

Opening Ceremony

Mr. Masakazu Arikawa

Date: June 8, 2006



Agenda

16:00 - 17:30: Improving Solvency through Smart Beta and Alpha Management - A Japanese Case Study Using AlphaEngine
Dr. Arun Muralidhar, Chairman

17:30 - 17:45 : Overview of M^{cube} Investment Solutions, Japan
Mr. Masakazu Arikawa, President

*Reception at the Sakura no Ma - Cherry Room
3rd floor of Jyosui Kaikan.*

M^{cube} Background – Global Presence

- 2002: Company founded in the United States
- 2003: Software development center in Bangalore
- *September 2004*: AlphaEngine™ v2.0 launched
- *December 2004*: First Client PME (NL) signs up
- Clients in Japan, U.S., Europe, Canada and Middle East, including CalPERS
- *May 2006*: DIAM becomes first Japanese client
- Offices in Japan (May 25), U.S., Netherlands (cooperation with ORTEC), and India
- Senior management from global pension funds

AlphaEngine™ Improves Portfolio Management

Being Smarter Just Got Easier...



Customized Solutions

Effective Portfolio Structure

Intelligent Rebalancing

Informed Manager Allocations

Evaluate Alpha Strategies

Manage Currency Risk

Improved Governance

Improving Solvency Through Smart Beta & Alpha Management Relative to Liabilities

Dr. Arun Muralidhar

Opening Ceremony:

Mcube Investment Solutions, Japan

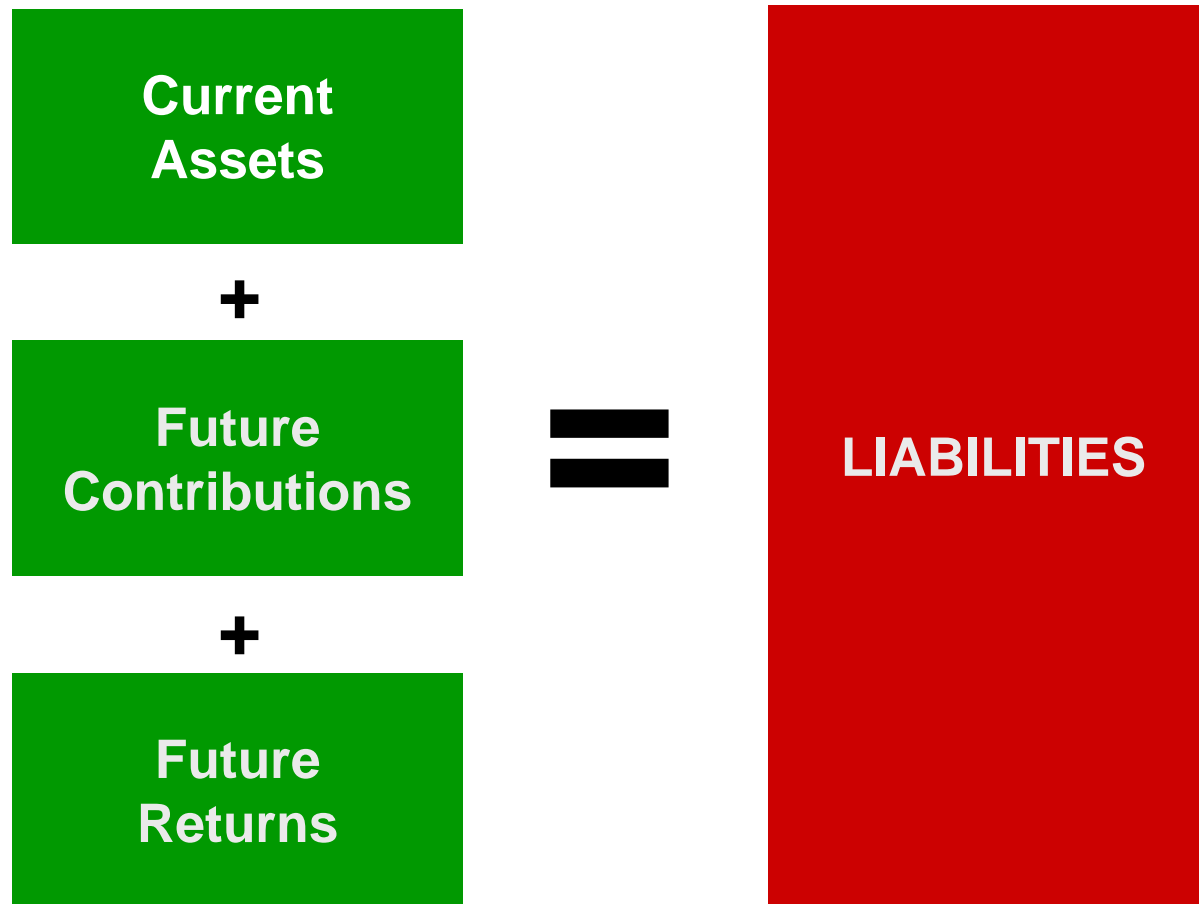
June 8, 2006



A More Comprehensive Approach

- Integrating LDI with Beta and Alpha Management – 3 Steps
 - Effective Modeling of Liabilities
 - Investment Decision Process (IDP) and Portfolio Structure
 - Managing the Dynamism of Portfolios
 - Drift/Naïve Rebalancing
 - Beta Management – Simple & Smart
 - Alpha Management
- Conclusion: Can implement in a step-by-step manner

What is a Pension Fund? The Static ALM Perspective

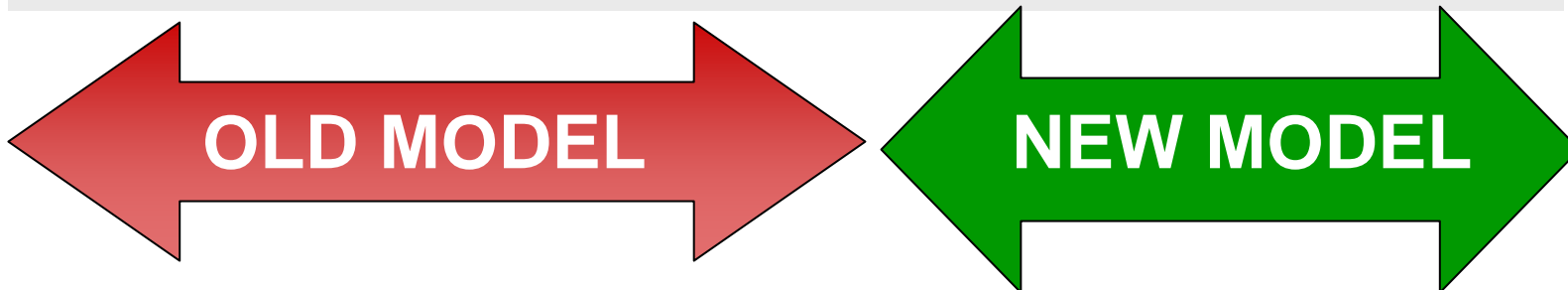
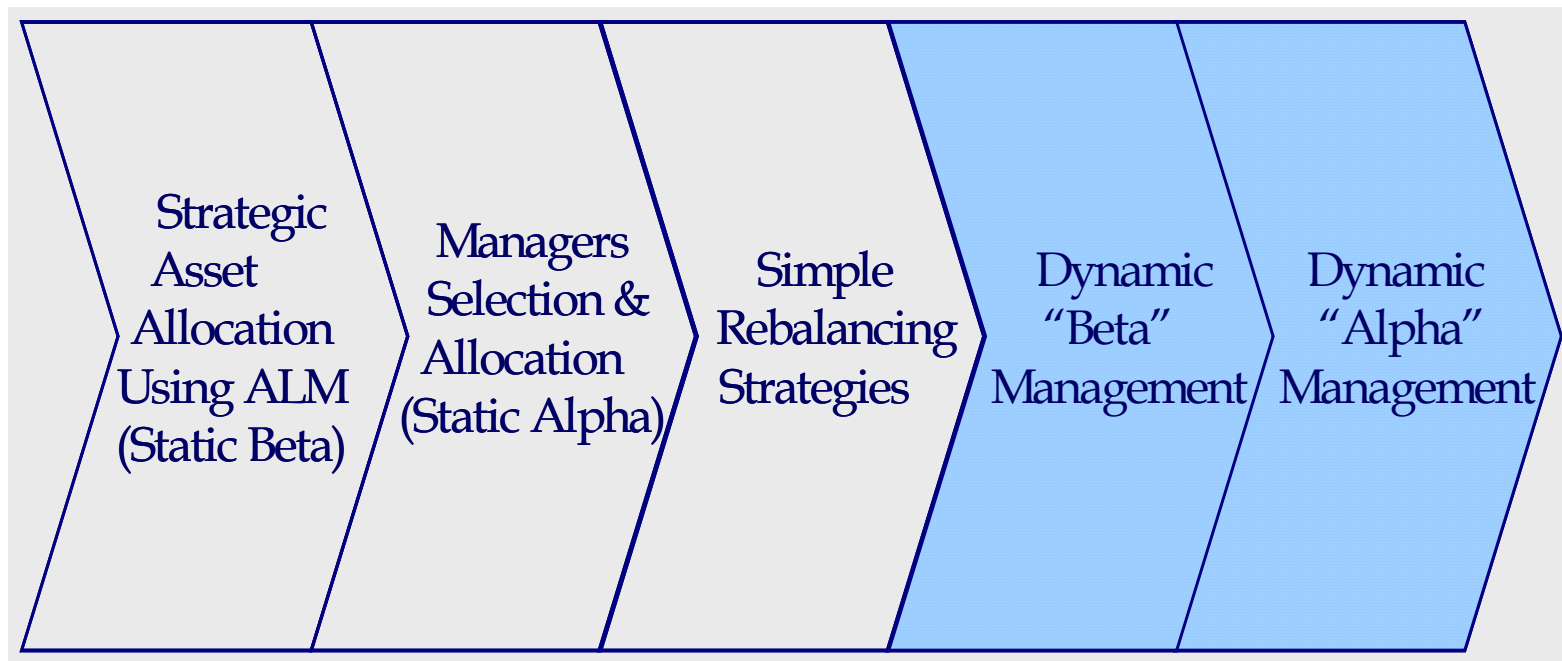


Simple picture hides complex problems of managing funds

Challenges in Managing Pension Funds - Dynamism

- Pension fund cash flows projected annually
- Liability value could be changing within year
- Funds experience periodic cash flows – which assets should be reduced/increased?
- Current recommendations are static (invest in LDI product; rebalancing; hire portable alpha)
- Must develop dynamic investment strategies to grow solvency (growth of assets vs liabilities)

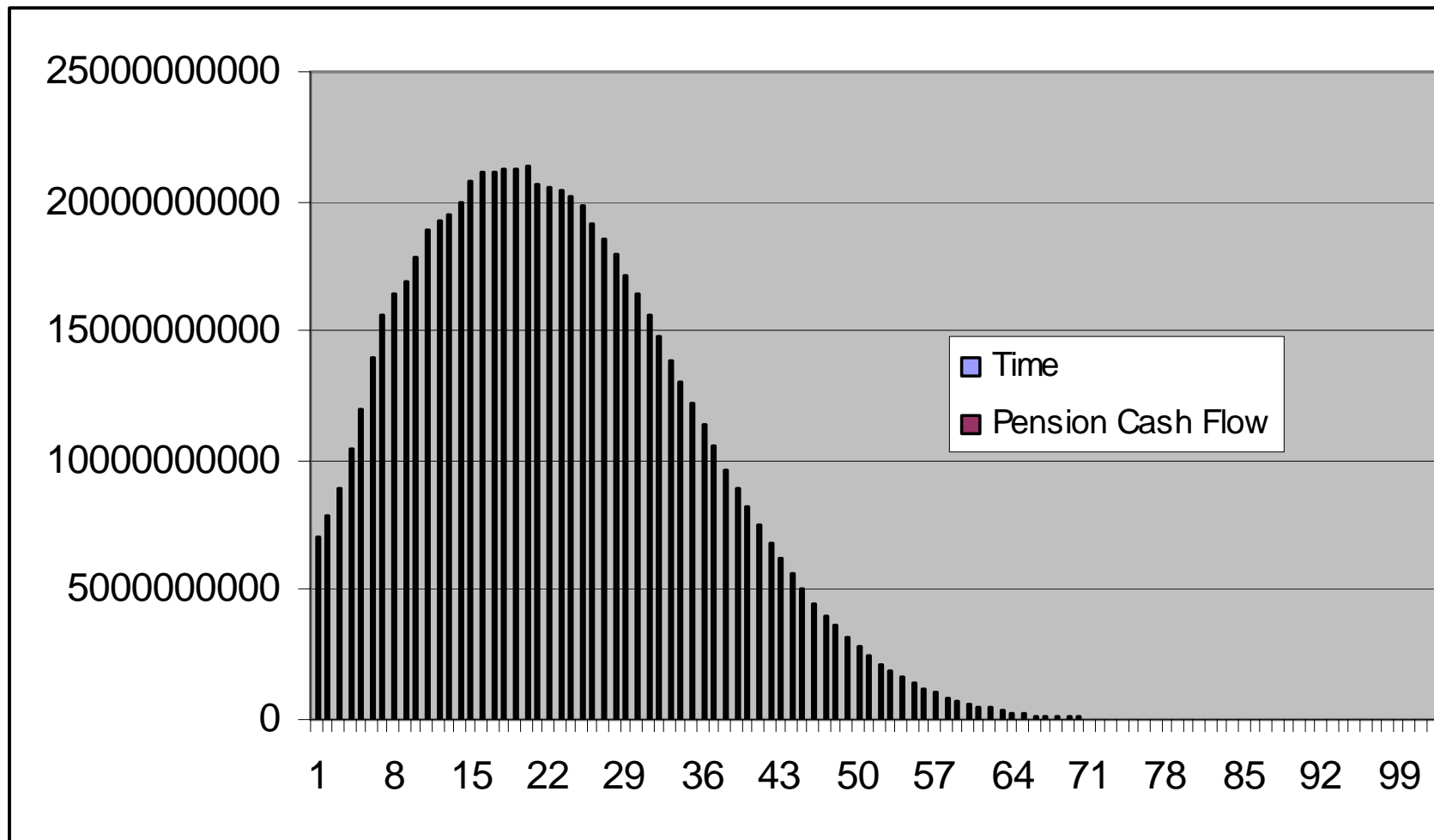
Move from Optimal Portfolios to Optimal Strategies



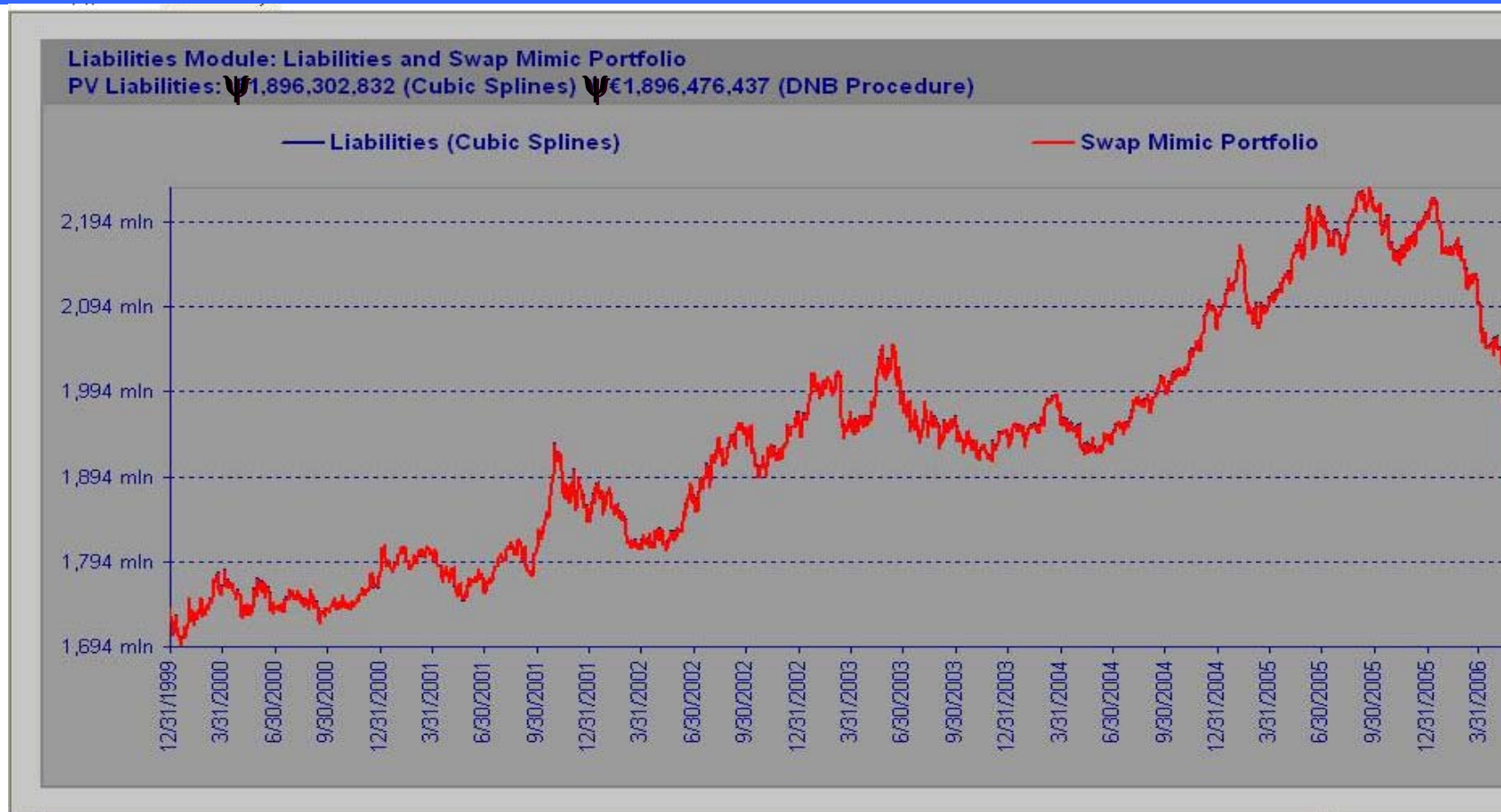
Market is dynamic; must manage Beta and Alpha

Effective Liability Modeling – An Easy Approach

- Begin with Annual Pension Cash Flow Projections



Liabilities are Dynamic and Evolve over Time



- *Influenced by market factors: interest rates and inflation*
- *Static policies will fail against a dynamic benchmark*

Investible Liability Benchmark: Easy Monitoring

- Create a simple portfolio of swaps to track liabilities

Select Date: 05/24/06

First Instrument: 012M SWAP

Last Instrument: 600M SWAP

Menu

Save

Print

Liabilities Module: Solution & Statistics

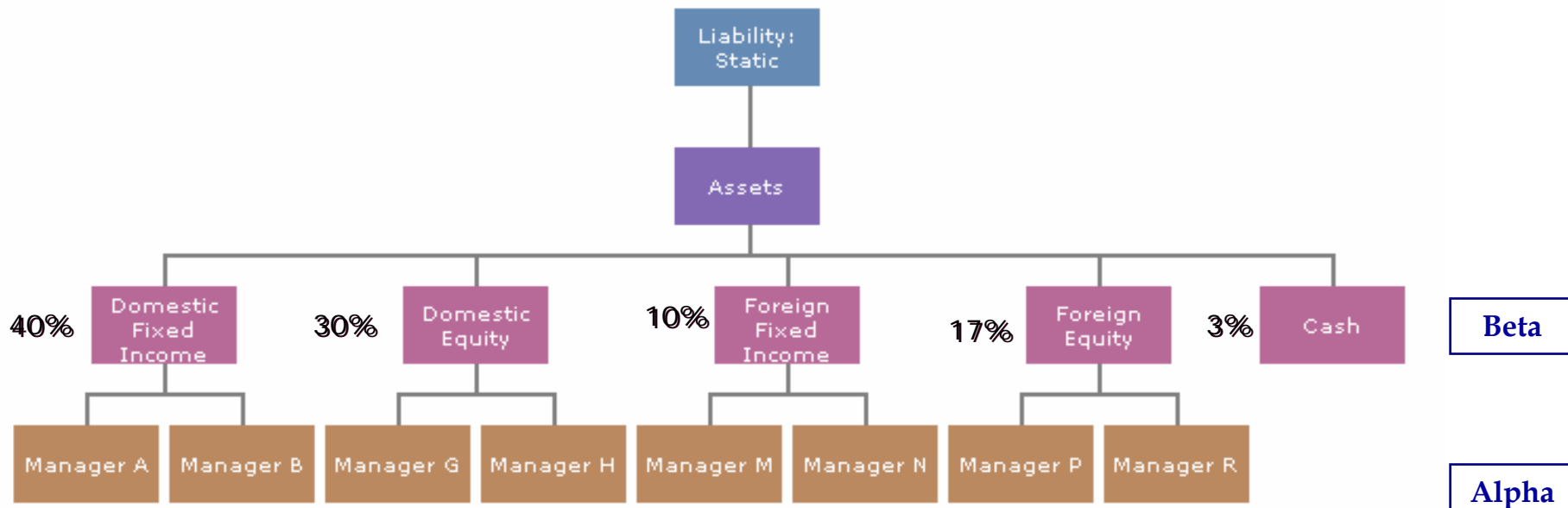
PV Liabilities: Ψ €1,896,302,832 (Cubic Splines) / Ψ €1,896,476,437 (DNB Procedure)

Swap Instrument	Swap Rate	Swap M.Dur.	Opt. %	Optimal Notional
012M SWAP	0.54%	0.99	-4.60%	-€ 87,216,885
024M SWAP	0.87%	1.97	-3.06%	-€ 57,997,285
060M SWAP	1.52%	4.80	-2.56%	-€ 48,600,389
120M SWAP	2.06%	9.06	15.99%	€ 303,302,607
240M SWAP	2.47%	15.90	20.55%	€ 389,598,380
360M SWAP	2.60%	20.92	42.08%	€ 798,010,558
480M SWAP	2.64%	24.64	19.71%	€ 373,699,043
600M SWAP	2.66%	27.42	8.71%	€ 165,253,926

Tracking Error Daily	0.006%
Tracking Error Annualized	0.103%
R-Squared	99.98%
Total Swap Notional	€ 1,836,049,955
Present Value (Cubic Splines)	€1,896,302,832
Present Value (DNB)	€1,896,476,437
Duration Liabilities	20.48
Duration Mimic Portfolio	20.53

Change in Solvency = Growth of Assets - Growth of Liabilities

Portfolio Structure Creates Decision Hierarchy



*Beta and Alpha Management can be implemented separately
Too much focus on manager selection – lowest level*

Investment Decision Process - Importance

- Identifies all the Portfolio Decisions being made, whether implicitly or explicitly, as a decision tree
- Within the “tree”, decisions are impacted by other higher level decisions
- Unmanaged decision can be a source of “return leakage”
- Link between structure, ongoing management and performance analysis – measure, manage, monitor

What gets measured gets managed

Understand Sources of Returns: Liability Return = 4.03%

All Managers Static Excess = 0.29%

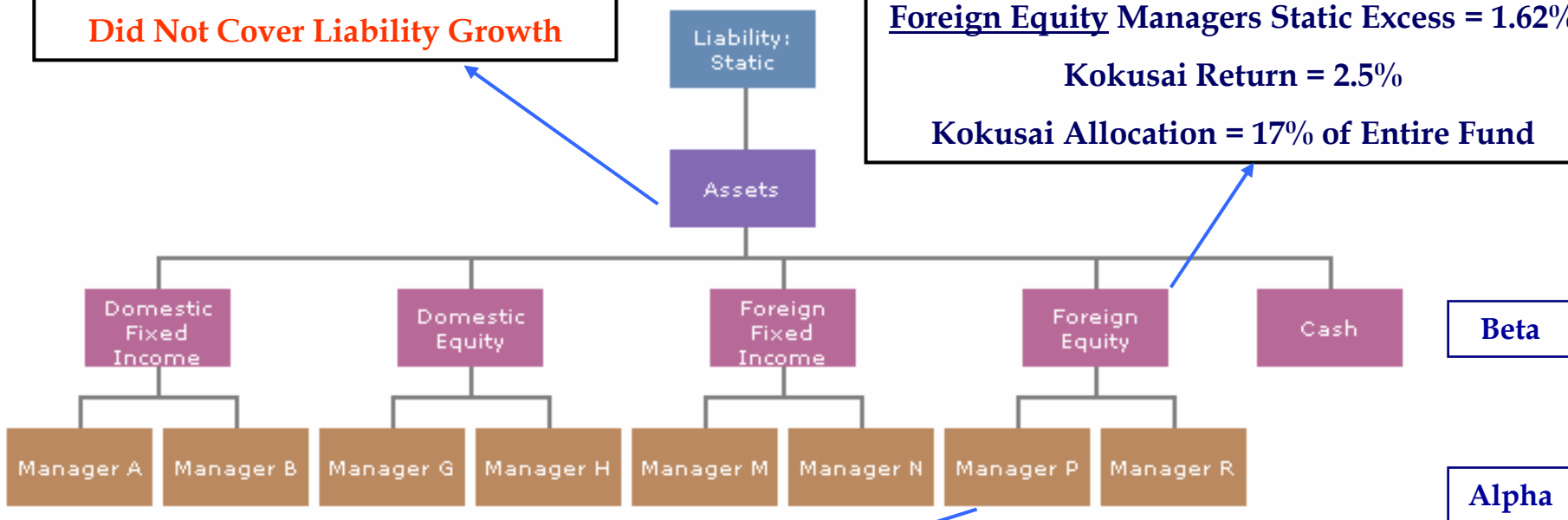
SAA Return = 2.75%

Did Not Cover Liability Growth

Foreign Equity Managers Static Excess = 1.62%

Kokusai Return = 2.5%

Kokusai Allocation = 17% of Entire Fund



Manager P Excess = -1.76%

Kokusai Return = 2.5%

Manager Allocation = 50% of Foreign Equity or 8.5% of Fund

Focus on Decisions with Greatest Impact

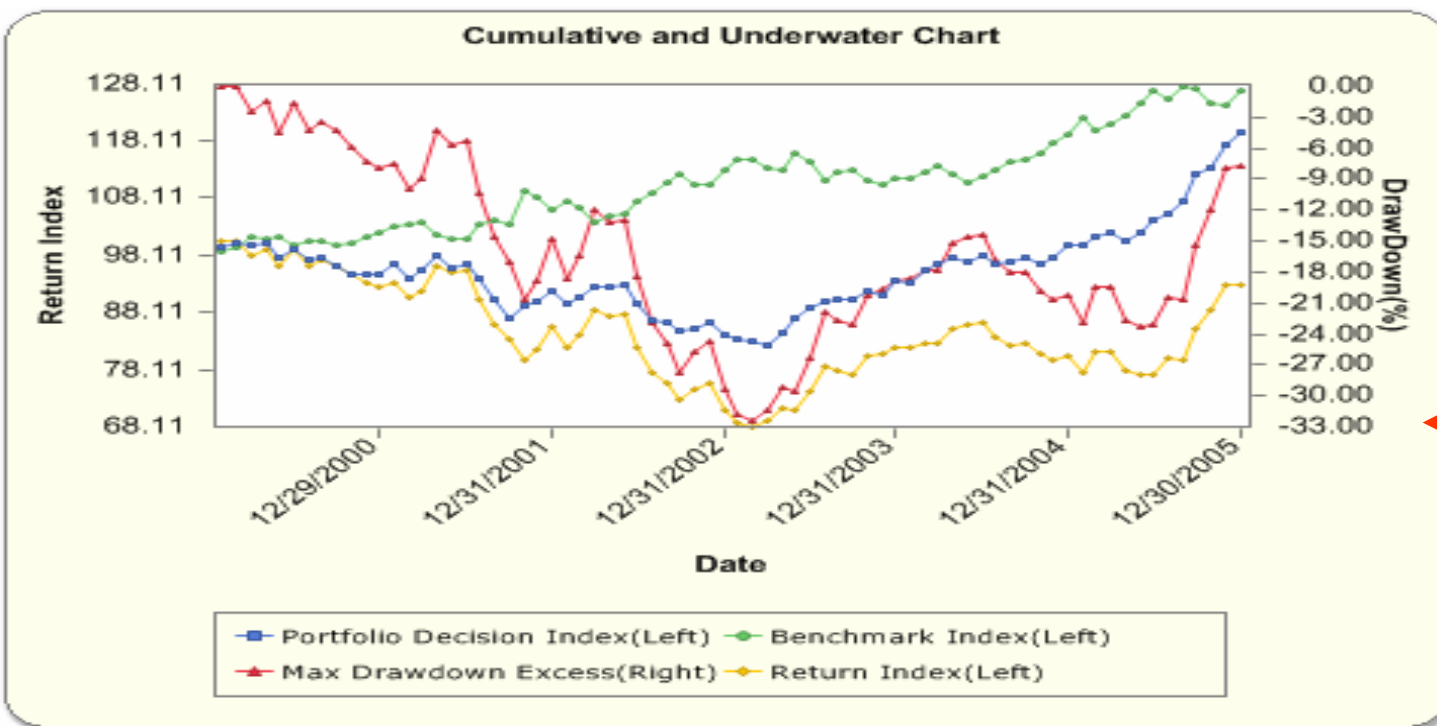
- Beta decision (allocation across asset classes) affects 100% of assets – greatest performance impact
- Manager decisions will affect only 5-10% of assets
- Decision Hierarchy allows attribution of performance to specific decisions and allows measurement
- Approach allows for each layer to be added incrementally – no need for “all or nothing”
 - Manager P worse than Kokusai by **-1.76%**
 - All managers beat Kokusai (2.75%) by 1.62%
 - Entire fund has 0.29% excess vs SAA (2.75%)

Markets are Dynamic – Need to Manage Portfolio

- Asset classes have different returns every day
 - Also, asset managers have different performance
- Weights of assets are drifting daily because of market
- DRIFT: Let the market introduce implicit bets
- DYNAMIC: Pension plan manages the portfolio
 - *Rebalancing: Fixed static rules – implies a view*
 - *Simple Beta: Manage beta assets for highest IR*
 - *Smart Beta: Manage beta versus liabilities*

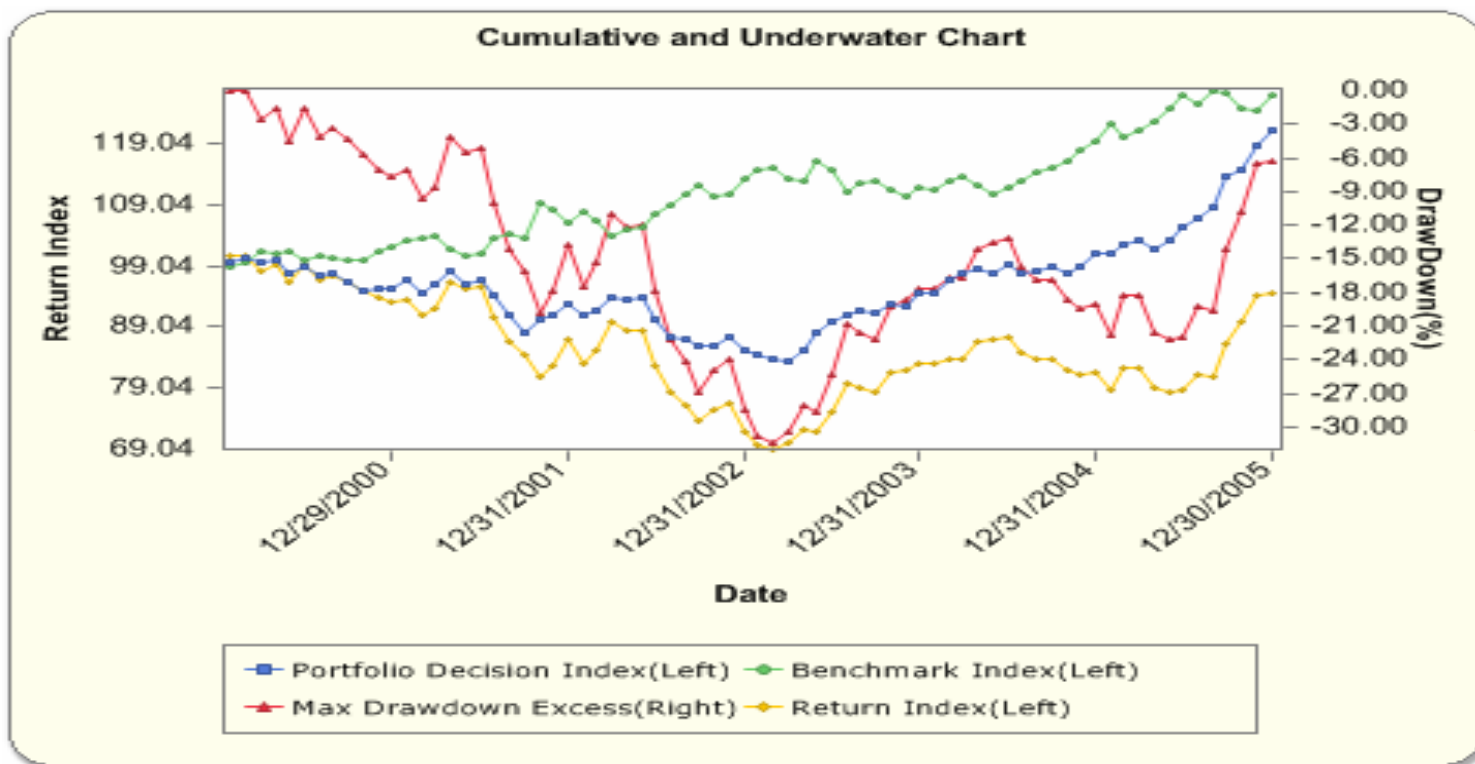
Performance Analysis - Static Portfolio

- **-99** bps annualized return relative to Liability
- High drawdown of excess between 2000 and 2002
- Negative correlation of assets and liabilities (-0.13)



Naïve Rebalancing – Marginal Improvement

- **-77** bps annualized return relative to Liability
- High drawdown of excess is abated only slightly
- Negative correlation of assets and liabilities (-0.129)



Why is Rebalancing an Active Bet?

- Rebalancing meant to keep portfolio close to SAA
- Was done because portfolio drifts every day
- “Do Nothing” = Buy and Hold is bad
- Rebalance to SAA based on Range or Calendar
 - This is a limited Buy and Hold – Implicit Bet
- Can have low tracking error, but big drawdown!

Definition of Dynamic Beta and Alpha

- Traditional static policies = active bet on market
- Beta Management: Focus on assets in SAA
 - Have ideas about what factors affect markets
 - Have good discipline to test these ideas and implement them consistently. Focus on key value-added decisions
 - Manage Beta allocations = “Dynamic Passive Management” (Dr. Woody Brock)
- Similarly for allocations to managers (alpha)

Dynamic Beta is Not Tactical Asset Allocation!

SMART BETA	TACTICAL ASSET ALLOCATION
Focuses only on assets in SAA	Can use any assets
Will be limited by rebalancing policy	Usually unconstrained
Can implement through pension cash flows	Usually implemented through futures
Designed relative to liability benchmark	Designed to have the highest return/risk
Each client creates unique strategies	Products usually standardized
Designed to have very low turnover	Turnover can be very high
Implemented by pension staff	Implemented by staff/investment companies

Smart Beta = Dynamic Passive Management

Example of a Simple Beta Rule – Stock Momentum

WHEN *2 Month Moving Average* Of TOPIX > *6 Month Moving Average* Of TOPIX
Allocate 62% to Domestic Equity

WHEN *2 Month Moving Average* Of TOPIX < *6 Month Moving Average* Of TOPIX
Allocate 58% to Domestic Equity,

IN ALL OTHER CASES *HOLD THE PREVIOUS ALLOCATION*

Benchmarks	
Domestic Equity	60%
Domestic Fixed Income	40%

Annualized Excess Return	Annualized Std Deviation
0.26%	0.33%

Formal rule removes emotion; analyzes cycles

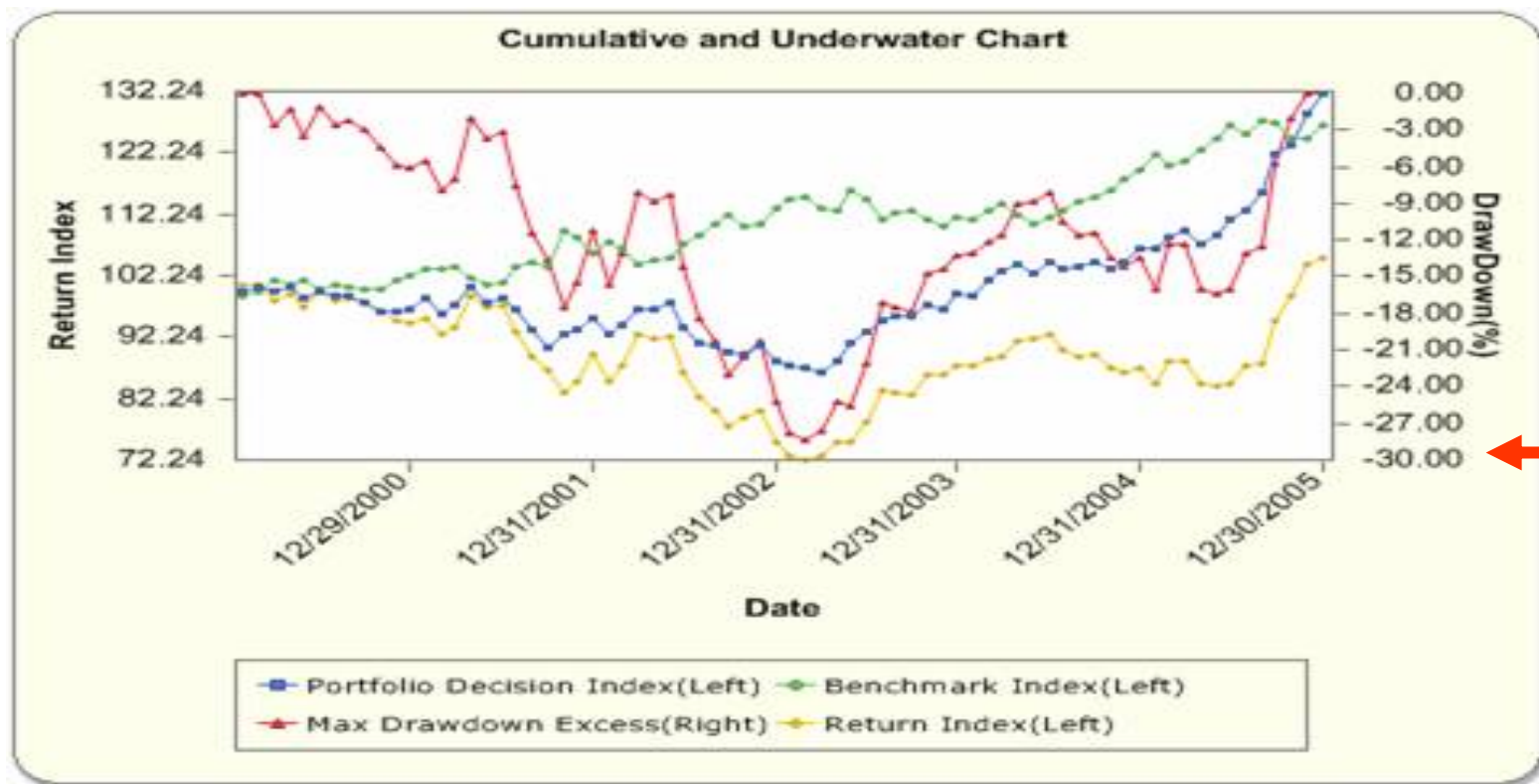
Simple Beta Rules – Diversification across Factors

Period = 2000 to 2005		Annualized Excess Return	Annualized Std Deviation	Annualized Return-Risk Ratio
Assets	Factors			
All SAA Assets	Equally Weighted Strategy on Factors Below	1.56%	1.19%	1.3125
Japan Equity vs Foreign Equity	Favor Region with Flat Yield Curve	0.20%	0.37%	0.5433
Japan Equity vs Japan Bonds	Favor Stocks when Dividend Yield is High	0.11%	0.27%	0.4248
Japan Equity vs Japan Bonds	Stocks underperform between June and October	0.05%	0.33%	0.1594
Japan Equity vs Japan Bonds	Favor Stocks when there is momentum in stocks	0.26%	0.33%	0.7717
Japan Equity vs Japan Bonds	Stocks do badly when global equity risk is high	0.15%	0.16%	0.95
Japan Equity vs Japan Bonds	Stocks do badly when the Yen is strong	0.24%	0.33%	0.7087
Japan Equity vs Japan Bonds	Favor stocks when JPY Yield Curve is flat	0.15%	0.17%	0.8793
Japan Equity vs Japan Bonds	Favor bonds when Liability Return > SAA	0.32%	0.33%	0.9766
Japan Bonds vs Foreign Bonds	Favor market with highest 10 yr yield momentum	0.04%	0.18%	0.2452

Publicly available, but not connected to Liabilities

Simple Beta Management – Best IR from 9 Rules

- +69 bps annualized return relative to Liability
- Drawdown of excess improves, but correlation with Liability is largely unchanged

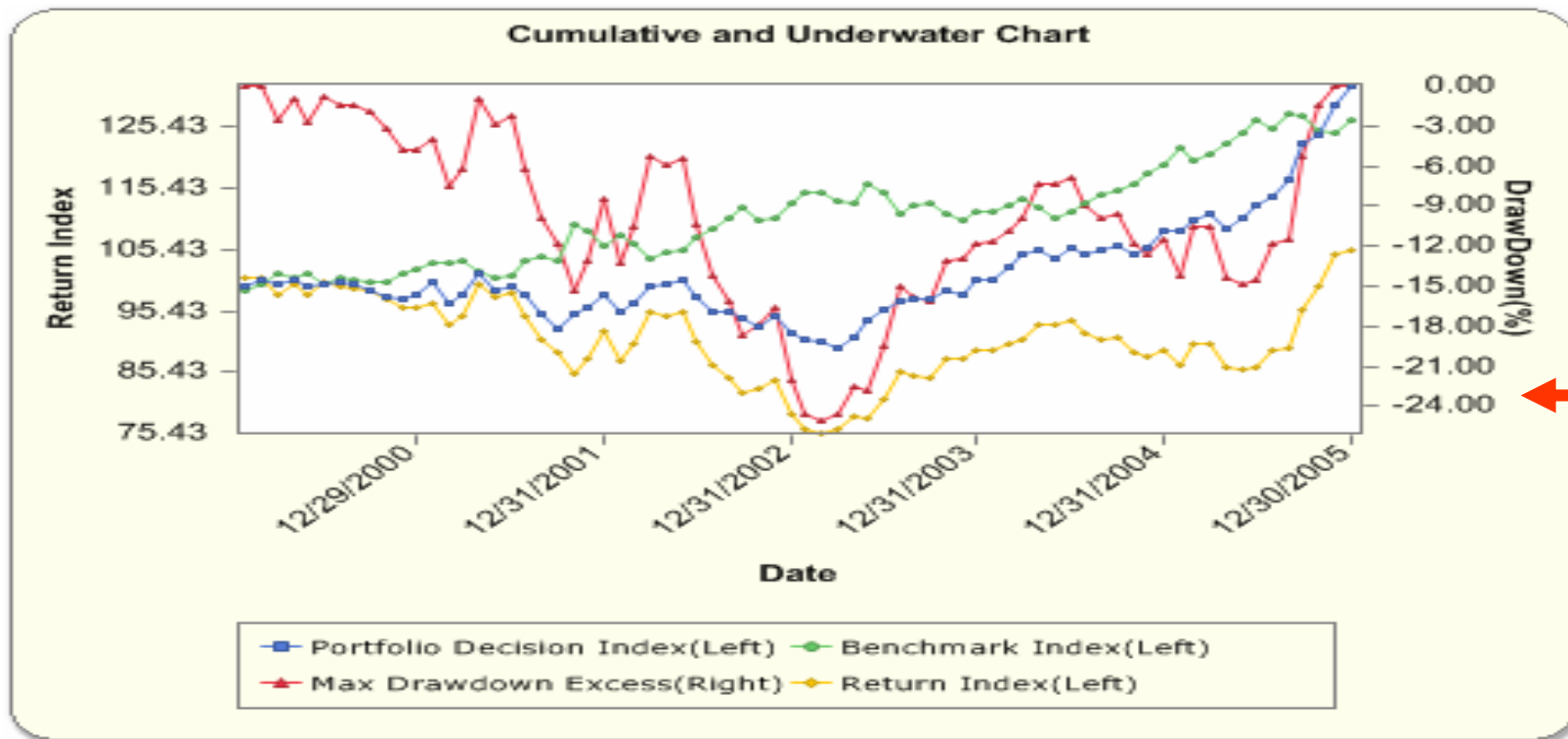


Moving from Simple Beta to Smart Beta

- Consider only Rules that have the correct correlation characteristic with liability
- Chose only 4 Rules from original list
 - Japanese Equity vs Bonds: Strength of Yen, Shape of Yield Curve and Seasonality; Japanese Equity vs Foreign Equity: Yield Curve Comparison
 - Mix had a IR of only 0.88, but that is less important
- By improving correlation between asset and liability portfolio, asset-liability risk is improved

Smart Beta Management – Uses Subset of Rules

- +73 bps annualized return relative to Liability
- Drawdown of excess is now -25% as portfolio correlation with Liabilities is improved



Example of Alpha Rules – Performance Mean Reverts

IF { (1 Month Return Of Manager P > 6 Month Moving Average Return Of Manager P) }

THEN Allocate 40% to Manager P

IF { (1 Month Return Of Manager P < 6 Month Moving Average Return Of Manager P) }

THEN Allocate 60% to Manager P

OTHERWISE HOLD PREVIOUS ALLOCATION

Benchmarks	
Manager P	50%
Manager R	50%

Annualized Excess Return	Annualized Std Deviation
0.14%	0.26%

Formal rule removes emotion; analyzes cycles

Performance Summary – Smart Management is Best

	Annualized Return (%)	Annualized Std. Deviation (%)	Annualized Return-Risk Ratio	Maximum Drawdown of Excess (%)	Correlation with Liability	Ratio of Good/ Bad Risk (excess)
Liability Benchmark	4.03%	5.14%	0.78	NA	NA	NA
Static Portfolio	3.04%	6.31%	0.48	-32.4%	-0.138	0.99
Rebalancing	3.26%	6.17%	0.53	-31.5%	-0.130	0.99
Simple Beta Management	4.72%	6.52%	0.72	-28.3%	-0.126	1.04
Smart Beta Management	4.76%	6.33%	0.75	-25.1%	-0.083	1.06
Smart Beta & Alpha Management	4.79%	6.33%	0.76	-25.2%	-0.082	1.05

Managing asset dynamism intelligently can improve solvency

Conclusions – Improve Solvency through Good Management

- The Future of Pension Fund Management is Here!
- Performance measurement must be relative to the appropriate benchmark = Liabilities
- Markets and Portfolios are dynamic – better to manage them in a smart manner to meet objectives
- This approach can be adopted in a step-by-step manner
- Can be used by pension funds, insurance companies, trust banks, manager of managers etc.

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