

State-of-the-Art Global Asset Allocation Practices: Dynamic Beta and Alpha Management

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CFA Institute Seminar, Tokyo

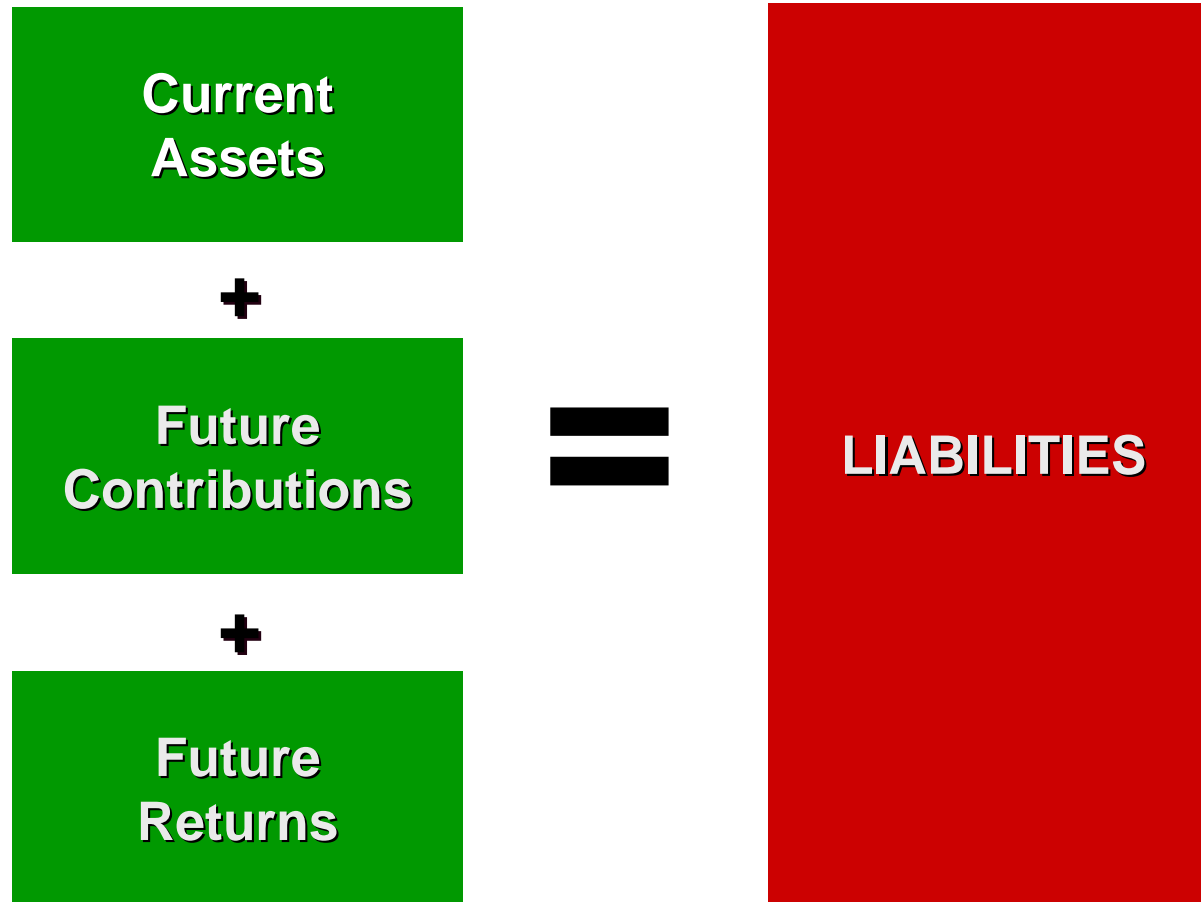
Date: March 2, 2006



Innovative Allocation Approaches Adopted Globally

- The New ALM Paradigm – Investible Liability Indices
 - Static vs “Dynamic” Beta Management
- The ALM Approach for Global Investments – Case Study
 - Percent of International and Currency Hedge
- New Path for Japanese Pension Funds – Case Study
 - The Role of Currency: Adding Overlays
 - Static vs Dynamic Beta and Alpha Management
- Best Practices Add Returns and Reduce Risks

What is a Pension Fund? The ALM Perspective



Funded ratio = assets/liabilities

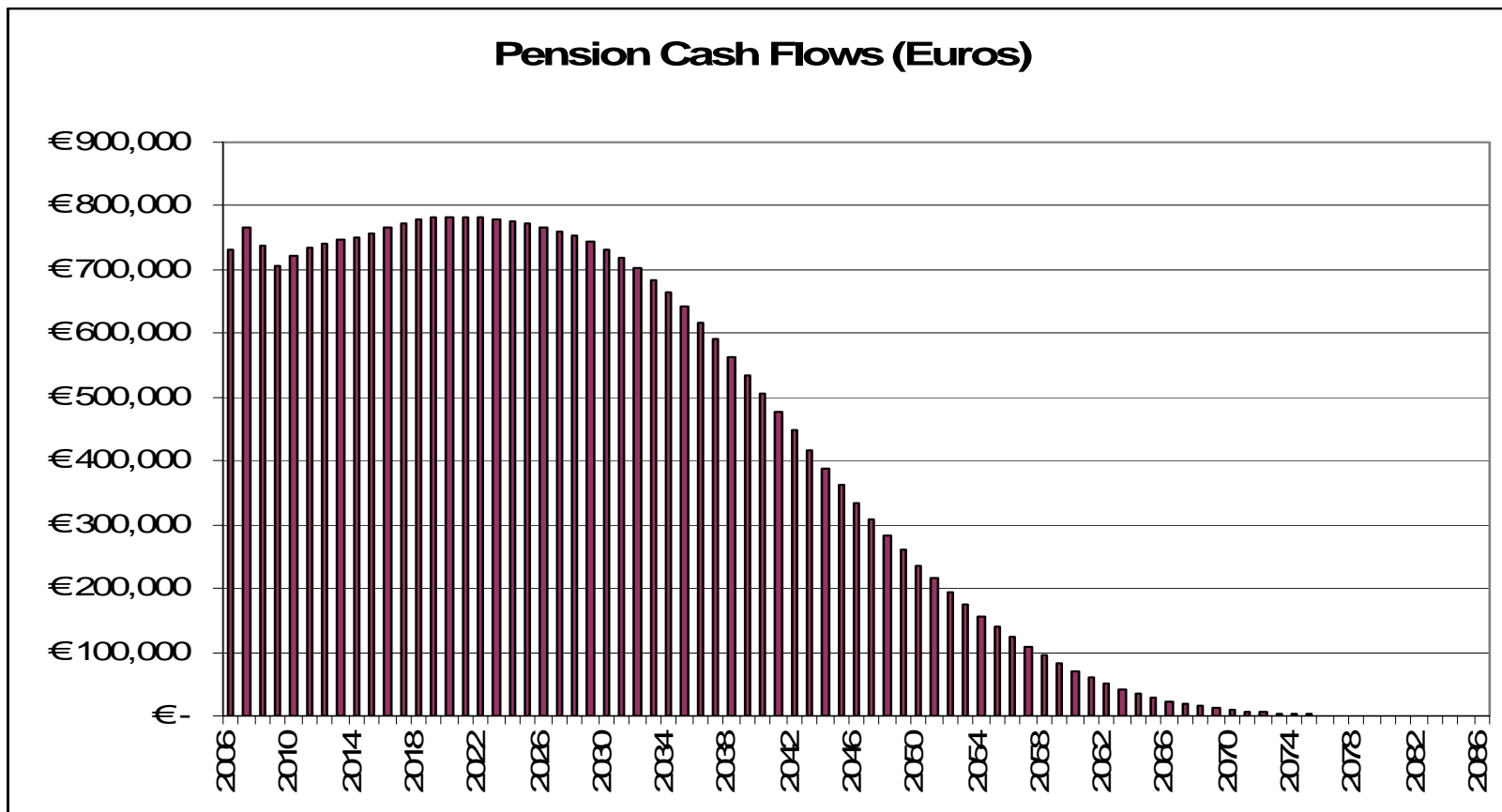
Challenges in Managing Pension Funds

- Pension fund driven by liabilities
- Actuarial cash flows projected once a year
- How to track liabilities intra-year?
- How to develop investment strategies to grow funded status (ratio of assets/liabilities)?
- Funds experience periodic cash flows – which assets should be reduced/increased?

Innovative Approaches to Managing Pension Funds

- Old Approach: Annual ALM sets SAA
 - Develop investment strategies to manage SAA. Risk is that strategies not linked to liabilities
- Alternative: Invest in fixed income to hedge liabilities
 - Wrong time to do it? Need buffer at current yield
- PME Approach: Clearly understand liabilities using investible indices. Develop dynamic strategies to manage assets.

PME Liability Cash Flow - Typical of a Pension Fund



Source: PME

Creating an Investible Index to Track Liabilities

- Mimic using zero coupon bonds for each maturity
 - Problems: Too many instruments in benchmark
Boards do not get comfort
- Create a portfolio of bellwether swap indices
 - Optimized portfolio that tracks liabilities
 - Easy to monitor daily. Transparent for Boards

PME Investible Liability Benchmark

Liabilities Module: Solution & Statistics

PV Liabilities: €15,039,226,092

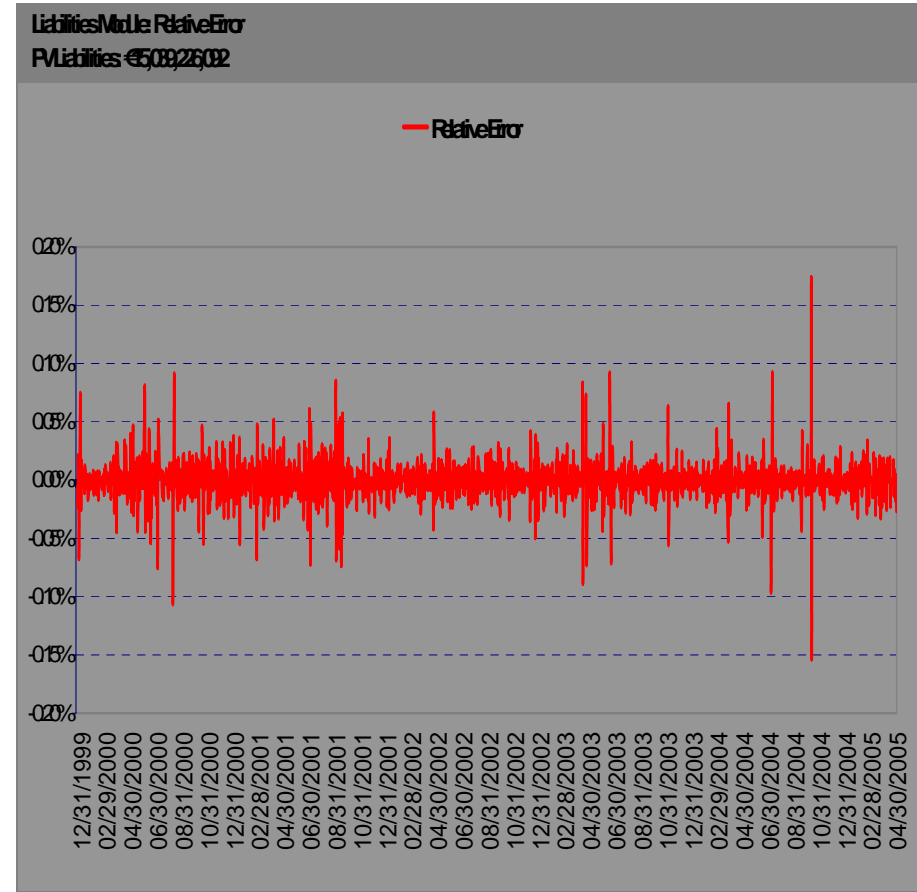
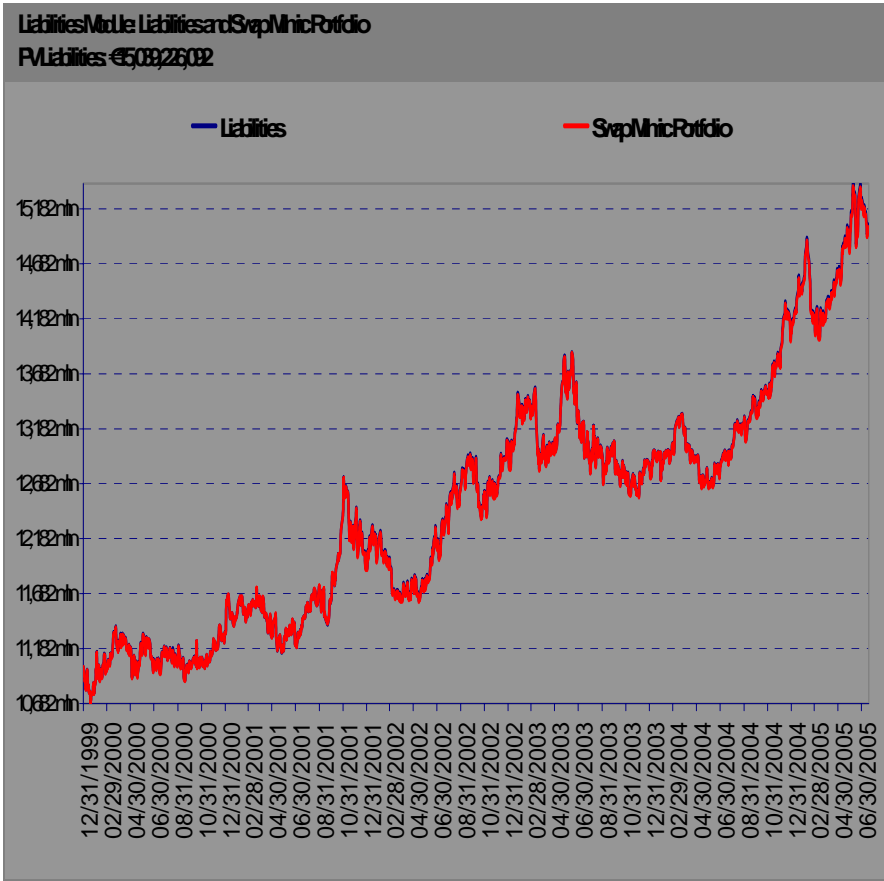
Instrument	Optimal Weights	Optimal Notional
012M SWAP	-6.29%	-€ 946,585,328
024M SWAP	7.82%	€ 1,176,410,795
060M SWAP	3.55%	€ 534,557,087
120M SWAP	16.60%	€ 2,496,188,497
240M SWAP	23.10%	€ 3,473,746,096
360M SWAP	27.29%	€ 4,103,839,938
480M SWAP	18.98%	€ 2,854,444,211
600M SWAP	6.92%	€ 1,041,095,121

Tracking Error Daily	0.019%
Tracking Error Annualized	0.303%
R-Squared	99.83%

Duration Liabilities	15.14
Duration Mimic Portfolio	15.00

Source: PME and Stuijvenberg Financial Services

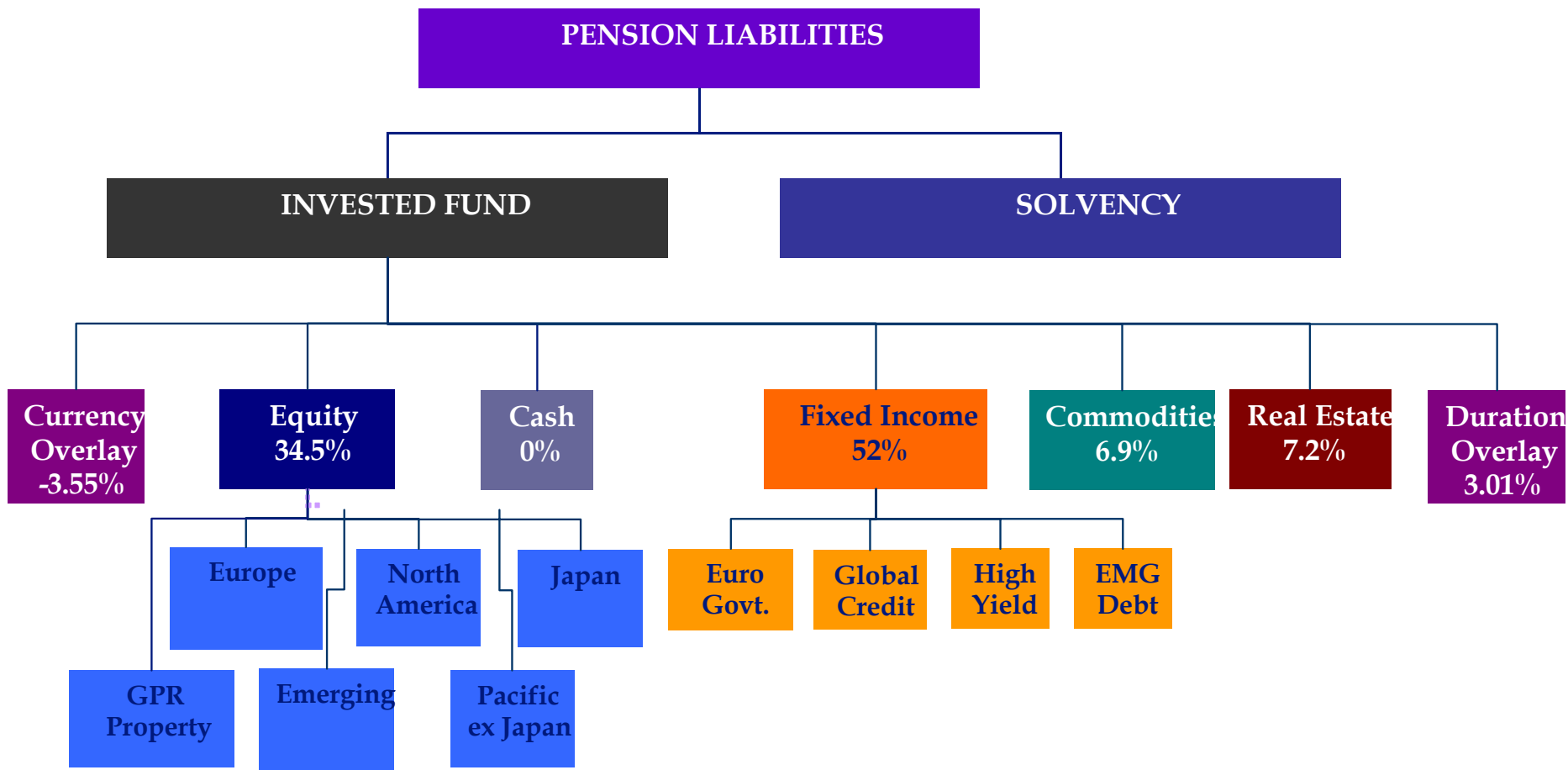
Swap Portfolio Tracks Liabilities – Effective Index



Annualized Growth of Liabilities = 8.2%

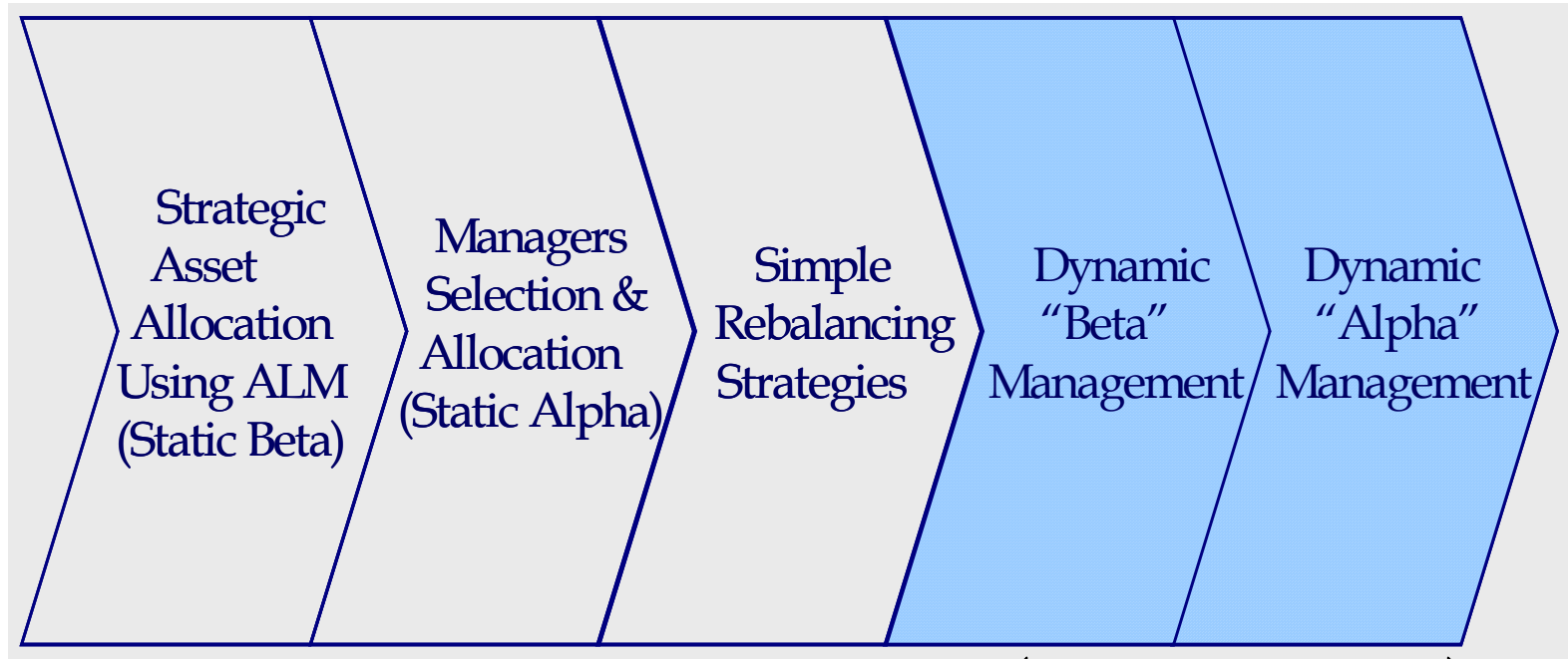
Source: PME and Stuijvenberg Financial Services

Assets: PME Investment Decision Process



Can dynamic beta management help?

New Pension Paradigm (Prof. Brock; M³ Inv. Tech.)



Must manage Beta and Alpha decisions

Definition of Dynamic/Smart Beta and Alpha

- Very often funds set SAA and rebalancing policy
- Effectively this is an active bet on the market
- Smart/Dynamic Beta: Allocation of assets in SAA
 - Actions linked closely to liability benchmark
 - Limited by SAA assets and rebalance ranges
- Similarly for allocations to managers (alpha)

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!

Dynamic Alpha and Beta Improves ALM Risk

Annualized Growth of Liabilities: 8.2%

Growth in Solvency = Return (Assets - Liabilities)

Funded Ratio Risk = Probability FR < 105% in 1 Year

	Static Beta	Static Alpha	Naïve Rebalancing	Dynamic Beta	Dynamic Alpha
Annualized Growth in Surplus	-1.36%	-0.72%	-0.58%	0.48%	0.66%
Volatility of Surplus	7.17%	6.95%	6.94%	7.15%	7.13%
Funded Ratio Risk	46.8%	35.2%	32.8%	17.8%	15.7%
Maximum Drawdown	-10.2%	-9.6%	-9.4%	-8.4%	-8.1%

Examples of Dynamic Beta Strategies

Rule	Description
Equity vs Fixed Income	
Dividend Yield	When Dividend Yield is low, stocks underperform and vice versa - Prices correct to return the yield to normal levels
Fed Model	Standard Federal Reserve Bank Model that compares the Yield of Stocks against the Yield of Bonds - overweight the higher yielding asset class
Halloween Effect	Sell in May and Go Away; Overweight stocks in October, underweight in June
Oil Rule	High Oil prices have a negative effect on Equities
P/E ratio	When PE ratio is low then the market is undervalued. <i>Source: John Campbell and Robert Shiller, Valuation ratios and the long-run stock market outlook, Journal of Port Mgmt, Winter 1998, pp. 11-26</i>
Equity: Euro vs EMG	
Bond performance	EMG equities do better when the spread of bonds to US governments are narrowing - EMBI used as proxy: <i>Source: Sovereign Spreads and Emerging Market Equity Returns Gendreau, Brian C.; Heckman, Leila, Fall 2003, Journal of Portfolio Management, Volume 30, Number 1, Pages 104 -</i>
Fed Funds	Falling LIBOR interest rates generally predict start of recessionary period, when emerging mkts outperform developed markets.
Equity: Euro vs US	
Relative Dividend Yield	Invest in the equity region with higher dividend yield
Interest Rates	Invest in Equity Region with higher interest rate - a variation of the currency carry rule which favors the strengthening currency
Fixed Income	
North American Credit vs Investment Grade	When the VIX is falling and US stocks are rising, then overweight North American Credit
High Yield vs Investment Grade: Yield Curve	When the yield curve is very upward sloping then it will likely mean revert: move to safer bonds (Inv. Grade)

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
Ideally 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 or investment companies

May use similar insights, but different goals

Summary on Innovative Dutch ALM Approach

- Can have excellent performance with few staff
- Get handle on liabilities: Investible Index
- Swaps provide most effective and simple method
- Can develop intelligent dynamic beta and alpha ideas to manage relative to liabilities
- Ideas for dynamic beta are publicly available

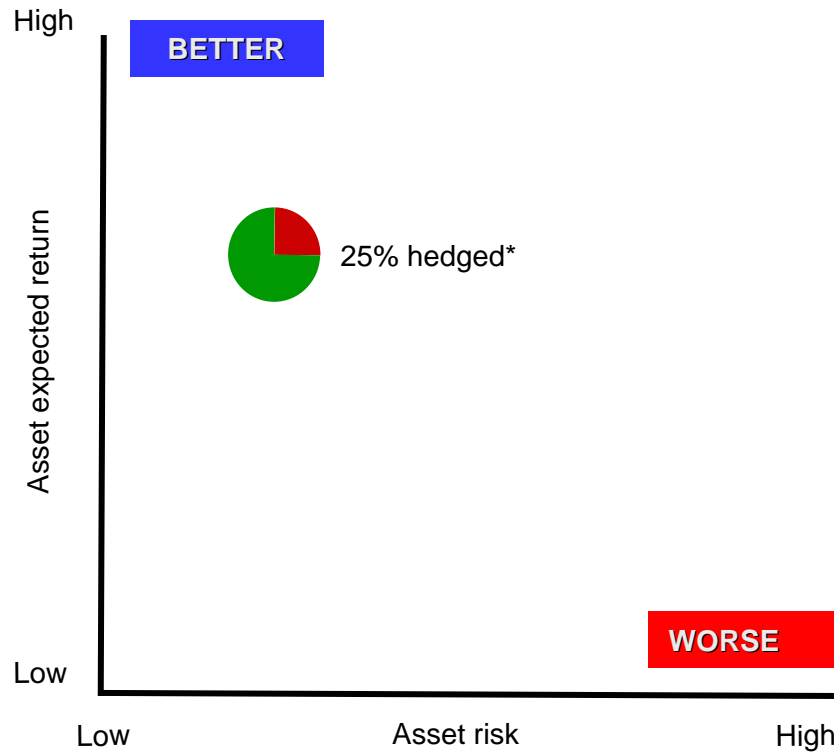
The Case for Global Investment – ALM Approach

- For years, Canadians had limits on investing abroad
- Most advisors gave bad advice on such investments
- Bad advice was on percent of international assets (diversification) and strategic currency hedge
- Japanese funds need to make such decisions carefully
- International assets provide diversification and currency risk
- This section as a preview to Japanese case study

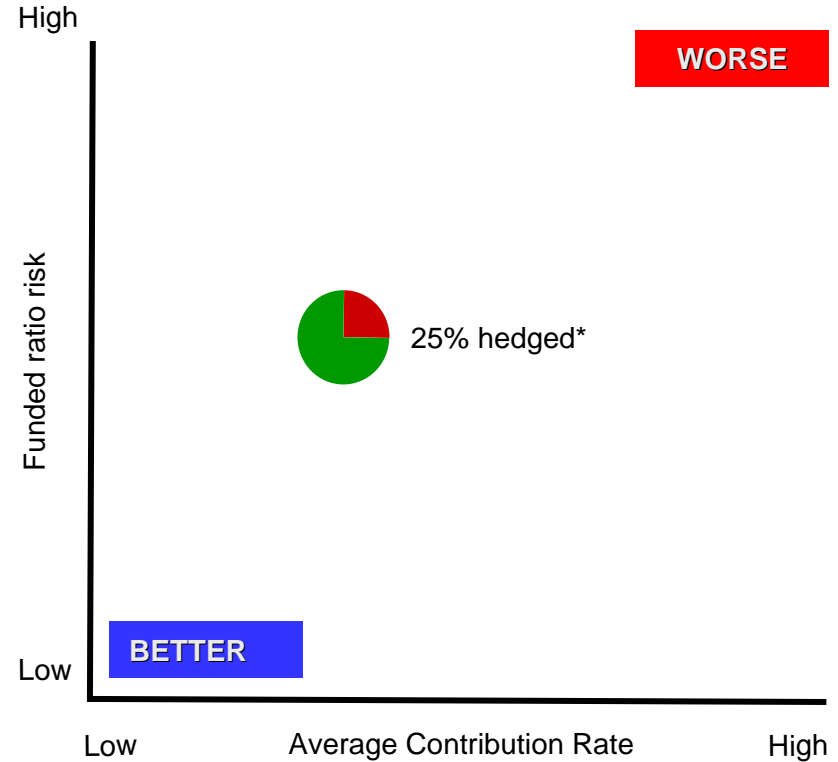
Framework for Analysis - ALM vs Asset-only

Looking only at the international component

Asset-only



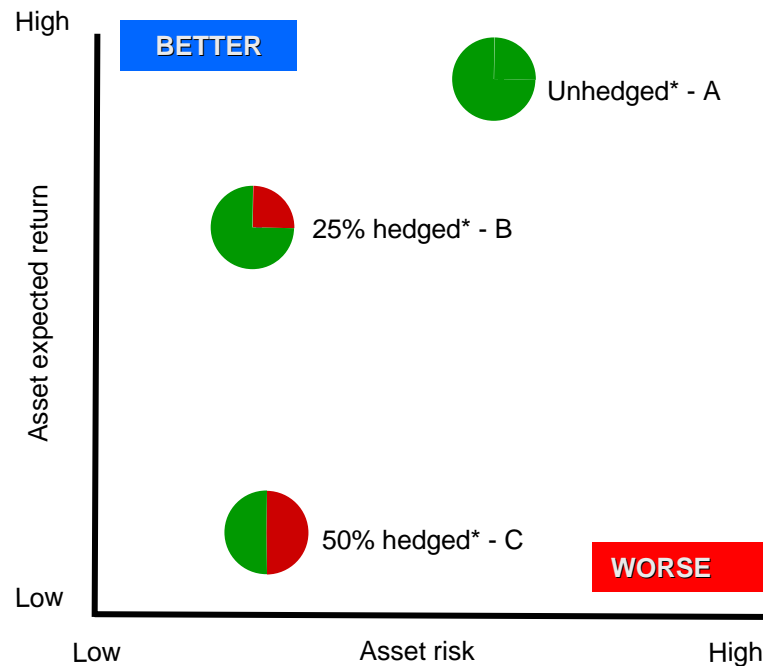
Asset liability



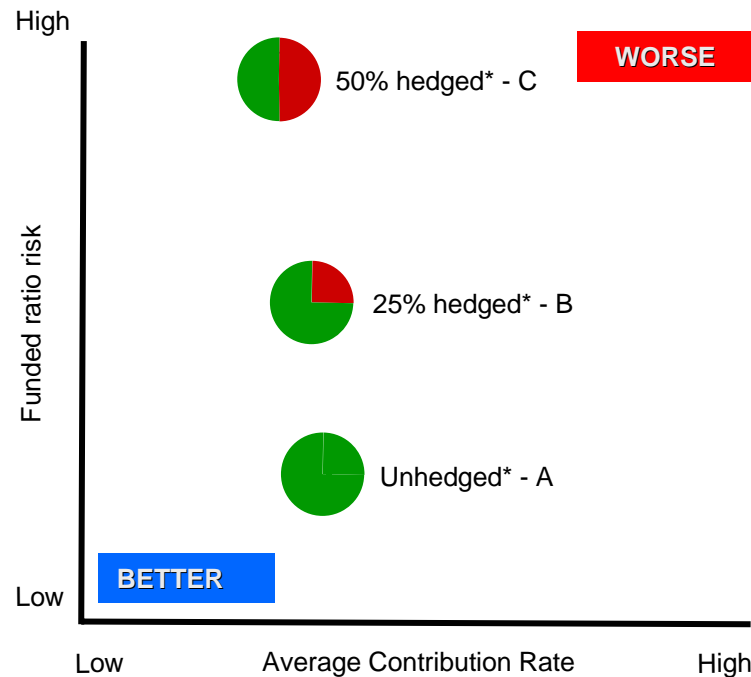
Asset-only vs Asset-Liability View: Different Results

Looking only at the international component

Asset-only



Asset liability

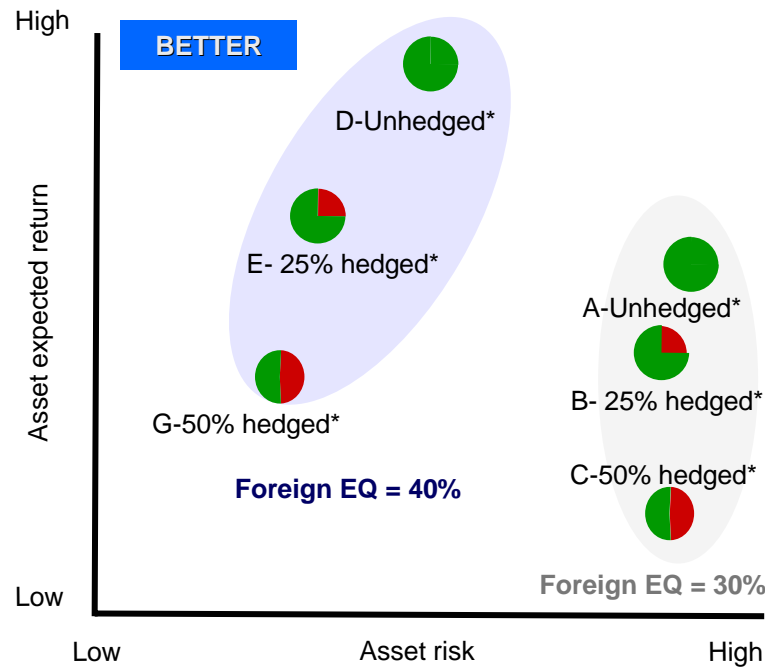


Foreign Exposures  Percent Hedged to CAD

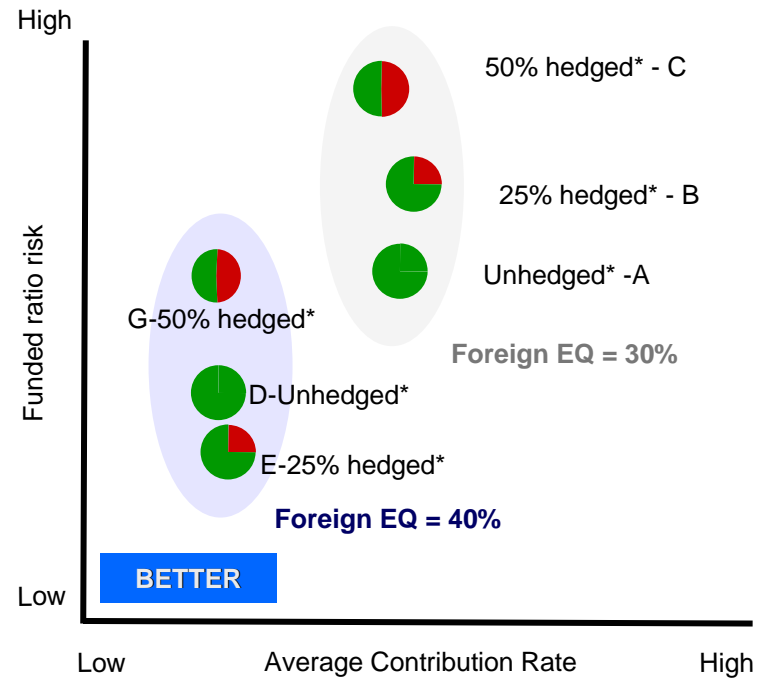
Above 30% Foreign is Better But Different Hedge Ratio


Looking only at the international component

Asset-only



Asset liability



Foreign Exposures  Percent Hedged to CAD

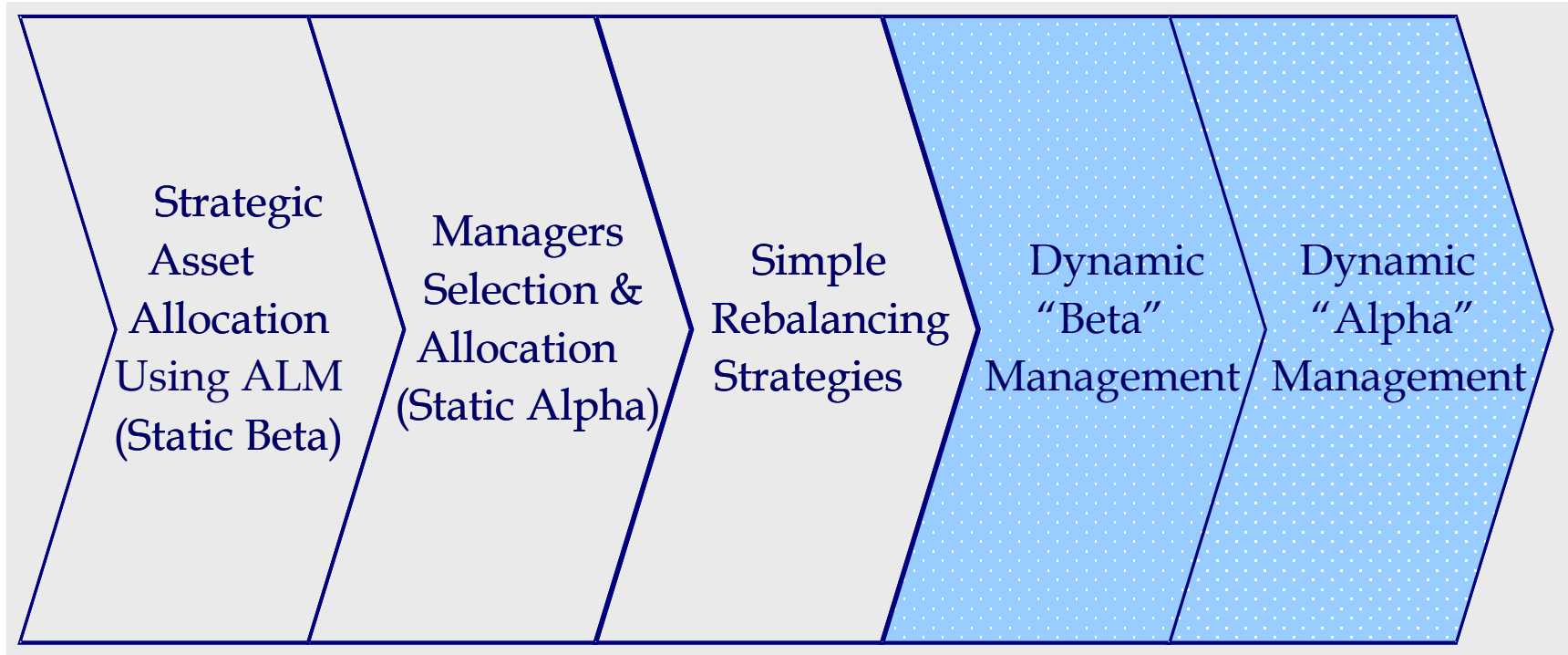
Summary on Canadian Case Study

- Must make decisions on all investments from an asset-liability perspective
- Higher strategic allocation to international assets (Static Beta) improves diversification of fund
- International investing also equals currency risk
- Strategic hedge ratio decision should be reviewed from an asset-liability perspective

Innovative Approaches for Japanese Pension Funds

- Had access to data from a Japanese pension fund (thanks to Nomura)
- Analyzed portfolio structure and past decisions
- Able to demonstrate value of currency overlay
- Dynamic Beta and Alpha Management would dramatically improve performance and risk.

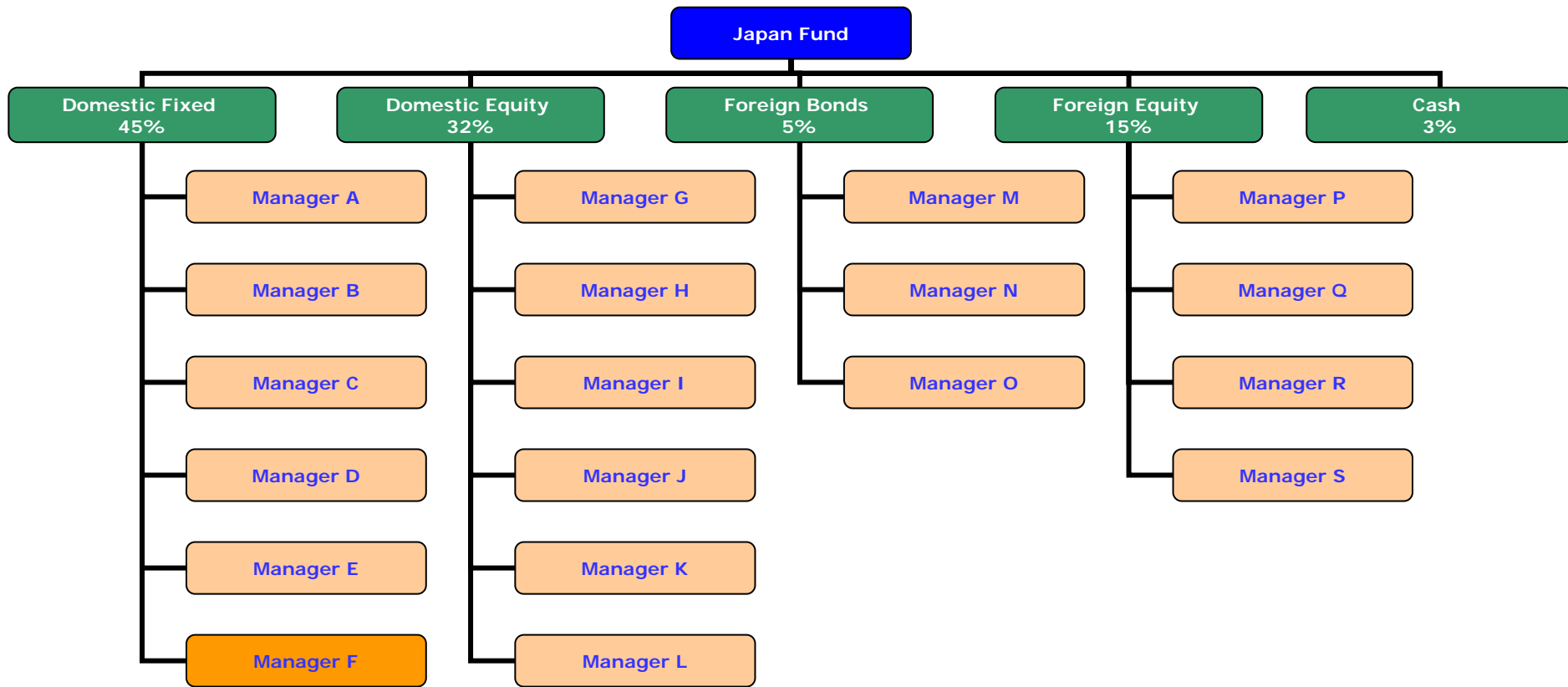
New Pension Paradigm (Asset-only Perspective)



Did not have liability information; can easily extend

Portfolio Structure: Diversified Across Managers/Assets

Examine the contribution of all decisions to performance



Foreign assets unhedged

Steps Followed for the Case Study (04/2002 - 06/2005)

- Study impact of SAA, structuring decisions (choice of benchmarks) and contribution of external managers
- Review historical decisions made across asset classes
- Consider what simple rebalancing would have done
- Consider three key possibilities
 - Adding a simple currency overlay on 10% of assets
 - Adding Intelligent Rebalancing Rules (Dynamic Beta)
 - Adding Intelligent Manager Rules (Dynamic Alpha)

Portfolio Structure: Diversified Across Managers/Assets

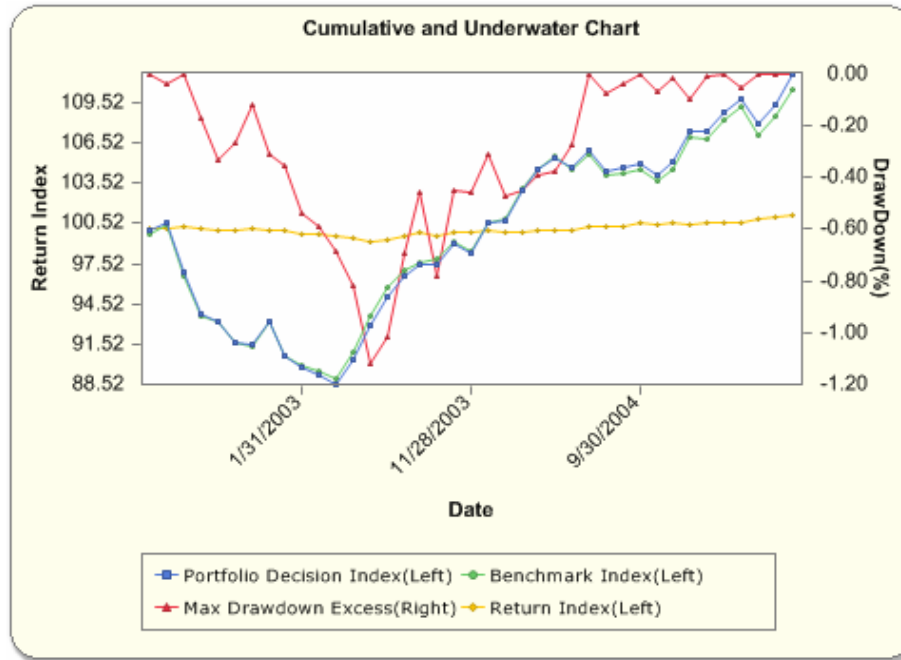
Portfolio Decision	Annualized Return	Risk	Return-Risk	Max Drawdown	Confidence in Skill	Success Ratio
Static Manager Alpha	3.4%	5.5%	0.6	-12.0%		
Japan Static Benchmark*	3.1%	5.5%	0.6	-11.5%		
Excess of Static Allocation	0.3%	0.6%	0.5	-1.1%	83.7%	56.4%
Excess within Domestic Fixed Inc**	0.3%	0.4%	0.8	-0.3%	92.0%	54.0%
Excess within Domestic Equity	0.4%	1.8%	0.2	-2.6%	65.0%	54.0%
Excess within Foreign Fixed Inc	0.4%	0.6%	0.7	-0.5%	88.0%	49.0%
Excess within Foreign Equity	0.2%	0.9%	0.2	-2.2%	67.0%	54.0%

*Benchmark: 32% TOPIX, 15% MSCI-KOKUSAI, 45% NOMURA-BPI, 5% Citigroup WGBI ex JAPAN, 3% Yu-tanpo Call Rate

** Benchmark Misfit in Fixed Income detracted -0.23% annualized (difference between Nomura BPI and Call Rate)

Added value but increased volatility and higher drawdown
Benchmarks to managers in Domestic Fixed Income detracted

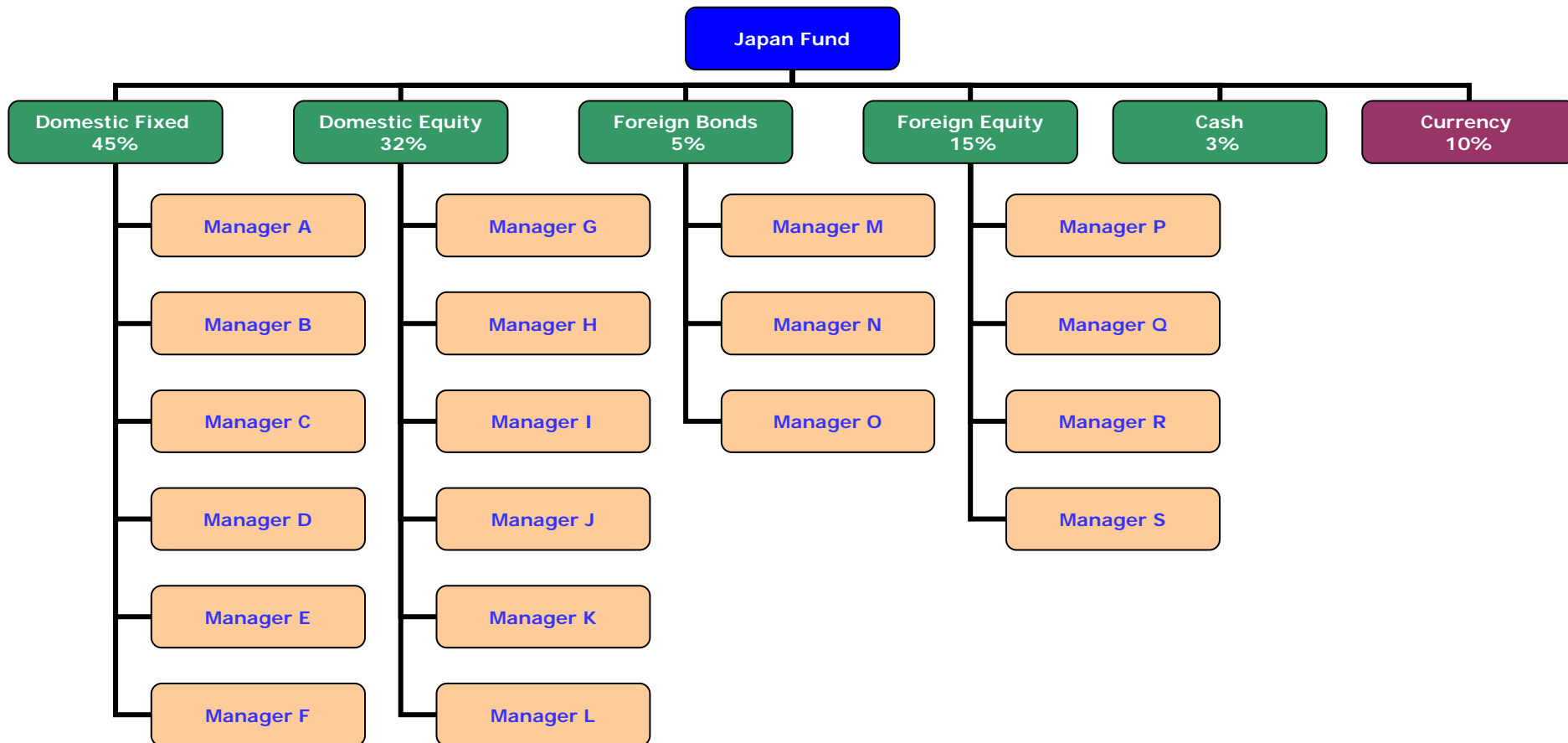
Portfolio Structure: Diversified Across Managers/Assets



*Portfolio declined in value dramatically (Drawdown) initially
Value-added negative in 2002; Currency risk was unmanaged*

Portfolio Structure: Impact of Adding Currency Program

Managed through derivatives - does not impact any other investment!



Portfolio Structure: Impact of Adding Currency Program

Portfolio Decision	Annualized Return	Risk	Return-Risk	Max Drawdown	Confidence in Skill	Success Ratio
Static Manager Alpha +DCO***	4.0%	5.5%	0.7	-11.3%		
Japan Static Benchmark*	3.1%	5.5%	0.6	-11.5%		
Excess of Static Allocation	0.9%	0.6%	1.4	-0.4%	99.5%	64.0%
Currency Overlay Program	5.3%	3.4%	1.6	-3.3%	99.0%	57.0%

*Benchmark: 32% TOPIX, 15% MSCI-KOKUSAI, 45% NOMURA-BPI, 5% Citigroup WGBI ex JAPAN, 3% Yu-tanpo Call Rate

** Benchmark Misfit in Fixed Income detracted -0.23% annualized (difference between Nomura BPI and Call Rate)

*** DCO = Currency Overlay Program targeting 4% tracking error (courtesy FX Concepts)

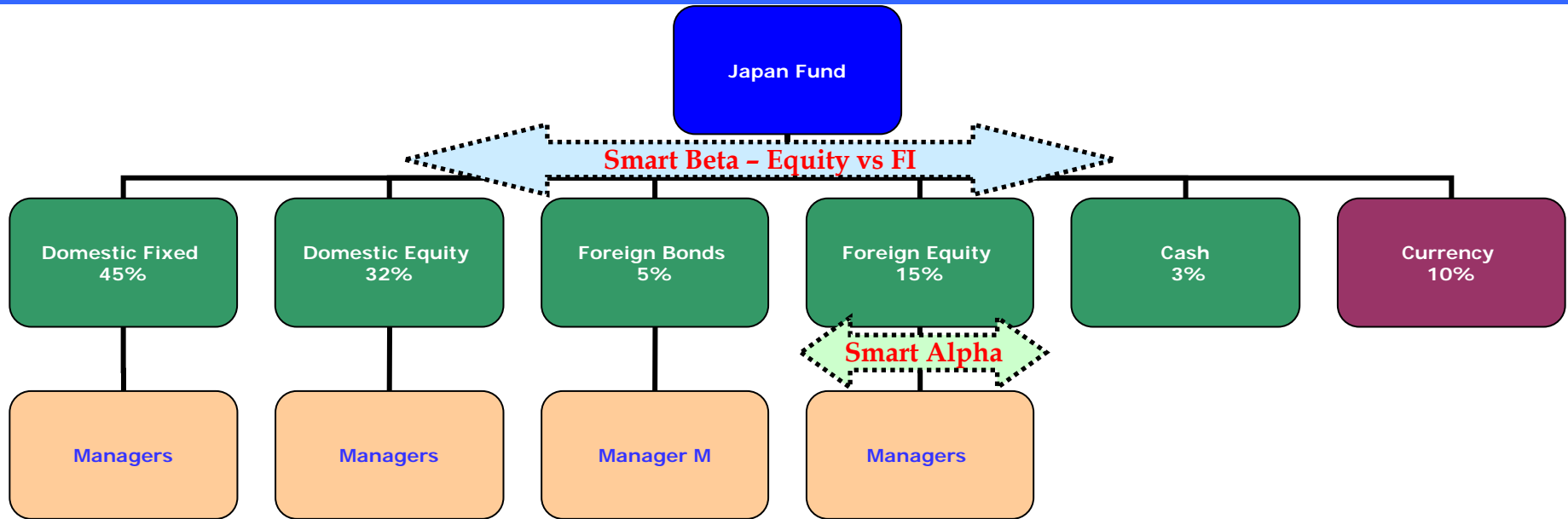
Fund drawdown is reduced (added value relative to unhedged benchmark)

International investing should be combined with currency management

Since it is unfunded, currency program will generate cash for plans

On Yen 10 bn fund, outperformance = Yen 90 million/year

Portfolio Structure: Dynamic Beta and Alpha Management



- Market causes allocations to drift from SAA
- Intelligent investors use rules to manage decisions
- Investors already make decisions on cash flows

Portfolio Structure: Dynamic Beta and Alpha Management

Portfolio Decision	Annualized Return	Risk	Return-Risk	Max Drawdown	Confidence in Skill	Success Ratio
Dynamic Beta & Alpha Fund (+DCO)	4.6%	5.5%	0.8	-10.6%		
Japan Static Benchmark*	3.1%	5.5%	0.6	-11.5%		
Excess of Dynamic Beta and Alpha	1.5%	1.2%	1.3	-1.2%	98.8%	64.1%
Dynamic Beta Contribution**	0.6%	1.1%	0.5	-1.2%	82.7%	61.5%
Dynamic Alpha in Foreign Equity	0.2%	0.2%	1.0	-0.2%	95.0%	67.0%

*Benchmark: 32% TOPIX, 15% MSCI-KOKUSAI, 45% NOMURA-BPI, 5% Citigroup WGBI ex JAPAN, 3% Yu-tanpo Call Rate

** Annual turnover is just 8%; Correlation with fund SAA = -0.08

Smart rebalancing could have added value for just 8% annual turnover

Excess return is negatively correlated – helps manage fund risk

Every level of the fund is a potential source of return if well managed

On Yen 10 bn fund, outperformance = Yen 150 million/year

Examples of Dynamic Beta Strategies for Japan

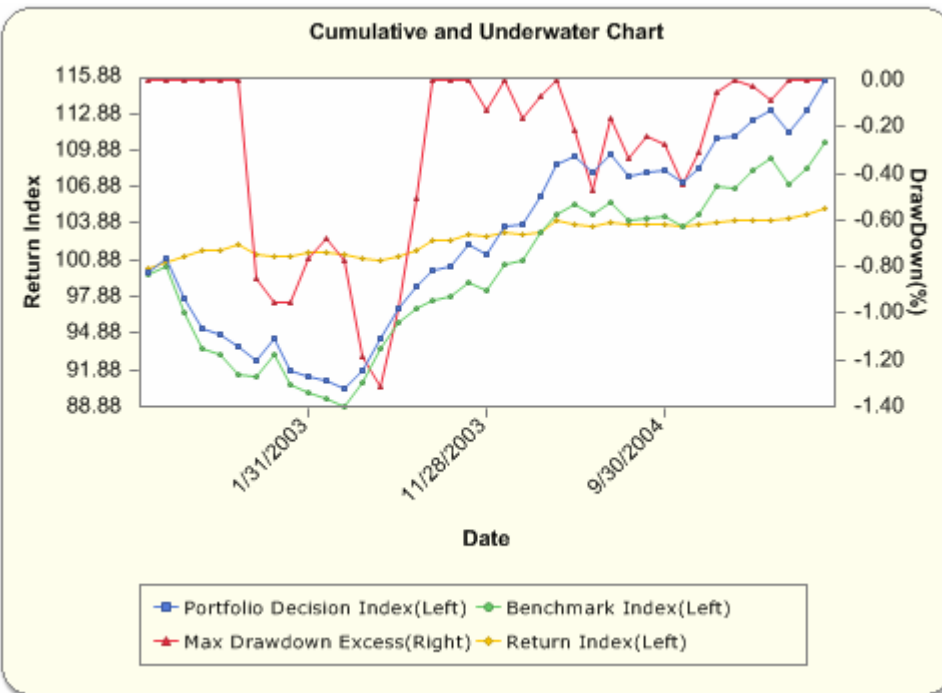
Rule	Rule Description	Information Ratio
Asset Allocation Level		0.52
EQ vs FI: Halloween Effect	Stocks tend to underperform bonds between June and Oct - apparently works in 16 out of 18 stock markets	0.176
EQ vs FI: Currency Strength	Strong Yen is bad for Japanese stocks and hence favor bonds	0.27
EQ vs FI: Stock Momentum	Markets globally have momentum. Favor stocks when current level is higher than 200 day moving average	0.27
EQ vs FI: Equity Volatility	Favor Bonds when Equity volatility is high - use the VIX as a proxy for equity volatility	0.53
EQ vs FI: Slope of JP Yield Curve	Yield curve mean reverts so favor stocks when the curve is flat (will steepen) and vice versa	1.12
Dom vs Foreign FI: Yield Momentum	Favor the region with the highest momentum in interest rates	0.76
Dom vs Foreign EQ: Relative Yield Curve Slope	Favor the country with the flatter yield curve (is effectively a currency play for unhedged international equity)	0.17

Commonsense rules – key to success is discipline

Need to formalize these ideas to ensure consistent application

Scope to add many more ideas across different asset pairs

How Dynamic Beta and Alpha Mgmt Improves Portfolio



Absolute decline of fund (through 06/03) less than that of benchmark
Calendar year excess is positive in every year

Comparing Various Portfolio Management Approaches

Portfolio Approach	Excess Annualized Return	Tracking Error	Information Ratio	Max Absolute Drawdown	Confidence in Skill	Success Ratio
Static Manager Allocation	0.3%	0.6%	0.5	-12.0%	83.7%	56.4%
Add Quarterly Rebalancing	0.4%	0.6%	0.7	-11.8%	90.6%	59.0%
Actual Allocation Decisions	0.0%	0.7%	0.0	-11.7%	52.6%	49.0%
Static Manager + DCO	0.9%	0.6%	1.4	-11.3%	99.5%	64.0%
Dynamic Beta and Alpha	1.5%	1.2%	1.3	-10.6%	98.8%	64.1%

Dynamic Beta and Alpha is best – superior risk and success ratios

Achieved with minimal turnover (quarterly rebalancing has 3% turnover)

Most positive excess months of all options (64.1%)

On Yen 10 bn fund, outperformance = Yen 150 million/year versus Actual

Comparing Actual to Smart Allocation Decisions

Actual Allocation

Recommendation at the close of
06/30/2005

Assets	BMK Allocation	Actual Action	Amount	Post Action Position
<u>Domestic Fixed Income</u>	45%	BUY	0.60%	43.30%
<u>Domestic Equity</u>	32%	SELL	-1.40%	31.90%
<u>Foreign Equity</u>	15%	SELL	-0.20%	15.80%
<u>Foreign Fixed Income</u>	5%	SELL	-0.20%	4.60%
<u>Cash</u>	3%	BUY	1.20%	4.40%

Japan Smart Allocation

Recommendation at the close of
06/30/2005

Assets	BMK Allocation	Trade Action	Trade Amount	Post Trade Position
<u>Domestic Fixed Income</u>	45%	SELL	-3%	42%
<u>Domestic Equity</u>	32%	BUY	3%	30%
<u>Foreign Equity</u>	15%	HOLD	0%	20%
<u>Foreign Fixed Income</u>	5%	HOLD	0%	5%
<u>Cash</u>	3%	HOLD	0%	3%

Demonstration of Software



Conclusions

- Creating an Investible Liability Index allows for effect “within year” management of ALM Risk
- Investing abroad provides diversification
 - Must manage the currency risk
- Dynamic Beta and Alpha Management Critical
 - Rebalancing is an active decision – impacts returns
 - Can use pension cash flows to improve fund

Innovative Allocation Approaches Adopted Globally

- **Key Message 1**: How does a Euro 20 billion fund generate 15% annualized in last 3 years with just 3 staff?
 - Good structure, focus on key value-added decisions, and good discipline in implementing smart ideas

- **Key Message 2**: Be smart about diversification abroad

- **Key Message 3**: Japanese funds can adopt best practices
 - Improve decisions made by pension fund managers
 - “Dynamic Beta and Alpha Management”

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