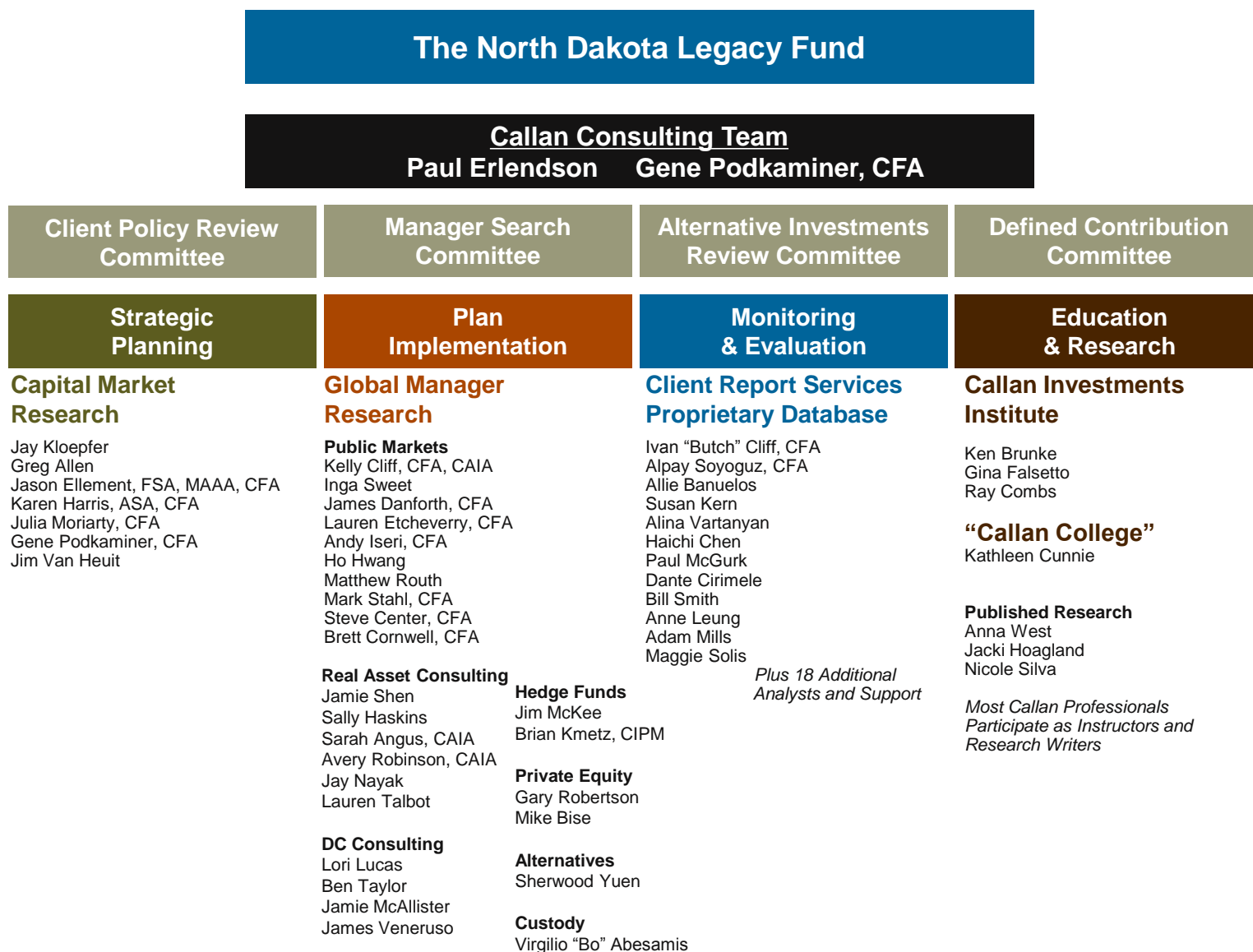
- Fiduciary Education
- Custom Topic Education Sessions



Manager/Fund Review and Search
Custodial Review and Search
Securities Lending Analysis
Transition Management
Fee/Cost Analysis

Total Plan Analysis
Asset Class Analysis
Risk Analysis
Investment Manager Analysis

Large Firm Resources with Client Service Focus



Capital Markets Research Group



Jay Kloepper
BS, MA



Jason Ellement
BS, CFA, FSA, MAAA



Karen Harris
ASA, BM, CFA



Julia Moriarty
BS, MBA, CFA



Eugene Podkaminer
BA, MBA, CFA



James Van Heuit
BA, BS, MA

Director of Capital Markets and Alternatives Research

- Determine the risk and return objectives for the Legacy Fund and identify a broad asset allocation target that is appropriate for those parameters
- Provide capital market research – all asset classes and strategies
- Develop proprietary capital market expectations
- Conduct a wide array of modeling assignments, including asset allocation and scenario analysis
- Provide custom client research and education
- Author Quarterly Capital Market Review and periodic research papers
- *We have extensive work experience with your actuary, Gabriel Roeder Smith and Co.*

25 Full asset/liability or spending studies conducted each year

25 Asset allocation-only studies conducted each year

20 Investment structure studies conducted each year

50 Custom research projects conducted each year

What is an Asset Allocation and Spending Study?

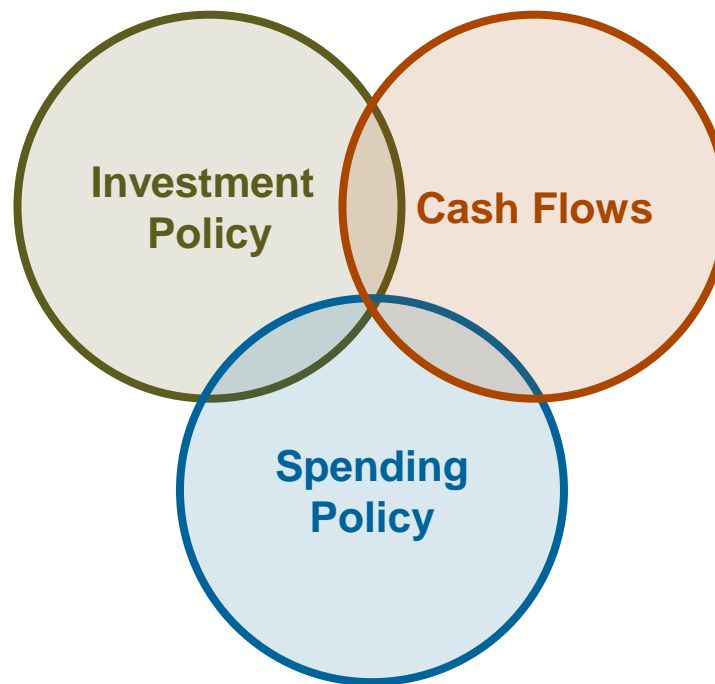
We evaluate the interaction of the three key policies that govern an endowment with the goal of establishing an appropriate investment policy

Investment Policy

- How will the assets supporting the spending be invested?
- What are the risk/return objectives?
- How to manage cash flows?

Spending Policy

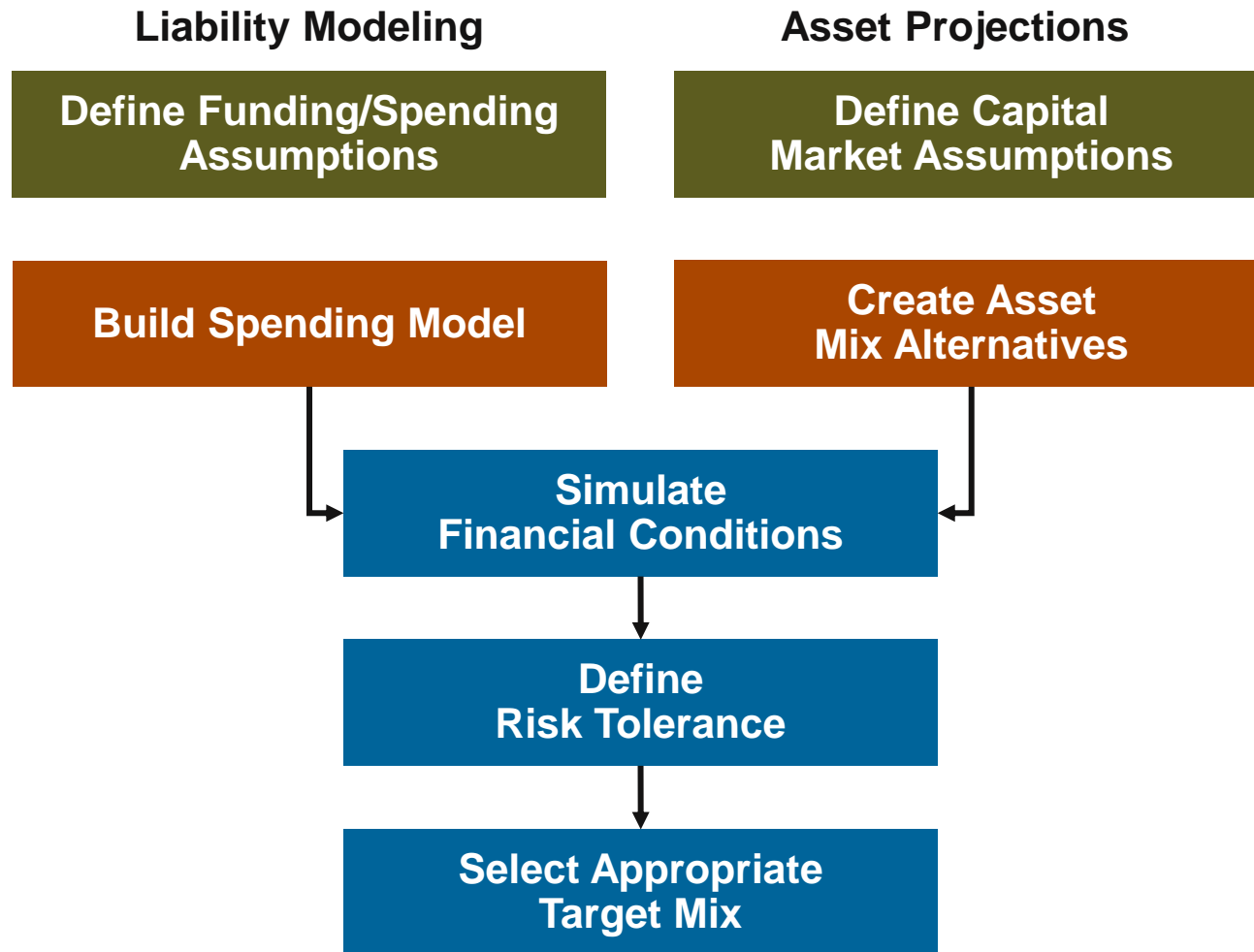
- What type of spending policy
- What level of spending?
- Expectations for fees?



Cash Flow Expectations

- Expected Contributions
- Forward-looking assumptions and scenarios

Overview of Asset-Spending Process

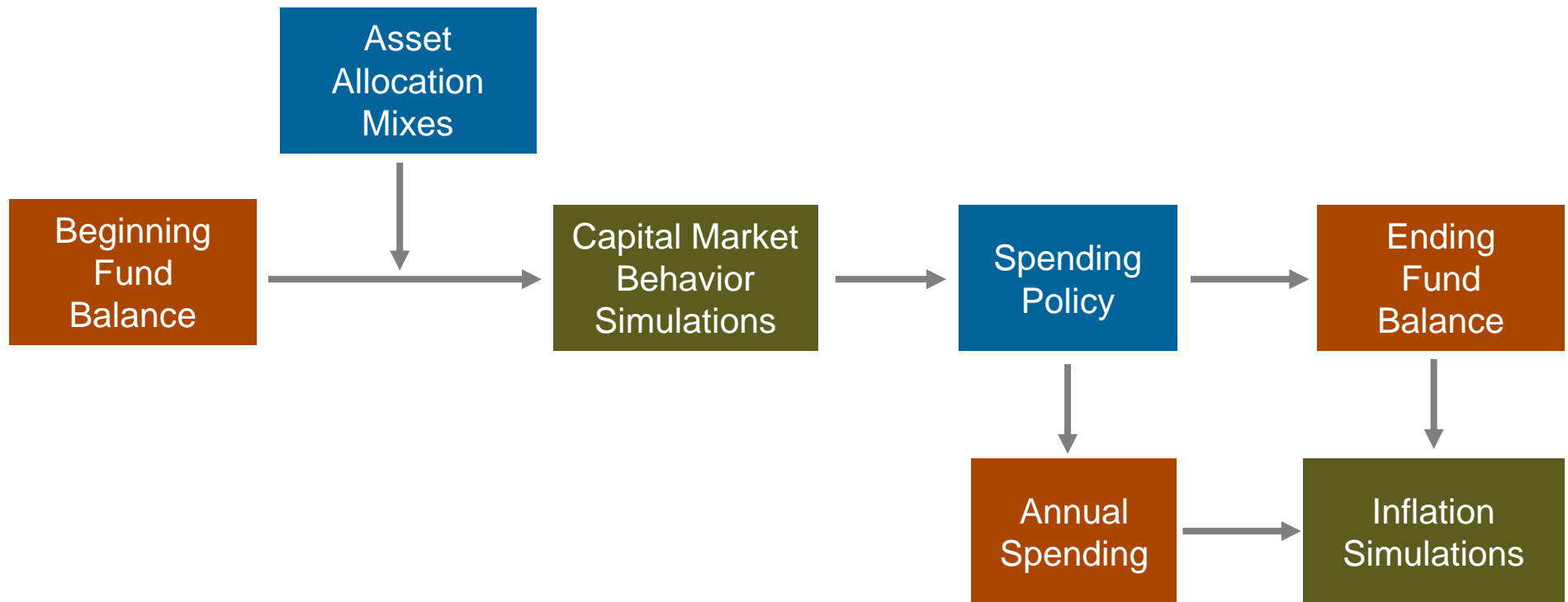


Goals and Objectives

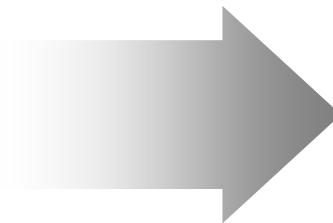
Determine the appropriate asset allocation policy for the Legacy Fund:

- The appropriate asset allocation will evaluate the dual objectives of maintaining or increasing real spending while maintaining or growing the real (inflation-protected) value of the Fund over the projection period
- The study focuses on 5-, 10-, and 20-year time horizons as they impact spending and the value of the corpus
- Because these can be competing objectives, careful consideration must be given to both goals when conducting long-term planning

Overview of Callan's Asset / Spending Model



Simulation allows us to measure the range of outcomes for each asset mix from best-case to worse-case



*Range of Fund Values
Range of Spending Values
(Nominal and Real)*

Note: Real values are determined by discounting nominal values by simulated inflation. Real values express future values in today's dollar equivalent.

Spending Policy Considerations for the Legacy Fund

- General rule of thumb: to balance intergenerational equity, a policy can't spend more than the expected real return on investments over the long run
- This rule leads many trusts, endowments, and foundations to seek a higher return to support higher real spending
 - Inflation of 2.5% – 3% and a nominal return target of 8% results in real return expectations of 5% – 5.5%
 - 5% – 5.5% is very typical of the spending targeted by a majority of foundations and endowments
 - Challenges in today's environment include generating a real return of 5%; many institutions are reevaluating spending policies in light of expectations for the capital markets
- Unique challenge for trusts built on resource royalty payments: How to accommodate inflows in the spending policy?
 - *Ignore* – dedicate to growing the endowment for future spending; market-value based spending policy: inflows are added to corpus over time, generating additional spending in the future
 - *Acknowledge* – may support spending in excess of the real investment return; income-based spending policies may acknowledge royalty payments as “income”
 - Royalty revenues can alter the asset allocation/spending relationship. Even with a market-value-based spending policy, projections of strong oil royalty revenue could suggest that the Legacy Fund can support spending in excess of any expected real return. However, the Fund can also be susceptible to declines in royalty inflows; a sharp reduction in royalty expectations could then spur reconsideration of the effective rate of spending by the Fund, and introduce uncertainty into the appropriate spending policy.

Commonly Used Spending Policies

Commonly used spending policies for foundations and endowments typically fall into four broad categories:

- **Income Only**
 - *Only coupon and dividend payments are spent*
 - Fairly stable spending from year to year
 - Asset allocation oriented towards income generation rather than total-return investing
 - Favors a large allocation to fixed income
- **Market Value-Related**
 - *A percentage of the fund's market value is spent each year*
 - Favors the long-term preservation of the corpus
 - Produces unstable spending from year to year
 - Over time, a market value-based spending policy will produce more total dollars for the institution as it frees the investment decisions from the spending policy
- **Historical Spending Plus an Adjustment**
 - *An amount equal to the prior year's spending plus some amount is spent*
 - Makes budgeting easier
 - Requires discipline to refrain from increasing spending during bull markets
- **The Hybrid Model**
 - *Balance competing goals of producing stable spending levels while preserving purchasing power by using more than one type of spending policy*
 - Best known example is the “Yale” model, where spending is equal to a weighted average of prior spending adjusted for inflation (70% weight) and 5% of current market value (30% weight)

The overwhelming majority of institutions employ some form of market value-based formula

Regardless of the spending policy selected, actual spending must average slightly less than the real investment return

Callan's Experience with Royalty-Based Trusts

- Alaska Permanent Fund

- Developed detailed model for projecting and simulating endowment fund assets, spending, and capital market outcomes including modeling of income-based dividend distribution policy
- *Ongoing engagement*

- Alabama Trust Fund

- Developed asset allocation policy to serve income and royalty-based distribution policy; model and studies used to support successful effort to amend Alabama constitution and change to an asset-based spending policy
- Revising asset allocation policy to serve new spending policy
- *Ongoing engagement*

- Utah Permanent Fund

- Regular studies to evaluate asset allocation policy to serve current income-only spending policy; alternative scenario analyses to evaluate potential move to asset-based spending policy
- *Periodic engagement*

- Texas Permanent School Fund

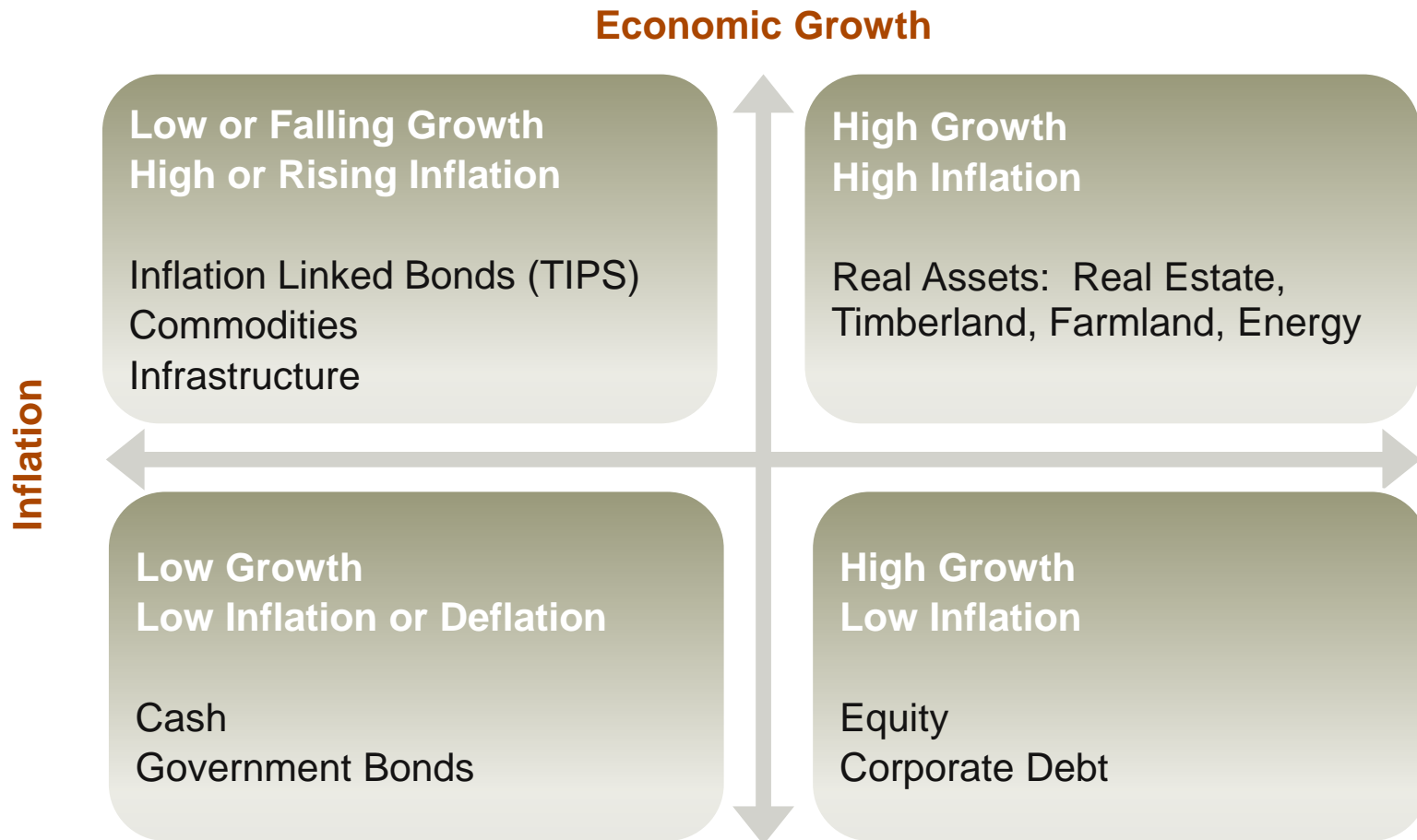
- Developed asset allocation policy to serve income-only distribution policy; model and studies used to support successful effort to amend Texas constitution and change to an asset-based spending policy
- *Former client*

What Concerns are Investors Facing Today?

- Placing an increased emphasis on understanding how different policies will react to specific economic/capital market outcomes:
 - High or rapidly rising inflation
 - Flight to quality
 - Rapidly declining interest rates or deflation
 - Low inflation, robust growth
- Asset classes will be defined increasingly by their expected reactions to these different environments
 - Creation of real-return or inflation hedging asset class
 - Flight to quality assets
 - Deflationary assets
 - Robust growth assets
- Liquidity is a more explicit consideration in strategic policy development and implementation
- Is there room in the portfolio for opportunistic strategies which can take advantage of shorter-term dislocations?

Economic Role of Asset Classes

- Investors are seeking greater economic diversification to a broader range of scenarios like inflation, deflation, stagflation and growth-given uncertainty



Purpose Driven Investing

Roles of Asset Classes

- **Capital Accumulation:** *Grow assets through relatively high long-term returns*
 - US Equity
 - Global Ex-US Equity
 - Private Equity
- **Flight to Quality:** *Protect capital in times of market uncertainty*
 - US Fixed Income
 - Cash Equivalents
- **Absolute Return:** *Earn returns between stocks and bonds while attempting to protect capital*
 - Absolute Return Hedge Funds
- **Inflation Hedge:** *Support the purchasing power of assets*
 - Real Estate, Timber, Farmland, etc.
 - Real Return Fund
 - Commodities
- **Opportunistic:** *Take advantage of dislocations in the market as opportunities arise*
 - Distressed Mortgages, etc.

Closing Considerations for the Legacy Fund

Establish the Spending Objective:

- Determine the risk and return objectives for the Legacy Fund and identify a broad asset allocation target that is appropriate for those parameters

Establish an Investment Policy that supports the spending objective:

- Purpose of assets
- Short-term and long-term objectives
- Liquidity needs
- Diversification
- Tolerance for downside risk



Appendix

Callan Presenter Biographies



Paul M. Erlendson, Senior Vice President. Paul is a senior consultant in Callan's Denver Consulting Office. He is a member of Callan's Client Policy Review, Manager Search and Defined Contribution Committees, and is a shareholder of the firm. Paul has assisted a variety of institutional investors with a broad array of investment policy formulation, implementation, and evaluation decisions. Paul has twenty-eight years of industry experience and has been with Callan for twenty-five years.

Prior to joining Callan Associates in 1986, Paul served on the staff of a state pension system. His background also includes work in the insurance industry, and a stint as a college instructor. His commitment to education extends to participating in speaking roles at various investment forums. Paul served as a member of the Pitzer College Parent Leadership Council. Paul earned a B.A. and an M.A. from North Dakota State University.



Eugene L. Podkaminer, CFA, Vice President. Eugene is a consultant in the Capital Markets Research Group. Eugene is responsible for assisting clients with their strategic investment planning, conducting asset allocation studies, developing optimal investment manager structures, and providing custom research on a variety of investment topics.

Prior to joining Callan in 2010, Eugene spent nearly a decade with Barclays Global Investors. As a Senior Strategist in the Client Advisory Group, he advised some of the world's largest and most sophisticated pension plans, non-profits, and sovereign wealth funds in the areas of strategic asset allocation, liability driven investing, manager structure optimization, and risk budgeting. As Chief Strategist of Barclays' CIO-outsourcing platform, Eugene executed CIO-level functions for corporate pension plans and endowments. Eugene was also a Senior Investment Consultant with Alan Biller and Associates.

Eugene received a B.A. in Economics from the University of San Francisco and an M.B.A. from Yale University. He earned the right to use the Chartered Financial Analyst designation and is a member of the CFA Society of San Francisco and the CFA Institute.

2012 Capital Market Expectations

Return and Risk

Summary of Callan's Long-Term Capital Market Projections (2012 - 2021)

		PROJECTED RETURN			PROJECTED RISK		2011 - 2020	
Asset Class	Index	1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	Projected Yield	10-Year Geometric*	Standard Deviation
Equities								
Broad Domestic Equity	Russell 3000	9.20%	7.75%	5.25%	18.70%	2.00%	8.00%	18.10%
Large Cap	S&P 500	8.95%	7.60%	5.10%	18.00%	2.20%	7.85%	17.25%
Small/Mid Cap	Russell 2500	10.25%	7.90%	5.40%	23.00%	1.20%	8.25%	23.00%
International Equity	MSCI EAFE	9.30%	7.60%	5.10%	20.00%	2.00%	7.85%	19.75%
Emerging Markets Equity	MSCI EMF	11.50%	8.00%	5.50%	27.75%	0.00%	8.35%	27.50%
Global ex-US Equity	MSCI ACWI ex-US	9.85%	7.90%	5.40%	21.15%	1.50%	8.20%	20.90%
Fixed Income								
Defensive	BC Gov't 1-3	3.00%	3.00%	0.50%	2.50%	3.00%	3.25%	2.50%
Domestic Fixed	BC Aggregate	3.30%	3.25%	0.75%	4.25%	3.30%	3.75%	4.50%
TIPS	BC TIPS	3.10%	3.00%	0.50%	5.60%	3.10%	3.50%	5.90%
Long Duration	BC Long Gov't/Credit	4.10%	3.45%	0.95%	11.80%	4.10%	4.00%	11.15%
High Yield	BC High Yield	6.00%	5.35%	2.85%	12.50%	6.00%	5.60%	11.55%
Non-US Fixed	Citi Non-US Gov't	3.25%	2.85%	0.35%	9.50%	3.25%	3.35%	9.70%
Other								
Real Estate	Callan Real Estate	7.65%	6.40%	3.90%	16.95%	5.00%	6.75%	16.35%
Private Equity	VE Post Venture Cap	13.05%	8.80%	6.30%	30.60%	0.00%	9.00%	30.00%
Hedge Funds	Callan Hedge FoF	5.90%	5.55%	3.05%	10.00%	0.00%	5.90%	10.00%
Commodities	DJ-UBS Commodity	4.75%	3.25%	0.75%	17.90%	2.75%	3.75%	24.00%
Cash Equivalents	90-Day T-Bill	2.75%	2.75%	0.25%	0.90%	2.75%	3.00%	0.90%
Inflation	CPI-U	2.50%	2.50%		1.40%		2.50%	1.40%

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

2012 Capital Market Expectations

Correlation Matrix

Key to Constructing Efficient Portfolios

	Broad	Lg Cap	Sm/Mid	Int'l Eq	Emerge	GlobxUS	Defensive	Dom Fix	TIPS	Hi Yield	NUS Fix	Real Est	Pvt Eq	Hedge Fd	Comm	Cash Eq
Broad Domestic Equity	1.000															
Large Cap	0.995	1.000														
Small/Mid Cap	0.954	0.920	1.000													
International Equity	0.833	0.830	0.790	1.000												
Emerging Markets Equity	0.836	0.830	0.805	0.840	1.000											
Global ex-US Equity	0.864	0.860	0.824	0.980	0.920	1.000										
Defensive	-0.109	-0.100	-0.130	-0.080	-0.120	-0.096	1.000									
Domestic Fixed	0.003	0.010	-0.020	0.000	-0.030	-0.010	0.820	1.000								
TIPS	-0.108	-0.095	-0.140	-0.090	-0.115	-0.102	0.460	0.640	1.000							
High Yield	0.624	0.620	0.600	0.555	0.555	0.575	0.050	0.110	0.020	1.000						
Non-US Fixed	-0.071	-0.060	-0.100	0.050	-0.090	0.006	0.420	0.430	0.300	0.000	1.000					
Real Estate	0.746	0.740	0.720	0.650	0.630	0.667	0.000	0.070	-0.020	0.550	0.000	1.000				
Private Equity	0.950	0.943	0.915	0.890	0.895	0.924	-0.160	-0.068	-0.150	0.630	-0.070	0.735	1.000			
Hedge Funds	0.777	0.775	0.735	0.695	0.710	0.725	0.050	0.215	0.100	0.550	0.000	0.590	0.735	1.000		
Commodities	0.150	0.150	0.140	0.130	0.135	0.136	-0.150	0.090	0.280	0.100	-0.050	0.150	0.100	0.180	1.000	
Cash Equivalents	-0.043	-0.030	-0.080	-0.010	-0.100	-0.040	0.350	0.100	0.070	-0.110	0.000	-0.060	0.000	-0.070	0.070	1.000

Source: Callan

Alternatives Investment Structure

	Real Estate	Private Equity	Hedge Funds
Key Risks	<ul style="list-style-type: none"> • Timing of investments • Economic risk exposures • Manager risk • Leverage • Liquidity 	<ul style="list-style-type: none"> • Timing of investments • Strategy exposure • Geographic and industry exposure • Manager selection • Liquidity 	<ul style="list-style-type: none"> • Strategy risk • “Hidden beta” risk • Lack of transparency • Leverage • Liquidity
Policy and Procedures to Address Key Risks	<ul style="list-style-type: none"> • Strategic and annual tactical plan • Geographic and property type diversification • In-depth manager/fund knowledge and due diligence • Well structured guidelines to limit and monitor leverage 	<ul style="list-style-type: none"> • Strategic and annual tactical planning • Diversification by vintage year, strategy type • In-depth manager/fund knowledge and due diligence 	<ul style="list-style-type: none"> • Diversification by strategy and underlying funds • Investment due diligence • Dedicated operational due diligence • Identification of institutional funds with reasonable transparency and fees

Real Estate Consulting

- Diverse, experienced team supported by broader organization
 - Consulting, plan sponsor, investment management, acquisitions/asset management, fund of funds, and performance monitoring backgrounds
 - Managed growth; add one to two retainer clients per year
 - 3:1 client to consultant ratio
- Long-term commitment to real estate
 - Full service real estate consulting division established in 1988
 - Over \$25 billion in real estate assets advised
- Extensive manager research
 - 300+ meetings per year
 - U.S. and non-U.S. real estate equity and debt, timber, infrastructure, agriculture
 - Proprietary database
- Consulting philosophy
 - Use real estate for diversification, income, and as an inflation hedge
 - Create solutions tailored to client objectives; no model portfolio
 - Integrate broader plan considerations
 - Bias to straightforward, cost effective investments

Private Equity Consulting

- In the last ten years, Callan's Private Markets Group has established or enhanced over 35 private equity programs, conducting over 70 searches, with total allocations of over \$6.5B
 - Mandates include customized mandates or vehicles (e.g., separate accounts), fund-of-funds, and direct partnerships
 - Act as an both an independent third party and extension of staff
 - Experience in launching successful new allocations
 - Experience diversifying existing portfolios
- We specialize in strategic planning, implementation, and monitoring for programs
 - Work with clients on a flexible basis to tailor consulting services to needs
 - We have a unique window on fund sponsor and manager activity
- Conduct and publish research, and provide education on private markets

Hedge Fund Consulting

- Largest independent asset management consulting firm
 - Dedicated hedge fund research team
- Established relationships with all major fund-of-funds
 - No affiliation or vested interest with any underlying funds
 - Long-standing relationships with most, if not all, major FoFs and key underlying funds
 - Experienced due diligence supported by broad hedge fund industry network
 - Dedicated to FoF solutions for implementing hedge fund exposure
- Experienced due diligence, with committee oversight
 - Investment policy statement documenting rationale, guidelines, and process
 - Asset allocation and manager structure reflecting experience and common sense
 - Search recommendations vetted by Callan's peer review process
 - Performance evaluation using peer groups and return attribution analysis

Risk Management

Four Key Elements

- Well-structured and comprehensive Investment Policy Statement
- Comprehensive performance and risk monitoring reporting platform
- Clearly defined governance structure with clear lines of authority, responsibilities, and proper separation of duties
- Well-structured and efficient operational platform
 - Custody
 - Trading
 - Cash Management
 - Securities Lending
 - Use of Derivatives
 - FX

Public Market Research



Kelly Cliff
BA, CFA, CAIA

CIO of Public Markets,
and co-lead of the Global
Manager Research Group



Inga Sweet
BA

Co-lead and Manager of the
Global Manager Research
Group and Manager of the
Published Research Group



Steve Center
BA, CFA, MBA

Fixed Income



Brett Cornwell
BA, CFA

Fixed Income



James Danforth
BS, CFA

Domestic Equity



Lauren Etcheverry
BS, CFA

Domestic Equity



Ho Hwang
BA

International Equity



Andy Iseri
BS, CFA

International Equity



Matt Routh*
BA, MA

Fixed Income



Mark Stahl
BA, CFA

Domestic Equity

*passed level 3 of the CFA exam

Alternative Investment Research



Sarah Angus
BA, CAIA

European and Latin
American Real Estate
Timber



Michael Bise
BA

Private Equity



Kelly Cliff
BA, CFA

Public and Multi-Strategy
Real Return
Commodities



Steve Center
BA, CFA, MBA
TIPS



Brett Cornwell
BA, CFA
TIPS, MLPs



Sally Haskins
BA, MS

General and Asian Real Estate



Jim McKee
BA, MBA

Hedge Funds



Jay Nayak
BA

Public Real Estate
Securities and Debt
Strategies
Timber



Gary Robertson
BA, MBA

Private Equity
Private Energy



Avery Robinson
BS, MBA

Core Real Estate
Infrastructure



Matthew Routh*
BA, MA

Commodities
Public and Multi-Strategy
Real Return



Jamie Shen
BS

General Real Estate,
Agriculture



Lauren Talbot Sertich
BA

General Real Estate



Sherwood Yuen
BA, MBA

Alternatives

*passed level 3 of the CFA exam

Approach to Manager Research

Qualitative Analysis	Quantitative Analysis
<i>Philosophy/Process</i> What is the firm's investment philosophy and process? Has it remained consistent over time? How is research conducted and incorporated into the investment process?	<i>Historical Performance</i> How has strategy performed relative to peers and benchmarks over various measures and time periods (cumulative, calendar year, rolling periods, rising/ declining markets, stylistically extreme periods)?
<i>Performance</i> Is there a rational explanation for periods of large out/underperformance?	<i>Risk Adjusted Returns</i> Have the returns generated by the portfolio been in line with the risks being taken?
<i>People/Organization</i> What are the investment professionals' qualifications and experience? Have there been any significant changes in ownership, personnel or assets under management?	<i>Portfolio Characteristics</i> Has the managers' holdings been consistent with their stated style over time? How do these characteristics compare to peers and to stated benchmarks? Does this help explain historical performance patterns given market environment?
<i>Portfolio Construction</i> How are portfolios constructed and what are the parameters?	<i>Attribution</i> What are the sources of relative performance? Is this consistent with stated philosophy, process, and objectives?

Endowment Spending Policies Since the Passage of UPMIFA

- ▶ As total-return investing took hold in the endowment community in the late 1960s and early 1970s, spending policies shifted from income-based to market value-related—the dominant model used today.
- ▶ However, there is a growing trend among endowments of all sizes toward hybrid models, accelerated by the early adoption of industry leaders such as Yale University.
- ▶ Endowments have increasingly allocated larger percentages of their assets to alternative investments over the last decade, giving rise to liquidity concerns.
- ▶ Callan assesses how the endowment spending landscape has changed in light of the passage of the Uniform Prudent Management of Institutional Funds Act (UPMIFA) in July 2006, the increasing use of alternative investments by endowments and the market collapse of 2008.

Introduction

A well-designed endowment spending policy balances the need for current spending with the goal of supporting future expenditures into perpetuity. As institutions periodically review their asset allocation policies, it is equally important that they review their spending policies because the two are interdependent and critical to the long-term success of any endowment.

This paper provides a brief overview of best practices in the design and implementation of endowment spending policies. We explore and evaluate the mechanics of various policies in terms of their ability to satisfy the competing objectives of stable current spending and real, long-term preservation of the corpus. Within this framework, Callan assesses how the endowment spending landscape has changed in light of the passage of the Uniform Prudent Management of Institutional Funds Act (UPMIFA) in July 2006, the increasing use of alternative investments by endowments of all sizes and the 2008 market collapse.

Authored by Callan Associates Inc.

If you have any questions or comments, please email institute@callan.com.

About Callan Associates

Founded in 1973, Callan Associates Inc. is one of the largest independently owned investment consulting firms in the country. Headquartered in San Francisco, Calif., the firm provides research, education, decision support and advice to a broad array of institutional investors through five distinct lines of business: Fund Sponsor Consulting, Independent Adviser Group, Institutional Consulting Group, Callan Investments Institute and the Trust Advisory Group. Callan employs more than 170 people and maintains four regional offices located in Denver, Chicago, Atlanta and Florham Park, N.J.

About the Callan Investments Institute

The Callan Investments Institute, established in 1980, is a source of continuing education for those in the institutional investment community. The Institute conducts conferences and workshops and provides published research, surveys and newsletters. The Institute strives to present the most timely and relevant research and education available so our clients and our associates stay abreast of important trends in the investments industry.

Introduction (continued)

In 1972, the National Conference of Commissions on Uniform State Laws (the Uniform Law Commission) passed the Uniform Management of Institutional Funds Act (UMIFA), which was ultimately adopted in 47 states and the District of Columbia. One of the major goals of the legislation was to encourage endowments to invest for the long run by adopting a total-return approach rather than seeking out investments with high current yields. UMIFA permitted endowments to spend a portion of realized and unrealized appreciation in addition to current income (dividends and interest), allowing institutions to focus their investment policies on maximizing total return per unit of risk rather than maximizing current income per unit of risk. This concentration on total return led to sweeping changes in best practices for both the investment and spending policies employed by most major endowments.

The Uniform Law Commission approved a revised version of UMIFA on July 13, 2006, providing a stronger, more unified framework for charitable fund management known as the Uniform Prudent Management of Institutional Funds Act (UPMIFA). UPMIFA, which applies retroactively, has been enacted in 43 states and the District of Columbia as of January 29, 2010.

The most important change UPMIFA made concerns endowment spending: doing away with the “historic dollar value” (HDV) concept, which had restricted spending to amounts above the original dollar value of the contributions that created the trust. Under UPMIFA, a fund is permitted to spend an amount it deems prudent after taking into consideration the donor’s intent that the fund continue permanently, the purposes of the fund and relevant economic factors. The new legislation also defines a more precise set of rules for the prudent management of charitable funds and the governing of donor restrictions. UPMIFA helps charitable institutions better manage their investments and spending to provide more money for their beneficiaries.

The original 1972 UMIFA paved the way for endowments to uncouple their investment and spending policies, leading to the widespread adoption of total return-oriented investment policies. However, it did not result in the same level of uniformity in spending policy design.

Evolution of Endowment Spending Policies

The concept of an endowment dates back to at least the 12th century in Europe, when plots of land were used to support religious organizations. Plots generated rent that was made available to the beneficiary institutions. Land values and rents generally increased over time, which allowed the institutions to deal with rising costs and increased activities. These land-based endowments had a significant influence on the spending practices of modern endowments.

In the United States, land was initially the main source of endowment income, but by the early 1900s most assets were invested in fixed income (bonds and mortgages) and inflows shifted from rent to interest. Endowments sacrificed the potential for appreciation for the safety of principal and income, and the built-in inflation protection which the land had provided disappeared.

When the stock market boomed in the 1950s and 1960s, pressure increased to allow endowment funds to participate in these equity returns. Rising inflation in the 1960s also became an issue, particularly for college and university endowments, which were predominantly exposed to fixed income investments. The problem was rooted in traditional spending rules which dictated that endowments could spend only dividends and interest, while the majority of the equity market returns came from capital gains.

At this time, institutions with longer-term perspectives and less reliance on current spending

were able to shift money into stocks. The higher associated growth rates ultimately led to a larger corpus and a substantial increase in both dividends and interest. However, institutions with shorter time horizons were forced to focus on high yield debt and high dividend-paying stocks, which prevented them from enjoying the full benefits of the bull market. This combination of circumstances threw the traditional income-based spending approach, and the investment approach that it engendered, into question.

Ultimately this led to a number of the largest endowments in the country advocating a “total return” investment approach—arguing it was in the best long-term interest of institutions to obtain the highest possible rate of total return (yield plus appreciation) consistent with a reasonable level of risk. However, without the ability to spend a portion of the capital gains, it was difficult to convince sponsoring institutions to adopt this new philosophy.

In addition to some moral arguments, the main debate centered on the legal definition of the term “income.” Until the mid-1960s, the prevailing legal opinion was that income did not include capital appreciation, realized or otherwise. The law for private trusts clearly ascribed appreciation to principal rather than income, however, no court decision applied specifically to charitable endowment funds. The question became whether or not endowment funds should be treated in the same manner as private trusts.

Separating principal and income for private trusts allowed the allocation of property between income beneficiaries and “remaindermen.” Income beneficiaries are entitled to the income that a private trust generates during its lifetime. Remaindermen are entitled to the corpus of the trust at the demise of the income

beneficiary. In the case of charitable or educational endowment funds, the institution is both the income beneficiary and the remainderman. This fact was used to support a definition of income that includes appreciation for endowment funds, which became the legal definition near the end of the 1960s.

Competing Objectives in Managing Endowments

A well-designed spending policy reflects the unique philosophy of the sponsor. There are a number of competing objectives in managing an endowment, and the sponsor must deal with the different levels of emphasis to place on each objective.

The primary objective governing the management of most endowments is the pursuit of intergenerational equity: that the real (inflation-adjusted) purchasing power of the corpus is maintained over time. Endowments that experience year-to-year market-related fluctuations in their corpus value may fall short of this goal. For this reason many endowments evaluate their success by looking at the average value of the corpus over many years. Ultimately, successfully maintaining the purchasing power of the corpus depends on choosing an average level of spending that can be supported by the investment policy. If this goal is achieved, it should enable another objective: a relatively constant level of real spending.

This second objective of stable and predictable spending also governs endowment management. The beneficiaries of endowments are generally unable to adjust their budgets to react to large and unpredictable swings in year-to-year spending. They are also subject to the same inflationary pressures as any other entity operating in the general economy. Spending rules are designed, at least in part, to accommodate the need for a stable and predictable level of spending that grows at the rate of inflation.

While stable real spending is a baseline objective for most endowments, many institutions come under significant pressure to grow spending by more than the underlying rate of inflation. This has been particularly true during weak periods in the economy when other sources of funding—such as tax revenue for public institutions or gifts to private institutions—decline considerably. Funding decreases tend to coincide with downturns in the stock market, which places endowments with an equity-oriented investment strategy under additional stress at the exact time they are least equipped to handle it.

A final objective is to grow the corpus by more than the underlying rate of inflation. While this goal is often discussed, it is seldom given the highest priority relative to the other three listed above. Occasionally an institution—usually in a secure financial condition with other reliable sources of funding—will forego current spending in an effort to accelerate the corpus' long-term real growth. Other institutions may pursue this strategy for a short period in anticipation of funding some major project in the near future.

A quick review of these four objectives reveals a plethora of conflicts. Growing the corpus by the rate of inflation and supporting any level of spending requires an endowment to take on at least some measure of investment risk:

- Pursuing a policy of maintaining a stable real corpus in the face of investment risk results in a volatile spending pattern;

- Pursuing a policy of stable real spending sacrifices the stability of the real value of the corpus, and can result in long periods where it actually declines;
- Pursuing a high growth strategy in current spending diminishes the growth rate of the corpus, favoring current beneficiaries over future beneficiaries;
- Pursuing a high growth rate in the corpus reduces current spending, favoring future beneficiaries over current beneficiaries, and may introduce more volatility in spending.

Finding the spending and investment policy combination that best balances this set of competing objectives is an important challenge faced by every endowment.

The Appropriate Average Spending Level

Before addressing the mechanics of a spending policy, an endowment must first decide on the appropriate target spending level over time. This spending level is typically expressed as a percentage of the endowment's market value. Most endowments pursue spending targets between 4% and 6%. In the absence of contributions, studies have shown that a spending rate in excess of 5% has virtually guaranteed the erosion of a fund's corpus in constant (inflation-protected) dollars over the long term.

In the 2009 NACUBO–Commonfund Study of Endowments, most institutions used an average market value-related approach to spending. Over the past 10 years, average spending rates ranged between 3.9% and 5.3% of the endowment's value annually. **Exhibit 1** shows an average annual 2009 spending rate of 4.4% for all reporting institutions, with private endowment spending rates exceeding those of their public counterparts. The 10-year average annual spending rate ranges between 4.6% and 4.9%, regardless of endowment size (assets) or type (public versus private).

Exhibit 1 Average Annual Spending Rates as a Percentage of Endowment's Value for Fiscal Years 2000–2009

Endowment Assets	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10-Year
Number of Respondents	668	693	700	718	738	756	769	776	772	842	Average
> \$1.0 bil	4.2%	4.2%	4.9%	5.3%	5.2%	4.7%	4.6%	4.4%	4.2%	4.6%	4.6%
\$500 mil to < \$1.0 bil	4.5	4.5	5.1	5.3	5.2	4.8	4.5	4.4	4.5	4.9	4.8
\$100 mil to < \$500 mil	4.6	4.9	5.1	5.2	4.9	4.7	4.7	4.5	4.2	4.4	4.7
\$50 mil to < \$100 mil	5.1	5.3	5.3	5.2	4.9	4.7	4.7	4.8	4.6	4.7	4.9
\$25 mil to < \$50 mil	4.7	4.9	4.9	5.0	4.8	4.7	4.8	4.8	4.3	4.3	4.7
< \$25 mil	4.6	4.9	4.7	4.8	4.6	4.8	4.6	4.6	4.1	3.9	4.6
Public	4.6	4.8	4.9	4.9	4.5	4.6	4.5	4.5	4.2	4.2	4.6
Private	4.7	4.9	5.1	5.2	5.1	4.8	4.7	4.7	4.4	4.5	4.8
Total Institutions	4.6	4.9	5.0	5.1	4.9	4.7	4.7	4.6	4.3	4.4	4.7

Table data are equal-weighted; numbers in percent.

Source: Fiscal Years 2000–2007, NACUBO Endowment Study 2008; Fiscal Years 2008–2009, NACUBO-Commonfund Study of Endowments 2009.

Historical analyses and current best practices support the argument that a targeted annual spending level in the range of 4.5% to 5% of market value is appropriate. The 2000 to 2002 equity bear market—combined with average market value-related spending policies—elevated

the average level of spending as a percentage of assets above the normal 5% target for many institutions from 2002 through 2004. As the equity markets recovered, the average spending level for most endowments dropped back down to 5% or lower.

The Mechanics of Spending Policies

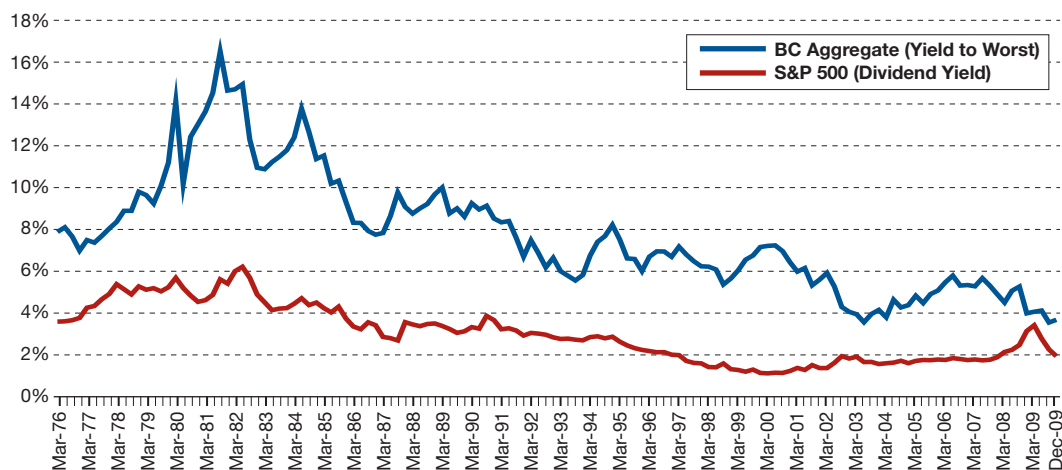
We categorize the mechanics of spending policies into four general groups that cover the majority of current models. We discuss each group in the following text, providing a general description of the underlying spending model, as well as the rationalization for and argument against its use.

Income-Only Spending Model

The income-only model is the original spending model for endowments, where only coupon and dividend payments can be spent. This type of policy offers two advantages. First, it provides for the preservation of the purchasing power of the trust over time. Since principal, by definition, cannot be spent, it requires a fairly creative investment policy to reduce the corpus of the trust over time. The second advantage is that it provides for relatively stable spending from year to year.

The disadvantage of an income-only spending model is that it can create pressure to pursue an investment policy that is income generation-oriented rather than total return. For example, in order to spend 5% of the endowment's value each year, an income-only policy might require a large allocation to fixed income, which thereby forces the exclusion of high-return but low-yielding equity asset classes. This may move the endowment toward a high yield investment management style for both equities and fixed income. These restrictions can affect the long-term growth of the corpus, and ultimately the probability of the endowment preserving its purchasing power over time.

Exhibit 2 Declining Yields



Sources: LehmanLive (BC Aggregate Yield to Worst), Standard & Poor's Index Services (S&P 500 Dividend Yield) and Callan Associates Inc.

Income-only spending policies are also highly sensitive to interest rate changes. With the secular decline in both interest rates and dividends since the early 1980s, income-only spending policies have resulted in declining spending levels as a percentage of the corpus over time. In many instances this has forced institutions to gradually alter their asset allocation policies to avoid a decline in real spending. While a 60%/40% stock/bond mix would have yielded well over 5% until the early 1990s, today it yields less than 3% (Exhibit 2). In the last several years, endowments with income-based spending models have struggled to reach a 5% spending rate irrespective of how they structured the stock/bond mix.

Market Value-Related Spending Model

Market value-related spending policies are today's predominant model for endowments. Under this model, endowments spend some fixed percentage of their market value each year. Typically spending is calculated as a percentage of the beginning market value, the ending market value or an average market value over some

period of years. Market value-related spending policies developed as a response to the fundamental shortcomings of income-only models. By disconnecting spending from income generation, market-value models encourage the adoption of total return-oriented investment policies.

Market value-based spending rules tend to favor the long-run preservation of the corpus. In concert with an appropriate investment policy, they encourage a sustainable rate of spending over time. As the market value of the corpus fluctuates, the spending dollar amount moves in lockstep. Assuming an appropriate target spending level is chosen, this precludes annual spending by the endowment from exceeding the ability of the corpus to support it.

Unfortunately, a protected corpus comes at the expense of stable and predictable spending levels. Over time a market value-based spending policy will produce more total dollars for the institution as it frees investment decisions from the spending policy, providing greater flexibility in selecting an asset allocation. The problem, however, is unstable spending from year to year, which

can make the annual budgeting process for the endowment more difficult. Institutions whose spending policies rely solely on the beginning market value each year risk extremely volatile spending levels from one year to the next. A partial solution to the problem has been to adopt a moving average market value, which reduces spending volatility but also places additional pressure on the corpus during declining markets.

Inflation-Adjusted/Constant-Growth Spending Model

Under an inflation-adjusted (constant-growth) spending model an endowment will spend the same amount as in the prior year (or a multi-period moving average of prior spending), adjusted for inflation or increased by a set percentage. This model places the utmost priority on stable and predictable spending over time, making budgeting considerably easier for the beneficiary institutions as they can anticipate (often years in advance) the funding level that they will enjoy in the future. An additional benefit of this model is that, like the market value-based model, it can be readily supported by total return-oriented investment policies.

The main drawback of the inflation-adjusted spending model is that it does not naturally adjust over time to reflect the underlying value of the corpus, creating two types of problems. During rapidly rising markets this approach can come under fire for “under-spending” (or spending less than the trust can support), often creating pressure to make ad hoc adjustments to the spending level to reflect the underlying growth in assets. These adjustments may or may not create future sustainable spending levels. Conversely, during declining markets this model places significant

stress on the corpus by spending more than can be supported over time. In extreme cases this can result in the value of the corpus temporarily dropping below the original dollar value of the trust. In the past this sometimes triggered UMIFA’s “historic dollar value” spending restriction, which precluded any additional spending until the corpus recovered. UPMIFA did away with the “historic dollar value” concept in July 2006, although sensitivity to this issue still exists in certain institutions.

Hybrid Spending Model

The hybrid model provides the greatest flexibility in allowing an endowment to satisfy multiple competing objectives by combining spending models. An infinite number of combinations exist under the hybrid model, allowing an institution to fine-tune its policy to meet its specific needs. The challenge under a hybrid model is finding the right combination and sticking with it during the difficult periods that it will inevitably face.

Some institutions utilize the hybrid model to balance the competing goals of producing stable spending levels while preserving the purchasing power of the endowment. Yale University is the most notable example, combining prior spending with a market value-based model.

Annual spending under the Yale model is determined using a weighted average of prior spending (80% weight) and 5.25% (current long-term spending rate target) of the market value two years prior (20% weight). The resulting amount is then adjusted for inflation and constrained to between 4.5% and 6% of the endowment’s inflation-adjusted market value one year prior. Incorporating prior spending levels helps to reduce large fluctuations from year to year.

Adjusting spending toward a long-term rate of 5.25% ensures that it will be linked to fluctuations in the endowment's market value, which helps to protect the long-term purchasing power of the fund. Finally, the 4.5% to 6% corridor helps to dampen spending volatility during extreme market environments.

The weighted average formula allows an institution to explicitly define the level of emphasis to place on smoothed spending relative to the preservation of the corpus. Beyond changing the weights in the equation, each of the formula's two components can be further modified to achieve more or less smoothing of spending over time.

Modifications to Basic Spending Policy Mechanics

Within the four general categories of spending models outlined above, countless variations have been designed to better meet the needs of the sponsoring entity. These variations typically take the form of an additional rule (or set of rules) that either reduces the volatility of spending or helps to protect the corpus during times of stress. Next we briefly discuss some of the more commonly used rules.

Inflation-adjusted or constant-growth spending policies result in very smooth predictable spending patterns over time. This stability, however, comes at a cost. The disconnect between spending growth and market value can result in unsustainable spending levels during times of severe market declines—particularly when coupled with high inflation. To mitigate this impact, many institutions employ spending ceilings (i.e., dollar or percentage limitations on spending), typically driven by the value of the underlying assets. The most common type of ceiling restricts spending to a set percentage of market value. For example, current year spending cannot exceed 7% of the previous year's ending market value. A second version requires that current spending cannot increase by more than a certain percentage or dollar amount over

the previous year's spending. Yet another variation restricts spending when the endowment value falls below a designated threshold.

As previously noted, spending rules tied to market value can result in significant year-to-year spending volatility. Spending floors help mitigate this issue by ensuring that spending does not fall dramatically in periods of weak market performance or negative inflation. Spending floors set dollar or percentage minimums and are typically driven by spending in previous years. For example, some endowment policies impose a floor on spending whereby the amount spent in one year must be equal to a set percentage of the amount spent in the previous year. Another version dictates that spending must be at least a certain percentage of market value.

When both a floor and a ceiling are employed (also known as the “snake in the tunnel” approach), year-to-year spending can fluctuate within reasonable bands, but volatility is significantly dampened during extreme periods. Used in conjunction with a market value-based spending model, this approach approximates the behavior of the hybrid models discussed in the previous section.

Survey of Current Practices

The 2009 NACUBO–Commonfund Study of Endowments provides insight into the popularity of the various spending models. **Exhibit 3** details the frequency with which different models are employed across endowments of various sizes and types.

Exhibit 3 Spending Policy for Fiscal Year 2009

Endowment Assets/Type (Number of Respondents)	Spend all current income	Percentage of moving average	Decide on appropriate rate each year	Grow distribution at predetermined inflation rate	Spend pre-specified percentage of beginning market value	Last year's spending plus inflation with upper and lower bands	Weighted average or hybrid method	Meet IRS minimum of 5 percent	Other
> \$1.0 bil (52)	2%	56%	8%	4%	0%	19%	15%	0%	13%
\$500 mil to < \$1.0 bil (60)	2	70	7	0	0	5	12	0	9
\$100 mil to < \$500 mil (219)	5	75	6	2	2	5	7	0	7
\$50 mil to < \$100 mil (164)	4	82	7	0	5	1	7	0	4
\$25 mil to < \$50 mil (137)	4	79	12	0	7	1	4	0	12
< \$25 mil (210)	6	68	14	0	6	1	2	1	9
Public (306)	5	68	14	1	5	3	7	1	9
Private (536)	4	77	6	1	4	4	6	0	9
Total Institutions (842)	4	74	9	1	4	3	6	*	9

Multiple responses allowed; numbers in percent.

*Less than 1 percent, results not meaningful.

Source: NACUBO–Commonfund Study of Endowments 2009.

Market value-related policies (denoted as “percentage of moving average” and “spend pre-specified percentage of beginning market value” in Exhibit 3) are clearly the dominant model today with over three-quarters of respondents employing them. The “Other” category and the ad hoc model—where the endowment decides on an appropriate rate each year—tied for second, each capturing 9% of respondents. Endowments with assets of \$50 million and below especially favor the ad hoc method. Hybrid models represented 6% of total respondents and were favored by the largest institutions. Inflation-adjusted and constant-spending growth models are particularly favored by larger endowments, but only represent 4% of total respondents. The usage of income-related models (4%) has gradually declined over time.

These results clearly indicate that the majority of institutions have shifted from income-oriented policies toward models that can support a total-return investment policy. Callan clients, too, have migrated further toward hybrid policies that take into account both market value and prior spending over the last several years. Given the flexibility of the hybrid models and their early adoption by industry leaders such as Yale University, we expect that the endowment community will increasingly move in this direction over time.

Alternative Investment Allocations Give Rise to Liquidity Concerns

The liquidity crisis and market collapse of 2008 caught many endowments off guard, especially those with large, illiquid alternative investment programs. As buyers disappeared and liquidity dried up, many endowments were forced to sell or consider selling assets at large markdowns. With limited cash on hand, many institutions struggled to meet their basic spending needs. The financial press published articles with headlines such as: “Ivy Leagues Get a Lesson in Liquidity,” “Harvard: the Inside Story of Its Financial Meltdown,” and “Ivory-Towering Infernos.” While some journalists exaggerated, there was plenty of truth to be found.

Over the last decade many endowments rapidly increased their exposure to alternative investments. The 2009 NACUBO–Commonfund Endowment Study showed exposure to alternative investments increased with the size of the endowment. The smallest endowments (<\$25 million) had 11% of their assets dedicated to alternative investments while the largest endowments (>\$1 billion) allocated more than half (**Exhibit 4**).

According to NACUBO–Commonfund, the largest (>\$1 billion) endowments more than doubled their allocations to alternative investments over the last decade.

Exhibit 4 Asset Allocations for Fiscal Year 2009

Endowment Assets/Type (Number of Respondents)	Domestic Equities	Fixed Income	International Equities	Alternative Strategies ¹	Short-term Securities/ Cash/Other
> \$1.0 bil (52)	14%	11%	14%	56%	5%
\$500 mil to < \$1.0 bil (60)	20	14	17	43	6
\$100 mil to < \$500 mil (219)	27	18	16	32	7
\$50 mil to < \$100 mil (164)	34	21	17	22	6
\$25 mil to < \$50 mil (137)	37	23	15	18	7
< \$25 mil (210)	39	28	12	11	10
Total Institutions (842)	31	21	15	25	8

Table data are equal-weighted; numbers in percent.

¹Includes private equity, marketable alternative strategies, venture capital, private equity real estate, energy and natural resources, and distressed debt.

Source: NACUBO–Commonfund Study of Endowments 2009.

In the fall of 2008, the Journal of Portfolio Management published a paper by Laurence B. Siegel entitled *Alternatives and Liquidity: Will Spending and Capital Calls Eat Your “Modern” Portfolio?* which addresses the liquidity problem brought about by large alternative investment allocations in private foundation and other endow-

ment portfolios. In addition to the illiquid nature of alternative investments, Siegel said alternatives—private equity in particular—often have forward capital call commitments which add to the liquidity problem. He stipulates that endowments should attempt to build a self-funding program where distributions are sufficient to cover capital

calls, however, it can take years to build such a program. If spending is required when public markets are down and alternatives are not generating cash and are in lock-up, an endowment can be forced to sell at depressed prices. This scenario became a reality for some during the 2008 market collapse.

Besides spending needs and capital calls, many endowments with large allocations to alternative investments also employ portable alpha strategies which use derivative contracts. These derivative positions can require margin calls in a down market, further raising liquidity needs. Yet another drain on liquidity can come from hedge fund gating provisions during extreme market downturns, which can limit or slow redemptions.

Siegel concluded that a reasonable initial alternatives allocation (e.g., 15%) does not generally pose a liquidity challenge across most market scenarios, while a large allocation (e.g., 50%) can critically hinder spending under stressed market conditions. He also notes that illiquid alternative allocations are less of a problem for endowments with robust contributions as opposed to private foundations, which often have high spending requirements and no new contributions. Siegel's ultimate recommendation for those with large alternative investments programs or those interested in establishing such programs is to carefully assemble a ladder, self-funding structure over a number of years.

It is clear that liquidity is yet another piece of the endowment puzzle that must be considered when designing a spending policy.

Conclusion

Total return-oriented investment policies have become almost universally adopted, representing current best practices in the endowment community. To keep pace with this trend, spending policies have evolved from income-based to market value-based models. However, increased volatility in market values, due in part to higher equity allocations, has resulted in more volatile spending patterns under this new paradigm. Hybrid spend-

ing models are becoming increasingly popular amongst endowments of all sizes—a trend Callan expects to continue as institutions periodically review their investment/spending policy combinations. Finally, as endowments ramp up allocations to alternative investments, liquidity is becoming an issue which needs to be factored into the spending/investment equation.

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XYZ Fund

Asset Allocation and Spending
Policy Study



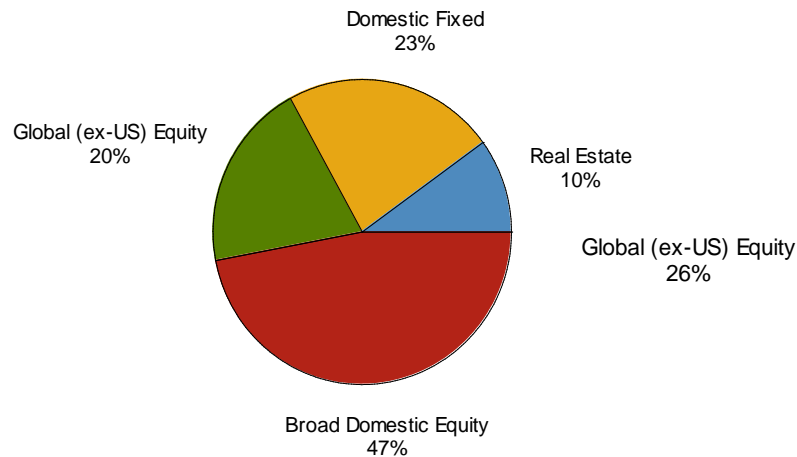
Executive Summary

- The current strategic asset allocation target is 47% broad domestic equity, 20% broad international equity, and 23% domestic fixed income, and 10% private real estate. This target allocation remains “efficient” in terms of optimizing expected return for the level of expected risk.
- The spending policy was modeled as income-only. The income-only spending policy excludes expenses. The current spending policy as well as alternative policies are tested to determine the suitability of their current spending levels given investment strategies. Contributions to the Funds in the form of income from the Trust lands are assumed to be \$65 million per year.
- The result of the income-only policy has been that the Funds have traditionally spent a relatively conservative amount (measured as a percentage of the assets) compared with most endowment and foundations, well under 3% of assets in recent years.
- The goal of at least maintaining spending in real terms (adjusted for inflation) is likely achievable even with the low yields expected over the next ten years. The flow of income from the Trust lands certainly supports growth in both spending and the asset value of the Funds. The conservative spending policy combined with the expected income from the Trust lands suggests the market value of the Funds should grow substantially in real terms over the next ten years ($7.4\% \text{ expected return} - 2.5\% \text{ inflation} - 2.75\% \text{ effective spending} = \text{more than } 2\% \text{ annual real growth in the corpus}$).
- The reward for taking on greater investment risk - higher market values and ultimately greater spending - becomes more evident given a longer time horizon. Using a ten year projection horizon suggests that a more aggressive asset allocation, with equity allocations in the 60-70% range, is reasonable.

Executive Summary

- The appropriate asset allocation policy for the Funds will satisfy two basic criteria:
 1. The asset mix will be efficient. Given an expected level of risk, the asset mix will generate the maximum level of expected return.
 2. The asset mix will reflect the appropriate level of risk for the Funds, based on a balanced consideration of the spending policy and the expected interaction of these cash flows with potential fund performance.
- The pie charts below illustrate the current target mix and two potential alternative policy mixes which, based on this study, satisfy the criteria above. Alternative asset Mix 3 (61% equity) and Mix 4 (70% equity) represent endpoints of a range of acceptable policy choices for the Funds.

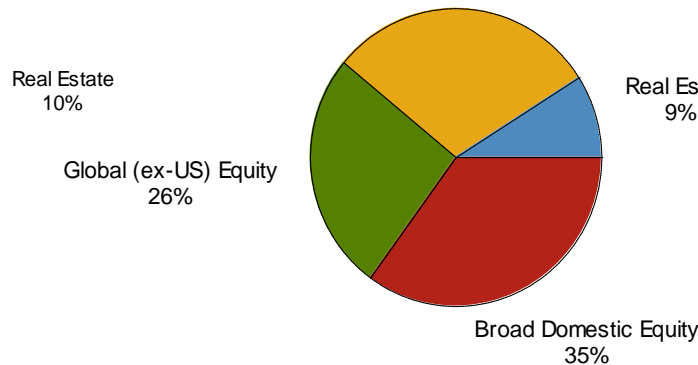
Current Target



Projected Return = 7.38%
Projected Risk = 13.55%
Projected Yield = 2.73%
67% Equity

Mix 3

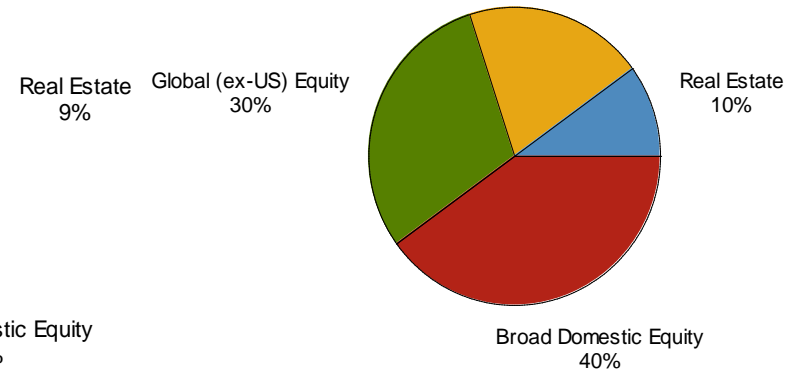
Domestic Fixed
30%



Projected Return = 7.16%
Projected Risk = 12.48%
Projected Yield = 2.80%
61% Equity

Mix 4

Domestic Fixed
20%



Projected Return = 7.520%
Projected Risk = 14.20%
Projected Yield = 2.65%
70% Equity

Executive Summary

- The current equity and fixed income allocation are implemented using pure passive or “enhanced” index strategies.
- We believe the Funds should consider the use of actively-managed strategies in certain areas of the equity and fixed income markets where active managers have demonstrated an ability to add value relative to their markets over longer-term periods.
- Specifically, we believe the Funds should consider active managers in Domestic Small Cap Equities, International Equities, and Core “Plus” Fixed Income.
- The Funds currently operate in a mutual fund only environment for its equity and fixed income investments. The use of active management may create a need for other vehicle types (i.e. commingled funds, collective trusts, or separately-managed accounts).
- The use of other vehicle types might necessitate the use of a custodian. In our experience, institutional investors with over \$1 billion in assets have a custodian/trustee to provide safekeeping of assets (where applicable) and to provide consolidated reporting of assets and transactions.

Goals and Objectives

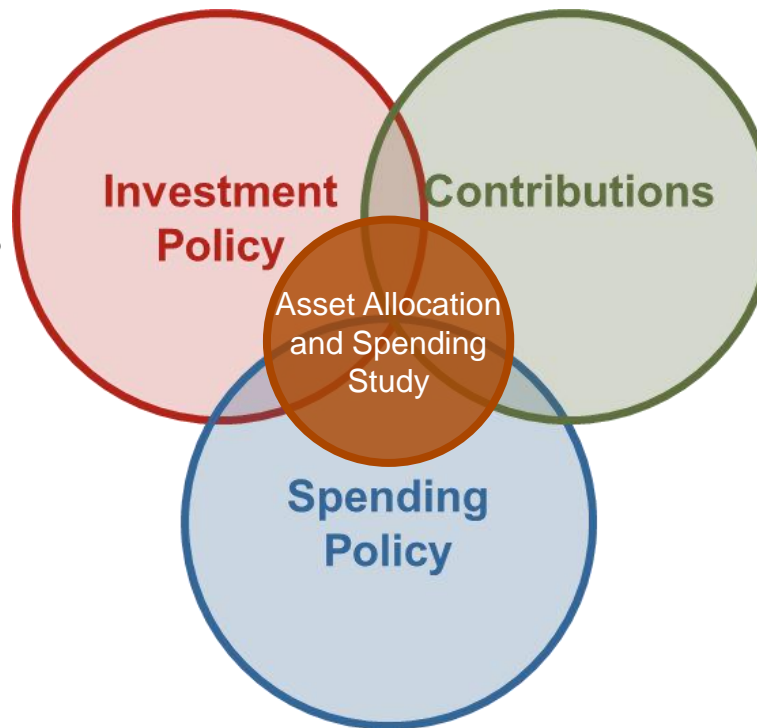
- Determine the appropriate strategic asset allocation for XYZ Corporation Funds (the “Funds”). The appropriate asset allocation policy will satisfy two basic criteria:
 - The asset mix will be **efficient**. Given an expected level of risk, the asset mix will generate the maximum level of expected return.
 - The asset mix will reflect the appropriate level of risk for the Funds, based on a balanced consideration of the spending policy and the expected interaction of these cash flows with potential fund performance.
- The appropriate asset allocation will balance the dual objectives of maintaining or increasing real (inflation-adjusted) spending while protecting or growing the real value of the Funds over the planning horizon.
 - The study focuses on 5 and 10-year projection periods.
- These objectives are entirely consistent with those spelled out in the Investment Policy Statement for the Funds.

What is an Asset Allocation and Spending Study?

We evaluate the interaction of the three key policies that govern the Funds with the goal of establishing an appropriate investment policy.

Investment Policy

- How will the assets supporting the spending be invested?
- What are the risk/return objectives?
- How to manage cash flows?



Contribution Expectations

- What is the source of new funds?
- What level of contribution can be expected?

Spending Policy

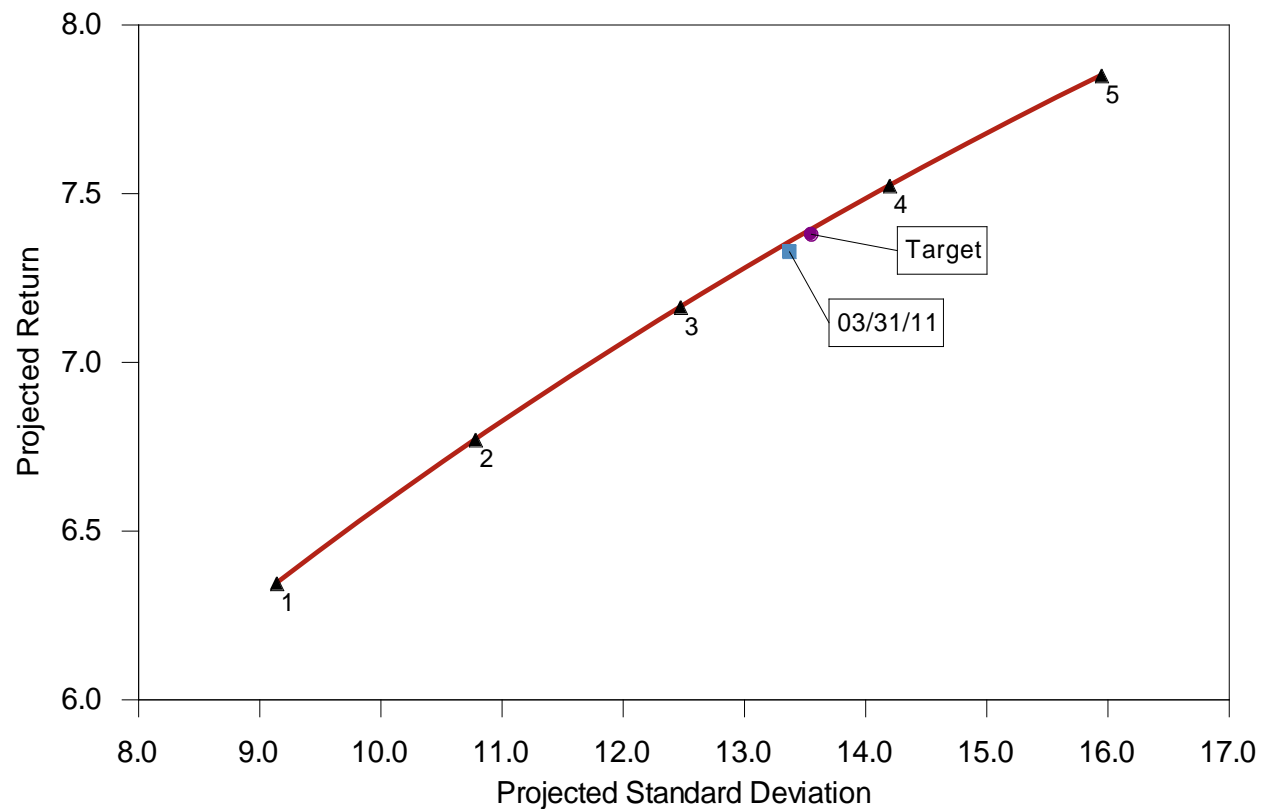
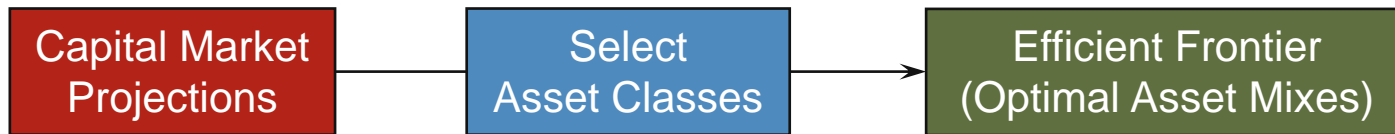
- What type of spending policy?
- What level of spending?
- What are Funds' expenses?

Why Conduct an Asset Allocation and Spending Study?

- Establish reasonable return expectations.
- Determine the Fund's risk tolerance.
- Provide a reasonable basis for the selection of a strategic asset allocation policy.
- Incorporate changes in the outlook and acknowledge uncertainty regarding the capital markets.
- Project and evaluate impact on how returns may effect the level of assets and spending.

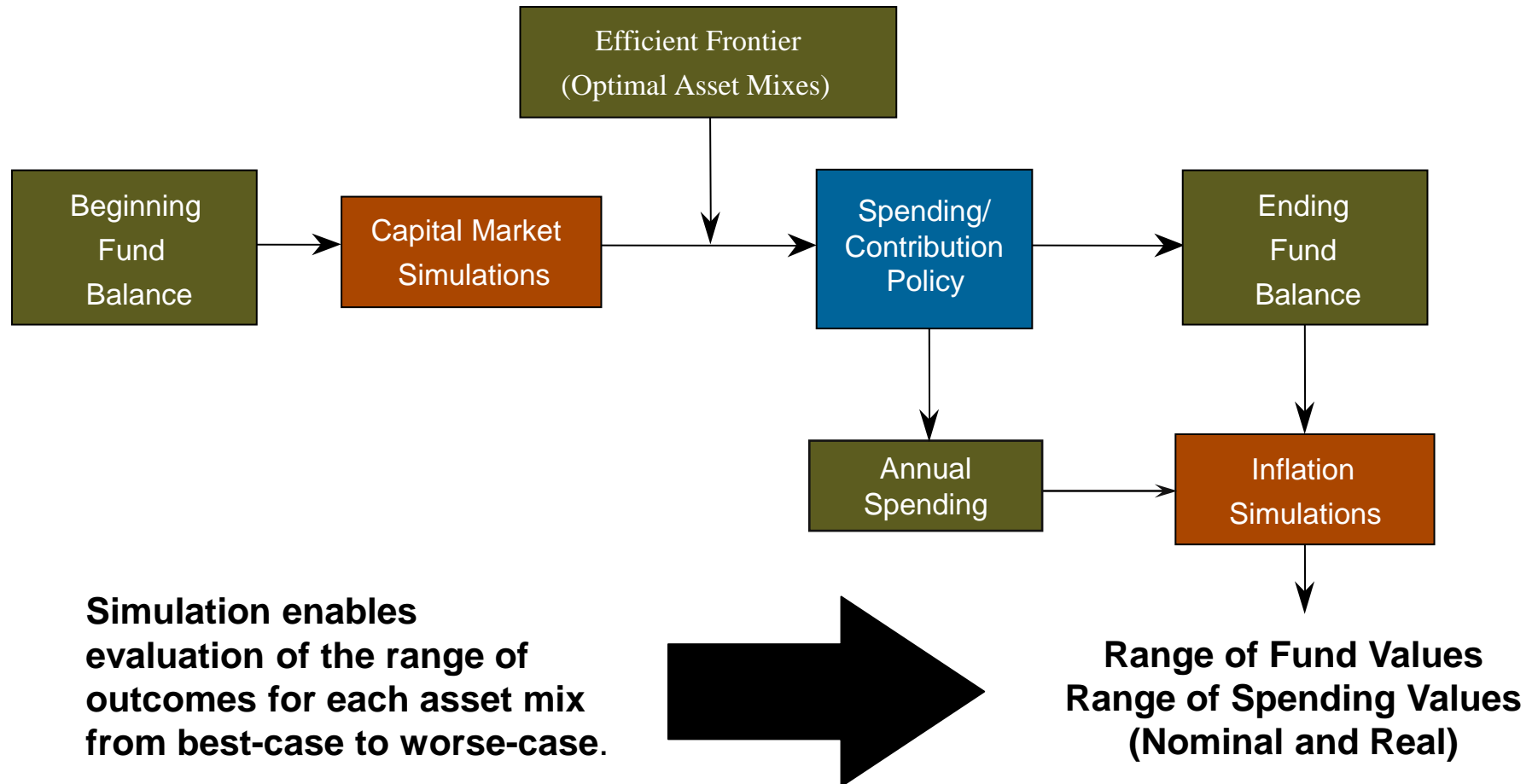
Model Overview

Determine Efficient Frontier



Model Overview

Simulate behavior across full range of capital market scenarios



*Real values are determined by discounting nominal values by inflation.
Real values show the future expressed in today's dollar equivalent.*

Study Assumptions

- The Funds have assets of approximately \$1.246 billion as of March 31, 2011.
- The current strategic target allocation is 47% broad domestic equity, 20% broad international equity (including emerging markets), 10% real estate and 23% fixed income.
- The spending or distribution policy is modeled as income-only; income generated in the current fiscal year is assumed to be distributed in the following fiscal year.
- The current spending policy as well as alternative policies were tested to evaluate the sustainability of the current spending level compared to other policies, given investment strategies.
- Contributions to the Funds are assumed to be \$65 million per year.

2011 Capital Market Expectations

- The path to a rational set of long-term capital market outcomes is likely through an ugly shorter term period of rising interest rates, capital losses in fixed income, and volatile equity markets.
- Inflation projection of 2.5%, while low relative to the long-term historical average, implies a sustained increase from current levels.
- Bond returns set at 3.75%.
 - Expect interest rates to rise, likely after 2011, resulting in capital loss before higher yields kick in.
 - Project cash returns to average 3.0% over 10 years, reflecting a (slim) real return of 0.5%.
 - Expect 10-year Treasury yield to reach 5%.
 - Project an upward sloping yield curve, with a slim risk premium for bonds over cash (1.0%).
- Equity returns (8%) built from long-term fundamentals: 3-3.5% real GDP growth, which means 5.5-6% nominal earnings growth, 2% dividend yield.
 - Nothing expected from the “buyback yield”. Equity looks reasonably priced, but no longer looks cheap relative to longer-term valuations.
- Real estate return set at 6.75%, relatively attractive compared to equities and bonds; income returns expected to steady at 6%.
- Hedge fund expectations of T-bill plus 3% keep returns close to 6%.

2011 Capital Market Assumptions

Return and Risk

		Projected Return		Projected Risk	
Asset Class	Index	Nominal **	Real	Standard Deviation	Projected Yield
Equities					
* Broad Domestic Equity	Russell 3000	8.00%	5.50%	18.10	2.00
* Broad Int'l Equity	MSCI ACWI ex-US	8.20%	5.70%	20.90	1.70
Fixed Income					
* Domestic Fixed	BC Aggregate	3.75%	1.25%	4.50	3.80
TIPS	BC TIPS	3.50%	1.00%	5.90	3.60
High Yield	CSFB High Yield	5.60%	3.10%	11.55	6.15
Non-US\$ Fixed	Citi Non-US Gov't	3.35%	0.85%	9.70	3.75
Other					
* Real Estate	Callan Real Estate	6.75%	4.25%	16.35	5.00
Private Equity	VE Post Venture Cap	9.00%	6.50%	30.00	0.00
Absolute Return	Callan Hedge FoF	5.90%	3.40%	10.00	0.00
Commodities	GSCI	3.75%	1.25%	24.00	3.00
Cash Equivalents	90-Day T-Bill	3.00%	0.50%	0.90	3.00
Inflation	CPI-U	2.50%		1.40	

** 10-year annualized geometric returns

- Most capital market expectations represent passive exposure (beta only); however, return expectations for real estate, private equity, and hedge funds reflect an active management premium because no effective market proxies exist.
- All return expectations are net of fees.

2011 Capital Market Assumptions

Correlation

Correlation	Broad	ACWI	Dom Fix	TIPS	Hi Yield	NUS Fix	Real Est	Pvt Eqt	Abs Ret	Comm	T-Bills
Broad Dom Eq	1.000										
ACWI exUS	0.845	1.000									
Domestic Fixed	0.010	-0.010	1.000								
TIPS	-0.103	-0.102	0.660	1.000							
High Yield	0.612	0.551	0.160	0.060	1.000						
Non US Fixed	-0.071	0.006	0.430	0.300	0.000	1.000					
Real Estate	0.736	0.658	0.080	-0.020	0.540	0.000	1.000				
Private Equity	0.947	0.911	-0.070	-0.160	0.600	-0.070	0.730	1.000			
Absolute Return	0.741	0.703	0.230	0.100	0.510	0.000	0.560	0.710	1.000		
Commodities	0.221	0.218	-0.020	0.140	0.120	-0.050	0.180	0.190	0.200	1.000	
Cash	-0.043	-0.040	0.100	0.070	-0.110	0.000	-0.060	-0.150	0.150	0.070	1.000

- Relationships between asset classes are as important, or more important, than the levels of individual asset class assumptions.
- These relationships will have a large impact on the generation of efficient asset mixes using mean-variance optimization.

Comparison of Strategic Asset Allocations

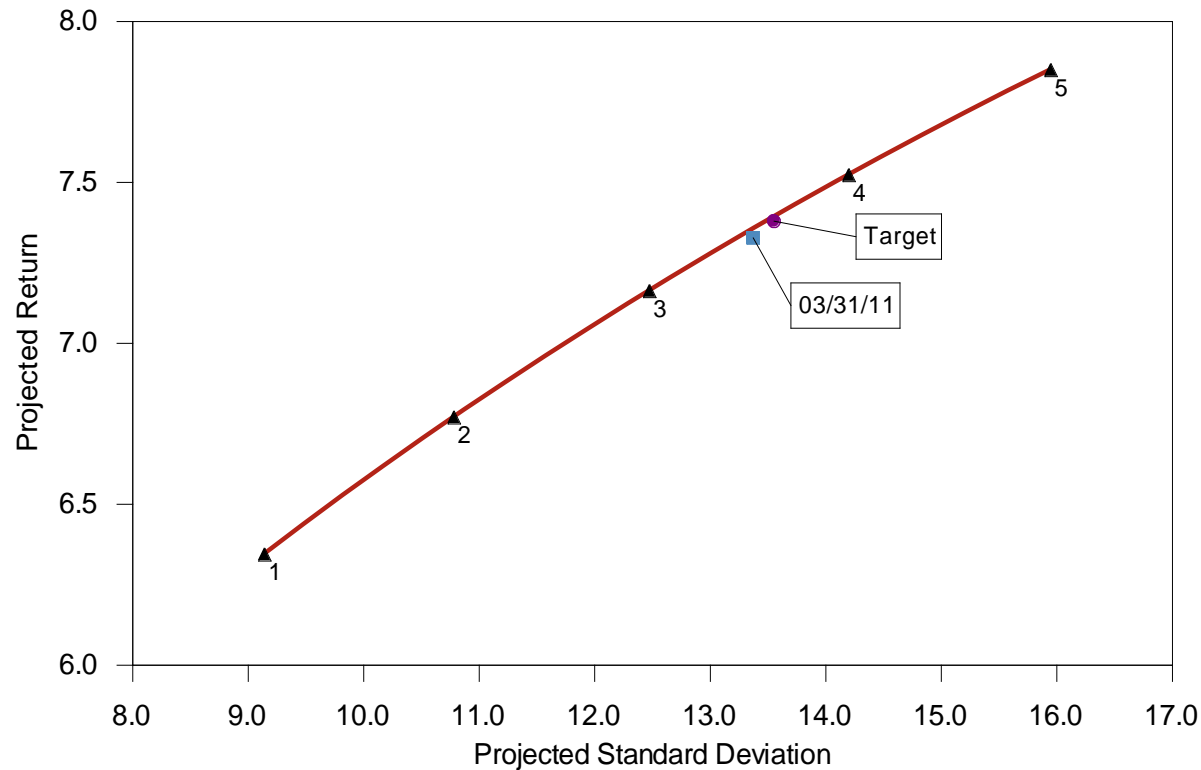
Current Target Mix versus Range of Optimal Portfolios

Portfolio Component	3/31/2011	Target	Min	Max	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
Broad Domestic Equity	48.3%	47.0%	0%	100%	25%	30%	35%	40%	45%
Broad International Equity	20.4%	20.0%	0%	100%	18%	22%	26%	30%	33%
Domestic Fixed Income	23.1%	23.0%	0%	100%	50%	40%	30%	20%	10%
Real Estate	6.2%	10.0%	0%	100%	7%	8%	9%	10%	12%
Cash Equivalents	2.0%	0.0%	0%	100%	0%	0%	0%	0%	0%
Totals	100%	100%	0%	0%	100%	100%	100%	100%	100%
Expected Return	7.33%	7.38%			6.34%	6.77%	7.16%	7.52%	7.85%
Standard Deviation	13.37%	13.55%			9.14%	10.78%	12.48%	14.20%	15.95%
Real Return	4.83%	4.88%			3.84%	4.27%	4.66%	5.02%	5.35%
Projected Yield	2.59%	2.73%			3.09%	2.94%	2.80%	2.65%	2.51%
Percentage Fixed Income	23%	23%			50%	40%	30%	20%	10%

- Current asset classes included in the construction of the alternative mixes – broad domestic equity, broad international equity, domestic fixed income, real estate and cash equivalents.
- Mixes 1 – 5:** Optimal mixes from the efficient frontier starting with 6.34% expected return and continuing to 7.85% expected return, moving in 10% increments of exposure to fixed income (from 50% to 10%).
- The current and target allocations, which lie just below the efficient frontier between Mix 3 and Mix 4, are slightly inefficient due to their non-US equity allocations relative to optimal mixes.
- Funds' stated Investment Policy goal is 5% real return. Current Target mix is expected to generate a real return just under this goal (4.88%), given Callan's capital market expectations.

Efficient Frontier

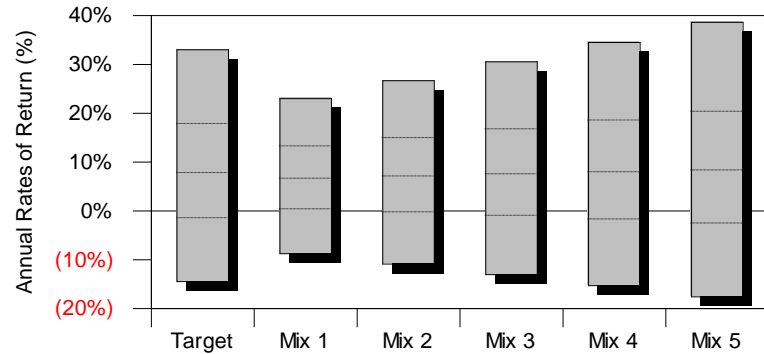
With Existing Asset Classes



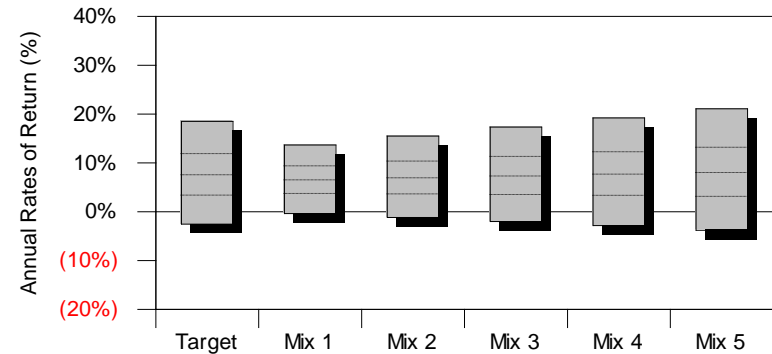
- The efficient frontier represents mixes which optimally trade off between expected return and expected risk.
- The current (03/31/11) and Target mixes lie just below the efficient frontier between Mix 3 and Mix 4.

Range of Projected Returns

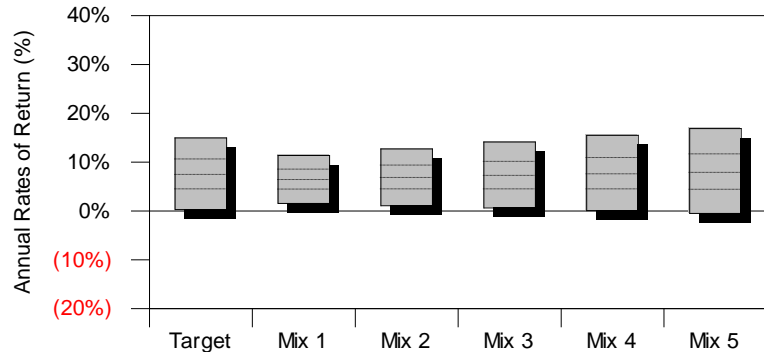
Over 1 Year



Over 5 Years



Over 10 Years



- Median assets reflect performance in average markets and are higher for more aggressive mixes.
- 95th percentile assets show the performance for the worst 5% of outcomes and are worse for more aggressive mixes.
- Every mix has more than a 5% probability of a loss over 1 year but negative returns are much less likely to persist over the longer term.

Integration of Asset and Spending Projections

Key Variables

- The Funds' spending policy is combined with the range of potential outcomes across the current target and alternative asset mixes to evaluate the projected financial condition of the Funds over 5 and 10-year time horizons and across various capital market scenarios.
- We focus on four key variables in the asset allocation and spending policy simulation process:
 - Ending market value (nominal and real)
 - Annual spending (nominal and real)
 - Cumulative spending (nominal and real)
 - Ultimate real purchasing power (URPP).
- URPP was created as a decision variable to balance the competing objectives of maintaining or increasing real spending while maintaining or growing the real value of the Funds.
 - Spend more today and the Funds will end up with less tomorrow, potentially harming future generations to benefit the current generation.
 - Spend less today and the Funds will end up with more tomorrow, potentially benefiting future generations at the expense of the current generation.
 - What a fund spends plus what is left afterwards can be thought of as the fund's ultimate purchasing power.
 - URPP is defined as the sum of real ending market value plus cumulative real spending.

How to Make a Decision?

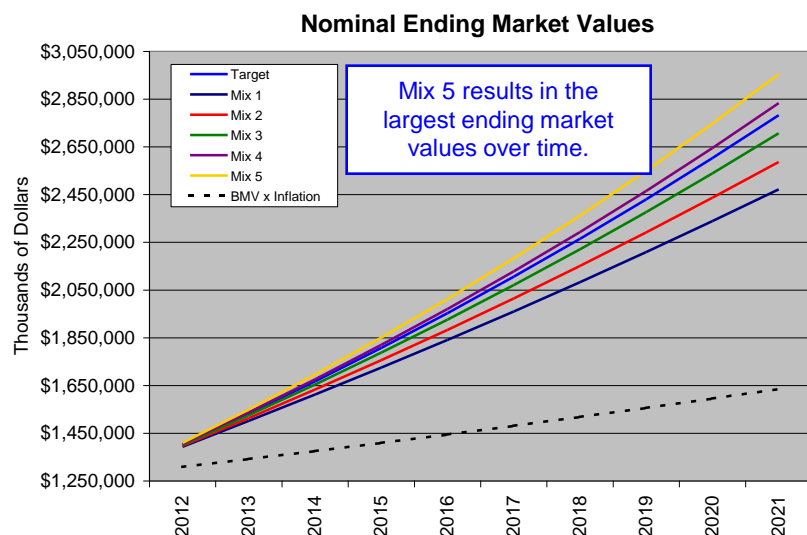
Balancing Risk and Reward

- Balance competing objectives: growth in the corpus of the Funds versus maximizing spending:
 - Time horizon matters.
 - Higher expected growth comes at the cost of higher volatility of results.
- Examine projected outcomes on an expected basis (“deterministic” results).
- Examine range of outcomes - evaluate risk - the impact of volatility (“stochastic” results).
- Risk versus reward:
 - How much can be gained by taking on more risk versus how much can be lost in a worse-case scenario?
- Ultimately, the Funds’ risk tolerance determines the appropriate asset allocation for the Funds.

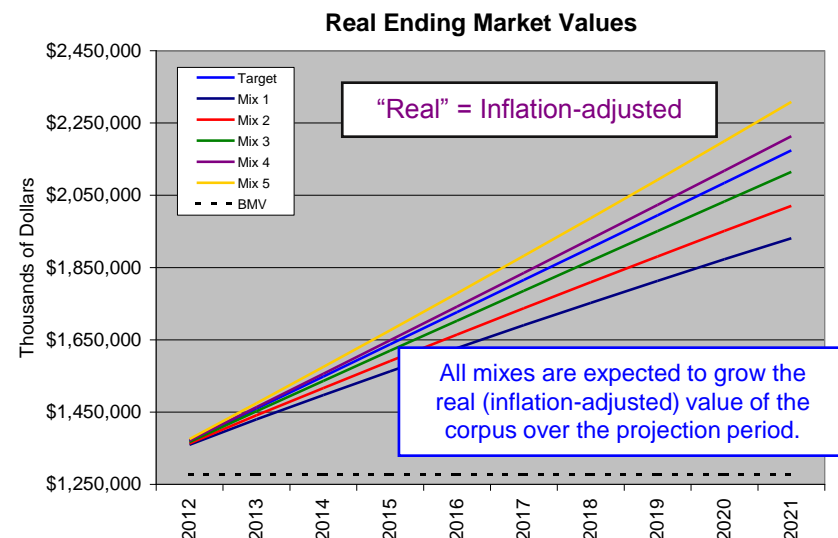


Integration of Asset and Spending Projections for the Funds

Projected Growth in Market Value



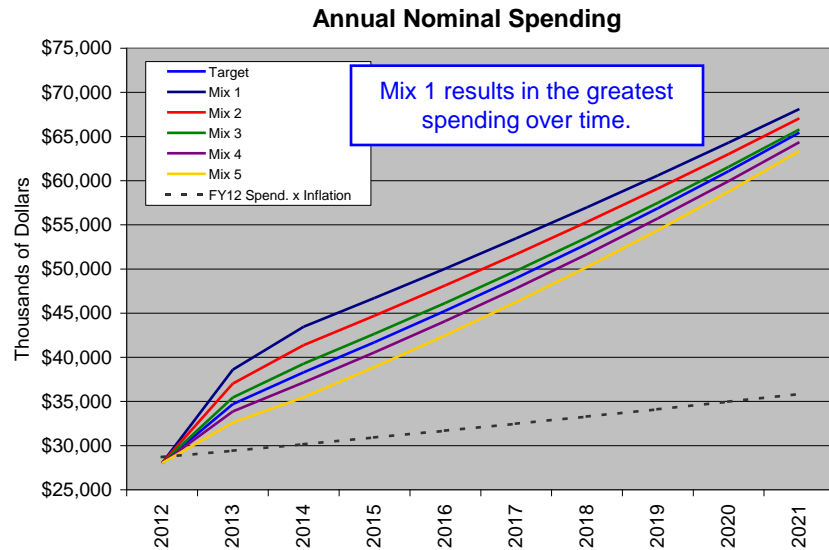
	2016 (Bil.)	2021 (Bil.)
Target	\$1.95	\$2.78
Mix 1	\$1.84	\$2.47
Mix 2	\$1.88	\$2.59
Mix 3	\$1.93	\$2.71
Mix 4	\$1.97	\$2.83
Mix 5	\$2.01	\$2.95
BMV x Infl.	\$1.44	\$1.63



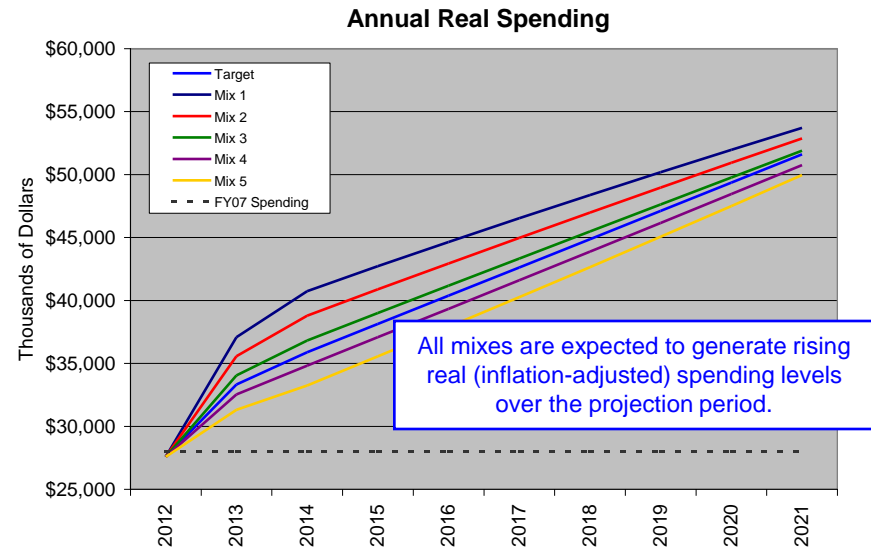
	2016 (Bil.)	2021 (Bil.)
Target	\$1.73	\$2.17
Mix 1	\$1.63	\$1.93
Mix 2	\$1.66	\$2.02
Mix 3	\$1.70	\$2.11
Mix 4	\$1.74	\$2.21
Mix 5	\$1.78	\$2.31
BMV	\$1.28	\$1.28

- The charts above show the projected nominal and real market value of assets over the next 10 years. Real values are determined by discounting nominal values with inflation.
- Given the relatively conservative spending policy and projected contribution levels, the current policy target and all of the alternative asset mixes are able to sustain the purchasing power of the Fund over the next 10 years. It is worth noting that if contributions were eliminated, the real value of the corpus would be expected to increase under all of the alternative asset mixes, as the real return is expected to exceed the low expected yield for all mixes.

Projected Growth in Spending



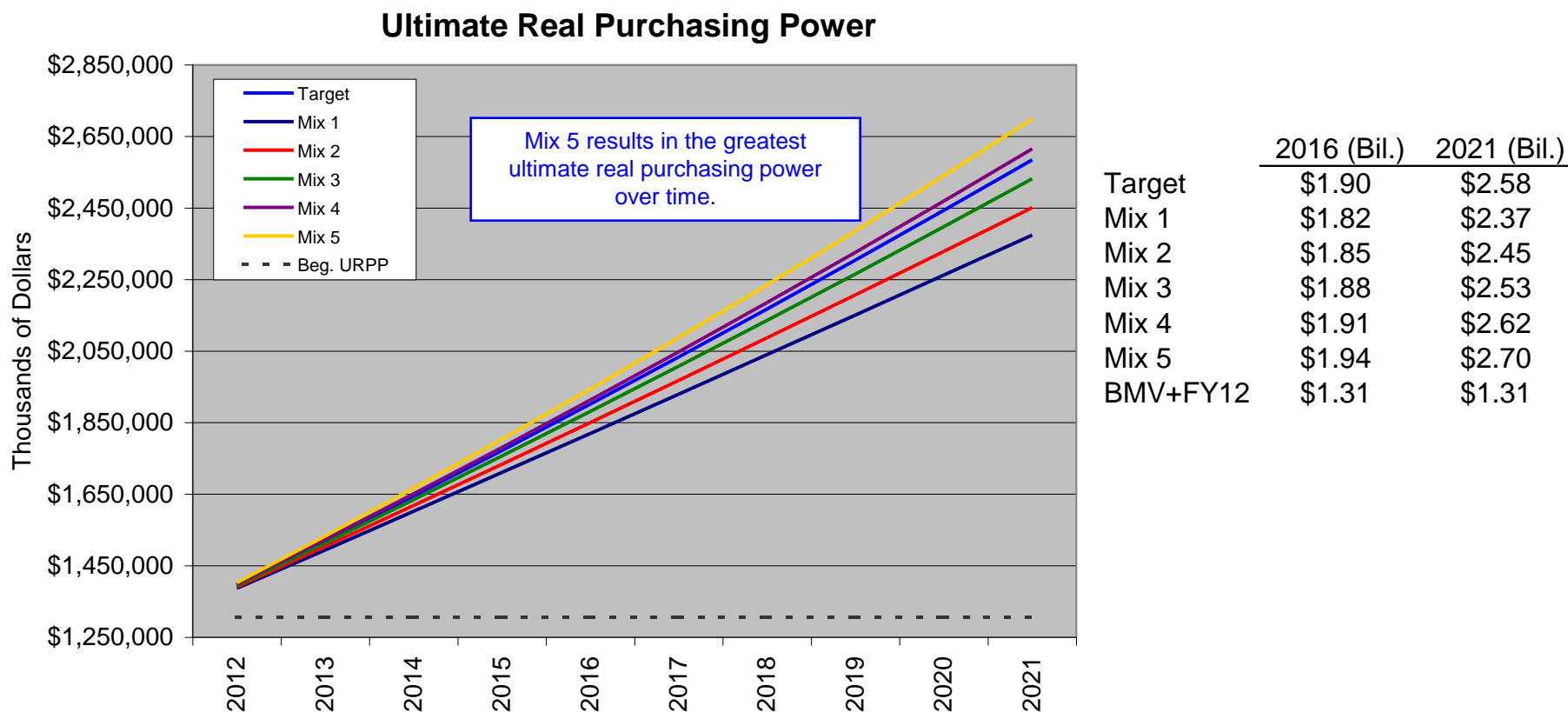
	2016 (Mil.)	2021 (Mil.)
Target	\$45.3	\$65.5
Mix 1	\$50.0	\$68.1
Mix 2	\$48.1	\$67.1
Mix 3	\$46.1	\$65.8
Mix 4	\$44.1	\$64.4
Mix 5	\$42.5	\$63.4
FY12 x Infl.	\$31.7	\$35.8



	2016 (Mil.)	2021 (Mil.)
Target	\$40.4	\$51.6
Mix 1	\$44.6	\$53.7
Mix 2	\$42.9	\$52.9
Mix 3	\$41.2	\$51.9
Mix 4	\$39.3	\$50.7
Mix 5	\$37.9	\$50.0
FY12	\$28.0	\$28.0

- The charts above show projected nominal and real spending over the next 10 years. Real values are determined by discounting nominal values with inflation.
- Given the relatively conservative spending policy and projected contribution levels, the current policy target and all of the alternative asset mixes are able to at least sustain the real level of spending by the Fund over the next 10 years. It is worth noting that if contributions were eliminated, real spending would still be expected to increase under all of the alternative asset mixes.

Ultimate Real Purchasing Power



- The chart above shows the projected Ultimate Real Purchasing Power over the next 10 years. In the static world of deterministic projections, where the Funds achieve the expected result each year without variation, more aggressive asset allocations result in greater ultimate real purchasing power levels for the Fund.
- Given the relatively conservative spending policy and projected contribution levels, the current policy target and all of the alternative asset mixes are able to at least sustain both the real level of spending by the Funds and the real value of assets over the next 10 years. URPP is expected to increase under all of the asset mixes under consideration irrespective of projected contributions.

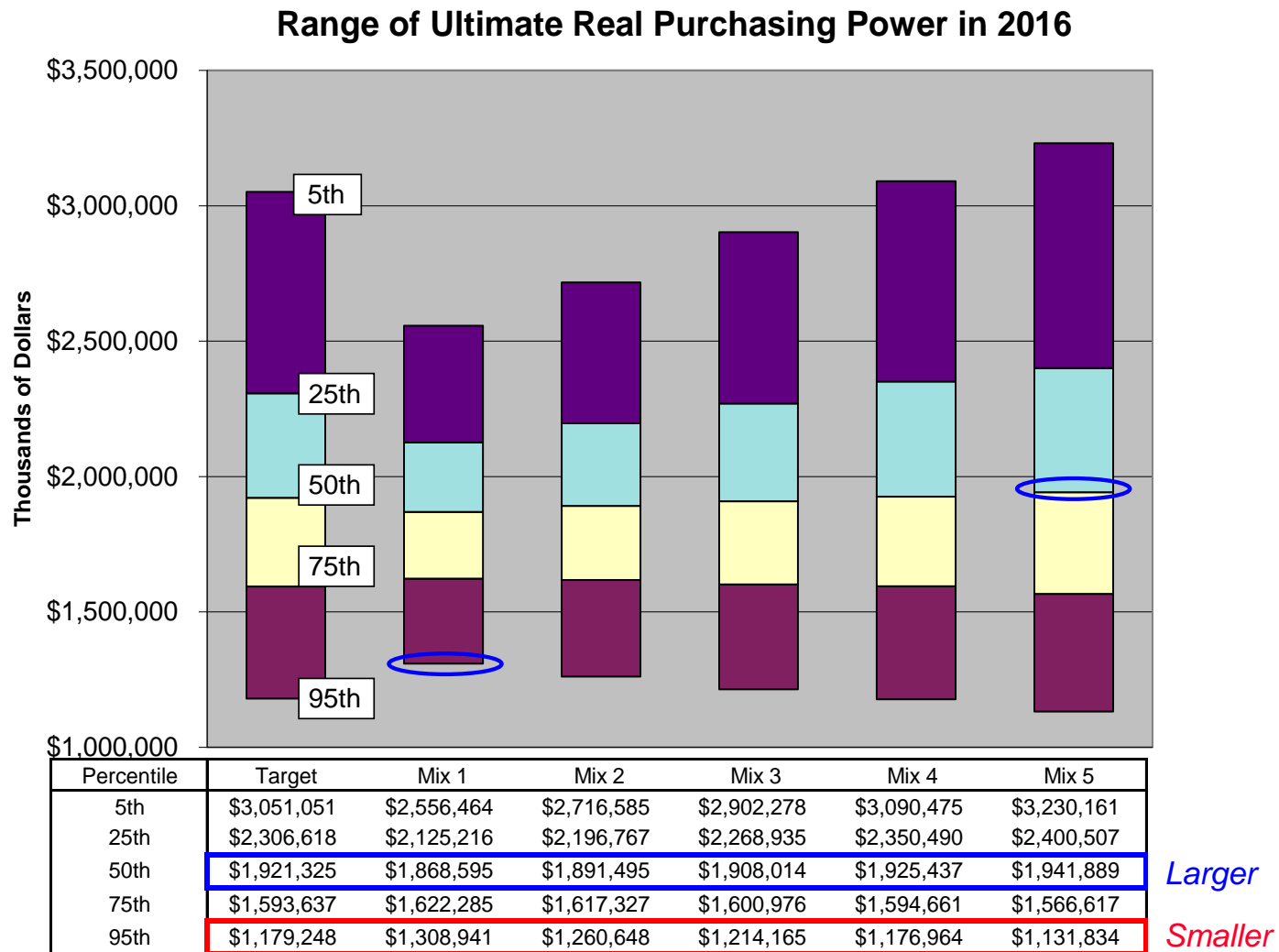
Conclusions – Deterministic Results

- In the static world of “deterministic” projections, where the Funds achieve the expected (median) result each year without variation, higher expected returns result in lower cumulative spending and faster growth in the corpus of the Funds.
- Higher expected returns are generated by asset mixes with greater equity exposure. Greater equity exposure means less fixed income and therefore less income.
- Given an income-only spending policy that is projected to distribute between 2.3-2.9% per year depending on the asset mix employed, each of the alternative mixes, including the current Target are able to generate enough return for the Funds to keep pace with both inflation and spending over the projection period irrespective of contributions. The real value of the corpus and the annual real spending by the Funds will increase under any asset mix that generates a real return greater than its spending percentage.

Using Simulation to Understand the Full Range of Potential Outcomes

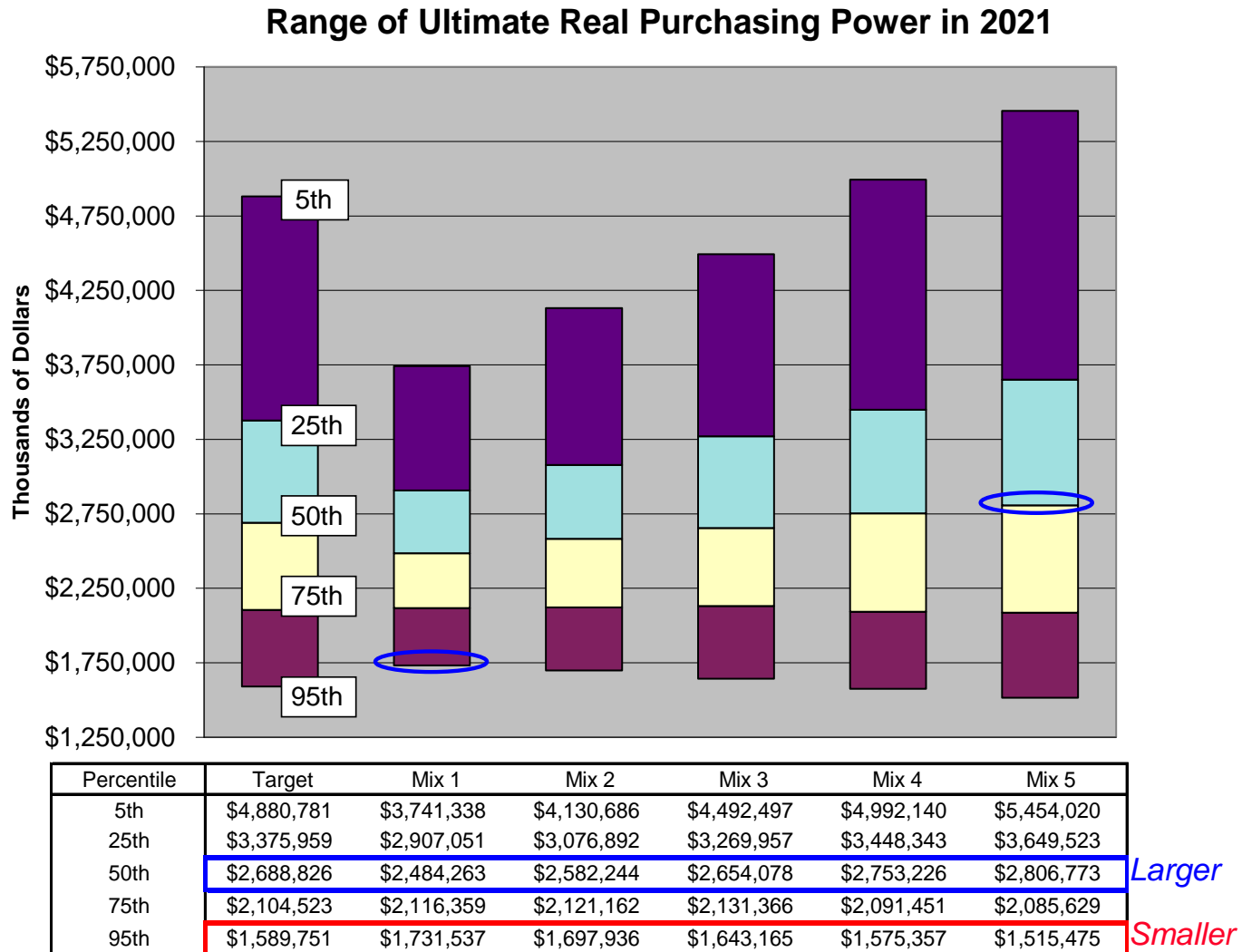
- One simulation is equivalent to one possible future economic scenario.
- Simulate 300 capital market outcomes for each asset mix.
- Simulate 300 inflation outcomes (consistent with capital market outcomes) for each asset mix.
- Quantify the impact on important variables (nominal and real) in median-case (50th percentile) and worse-case (95th percentile) outcomes.

Ultimate Real Purchasing Power in 2016



- Ultimate Real Purchasing Power is expected (50th percentile) to rise as equity exposure increases. In a worse-case scenario, however, higher equity exposure results in larger investment losses to the Funds, lower spending, and ultimately a lower measure of URPP. The worse-case scenario is a measure of the potential risk of an asset allocation decision.

Ultimate Real Purchasing Power in 2021



Defining Risk Tolerance

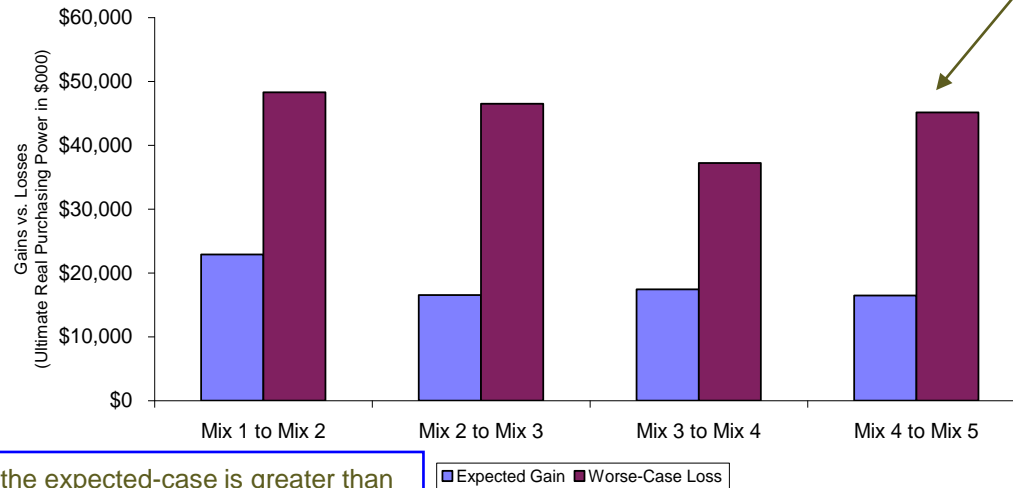
Risk versus Reward

- Expected reward:
 - Increase in the expected-case (median) real ending market value (50th percentile).
- Downside risk:
 - Decrease in the worse-case real ending market value (95th percentile).
- Callan's approach:
 - Moving to a more aggressive asset mix is justified if the reward exceeds the risk.

Risk versus Reward

Ultimate Real Purchasing Power

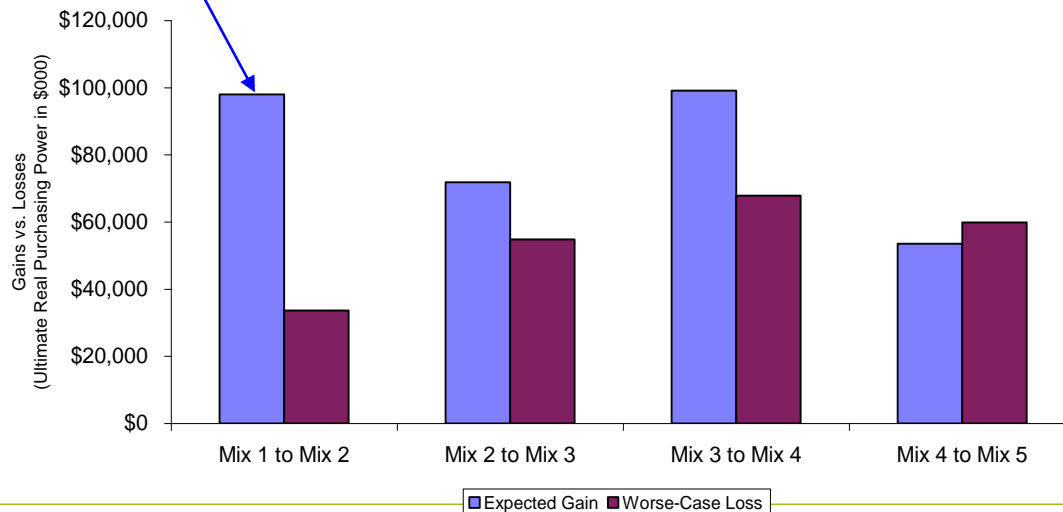
Ultimate Real Purchasing Power in 2016



Gain in the expected-case is greater than the loss in the worse-case.

Loss in the worse-case is greater than the gain in the expected-case.

Ultimate Real Purchasing Power in 2021



- Ultimate real purchasing power incorporates the competing objectives of growth in assets versus growth in spending. What a fund spends plus what it is left with afterwards can be thought of as the fund's ultimate purchasing power. The real purchasing power adjusts for inflation.
- Using the ultimate real purchasing power ending in 2016 as the decision-making variable, the analysis indicates that the risk outweighs the reward in pursuing investment policies with equity exposures and return expectations greater than Mix 1.
- Extending the time horizon to ten years suggests that a more aggressive asset allocation – between Mix 3 and Mix 4 - is reasonable. This conclusion is between those drawn in the risk/reward analyses of market value and cumulative spending, demonstrating how the URPP concept attempts to balance competing objectives.

Conclusions – Stochastic Results

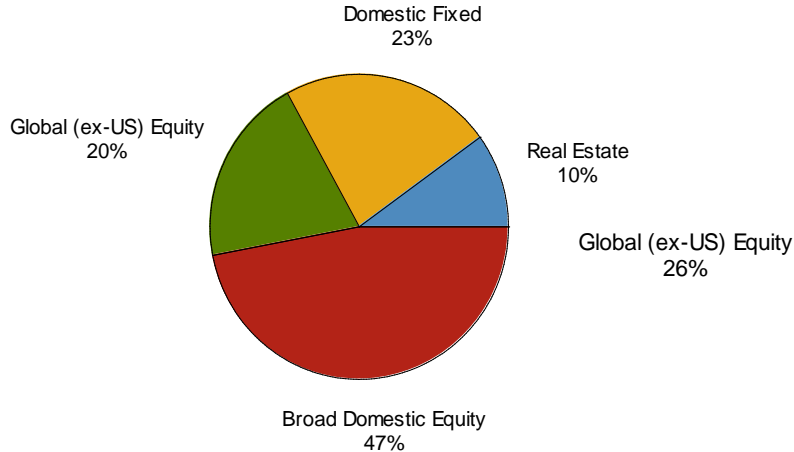
- The suggested target allocation depends on the time horizon focused upon and the variable in question. The shorter the time horizon, the more conservative the suggested target allocation. Extending the time horizon allows for a more aggressive asset allocation.
- The decision variables to consider are the real ending market values, cumulative real spending, and an inflation-adjusted balanced consideration of these two competing factors.
- The current target and all of the alternative mixes are expected to prevent the real value of the corpus and annual real spending from declining (below the initial values) over all time horizons given the current income-only spending policy, low expected yields and projected contribution levels.
- Focusing on the ultimate real purchasing power of the Funds and a five-year horizon, the risk/reward analysis suggests that the risk outweighs the reward for pursuing investment policies with equity exposures and return expectations greater than those of Mix 1. Extending the time horizon to ten years suggests that a more aggressive asset allocation – between Mix 3 and Mix 4 - is reasonable. The reward for taking on greater investment risk - higher market values and ultimately greater spending - becomes more evident given a longer time horizon, even though the spending policy does not necessitate a need for higher return.

Interpreting the Results

Selecting An Investment Policy Target Mix

- Alternative asset Mixes 3 and 4 shown below represent endpoints of a range of acceptable policy choices for the Funds. The current Target Mix lies in this range.
- Mix 3 - 61% equity (35% U.S., 26% non-U.S.), 30% fixed income and 9% real estate - has a risk and return profile that is modestly less aggressive than that of the current Target mix. Mix 4 - 70% equity (40% U.S., 30% non-U.S.), 20% fixed income and 10% real estate - is slightly more aggressive than the current Target mix. Mix 4 has a lesser yield and therefore a lower effective spending rate than the Target, while Mix 3 has a greater yield. Asset mixes in the range between Mixes 3 and 4 are both expected to generate enough return to comfortably sustain the current spending policy while providing the opportunity for growth in the real value of the corpus.

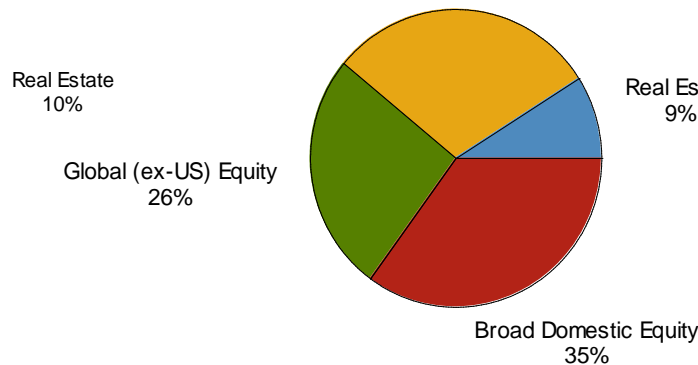
Current Target



Projected Return = 7.38%
Projected Risk = 13.55%
Projected Yield = 2.73%
67% Equity

Mix 3

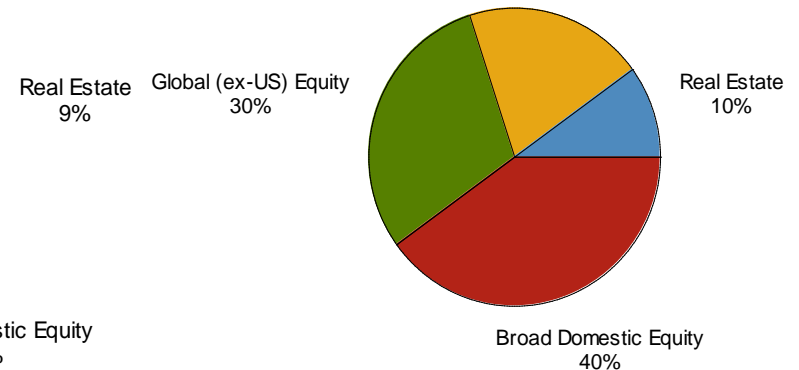
Domestic Fixed
30%



Projected Return = 7.16%
Projected Risk = 12.48%
Projected Yield = 2.80%
61% Equity

Mix 4

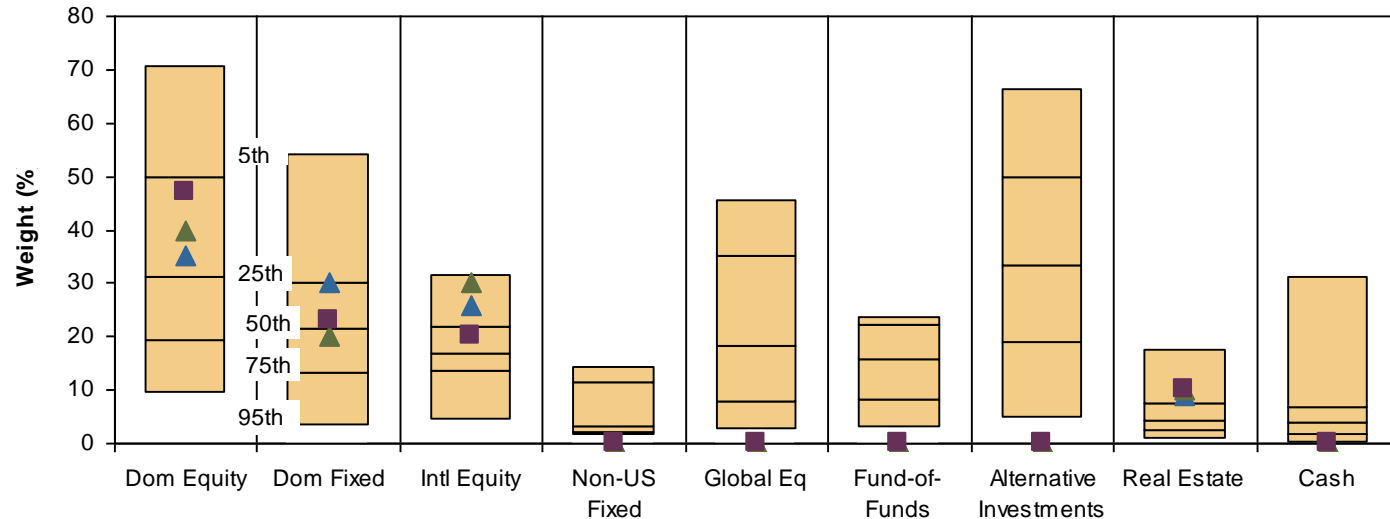
Domestic Fixed
20%



Projected Return = 7.520%
Projected Risk = 14.20%
Projected Yield = 2.65%
70% Equity

Peer Group Comparison

XYZ Corp. Funds versus Callan Database of Endowments & Foundations



5th Percentile	71%	54%	32%	14%	46%	24%	66%	18%	31%	82%
25th Percentile	50%	30%	22%	11%	35%	22%	50%	8%	7%	58%
Median	31%	21%	17%	3%	18%	16%	33%	4%	4%	39%
75th Percentile	19%	13%	13%	2%	8%	8%	19%	3%	2%	0%
95th Percentile	10%	4%	5%	2%	3%	3%	5%	1%	0%	0%
Current Target	47%	23%	20%	0%	0%	0%	0%	10%	0%	67%
Mix 3	35%	30%	26%	0%	0%	0%	0%	9%	0%	61%
Mix 4	40%	20%	30%	0%	0%	0%	0%	10%	0%	70%
Percentage Targeted	93%	84%	86%	10%	5%	3%	53%	14%	40%	100%

- Actual asset allocations for peer group as of 12/31/2010. Some allocations may lag one or two quarters. 159 plan sponsors represented.
- 53% of peer group is invested in alternative investments which is mostly private equity and hedge funds.

Peer Group Comparison

XYZ Corp. Funds versus Callan Database of Endowments & Foundations

- The allocations to asset classes depict the range for those institutions that actually target investments in the particular asset class. The “percentage targeted” line in the table above shows what share of funds in Callan’s endowment and foundation universe are targeting investments in each asset class. Note that endowments and foundations with large single-stock positions (typically derived from founders or large donors) are excluded from the data base.
- The current target has a substantially higher total equity allocation but a similar allocation to domestic fixed income relative to the universe median. Many of the funds in this peer group have made substantial allocations to alternatives (such as hedge funds and private equity), largely at the expense of public markets equity. Without an allocation to alternative strategies (outside of real estate), the current target and any other proposed mixes will likely maintain a relative overweight to one of the traditional asset classes in comparison to this group of funds.
- Dividing the asset classes into two broad categories - fixed income and “return-seeking” or risky assets - the current target for the Funds’ total fixed income allocation is roughly in line with the majority of endowments and foundations in Callan’s database.

Peer Group Comparison

2009 NACUBO Endowment Study

Asset Allocations for Fiscal Year 2009

Endowment Assets/Type (Number of Respondents)	Domestic equities	Fixed income	International equities	Alternative strategies ¹	Short-term securities/cash/ other
Over \$1 Billion (52)	14	11	14	56	5
\$501 Million-\$1 Billion (60)	20	14	17	43	6
\$101-\$500 Million (219)	27	18	16	32	7
\$51-\$100 Million (164)	34	21	17	22	6
\$25-\$50 Million (137)	37	23	15	18	7
Under \$25 Million (210)	39	28	12	11	10
Total Institutions (842)	31	21	15	25	8

Table data are equal-weighted; numbers in percent.

¹Includes private equity, marketable alternative strategies, venture capital, private equity real estate, energy and natural resources, and distressed debt.

Source: NACUBO-Commonfund Study of Endowments 2009.

Alternative Strategies Asset Mix for Fiscal Year 2009

Endowment Assets/Type (Number of Respondents)	Private equity ¹	Marketable alternative strategies ²	Venture capital	Private equity real estate ³	Energy and natural resources ⁴	Distressed debt
Over \$1 Billion (48)	20	42	9	11	12	6
\$501 Million-\$1 Billion (57)	19	48	8	9	10	6
\$101-\$500 Million (209)	16	55	5	8	11	5
\$51-\$100 Million (142)	11	58	2	14	10	5
\$25-\$50 Million (106)	7	61	4	12	8	8
Under \$25 Million (139)	7	58	4	11	5	15
Total Institutions (701)	14	54	5	10	10	7

Table data are equal-weighted; numbers in percent.

¹LBOs, mezzanine, M&A funds, and international private equity.

²Hedge funds, absolute return, market neutral, long/short, 130/30, event-driven, and derivatives.

³Non-campus.

⁴Oil, gas, timber, commodities, and managed futures.

Source: NACUBO-Commonfund Study of Endowments 2009.

- The largest difference in the average asset allocation of endowments compared to the Funds' current target allocation is a much lower allocation to public markets equity in favor of allocations to other asset classes such as real estate, hedge funds and private equity.

Summary of Results

- The analysis confirms a tradeoff between growing the corpus and spending.
- Focusing on a five-year horizon suggests that the risks outweigh the rewards in pursuing investment policies with equity exposures and return expectations greater than those of Mix 1. Extending the time horizon to ten years suggests that a more aggressive asset allocation – between Mix 3 and Mix 4 - is reasonable. The reward for taking on greater investment risk - higher market values and ultimately greater spending - becomes more evident given a longer time horizon, even though the spending policy does not necessitate a need for higher return.
- Alternative asset Mixes 3 and 4 represent endpoints of a range of acceptable policy choices for the Funds. The current Target mix lies in this range, and can easily be retained as the appropriate policy mix going forward.
- Optimal mixes close to the current Target contain greater allocations to non-US equity. The current Target allocates 30% of total equity to non-US; Callan suggests the Funds consider moving the non-US allocation closer to 45%. For the current total equity allocation of 67%, we would suggest moving the US allocation from 47% to 38%, funding an increase in the non-US allocation from 20% to 29%. The current global equity opportunity set is 42% US/58% non-US; the recommendation moves the Funds another step toward this “neutral” position.
- Given an income-only spending policy that is projected to distribute between 2.3-2.9% per year depending on the asset mix employed, each of the alternative mixes, including the current Target are able to generate enough return for the Funds to keep pace with both inflation and spending over the projection period irrespective of contributions. The real value of the corpus and the annual real spending by the Funds will increase under any asset mix that generates a real return greater than its spending percentage.

Summary of Results

- While Callan does not recommend asset allocation strategies based solely on what others are doing, we believe that a comparison to the endowment and foundation peer group is a reasonable check.
 - Most endowments and foundations employ a percentage of assets spending policy and spend at a much higher rate compared to the Funds.
 - As a result, many endowments and foundations have moved toward investment policies that target a high rate of total return, without regard to income or yield.
 - In an effort to diversify and control risk while pursuing higher return, many endowments and foundations have embraced substantial allocations to illiquid, alternative strategies. Hedge funds and private equity are the most common alternatives exposures, but other strategies include timber, commodities, energy, and infrastructure.
- The fixed income exposure for the current Target mix is comparable to that of the average for endowments and foundations in Callan's database, suggesting that the balance between fixed income or "safe" investments and return-seeking investments in the current Target is reasonably similar to that of the majority of endowments and foundations.
- Ultimately, the appropriate allocation depends on the time horizon and variable deemed most important by the Funds.



Appendix 1

Alternative Spending Policies

Commonly Used Spending Policies

- The XYZ Corporation Funds have historically employed an income-only spending policy. Is the current policy reasonable? How does the investment policy interact with the spending policy? How much spending is too much, and what limits or controls should be placed on spending? Each of these questions will be addressed in the following section. The current spending policy and two alternative policies are tested to determine the sustainability of their spending rates given investment strategies.
- Commonly used spending policies for foundations and endowments typically fall into four broad categories:
 - Income Only: Only coupon and dividend payments are spent.
 - *Provides for fairly stable spending from year to year.*
 - *Results in an asset allocation that is oriented towards income generation rather than total-return investing.*
 - *Favors a large allocation to fixed income and a limitation on high-return, low-yielding asset classes.*
 - *These restrictions can affect the long-term growth of the corpus and the probability of the fund preserving its purchasing power over time.*
 - Market Value-Related: A percentage of the fund's market value is spent each year.
 - *Favors the long-term preservation of the corpus at the expense of stable and predictable spending levels.*
 - *Produces unstable spending from year to year, making budgeting more difficult. A partial solution to the problem is the use of a moving average market value approach which reduces spending volatility.*
 - *Over time, a market value-based spending policy will produce more total dollars for the institution as it frees the investment decisions from the spending policy, providing greater flexibility in selecting an asset allocation.*

Commonly Used Spending Policies

- Historical Spending Plus an Adjustment: An amount equal to the prior year's spending (or a multi-period moving average of prior spending) plus some amount, whether it be an adjustment for inflation or a fixed percentage increase, is spent.
 - *Makes budgeting easier for the beneficiary institutions. In declining markets this policy can have a detrimental affect on the value of the corpus.*
 - *Requires the discipline to refrain from increasing spending during bull markets. Is the projected spending amount sustainable?*
- The Hybrid Model: Balance the competing goals of producing stable spending levels while preserving the purchasing power of the fund by using more than one type of spending policy. Best known example is the “Yale” model, where spending is equal to a weighted average of prior spending adjusted for inflation (70% weight) and 5% of current market value (30% weight).
 - *Annual spending = $x\%$ times some measure of historical spending plus $(1-x)\%$ times some measure of market value.*
 - *Trustees can shift the value of “ x ” to reflect preference for each goal.*
- Today's best practices:
 - The overwhelming majority of institutions employ some form of market value-based spending formula. In practice, there is a continuum of spending policies. At one end is a policy that provides total stability in spending each year, whether it's a flat dollar amount or a steadily rising rate of spending tied to something other than the market value of assets. On the other end of the spectrum is a policy that spends each year a fixed percentage of the fund market value at some earlier point in time.
 - Regardless of the spending policy employed, spending must average slightly less than the real investment return. Studies of historical performance and spending for private foundations concluded that a spending rate greater than 5% almost guarantees the erosion of a fund's grant-making capacity in constant dollars over the long term.

NACUBO Spending Policies

Spending Policy for Fiscal Year 2009

Endowment Assets/Type (Number of Respondents)	Spend all current income	Percentage of moving average	Decide on appropriate rate each year	Grow distribution at predetermined inflation rate	Spend pre-specified percentage of beginning market value	Last year's spending plus inflation with upper and lower bands	Weighted average or hybrid method	Meet IRS minimum of 5 percent	Other
Over \$1 Billion (52)	2	56	8	4	0	19	15	0	13
\$501 Million-\$1 Billion (60)	2	70	7	0	0	5	12	0	13
\$101-\$500 Million (219)	5	75	6	2	2	5	7	0	9
\$51-\$100 Million (164)	4	82	7	0	5	1	7	0	7
\$25-\$50 Million (137)	4	79	12	0	7	1	4	0	4
Under \$25 Million (210)	6	68	14	0	6	1	2	1	12
Public (306)	5	68	14	1	5	3	7	1	9
Private (536)	4	77	6	1	4	4	6	0	9
Total Institutions (842)	4	74	9	1	4	3	6	*	9

Multiple responses allowed; numbers in percent.

*Less than 1 percent, results not meaningful.

Source: NACUBO-Commonfund Study of Endowments 2009.

- According to the 2009 NACUBO Endowment Study, an overwhelming majority (74%) of the institutions polled (regardless of size) spend a pre-specified percentage of moving average endowment market values. However, a significant percentage of endowments, particularly the smallest (14%) decide on the appropriate rate each year.

Deciding on a Spending Policy

- A well designed spending policy for a fund balances the need for current spending with the need to preserve the corpus to support spending into perpetuity. The investment policy and the spending policy are interdependent, and a harmonious interaction between the two is critical to the long-term success of any fund.
- Most endowments and foundations in the U.S. pursue a “total return” investment approach, where the institution seeks to obtain the highest possible rate of total return (yield plus appreciation) consistent with a reasonable level of risk. Key to adopting a total return approach is the willingness and ability to spend a portion of the capital gains in addition to current income.
- Callan supports a total return approach for a fund seeking to support spending in perpetuity. Total return encourages a fund to invest for the long run and take advantage of assets with higher capital appreciation such as equity rather than seeking out investments with high current yields. Stated another way, total return allows institutions to focus on maximizing return per unit of risk, rather than income.
- Regardless of the mechanics of the spending policy employed, a fund must first decide on the appropriate level of spending to target over time. How high a spending rate is sustainable over time? Spending rates are typically expressed as a percentage of the market value of the endowment. Experience and research suggest that spending must average slightly less than the real investment return. Studies of historical performance and spending have concluded that a spending rate greater than 5% almost guaranteed the erosion of an endowment’s spending capacity in real dollars over the long-term. The 2009 NACUBO Endowment Study indicates that the average spending rate among its respondents is 4.4%.

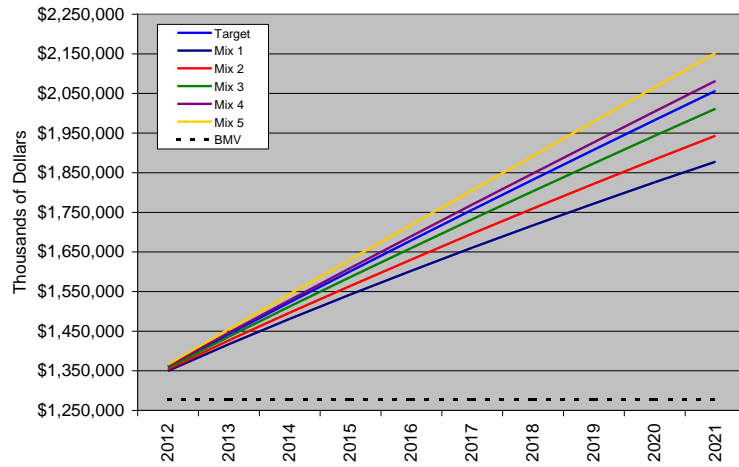
Alternative Spending Policies

- Callan tested the sensitivity of the Funds to alternative spending policies, focusing on real market values and annual real spending amounts. We compared the current income-only spending policy to 12- and 20-quarter rolling average market value policies, using both a 3.5% and 4% spending rate.
- The first set of charts on pages 48-49 show the projected real market value of assets and annual real spending over the next 10 years under a 12-quarter rolling average market value spending policy. The current policy is shown for comparative purposes.
- The second set of charts on page 50-51 show the projected real market value of assets and annual real spending over the next 10 years under a 20-quarter rolling average market value spending policy.

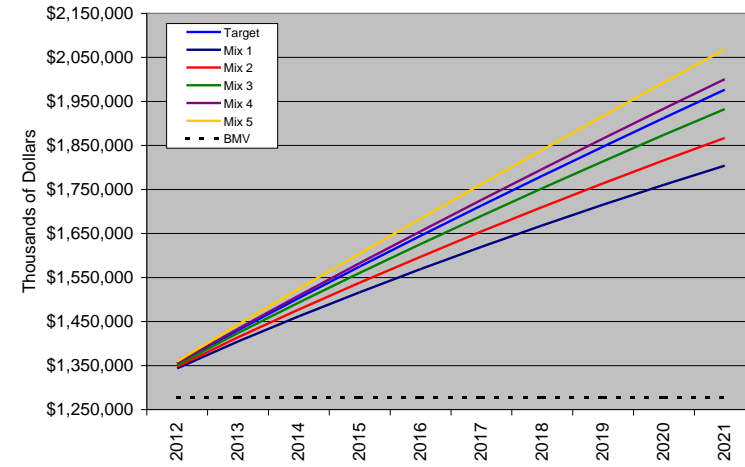
Real Market Value of Assets

12-Quarter Average Market Value

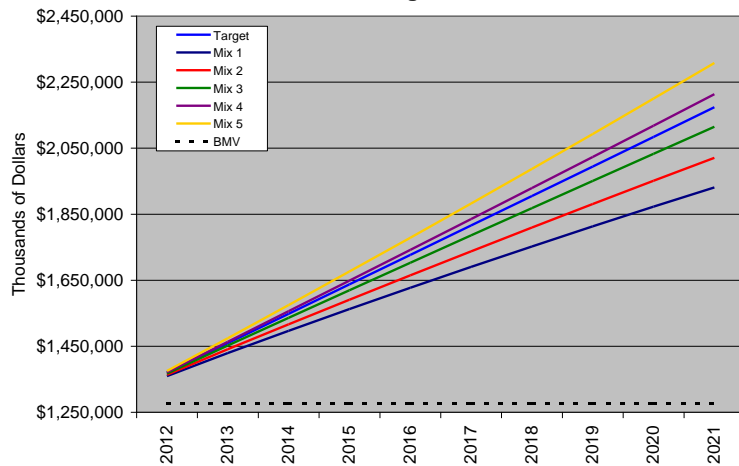
**3.5% of Rolling 12-Quarter Average Market Value
Real Ending Market Values**



**4% of Rolling 12-Quarter Average Market Value
Real Ending Market Values**



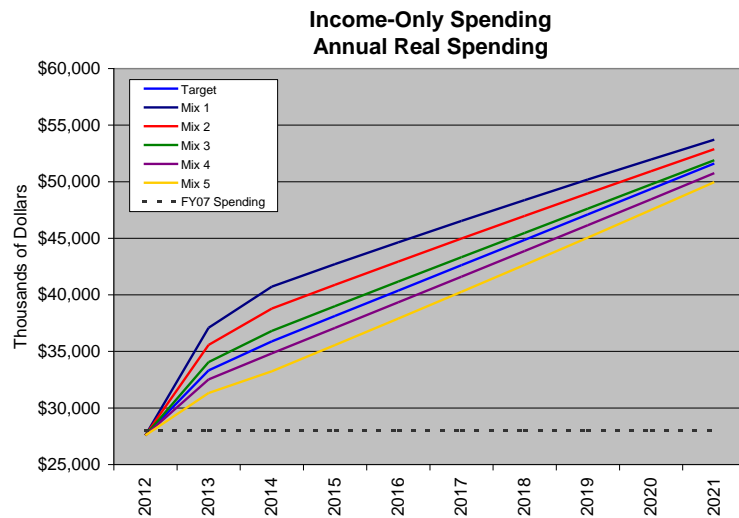
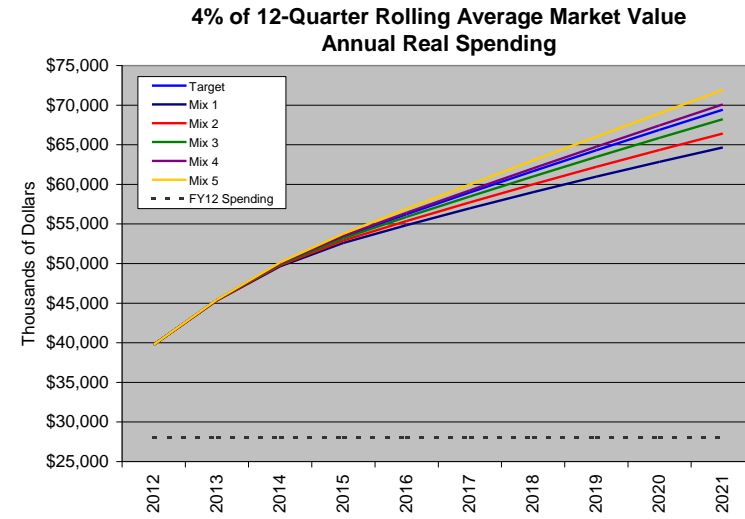
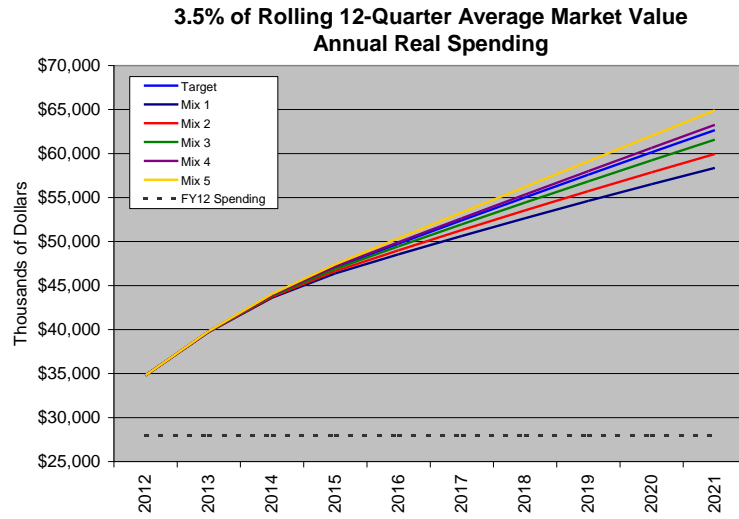
**Income-Only Spending
Real Ending Market Values**



- Under the three spending policies, the current policy target and all of the alternative asset mixes are expected to grow the real value of assets given projected contribution levels, thereby affording protection of the purchasing power of the Funds. While the more aggressive mixes generate higher ending asset values, these mixes expose the Funds to substantially greater volatility and lower worst-case results.
- It is important to note that if contributions were eliminated, Mix 1 would be unable to support the purchasing power of the Funds under the 4% rolling average market value policy while all of the alternative mixes would be able to support the 3.5% policy. All of the mixes, including the current Target, are able to generate enough return to preserve the purchasing power of the Funds under the current spending policy.

Real Spending

12-Quarter Average Market Value

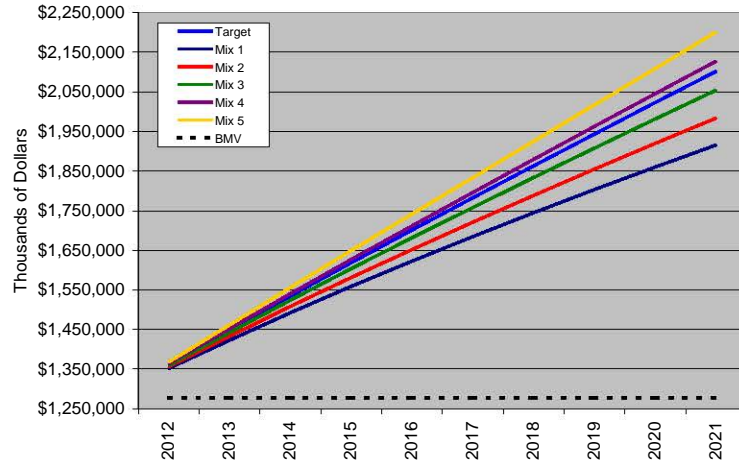


- All mixes are expected to generate growth in real spending over the 10-year projection given projected contribution levels. While the more aggressive mixes generate greater spending levels under the rolling average market value spending policy, these mixes result in lower spending levels under the current policy.
- Once again, if contributions were eliminated, Mix 1 would be unable to generate growth in real spending under the 4% rolling average market value policy while all of the alternative mixes would be able to support the 3.5% policy. All of the mixes, including the current Target, are able to generate enough return to preserve real spending under the current policy.
- A 2.75% rolling 12-quarter average market value policy generates approximately the same effective spending rate as the current income-only policy over the next 10 years using a mix similar to the current Target.

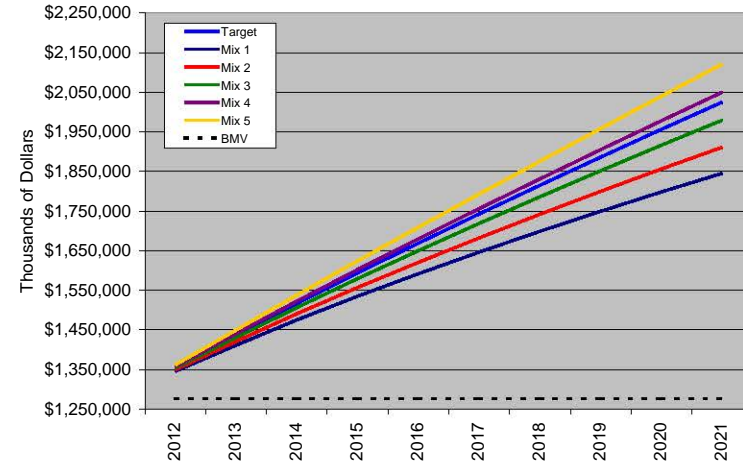
Real Market Value of Assets

20-Quarter Average Market Value

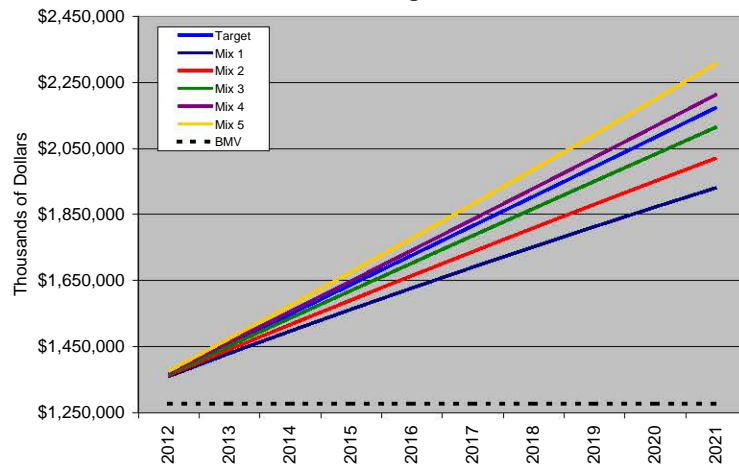
3.5% of Rolling 20-Quarter Average Market Value
Real Ending Market Values



4% of Rolling 20-Quarter Average Market Value
Real Ending Market Values



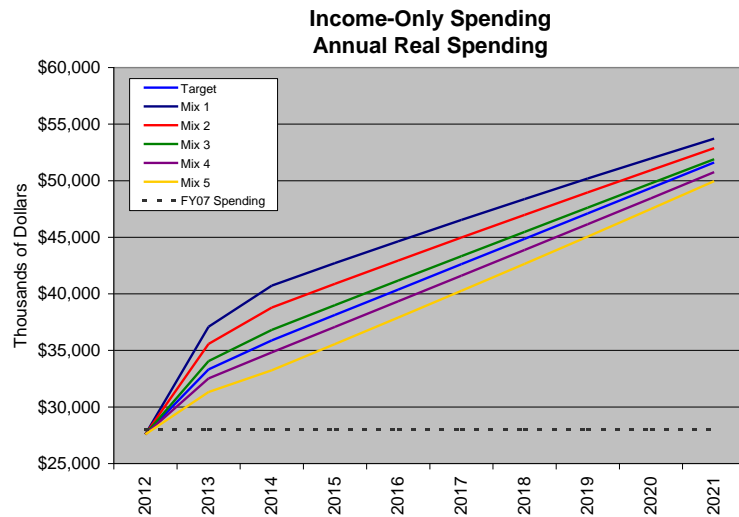
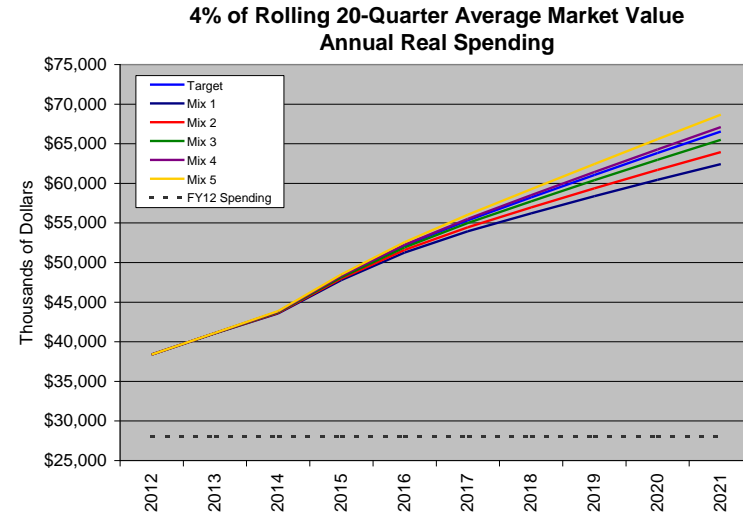
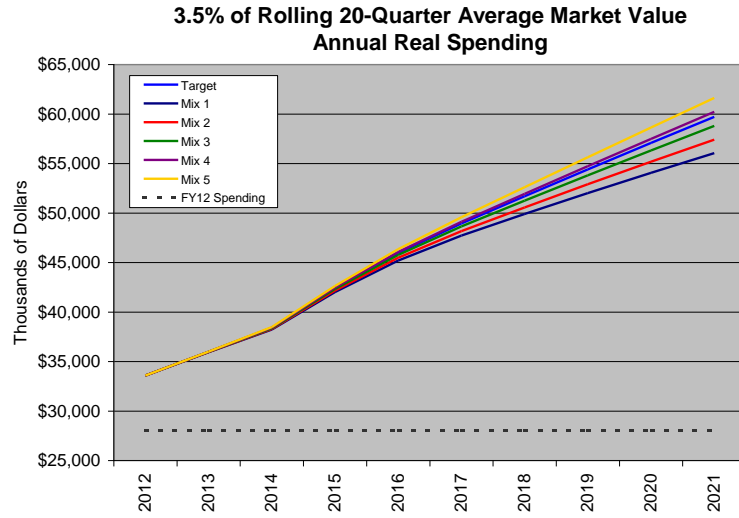
Income-Only Spending
Real Ending Market Values



- Using a long period to calculate the average market value effectively lowers the spending rate. Under the three spending policies, the current policy target and all of the alternative asset mixes are expected to grow the real value of assets given projected contribution levels, thereby affording protection of the purchasing power of the Funds. While the more aggressive mixes generate higher ending asset values, these mixes expose the Funds to substantially greater volatility and lower worst-case results.
- It is important to note that if contributions were eliminated, Mix 1 would be unable to support the purchasing power of the Funds under the 4% rolling average market value policy while all of the alternative mixes would be able to support the 3.5% policy. All of the mixes, including the current Target, are able to generate enough return to preserve the purchasing power of the Funds under the current spending policy.

Real Spending

20-Quarter Average Market Value



- All mixes are expected to generate growth in real spending over the 10-year projection given projected contribution levels. While the more aggressive mixes generate greater spending levels under the rolling average market value spending policy, these mixes result in lower spending levels under the current policy.
- Once again, if contributions were eliminated, Mix 1 would be unable to generate growth in real spending under the 4% rolling average market value policy while all of the alternative mixes would be able to support the 3.5% policy. All of the mixes, including the current Target, are able to generate enough return to preserve real spending under the current policy.
- A 3.0% rolling 20-quarter average market value policy generates approximately the same effective spending rate as the current income-only policy over the next 10 years using a mix similar to the current Target.

Comparison of Alternative Spending Policies

- Income-only spending policy drives results that can be in direct contrast to percentage-of-assets policies.
 - Focusing on spending, income-only favors portfolios with greater fixed income exposure and higher yields, particularly over the short- and medium-term. However, a move toward yield-oriented portfolios will generate less potential asset growth, and therefore potentially less spending over the very long term (smaller asset base). On the other hand, a move toward more growth assets in the portfolio will limit yield and therefore spending, to a level likely below that of a typical percentage-of-assets policy.
 - Percentage-of-assets policies favor portfolios with higher expected return and therefore a larger corpus against which the spending policy can be applied. Yield factors into spending only as a component of the total return. A move toward growth assets to increase spending leads to higher volatility, in both the asset values and in spending.
 - Expected spending under income-only is greatest for the most conservative mix (Mix 1); spending is lowest for the most aggressive mix (Mix 5). Under percentage-of-assets policies, the opposite is true: the most aggressive mixes generate the highest expected returns and the greatest spending.
- The current income-only policy results in an effective spending rate (assuming the current Target asset mix) of approximately 2.5%-2.75% of total fund assets.
 - Effective rate is substantially lower than the average of more than 4% reported in the NACUBO study.
 - The conservative spending policy combined with the expected income from the Trust lands suggests the market value of the Funds should grow substantially in real terms over the next ten years (7.4% expected return – 2.5% inflation – 2.75% effective spending = more than 2% annual real growth in the corpus).

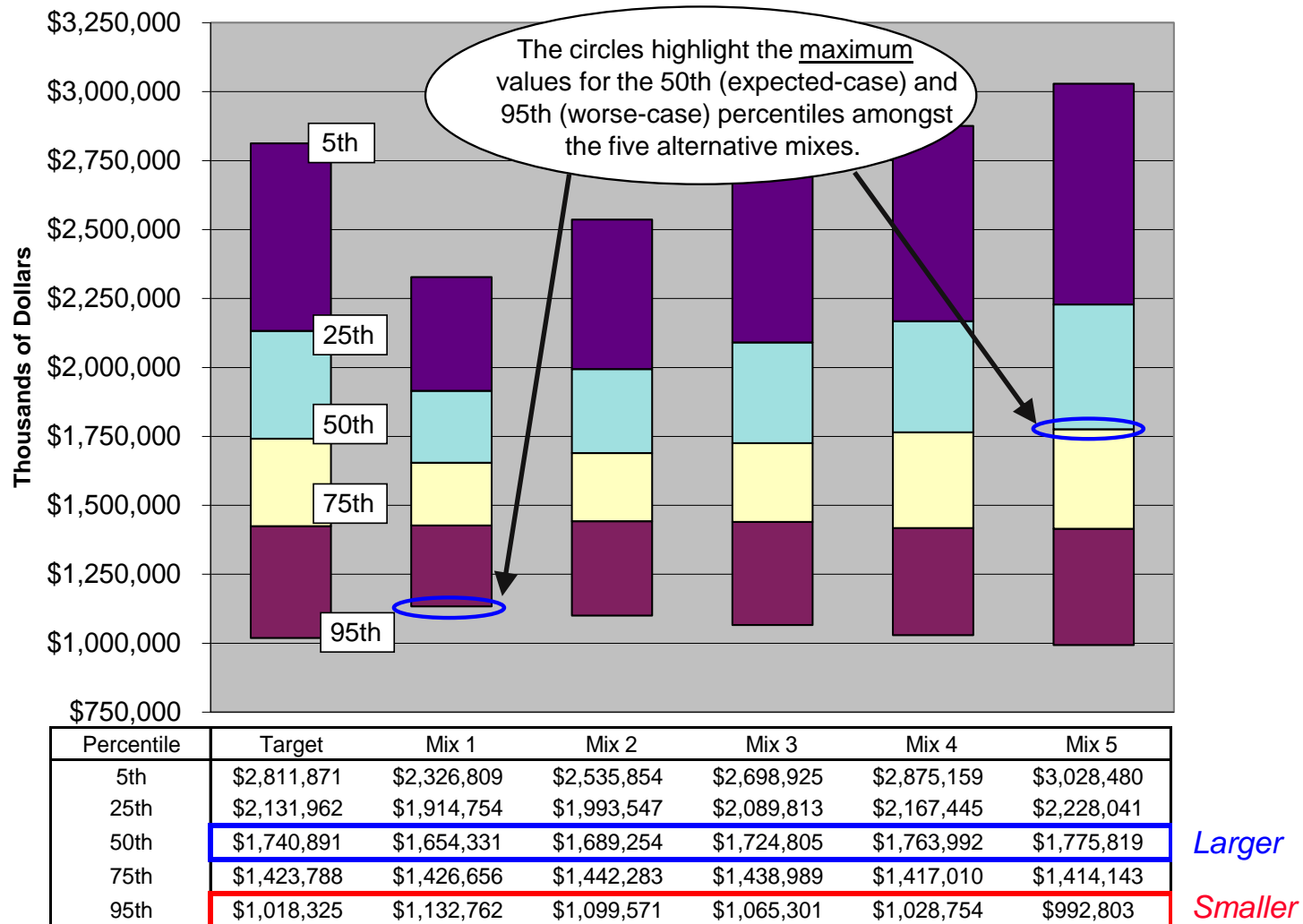


Appendix 2

Simulation Detail

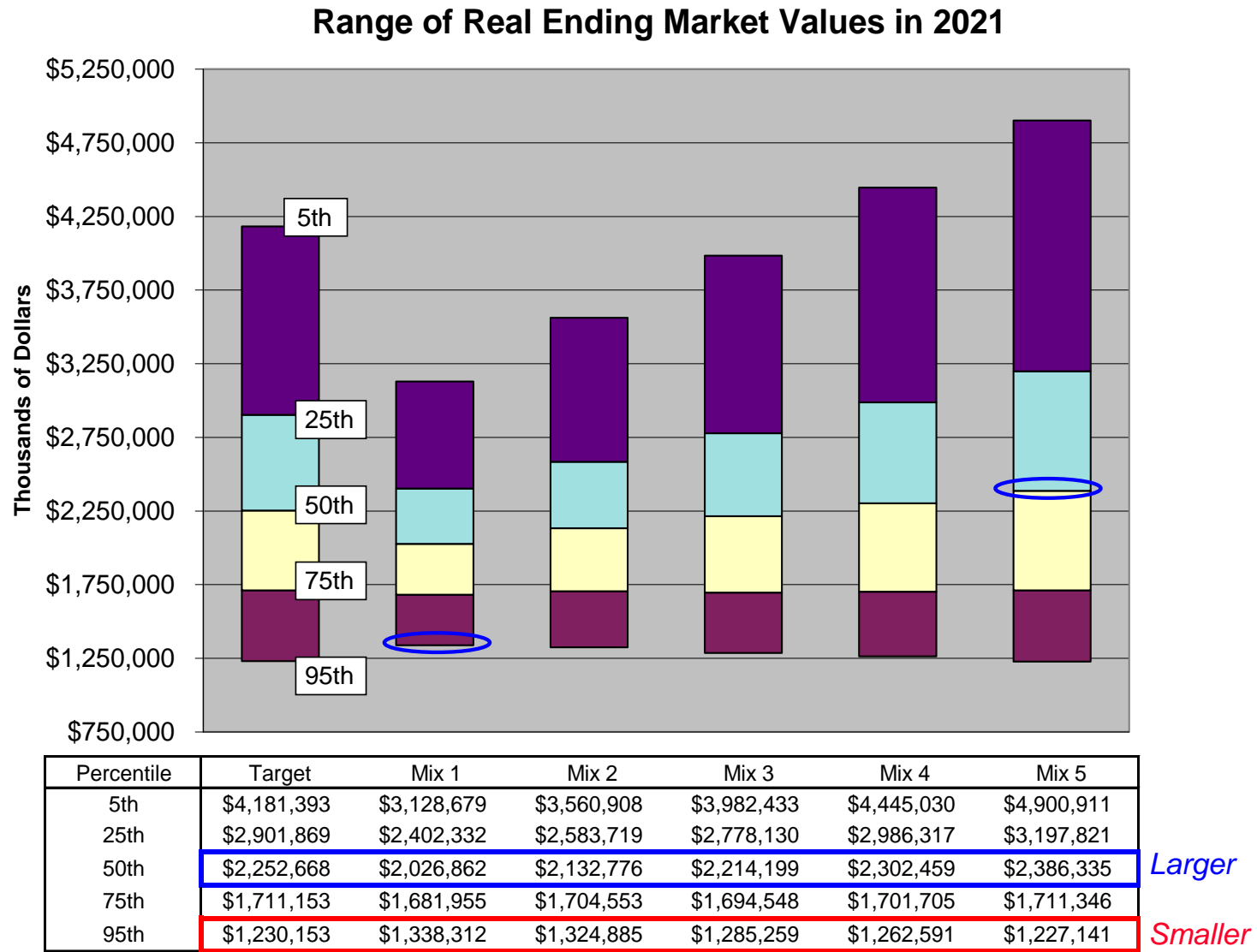
Real Market Value of Assets in 2016

Range of Real Ending Market Values in 2016

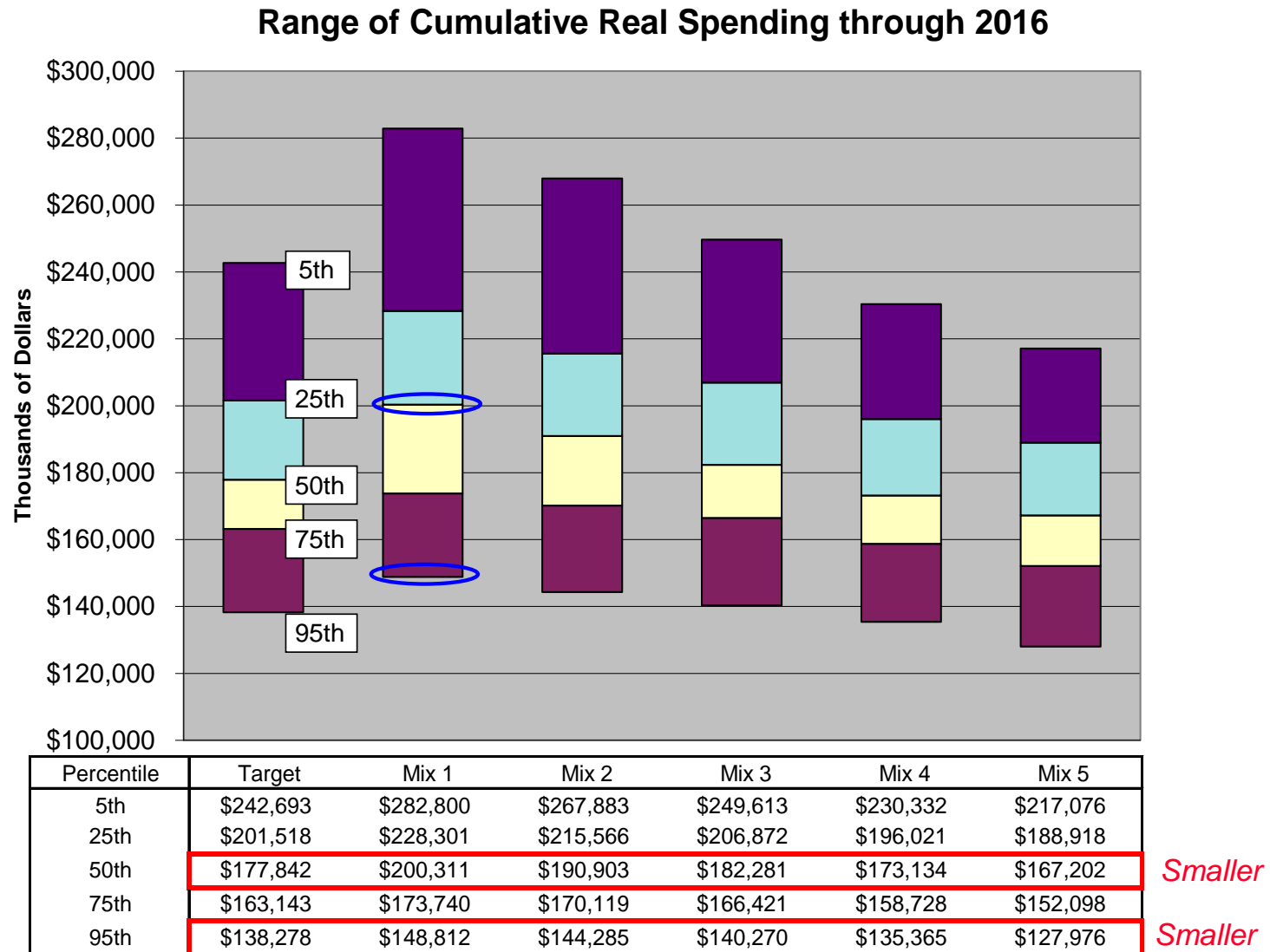


- Real market value of assets is expected (50th percentile) to increase from the current level for each asset mix, and to rise as equity exposure increases – the reward for assuming investment risk. However, in the worse-case scenario, the real market value of assets is lower as equity exposure increases.

Real Market Value of Assets in 2021

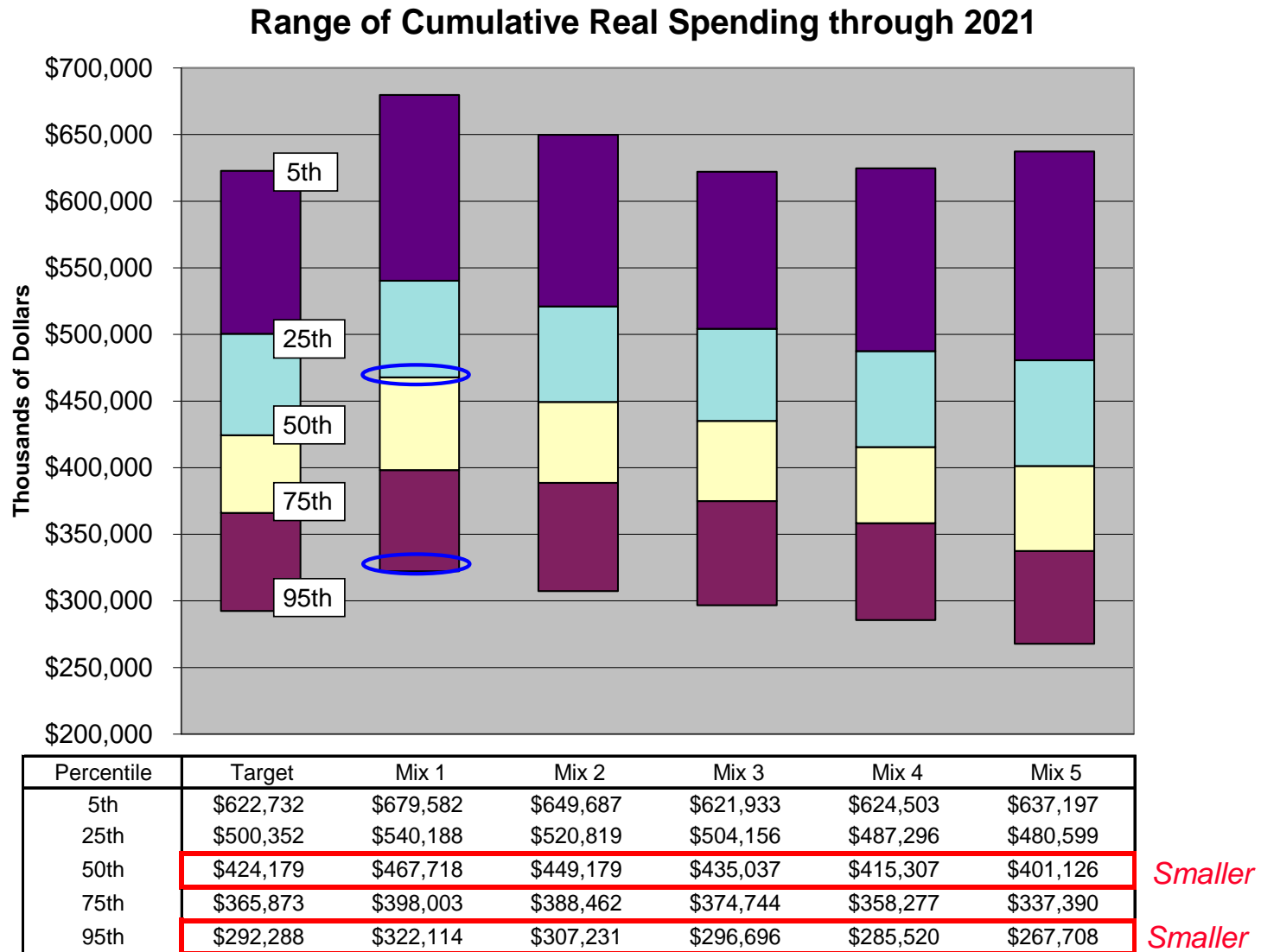


Real Cumulative Spending in 2016



- Real cumulative spending is expected (50th percentile) to decrease as equity exposure increases. Higher fixed income exposure generates greater portfolio yield, and results in greater spending; higher equity exposure reduces yield and results in lower spending.

Real Cumulative Spending in 2021



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