

Pension Asset-Liability Study Results **United Nations Joint Staff Pension Fund**

May 2011

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Introduction

Introduction

Summary of Engagement

In December, 2010, Hewitt EnnisKnupp, an Aon Company, was engaged by the United Nations Joint Staff Pension Fund to conduct a pension asset-liability study.

Hewitt EnnisKnupp's pension risk experts from around the globe have contributed to this project. Our staff is a collection of both actuaries and investment experts, with dozens of professional credentials in aggregate. Our team has global expertise, primarily based in the US and the UK, working together to optimize the result.

The project includes the following scope:

- 1) Review of actuarial valuation and assumptions
- 2) Analysis of Two Track System
- 3) Analysis of hedging alternatives
- 4) Analysis of major risk factors of the plan
- 5) Asset-liability projection analysis
- 6) Review of current and proposed strategic asset allocation

Our study results and findings are included within this material.

Introduction

Objectives of Study

The purpose of a pension asset-liability study is primarily two-fold:

- 1) Understand the nature of the pension plan
- 2) Determine the optimal pension investment strategy

Understanding the Nature of the Pension Plan

In order to optimally manage the pension plan, it is critical to understand the nature of the pension plan. As part of this study, we present the following:

- 1) Analysis of current and projected future states of the plan, including review of the funding requirements, funded status, and the economic cost of the plan
- 2) Major risk factors, including market risk, inflation risk, currency risk, and demographic risks
- 3) UNJSPF key objectives, including fully funding the pension obligation over the long-term
- 4) UNJSPF risk tolerance, including discussion of the need to take risk in order to achieve the ultimate objectives

Determining the Optimal Pension Investment Strategy

In order to optimize the pension investment strategy, we need to accomplish the following:

- 1) Optimization of the asset investment structure relative to the liabilities, creating an asset-liability efficient portfolio
- 2) The expected return on assets should be sufficient to support the desired level of funding, understanding that lower expected returns will likely require higher funding in the long run
- 3) The level of risk should be appropriate given the risk tolerance level of the UNJSPF: high enough to support the desired level of expected return, but controlled in order to avoid intolerable levels of downside risk

Executive Summary

Executive Summary

Desired Outcomes of Pension Asset-Liability Study

The UNJSPF has identified six desired outcomes of the pension asset-liability study:

- 1) Review of actuarial valuation and assumptions
- 2) Analysis of Two Track System
- 3) Analysis of hedging alternatives
- 4) Analysis of major risk factors of the plan
- 5) Asset-liability projection analysis
- 6) Review of current and proposed strategic asset allocation

Current Situation

The plan's current annual funding rate is 23.7% of annual pension remuneration. Based on the December 31, 2009 actuarial valuation results, 24.08% of annual pension remuneration was needed to fully fund the pension plan over the long-term, based on actuary's assumption of a 7.5% expected return on assets, among other assumptions.

The present value of all future benefits payable by the plan is \$114.0 billion. The value of plan assets, plus present value of future expected contributions, is \$112.8 billion. This is based on assumed annual funding rate of 23.7% of pensionable remuneration. This represents expected shortfall of \$1.2 billion on a present value of benefits basis over the long term. The actuary has determined that a 24.08% funding rate is required to keep the pension fund in balance (i.e., present value of assets plus contributions would be equal to \$114.0 billion).

The present value of accrued benefits (past benefits only) is \$41.9 billion, versus an actuarial value of assets of \$38.2 billion. Therefore, on a present value of accrued benefits basis, the plan is 91% funded.

Executive Summary

UNJSPF Objectives

The UNJSPF desires to fully fund the long-term pension obligation over the long-term. The primary objective is to ensure that all long-term pension obligations are covered by pension assets. The pension obligations will ultimately be covered by a mix of funding and investment returns. In this way, the funding and investment strategies are linked. Lower investment returns would lead to higher required funding, and vice versa. The current level of funding (23.7% of pension remuneration) is based on the assumed 7.5% long-term return on pension assets, among other assumptions.

The UNJSPF also desires to take risk needed to achieve investment returns sufficient to support the desired level of annual pension funding. Some degree of investment risk must be taken in order to satisfy the 7.5% expected return on plan assets. However, the UNJSPF must exercise caution to not take more risk than necessary in order to achieve desired investment result.

Finally, the UNJSPF should invest in an asset-liability efficient manner. In a risk/reward context, we have optimized the expected investment return per unit of funded status (i.e., asset-liability) risk via an asset-liability efficient frontier analysis. Portfolios from this asset-liability efficient frontier were then studied further using a stochastic asset-liability projection analysis. In order to optimize the asset-liability efficiency of the pension fund, we have considered the pension liability structure when structuring the alternative pension investment portfolios.

Major Risk Factors to the Plan

The major risk factors to the plan include capital market risk, return-shortfall risk, inflation risk, currency risk, and demographic risks.

The capital market risk is the risk to the plan caused by capital market fluctuations. As capital markets fluctuate, the pension assets and liabilities may fluctuate as well, creating funded status volatility. Capital market risk primarily consists of equity and fixed income market risk. Equity market risk is significant, but carries a higher expected return on assets than most other asset classes (high risk / high reward). Fixed income market risk is typically less substantial than equity market risk, and is primarily exposed to interest rate fluctuations (moderate risk / moderate reward).

Return shortfall risk is the risk of falling short of the 7.5% actuarial interest rate assumption. The actuarial valuation assumption is based on a 7.5% expected return on assets. Long-term investment returns less than the assumed 7.5% will result in increased annual funding requirements as a percent of pensionable remuneration over the long run.

Inflation risk is the risk to the plan caused by potentially higher inflation rates. Pension benefits will increase with inflation. High inflation will increase the pension obligation, and ultimately the funding requirements. The Two Track System creates inflation exposure to multiple currencies.

Currency risk is the risk to the plan of currency fluctuations. The plan's pension benefits are payable in multiple currencies. While the benefits are primarily US dollar-denominated, the plan is exposed to other currencies as well. Other currency exposures primarily include the Euro and Swiss Franc.

Executive Summary

Demographic risks include longevity risk, retirement rate risk, and other risks. These involve demographic experience which may be different than the actuarial assumptions. For example, plan participants who live longer than expected will collect benefit payments longer than expected, resulting in a greater obligation than is currently expected. Rates of retirement which are different than expected might also result in a higher pension obligation that is higher than currently expected.

All of the above risks could eventually lead to higher funding requirements than are currently expected. As such, it is important to be aware of these risks, and to continually measure and monitor these risk exposures on an ongoing basis in order to optimally manage these risks.

Asset-Liability Projection Results

As part of the pension asset-liability study, we reviewed the projected results for the funded status and economic cost.

The plan's funded ratio is expected to increase from today's 91% funding level. As the projections show, under today's investment strategy, the funded ratio is expected to trend towards 100%, but is not expected to hit 100% funded in the next 30 years. Under the recommended investment strategy, the funded ratio is expected to become fully funded (i.e., 100% or more) over the next 30 years, with less risk of fund exhaustion.

Economic Cost is defined as the present value of contributions over the next 30-years, plus the present value of the ending funding shortfall. For purposes of this calculation, we have used a 7.5% interest rate, consistent with the actuary's interest rate assumption. The current investment strategy has expected economic cost of \$27.2 billion over the next 30 years. Hewitt EnnisKnupp's recommended investment strategy has an expected economic cost of \$21.9 billion over the next 30 years, with lower economic risk than the current investment strategy.

The projections are based on the December 31, 2009 actuarial valuation results as a starting point, and our forward looking capital market assumptions. In 2010, no cost of living adjustment was granted within the plan. As such, actual funded ratios post-2010 are expected to be higher than our projections show. Our capital market assumptions are our best estimates and are based on our forward looking market views.

Executive Summary

Investment Strategy Optimization

The current investment strategy consists of 60% global equity, 31% global fixed income, 6% real estate, and 3% cash. The Hewitt EnnisKnupp recommended strategic asset allocation is 60% global equity, 25% global fixed income, and 15% indirect real assets.

The recommended changes to the portfolio strategy are small, and follow similar themes as were presented within the first asset-liability study. The UNJSPF investment strategy already includes many of the suggestions put forth in our recommendation.

The recommended global equity allocation includes allocations to emerging markets equity and private equity. These allocations would increase expected investment returns and improve the diversification of the fund. Note that, due to the nature of private equity, the desired allocation may take a period of several years to fully attain.

The recommended fixed income allocation includes a significant allocation to inflation-linked bonds. The recommended fixed income allocation increases the inflation hedge, and better matches the liability structure.

The recommended indirect real asset allocation includes a 10% allocation to global real estate and a 5% allocation to commodities. These asset classes will increase the inflation hedge, and better match the liability structure.

Advantages of the recommended investment strategy relative to current investment strategy include:

- Higher expected return per unit of asset risk
- Higher expected return per unit of asset-liability risk
- Lower expected economic cost
- Higher expected ending funded status
- Improved asset-liability risk hedging

While the above recommended asset allocation may be considered as an update to the current investment strategy, there are several alternative portfolio constructs which may also appeal to the UNJSPF. Potential alternative portfolio strategy approaches are summarized below.

Improved Efficiency

The portfolio efficiency may be increased in risk/reward terms by relaxing the portfolio constraints. Relaxing the portfolio constraints would increase the allocations to emerging markets equity and private equity. The portfolio would become less liquid, and would require greater ongoing oversight. The return enhancement would reduce economic plan cost, while the portfolio diversification would reduce risk.

Higher Expected Return on Assets

The expected return on assets would be increased if the UNJSPF were to increase the allocation to return-seeking assets (e.g., 70% or 75% equity portfolios). This would generally increase the expected portfolio return and risk, and result in lower expected economic cost. In this event, the UNJSPF could potentially justify a higher actuarial valuation interest rate, and a lower annual funding rate. However, there would generally be greater risk of significant funding shortfalls, and higher likelihood of long-term fund exhaustion.

Executive Summary

Lower Expected Risk

The UNJSPF could reduce the expected risk by reducing the allocation to return-seeking assets (e.g., 45% or 50% equity portfolios). This would generally reduce the expected portfolio return and risk, and result in higher expected economic cost. However, per the analysis, note that the relaxed 45% and 50% equity portfolios compare favorably in a risk/reward context relative to the current 60% equity portfolio.

Application to the UNJSPF

The application of the study findings will depend on the UNJSPF's objectives, and the UNJSPF's willingness to relax the constraints on the portfolio construction.

If expected cost reduction or enhanced funded status is desired, higher equity portfolios may be used. If risk reduction is desired, and cost increase is acceptable, a lower equity allocation may be desired. If a lower degree of portfolio liquidity is acceptable, and the UNJSPF can become comfortable with the oversight required, relaxing the constraints of the portfolio construct may enhance the risk/reward characteristics of the fund. This may include expanded exposure to emerging markets equity and/or private equity.

Executive Summary

Hewitt EnnisKnupp Observations and Recommendations

Hewitt EnnisKnupp believes there are four key levers in the financial management of pension funds: investment policy, funding strategy, plan design, and actuarial assumptions and methods. As these levers are invariably related, it is critical to manage the pension fund with proper consideration to each of the four levers, understanding how each lever will implicate the others.

Investment Policy

Due to the inflation-sensitive nature of the pension obligation, Hewitt EnnisKnupp recommends an increase in real asset exposure in order to better hedge the pension liability's inflation risk exposure. This includes exposure to both direct and indirect inflation hedges. The UNJSPF should also consider the overall currency exposure for liabilities and assets (e.g., US dollar, Euro, Swiss Franc), and consider aligning the asset and liability currency exposures as appropriate. Given the importance of the level of long-term return on assets, the UNJSPF should continue to focus on portfolio strategies which seek return in order to control long-term plan costs.

Given the above, in addition to the UNJSPF's objectives, Hewitt EnnisKnupp recommends adoption of a 60% global equity, 25% global fixed income, 15% indirect real asset mix. To the extent the UNJSPF might be willing to relax the portfolio constraints in order to enhance the risk/reward characteristics of the fund, increased allocations to asset classes such as emerging markets and/or private equity could further enhance the portfolio construct in risk/reward terms.

Funding Strategy

The annual pension funding consists of 23.7% of annual remuneration, with little flexibility. Employees fund a portion of this rate each year. Per the December 31, 2009 actuarial valuation report, the actuary reports a 24.08% funding rate is necessary to completely fund long-term obligation. The current contribution rate represents an annual funding shortfall of 0.38% of annual remuneration.

Changes to the investment policy may implicate the annual funding strategy. As such, it is critical that the UNJSPF consider both the investment and funding strategies, and the relationship between the two.

Plan Design

The pension plan design will define the ultimate cost of the program. The pension benefit is predominantly a final-average pay related benefit. Benefits are potentially payable in multiple currencies under the Two Track System. The Two Track System allows for the selection of the payable currency, which introduces optionality which adds cost to the plan, and introduces currency risk to the program.

Assumptions and Methods

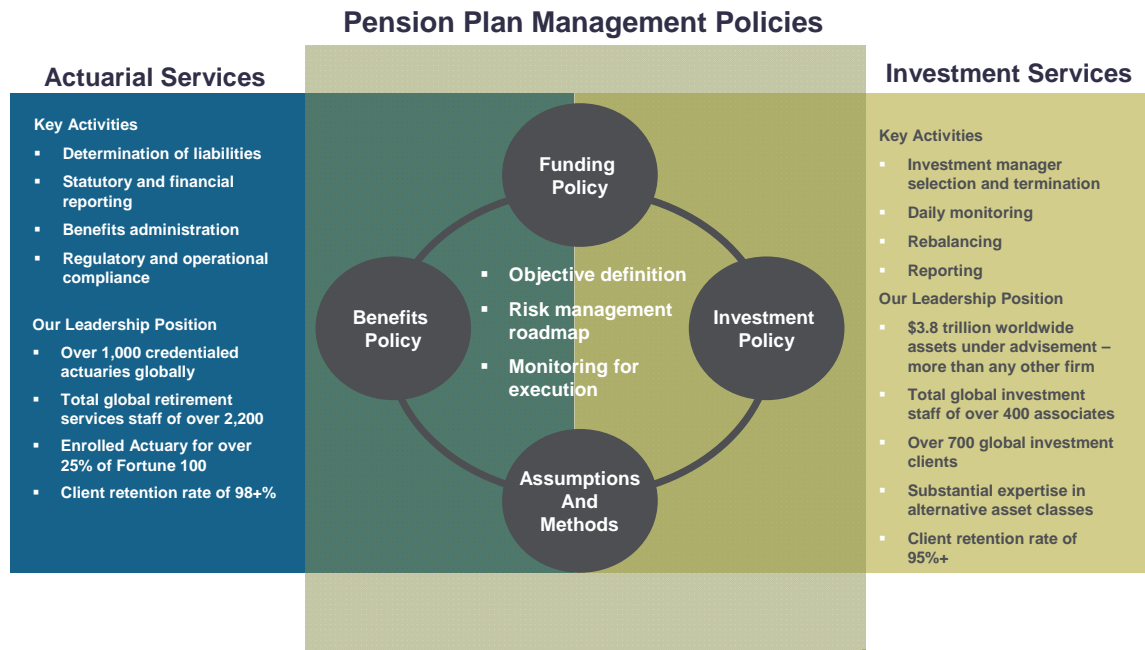
The actuarial assumptions and methods employed will affect the results of the actuary's valuation. Based on our analysis of the actuarial valuation as of December 31, 2009, the actuarial assumptions used appear to be reasonable in aggregate. Our review of the actuarial valuation yielded a close match of the actuary's results.

Asset-Liability Study Process and Model

Asset-Liability Study Process and Model

About Aon Hewitt and Hewitt EnnisKnupp

Aon Hewitt and Hewitt EnnisKnupp, an Aon Company, are market leaders in pension plan risk management. Our pension risk management team consists of our most forward thinking actuarial services, coupled with our leading edge investment services.



Pension plan management strategies consist of four key levers:

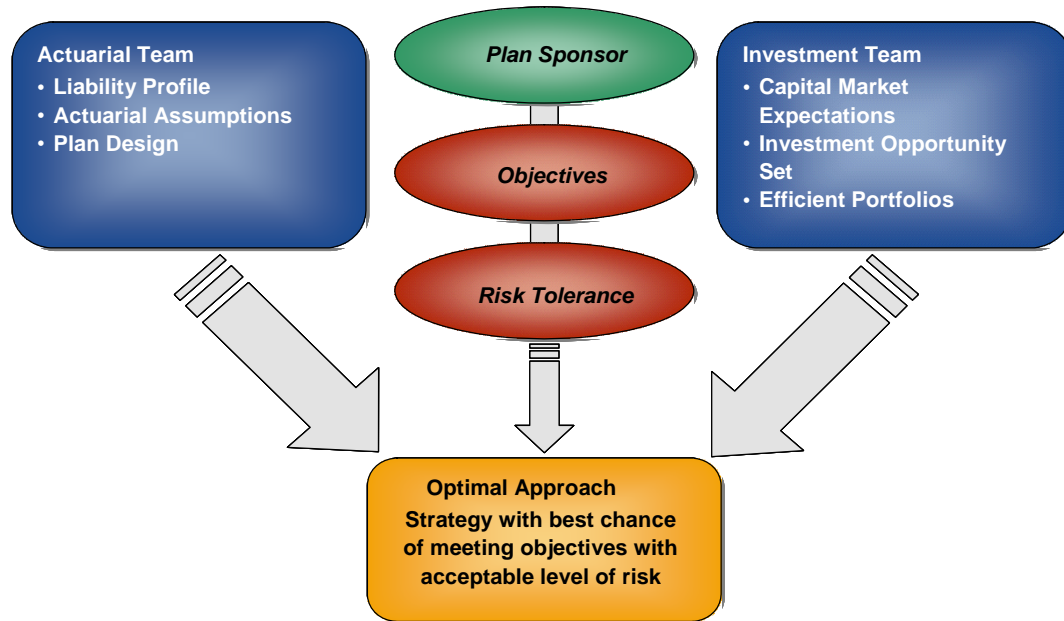
- 1) Investment policy
- 2) Funding policy
- 3) Benefits policy
- 4) Assumptions and methods

Successful strategies will link each of these areas thoughtfully. In order to develop the optimal management strategy, the UNJSPF must define the objectives, develop a risk management strategy roadmap, and then execute the optimized strategy on an ongoing basis. A coordinated view of plan assets and liabilities is critical in this regard. After the optimal strategy is adopted, successful oversight practices will require ongoing monitoring of assets and liabilities to facilitate sound decision making.

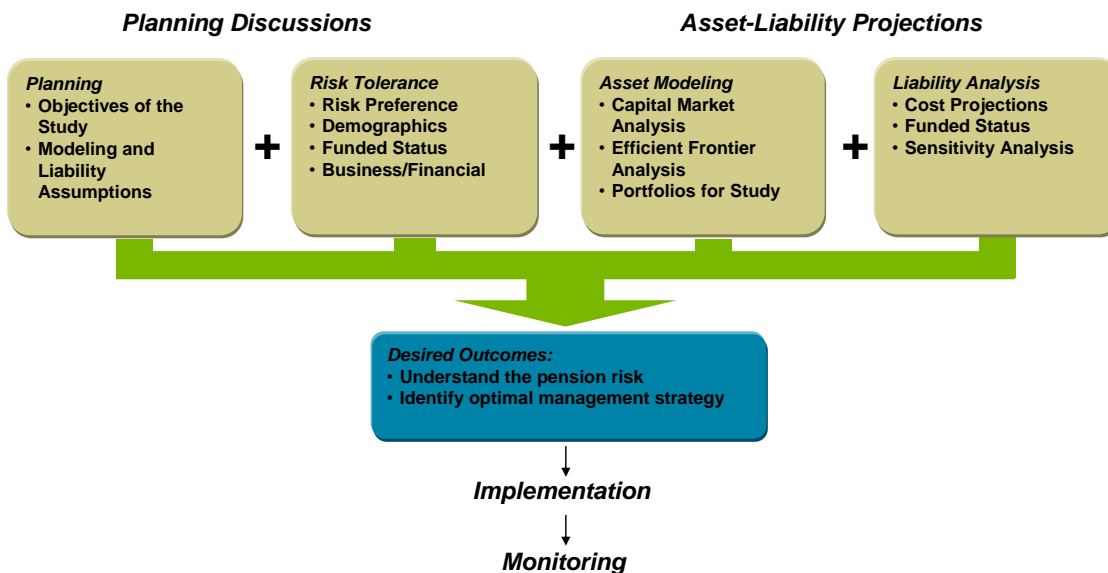
Asset-Liability Study Process and Model

Hewitt EnnisKnupp's Asset-Liability Study Approach: A Collaborative Effort

Hewitt EnnisKnupp's approach to asset-liability studies is a collaborative effort among actuarial experts, investment experts, and coordination with the plan sponsor. Each of these inputs is critical to the success of the study.

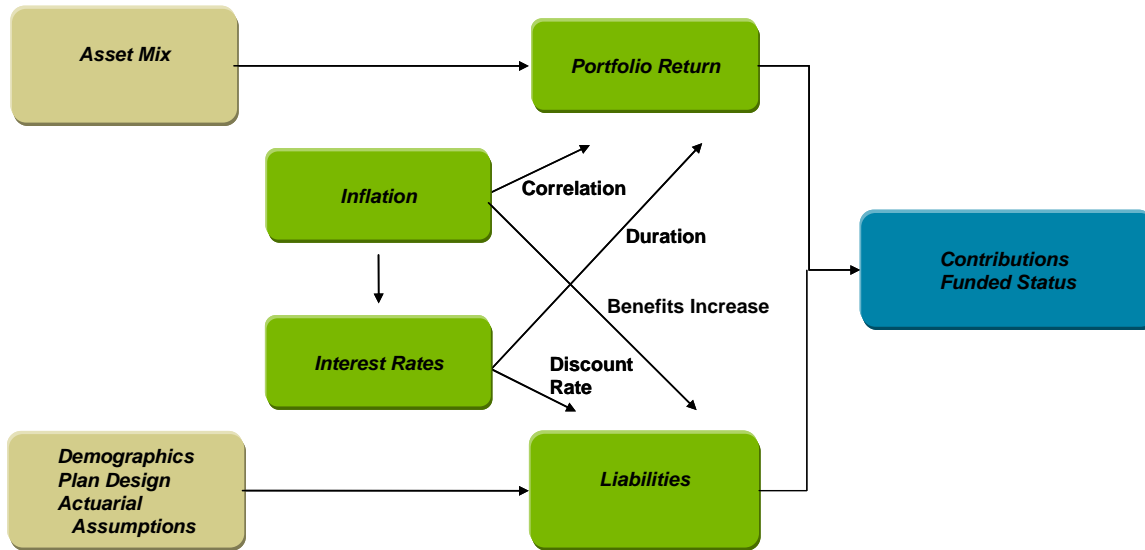


The asset-liability process is summarized in the pictorial below. The desired outcomes of the study are two-fold: (1) understand the nature of the pension plan, and (2) identify the optimal pension management strategy.



Asset-Liability Study Process and Model

The graphic below details the asset-liability modeling mechanics. Specifically, it shows how pension assets and liabilities are impacted by common factors such as inflation and interest rates. It also depicts the flow chart for asset-liability modeling used for the projections that follow.



Our capital market simulations are created using a building blocks approach. The building blocks start with inflation, then build simulations of interest rates and equity market returns. These simulations affect our projections of both the assets and liabilities. Once we have developed our projected assets and liabilities, we then develop the projections of contributions, funded status, and economic cost (defined as the present value of contributions plus the shortfall at the end of the projection period).

Pension Asset-Liability Interaction

In order to minimize the financial risk to the organization, the pension plan's assets and liabilities should be managed in tandem. In order to manage the assets and liabilities in tandem, we must understand the nature of the pension liabilities, and then structure the assets accordingly.

The pension liabilities are the present value of future benefit payments over plan participants' lives. These pension liabilities grow each year with interest cost, i.e., time value of money, and service cost, i.e., continued benefit accruals. The Two Track System introduces currency and inflation sensitivity to the pension liability.

The pension assets consist of equities, fixed income, real estate, and cash. The portfolio is global in nature.

Asset-Liability Study Process and Model

Equities comprise the primary growth asset, with high expected reward and high risk. This includes US equities, developed international equities, emerging markets, and private equity. In the case of the UNJSPF, fixed income is primarily used for portfolio stability. Fixed income includes global fixed income and inflation-linked bonds. Global real assets are primarily used as portfolio diversifier and inflation hedge. Real assets have compelling hedging properties relative to the UNJSPF liability. This class consists of global real estate and commodities, among other classes (e.g., infrastructure, timber, and certain hedge funds).

The primary goal of an asset-liability study is to determine the optimal mix of assets. This mix will be primarily focused on the macro allocations among global equities, fixed income, and real assets. This optimal mix may be static or dynamic, based on the plan's funded status and return needs. In the case of the UNJSPF, a heavier allocation to real assets would improve the asset-liability alignment, and reduce the financial risk to the organization.

Actuarial Valuation Match and Review

Actuarial Valuation Match and Review

Per the December 31, 2009 actuarial valuation report, the financial position at 31 December 2009 was as follows (\$ in millions):

Assets	
Actuarial asset value ¹	\$38,154.0
Present value of future contributions on behalf of:	
Present participants	18,764.6 ²
Future participants	<u>55,869.4²</u>
Total Assets (including future contributions)	\$112,788.0
Liabilities³	
Present value of benefits payable to or on behalf of retired participants and beneficiaries	\$24,395.6
Present value of benefits expected to be paid on behalf of:	
Present participants	39,936.9
Future participants	<u>49,677.8</u>
Total liabilities	\$114,010.3
Surplus/(Deficit)	
Present participants	(\$7,413.9)
All participants, including future participants	(\$1,222.3)
Nominal rate of interest (investment return)	7.5%

¹ 5-Year moving average method. Market value of assets is \$37,659.6 million.

² Based on a net rate of 23.31 per cent (excludes expenses of 0.39 per cent) of pensionable remuneration. The present value of 1% of future pensionable remuneration is equivalent to \$3,201.8 million.

³ Includes loadings for two-track pension adjustment system.

Source: 31 December 2009 Actuarial Valuation Report

The plan was underfunded on a present value of benefits (PVB) basis. This is true when considering present participants only, or all participants including future participants. Per the actuary's analysis, the current annual funding rate 23.7% of pensionable remuneration is not expected to meet the long-term pension obligations of the fund. As a result, assuming the plan design and actuarial methods remain constant, one of the following must be changed in order to fully fund the expected obligations of the plan:

- 1) Higher actual future investment returns than the 7.5% assumed by the actuary
- 2) Higher annual funding rate than the current 23.7% of pensionable remuneration (plan actuary had determined that 24.08% of pensionable remuneration was needed to bring the fund back into balance on an expected basis)

Actuarial Valuation Match and Review

Market value of assets and its component elements as of 31 December 2009

Component Elements	Market Value
Temporary Investments	\$114
Bonds	11,187
Real Estate	1,351
Stocks and Convertible Bonds	24,055
Net excess of cash and incurred asset items over incurred liability items	<u>953</u>
Total	37,660

Source: 31 December 2009 Actuarial Valuation Report

Market value of assets and its component elements as of 31 December 2010:

Component Elements	Market Value
Temporary Investments	\$994
Bonds	11,763
Real Estate	1,615
Stocks and Convertible Bonds	26,957
Commodities and Other	<u>80</u>
Total	41,409

Source: 31 December 2010 asset statement

The market value of plan assets was \$37.66 billion as of December 31, 2009. This was the asset value used in the last actuarial valuation report. Assets grew to \$41.409 billion by December 31, 2010 as a result of funding and investment performance. This amount was reflected in the study for projection purposes.

Actuarial Valuation Match and Review

Actuarial value of accrued benefits as of 31 December 2009 (millions):

Rate of:		If Future Pension Payments are Made:			
		Under Regulations Without Pension Adjustments ^a		Under Regulations With Pension Adjustments ^b	
Interest	Pension Adjustment	Actuarial Value	Funded Ratio	Actuarial Value	Funded Ratio
(per cent)	(per cent)		(per cent)		(per cent)
5.0	3.0	\$34,037.1	112.1	\$47,438.2	80.6
7.0	4.0	\$28,348.8	134.6	\$44,518.3	85.7
7.5	4.0	\$27,323.3	139.6	\$41,949.7	91.0
8.0	4.0	\$26,404.3	144.5	\$39,687.9	96.1

^a This is the minimum benefit liability that must be funded by the member organizations under Article 26 of the Fund's Regulations.

^b This is the liability based on the assumption that cost-of-living adjustments would continue in accordance with the current pension adjustment system. Results include loadings for two-track adjustment system.

Source: 31 December 2009 Actuarial Valuation Report

Accrued benefits include only benefits for current participants which have been earned to date. Under the "regular valuation," assuming 7.5% interest and 4% pension adjustments, as of December 31, 2009, the plan was 91% funded based on actuarial (smoothed) assets relative to the actuarial value of accrued benefits.

The above table also demonstrates that the actuarial valuation results are sensitive to the assumptions used. For example, a lower interest rate (i.e., lower expected investment returns) will create a lower funded ratio. Pension adjustments increase the obligation and reduce the funded ratio.

Actuarial Valuation Match and Review

Contribution rates required to attain actuarial balance of fund

Valuation Date	Valuation Basis	Contribution Rate Required (As Per Cent of Pensionable Remuneration)		
		Total Required	Fund's Rate	Excess Over Fund's Rate = Imbalance
31 December 2009 ^a	4.5/7.5/4, with Ten-Year 0.5 Per Cent Participant Growth Assumptions	24.08	23.70	0.38
31 December 2007 ^b	4.5/7.5/4, with Ten-Year 0.5 Per Cent Participant Growth Assumptions	23.21	23.70	(0.49)

^a Provision for administrative expenses is assumed to be 0.39 percent of pensionable remuneration.

^b Provision for administrative expenses is assumed to be 0.37 percent of pensionable remuneration.

Source: 31 December 2009 Actuarial Valuation Report

The plan was in an actuarial surplus position during 2007, but moved to an actuarial deficit in 2009. This was largely a result of market returns during 2008 and 2009, which eroded the market value of plan assets.

Contribution Rate Sensitivity Analysis

Valuation Basis	Contribution Rate Required (As Per Cent of Pensionable Remuneration) ^a	
	Total Required	Excess over 23.7 ^b Rate = Imbalance
Ten-Year 0.5 Per Cent Participant Growth Assumption		
- 4.5/7.5/4	24.08	0.38
- 4.5/7.0/4	26.70	3.00
- 4.5/8.0/4	21.56	(2.14)
- 3.5/5.0/3	34.15	10.45
Zero Participant Growth Assumption		
- 4.5/7.5/4	24.21	0.51
Ten-Year 1.0 Per Cent Participant Growth Assumption		
- 4.5/7.5/4	23.96	0.26
Ten-Year Zero Plus (0.5) Per Cent Participant Growth Assumption		
- 4.5/7.5/4	24.43	0.73

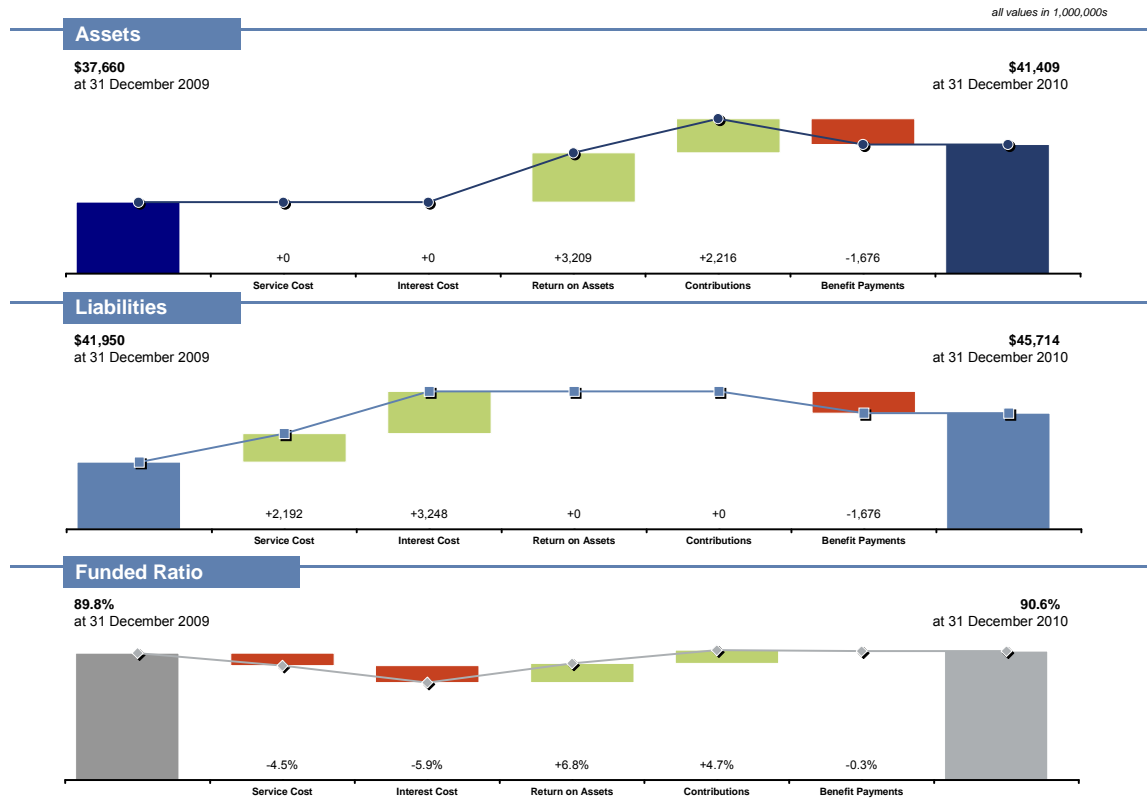
^a Provision for future administrative expenses is assumed at the rate of 0.39 per cent of pensionable remuneration.

^b Rate of contribution in effect on the valuation date.

Source: 31 December 2009 Actuarial Valuation Report

Actuarial Valuation Match and Review

UNJSPF Asset-Liability Growth Attribution¹



¹ Unofficial estimate

Both the assets and the liabilities grew over the past year. The assets grew over the year due to positive investment returns and contributions to the fund. The liabilities grew over the past year due to both new benefit accruals and interest cost during the year (i.e., time value of money).

Based on the above unofficial estimate of asset-liability growth in 2010, the funded ratio is approximately 91%.

Actuarial Valuation Match and Review

As part of this project, we were able to reasonably closely reproduce the actuarial valuation results as of December 31, 2009. We generally find an actuarial valuation match within 5% to be reasonable. We have summarized the results of our actuarial valuation results matching exercise below:

(\$, Millions)	Valuation Report¹	Matching Exercise	Difference
Present Value of Accrued Benefits	\$41,949.7	\$41,856.1	-0.2%
Present Value of Benefits ²	\$64,332.5	\$64,950.0	+1.0%
Funding Requirement (% of remuneration) ³	24.1%	24.3%	+0.8%

¹ Source: 31 December 2009 Actuarial Valuation Report.

² Current active and inactive participants.

³ Includes assumed 0.39% provision for administrative expenses.

After the actuarial valuation matching exercise, the starting liability values for this projection analysis were synchronized to match actuary's valuation results as of December 31, 2009.

Actuarial Valuation Match and Review

Reasonableness of Actuarial Valuation Assumptions

The actuarial assumptions and methods employed substantially affect the results of the actuary's valuation. We generally find the actuarial assumptions to be reasonable in aggregate, with a few notes.

Demographic Assumptions

The plan actuary must make a series of actuarial assumptions regarding future demographics, including retirement rates, termination rates, mortality rates, disability rates, and new entrants to the population.

We have the following notes related to the actuarial assumptions:

- Retirement rates appear to be reasonable, but may evolve as workforce dynamics and demographics shift over time
- Termination rates are select and ultimate rates, and appear to be reasonable
- Mortality rates appear to be reasonable, reflect generational mortality rates for the next twenty years
- Disability rates appear to be reasonable
- New entrant population appears to be reasonable, subject to the UN's insights regarding expected future staffing

Economic assumptions

The plan actuary must make a series of actuarial assumptions regarding future economics, including inflation rates and salary increases. In addition, the interest rate used in the actuary's present value calculations is based on the expected long-term return on plan assets.

We have the following notes related to the actuarial assumptions:

- Inflation: 4% appears to be higher than Hewitt EnnisKnupp's long-term inflation expectations
- Salary scale: 4.5% appears to be reasonable

Expected Return on Assets

Based on the capital market assumptions used for this study, a 7.5% expected return on assets appears reasonable. Using the Hewitt EnnisKnupp capital market assumptions, we determine the following:

	Expected Nominal Return	Standard Deviation	Global Equity	Emerging Markets Equity	Private Equity	Hedge Funds	Real Estate	Commodities	Inflation Linked Bonds	Global Bonds ³
Current Portfolio (60% Equity) ¹	7.7%	11.9%	52%	8%	0%	0%	6%	0%	0%	34%
Actual 31 December 2010 (65% Equity)	7.8%	12.7%	56%	9%	0%	0%	4%	0%	2%	29%
Return-Oriented (63% Equity) ²	7.9%	11.9%	53%	7%	3%	0%	5%	0%	3%	29%
2007 Recommended	7.9%	11.9%	47%	8%	4%	4%	10%	0%	0%	27%

¹Target portfolio. Assumed All Country World Index (ACWI) market weights

²From 2007 AL Study

³Includes cash

Actuarial Valuation Match and Review

Two Track System Assumptions

Since the Two Track System is selected by members, cost as a whole is generally expected to be higher than the dollar only system, due to the value of the optionality of the benefit.

The Two Track System participants receive the greater of the dollar track or local track payment – this option is a valuable benefit. Members will elect the two-track when a known or perceived increase in benefits exists; otherwise they stay in dollar track. If the quarterly exchange rate produces a higher benefit than the 36-month exchange rate, electing Two Track would instantly provide a higher benefit. This is evidenced by recent increase in utilization as the result of the weakening dollar against major currencies.

The actuary's Two Track System assumption load is 1.9% of future pensionable remuneration. Our option pricing model results in a similar, but somewhat higher estimate of future cost. Based on our review, we find a load of 2.7% of future pensionable remuneration due to the Two Track System.

Our determination for the value of this benefit is based on our option pricing model. Our model reflects higher expected market volatility going forward than has been experienced historically. This view results in an increased value of the Two Track System's optionality relative to history.

Asset-Liability Matching Analysis

Asset-Liability Matching Analysis

Liability Interest Rate and Inflation Risk Exposures¹

Liability Risk Snapshot		
Metric (\$ Millions)	Years	Dollars
Interest Rate Duration ²	12.0	\$5,517
Inflation Rate Duration ³	15.0	\$6,897

¹ Estimated.

² Interest rate duration is an estimate of the percentage change in liability given a 1% change in interest rate.

³ Inflation rate duration is an estimate of the percentage change in liability given a 1% change in inflation rate.

The pension liability is based on the assumed interest rate for actuarial valuation purposes. To the extent the interest rate is changed, the value of the pension liability would also change. A decrease in the assumed 7.5% valuation interest rate would increase the actuarial valuation of the liability. A 1% change in the interest rate used for the actuarial valuation would result in an approximately 12% change in the actuarial valuation of the liability. For example, a 6.5% valuation interest rate would result in an approximately 12% increase in the actuarial liability. A return shortfall relative to the 7.5% expected rate of return on assets assumption would ultimately result in an increase in the funding requirements of the plan over the long run.

The pension liability is based on the assumed inflation rate for actuarial valuation purposes. An increase in the assumed 4% inflation rate would increase the actuarial valuation of the liability. A 1% change in the inflation rate used for the actuarial valuation would result in an approximately 15% change in the actuarial valuation of the liability. For example, a 5% assumed inflation rate would result in an approximately 15% increase in the actuarial liability. Actual inflation of above 4% would ultimately result in an increase in the funding requirements of the plan. While the overall inflation risk exposure is global, most of the inflation exposure is US-based given the nature of the benefits payable by the plan.

Two Track System Empirical Utilization Rate, 31 December 2009: 34.5%

Two Track System Benefit Payment Distribution		
Currency (\$, Millions)	Current TTS Exposure	Overall Fund Exposure ²
Euro	57%	28%
Swiss Franc	28%	13%
Other (GBP, JPY, etc.)	15%	7%

¹ Estimated.

² Estimated based on current Two Track System utilization and current proportion of retiree benefit payments.

Asset-Liability Matching Analysis

Since the majority of retired plan participants have not elected the Two Track System, the majority of currency exposure for the plan today is in US dollars. Of the foreign currency exposures, the Two Track System is currently most exposed to Euro and Swiss Franc exchange rates. The current Two Track System population is distributed approximately as shown above.

Instantaneous appreciation of foreign currencies relative to the US dollar would increase the accrued pension liability, reduce the plan's funded status, and increase the required funding to the plan. For non-US dollar denominated liabilities, the retired pension liability is most exposed to the Euro and Swiss Franc. Hedging the currency risk with options may remove some of this risk, but would come with some cost. Euro exposure can be more easily achieved with physical market exposures than Swiss Franc exposure. Euro currency exposure is likely already partially hedged via Euro-denominated current investment holdings. We have analyzed the effect of Swiss Franc currency options, with results shown later in this section.

Currency Risk

The Two Track System introduces currency risk to the pension liability. The highest currency exposures of current Two Track System participants are the Euro and Swiss Franc. Most of the current Two Track System benefit payments are potentially payable in Euros (57%) or Swiss Francs (28%).

Hedging alternatives include physical investments, denominated in Euros or Swiss Francs, for example, and derivative investments such as currency options. Physical investments would be most appropriate for the Euro exposure, as there is no shortage of Euro denominated assets. It is more challenging to engage Swiss Franc exposure, as the market availability of Swiss Franc denominated assets is less than the Euro. Derivative investments include currency call options. Based on our analysis, at the money currency call options may be expensive, and would have a measurable explicit cost to the plan. Out of the money currency call options may be used to inexpensively hedge the extreme tail risks, but would be a less precise currency hedge.

Euro payments currently represent the largest portion of non-US dollar denominated benefit payments. Physical investments in equities and fixed income can readily be used to hedge the existing Euro currency exposure. Swiss Franc payments represent the next largest current currency exposure. While this exposure is more difficult to obtain in the physical market, the relatively smaller scale of Swiss Franc currency exposure lessens the need to hedge this exposure with derivatives. This is particularly true if some physical exposures to the Swiss Franc exist.

Asset-Liability Matching Analysis

Currency Option Analysis – At-the-money Call Options

The UNJSPF has a measurable currency risk exposure to the Swiss Franc. One year, at-the-money Swiss Franc currency calls cost approximately 5%. This type of hedging vehicle would closely match the characteristics of the Swiss Franc exposure under the Two Track System. Based on the option pricing cited, the inherent option in the Two Track System would be costly to hedge using currency options. Hedging the Swiss Franc currency exposure would have an explicit annual cost for option premiums.

Scenario analysis:

Swiss Franc vs USD

Exchange Rate Performance	<u>-20%</u>	<u>-10%</u>	<u>0%</u>	<u>10%</u>	<u>20%</u>
Option Cost	5%	5%	5%	5%	5%
Option Payoff	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>10%</u>	<u>20%</u>
Net Payoff	-5%	-5%	-5%	5%	15%

Using a probability density function of 5%, 20%, 50%, 20%, and 5% to approximate a Normal distribution, the expected payoff to the above is -2%. Based on this analysis, expected return on assets would decline by approximately 0.2% if Swiss Franc call options were used. Swiss Franc currency risk exposure (11% volatility) would be removed. Funded ratio volatility reduced by less than 1% as a result. More effective risk/reward tradeoffs could be achieved by reducing public equity exposure and moving towards asset classes such as inflation-linked bonds, real estate, or private equity.

At-the-money call options represent an expensive currency hedge. While this option strategy represents an effective currency hedge, we believe this is not a cost effective ongoing hedging strategy. As a result, we analyzed an alternative call option strategy, an out-of-the-money currency call option, which follows.

Asset-Liability Matching Analysis

Currency Option Analysis – Out-of-the-money Call Options

One year, 20% out-of-the-money Swiss Franc currency calls cost approximately 0.4%. This type of hedging vehicle would partially match the characteristics of the Swiss Franc exposure under the Two Track System. Based on the option pricing cited, the inherent option in Two Track System would be less costly to hedge using out-of-the-money currency options rather than at-the-money options, but the risk would remain less than fully hedged. This strategy might be considered as a less expensive tail risk-only hedge.

Partially hedging the Swiss Franc currency exposure would be a less costly hedging solution. The effect on the expected return on assets would be negligible.

Scenario analysis:

Swiss Franc vs USD

Exchange Rate Performance	<u>-40%</u>	<u>-30%</u>	<u>-20%</u>	<u>-10%</u>	<u>0%</u>	<u>10%</u>	<u>20%</u>	<u>30%</u>	<u>40%</u>
Option Cost	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Option Payoff	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>10.0%</u>	<u>20.0%</u>
Net Payoff	-0.4%	-0.4%	-0.4%	-0.4%	-0.4%	-0.4%	-0.4%	9.6%	19.6%

This out of the money call option strategy would be profitable in only extreme cases, approximately 2.5% of scenarios per the above analysis. This is a two standard deviation event. In extreme events, the value of this type of option could offset the increase in the pension liability due to currency exchange rate changes.

This should be considered a tail risk hedging vehicle, with high probability of loss, and low probability of payoff in extreme events. In extreme events, this form of insurance would be beneficial to the fund. If the UNJSPF is concerned about cost effective tail risk hedging, these out of the money currency call options may be utilized to cost effectively hedge the tail risk exposure. Note that, given the relatively smaller scale of Swiss Franc currency exposure, the need to hedge this exposure with derivatives is small, particularly if some physical exposures to the Swiss Franc already exist.

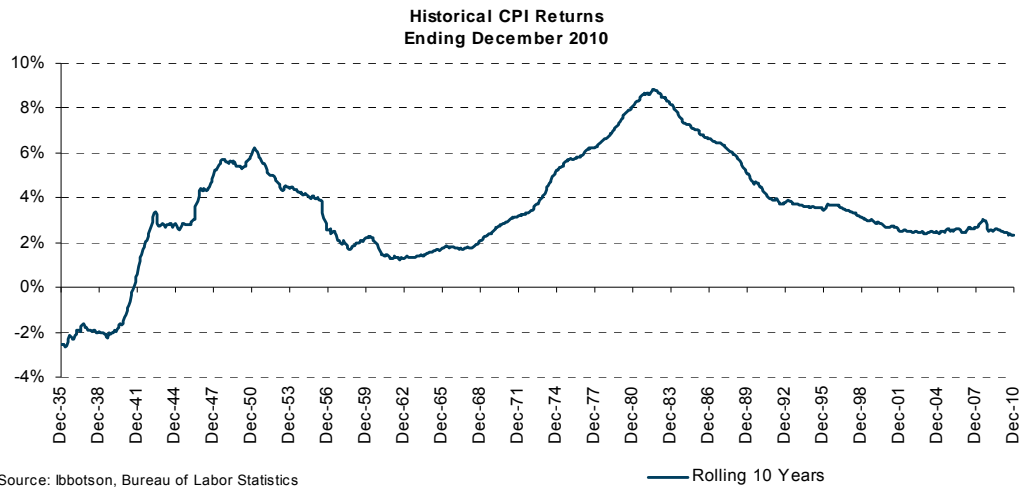
Asset-Liability Matching Analysis

Inflation Risk Exposure – Historical Inflation Rates (US CPI)

US CPI inflation has been volatile over time. The table below summarizes the distribution of rolling 10-year inflation. The median 10-year inflation rate since 1926 has been 3.1%. Note that rolling 10-year inflation has exceeded 4% in 36% of the cases studied.

US CPI from 1926 to 2010

Percentile	Rolling 10-Years
5 th	7.9%
25 th	5.2%
50 th	3.1%
75 th	2.3%
95 th	-1.9%
Frequency > 4%	36%



Source: Ibbotson, Bureau of Labor Statistics

Asset-Liability Matching Analysis

Global Inflation Expectations

Long-term inflation expectations are currently low across the primary currency exposures of the UNJSPF, with the lowest expected inflation in Switzerland, and the highest in the UK. Note that, even in the UK, expected long-term inflation is below 4%.

We have used Consensus Economics and existing pricing conditions in the inflation-linked bond market to develop our views. In the table below, we have summarized data from Consensus Economics and the inflation-linked bond market.

Consensus Economics is a recognized survey of 240 prominent financial and economic forecasters. The forward looking inflation estimates and spot inflation estimates represent the consensus view among these 240 financial and economic forecasters. Note that, among the 240 forecasters, some have inflation views which are higher than the averages shown below, while others have lower expectations. The estimates shown below represent the conglomeration of views among all 240 forecasters.

The break-even inflation rates represent the market-pricing for forward inflation. In theory, the expected realized yield for an inflation-linked bond should be on par with the expected realized yield for a Treasury bond with a similar term. The difference in market yield is a representation of the market pricing for forward looking inflation.

	Forward Inflation Estimates			Spot Inflation Estimates			Zero Coupon Break-Even Inflation		
	Year 1	Year 2	Long-Term*	10 Yrs	20 Yrs	30 Yrs	10 Yrs	20 Yrs	30 Yrs
US	2.0%	2.0%	2.3%	2.2%	2.3%	2.3%	2.4%	2.8%	3.0%
Euro	1.8%	1.8%	2.1%	2.0%	2.1%	2.1%	2.4%	2.6%	2.6%
Switzerland	1.4%	1.5%	1.7%	1.6%	1.7%	1.7%			
UK	2.7%	2.1%	2.7%	2.6%	2.7%	2.7%	3.3%	3.8%	3.8%
Canada	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.7%	2.8%	2.6%

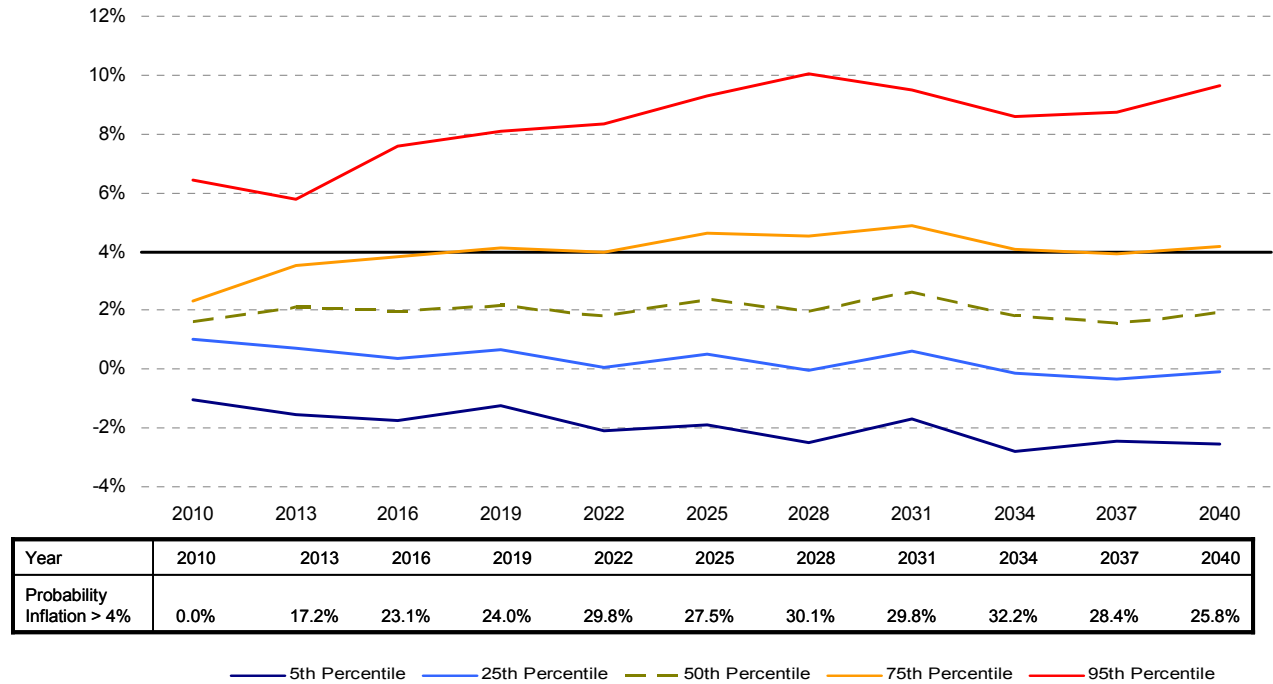
Source: Aon Hewitt
* More than 10 years.

- The principal source we use to formulate our inflation expectations is Consensus Economics, a recognized survey of over 240 prominent financial and economic forecasters.

Asset-Liability Matching Analysis

Hewitt EnnisKnupp's Stochastic Projection of Future Inflation Rates

Our stochastic projection of future inflation shows that median inflation consistently runs in the 2% to 2.5% range. According to our forecasts, the likelihood of inflation over 4% in any year is approximately 25%.



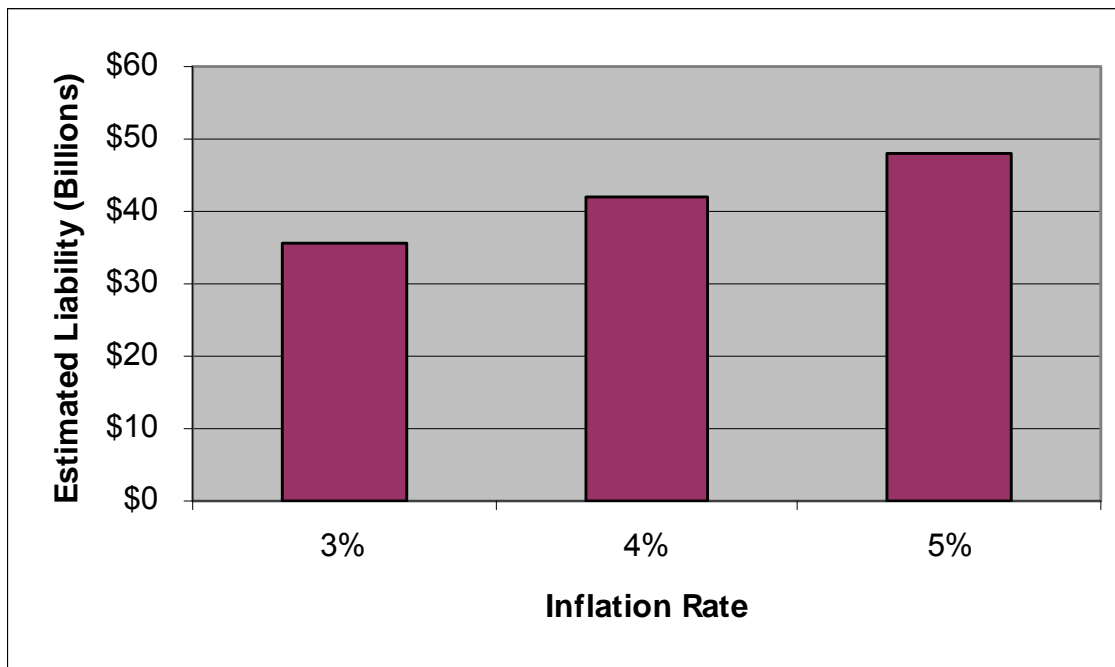
Asset-Liability Matching Analysis

Inflation Sensitivity of Pension Liabilities

The UNJSPF pension liability is subject to inflation risk. In the event actual future inflation is greater than the 4% assumed inflation rate, the actual obligation of the plan would exceed that which is currently expected. The actuary is currently reflecting an inflation assumption which is higher than the Hewitt EnnisKnupp inflation expectation. Ultimately, inflation could be higher or lower than 4%.

The bar chart below shows liability's sensitivity to inflation. This graph reflects the pension liability's inflation duration of approximately 15.

The middle bar represents the \$42 billion present value of accrued benefits, using the actuary's current inflation assumption of 4%. If the actuary's inflation expectation were to increase to 5%, for example, the present value of accrued benefits would increase to approximately \$48 billion. The converse is also true – if the inflation assumption were to decrease to 3%, the present value of accrued benefits would decrease to approximately \$36 billion.



This graph is instructive regarding the inflation exposure. To the extent actual realized long-term inflation is higher than expected, the pension liability would be higher than is reflected in the actuary's analysis, which would eventually prompt a higher degree of required annual funding. If the UNJSPF were to hedge this inflation risk exposure, a large financial risk would be removed from the organization.

Asset Class Discussion

Asset Class Discussion

Real Assets

Real assets are defined as a broad category of assets sharing the common trait of being tangible; sometimes called “hard assets.” Real assets can also be characterized as assets or strategies that protect against inflation (i.e., provide a “real” return). This includes “paper” assets such as inflation-linked bonds. The objectives of real assets are inflation protection, and capital preservation in crisis situations.

Characteristics of Inflation Hedging Assets

Asset Class	Expected Volatility	Expected Correlation to Traditional Portfolio	Expected Inflation Hedging Ability	Liquidity
Commodity Futures	High	Low	High	High
Inflation-Linked Bonds	Low	Moderate	High	High
Core Private Real Estate	Moderate	Low	Moderate - High	Low

Real asset strategies are primarily implemented via active management given the greater opportunity (relative to traditional markets) to exploit structural inefficiencies and/or transient market mispricings.

Commodities

Commodities are a highly volatile, lowly correlated, strong inflation-hedging asset. They are also highly liquid (if implemented via futures). Commodity futures can be backed by inflation-linked securities to enhance inflation sensitivity.

Global Inflation-Linked Bonds

The inflation-linked bond market is large and growing; the market value of the Barclays World Government Inflation-Linked Bond Index is \$1.6 trillion, of which 40% is U.S. TIPS. They offer explicit inflation protection (if individual securities are held to maturity). The divergence in global monetary/economic policy may lead to diverging inflation trends.

Private Real Estate

Core private real estate has a strong link to inflation. Value-Add and Opportunistic investing should be perceived primarily as return enhancing strategies. Publicly traded real estate has historically led private real estate in terms of returns. This cycle has been no different.

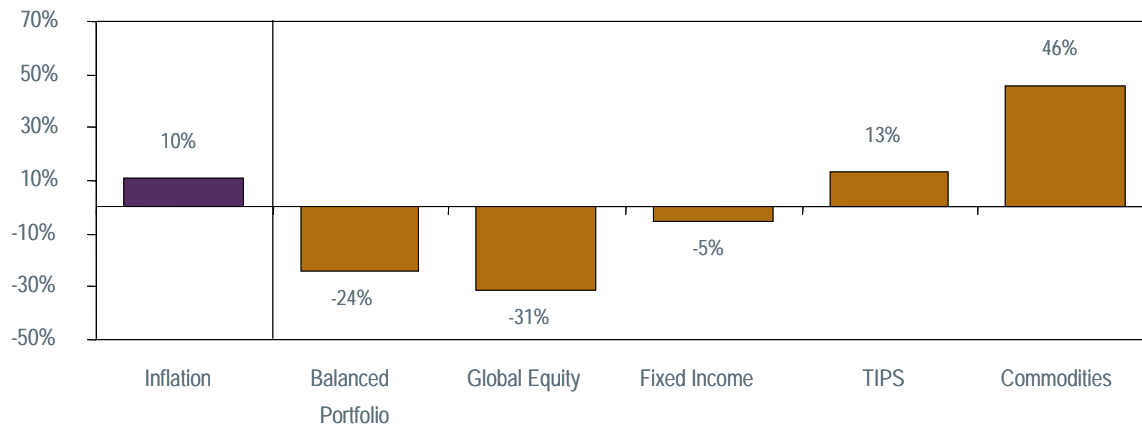
Real estate is primarily implemented via active management given the greater opportunity (relative to traditional markets) to exploit structural inefficiencies and/or transient market mispricings.

Asset Class Discussion

The Potential Impact of Inflation

The chart below shows annualized real returns from 1973-1974.

Real Returns
1973-1974 (Annualized)



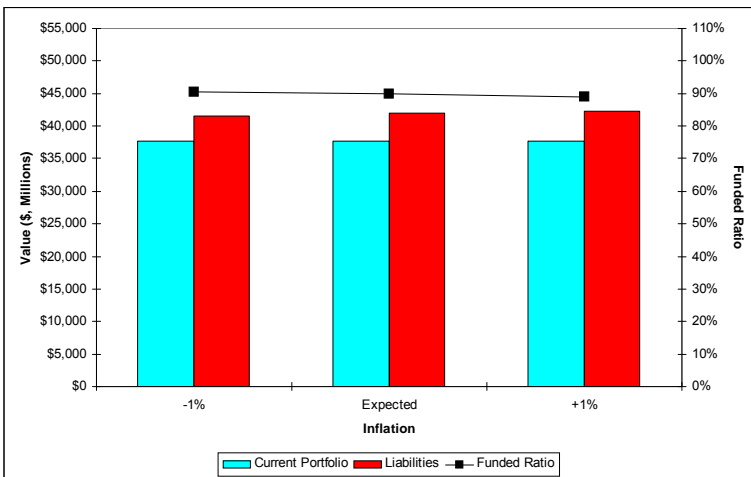
In this case, TIPS and commodities were effective inflation hedging vehicles. In fact, TIPS closely matched the inflation experience, while commodities provided a high beta exposure to the unexpected inflation. Note that both equities and other fixed income vehicles lost value during this period.

Asset Class Discussion

The Potential Impact of Inflation on Assets and Liabilities

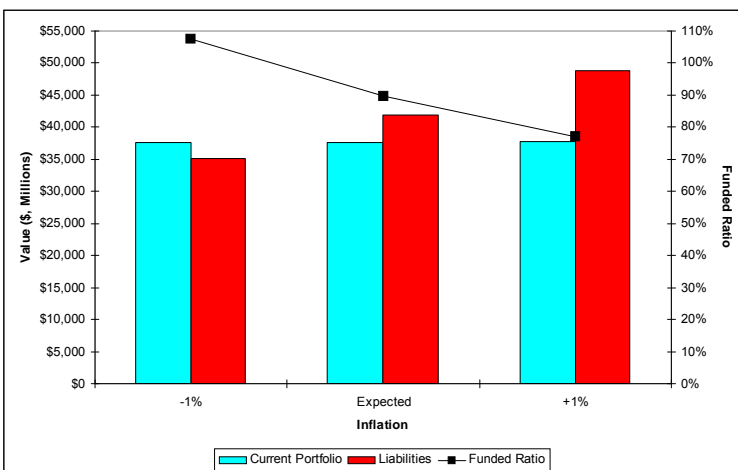
Inflation will impact the actuarial valuation of the pension liability. On an annual (or, in the case of the UNJSPF, a biannual) basis, as inflation is realized, it will effect the valuation of the liabilities via the impact on cost of living increases, as well as salary increases. On an annual basis, the effect of inflation on the liabilities is minimal. As shown in the graph below, the funded ratio is little impacted by a 1% deviation in inflation over one year.

One-Year Inflation Effect



Over the long-term, however, inflation deviations relative to expectations would significantly affect the value of the pension obligation. The current investment policy does not have a large exposure to inflation-sensitive assets. As a result, the funded status might be adversely impacted by high inflation rates over the long-term, as the liabilities would be materially affected, while the assets would not be materially affected.

Long-Term Inflation Effect



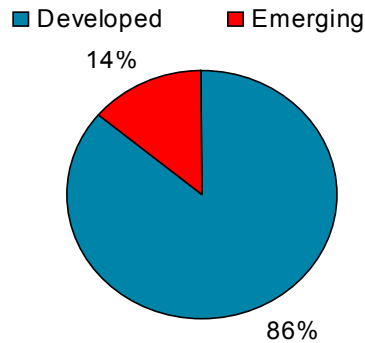
Asset Class Discussion

Equity

Public Equity

We tend to view developed markets as a single “global” asset class. U.S. and non-U.S. equities are highly correlated as a result of corporations seeking a global footprint. Emerging markets equity tends to be more influenced by macro/country factors. We believe emerging markets distinguish themselves from developed markets such that a dedicated policy allocation is warranted, helping facilitate a tactical investment approach.

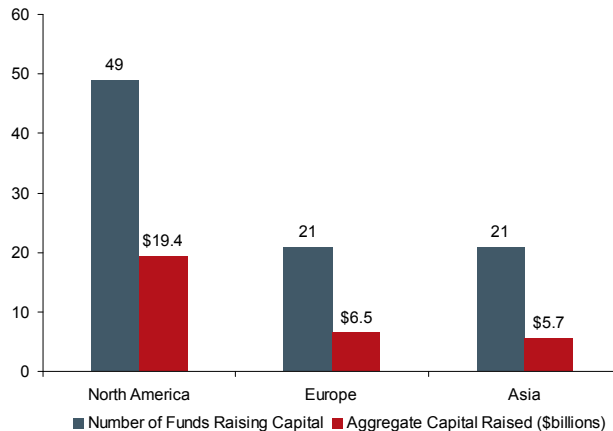
**Public Equity Universe
(Measured by Market Capitalization)**



Private Equity

We view private equity as an extension of public equity with the primary purpose of increasing return expectations. Private equity seeks to exploit persistent excess return as demonstrated by certain active managers. The “private” nature of this asset class leads to generally low levels of liquidity (i.e., a long holding period asset). Private equity investors should seek diversification by vintage year, manager, strategy, and geographic location. Also note that a new private equity allocation must be implemented over a period of several years (typically 5-10 years).

Global Private Equity Fund Raising – Q4 2010



Asset Class Discussion

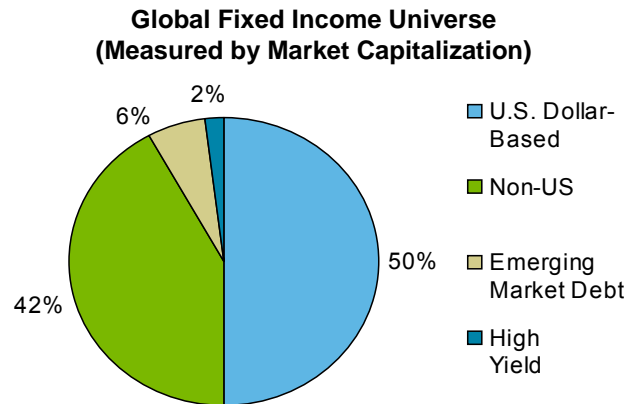
Fixed Income – A Multi-Purpose Asset Class

As part of the UNJSPF pension fund, the fixed income allocation can both mitigate risk and in certain cases, seek return.

Fixed income can provide downside protection, particularly when US Treasuries and global sovereign bonds are utilized. These classes provide valuable “flight to quality” protection. Further, due to low correlations to other asset classes, these securities provide diversification benefits to the fund.

Certain classes of fixed income may also provide return seeking benefits. In particular, high yield bonds, emerging markets debt, and non-agency mortgage backed securities may provide attractive, above average yields.

Finally, fixed income may provide liability hedging attributes. Fixed income securities may provide cash flow matching relative to the pension liabilities. Perhaps most importantly, inflation-linked bonds may provide inflation hedging relative to the inflation sensitive liabilities. Global fixed income securities may provide the currency exposure needed to hedge the currency exposures of the pension liabilities.



Asset Class Discussion

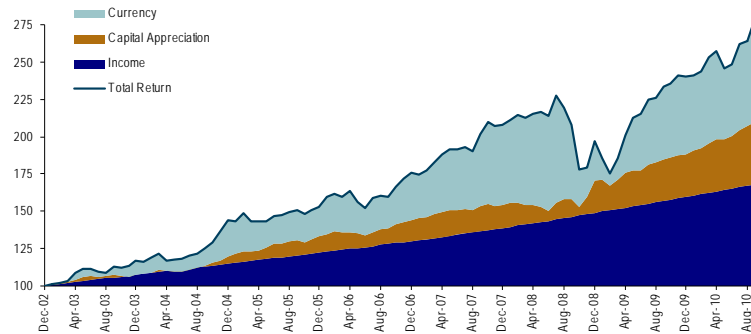
Emerging Market Debt (EMD) – A Closer Look

Emerging market debt can be a compelling diversifier that may warrant a dedicated allocation to facilitate a tactical investment approach. Note that a broad “core-plus” mandate may offer exposure to EMD as well.

Emerging markets are becoming a growing influence within the G-20 nations. In general, they are lowly indebted economies with large foreign currency reserves. This asset class has exhibited declining volatility recently. There has been increasing liquidity coupled with growing issuance in the local currency.

Emerging Market Debt - Components of Return

JP Morgan GBI-EM Global Diversified Index, in unhedged U.S. dollar terms
As of September 2010



Source: JP Morgan, Hewitt

Asset Class Discussion

Capital Market Assumptions – 30 Year

The capital market assumptions that were the basis for our analysis are shown below. We build our capital market assumptions using a building block approach. We start with our expectations for inflation and interest rates, incorporating the full yield curve, then move forward to build returns for several asset classes. Our assumptions reflect our forward-looking views, based on history, current market conditions, and our professional judgment.

	Expected Return	Nominal Volatility	
Equities			
Global Equity	8.10%	18.90%	
Emerging Markets Equity	8.90%	30.50%	
Fixed Income			
Global Fixed Income	4.80%	6.30%	
Inflation Linked Bonds	5.00%	7.10%	
Alternatives			
Real Estate	8.40%	11.60%	
Commodities	6.60%	25.10%	
Private Equity	8.90%	28.00%	
Hedge Fund of Funds	6.30%	8.90%	
Inflation	2.50%	3.60%	

Notes

- Our capital market assumptions are developed based on our forward-looking expectations of the market, and are based on market available data, as well as our proprietary models and professional judgment
- The assumptions shown were used in the asset-liability projection analysis
- The asset classes shown were included in the efficient frontier model
 - The efficient frontier model optimizes the risk/reward characteristics of the fund at a wide range of risk levels
 - Asset classes not shown in the efficient frontier results, such as Hedge Fund of Funds, did not appear to add value from a risk/reward standpoint

Nominal Correlations									
	1	2	3	4	5	6	7	8	9
1-Global Equity	1.00	0.59	0.01	0.24	0.42	0.21	0.70	0.02	0.17
2-Emerging Markets Equity		1.00	0.01	0.02	0.17	0.15	0.45	0.01	0.11
3-Global Fixed Income			1.00	0.03	0.01	0.01	0.01	0.23	0.01
4-Inflation Linked Bonds				1.00	0.53	0.24	-0.04	0.01	0.44
5-Real Estate					1.00	0.15	0.13	0.02	0.22
6-Commodities						1.00	0.12	0.27	0.50
7-Private Equity							1.00	0.24	-0.01
8-Hedge Fund of Funds								1.00	0.12
9-Inflation									1.00

Pension Asset-Liability Study Results

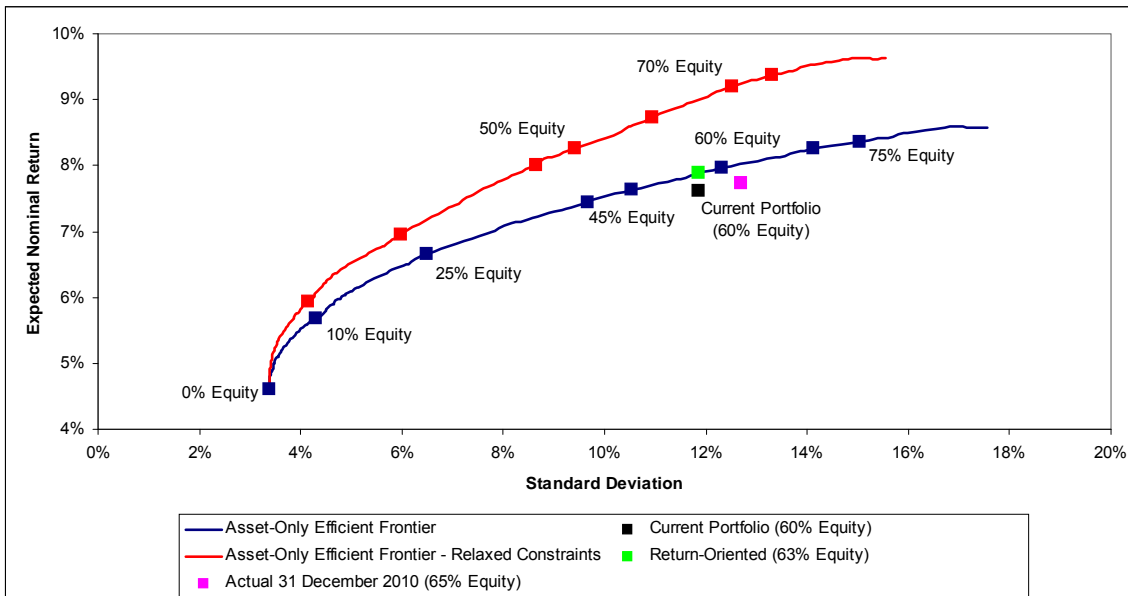
Pension Asset-Liability Study Results

Asset-Only Efficient Frontier

The asset only efficient frontier is a risk/reward optimization based on asset return versus asset volatility.

Per the analysis, from an asset-only perspective, while the current portfolio lies near the efficient frontier, subtle changes to the portfolio structure can improve the portfolio from a risk/reward perspective. Increased portfolio diversification via emerging markets equity, private equity, real estate, commodities, and inflation linked bonds can improve the portfolio construction in risk/reward terms.

Relaxing the constraints beyond market weights can further enhance the diversification and risk/reward characteristics of the pension fund.



	Expected Nominal Return	Standard Deviation	Global Equity	Emerging Markets Equity	Private Equity ²	Real Estate	Commodities	Inflation Linked Bonds	Global Bonds
Current Portfolio (60% Equity)	7.7%	11.9%	52%	8%	0%	6%	0%	0%	34%
Actual 31 December 2010 (65% Equity)	7.8%	12.7%	56%	9%	0%	4%	0%	2%	29%
Return-Oriented (63% Equity) ¹	7.9%	11.9%	53%	7%	3%	5%	0%	3%	29%
Efficient Portfolios									
0% Equity	4.7%	3.4%	0%	0%	0%	0%	0%	70%	30%
10% Equity	5.7%	4.2%	8%	1%	1%	8%	3%	44%	35%
25% Equity	6.7%	6.5%	19%	3%	3%	10%	5%	29%	31%
45% Equity	7.5%	9.7%	35%	5%	5%	10%	5%	15%	25%
50% Equity	7.6%	10.5%	39%	6%	5%	10%	5%	11%	24%
60% Equity	8.1%	12.4%	46%	8%	6%	10%	5%	4%	21%
70% Equity	8.3%	14.1%	54%	9%	7%	10%	5%	1%	14%
75% Equity	8.5%	15.1%	58%	9%	8%	10%	5%	0%	10%
Relaxed Constraints³									
10% Equity	5.9%	4.1%	6%	2%	2%	8%	3%	44%	35%
25% Equity	6.9%	6.0%	15%	5%	5%	10%	5%	29%	31%
45% Equity	8.0%	8.7%	27%	9%	9%	10%	5%	15%	25%
50% Equity	8.3%	9.4%	30%	10%	10%	10%	5%	11%	24%
60% Equity	8.7%	10.9%	36%	12%	12%	10%	5%	4%	21%
70% Equity	9.1%	12.5%	42%	14%	14%	10%	5%	1%	14%
75% Equity	9.4%	13.3%	45%	15%	15%	10%	5%	0%	10%

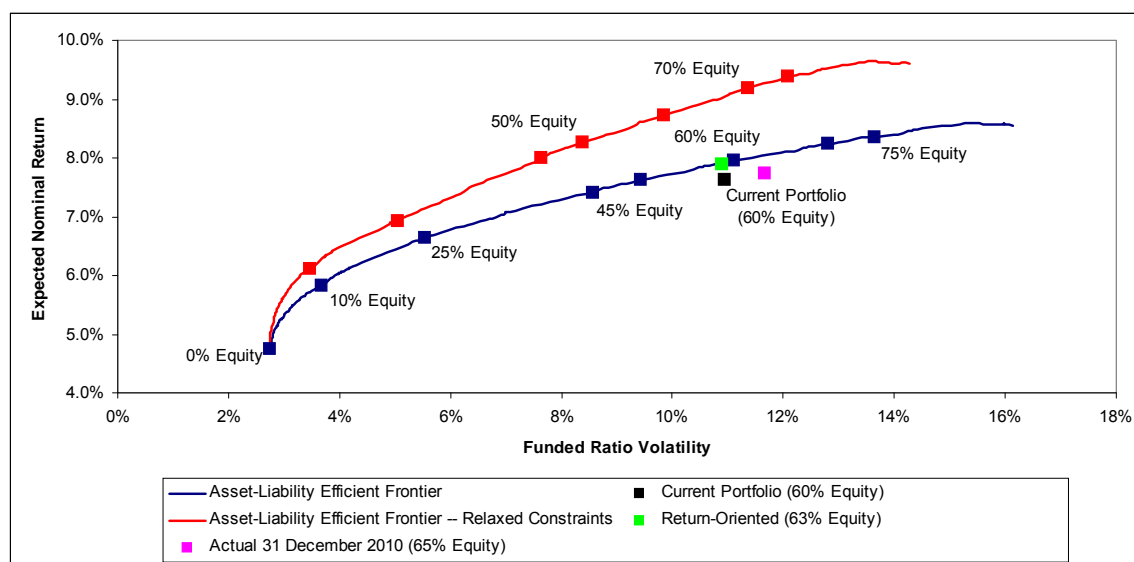
Pension Asset-Liability Study Results

Asset-Liability Efficient Frontier

The asset-liability efficient frontier is a risk/reward optimization based on asset return versus funded status (i.e., asset-liability) volatility.

Per the analysis, from an asset-liability perspective, while the current portfolio lies near the efficient frontier, subtle changes to the portfolio structure can improve the portfolio from a risk/reward perspective. Increased portfolio diversification via emerging markets equity, private equity, real estate, commodities, and inflation linked bonds can improve the portfolio construction in risk/reward terms. Inflation-sensitive assets (e.g., inflation-linked bonds, real estate, commodities) are particularly beneficial due to their inflation hedging properties relative to the pension liability.

Relaxing the constraints beyond market weights can further enhance the diversification and risk/reward characteristics of the pension fund.



	Expected Nominal Return	Funded Ratio Volatility ²	Global Equity	Emerging Markets Equity	Private Equity ³	Real Estate	Commodities	Inflation Linked Bonds	Global Bonds
Current Portfolio (60% Equity)	7.7%	11.0%	52%	8%	0%	6%	0%	0%	34%
Actual 31 December 2010 (65% Equity)	7.8%	11.7%	56%	9%	0%	4%	0%	2%	29%
Return-Oriented (63% Equity) ¹	7.9%	10.9%	53%	7%	3%	5%	0%	3%	29%
Efficient Portfolios									
0% Equity	4.7%	2.8%	0%	0%	0%	0%	0%	24%	76%
10% Equity	5.7%	3.6%	8%	1%	1%	10%	5%	35%	40%
25% Equity	6.7%	5.5%	19%	3%	3%	10%	5%	40%	20%
45% Equity	7.5%	8.6%	35%	5%	5%	10%	5%	25%	15%
50% Equity	7.6%	9.4%	39%	6%	5%	10%	5%	11%	24%
60% Equity	8.1%	11.1%	46%	8%	6%	10%	5%	14%	11%
70% Equity	8.3%	12.8%	54%	9%	7%	10%	5%	1%	14%
75% Equity	8.5%	13.6%	58%	9%	8%	10%	5%	2%	8%
Relaxed Constraints⁴									
10% Equity	6.1%	3.4%	6%	2%	2%	10%	5%	35%	40%
25% Equity	6.9%	5.0%	15%	5%	5%	10%	5%	40%	20%
45% Equity	8.0%	7.6%	27%	9%	9%	10%	5%	25%	15%
50% Equity	8.3%	8.4%	30%	10%	10%	10%	5%	11%	24%
60% Equity	8.7%	9.8%	36%	12%	12%	10%	5%	14%	11%
70% Equity	9.1%	11.3%	42%	14%	14%	10%	5%	1%	14%
75% Equity	9.4%	12.1%	45%	15%	15%	10%	5%	2%	8%

Pension Asset-Liability Study Results

Expected Return on Assets Calculation

The expected return on assets is calculated using a geometric (i.e., compound) mean return. Note that the geometric mean return will differ from the arithmetic mean return. As an example, a portfolio with an arithmetic annual mean return of 8.5% will have a compound annual return of less than 8.5% over time. The calculation of compound expected return must include the diversification/rebalancing effect. The current portfolio's expected return calculations, both compound and arithmetic, are shown below.

	Compound	Arithmetic
Weighted Average Return	7.1%	8.5%
Diversification/Rebalancing Effect	<u>0.6%</u>	<u>NA</u>
Expected Return on Assets	7.7%	8.5%
Estimated Portfolio Volatility	11.9%	11.9%

Economic Cost

Economic cost is a measure of the true economic impact of the pension plan on the organization's financials. Economic cost defined as the sum of the present value of contributions over the period, plus the present value of the projected shortfall at the end of the projection period. All present value calculations are performed using the 7.5% interest rate assumption, consistent with the actuarial valuation.

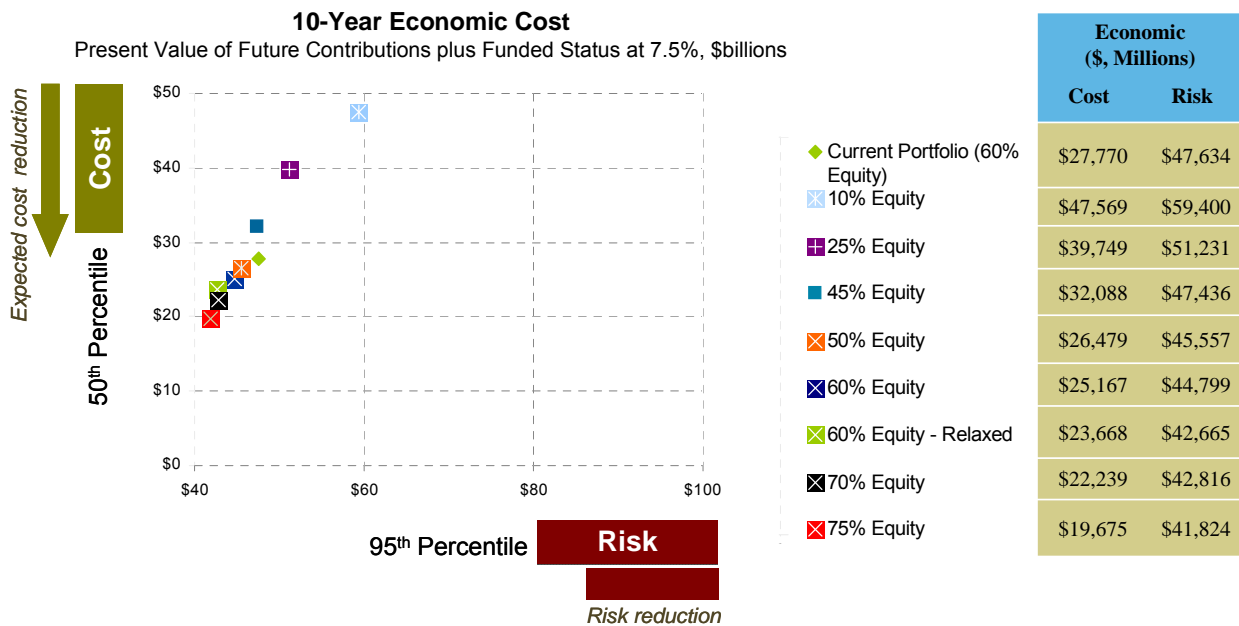
We have analyzed a variety of portfolio strategies (i.e., 10% equity to 75% equity) over a variety of projection periods (i.e., 10, 20, and 30 years).

Pension Asset-Liability Study Results

10-Year Economic Cost Analysis

The ten year analysis of economic cost is summarized in the graph below. The graph below shows the median (i.e., 50th percentile) economic cost on the vertical axis, and the economic risk (i.e., the 95th percentile of economic cost) on the horizontal axis.

Per the analysis, the current portfolio has an expected economic cost of \$27.77 billion over the next ten years, with economic risk of \$47.63 billion. The recommended portfolio, shown below as the 60% equity portfolio, has an expected economic cost of \$25.17 billion over the same period, with economic risk of \$44.80 billion.

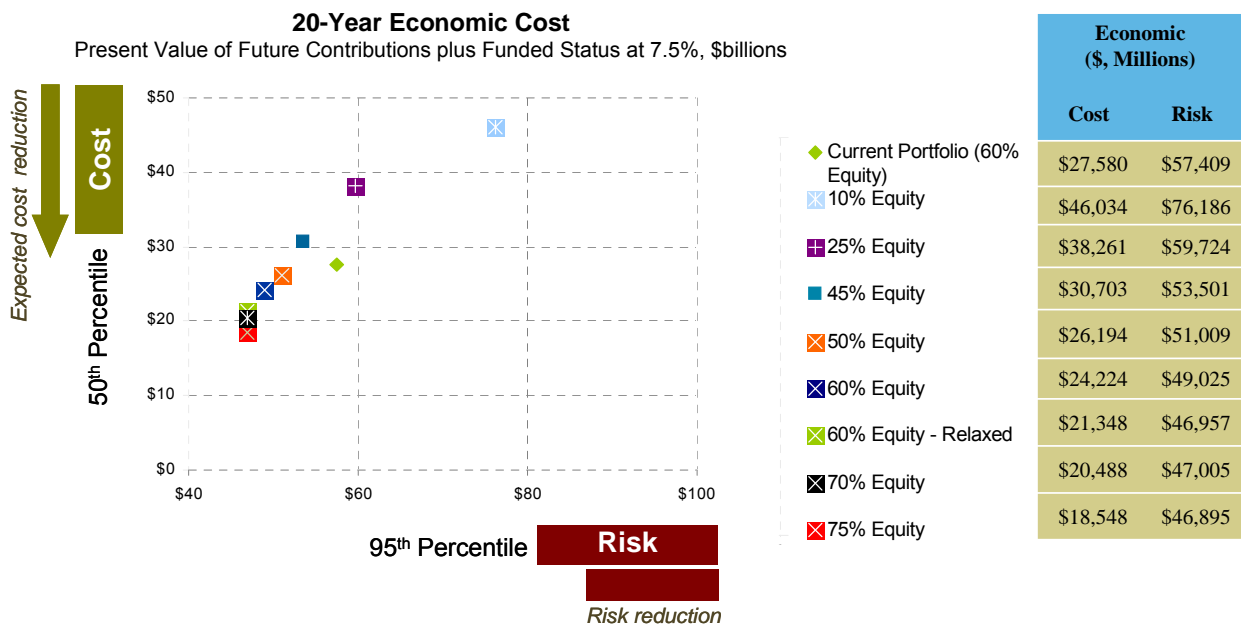


Pension Asset-Liability Study Results

20-Year Economic Cost Analysis

The twenty year analysis of economic cost is summarized in the graph below. The graph below shows the median (i.e., 50th percentile) economic cost on the vertical axis, and the economic risk (i.e., the 95th percentile of economic cost) on the horizontal axis.

Per the analysis, the current portfolio has an expected economic cost of \$27.58 billion over the next twenty years, with economic risk of \$57.41 billion. The recommended portfolio, shown below as the 60% equity portfolio, has an expected economic cost of \$24.22 billion over the same period, with economic risk of \$49.03 billion.

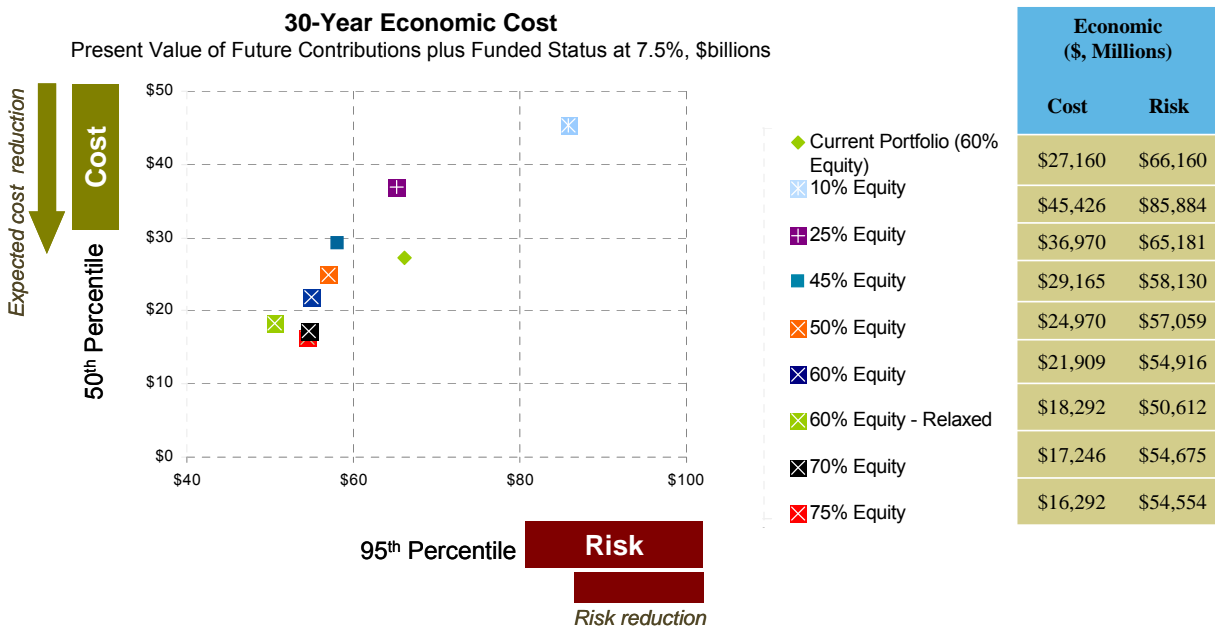


Pension Asset-Liability Study Results

30-Year Economic Cost Analysis

The thirty year analysis of economic cost is summarized in the graph below. The graph below shows the median (i.e., 50th percentile) economic cost on the vertical axis, and the economic risk (i.e., the 95th percentile of economic cost) on the horizontal axis.

Per the analysis, the current portfolio has an expected economic cost of \$27.16 billion over the next twenty years, with economic risk of \$66.16 billion. The recommended portfolio, shown below as the 60% equity portfolio, has an expected economic cost of \$21.91 billion over the same period, with economic risk of \$54.92 billion.



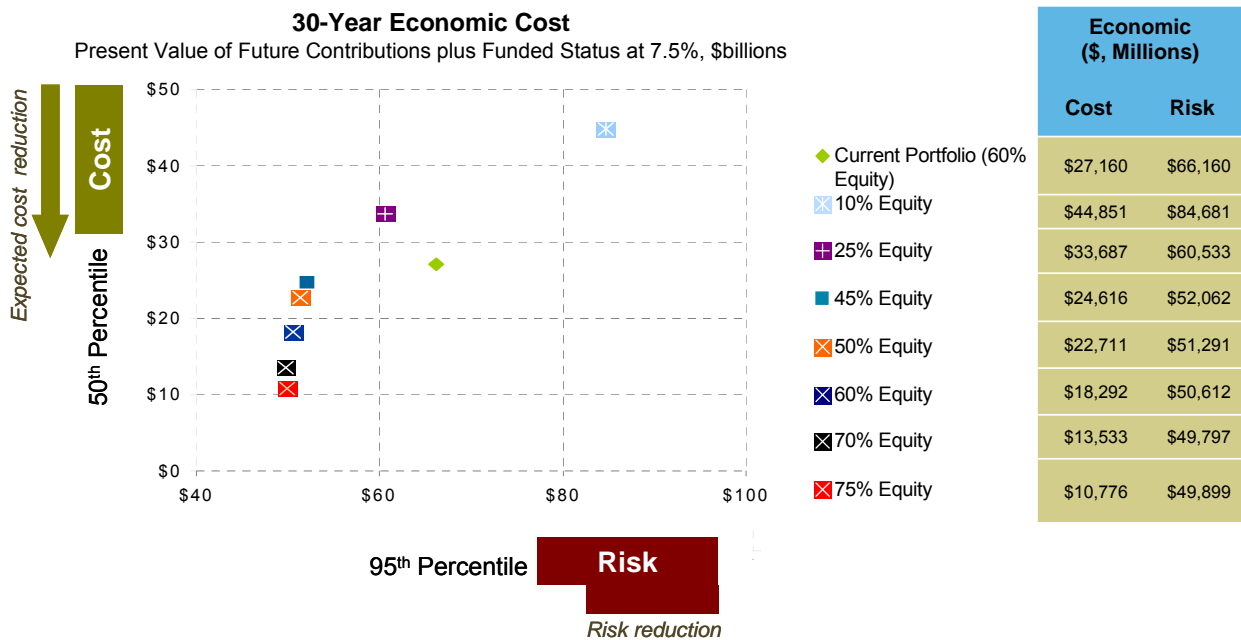
Pension Asset-Liability Study Results

30-Year Economic Cost Analysis – Relaxed Portfolio Constraints

The thirty year analysis of economic cost is summarized in the graph below. The graph below shows the median (i.e., 50th percentile) economic cost on the vertical axis, and the economic risk (i.e., the 95th percentile of economic cost) on the horizontal axis.

This analysis is slightly different than the previous analysis in that it shows portfolios which were selected from a second efficient frontier. The second efficient frontier contained relaxed portfolio constraints which allowed higher allocations to emerging markets equity and private equity.

Per the analysis, the current portfolio has an expected economic cost of \$27.16 billion over the next twenty years, with economic risk of \$66.16 billion. The relaxed 60% equity portfolio has an expected economic cost of \$18.29 billion over the same period, with economic risk of \$50.61 billion.



Key Takeaways – Economic Cost Analysis

Per the above economic cost analysis, we have the following key takeaways:

- 1) Higher equity portfolios reduce long-term expected economic cost.
- 2) Smoothing mechanisms employed by the actuary dampen cost volatility.
- 3) The efficient 60% equity portfolio improves the economic risk/reward characteristics of the fund relative to the Current Portfolio.
- 4) Relaxing the constraints of the portfolio further reduces economic cost and risk.

Pension Asset-Liability Study Results

Summary of Economic Cost and PV Contributions (\$ Billions)

Baseline Analysis

	Economic Cost		PV Contributions	
	50th	95th	50th	95th
Current Portfolio	27.2	66.2	23.5	37.1
10% Equity	45.4	85.9	35.6	56.0
25% Equity	37.0	65.2	30.8	48.5
45% Equity	29.2	58.1	26.7	41.9
50% Equity	25.0	57.1	23.1	36.2
60% Equity	21.9	54.9	23.1	36.2
60% Equity Relaxed	18.3	50.6	23.1	36.2
70% Equity	17.2	54.7	23.1	36.2
75% Equity	16.3	54.6	19.9	32.5

Relaxed Portfolios

	Economic Cost		PV Contributions	
	50th	95th	50th	95th
Current Portfolio	27.2	66.2	23.5	37.1
10% Equity	44.9	84.7	35.6	56.0
25% Equity	33.7	60.5	26.7	41.9
45% Equity	24.6	52.1	23.1	36.2
50% Equity	22.7	51.3	23.1	36.2
60% Equity	18.3	50.6	23.1	36.2
70% Equity	13.5	49.8	23.1	36.2
75% Equity	10.8	49.9	19.9	32.5

Key Takeaways

- 1) Economic cost is defined as the present value of contributions plus the present value of the (surplus)/shortfall at the end of the projection period.
- 2) The contributions are based on the assumed funding policies, given various portfolio strategies.
- 3) The difference between the economic cost and PV contributions is generally due to the funded status at the end of the projection period.
- 4) Note that the 50th and 95th percentile trials of the economic cost distribution and the same percentile trials of the PV contribution distribution do not necessarily perfectly align. As such, these side by side results are not necessarily additive.

Pension Asset-Liability Study Results

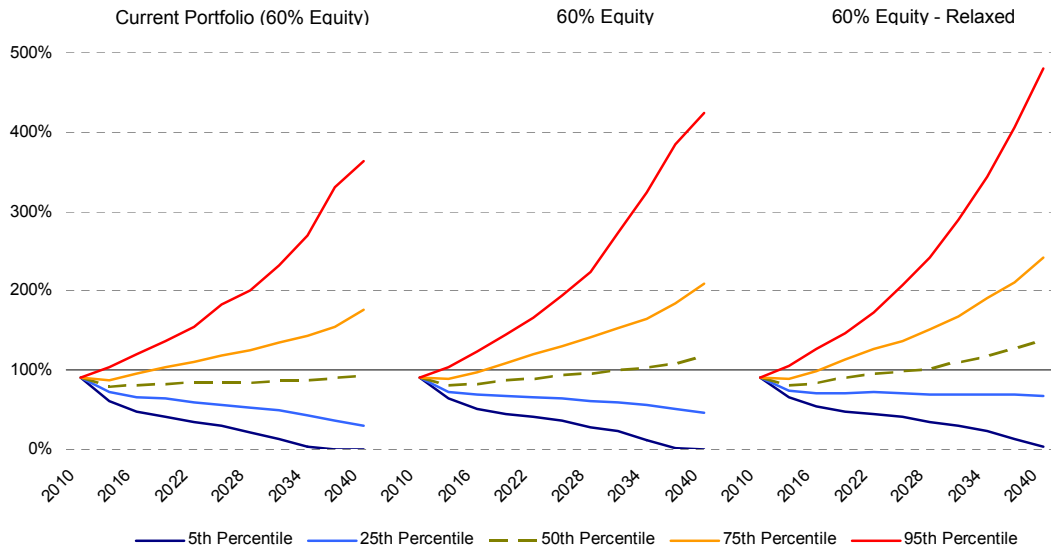
Projected Funded Ratios (Present Value of Accrued Benefits Basis)

Below we show the projected funded ratios for the plan over the next thirty years for three investment strategies: (1) current portfolio (60% equity), (2) efficient 60% equity (selected from the asset-liability efficient frontier), and (3) relaxed 60% equity (selected from the relaxed asset-liability efficient frontier). Each year we show the distribution of funded ratio results, from the 5th percentile (bottom line) to the 95th percentile (top line). The dashed line represents the median (i.e., 50th percentile) case.

Per the results of the projection analysis, the current portfolio strategy shows a median case which trends toward 100% over the thirty year projection period, but does not achieve 100% in the median case during this period. The current strategy also has a 5% or greater likelihood of fund exhaustion during the later years of the projection.

The second investment strategy shown below, i.e., the recommended 60% equity strategy, shows a median case which achieves full funding in the median case during the projection period. Per the analysis, this strategy has less risk of fund exhaustion over the next thirty years than the current portfolio.

The third investment strategy shown below, i.e., the relaxed 60% equity strategy, shows a median case which achieves full funding earlier than the recommended 60% equity strategy, with even less risk of fund exhaustion than the recommended portfolio over the long-term.



Key Takeaways – Projected Funded Ratios

Per the above funded ratio analysis, we have the following key takeaways:

- 1) The current portfolio trends towards 100% funded, but does not achieve full funding in the median case over the next thirty years.
- 2) The efficient 60% equity portfolio attains a fully funded status in the median case over the next thirty years.
- 3) The relaxed 60% equity portfolio attains a higher median funded status than the efficient 60% equity portfolio, and has less risk of fund exhaustion.

Pension Asset-Liability Study Results

Projected Asset Returns

The stochastic asset-liability projections reflect the following stochastic asset return projections (first ten years shown individually, followed by five year increments). The following table summarizes the stochastically projected asset returns for the Current Portfolio and six alternative portfolios: 50%, 60%, and 70% Equity, and 50%, 60%, and 70% Equity with relaxed portfolio constraints. These asset return projections in large part drive the projected financial results for the UNJSPF.

Percentiles	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2026	2031	2036	2039
Current Portfolio															
95th	26.3%	26.0%	25.9%	24.4%	25.0%	25.9%	25.3%	25.2%	24.2%	23.4%	25.1%	26.5%	24.6%	27.3%	26.6%
75th	14.6%	14.3%	14.3%	13.6%	14.2%	14.6%	14.3%	14.4%	14.3%	13.2%	14.5%	16.0%	15.2%	16.2%	16.0%
50th	6.1%	6.2%	6.4%	6.6%	6.9%	6.8%	7.0%	7.7%	7.6%	7.4%	7.9%	9.2%	7.6%	8.8%	8.5%
25th	-2.2%	-3.2%	-1.4%	-2.2%	-0.6%	-0.9%	-0.2%	-0.6%	0.2%	-0.6%	-0.4%	1.0%	0.4%	1.5%	1.3%
5th	-16.9%	-19.0%	-16.3%	-16.2%	-16.9%	-14.4%	-12.6%	-13.3%	-14.1%	-14.7%	-12.5%	-10.3%	-12.4%	-9.6%	-12.0%
50% Equity															
95th	23.2%	22.9%	22.1%	21.5%	21.9%	23.0%	22.8%	21.7%	21.5%	21.2%	22.7%	23.9%	22.5%	24.4%	24.3%
75th	12.9%	13.0%	12.9%	12.1%	12.8%	12.8%	13.0%	13.1%	12.9%	12.6%	13.5%	14.4%	14.3%	15.0%	14.8%
50th	6.1%	6.3%	6.7%	6.4%	6.6%	6.8%	6.6%	7.4%	7.3%	7.0%	7.6%	9.0%	7.9%	8.5%	8.3%
25th	-0.8%	-1.5%	-0.5%	-0.6%	0.5%	0.2%	1.3%	1.1%	1.1%	0.7%	1.0%	2.6%	1.7%	2.1%	2.2%
5th	-13.2%	-13.9%	-12.4%	-12.2%	-11.4%	-10.8%	-9.4%	-9.5%	-9.7%	-10.5%	-8.6%	-6.3%	-8.5%	-6.6%	-8.2%
60% Equity															
95th	26.6%	25.9%	25.2%	24.6%	25.0%	25.8%	25.7%	24.6%	24.6%	23.8%	25.2%	26.6%	24.9%	27.2%	26.9%
75th	14.8%	14.6%	14.6%	13.8%	14.6%	14.5%	14.6%	14.7%	14.3%	14.0%	14.8%	15.8%	15.5%	16.6%	16.3%
50th	6.8%	6.9%	7.2%	7.0%	7.3%	7.6%	7.4%	8.3%	8.1%	7.8%	8.3%	9.6%	8.3%	9.1%	8.9%
25th	-1.2%	-2.1%	-0.5%	-1.1%	0.3%	-0.5%	1.0%	0.7%	1.0%	0.4%	0.3%	1.9%	1.3%	1.6%	1.6%
5th	-15.8%	-17.0%	-15.6%	-14.9%	-14.3%	-12.9%	-11.4%	-11.7%	-12.3%	-12.6%	-10.7%	-8.3%	-10.9%	-8.5%	-10.6%
70% Equity															
95th	30.6%	30.0%	28.9%	28.6%	28.1%	28.5%	28.5%	27.8%	27.9%	27.1%	28.4%	29.4%	27.6%	30.6%	30.0%
75th	17.2%	16.9%	16.7%	15.7%	16.2%	16.2%	16.2%	16.6%	16.2%	15.3%	16.7%	17.2%	17.2%	18.5%	18.1%
50th	7.6%	8.0%	8.2%	7.8%	8.0%	8.2%	8.3%	9.0%	8.8%	8.3%	8.8%	10.4%	9.2%	10.0%	9.6%
25th	-1.5%	-2.4%	-0.8%	-1.7%	-0.2%	-1.0%	0.7%	0.3%	0.8%	-0.3%	0.3%	1.4%	0.6%	1.3%	1.3%
5th	-18.7%	-20.1%	-17.9%	-17.4%	-16.7%	-14.8%	-13.3%	-13.8%	-14.6%	-15.0%	-13.0%	-10.7%	-13.1%	-10.8%	-12.9%
50% Equity (Relaxed)															
95th	23.2%	23.2%	21.8%	21.6%	21.5%	22.4%	22.1%	22.1%	21.4%	21.2%	22.5%	23.7%	23.0%	23.9%	24.4%
75th	13.2%	12.9%	13.2%	12.5%	13.0%	12.6%	12.8%	13.3%	12.8%	12.8%	13.2%	14.5%	14.4%	15.0%	15.0%
50th	6.1%	6.0%	6.9%	6.6%	7.0%	6.8%	7.2%	7.3%	7.5%	7.4%	7.7%	9.0%	8.1%	8.8%	8.5%
25th	-0.5%	-1.1%	0.1%	-0.1%	0.8%	0.5%	1.5%	1.5%	1.9%	1.1%	1.7%	3.2%	2.2%	2.3%	2.6%
5th	-11.1%	-11.7%	-11.2%	-10.3%	-10.2%	-8.9%	-7.7%	-7.5%	-7.8%	-8.8%	-7.0%	-5.8%	-7.2%	-6.3%	-6.7%
60% Equity (Relaxed)															
95th	26.5%	27.2%	24.8%	25.0%	25.0%	25.4%	25.1%	25.5%	24.5%	24.3%	25.6%	26.9%	25.1%	27.3%	27.3%
75th	14.9%	14.7%	15.1%	14.3%	14.6%	14.6%	14.4%	15.0%	14.4%	14.2%	15.0%	16.1%	15.8%	16.7%	16.5%
50th	6.6%	6.6%	7.5%	7.2%	7.8%	7.6%	7.8%	8.2%	8.4%	7.9%	8.4%	9.8%	8.7%	9.6%	9.2%
25th	-1.1%	-1.5%	-0.2%	-0.5%	0.5%	0.2%	1.4%	1.2%	1.6%	0.6%	1.4%	2.8%	1.7%	2.0%	2.3%
5th	-13.5%	-14.6%	-14.0%	-12.8%	-12.0%	-11.1%	-9.6%	-9.4%	-9.5%	-10.8%	-9.6%	-8.0%	-9.4%	-7.8%	-8.8%
70% Equity (Relaxed)															
95th	30.0%	30.8%	28.5%	28.2%	28.1%	28.3%	28.2%	28.9%	27.2%	26.3%	28.2%	29.6%	27.7%	30.4%	30.2%
75th	17.2%	16.7%	17.1%	16.1%	16.2%	16.3%	16.1%	16.7%	16.2%	16.0%	16.4%	17.6%	17.2%	18.5%	18.3%
50th	7.3%	7.2%	8.2%	7.9%	8.6%	8.5%	8.6%	9.1%	9.1%	8.6%	8.9%	10.4%	9.4%	10.3%	9.9%
25th	-1.6%	-2.1%	-0.6%	-1.1%	0.4%	-0.2%	1.1%	1.1%	1.3%	0.3%	0.9%	2.2%	1.4%	1.8%	1.7%
5th	-16.6%	-17.1%	-16.3%	-14.9%	-14.0%	-13.3%	-11.5%	-11.3%	-11.2%	-12.7%	-11.6%	-10.0%	-11.4%	-9.7%	-11.2%

Pension Asset-Liability Study Results

Risk Budgeting

The following table summarizes the key results of the pension asset-liability study. In particular, we focus on the economic cost and the ending funded ratio, under a variety of investment strategies.

We have summarized the expected economic cost (i.e., 50th percentile) and risk (i.e., 95th percentile), and the expected ending funded ratio (i.e., 50th percentile) and risk (i.e., 95th percentile) for each of the investment strategies shown below. We have also summarized the changes relative to the current portfolio.

	Economic		Ending Funded Ratio		Changes vs. Current Portfolio			
	Expected Cost	Risk	Expected	Risk	Economic		Ending Funded Ratio	
					Expected Cost	Risk	Expected	Risk
Current Portfolio (60% Equity)	27,160	66,160	89.4%	0.0%				
Efficient Portfolios								
10% Equity	45,426	85,884	69.9%	29.8%	18,266	19,724	-19.5%	29.8%
25% Equity	36,970	65,181	79.2%	20.4%	9,810	(979)	-10.2%	20.4%
45% Equity	29,165	58,130	101.8%	4.0%	2,005	(8,030)	12.4%	4.0%
50% Equity	24,970	57,059	106.6%	1.3%	(2,190)	(9,101)	17.2%	1.3%
60% Equity	21,909	54,916	116.1%	0.0%	(5,251)	(11,244)	26.7%	0.0%
70% Equity	17,246	54,675	124.6%	0.0%	(9,914)	(11,485)	35.2%	0.0%
75% Equity	16,292	54,554	128.8%	0.0%	(10,868)	(11,606)	39.4%	0.0%
Relaxed Portfolios								
10% Equity	44,851	84,681	72.3%	31.9%	17,691	18,521	-17.1%	31.9%
25% Equity	33,687	60,533	72.2%	12.6%	6,527	(5,627)	-17.2%	12.6%
45% Equity	24,616	52,062	99.9%	1.1%	(2,544)	(14,098)	10.5%	1.1%
50% Equity	22,711	51,291	111.5%	3.3%	(4,449)	(14,869)	22.1%	3.3%
60% Equity	18,292	50,612	137.8%	2.5%	(8,868)	(15,548)	48.4%	2.5%
70% Equity	13,533	49,797	164.9%	1.6%	(13,627)	(16,363)	75.5%	1.6%
75% Equity	10,776	49,899	178.4%	0.3%	(16,384)	(16,261)	89.0%	0.3%

Key Takeaways – Risk Budgeting Analysis

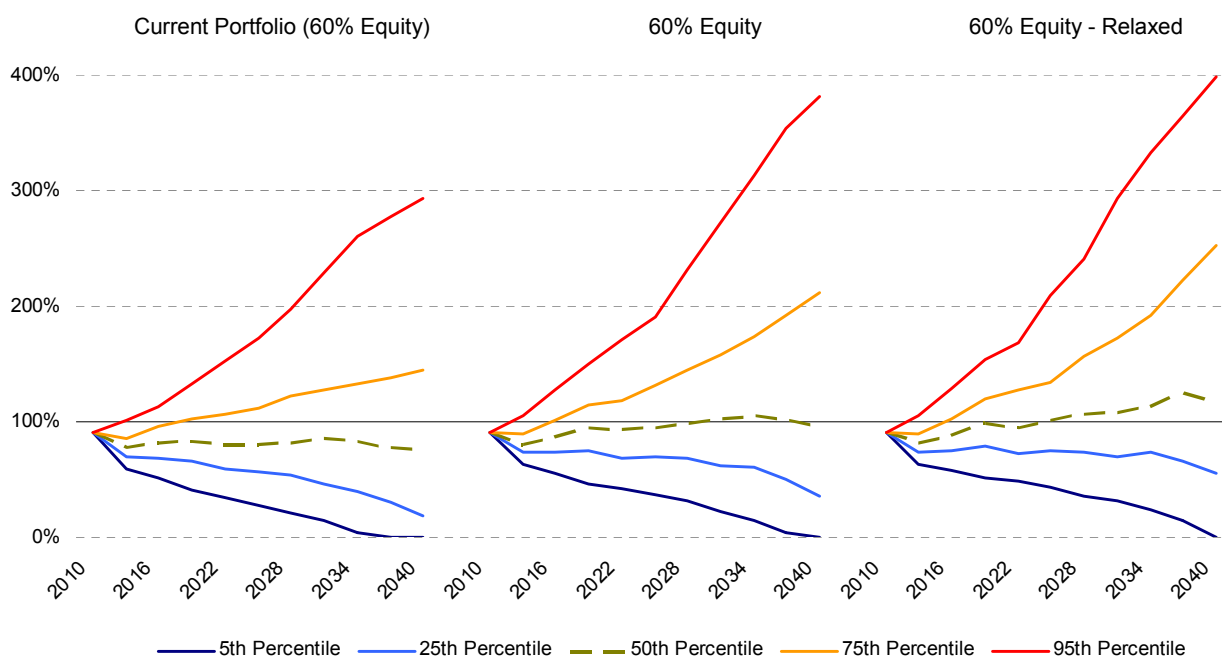
- 1) The efficient 60% equity portfolio has a lower economic cost and risk than the current portfolio, and a higher expected ending funded ratio. Higher equity portfolios also appear to reduce the economic cost and risk over the next thirty years.
- 2) Lower equity portfolios may increase economic cost over the 30-year period, but have less likelihood of fund exhaustion.
- 3) The relaxed portfolios may enhance the risk/reward characteristics of the portfolio by adding return enhancing and diversifying assets. The relaxed 45% and 50% equity portfolios have lower economic cost and risk than the current portfolio, while improving the expected ending funding ratio.

Pension Asset-Liability Study Results

Projected Funded Ratios – High Inflation (Present Value of Accrued Benefits Basis)

Below we show the projected funded ratios for the plan over the next thirty years for three investment strategies: (1) current portfolio (60% equity), (2) efficient 60% equity (selected from the asset-liability efficient frontier), and (3) relaxed 60% equity (selected from the relaxed asset-liability efficient frontier). Each year we show the distribution of funded ratio results, from the 5th percentile (bottom line) to the 95th percentile (top line). The dashed line represents the median (i.e., 50th percentile) case.

The high inflation analysis shows similar, albeit slightly different results than the overall analysis. High inflation would increase the pension liability for two reasons: (1) retiree benefits would be indexed with inflation to higher amounts, and (2) salary increases would lead to higher projected benefits for active participants. The higher projected pension liability would reduce the projected funded ratios, all else equal. These projection results show funded ratios which are less than the funded ratios shown in the baseline funded ratio analysis shown earlier.



Key Takeaways – Projected Funded Ratios (High Inflation)

Per the above funded ratio analysis, we have the following key takeaways:

- 1) The current portfolio does not achieve full funding in the median case over the next thirty years.
- 2) The efficient 60% equity portfolio improves the expected funded ratio and reduces the potential of being underfunded.
- 3) The relaxed 60% equity portfolio further improves the expected funded ratio and further reduces the risk of being underfunded.

Conclusions and Recommendations

Conclusions and Recommendations

Current and Recommended Investment Strategies

The current investment strategy consists of 60% global equity, 31% global fixed income, 6% real estate, and 3% cash. The Hewitt EnnisKnupp recommended strategic asset allocation is 60% global equity, 25% global fixed income, and 15% indirect real assets.

The recommended changes to the portfolio strategy are small, and follow similar themes as were presented within the first asset-liability study. The UNJSPF investment strategy already includes many of the suggestions put forth in our recommendation.

The recommended global equity allocation includes allocations to emerging markets equity and private equity. These allocations would increase expected investment returns and improve the diversification of the fund. Note that, due to the nature of private equity, the desired allocation may take a period of several years to fully attain.

The recommended fixed income allocation includes a significant allocation to inflation-linked bonds. The recommended fixed income allocation increases the inflation hedge, and better matches the liability structure.

The recommended indirect real asset allocation includes a 10% allocation to global real estate and a 5% allocation to commodities. These asset classes will increase the inflation hedge, and better match the liability structure.

Advantages of the recommended investment strategy relative to current investment strategy include:

- Higher expected return per unit of asset risk
- Higher expected return per unit of asset-liability risk
- Lower expected economic cost
- Higher expected ending funded status
- Improved asset-liability risk hedging

While the above recommended asset allocation may be considered as an update to the current investment strategy, there are several alternative portfolio constructs which may also appeal to the UNJSPF.

Alternative portfolio strategies include:

Improved Efficiency

The portfolio efficiency may be increased in risk/reward terms by relaxing the portfolio constraints. This would consist of greater allocations to emerging markets equity and private equity. The portfolio would become less liquid, and would require greater ongoing oversight. The return enhancement would reduce economic plan cost, while the portfolio diversification would reduce risk.

Higher Expected Return on Assets

The expected return on assets would be increased if the UNJSPF were to increase the allocation to return-seeking assets (e.g., 70% or 75% equity portfolios). This would generally increase the expected portfolio return and risk, and result in lower expected economic cost. In this event, the UNJSPF could potentially justify a higher actuarial valuation interest rate, and a lower annual funding rate. However, there would generally be greater risk of significant funding shortfalls, and potential long-term fund exhaustion.

Conclusions and Recommendations

Lower Expected Risk

The UNJSPF could reduce the expected risk by reducing the allocation to return-seeking assets (e.g., 45% or 50% equity portfolios). This would generally reduce the expected portfolio return and risk, and result in higher expected economic cost. However, per the analysis, note that the relaxed 45% and 50% equity portfolios compare favorably in a risk/reward context relative to the current 60% equity portfolio.

Application to the UNJSPF

The application of the study findings will depend on the UNJSPF's objectives, and the UNJSPF's willingness to relax the constraints on the portfolio construction.

If expected cost reduction or enhanced funded status is desired, higher equity portfolios may be used. If risk reduction is desired, and cost increase is acceptable, a lower equity allocation may be desired. If a lower degree of portfolio liquidity is acceptable, and the UNJSPF can become comfortable with the oversight required, relaxing the constraints of the portfolio construct may enhance the risk/reward characteristics of the fund. This may include expanded exposure to emerging markets equity and/or private equity.

Two-Track System – Investment Strategy Implications

The pension liability is subject to currency risk and inflation risk as a result of the Two Track System. Potential solutions include global real assets (index-linked government bonds, global real estate, commodities) and global currency investment.

Based on the findings of our analysis, real assets should be utilized due to inflation risk hedging and enhanced portfolio diversification. Currency risk, particularly today's Swiss Franc currency risk within the Two Track System, should also be considered. As a general rule, use of derivatives as an insurance policy (e.g., currency calls) will have an explicit cost to the fund. Use of out of the money Swiss Franc calls, as shown earlier, may be a cost effective way to hedge the tail risk of Swiss Franc currency fluctuations. There is a minimal cost to these strategies due to being far out of the money. The above strategy is an effective tail risk hedge, which insures against catastrophic events, at minimal cost. As an alternative approach, overweight of Swiss Franc denominated assets relative to the All Country World Index (ACWI) could also potentially hedge the liability's current Swiss Franc risk exposure.

The above currency risk exposures add complexity to the asset-liability management of the pension fund. However, it is important to note that the majority of the pension obligation is US dollar denominated. Further, the second highest currency exposure is the Euro, which can be easily attained with physical investments. The third highest currency exposure, the Swiss Franc, is small relative to the US dollar and Euro, and does not pose a large risk to the overall pension fund. As such, while the tail risk hedging described above may appeal to the UNJSPF, tail risk management of the Swiss Franc risk exposure is likely not critical to the overall success of the fund in aggregate. The UNJSPF should seek to attain as much physical exposure to the Swiss Franc as is practicable.

Conclusions and Recommendations

Hewitt EnnisKnupp Observations and Recommendations

Hewitt EnnisKnupp believes there are four levers in the financial management of pension funds: investment policy, funding strategy, plan design, and actuarial assumptions and methods. As these levers are invariably related, it is critical to manage the pension fund with proper consideration to each of the four levers, understanding how each lever will implicate the others.

Investment Policy

Hewitt EnnisKnupp recommends an increase in real asset exposure in order to better hedge the pension liability's inflation risk exposure. This includes exposure to both direct and indirect inflation hedges. The UNJSPF should also consider the overall currency exposure for liabilities and assets (e.g., US dollar, Euro, Swiss Franc), and consider aligning the asset and liability currency exposures as appropriate. Given the importance of the level of long-term return on assets, the UNJSPF should continue to focus on portfolio strategies which seek return in order to control long-term plan costs.

Given the above, in addition to the UNJSPF's objectives, Hewitt EnnisKnupp recommends adoption of a 60% global equity, 25% global fixed income, 15% indirect real asset mix. To the extent the UNJSPF might be willing to relax the portfolio constraints in order to enhance the risk/reward characteristics of the fund, increased allocations to asset classes such as emerging markets and/or private equity could enhance the portfolio construct in risk/reward terms.

Funding Strategy

The annual pension funding consists of 23.7% of annual remuneration, with little flexibility. Employees fund a portion of this rate each year. Per the December 31, 2009 actuarial valuation report, the actuary reports a 24.08% funding rate is necessary to completely fund long-term obligation. The current contribution rate represents an annual funding shortfall of 0.38% of annual remuneration.

Changes to the investment policy may implicate the annual funding strategy. As such, it is critical that the UNJSPF consider both the investment and funding strategies, and the relationship between the two.

Plan Design

The pension plan design will define the ultimate cost of the program. The pension benefit is predominantly a final-average pay related benefit. Benefits are potentially payable in multiple currencies under the Two Track System. The Two Track System allows for the selection of the payable currency, which introduces optionality which adds cost to the plan, and introduces currency risk to the program.

Assumptions and Methods

The actuarial assumptions and methods employed will affect the results of the actuary's valuation. Based on our analysis of the actuarial valuation as of December 31, 2009, the actuarial assumptions used appear to be reasonable in aggregate. Our review of the actuarial valuation yielded a close match of the actuary's results.

Conclusions and Recommendations

Next Steps

At the conclusion of the pension asset-liability study, the UNJSPF might consider the following next steps:

- 1) Update Investment Policy Statement
- 2) Implementation
- 3) Ongoing asset-liability monitoring

If the UNJSPF concludes that an update in investment strategy is desirable, new asset classes (e.g., dedicated allocation to inflation-linked bonds, private equity) may be considered. Further, since the funded ratio is a critical measure of the financial health of the pension fund, the UNJSPF might consider a liability benchmark for pension assets in order to monitor both asset performance, as well as asset-liability performance of the fund.

Appendix

Pension Plan Structure

Key Plan Characteristics

The plan has a final average pay formula. In the actuarial valuation of the liabilities, both current plan participants as well as projected new entrants are valued.

The 31 December 2009 funded ratio is 91.0% for present participants, retired participants, and beneficiaries. This includes the asset smoothing, and is assuming the “regular valuation basis” (4.5/7.5/4)¹. The 31 December 2009 funded ratio is 80.6% using more conservative actuarial assumptions (3.5/5.0/3.0)¹. The 31 December 2009 funded ratio is 144.5% using more aggressive actuarial assumptions (4.5/8.0/4.0)¹ and assuming no future pension adjustments

The funded status of the plan will change each valuation due to changes in both the asset and liabilities. Assets will change due to market conditions, and experience will be recognized over a five year smoothing period. Liabilities will change due to actuarial experience (economic and demographic), as well as changes in actuarial assumptions and methods, if applicable. The funded status decreased between December 31, 2007 and December 31, 2009, primarily due to market events in 2008.

¹ Salary scale/Interest Rate/Inflation assumptions
Source: 31 December 2009 Actuarial Valuation Report

Retirement Benefit

Amount of Retirement Benefit

The standard annual rate of retirement benefit for a participant who enters the Fund on or after 1 January 1983 is the sum of:

- 1.5 per cent of final average remuneration multiplied by the first five years of contributory service,
- 1.75 per cent of final average remuneration multiplied by the next five years of contributory service,
- 2 per cent of final average remuneration multiplied by the years of contributory service in excess of 10, but not exceeding 25, and
- 1 per cent of his final average remuneration multiplied by his years of contributory service in excess of 35, but not including service credited prior to 1 July 1995, and not exceeding 3.75.

The standard annual rate of retirement benefit for a participant who entered the Fund prior to 1 January 1983, is 2 per cent of final average remuneration multiplied by contributory service not exceeding 30 years plus 1 per cent of final average remuneration multiplied by such service in excess of 30 years, not exceeding 5 years plus 1 per cent of his final average remuneration multiplied by such service in excess of 35 years, but not including service credited prior to 1 July 1995 and not exceeding 5 years.

The maximum benefit to participants at the equivalent level of Under-Secretary General or Assistant Secretary General is the greater of 60 per cent of pensionable remuneration at date of separation or the maximum benefit that would be payable, at that date, to a participant at level D-2 (top step for the preceding five years) with 35 years of contributory service.

The minimum annual rate of retirement benefit is the smaller of \$180 and 1/30 of final average remuneration multiplied by contributory service not exceeding 10 years.

The annual rate of the benefit is nevertheless not less, when no other benefit is payable on the account of the participant, than the smaller of \$300.

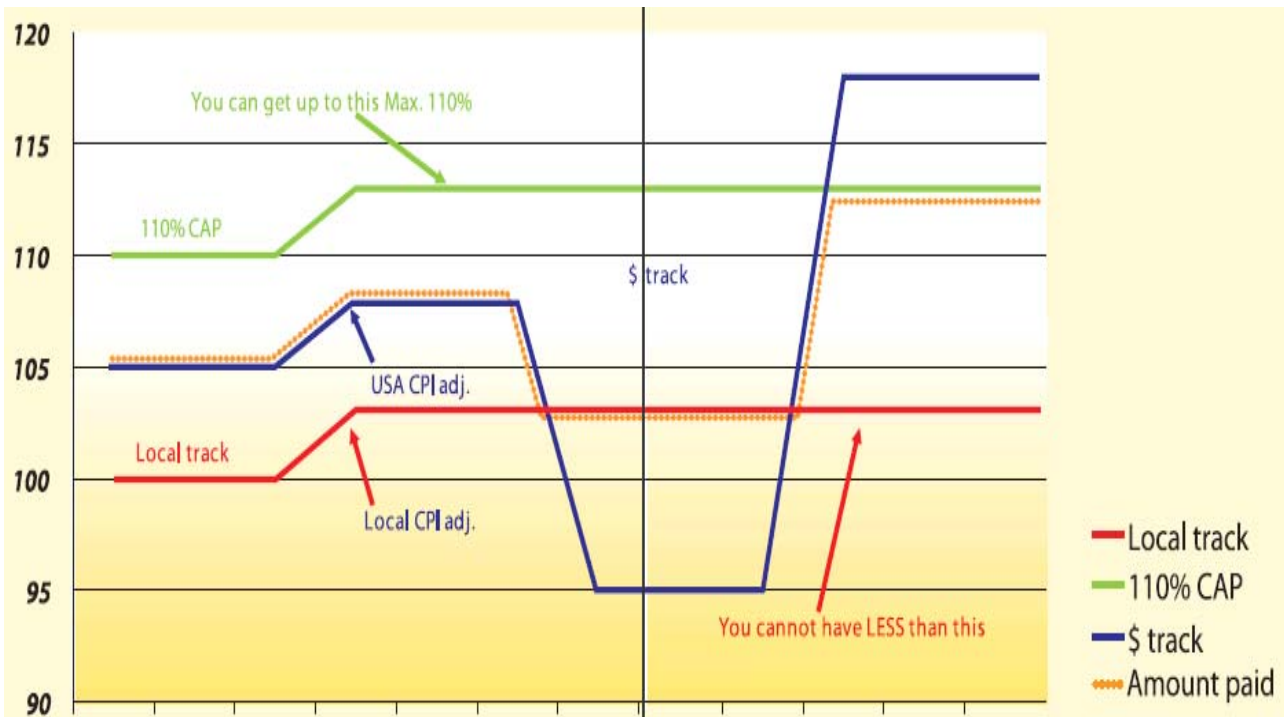
Pension Adjustments

The current pension adjustment system is intended to ensure that a periodic benefit never falls below the "real" value of its U.S. dollar amount, as determined under the Regulations, and preserves its purchasing power as initially established in the currency of the recipient's country of residence: this is achieved by establishing a dollar base amount and a local currency base amount (two-track system).

The "real" value of a U.S. dollar amount is that amount adjusted over time for movements of the U.S. CPI(U), while the purchasing power of a recipient's benefit, once established in local currency, is preserved by adjusting it to follow movements of the CPI in his or her country of residence.

Adjustments also operate on flat dollar benefit amounts; flat dollar amounts included in this summary are prior to the application of such adjustments.

Two Track System—How It Works



The above graphic demonstrates how the Two Track System works. This picture was taken from a UNJSPF communication.

The table below represents a decision framework for the Two Track System:

Situation Over Last Three Years	Long-Term Expectation for Local Currency Against the Dollar	Action
Local Currency Appreciating Against the Dollar	Appreciating	Two-Track
	Remain at Current Rate	Two-Track
	Depreciating	Depends on amount of depreciation expected
Constant Rate	Appreciating	Two-Track
	Remain at Current Rate	Defer election
	Depreciating	Defer election
Local Currency Depreciating Against the Dollar	Appreciating	Depends on amount of appreciation expected
	Remain at Current Rate	Defer election
	Depreciating	Defer election

Review of Assumptions for “Regular Valuation”

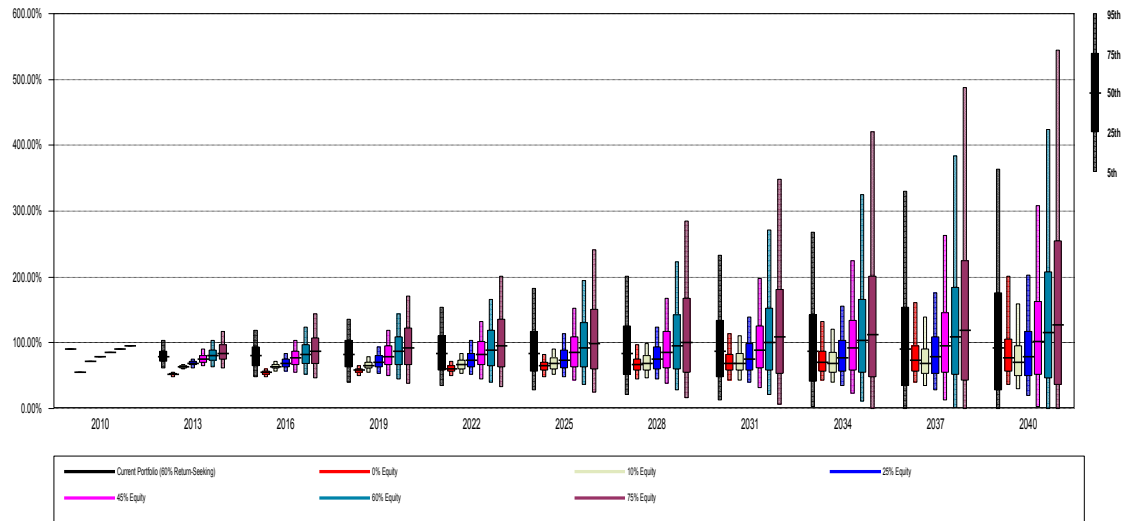
Economic Factors	
Increases in pensionable remuneration (in addition to real increases)	4.5%
Nominal rate of interest (investment return)	7.5%
Price increases (reflected in increases of pensions to beneficiaries)	4.0%
Real rate of interest (investment return after inflation)	3.5%
Usual designation	4.5%/7.5%/4%
Cost of two-track adjustment system (1.9% of pensionable remuneration)	Included

Future Growth of Participant Population	
For each of the first 10 years:	
Professional staff	0.5%
General Service staff	0.5%
For each of the next 20 years (zero growth thereafter):	
Professional staff	0.0%
General Service staff	0.0%

Other Assumptions

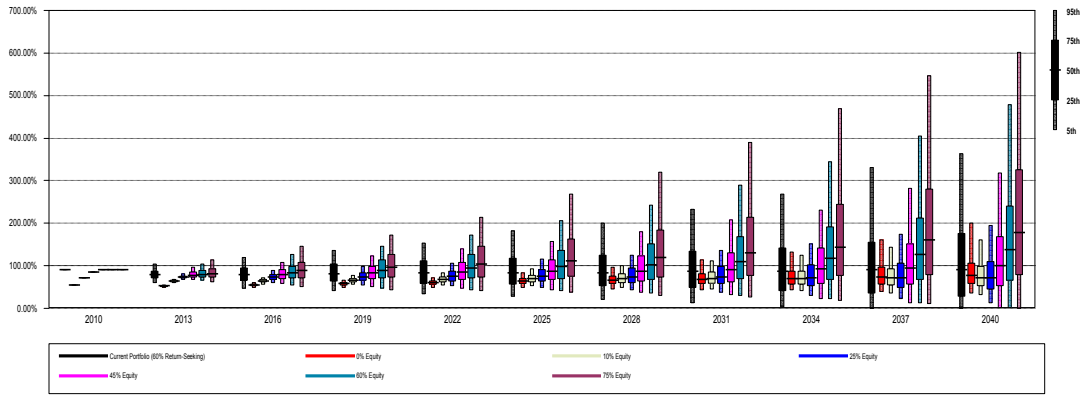
- Asset valuation method: 5-year moving market value
 - Adjusted for
 - Cash flow, excluding realized and unrealized profits and losses, and
 - Limited by 15% of the market value as of each 31 December
 - Actuarial tables used as valuation basis: As described in Schedule B I ‘Report on the Thirtieth Actuarial Valuation of the United Nations Joint Staff Pension Fund’

PVAB Funded Ratio



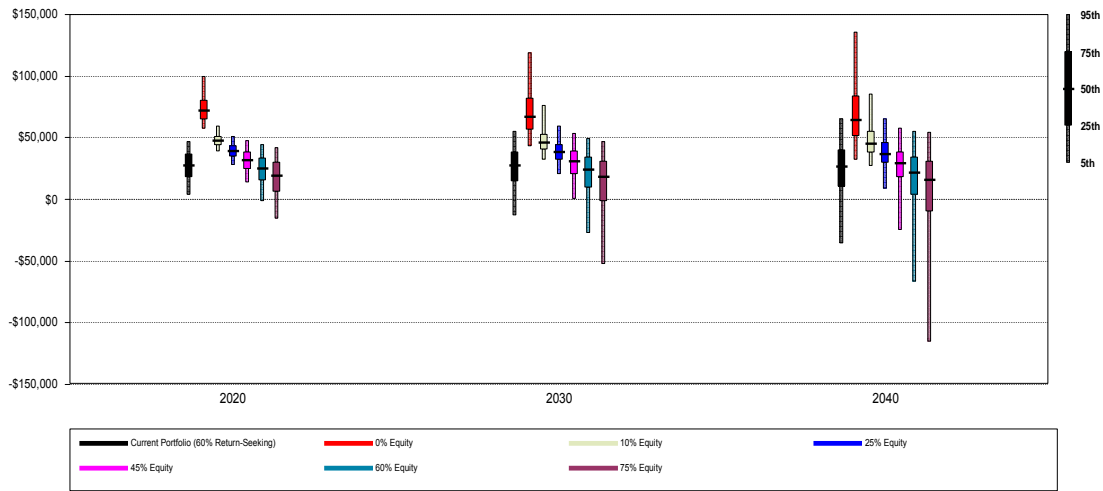
	2010	2013	2016	2019	2022	2025	2028	2031	2034	2037	2040
Current Portfolio (60% Return-Seeking)											
Very Optimistic	91.0%	103.6%	120.5%	136.0%	150.4%	178.3%	199.8%	232.9%	270.8%	321.0%	377.6%
Optimistic	91.0%	87.7%	94.3%	104.0%	111.3%	118.5%	124.5%	133.2%	144.4%	156.5%	179.4%
Expected	91.0%	78.7%	79.5%	81.0%	83.0%	83.2%	83.5%	87.0%	86.7%	87.2%	89.4%
Pessimistic	91.0%	72.0%	65.8%	62.9%	58.8%	56.1%	52.4%	48.6%	42.7%	35.7%	29.0%
Very Pessimistic	91.0%	60.9%	47.5%	40.3%	35.1%	28.4%	21.3%	14.4%	4.6%	0.0%	0.0%
0% Equity											
Very Optimistic	54.6%	54.8%	59.7%	65.6%	72.7%	82.8%	96.4%	113.4%	133.1%	161.3%	201.2%
Optimistic	54.6%	53.2%	56.5%	61.0%	65.2%	70.7%	75.9%	81.7%	88.0%	96.3%	106.1%
Expected	54.6%	52.4%	54.6%	58.3%	60.7%	64.6%	66.9%	68.9%	70.1%	73.2%	77.4%
Pessimistic	54.6%	51.4%	52.6%	55.0%	56.8%	58.6%	58.4%	58.3%	57.5%	57.4%	57.7%
Very Pessimistic	54.6%	49.1%	48.7%	49.7%	49.8%	49.2%	46.0%	44.4%	43.6%	40.0%	36.7%
10% Equity											
Very Optimistic	71.9%	67.3%	72.0%	78.1%	83.8%	90.7%	99.4%	110.5%	121.1%	138.9%	159.7%
Optimistic	71.9%	65.3%	67.0%	70.0%	73.1%	76.6%	79.7%	83.4%	85.7%	91.0%	95.0%
Expected	71.9%	63.9%	64.1%	65.8%	66.8%	68.1%	68.3%	69.2%	68.9%	68.8%	69.9%
Pessimistic	71.9%	62.6%	61.2%	61.5%	61.0%	60.6%	59.1%	57.9%	55.3%	53.0%	50.7%
Very Pessimistic	71.9%	60.4%	56.9%	55.5%	54.1%	51.8%	47.0%	43.9%	40.0%	34.6%	29.8%
25% Equity											
Very Optimistic	78.0%	76.1%	84.3%	94.6%	103.3%	114.4%	124.0%	139.3%	155.2%	176.7%	203.6%
Optimistic	78.0%	71.2%	75.0%	79.8%	83.9%	89.3%	93.9%	98.6%	103.4%	109.5%	118.1%
Expected	78.0%	68.8%	69.4%	71.2%	73.3%	74.6%	75.3%	75.9%	76.8%	78.0%	79.2%
Pessimistic	78.0%	66.3%	64.2%	64.2%	63.5%	62.4%	60.5%	58.9%	56.3%	53.9%	51.0%
Very Pessimistic	78.0%	62.7%	56.8%	53.0%	51.2%	49.0%	44.9%	39.5%	34.6%	29.0%	20.4%
45% Equity											
Very Optimistic	85.7%	90.4%	103.6%	119.4%	131.8%	151.7%	167.9%	198.2%	224.3%	263.1%	308.4%
Optimistic	85.7%	80.6%	86.9%	95.8%	102.4%	109.2%	117.0%	125.9%	134.3%	146.0%	162.2%
Expected	85.7%	75.1%	76.9%	79.4%	82.6%	84.8%	85.8%	89.4%	91.6%	96.1%	101.6%
Pessimistic	85.7%	70.8%	67.8%	67.1%	66.6%	64.3%	61.8%	61.8%	59.2%	55.3%	51.6%
Very Pessimistic	85.7%	64.9%	54.7%	49.6%	45.9%	43.1%	37.7%	31.9%	24.0%	13.2%	4.0%
60% Equity											
Very Optimistic	91.0%	103.8%	123.5%	143.9%	166.0%	193.6%	223.5%	272.3%	324.5%	384.6%	424.1%
Optimistic	91.0%	88.6%	97.5%	109.2%	119.4%	130.6%	141.6%	153.3%	165.3%	184.8%	208.3%
Expected	91.0%	79.8%	82.8%	86.4%	89.6%	93.0%	94.7%	99.7%	103.6%	109.2%	116.1%
Pessimistic	91.0%	73.1%	68.8%	67.6%	66.1%	63.9%	60.5%	58.9%	55.8%	51.3%	46.5%
Very Pessimistic	91.0%	64.0%	51.2%	44.5%	40.4%	36.1%	28.2%	22.2%	12.2%	1.1%	0.0%
75% Equity											
Very Optimistic	96.1%	117.7%	143.8%	170.8%	201.5%	241.6%	284.1%	349.4%	420.9%	486.9%	544.5%
Optimistic	96.1%	96.7%	107.6%	122.9%	135.4%	150.5%	167.2%	181.0%	201.2%	224.8%	254.3%
Expected	96.1%	84.1%	87.8%	92.1%	96.2%	99.1%	99.8%	108.8%	111.5%	118.5%	128.1%
Pessimistic	96.1%	75.3%	69.4%	67.0%	64.1%	60.6%	56.0%	53.2%	48.4%	43.1%	36.2%
Very Pessimistic	96.1%	62.3%	46.6%	38.7%	32.8%	24.8%	17.1%	7.5%	0.0%	0.0%	0.0%

PVAB Funded Ratio—Relaxed Portfolios



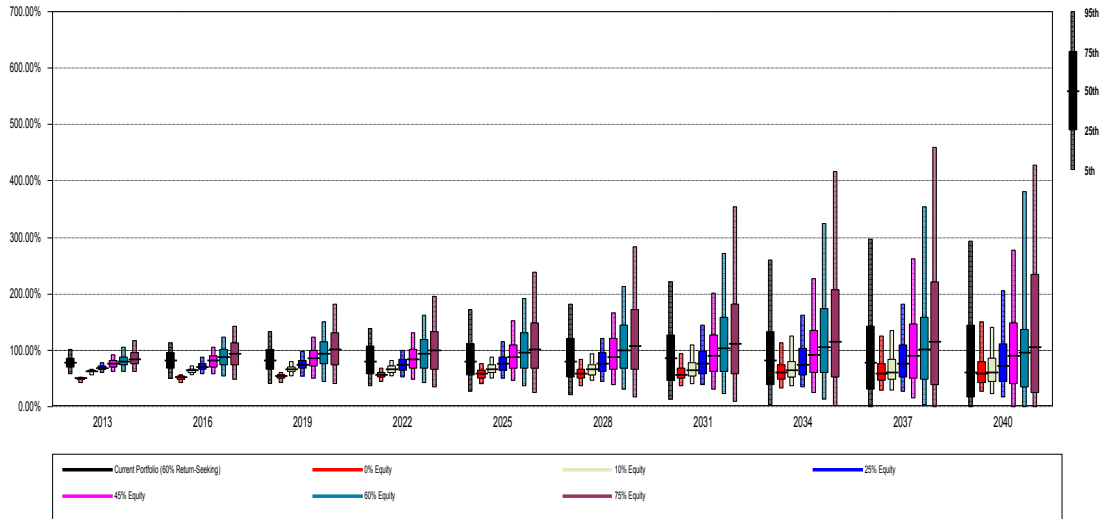
	2010	2013	2016	2019	2022	2025	2028	2031	2034	2037	2040
Current Portfolio (60% Return-Seeking)											
Very Optimistic	91.0%	103.5%	119.8%	136.4%	153.9%	182.4%	200.4%	232.6%	268.9%	330.4%	364.0%
Optimistic	91.0%	87.9%	94.6%	103.8%	110.8%	117.8%	125.3%	134.6%	142.8%	154.2%	176.4%
Expected	91.0%	78.8%	79.8%	81.6%	83.1%	83.3%	83.5%	87.4%	87.2%	90.6%	91.4%
Pessimistic	91.0%	72.0%	65.8%	63.5%	59.4%	56.2%	52.5%	48.7%	42.1%	35.6%	28.9%
Very Pessimistic	91.0%	61.2%	48.0%	40.8%	34.9%	28.8%	21.4%	13.2%	4.1%	0.0%	0.0%
0% Equity											
Very Optimistic	54.6%	54.8%	59.7%	65.6%	72.7%	82.8%	96.4%	113.4%	133.1%	161.3%	201.2%
Optimistic	54.6%	53.2%	56.5%	61.0%	65.2%	70.7%	75.9%	81.7%	88.0%	96.3%	106.1%
Expected	54.6%	52.4%	54.6%	58.3%	60.7%	64.6%	66.9%	68.9%	70.1%	73.2%	77.4%
Pessimistic	54.6%	51.4%	52.6%	55.0%	56.8%	58.6%	58.4%	58.3%	57.5%	57.4%	57.7%
Very Pessimistic	54.6%	49.1%	48.7%	49.7%	49.8%	49.2%	46.0%	44.4%	43.6%	40.0%	36.7%
10% Equity											
Very Optimistic	71.9%	67.2%	72.2%	78.5%	84.1%	92.0%	100.5%	111.8%	125.2%	144.7%	161.1%
Optimistic	71.9%	65.3%	67.3%	70.5%	73.9%	77.9%	81.0%	85.0%	87.3%	92.4%	99.1%
Expected	71.9%	64.0%	64.3%	66.2%	67.5%	69.1%	69.1%	70.7%	70.6%	71.1%	72.3%
Pessimistic	71.9%	62.7%	61.6%	62.2%	62.0%	61.6%	60.6%	59.2%	56.8%	54.9%	52.9%
Very Pessimistic	71.9%	60.6%	57.3%	56.3%	55.3%	52.8%	48.7%	45.7%	41.5%	36.8%	31.9%
25% Equity											
Very Optimistic	85.7%	82.2%	89.3%	98.8%	106.6%	116.3%	125.5%	136.3%	152.3%	174.2%	194.2%
Optimistic	85.7%	76.6%	79.4%	83.0%	86.6%	90.4%	93.9%	99.0%	101.8%	105.1%	110.3%
Expected	85.7%	73.8%	73.3%	74.5%	75.2%	75.7%	74.2%	74.1%	72.6%	72.4%	72.2%
Pessimistic	85.7%	71.4%	68.2%	66.7%	65.1%	63.8%	60.0%	58.1%	53.7%	49.1%	44.6%
Very Pessimistic	85.7%	67.6%	60.4%	55.6%	52.5%	48.6%	42.8%	37.4%	30.7%	22.4%	12.6%
45% Equity											
Very Optimistic	91.0%	96.0%	108.6%	122.7%	139.9%	157.5%	179.8%	208.9%	230.7%	281.1%	318.1%
Optimistic	91.0%	84.6%	91.1%	99.1%	107.4%	113.0%	122.2%	130.1%	141.0%	150.9%	168.7%
Expected	91.0%	78.5%	79.7%	83.1%	85.4%	86.9%	87.9%	90.6%	92.4%	95.4%	99.9%
Pessimistic	91.0%	74.2%	70.7%	69.5%	68.5%	67.6%	63.7%	61.9%	59.1%	57.3%	52.7%
Very Pessimistic	91.0%	67.9%	57.8%	51.2%	47.1%	44.0%	37.5%	31.3%	22.9%	13.2%	1.1%
60% Equity											
Very Optimistic	91.0%	104.7%	126.7%	145.6%	171.9%	206.7%	242.6%	288.6%	343.6%	404.9%	478.0%
Optimistic	91.0%	88.7%	98.8%	113.1%	126.3%	136.8%	151.0%	168.4%	190.9%	211.1%	241.1%
Expected	91.0%	80.2%	83.8%	89.7%	95.0%	99.1%	102.2%	110.2%	117.3%	126.7%	137.8%
Pessimistic	91.0%	74.0%	71.5%	71.7%	71.6%	70.9%	68.5%	69.3%	68.1%	68.1%	66.2%
Very Pessimistic	91.0%	65.7%	54.9%	47.4%	44.2%	41.1%	35.1%	30.5%	22.6%	12.7%	2.5%
75% Equity											
Very Optimistic	91.0%	114.4%	145.6%	172.9%	213.6%	269.6%	320.4%	390.2%	468.5%	546.2%	601.5%
Optimistic	91.0%	93.2%	107.5%	126.9%	145.1%	163.3%	184.2%	213.7%	244.3%	279.9%	326.0%
Expected	91.0%	81.7%	88.0%	96.7%	104.0%	111.6%	119.1%	130.7%	143.9%	160.1%	178.4%
Pessimistic	91.0%	74.0%	71.6%	73.0%	73.5%	74.9%	74.5%	77.7%	77.0%	78.8%	78.9%
Very Pessimistic	91.0%	62.8%	51.0%	44.3%	41.4%	37.4%	30.8%	27.4%	19.0%	11.7%	0.3%

Economic Cost (\$, Millions)



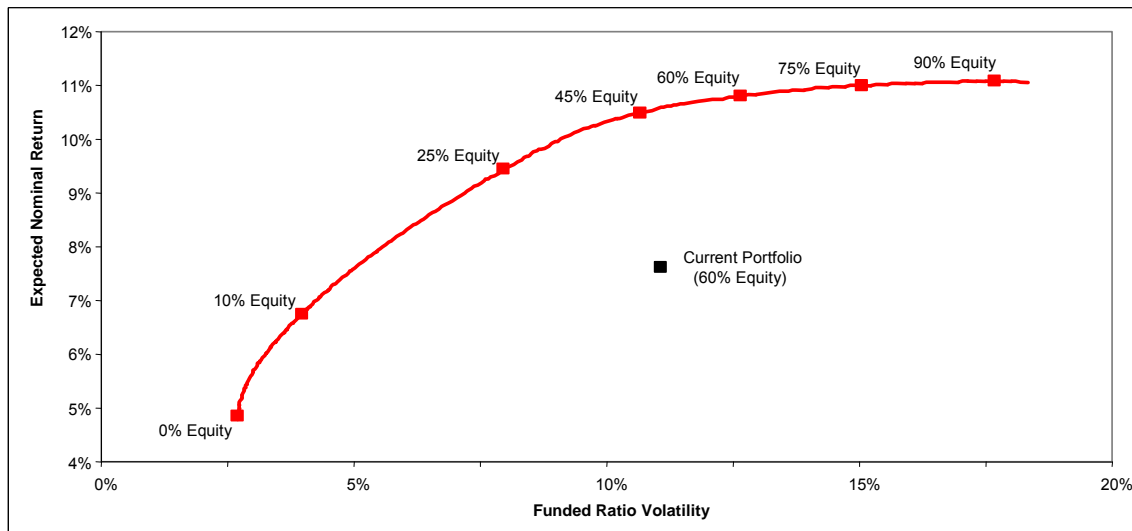
	2020	2030	2040
Current Portfolio (80% Return-Seeking)			
Very Pessimistic	\$47,634	\$57,409	\$66,160
Pessimistic	\$36,526	\$39,156	\$40,546
Expected	\$27,770	\$27,580	\$27,160
Optimistic	\$18,051	\$15,039	\$10,320
Very Optimistic	\$3,897	(\$9,934)	(\$32,567)
0% Equity			
Very Pessimistic	\$99,459	\$119,125	\$135,475
Pessimistic	\$80,609	\$82,468	\$83,837
Expected	\$72,055	\$67,222	\$64,733
Optimistic	\$65,769	\$57,081	\$51,997
Very Optimistic	\$57,528	\$43,896	\$32,837
10% Equity			
Very Pessimistic	\$59,400	\$76,186	\$85,884
Pessimistic	\$51,270	\$52,896	\$55,585
Expected	\$47,569	\$46,034	\$45,426
Optimistic	\$44,101	\$40,975	\$38,132
Very Optimistic	\$39,231	\$32,848	\$27,624
25% Equity			
Very Pessimistic	\$51,231	\$59,724	\$65,181
Pessimistic	\$43,726	\$44,654	\$46,006
Expected	\$39,749	\$38,261	\$36,970
Optimistic	\$35,590	\$32,339	\$30,030
Very Optimistic	\$28,485	\$21,012	\$8,995
45% Equity			
Very Pessimistic	\$47,436	\$53,501	\$58,130
Pessimistic	\$38,316	\$39,126	\$38,645
Expected	\$32,088	\$30,703	\$29,165
Optimistic	\$25,322	\$21,110	\$18,559
Very Optimistic	\$14,381	\$451	(\$23,888)
60% Equity			
Very Pessimistic	\$44,799	\$49,025	\$54,916
Pessimistic	\$33,861	\$34,258	\$34,019
Expected	\$25,167	\$24,224	\$21,909
Optimistic	\$15,588	\$10,145	\$4,095
Very Optimistic	(\$672)	(\$26,422)	(\$66,477)
75% Equity			
Very Pessimistic	\$41,824	\$46,895	\$54,554
Pessimistic	\$30,223	\$31,384	\$31,362
Expected	\$19,675	\$18,548	\$16,292
Optimistic	\$6,820	(\$900)	(\$9,025)
Very Optimistic	(\$14,885)	(\$51,779)	(\$115,222)

PVAB Funded Ratio—Inflation over 4%



	2013	2016	2019	2022	2025	2028	2031	2034	2037	2040
Current Portfolio (60% Return-Seeking)										
Very Optimistic	100.8%	113.6%	133.2%	139.8%	173.0%	182.2%	220.9%	280.7%	298.2%	293.3%
Optimistic	86.2%	96.2%	102.4%	107.1%	112.0%	122.2%	127.9%	132.4%	143.4%	144.4%
Expected	77.6%	81.2%	82.7%	80.9%	79.9%	81.0%	85.6%	82.4%	78.0%	61.4%
Pessimistic	70.1%	67.9%	65.6%	59.2%	57.2%	53.5%	46.4%	39.4%	30.8%	18.1%
Very Pessimistic	58.8%	50.7%	40.6%	37.8%	27.8%	20.6%	13.8%	4.2%	0.0%	0.0%
0% Equity										
Very Optimistic	53.2%	57.5%	60.9%	68.7%	75.6%	83.9%	93.0%	113.7%	125.8%	150.7%
Optimistic	51.8%	54.5%	57.2%	61.1%	65.1%	65.8%	68.7%	73.5%	76.3%	79.8%
Expected	50.7%	52.4%	54.1%	57.2%	58.1%	58.0%	57.0%	60.0%	59.4%	58.0%
Pessimistic	49.1%	49.4%	50.9%	53.1%	51.6%	51.6%	50.0%	49.2%	46.8%	43.7%
Very Pessimistic	42.9%	43.2%	42.6%	44.9%	40.4%	38.1%	36.2%	33.6%	29.2%	26.7%
10% Equity										
Very Optimistic	66.6%	71.7%	79.5%	81.2%	88.6%	93.9%	108.9%	125.0%	135.0%	140.0%
Optimistic	64.6%	66.9%	70.3%	72.3%	74.5%	75.3%	78.6%	80.0%	84.0%	86.2%
Expected	63.4%	64.0%	66.1%	66.3%	66.8%	65.9%	64.4%	63.9%	61.6%	60.4%
Pessimistic	61.7%	61.0%	61.7%	61.1%	59.8%	57.1%	54.5%	53.0%	48.6%	44.9%
Very Pessimistic	56.6%	56.8%	54.7%	54.3%	51.2%	46.2%	40.6%	36.9%	30.2%	23.7%
25% Equity										
Very Optimistic	77.3%	87.1%	98.4%	100.1%	115.0%	120.8%	144.9%	161.9%	182.6%	205.7%
Optimistic	71.8%	76.3%	82.1%	84.8%	88.4%	95.8%	98.6%	103.4%	109.5%	110.6%
Expected	68.9%	71.3%	74.8%	74.6%	76.5%	75.9%	76.4%	73.7%	75.3%	72.4%
Pessimistic	65.7%	65.9%	68.0%	64.5%	63.7%	62.4%	58.9%	56.4%	52.1%	44.7%
Very Pessimistic	61.2%	58.7%	53.9%	52.1%	50.1%	45.8%	39.2%	34.7%	28.2%	17.8%
45% Equity										
Very Optimistic	92.5%	104.9%	123.4%	130.1%	151.9%	165.2%	201.7%	226.4%	262.7%	277.1%
Optimistic	81.4%	90.7%	99.7%	102.6%	109.0%	120.9%	127.1%	134.3%	147.3%	147.9%
Expected	75.6%	81.2%	85.1%	84.9%	87.7%	88.9%	90.7%	91.3%	90.1%	89.7%
Pessimistic	70.0%	70.4%	72.9%	68.7%	68.2%	66.6%	63.3%	60.2%	51.1%	41.9%
Very Pessimistic	63.3%	57.7%	49.9%	48.8%	46.1%	38.8%	30.4%	25.0%	14.7%	0.1%
60% Equity										
Very Optimistic	105.5%	123.8%	150.5%	163.2%	190.9%	214.1%	272.5%	324.3%	353.4%	381.1%
Optimistic	88.8%	101.7%	114.6%	118.9%	131.2%	145.3%	158.0%	174.2%	157.8%	136.1%
Expected	80.1%	87.3%	94.2%	93.4%	95.0%	98.9%	103.1%	105.1%	101.4%	96.0%
Pessimistic	73.5%	73.6%	75.3%	68.9%	69.4%	68.0%	62.0%	60.0%	49.8%	35.1%
Very Pessimistic	63.1%	54.9%	45.6%	42.6%	36.7%	31.4%	22.7%	14.3%	3.8%	0.0%
75% Equity										
Very Optimistic	117.5%	143.1%	181.7%	195.0%	238.9%	283.3%	354.3%	416.1%	460.1%	428.9%
Optimistic	96.7%	112.5%	131.0%	133.2%	148.3%	172.9%	181.4%	208.0%	221.0%	235.5%
Expected	84.2%	93.3%	101.0%	100.1%	101.9%	107.4%	111.1%	116.0%	115.4%	105.0%
Pessimistic	75.5%	74.8%	75.0%	67.3%	69.1%	66.4%	58.1%	52.5%	38.8%	24.5%
Very Pessimistic	62.1%	49.8%	40.9%	35.0%	25.5%	16.8%	10.0%	1.4%	0.0%	0.0%

Unconstrained Asset-Liability Efficient Frontier



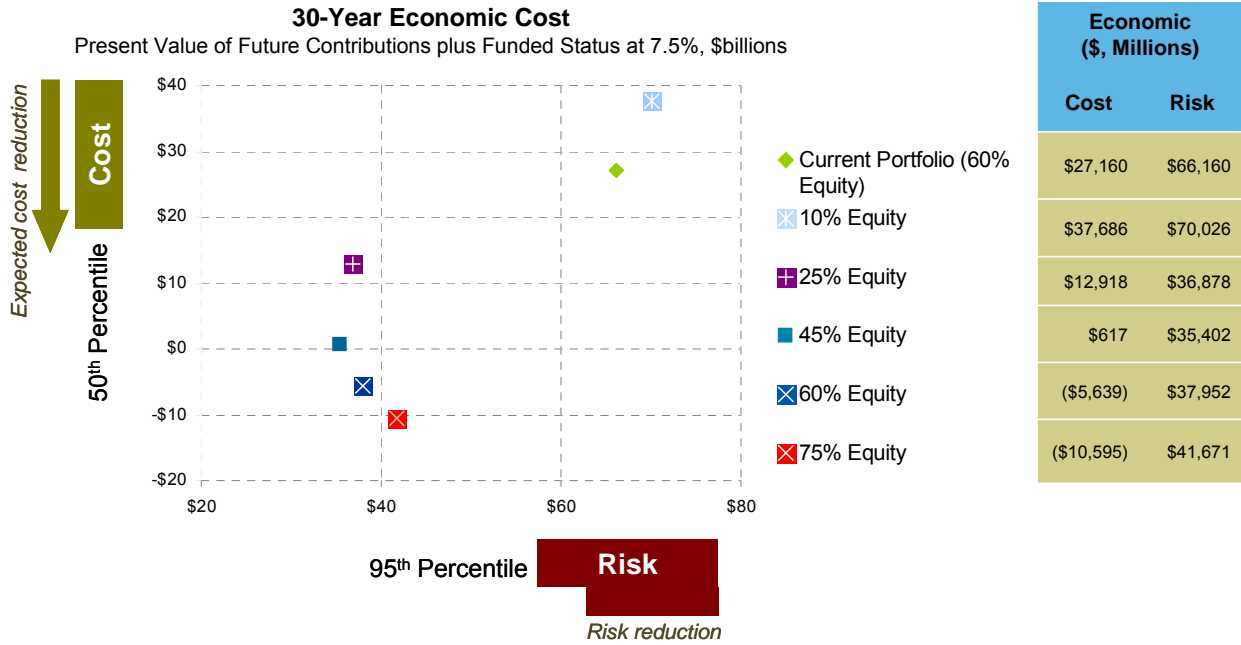
	Expected Nominal Return	Funded Ratio Volatility	Global Equity	Emerging Markets Equity	Private Equity	Real Estate	Commodities	Inflation Linked Bonds	Global Bonds
Current Portfolio (60% Equity)	7.7%	11.0%	52%	8%	0%	6%	0%	0%	34%
Efficient Portfolios									
0% Equity	4.7%	2.8%	0%	0%	0%	0%	0%	24%	76%
10% Equity	6.8%	3.9%	0%	4%	6%	20%	7%	27%	36%
25% Equity	9.4%	7.9%	0%	10%	15%	50%	13%	0%	12%
45% Equity	10.5%	10.5%	0%	20%	25%	43%	12%	0%	0%
60% Equity	10.8%	12.5%	0%	28%	32%	32%	8%	0%	0%
75% Equity	11.0%	14.9%	0%	36%	39%	20%	5%	0%	0%
90% Equity	11.1%	17.5%	0%	45%	45%	10%	0%	0%	0%

Key Takeaways

- 1) The unconstrained efficient frontier allocates towards emerging markets equity, private equity, and real estate
- 2) Quantitative advantages include enhanced return and diversification via emerging markets equity, private equity, and real estate
- 3) Qualitative disadvantages include liquidity and concentration risk

A-L Projection Analysis

30-Year Economic Cost—Unconstrained Portfolios



Key Takeaways

- 1) Higher equity portfolios reduce long-term expected cost.
- 2) Smoothing mechanisms employed by the actuary dampen cost volatility.
- 3) The relaxed 45% equity portfolio appears to minimize risk, while also significantly reducing the expected economic cost.
- 4) Heavier allocations to equity increased the risk, but further reduced cost.

Pragmatic Optimization and Stress Testing

The primary issue with unconstrained optimizations is that they produce portfolios that do not hold up in alternative scenarios. An example of this would be the significantly different outcomes that are produced by minor adjustments in capital market assumptions. Our view is that statistical tools are best used to arrive at a process of “pragmatic optimization”. This involves identifying a series of ‘best ideas’ portfolios for further consideration. The purpose is to identify a set of portfolios that lie on or just inside the theoretical efficient frontier, but which must meet real world tests of appearing sensible and realistic.

Using all the asset classes modeled, or a constrained set where the client has inadequate comfort levels for certain asset classes, a range of possible portfolios within the appropriate risk ranges agreed can be developed. It is important that for the portfolio options then developed, a stress testing process is used to check for robustness. The stress testing should involve considering alternative scenarios – either for particular market outcomes such as changes in correlations or a volatility shock, or the impact of market falls in riskier asset classes. The sensitivity of the risk measures to these scenarios or shocks would help to establish, with the client’s input, changes that need to be made to ensure that risk and returns stay within the tolerances made clear at the outset.

Unconstrained vs. Constrained

Aside from the input assumptions, one can affect the shape of the efficient frontier through the use of *constraints*. Constraints place limits on the amount of money that can be invested in any one asset class or in multiple assets

Constraints are necessary in the very *real* world of investment decisions. As an example, a plan sponsor may wish to limit the amount of foreign stocks to 20% in its portfolio

Optimizers tend to favor “illiquid” asset classes because of their higher expected return (premium for taking on illiquidity). Most institutional investors face cash flow requirements that make large allocations to illiquid investments unacceptable

Mean-Variance Analysis—Limitations

Assets are infinitely divisible: Clearly no one can invest in any portfolio in increments of smaller than the smallest unit of their currency (penny). Therefore, the efficient frontier cannot in reality be a smooth curve

Investors evaluate a portfolio based on its expected return and standard deviation: Mean-variance analysis depends on the assertion that the higher moments of security return distribution are zero. In actuality, tests of historical return data has found evidence of negative skewness and leptokurtosis

No transaction costs: All investors in the real world face some form of transaction costs

Unlimited borrowing and lending at the risk-free rate: In the real world, no market participant other than the U.S. government can borrow unlimited funds at the risk-free rate (considering treasury securities to be risk-free)

Qualitative Factors Influencing Asset Allocation Decision

Risk Tolerance and Return objectives

Liability structure and Funded status

Time and Resources

Liquidity

Leverage

Time Horizon

Fees

Transparency

Conventionality

Ability to benchmark

Peer practices

Access

Restrictions due to legal or regulatory imperatives or internal policies

Quantitative Factors Influencing Asset Allocation Decision

Return expectations

Inflation sensitivity

Beta exposures

Beta consistency

Correlations among asset classes

Volatility

Rebalancing Strategy

Rebalancing is an important tool for controlling the risk of a diversified investment program. The goal of a rebalancing program is to balance tracking risks against rebalancing costs while keeping the administration of the process manageable.

Rebalancing is necessary when the actual allocation falls outside of a pre-determined range (e.g., +/-5%). There are two ways to rebalance. One is rebalancing to policy targets. The other way is rebalancing to boundaries of the pre-determined ranges.

Given the same pre-determined ranges, rebalancing to targets results in a lower benchmark risk than rebalancing to boundaries as the actual allocations are more consistent with the policy targets. Benchmark risk is defined as tracking error or standard deviation of the difference between actual fund performance and the policy benchmark performance.

On the other hand, rebalancing to target typically incurs a higher cost than rebalancing to boundaries, given the same rebalancing ranges.

Rebalancing to midpoint (i.e., middle of boundary and target) should have a mixed result between rebalancing to boundary and to target.

Rebalancing Study – Assumptions

We conducted a simulation analysis:

- Assumes the goal of rebalancing is to control risk
- Simulates 5 years of monthly returns for equity and fixed income
- Uses a policy of 70% Equity/30% Fixed Income
- Assumes rebalancing between two asset classes – Equity and Fixed Income
- We assume one way trading costs to be 24 basis points for equity and 12 basis points for fixed income
- Portfolio size is assumed to be \$1 billion
- Randomly generated 10,000 observations from distributions built using our capital markets expectations

Rebalancing Study – Observations

The numbers on the graph represent the tightness of the rebalancing ranges. For instance, “5%” represents +/- 5% around the policy target. Quarterly rebalancing stands for no tolerance of any deviation from the target (+/-0% range).

As illustrated, rebalancing to the target results in better risk control while rebalancing to the boundary incurs lower costs, given the same rebalancing ranges.

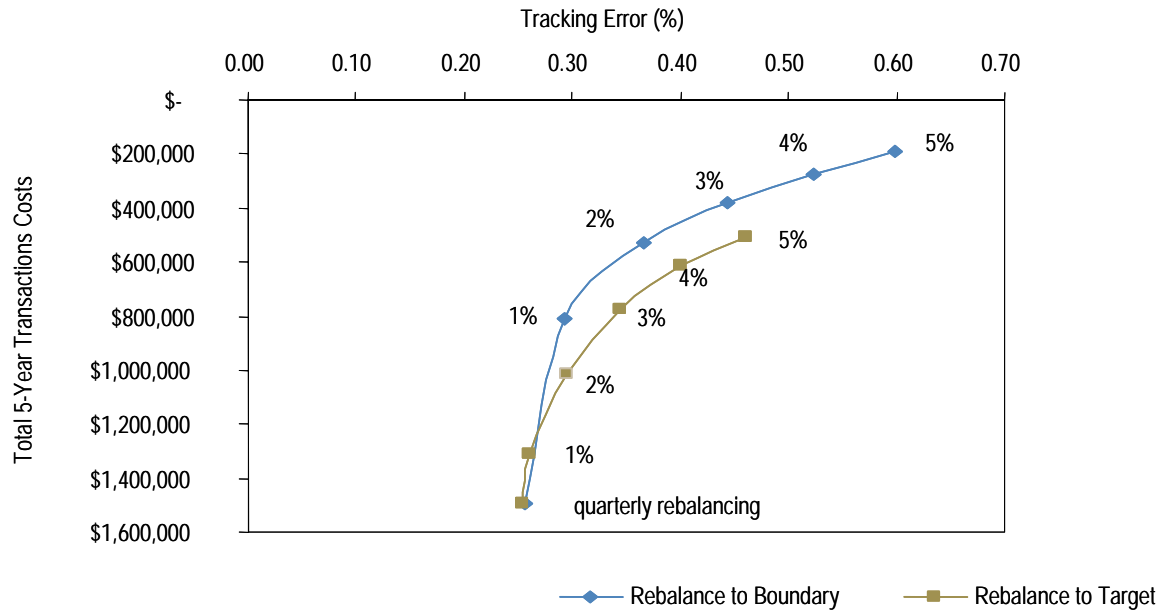
As shown in Figure 1, most of the gains (in terms of risk control) are achieved by adopting rebalancing ranges of 2-3% for the “rebalance to boundary” or 3-4% for the “rebalance to target.”

Figure 2 shows that the average number of transactions will be higher with the rebalancing ranges of 2-3% for the “rebalance to boundary” than with the ranges of 3-4% for the “rebalance to target”, at a slightly lower trading cost.

Figure 3 shows that the average number of transactions will be higher with the rebalancing ranges of 2-3% for the “rebalance to boundary” than with the ranges of 3-4% for the “rebalance to target”, at a similar tracking error.

Rebalancing Study – Figure 1: Risk Control / Cost Trade-Off

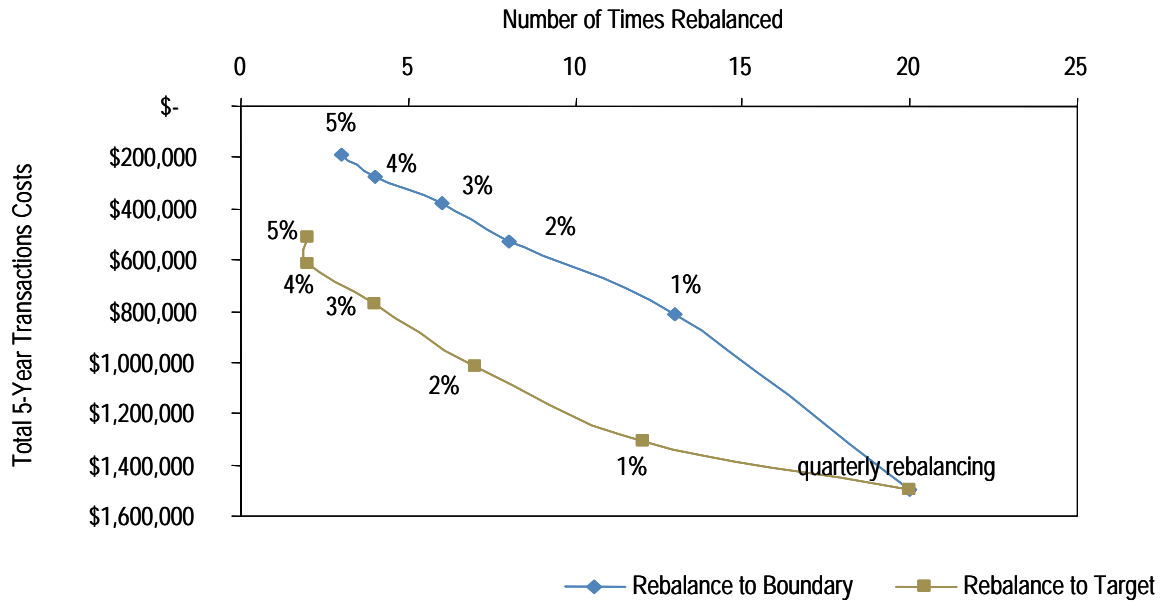
Rebalancing Simulation Results



Tracking error is defined as the standard deviation of the difference between actual Fund performance and the Total Fund's benchmark performance.

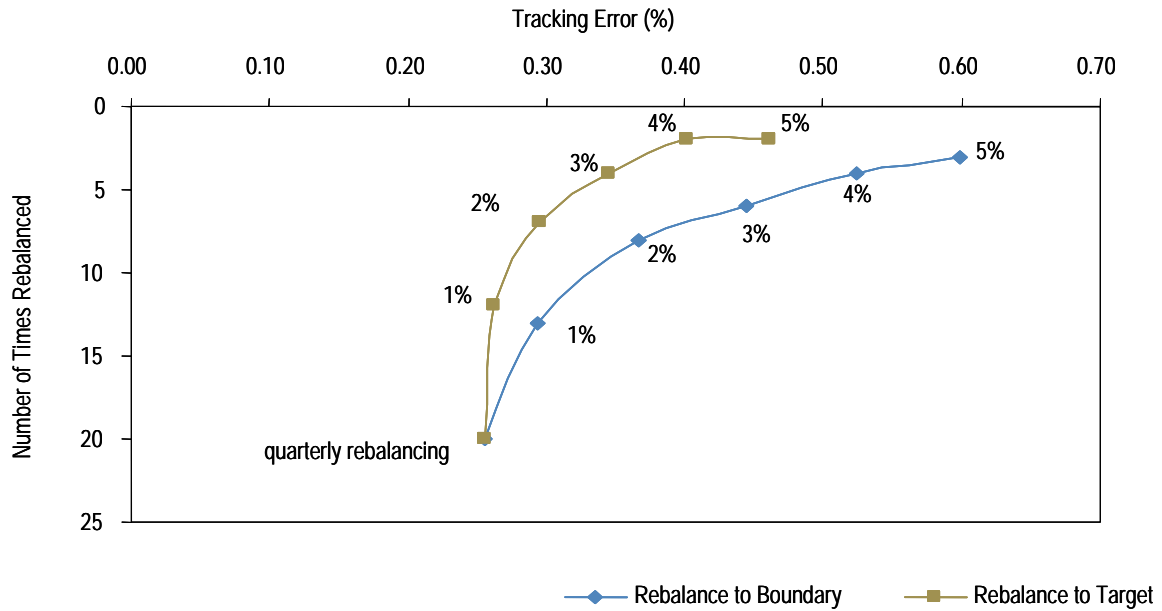
Rebalancing Study – Figure 2: Cost / Number of Transactions

Trading Costs and Number of Times Rebalanced



Rebalancing Study – Figure 3: Risk Control / Number of Transactions

Tracking Error and Number of Times Rebalanced



Views on Rebalancing

Standard institutional practice, and Hewitt EnnisKnupp's view, is to rebalance when actual allocations deviate materially from target allocations, rather than rebalancing at specified time intervals.

Actual allocations should be examined monthly or quarterly for rebalancing purposes.

Narrower rebalancing ranges improve risk control but generally result in higher transaction costs and more frequent rebalancing trades.

Narrow ranges (e.g., +/-5% or less) are generally appropriate.

Rebalancing to the edge of the range as opposed to the target provides a superior risk control/cost outcome.

When trading can be done at very low cost, even narrower ranges and rebalancing to the target may be appropriate.

Inflation—A Self-Fulfilling Prophecy

Governments tend to enact programs to combat recessions and/or financial crises.

Financing government activities are typically accomplished via increased taxation or deficit spending. Increasing the tax burden of a constituent base tends to be unpopular, hence government authorities typically use this tactic as a last resort.

Deficit spending:

- A tax on future consumption
- Sale of government securities to the private sector
- Reduces the purchasing power of the buyer (and local populace) as the supply of money increases

As people become aware of an expanded money supply they tend to expect price increases.

Higher inflation premiums begin to be incorporated into interest rates.

Governments generally prefer lower interest rates (especially in times of crisis) and will spend in order to achieve this goal.

- Securities are created and sold to the central bank
- Central bank buys these securities with newly created money

When the government's concern over inflation is greater than maintaining low interest rates attempts will be made to reduce the money supply.

A reduction in money supply can aggravate an already recession-sensitive economy, thus negating much of the benefit attempting to be derived from initial deficit spending.

The importance of managing inflation expectations

- Recessions and crises generally lead to increased volatility in expected inflation
- Productivity and future consumption levels are put at risk as the populace comes to expect fluctuating levels of inflation and reduced clarity regarding expected inflation
- Long-term contracts are perceived as more "risky" and can possibly become less prevalent
- Inflation expectations play a key role in determining actual inflation; hence a self-fulfilling prophecy

Inflation—A Self-Fulfilling Prophecy

Everyone has to get on the “inflation train.”

- Assuming a highly competitive market, individual corporations trying to push through price increases run the risk of losing market share unless the vast majority of other sellers also increase prices

High levels of inflation ultimately lowers a country’s standard of living and undermines political, social, and economic systems.

The Inflation Debate Today

Case For Inflation

- Massive fiscal and monetary stimulus will result in an inflationary environment
 - Substantial stimulus programs
 - Quantitative easing efforts
 - Record-high fiscal deficit
 - Imbalance in supply/demand dynamics for energy and commodities

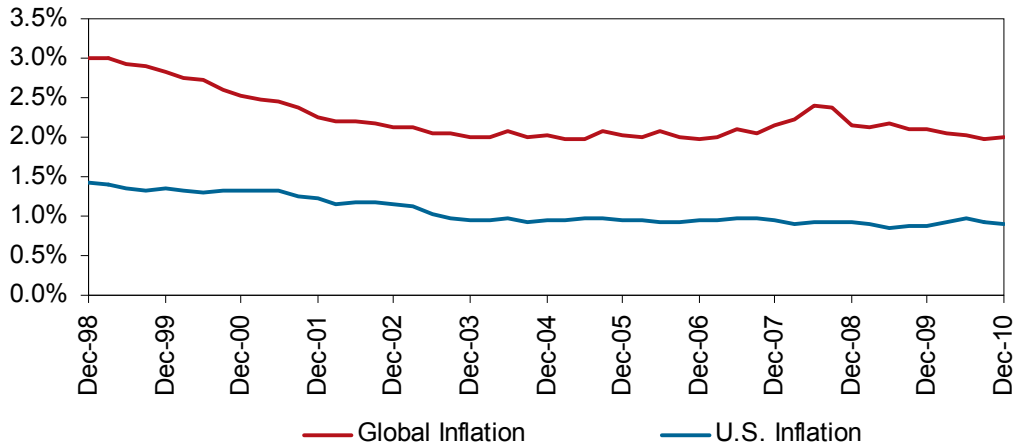
Case Against Inflation

- Certain indicators predict more modest levels of inflation or potentially deflation
 - Unemployment rate and output gap at high levels
 - Depressed consumer demand
 - Structural changes in bank financing
 - Savings rate increasing

Leading economists surveyed by Blue Chip Economic Indicators indicate expectations for annualized inflation between 2% and 3% over the next ten years.

Global Inflation and US Inflation Over Time

Inflation: Rolling 10-Year Analysis
January 1983 - December 2010



Inflation Hedging—Considerations

To the extent pension benefits are tied to wages, both rise with inflation and signal an increased need to investigate/implement hedging strategies

When investing in inflation-linked securities, it is important to be mindful whether these securities track an inflation index that approximates inflation experienced by the plan

Typically, interest rates rise with inflation; to the extent the discount rate is tied to interest rates, a plan may experience a decline in liabilities (all else being equal)

Depending on the needs of the plan, the inflation hedging component of the portfolio can take the form of a:

- Dedicated policy allocation
- Overlay approach where inflation hedging strategies (already present in the plan) are aggregated and analyzed
- Hybrid solution

The vast majority of strategies with inflation protection/real return attributes have an expected return that is less than that of the overall plan

- Allocating to inflation hedging strategies can lead to a lower total portfolio expected return
- Allocating to inflation hedging strategies typically reduces overall portfolio risk and improves the Sharpe Ratio

The Link Between Inflation and Real Assets

The vast majority of real assets have certain commonalities such as being tangible as well as having inflation hedging properties; below we discuss the link between certain real assets and inflation

Commodities

- The source of raw materials used to produce countless consumption items
- Commodity prices have an effect on most of the major underlying inflation components (e.g., energy, food, housing, apparel, and transportation)

Global Inflation-Linked Bonds

- While not a tangible asset, these securities possess the feature of having their value explicitly tied to inflation

Private Real Estate

- A significant underlying component of a country's inflation estimation; more specifically, within the U.S. it is the cost of shelter (also termed owner's equivalent rent) that factors into the U.S. CPI measurement
- Inflation sensitivity is strongly tied to indexed escalations in rent as well as the ability for landlords to pass through expenses
- Core, income producing, properties have been shown to produce better inflation hedging results than properties that rely more heavily on appreciation

Global Equity

- Represents a claim (via dividends) on a real asset
- In theory, corporations will pass along inflation through higher prices
- Over long periods of time, global equities have been shown to provide an inflation hedge

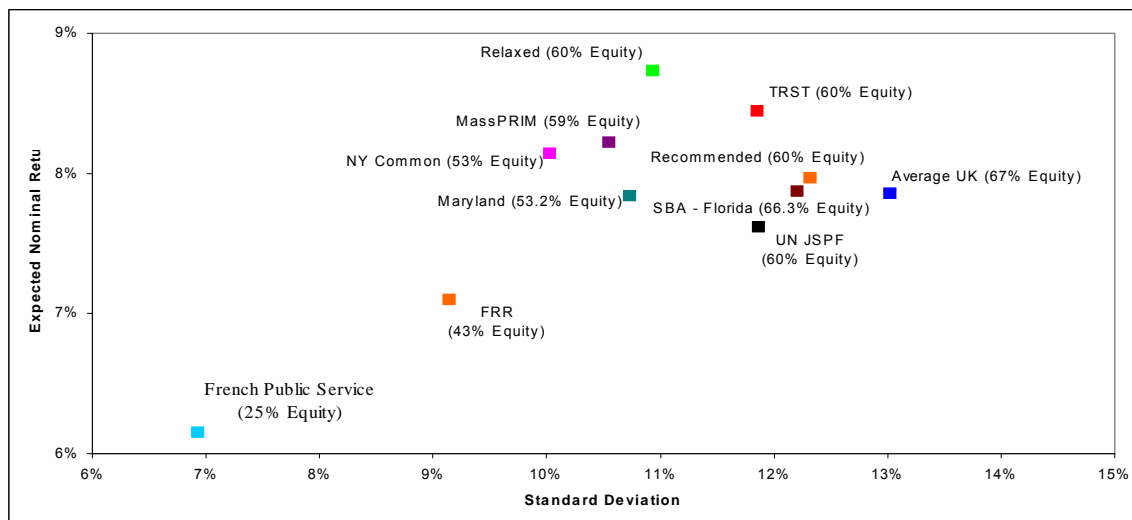
Sample Public Pension Fund Asset Allocations

Asset Class	TRST	NY Common	MassPRIM	SBA (Florida)	Maryland	UK ¹	French Public Service Pension Scheme	Fonds de Reserve Pour Les Retraites (FRR)
Global Equity	50.0	43.0	49.0	62.2	49.7	66	25	43
Private Equity	10.0	10.0	10.0	4.1	3.5	1	0	0
Fixed Income	15.0	22.0	19.0	24.3	24.5	12	60	34
Hedge Funds	4.0	8.0	8.0	2.6	4.3	1	0	0
Cash	1.0	0.0	0.0	0.6	2.0	5	0	0
Real Estate	2.0	6.0	10.0	6.2	6.0	6	0	5
Real Return Strategies	18.0	11.0	4.0	0.0	10.0	9	15	18

■ For purposes of the table above, Real Return Strategies can include

- Inflation protection securities
- Commodities
- Timber

Sample Public Pension Fund Asset Allocations



	Expected Nominal Return	Standard Deviation	Global Equity ¹	Private Equity	Real Estate	Real Return Strategies ²	Hedge Funds	Fixed Income	Cash
UN JSPF (60% Equity)	7.7%	11.9%	60.0%	0.0%	6.0%	0.0%	0.0%	34.0%	0.0%
Recommended (60% Equity)	8.1%	12.4%	54.0%	6.0%	10.0%	5.0%	0.0%	25.0%	0.0%
Relaxed (60% Equity)	8.7%	10.9%	48.0%	12.0%	10.0%	5.0%	0.0%	25.0%	0.0%
TRST (60% Equity)	8.4%	11.9%	50.0%	10.0%	2.0%	18.0%	4.0%	15.0%	1.0%
NY Common (53% Equity)	8.1%	10.0%	43.0%	10.0%	6.0%	11.0%	8.0%	22.0%	0.0%
MassPRIM (59% Equity)	8.2%	10.5%	49.0%	10.0%	10.0%	4.0%	8.0%	19.0%	0.0%
SBA - Florida (66.3% Equity)	7.9%	12.2%	62.2%	4.1%	6.2%	0.0%	2.6%	24.3%	0.6%
Maryland (53.2% Equity)	7.8%	10.7%	49.7%	3.5%	6.0%	10.0%	4.3%	24.5%	2.0%
Average UK (67% Equity)	7.9%	13.0%	66.0%	1.0%	6.0%	9.0%	1.0%	12.0%	5.0%
French Public Service (25% Equity)	6.2%	6.9%	25.0%	0.0%	0.0%	15.0%	0.0%	60.0%	0.0%
FRR (43% Equity)	7.1%	9.1%	43.0%	0.0%	5.0%	18.0%	0.0%	34.0%	0.0%

Key Takeaways

- 1) Several global public fund allocations were studied.
- 2) US and UK sponsors tend to maintain riskier portfolios than the French.
- 3) Many of these sponsors maintained significant real return strategies to hedge inflation risk exposures.
- 4) Higher allocations to alternatives result in higher return per unit of risk.
- 5) Alternatives are generally illiquid – this should be considered before utilization.

Sample Public Pension Fund Asset Allocations

Plan	Funded Ratio	Actuarial Assets (B)	Actuarial Liabilities (B)
US Average (126 plans)	79%	2.6	3.3
IL SERS	43%	11.0	25.3
Louisiana Teachers	59%	13.5	22.8
MI Public Schools	84%	45.7	54.6
NJ Police & Fire	71%	22.9	32.4
NY STRS	103%	88.8	86.1
AGIRC (France)	64%	12.0	18.7
ARRCO (France)	77%	47.8	61.9
FRR (France) ¹	100%		
UK Average (71 plans) ²	70%		
ABP (Holland) ³	104%		
UNJSPF	91%	38.2	41.9

- Average public pension plan has a lower funded ratio than the UNJSPF

Glossary

Actuarial assumptions are the plan actuary's best estimate of future demographic and economic experience.

Actuarial methods are the methods of cost allocation and smoothing employed by the actuary in the determination of the actuarial valuation.

Actuarial valuation is the calculation of the present value of the pension liabilities and the funding rate needed. The actuarial valuation is based on several actuarial assumptions and methods.

Actuarial Value of Assets is the smoothed value of assets for actuarial valuation purposes. The actuary smoothes investment experience over a five year period in order to avoid undue volatility in the actuarial valuation.

Asset Allocation Policy/Strategy is the target portfolio mix, which is constructed of specific target mixes to a variety of asset classes.

Asset Class is a major segment of the market (e.g., global equities, fixed income, real estate, etc.). Each asset class has specific risk/reward attributes.

Asset-liability efficient frontier is the set of portfolio strategies which maximize the return per unit of risk. In this case the unit of risk is asset-liability risk (i.e., funded ratio risk).

Asset-liability matching is the process of aligning the properties of the assets with the properties of liabilities.

Capital market risk is the risk of a loss of value due to capital market volatility.

Contribution is the amount of annual funding to the plan.

Contribution rate is the annual funding rate to the pension plan as a percentage of pensionable remuneration. The contribution rate is 23.7% of pensionable remuneration each year.

Cost of living adjustment (COLA) is the adjustment to benefits payable due to actual realized inflation.

Currency hedging is the removal of currency risk from the plan.

Currency risk is the risk to the plan of changes in currency exchange rates.

Direct real assets are real assets which are directly linked to inflation, such as inflation-linked bonds.

Diversification is the process of building a portfolio of a variety of asset classes, in an effort to improve the risk/reward properties of the fund.

Economic Cost is the Present Value of Contributions plus the Present Value of the Shortfall/(Surplus) at the end of the projection period.

Glossary

Efficient frontier is the set of portfolio strategies which maximize the return per unit of risk. In this case the unit of risk is asset risk (i.e., asset return risk).

Funded ratio is the ratio of the pension assets divided by the value of the pension liabilities.

Funded status is the value of the pension assets minus the value of the pension liabilities.

Indirect real assets are real assets which are strongly correlated with inflation, but are not directly linked to inflation. Examples include real estate and commodities.

Inflation hedging is the removal of inflation risk from the plan.

Inflation risk is the risk to the plan of changes in the inflation rate.

Interest Cost is the cost due to the passage of time. Each year, benefits payable in the future are deferred by one less year in the present value calculation.

Normal Cost is the present value of the cost of new benefits which were accrued by plan participants during the year.

Optimal investment strategy is the strategy with the best risk/reward properties within the context of the pension plan.

Pensionable Remuneration (PR) is the value of pay which is used for purposes of calculating the benefit values and contribution rate.

Present Value of Accrued Benefits (PVAB) is the present value of future payable benefits, including only those benefits which have been accrued to date. No future benefit accruals are considered.

Present Value of Benefits (PVB) is the present value of all future payable benefits, including those benefits which have been accrued in the past and future.

Real assets are assets which are linked to inflation. These assets have historically preserved the real rate of return.

Real rate of return is the rate of return in excess of the inflation rate.

Rebalancing is the process of moving the asset mix back towards the target asset mix after market fluctuations change the mix.

Return shortfall risk is the risk of falling short of the long-term expected return on assets.

Service Cost, see Normal Cost.

Glossary

Stochastic projections are Monte Carlo projections of several thousands of economic trials. The distribution of the thousands of trials over the projection period can be analyzed, and management decisions may be made based on this analysis.

Two Track System is the provision within the UNJSPF which allows plan participants to select the basis for future pension benefit adjustments – either the US dollar, or the local currency.

About This Material

This material includes a summary of calculations and consulting related to the finances of the United Nations Joint Staff Pension Fund (UNJSPF). Thirty-year stochastic projections of the following have been addressed:

- Employer Contributions
- PVAB funded ratios

This analysis is intended to assist the Investments Committee, the Committee of Actuaries, and the Pension Board of the UNJSPF in their respective roles. with a review of the associated issues and options, and its use may not be appropriate for other purposes. This analysis has been prepared solely for the benefit of the Investments Committee, the Committee of Actuaries, and the Pension Board of the UNJSPF. Any further dissemination of this report is not allowed without the written consent of Hewitt EnnisKnupp.

Our calculations were generally based on prescribed methodology using the aggregate funding method as described in the 31 December 2009 Actuarial Valuation Report. We believe the methodology used in these calculations conforms to the requirements of those laws, regulations, and statements.

Experience different than anticipated could have a material impact on the ultimate costs of the benefits. In addition, changes in plan provisions or applicable laws could have a significant impact on cost. Actual experience may differ from our modeling assumptions.

Our calculations for the Plan were based on 31 December 2009 participant information provided by Buck Consultants. The actuarial assumptions and methods and plan provisions reflected in these projections are the same as those used for the 31 December 2009 Actuarial Valuation Report. Unless specifically noted, our calculations do not reflect any other changes or events after 31 December 2009.

In conducting these projections, we have relied on plan design, demographic and financial information provided by other parties, including the plan's custodian, sponsor, and investment consultant. While we cannot verify the accuracy of all of the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

These projections have been conducted in accordance with generally accepted actuarial principles and practices, including applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board. The undersigned actuaries are familiar with the near-term and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All sections of this report are considered an integral part of the actuarial opinions.

To our knowledge, no associate of Hewitt EnnisKnupp providing services to the United Nations has any direct financial interest or indirect material interest in the United Nations. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this report for the United Nations.

Hewitt EnnisKnupp, Inc.
Phil Kivarkis, FSA, EA, CFA