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CFA Emirates

Hedge funds, active management, and the asset allocation decision

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Advanced Portfolio Management

HEDGEFUNDS, ACTIVE MANAGEMENT, AND THE ASSET ALLOCATION DECISION

Advanced Portfolio Management (APM) is a specialty asset management company that constructs and manages customized portfolios of hedge funds and other financial instruments for endowments, foundations, pension funds, insurance companies, and other financial institutions in North America, Europe, and Asia. Each APM product is designed to complement, enhance, and complete an existing asset allocation and investment portfolio. All products are managed to realize the client's unique investment objectives and risk parameters. APM products are currently utilized as active management overlays, alpha transport programs, completion funds, and stand-alone multi-manager hedge fund investments.

APM's investment process integrates experienced qualitative investment judgment with rigorous analytical structure. The professionals at APM have over 100 years of combined investment and capital markets experience providing a comprehensive understanding of the potential profit opportunities and the accompanying risks of active investing. To complement this experience and judgment, APM has constructed a state-of-the-art analytical platform which comprises: (i) manager-level risk and return attribution analysis and risk budgeting, (ii) non-linear Monte Carlo simulation processes driven by forward-looking expectations of return and risk, and (iii) portfolio optimization and rebalancing in a shortfall risk framework.

By integrating experienced qualitative insights with robust analytical methods, APM delivers superior risk-adjusted returns with negligible correlation or beta to the major market factors or benchmarks. APM is a Registered Investment Advisor with the US Securities and Exchange Commission (SEC).

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Outline

Part one: concepts

The asset allocation decision

What is the asset allocation decision?

- Provides a framework for portfolio management
- Defines the investment objective
- Defines the risk budget
- Incorporates future liabilities and/or purchasing power
- Uses asset classes as building blocks
- Establishes the appropriate benchmarks

The asset allocation decision

What is the asset allocation decision?

- Benchmarks provide a policy portfolio
- Policy portfolio provides a means to evaluate thousands of potential investments
- Accommodates multiple time horizons
  - Long-term versus short-term
  - Strategic versus tactical
- *Regardless of time horizon, expected returns require forecasts*
- *Regardless of time horizon, risk parameters require forecasts*

The asset allocation decision

What is the appropriate policy portfolio?

- Policy portfolio should comprise the asset classes of the asset allocation decision
- Asset classes should be definable, feasible, stable, and investable
- Asset class investments are, by definition, passive
- Asset class investments should be available as index funds
- Asset classes will have expected returns and risks

The asset allocation decision

What are the sources of expected return?

- Expected return premium for bearing systematic risk
  - Return from "beta" exposure to a market or asset class
  - Example: equity risk premium
  - Example: credit spread

- Expected return from security-specific investment decisions
  - Return from security selection or "alpha"
  - Return from disaggregation
  - Example: return from equity long / short pairs trade
  - Example: return from capital structure arbitrage trade

The asset allocation decision

What are the sources of expected risk?

- Systematic or market risk
  - Risk from exposure to "beta"
  - Risk of markets in the aggregate
  - Risk of asset classes
- Idiosyncratic or specific risk
  - Risk related to "alpha"
  - Not systematic, but security-specific
  - Risk from disaggregation

The asset allocation decision

- All investments can be evaluated relative to the policy portfolio
- Returns are additive
  - Individual returns add up to portfolio returns
  - Individual expected returns add up to portfolio expected returns
- Risks typically are *not* additive
  - Correlation matters for diversification
  - Difference between incremental and marginal contributions to risk
- Beyond normality: sources of "tail risk" and the importance of skewness

Portfolio math

- Individual security returns
  - $R_i = E(R_i) + \varepsilon_i$, $E(\varepsilon_i) = 0$
- Portfolio returns
  - $R_P = \sum_i w_i R_i = \sum_i w_i E(R_i) + \sum_i w_i \varepsilon_i$

    $= E(R_P) + \varepsilon_P$
- Returns and expected returns add

Portfolio math

- Returns can be thought of as riskless rate plus the incremental (positive or negative) return from bearing risk
- Individual security returns
  - $R_i = R_f + \beta_i(R_M - R_f) + \alpha_i + \varepsilon_i , \quad E(\varepsilon_i) = 0$
- Portfolio returns
  - $R_P = \sum_i w_i R_i = R_f + \sum_i w_i \beta_i(R_M - R_f) + \sum_i w_i \alpha_i + \sum_i w_i \varepsilon_i$

    $= R_f + \beta_P(R_M - R_f) + \alpha_P + \varepsilon_P$
- Returns and expected returns add

Portfolio math

- Covariance of returns between two securities
  - $\sigma_{ij} = E\ \{[R_i - E\ (R_i)][R_j - E\ (R_j)]\}$

    $= E\ (R_i\ R_j) - E\ (R_i)\ E\ (R_j)$
- Variance of returns
  - $\sigma_i^2 = E\ (R_i^2) - [E\ (R_i)]^2$
- Standard deviation of returns
  - $\sigma_i = \sqrt{\ } \sigma_i^2$
- Correlation of returns between two securities
  - $\rho_{ij} = \sigma_{ij} /(\sigma_i\ \sigma_j) \quad \rightarrow \quad \sigma_{ij} = \rho_{ij}\ \sigma_i\ \sigma_j$

Portfolio math

- Portfolio variance
  - $\sigma_P^2 = \sum_i \sum_j w_i w_j \sigma_{ij} = \sum_i w_i \sigma_{iP}$

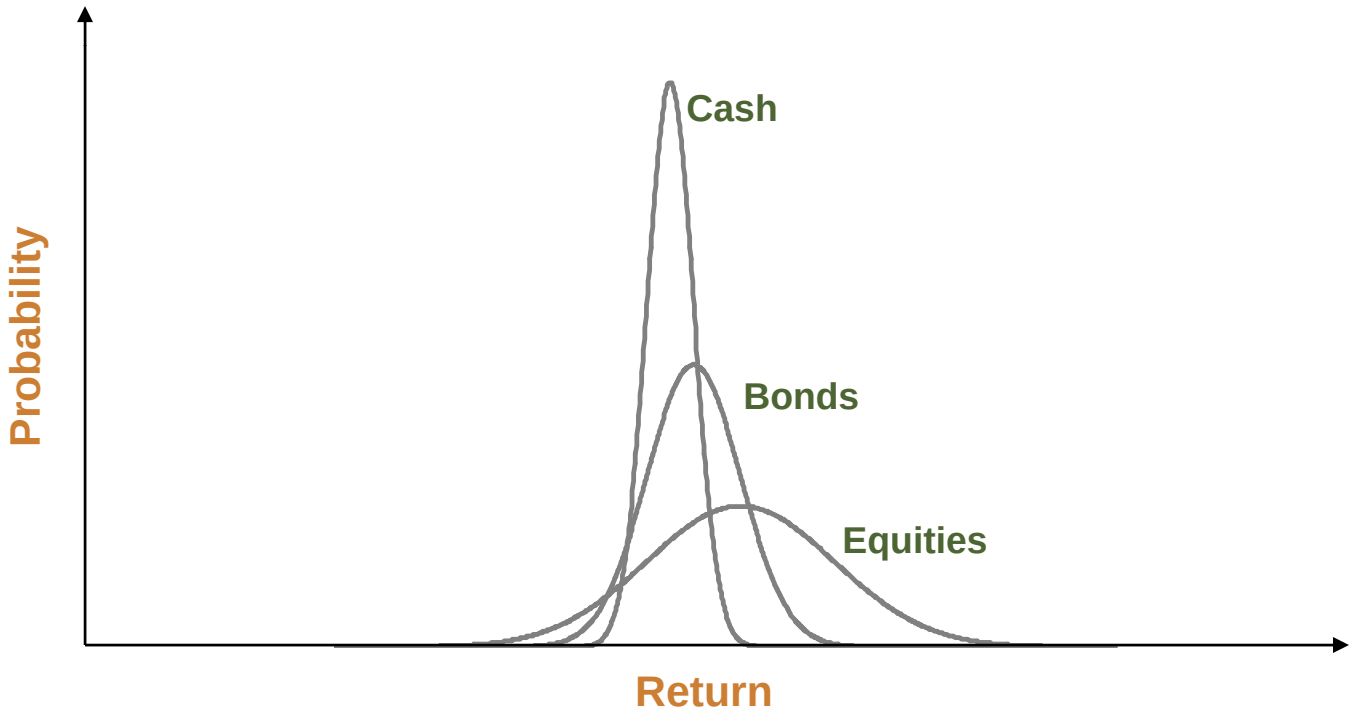
    not equal to $\sum_i w_i \sigma_i^2$
- Portfolio standard deviation
  - $\sigma_P = \sqrt{\sigma_P^2}$
- Variances and standard deviations do *not* add

Portfolio math

- Skewness is the third moment of the distribution, measuring the asymmetry of the tails of the distribution
- A normal distribution has zero skewness
- Positive skewness means that there are more outcomes in the "right tail" than would be expected from a normal distribution
- Negative skewness means that there are more outcomes in the "left tail" than would be expected from a normal distribution
- Skewness = $E\ \{[R_p - E\ (R_P)] / \sigma_P\}^3$

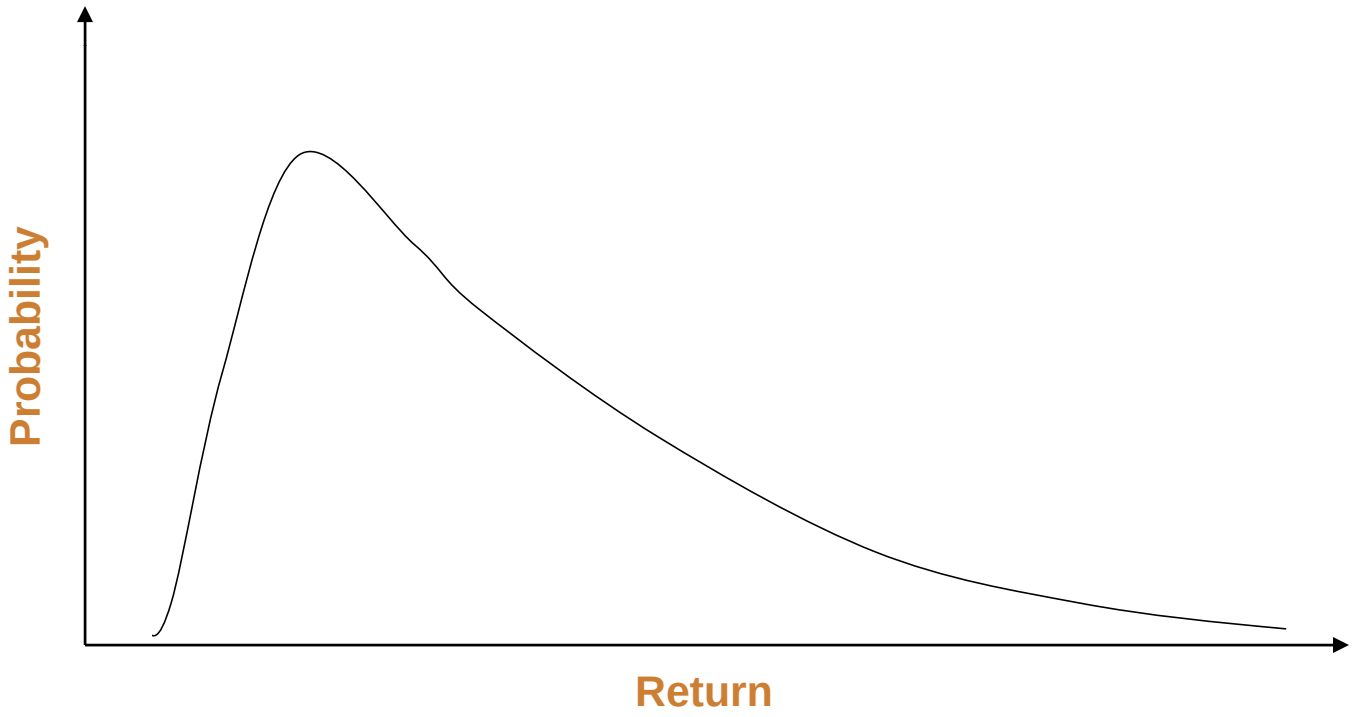
A distribution perspective

Typical tradeoff between asset classes



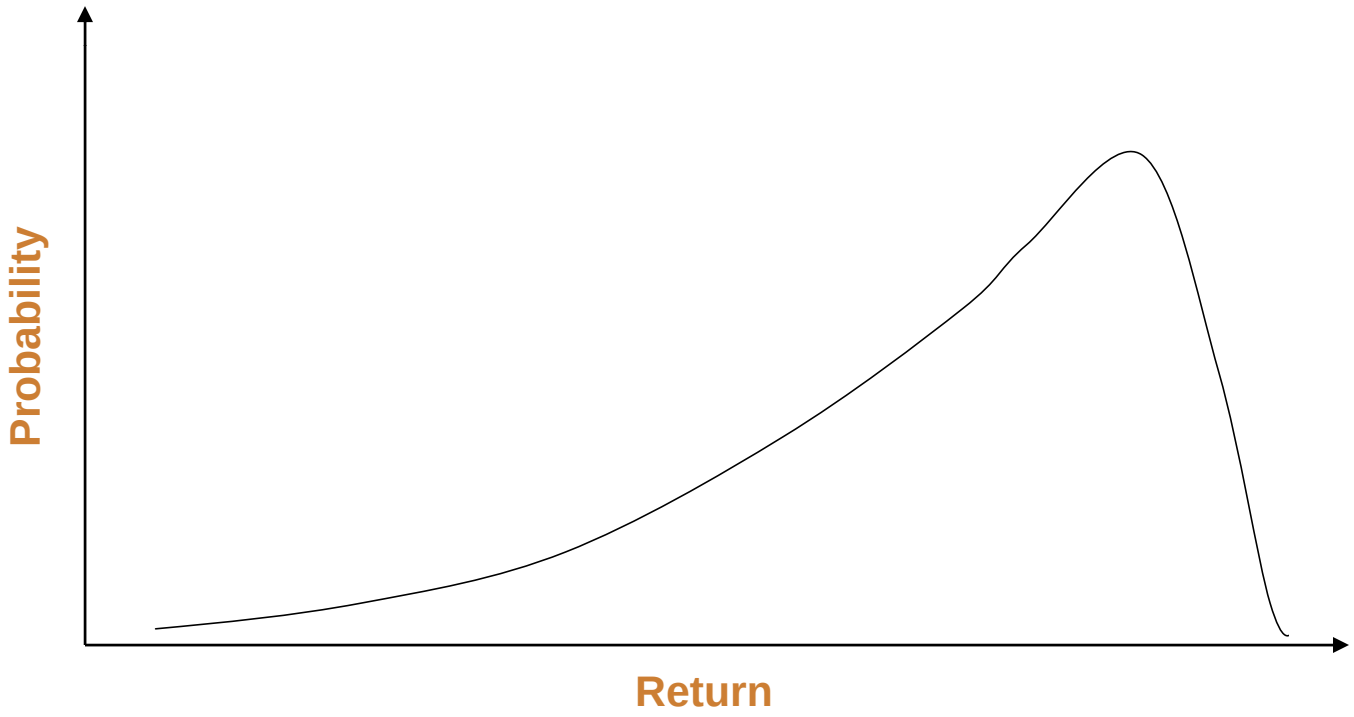
A distribution perspective

Positive skewness: extreme returns more likely to be positive



A distribution perspective

Negative skewness: extreme returns more likely to be negative



A distribution perspective

What is shortfall risk?

- Shortfall risk measures the probability and the magnitude of returns falling below a predetermined return threshold
- Shortfall risk is measured relative to shortfall threshold that segments a "tail" in the return distribution.
- The shortfall threshold should reflect the investment objective's minimum acceptable return
- The shortfall probability measures the likelihood of the return falling below the shortfall threshold
- The average shortfall measures the average underperformance to the threshold of all outcomes less than the shortfall threshold

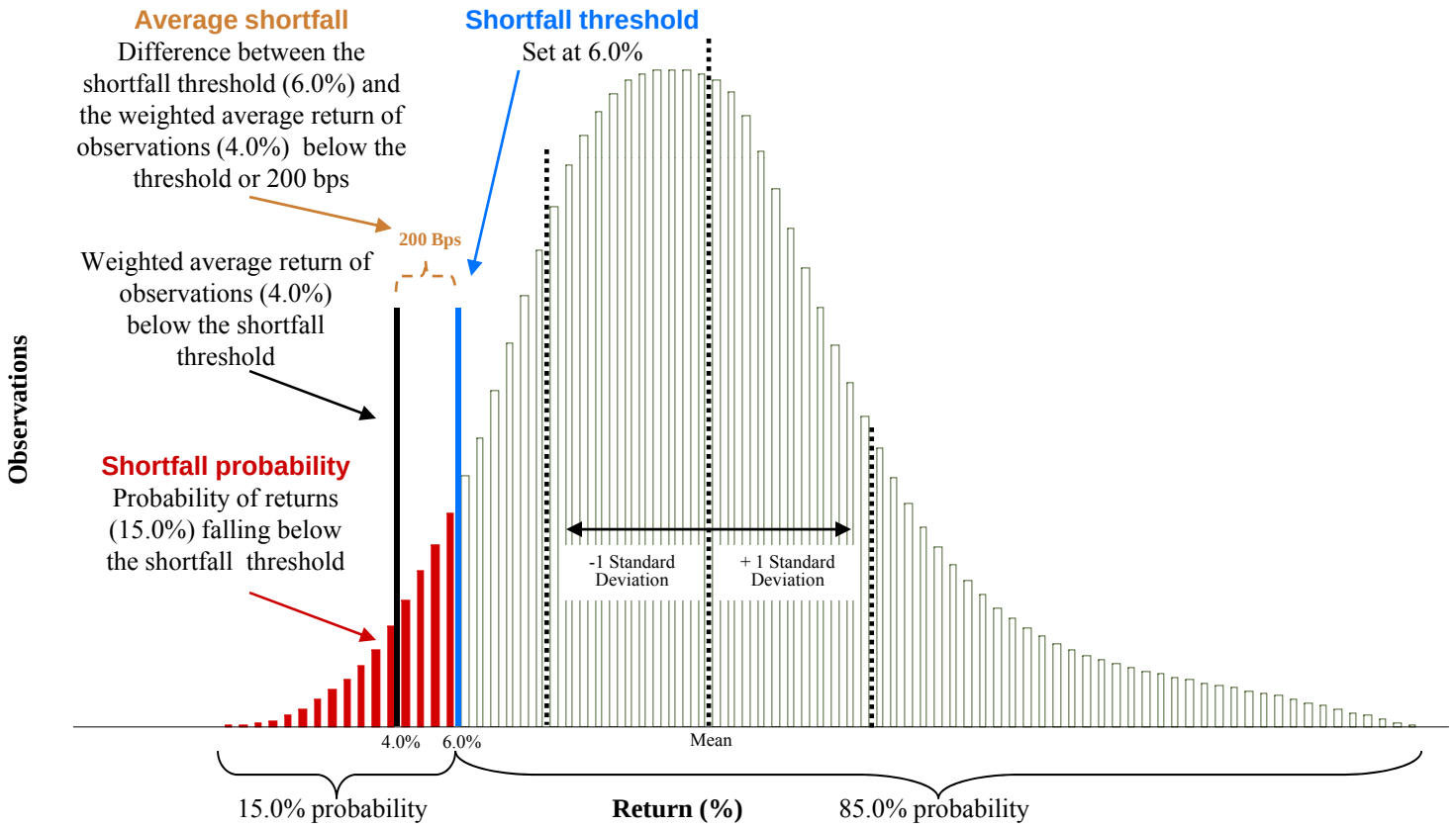
A distribution perspective

What is shortfall risk?

- Shortfall risk = shortfall probability * average shortfall
- Shortfall risk = $\sum_k$ {- [Min (R_{Pk} - shortfall threshold, 0)]}
  = $\sum_k$ {- [Min ($\sum_i w_i R_{ik}$ - shortfall threshold, 0)]}
- Individual security shortfalls are *not* additive as shortfall outcomes are not necessarily the same for all possible outcomes
- Contribution of individual securities to portfolio shortfall depends on the performance of the security in outcomes when the portfolio is in shortfall

A distribution perspective

An illustrative example of shortfall risk



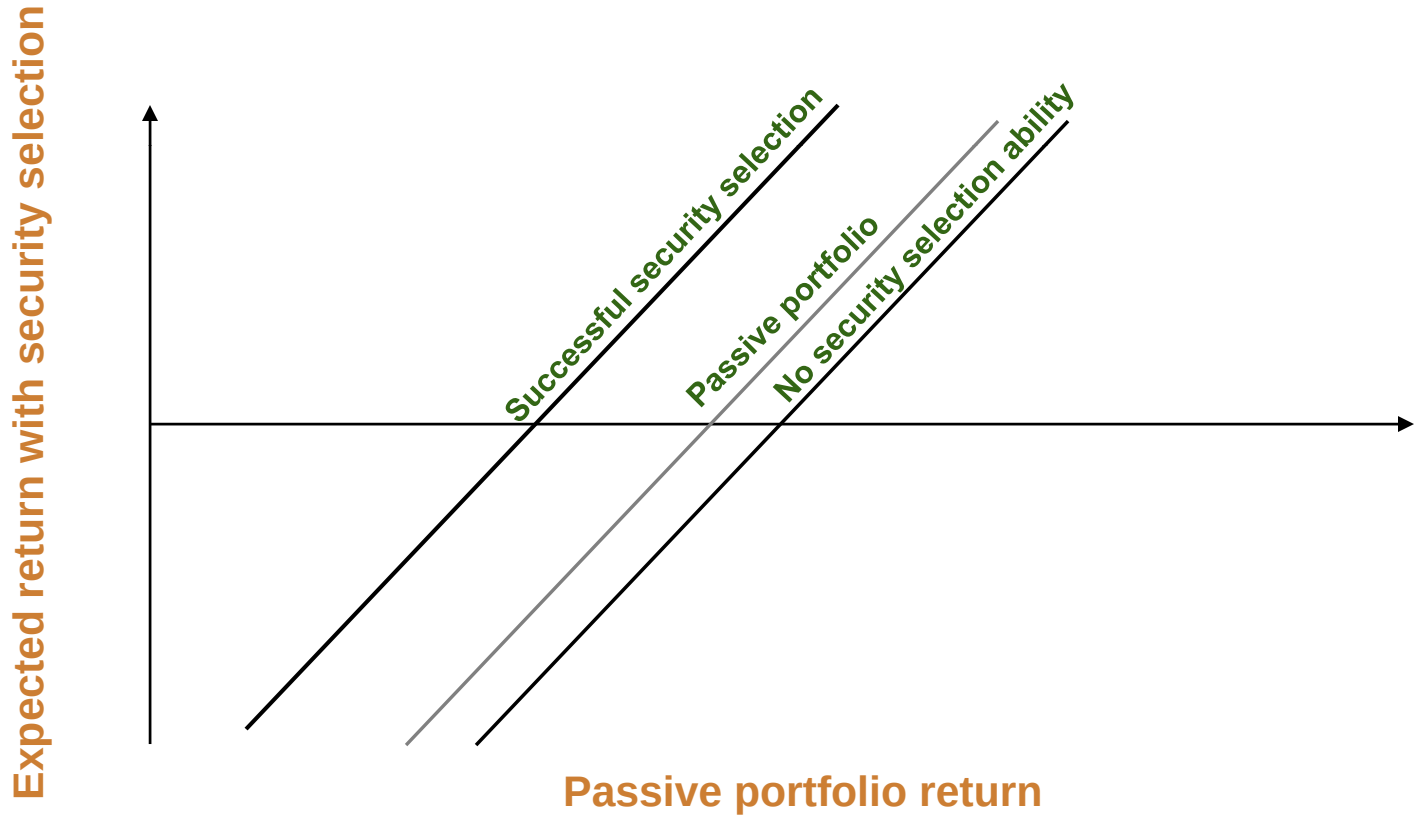
Advanced Portfolio Management

A distribution perspective

- The dimensions of active management
  - Security selection
  - Market timing
- Security selection: underweighting and overweighting individual securities relative to a benchmark portfolio
  - Potential source of incremental expected return
  - Source of incremental risk and costs
- Market timing: underweight and overweight markets and submarkets relative to a benchmark asset allocation
  - Potential source of incremental expected return
  - Source of incremental risk and costs

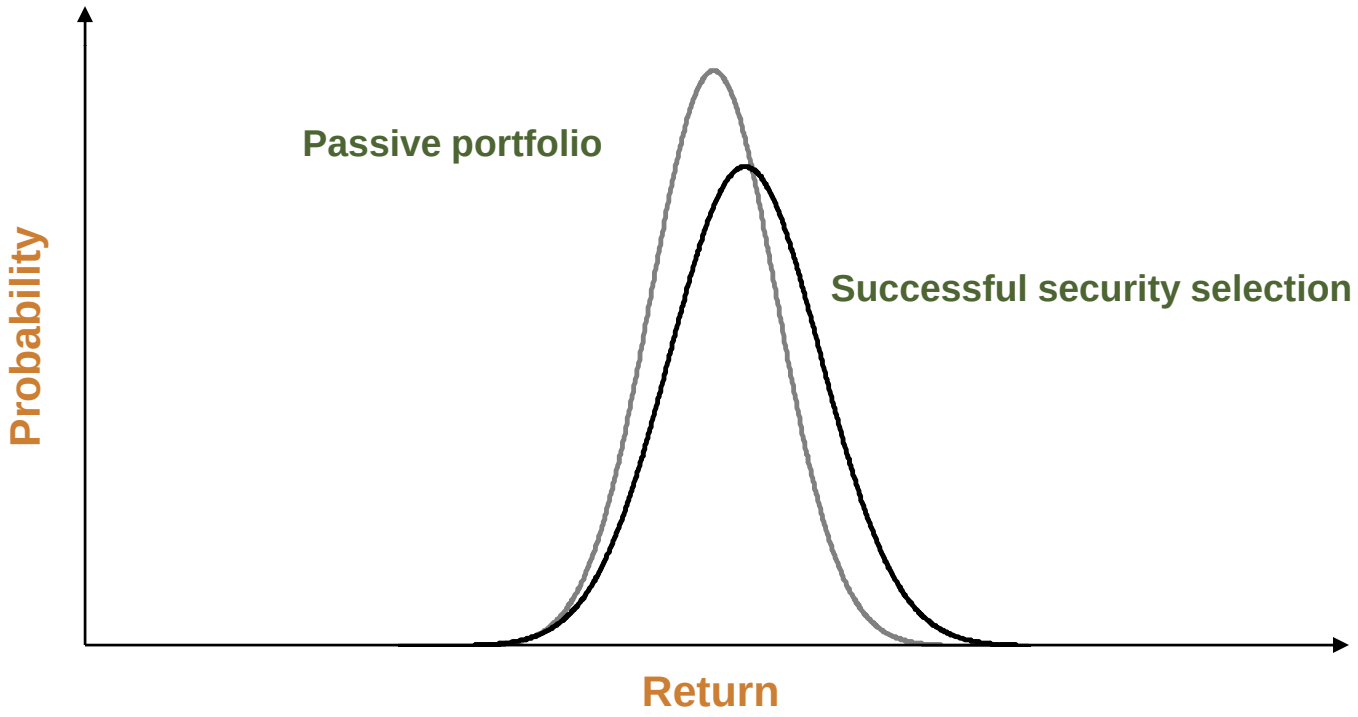
A distribution perspective

Expected payoff from security selection

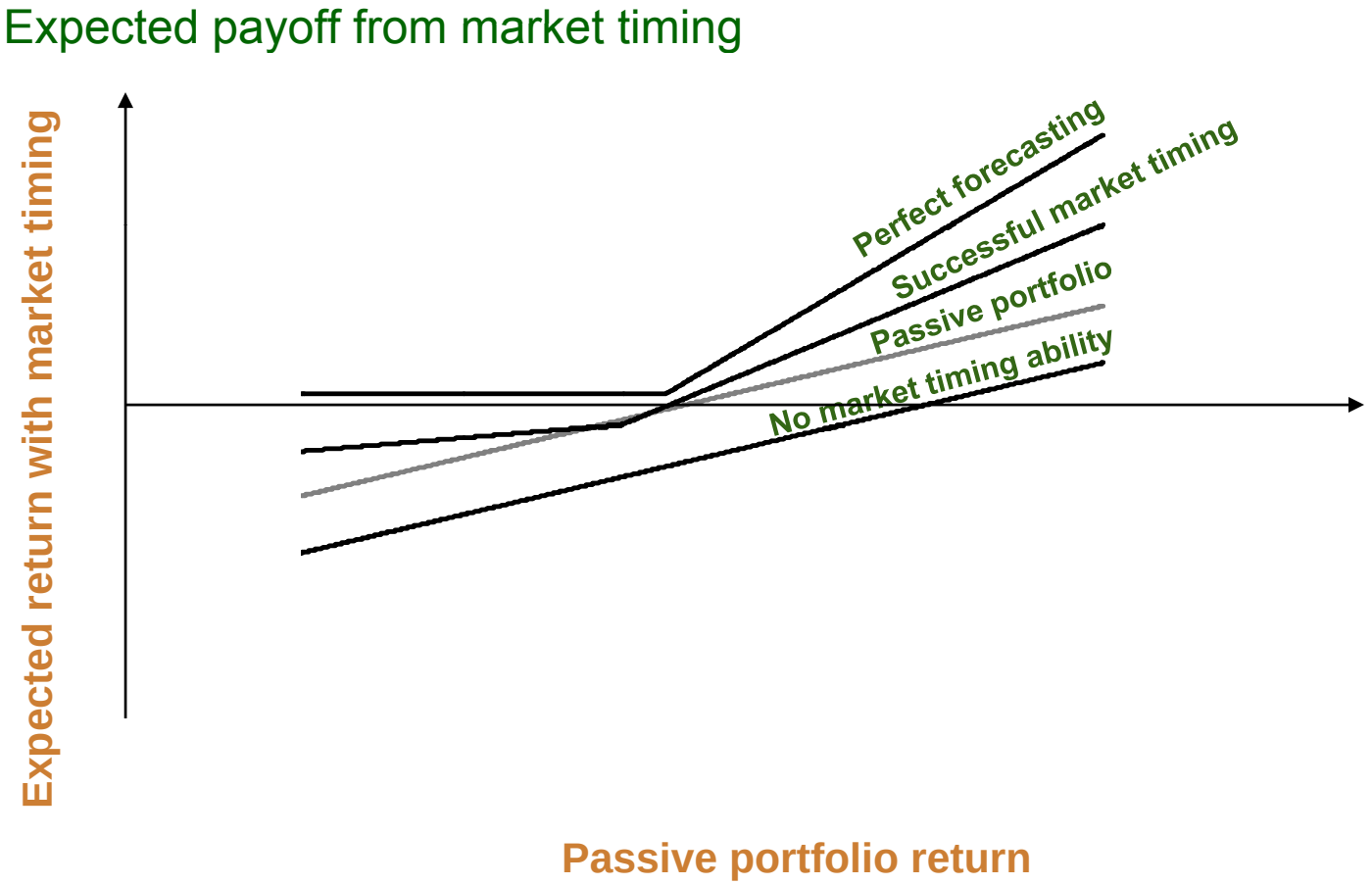


A distribution perspective

Return distribution with successful security selection

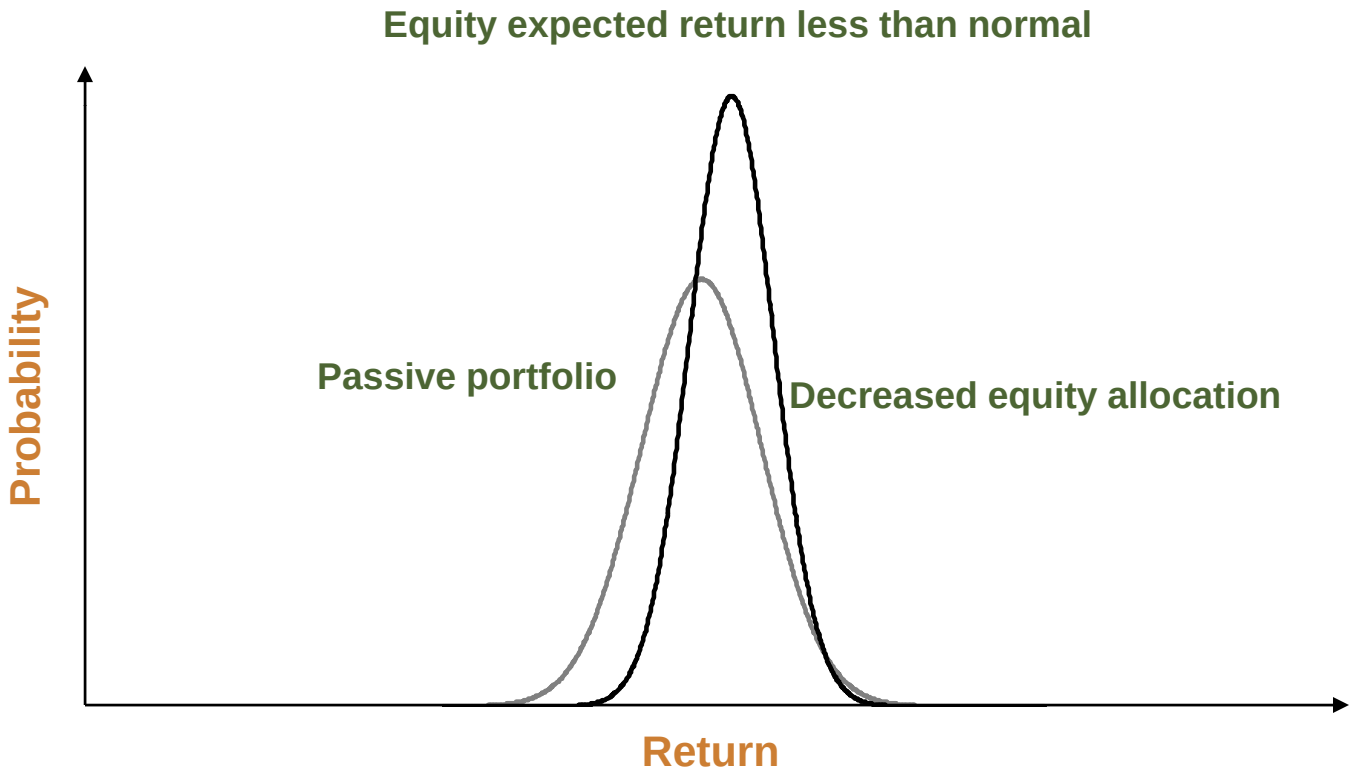


A distribution perspective



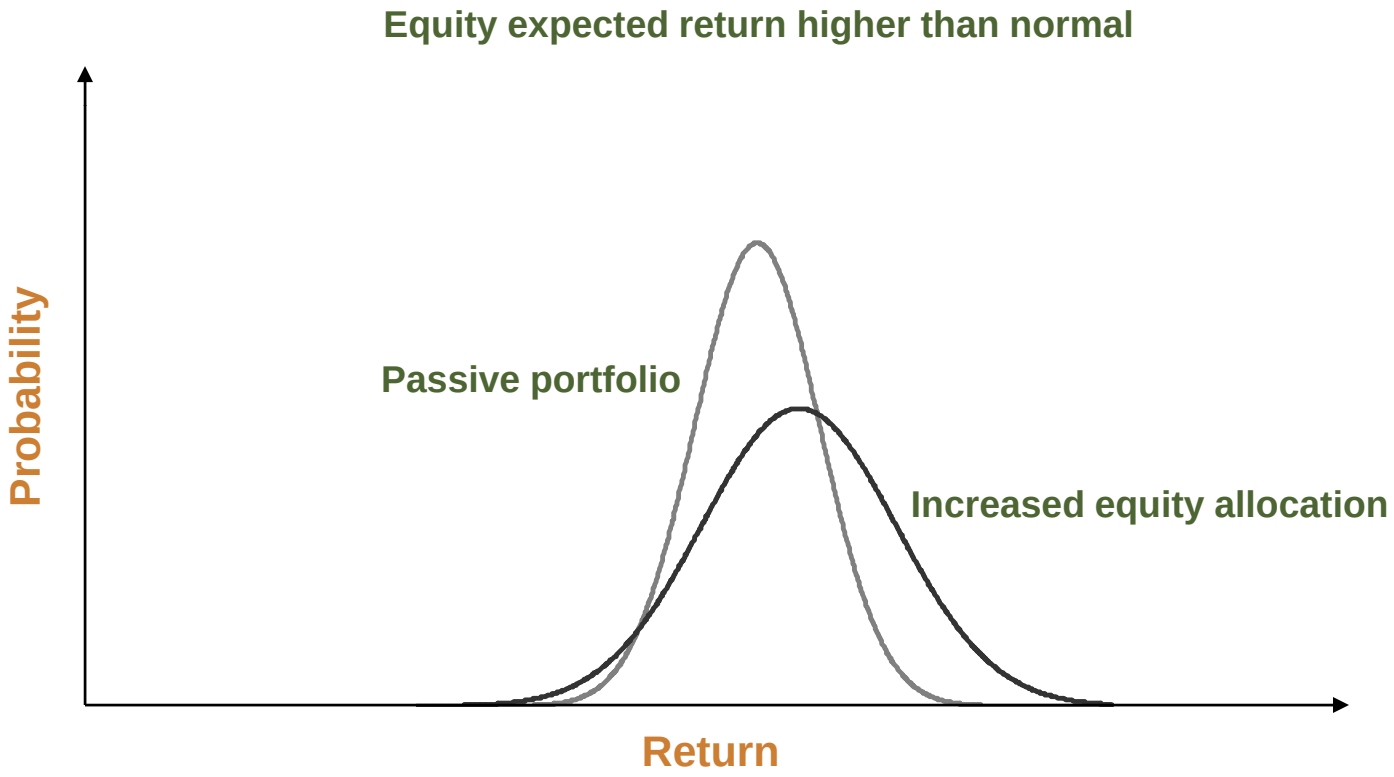
A distribution perspective

Changing the return distribution with successful market timing



A distribution perspective

Changing the return distribution with successful market timing



Active management: a portfolio perspective

Separation of active management from passive management

- Establish the appropriate policy portfolio from asset allocation decision
- How do the actual portfolio holdings differ from those of the policy portfolio?
- Returns are additive: disaggregation of portfolio holdings also provides disaggregation of returns
- Active management can be separated into security selection and market timing

Active management: a portfolio perspective

Disaggregation of portfolio holdings

- Portfolio Holdings = $\sum i\ w_{Pi}$ (security i) + w (cash)

  $= \beta_P$* Benchmark Portfolio Holdings +
  Security Selection Portfolio + w (cash)

- Benchmark Portfolio Holdings = $\sum_i w_{Mi}$ (security i)

- Security Selection Portfolio = $\sum_i (w_{Pi} - \beta_P * w_{Mi})$ (security i)

Active management: a portfolio perspective

Determine the appropriate passive portfolio

- Passive Portfolio Holdings = b_P* Benchmark Portfolio Holdings + $(1 - b_P)$ (cash)

$$= b_P * \sum_i w_{Mi} \text{ (security i)} + (1 - b_P) \text{ (cash)}$$

The active portfolio is everything else

- Active Portfolio Holdings $= \sum_i (w_{Pi} - b_P * w_{Mi})$ (security i) + (incremental cash requirement)

Active management: a portfolio perspective

Market timing decisions are implemented by deviations from the predetermined passive benchmark exposure: $\mathbf{b}_P$

- Market timing changes benchmark exposure by θ_P
- $\beta_P = b_P + \theta_P$
- θ_P can be positive or negative
- Market Timing Portfolio = θ_P * Benchmark Portfolio

Active management: a portfolio perspective

Security selection decisions are implemented by deviations from the portfolio weights of the benchmark exposure

- Security selection implemented by $[w_i - (b_P + \theta_P) * w_{Mi}]$
- Overweighting and underweighting relative to the benchmark
- Aggregate market exposure, or "beta" of security selection must be zero
- "Beta" of under-weighted positions = "beta" of over-weighted positions

Active management: a portfolio perspective

Active management can be disaggregated

- All incremental "beta" exposure is market timing
- By definition, security selection has zero beta

- Active Portfolio Holdings = Market Timing Portfolio +

  Security Selection Portfolio

  $= \theta_P * \sum_i w_{Mi}$ (security i) +

  $\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})$ (security i) +

  (incremental cash requirement)

Active management: a portfolio perspective

All active management decisions can be separated from the underlying passive portfolio

- Portfolio Holdings = Passive Portfolio Holdings + Active Portfolio Holdings

$$= \{b_P * \sum_i w_{Mi}\,(\text{security i}) + (1 - b_P)\,(\text{cash})\} +$$
$$\{\theta_P * \sum_i w_{Mi}\,(\text{security i}) +$$
$$\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})\,(\text{security i}) +$$
$$(\text{incremental cash requirement})\}$$

Active management: a portfolio perspective

Since the passive benchmark portfolio must be fully invested, any active management must be self-financing

- All capital is allocated to the passive portfolio

$$b_P + (1 - b_P) = 1$$

- No capital is allocated to active management
- Active management can generate positive excess cash
- Active management can require financing: negative excess cash
  - Financing can be provided from the cash in the passive portfolio
  - Cash requirements beyond this require borrowing from a counterparty

Active management: a portfolio perspective

Portable alpha can combine the active management portfolio with any underlying benchmark component by the use of an overlay

- Portability of alpha follows directly from
  - Active management can be separated from the underlying passive portfolio
  - Active management is self-financing

- Asset class derivatives make implementation of the overlay feasible at minimal incremental cost, for a wide range of benchmark portfolio components

Active management: a portfolio perspective

Portable alpha maintains the exact same active management portfolio, but changes the underlying benchmark portfolio component

- Portable alpha allows the allocation to active management to be separated from the asset allocation policy portfolio
- Portable alpha allows the asset class of the benchmark to be completely separate from the investment universe of the active manager

Active management: a portfolio perspective

Portable alpha allows the investor to choose the underlying benchmark portfolio component

- Initial passive portfolio is 100% cash
- Changing from cash to portfolio N
- Transform by overlay of "futures" reflecting the following portfolio

Δ Passive Portfolio Holdings = b_N * [$\sum_i w_{Ni}$ (security i) – (cash)]

New Passive Portfolio Holdings = b_N * $\sum_i w_{Ni}$ (security i) + (1 – b_N) (cash)

Active management: a portfolio perspective

Portable alpha separates the active management universe and active portfolio from the underlying benchmark portfolio component

- Old Portfolio Holdings $= \{100\%\ (\text{cash})\} +$
$\{\theta_P * \sum_i w_{Mi}\ (\text{security i}) +$
$\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})\ (\text{security i}) +$
$(\text{incremental cash requirement})\}$

- New Portfolio Holdings $= \{b_N * \sum_i w_{Ni}\ (\text{security i}) + (1 - b_N)\ (\text{cash})\} +$
$\{\theta_P * \sum_i w_{Mi}\ (\text{security i}) +$
$\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})\ (\text{security i}) +$
$(\text{incremental cash requirement})\}$

Active management: a portfolio perspective

Portable alpha allows the investor to change the underlying benchmark portfolio component

- Initial passive portfolio is $b_P * \sum_i w_{Mi}$ (security i) + $(1 - b_P)$ (cash)
- Changing from portfolio M to portfolio N
- Transform by overlay of "futures" reflecting the following portfolio

Δ Passive Portfolio Holdings = $b_N * \sum_i w_{Ni}$ (security i) –
$b_P * \sum_i w_{Mi}$ (security i) + $(b_P - b_N)$ (cash)

New Passive Portfolio Holdings = $b_N * \sum_i w_{Ni}$ (security i) + $(1 - b_N)$ (cash)

Active management: a portfolio perspective

Portable alpha separates the active management universe and active portfolio from the underlying benchmark portfolio component

- Old Portfolio Holdings = $\{b_P * \sum i\ w_{Mi}\ (\text{security i}) + (1 - b_P)\ (\text{cash})\} +$
  $\{\theta_P * \sum_i w_{Mi}\ (\text{security i}) +$
  $\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})\ (\text{security i}) +$
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  $\{\theta_P * \sum_i w_{Mi}\ (\text{security i}) +$
  $\sum_i (w_{Pi} - (b_P + \theta_P) * w_{Mi})\ (\text{security i}) +$
  (incremental cash requirement)$\}$

The role of hedge funds

What are hedge funds?

- Hedge funds should offer superior, consistent returns from alpha
- Sources of risk not specifically related to the generation of *alpha* should be minimized
- Hedge funds should not be a source of *passive* returns
- *Alpha*, not *beta*
- But what is *passive* and what is *beta?*

The role of hedge funds

What have we meant by passive?

- Asset classes of the asset allocation policy portfolio
- Available as index funds or derivatives
- Asset classes offer, in the long-term, an expected return premium for bearing the systematic risk of the asset class
- Systematic returns and systematic risk
- Minimal difference between the returns of the index fund or derivative on paper and as an investment

The role of hedge funds

What have we meant by beta?

- Origin in the Capital Asset Pricing Model
- β = Correlation (between investment and stock index) * [Standard Deviation (investment) / Standard Deviation (stock index)]
- Terminology from regression analysis: $y = \alpha + \beta x$
- Measure of systematic risk
- Meant to capture stable, long-term relationships
- Not meant to represent all possible *ex post* correlations

The role of hedge funds

Hedge funds are (expensive) unconstrained active managers

- Two important characteristics that consistently apply to hedge funds
  - they are subject to minimal investment constraints
  - they charge high fees
- Hedge funds have the ability to invest in a wide range of securities, to hold negative positions in securities through short sales or derivatives, and to borrow or use other forms of leverage
- Hedge funds charge fees that are much higher than those charged by most other asset managers

The role of hedge funds

Hedge funds: the bad news

- Given their fee structure, hedge funds provide an extremely inefficient source of passive asset class returns
- Index funds will dominate hedge fund as providers of passive asset class returns
- Index funds will dominate in terms of fees, costs, liquidity, and transparency

The role of hedge funds

Hedge funds: the good news

- Given their investment flexibility, hedge funds can be constructed to provide a pure play on active management or skill-based investing
- Given their investment flexibility, hedge funds should be able to maximize the profit opportunities available from skill-based investment opportunities
- Given their flexibility and fee structure, hedge funds should attract the best skill-based managers

The role of hedge funds

Hedge fund fees should *only* be paid for successful active management

- Successful skill-based managers are scarce and can command high fees
- Alpha generation is a zero-sum game (negative after costs and fees)
- Opportunity set should be expected to change, therefore the trades should be expected to change – risks and returns are non-stationary
- Alpha generation requires a dynamic investment process
- EMT requires that exploitation of opportunities is more difficult with time
- Successful skill-based managers continually seek/find new opportunities

The role of hedge funds

Same manager provides active (α) and passive (β) returns. Hedge fund fees are charged on both. Performance fee is charged on R_f.

- *Portfolio return before fees*

$$R_P = R_f + \beta_P(R_M - R_f) + \alpha_P$$

$$= 5\% + 1(10\% - 5\%) + 4\% = 14\%$$

- *Portfolio return after hedge fund fees*

$$R_P = R_f + \beta_P(R_M - R_f) + \alpha_P$$

$$= \{[5\% + 1(10\% - 5\%) + 4\%] - 2\%\} * 0.80 = 9.6\%$$

The role of hedge funds

Separate active (α) and passive (β) managers. Hedge fund fees are not charged on returns from beta, but charged on R_f.

- *Portfolio return before fees*

$$R_P = \{R_f + \alpha\} + \beta(R_M - R_f)$$

$$= 5\% + 1(10\% - 5\%) + 4\% = 14\%$$

- *Portfolio return after hedge fund fees and beta overlay*

$$R_P = \{[(R_f + \alpha) - \text{Mgmt Fee}] * (1 - \text{Perf Fee})\} + \{\beta(R_M - R_f) - \beta \text{ Fee}\}$$

$$= \{[(5\% + 4\%) - 2\%] * 0.80\} + \{1(10\% - 5\%) - 0.1\%\} = 10.5\%$$

The role of hedge funds

Separate active (α) and passive (β) managers. Hedge fund fees are not charged on returns from beta. Performance fee is not paid on R_f.

- *Portfolio return before fees*

$$R_P = R_f + \alpha + \beta(R_M - R_f)$$

$$= 5\% + 1(10\% - 5\%) + 4\% = 14\%$$

- *Portfolio return after hedge fund fees on α and beta overlay*

$$R_P = R_f + \{[\alpha - \text{Mgmt Fee}] * (1 - \text{Perf Fee})\} + \beta(R_M - R_f) - \beta \text{ Fee}$$

$$= 5\% + \{[4\% - 2\%] * 0.80\} + 1(10\% - 5\%) - 0.1\% = 11.5\%$$

Part two: applications

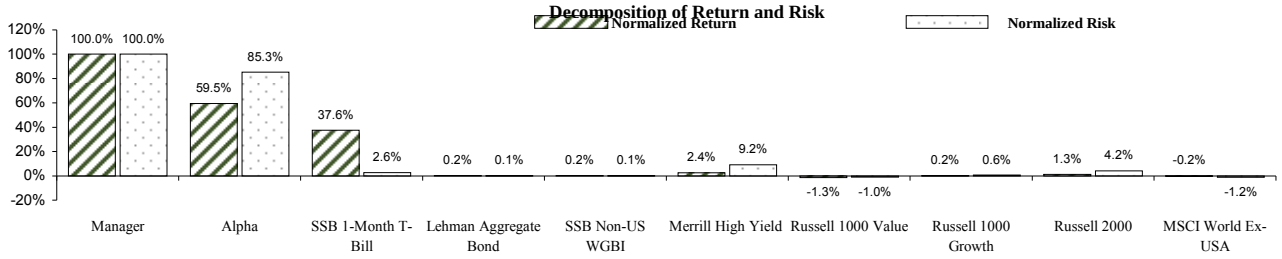
Historical manager returns

Manager			Relative Value					Multi-strategy
Period: Jul 1996 to Jun 2004								
	Annualized Monthly Returns					**Shortfall Analysis**		
Manager/Benchmark	**1Y Return**	**5Y Return**	**Period Return**	**Standard Deviation**	**Sharpe Ratio**	**Shortfall Probability**	**Average Shortfall**	**Shortfall Risk**
Manager	**6.0%**	**9.6%**	**9.4%**	**2.1%**	**2.8**	**5.2%**	**0.8%**	**0.0%**
Altvest Relative Value Index	6.7%	9.8%	11.0%	2.7%	2.7	3.1%	1.0%	0.0%
HFR Relative Value Index	5.7	8.6	9.3	3.4	1.7	16.5	1.8	0.3
Tremont F.I. Arbitrage Index	6.5	7.0	6.5	4.1	0.7	46.8	3.0	1.4
Average	**6.3**	**8.4**	**8.9**	**3.4**	**1.7**	**22.1**	**1.9**	**0.6**
US 1M T-Bill	0.9%	2.9%	3.5%	0.5%	N/A	100.0%	2.5%	2.5%
Lehman Aggregate Bond Index	0.5	6.8	6.9	3.8	0.9	41.3	2.6	1.1
SSB Non-US WGBI Index	7.8	7.0	5.5	8.5	0.2	54.1	6.8	3.7
Merrill High Yield Index	9.9	5.1	6.5	7.8	0.4	49.1	5.9	2.9
Russell 1000 Value Index	19.7	3.0	11.1	15.9	0.5	38.6	10.5	4.1
Russell 1000 Growth Index	16.8	-4.2	8.0	21.5	0.2	48.1	15.8	7.6
Russell 2000 Index	29.8	8.8	10.3	21.4	0.3	43.6	15.0	6.5
MSCI World Ex-USA Index	33.7	2.7	5.4	15.9	0.1	53.2	12.6	6.7

Comparative historical analysis of individual manager performance

Factor-based risk and return attribution

Investment Class	R Square 0.12	Period Return	Standard Deviation	Correl vs. Manager	Beta vs. Manager	Factor Weighting	t Statistics	Return Attribution	Risk Attribution (*)
0 – Manager		**9.4%**	**2.1%**	**1.00**	**1.00**	**0.09**	--	**9.4%**	**100.0%**
1 – Alpha		--	--	--	--	--	7.39	5.6	85.3
2 – US 1M T-Bill		3.5	0.5	-0.06	-0.25	--	--	3.5	2.6
3 – Lehman Aggregate Bond Index		6.9	3.8	0.07	0.04	0.01	0.09	0.0	0.1
4 – SSB Non-US WGBI Index		5.5	8.5	0.03	0.01	0.01	0.35	0.0	0.1
5 – Merrill High Yield Index		6.5	7.8	0.32	0.08	0.08	2.32	0.2	9.2
6 – Russell 1000 Value Index		11.1	15.9	0.09	0.01	-0.02	-0.80	-0.1	-1.0
7 – Russell 1000 Growth Index		8.0	21.5	0.16	0.02	0.00	0.21	0.0	0.6
8 – Russell 2000 Index		10.3	21.4	0.24	0.02	0.02	1.11	0.1	4.2
9 – MSCI World Ex-USA Index		5.4	15.9	0.14	0.02	-0.01	-0.44	0.0	-1.2

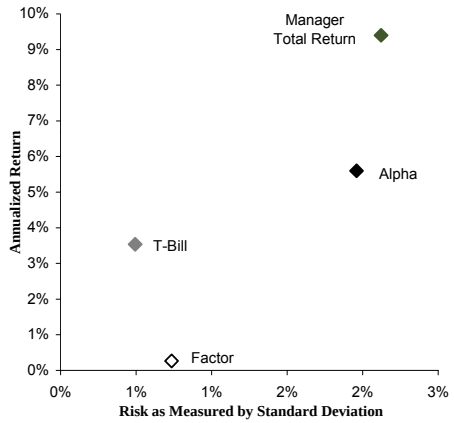


Factor analysis is applied to isolate alpha and precisely attribute both risk and return

* *Normalized*

Decomposition of risk and return

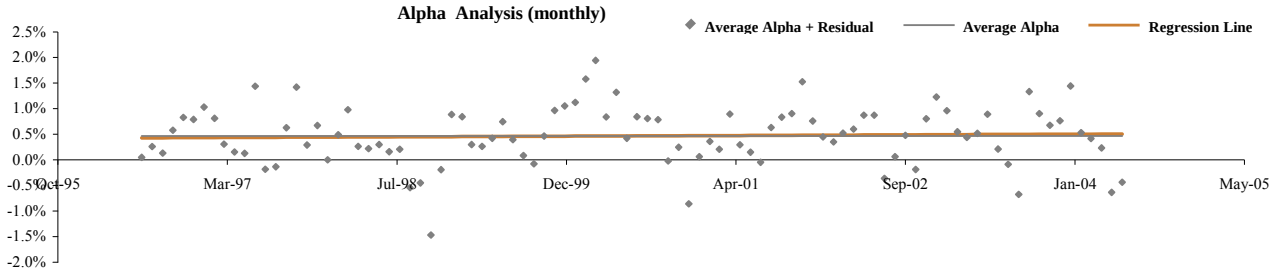
Statistics	Manager	=	Alpha Stats	+	Factor Stats	+	US 1M T-Bill
Return:	9.4%		5.6%		0.3%		3.5%
Shortfall Probability @ 6.0%	5.2%		59.7%		100.0%		100.0%
Average Shortfall @ 6.0%	0.8		1.7		5.7		2.5
Shortfall Risk @ 6.0%	0.0		1.0		5.7		2.5
Shortfall Probability @ 0.0%	0.0%		0.1%		36.8%		0.0%
Average Shortfall @ 0.0%	0.0		0.3		0.5		0.0
Shortfall Risk @ 0.0%	0.0		0.0		0.2		0.0
Standard Deviation:	2.1%		2.0%		0.7%		0.5%
Sharpe Ratio:	2.8		2.9		0.4		N/A
Spread to US 1 M T-Bill (Bps)	586		560		26		N/A



Once risk and return are deconstructed, the manager's performance becomes more readily understood

Drawdown and period analysis

Historical Statistics				Manager			
				Twelve months ending			
	Period	5Year	1Year	Jun-03	Jun-02	Jun-01	Jun-00
Compounded Return	111.2%	61.5%	6.2%	9.1%	10.8%	8.7%	15.8%
Maximum Drawdown	-1.3%	-0.9%	-0.9%	-0.5%	0.0%	-0.2%	0.0%
From	Oct-98	May-04	May-04	Jul-02	N/A	Dec-00	N/A
To	Jan-99	Current	Current	Sep-02	N/A	Jan-01	N/A
Length of Drawdown	4	Min 3	Min 3	3	N/A	2	N/A
Trough to Recovery	2	Min 1	Min 1	2	N/A	1	N/A
Monthly Average Return	0.8%	0.8%	0.5%	0.7%	0.9%	0.7%	1.2%
Monthly Standard Deviation	0.6%	0.6%	0.8%	0.6%	0.5%	0.5%	0.6%
Best Month	2.4%	2.4%	1.7%	1.5%	2.0%	1.4%	2.4%
Worst Month	-0.8%	-0.7%	-0.7%	-0.6%	-0.3%	-0.2%	0.3%
Skewness	-0.20	-0.31	0.07	-0.81	1.14	-0.29	0.04
Serial Correlation	0.43	0.36	0.38	0.25	0.21	0.43	0.82
Ann. Avg. Alpha + Residual Return	5.6%	6.4%	4.5%	5.6%	8.3%	3.8%	10.1%
Annualized Slope	**0.0%**						
Average Monthly Alpha	**0.5%**						



Drawdown analysis and alpha trends are important dimensions of manager performance

Outlier analysis

Correlation and Beta Analysis

		US 1M T-Bill	Lehman Aggregate	SSB Non-US WGBI	Merrill High Yield	Russell 1000 Value	Russell 1000 Growth	Russell 2000	MSCI World xUSA
Correlation	Period	-0.06	0.07	0.03	0.32	0.09	0.16	0.24	0.14
	5Year	-0.01	0.09	0.14	0.41	0.15	0.30	0.34	0.26
	1Year	0.47	0.45	0.52	0.68	0.16	-0.01	-0.02	0.33
Beta	Period	-0.25	0.04	0.01	0.08	0.01	0.02	0.02	0.02
	5Year	-0.04	0.05	0.03	0.10	0.02	0.03	0.03	0.04
	1Year	71.25	0.22	0.14	0.38	0.05	0.00	0.00	0.12

Worst and Best Performing Months

	Manager	US 1M T-Bill	Lehman Aggregate	SSB Non-US WGBI	Merrill High Yield	Russell 1000 Value	Russell 1000 Growth	Russell 2000	MSCI World xUSA
Nov-98	-0.8%	0.3%	0.6%	-2.0%	5.2%	4.7%	7.6%	5.2%	5.1%
May-04	-0.7	0.1	-0.4	1.1	-1.6	1.0	1.9	1.6	0.5
Jul-02	-0.6	0.1	1.2	0.6	-3.9	-9.3	-5.5	-15.1	-9.9
Aug-03	-0.5	0.1	0.7	-0.9	1.3	1.6	2.5	4.6	2.6
Oct-98	-0.5	0.3	-0.5	4.5	-2.1	7.8	8.0	4.1	10.4
Feb-00	2.4%	0.4%	1.2%	-1.6%	0.2%	-7.4%	4.9%	16.5%	2.8%
Nov-01	2.0	0.2	-1.4	-1.1	3.5	5.8	9.6	7.7	3.9
Mar-00	2.0	0.5	1.3	3.5	-1.5	12.2	7.2	-6.6	4.1
Oct-97	1.9	0.4	1.5	2.2	0.5	-2.8	-3.7	-4.4	-7.5
Jun-97	1.9	0.4	1.2	1.2	1.6	4.3	4.0	4.3	5.3

Worst and best monthly returns are examined to allow detailed investigation into outlying performance

Quartile analysis

Quartile Analysis of Index Returns (from worst to best, monthly)		I	II	III	IV
Manager	**Average Return**	**0.7%**	**0.7%**	**0.8%**	**0.9%**
	Standard Deviation	**0.6**	**0.6**	**0.6**	**0.6**
Lehman Aggregate Bond Index	Average Return	-0.8	0.3	1.0	1.8
	Standard Deviation	0.8	0.2	0.2	0.4
Manager	**Average Return**	**0.8%**	**0.8%**	**0.7%**	**0.8%**
	Standard Deviation	**0.7**	**0.6**	**0.6**	**0.6**
SSB Non-US WGBI Index	Average Return	-2.6	-0.3	1.0	3.8
	Standard Deviation	1.0	0.4	0.5	1.4
Manager	**Average Return**	**0.5%**	**0.8%**	**1.0%**	**0.9%**
	Standard Deviation	**0.6**	**0.6**	**0.5**	**0.6**
Merrill High Yield Index	Average Return	-2.3	0.2	1.3	3.0
	Standard Deviation	1.9	0.4	0.3	1.4
Manager	**Average Return**	**0.8%**	**0.8%**	**0.7%**	**0.8%**
	Standard Deviation	**0.6**	**0.5**	**0.6**	**0.7**
Russell 1000 Value Index	Average Return	-4.9	-0.4	2.5	6.5
	Standard Deviation	3.1	1.0	1.1	1.7
Manager	**Average Return**	**0.7%**	**0.7%**	**0.8%**	**0.8%**
	Standard Deviation	**0.6**	**0.4**	**0.7**	**0.7**
Russell 1000 Growth Index	Average Return	-7.6	-1.2	3.5	8.0
	Standard Deviation	3.8	1.3	1.5	1.5
Manager	**Average Return**	**0.7%**	**0.8%**	**0.7%**	**0.9%**
	Standard Deviation	**0.6**	**0.4**	**0.7**	**0.7**
Russell 2000 Index	Average Return	-7.2	-0.9	3.2	8.3
	Standard Deviation	3.9	1.6	1.2	2.4
Manager	**Average Return**	**0.7%**	**0.7%**	**0.8%**	**0.9%**
	Standard Deviation	**0.6**	**0.4**	**0.7**	**0.7**
MSCI World Ex-USA Index	Average Return	-5.7	-0.5	2.3	5.7
	Standard Deviation	2.8	1.2	0.9	1.9

Worst-to-best quartile analysis of index returns versus the manager provide additional intuition

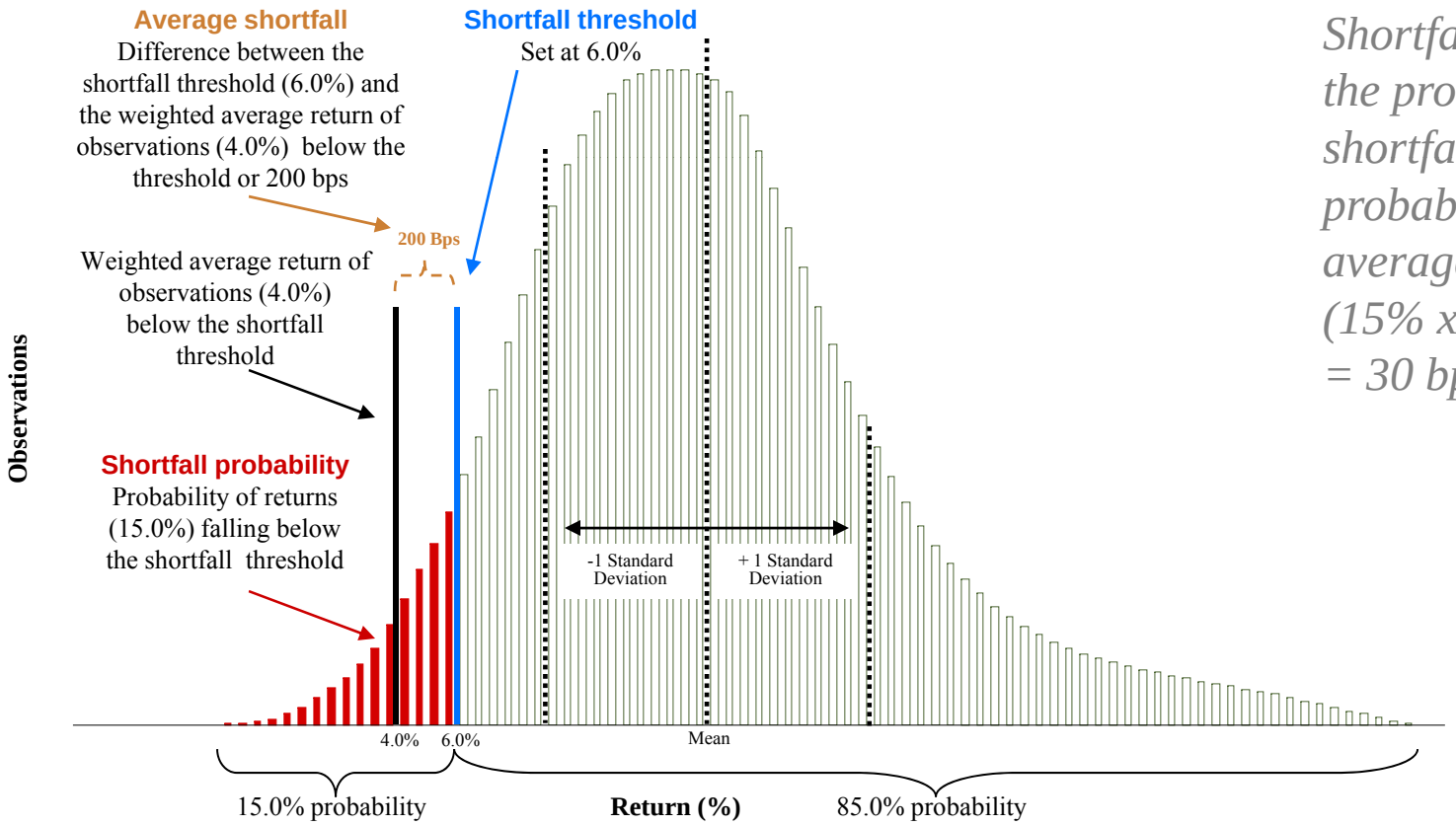
Defining shortfall risk

Shortfall risk	Shortfall risk measures the probability *and* the magnitude of potential portfolio returns that fall below a predetermined absolute return threshold.
Shortfall threshold	In measuring shortfall risk, a return threshold is first specified. This threshold determines risk tolerance and segments a 'tail' in the distribution of expected returns. The threshold is also referred to as the shortfall threshold or minimum acceptable return.
Shortfall probability	Measures the percentage of observations falling below the shortfall return threshold.
Average shortfall	The shortfall threshold less the weighted-average of all returns below the threshold.

Shortfall risk is the risk of **not** *achieving your minimum return threshold*

Shortfall risk = **(shortfall probability) x (average shortfall)**

Illustrative example



Shortfall risk is the product of shortfall probability and average shortfall (15% x 200 bps = 30 bps)

Comparative risk/return measures

	Definition	Advantages	Disadvantages
Mean-variance	Traditional measure of expected risk and return. Quantifies dispersion around the mean return in traditional statistical terms. Return equals mean of distribution. Risk equals sigma of distribution.	Widely accepted by both academics and practitioners. Long research pedigree. Easy to model using traditional statistical techniques. Utilized as portfolio optimization tool.	Fails to distinguish good from bad outcomes. Difficult to incorporate risk tolerance. Mean return is unrelated to a priori investment objectives. Works best with normal distributions.
VaR	Uses historical variance to calculate potential downside. Takes a current mark-to-market and calculates potential loss based on probabilistic confidence intervals.	Focus on negative tail of return distribution. Widely accepted risk management metric. When applied properly, measures potential downside exposure.	Does not capture specificity of risk. Does not capture non-normal risk. Does not serve as an optimization objective. Fails to incorporate risk tolerance.
Shortfall risk	Simple product of shortfall probability and the weighted average shortfall. Requires a statement of risk tolerance (shortfall threshold).	Two dimensional characterization of distribution tail. Works with non-normal distributions. Optimization is performed relative to an absolute return threshold (risk tolerance).	Requires computationally intense statistical methods.

While mean-variance and VaR are useful risk/return metrics, they have substantial shortcomings which are addressed by shortfall risk

Optimization results

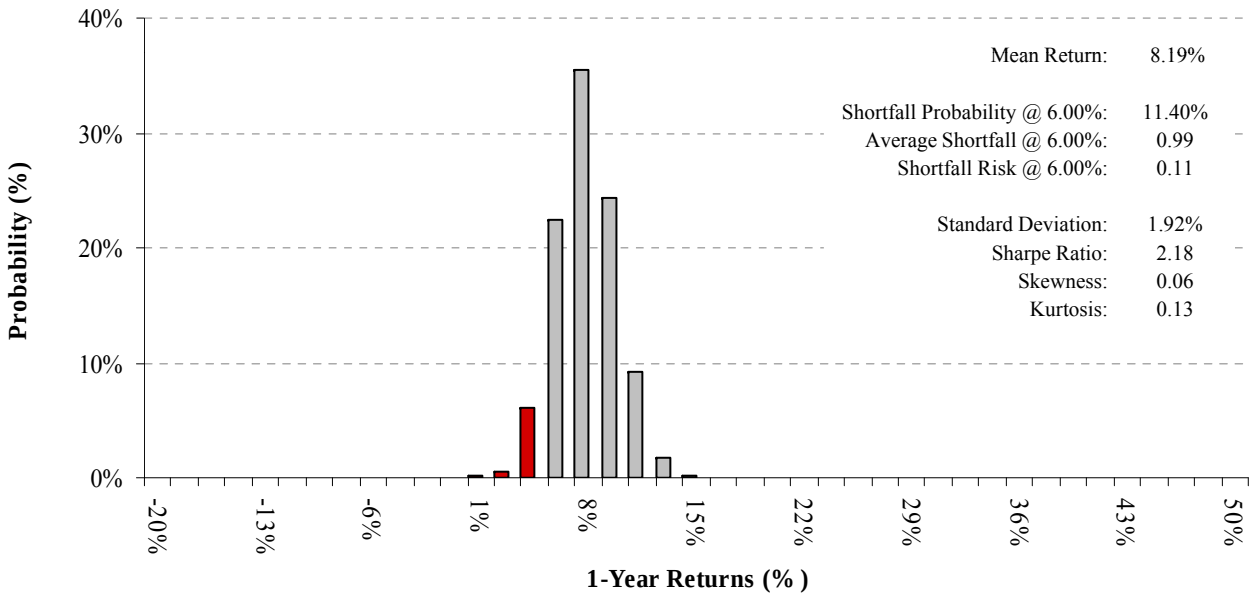
	MV1	SFR1	SFR2	SFR3	MV2
Expected Return:	8.19%	8.98%	9.61%	10.24%	10.88%
Shortfall Probability @ 6.00%:	11.40%	6.90%	6.80%	8.70%	14.30%
Average Shortfall @ 6.00%:	0.99	1.04	1.41	1.85	2.87
Shortfall Risk @ 6.00%:	0.11	0.07	0.10	0.16	0.41
Standard Deviation:	1.92%	2.11%	2.57%	3.34%	4.99%
Sharpe Ratio:	2.18	2.36	2.18	1.87	1.38
Skewness:	0.06	0.03	-0.02	-0.05	-0.01
Kurtosis:	0.13	0.14	0.27	0.37	0.51

Three shortfall optimized portfolios illustrate risk and return trade-offs; mean-variance optimized portfolios create boundaries for evaluating trade-offs

MV = Mean Variance

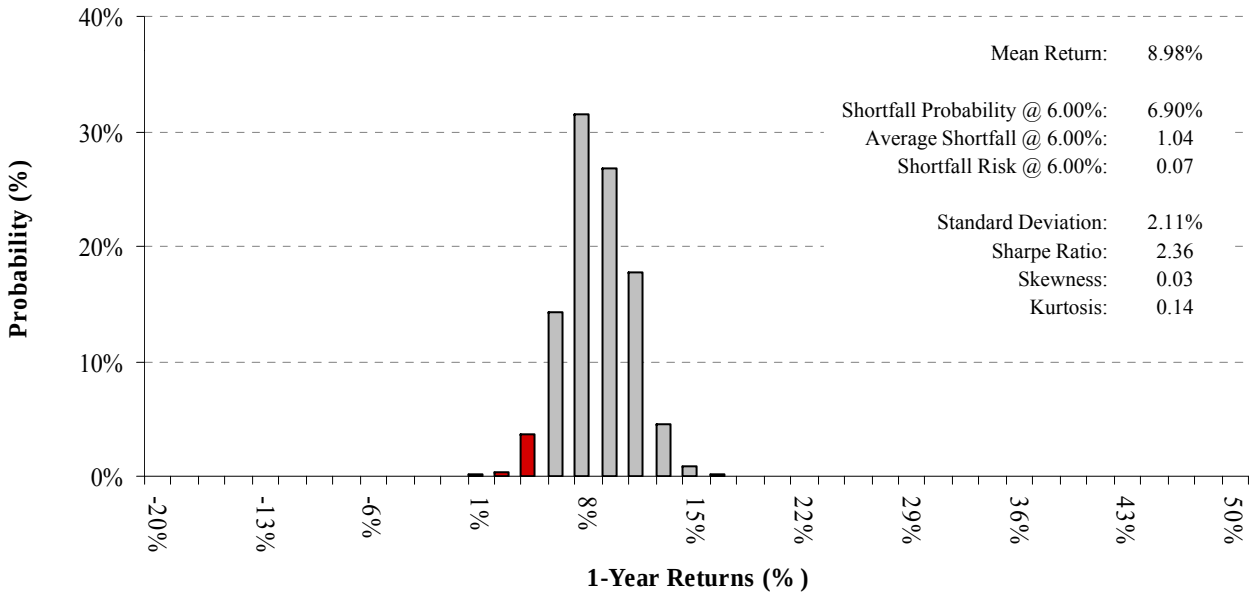
SFR = Shortfall Risk

Optimization results Portfolio MV1



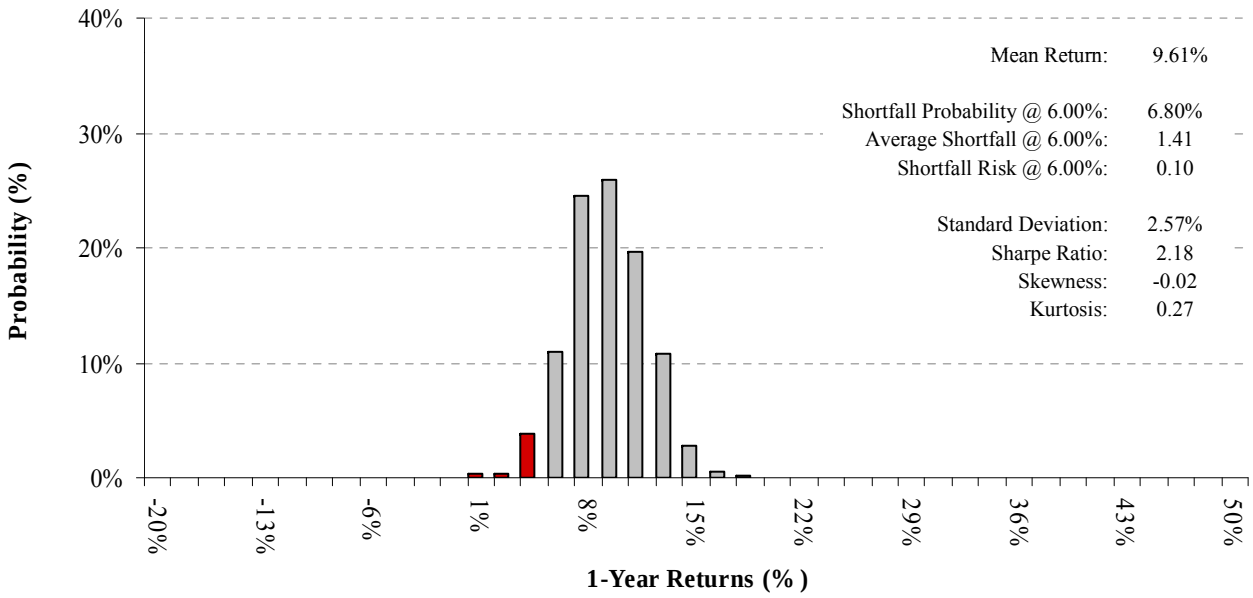
The minimum risk mean-variance optimized portfolio exhibits low standard deviation but high shortfall risk

Optimization results Portfolio SFR1



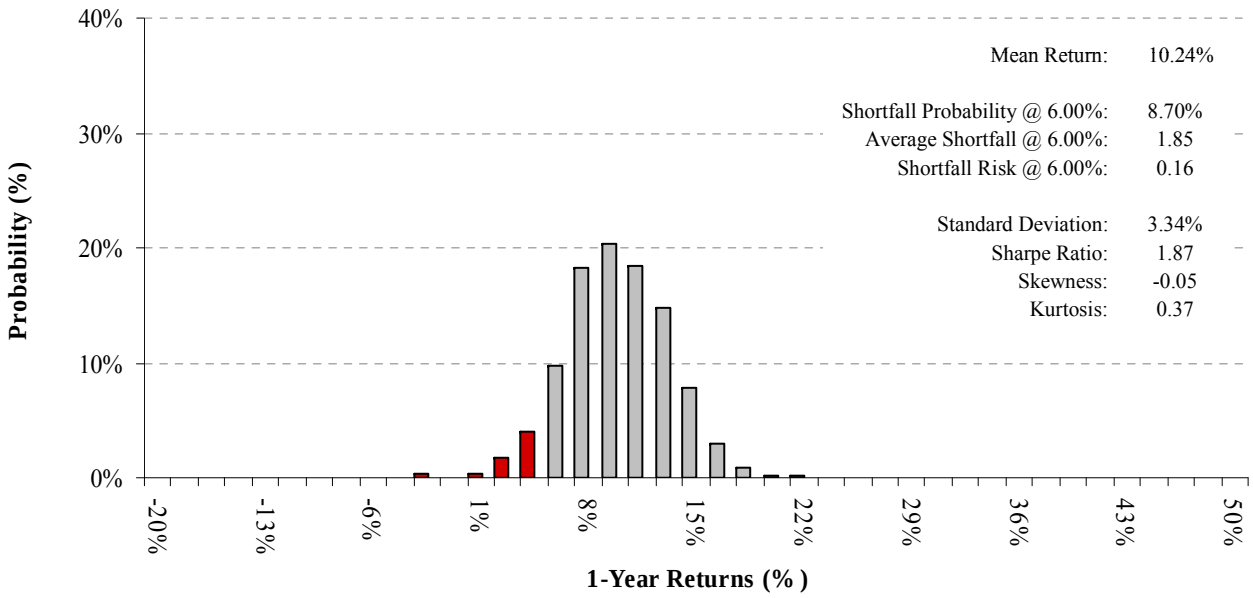
The SFR1 portfolio exhibits 19 basis points greater standard deviation than MV1, but less shortfall risk and 79 basis points of incremental return

Optimization results Portfolio SFR2



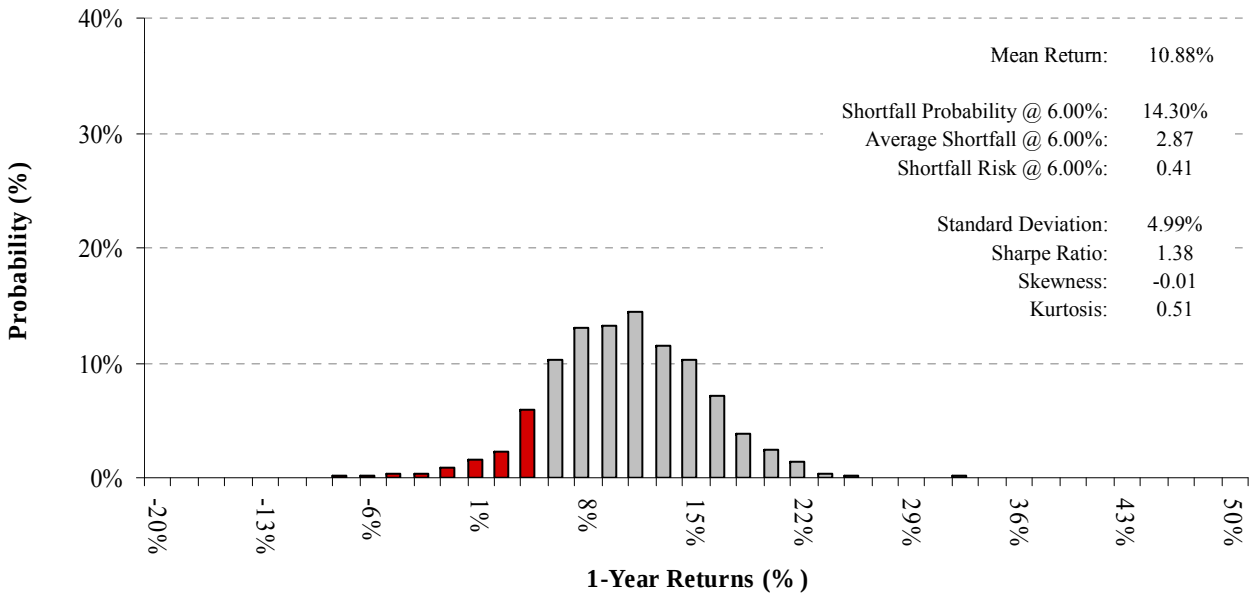
SFR2 has a Sharpe ratio and shortfall risk similar to MV1, but 142 basis points of incremental return

Optimization results Portfolio SFR3



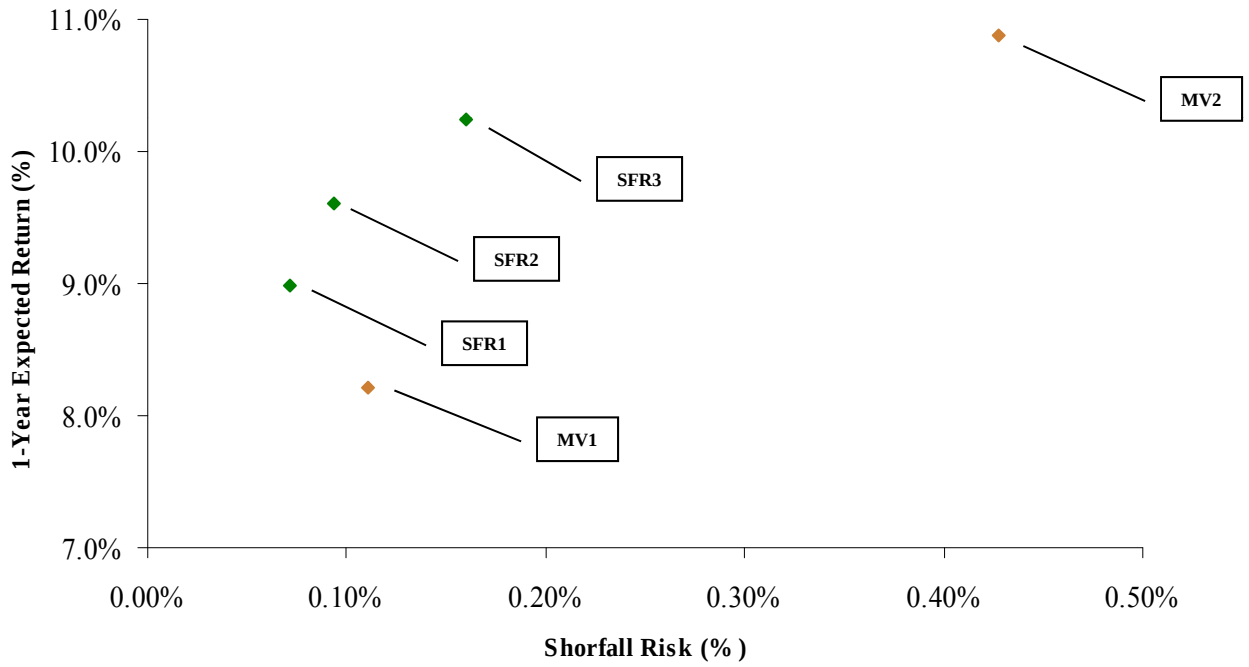
SFR3 captures 94% of the return in the MV2 maximum return portfolio, but has only 40% of the shortfall risk

Optimization results Portfolio MV2



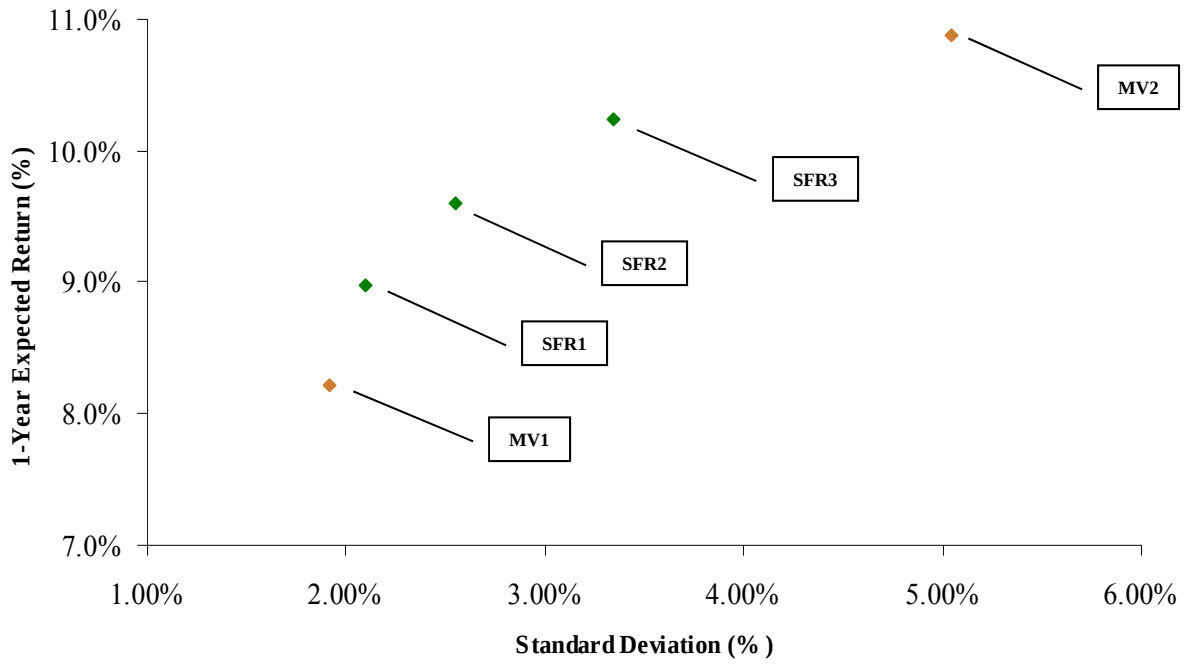
Except for concentration constraints, MV2 is the otherwise unconstrained maximum return portfolio available within the investment universe

Optimization results



Risk-return trade-offs can be viewed in terms of shortfall risk

Optimization results



Alternatively, risk-return trade-offs can be viewed in terms of standard deviation

Rationale for a portable alpha strategy

The rationale for a portable alpha strategy is predicated on the ability to separate passive returns, or beta, from active returns, or alpha. Passive returns (beta) are the returns that come from taking risk exposures to well-defined, stable, and liquid asset classes. Active returns (alpha) are the returns that come from taking risk exposures based on market timing skills or security selection skills.

By definition, the result of the asset allocation decision is a portfolio of investments in well-defined, stable, and liquid asset classes that result in passive returns (beta). This portfolio is often referred to as the 'policy portfolio' and can typically be represented, or benchmarked, with passive asset class indices. In many cases, these indices can also be purchased as investment vehicles in the form of futures contracts, ETFs, and over-the-counter derivative contracts. In most cases, these vehicles have very small transaction costs and little, if any, investment management fees.

Active returns (alpha) are difficult to acquire in the form of an indexed investment vehicle due to the fact that market timing skills and security selection skills are scare and therefore can command relatively higher transaction costs and investment management fees. However, a well-constructed portfolio of hedge fund managers which contains little, if any, beta, makes a highly efficient investment vehicle through which to gain active management (alpha) returns.

The recombination of the of the passive and active exposures, sometimes referred to as an "index plus" investment, is the simplest form of a portable alpha strategy.

The rationale for a portable alpha strategy is predicated on the ability to separate passive returns (beta) from active returns (alpha) and then combine them in a manner which preserves the policy portfolio

Advantages of a portable alpha strategy

A portable alpha strategy provides three distinct advantages for a plan sponsor or investment portfolio manager.

First, a portable alpha strategy allows the portfolio manager to separate the asset allocation decision from the passive/active management decision. This is a more conceptually consistent manner in which to manage the overall portfolio which creates a more disciplined and robust framework in which to measure and manage risk exposures.

Second, a portable alpha strategy allows the portfolio manager to separate and independently source the investment vehicles used to gain exposures to passive returns from the investment vehicles used to gain exposure to active returns.

Third, by virtue of the ability to separate and independently source exposures to active and passive return, a portable alpha strategy allows the portfolio manager to select investment vehicles that more precisely and more efficiently realize the portfolio's risk and investment objectives.

For example, the policy portfolio can be created by index products which deliver the precise desired passive exposures at very small transaction costs. Likewise, the active management exposure can be created using managers who deliver very little beta and thereby are more cost-efficient since the relatively higher active management fees are not charged on beta returns.

The advantage of a portable alpha strategy is the ability to independently obtain exposures to the most efficient sources of passive and active returns

Methodology of analysis

The analysis was prepared on a forward-looking basis using expected return and expected risk assumptions in yen for each asset class in the policy portfolio as well as for the managers comprising the hedge fund investment portfolios.

Within each hedge fund strategy portfolio, distributions for individual managers were generated using a non-linear Monte Carlo process which generates non-normal expected return distributions while preserving observed correlation characteristics. Optimizations were prepared using a shortfall risk optimization process, the objective of which is to reduce the probability and magnitude of outcomes below a specified shortfall threshold.

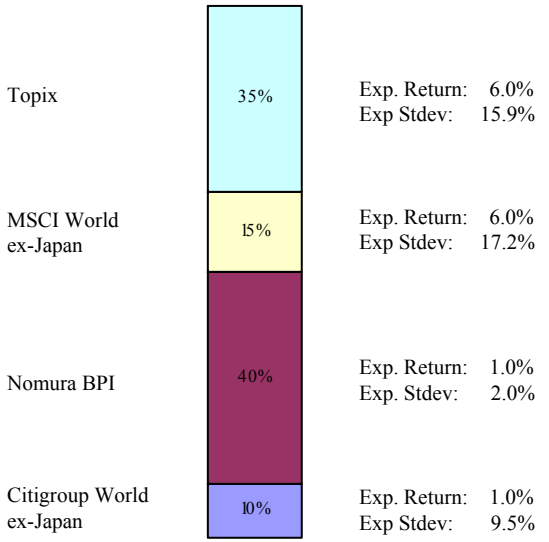
Using the same methodology, along with mean variance optimizations, the recommended portable alpha portfolio was constructed using a combination of Equity-related, Event Driven, Credit-related, Fixed Income, Volatility, and Tactical hedge fund strategies.

In this example, all hedge fund portfolio returns reported have been hedged back into yen.

This analysis was prepared using forward-looking risk and return expectations, a non-linear Monte Carlo simulation process, and a shortfall risk optimization methodology

Policy portfolio as point of departure

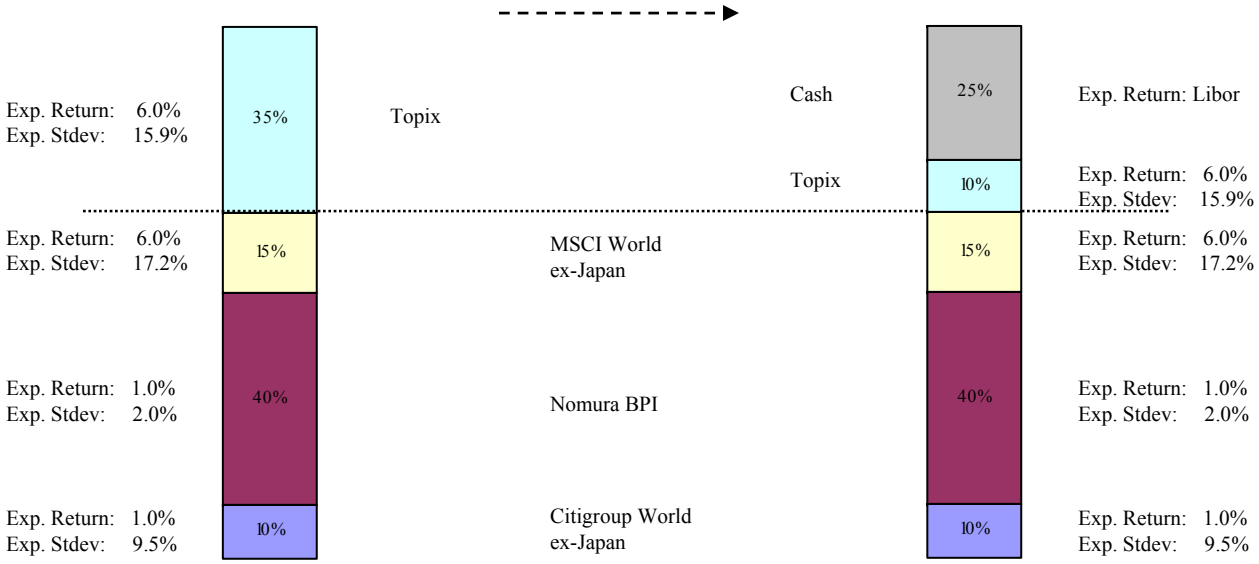
The point of departure for any portable alpha strategy is the existing asset allocation or policy portfolio. Below is a graphical representation of the policy portfolio for a hypothetical institutional investor. By definition, this represents the investor's total passive exposure. The expected return and volatility are also reported for each asset class and the total portfolio. For clarity of this example, we will assume that the total capital in the policy portfolio is 100 yen.



The implementation of a portable alpha strategy is most easily understood when it is decomposed into its constituent parts

Liquidating a portion of the policy portfolio

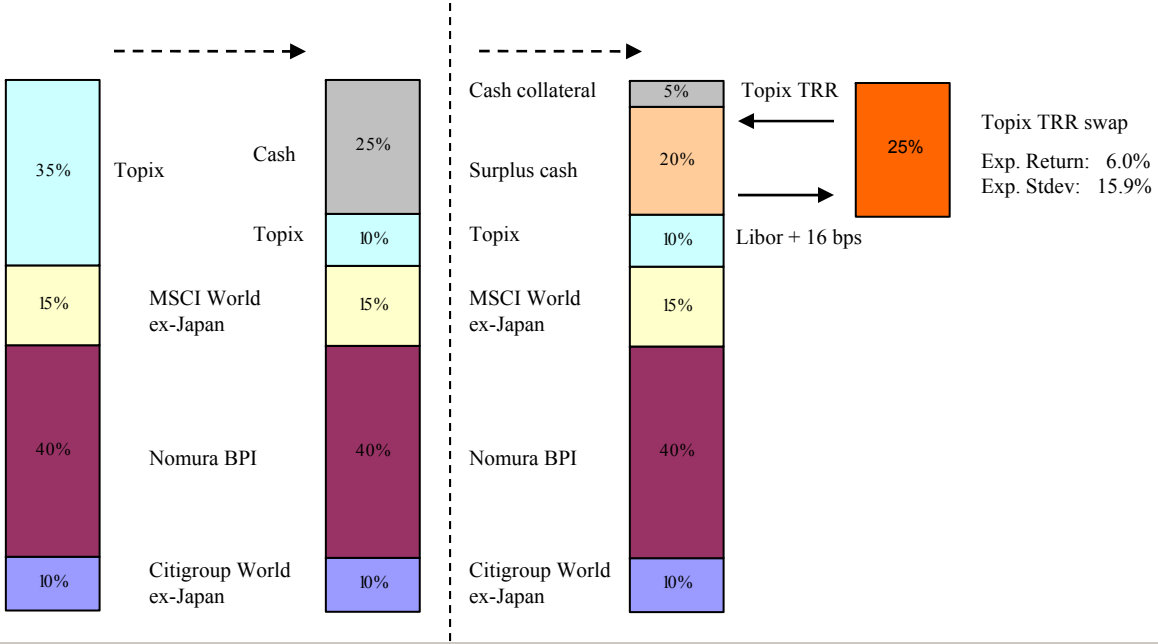
Because most passive asset class exposures can be expressed as indices, and because they can be obtained in a cost efficient manner using futures contracts, ETFs, and other derivative contracts, the next step is to determine the most cost efficient passive return to replicate with an index strategy. Here, we have selected the Japanese equity exposure, benchmarked by the Topix, as the passive return to replicate because it requires the smallest transaction cost. The portfolio manager sells 25 yen of the 35 yen capital exposure to Japanese equities and realizes the following asset allocation and expected risk and return.



The portion of the asset allocation that is most efficiently replicated is first liquidated to cash

Reestablishing equity exposure via swap

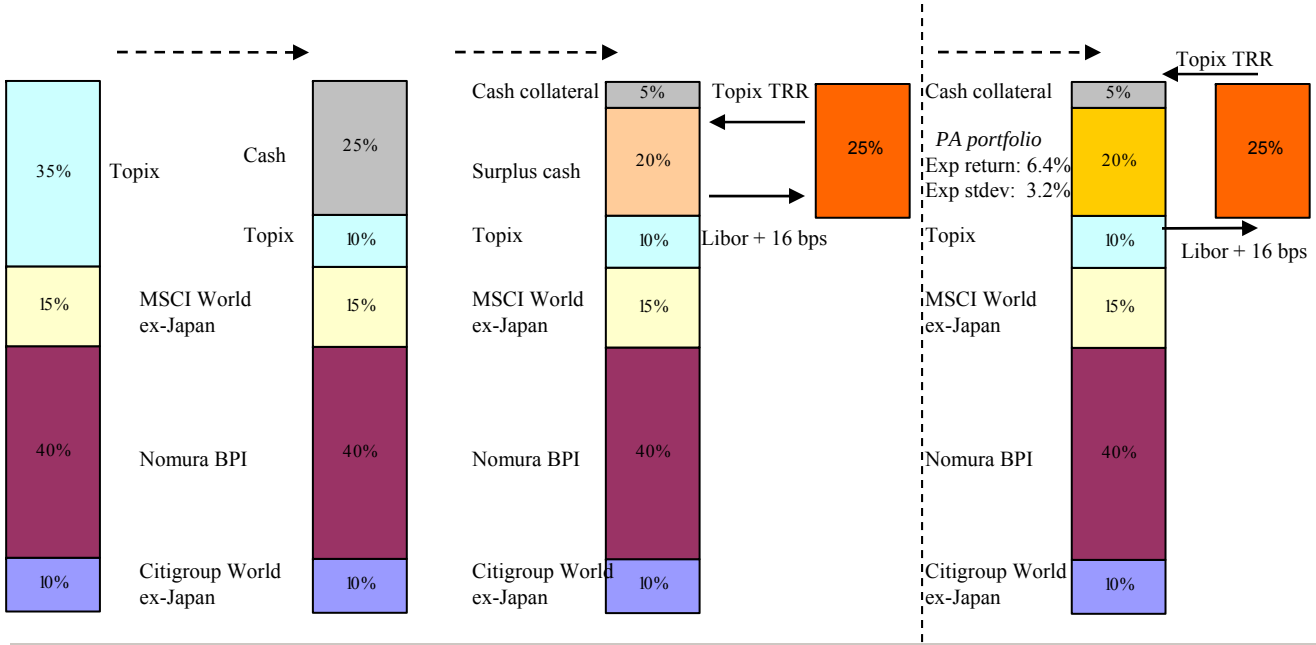
To regain the exposure to Japanese equities, the portfolio manager enters into a total rate of return swap in a notional amount of 25 yen, paying Libor plus sixteen basis points and receiving the total return on the Topix index (this was the average market price of the swap at the time of this analysis). This transaction, requiring 5 yen of swap cash collateral, reestablishes the original policy portfolio exposures while leaving an additional 20 yen of surplus cash.



By entering into a total rate of return swap to receive the Topix, the portfolio reestablishes the initial exposure to Japanese equities

Purchasing active management portfolio

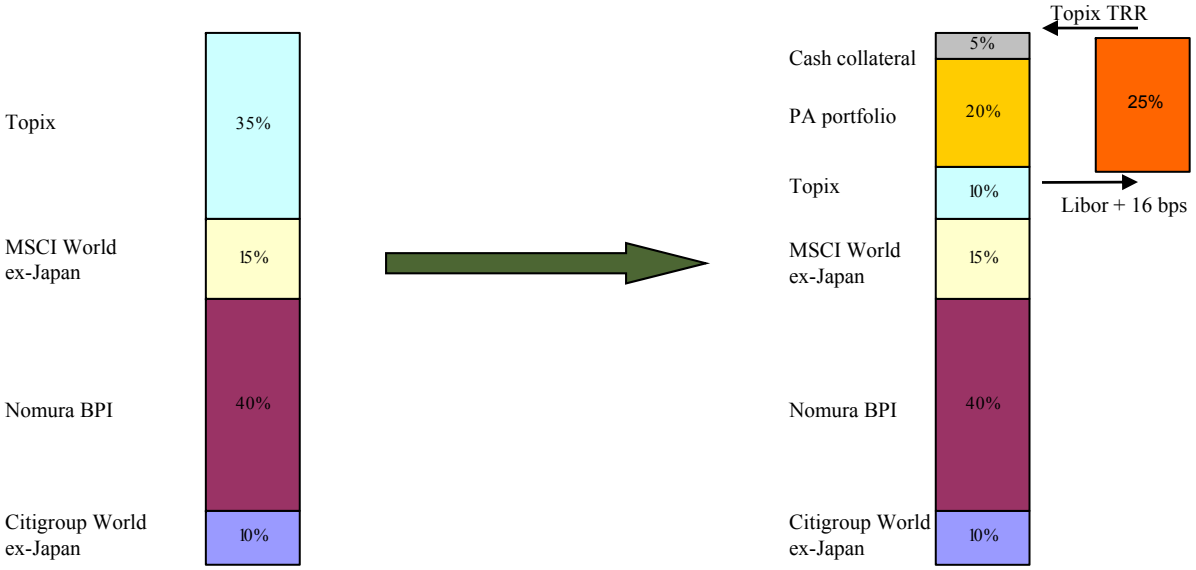
Having reestablished the policy portfolio exposures, the portfolio manager now needs to source the active management. This is accomplished by purchasing a customized portfolio of hedge fund managers which is constructed to have little or no beta to the policy portfolio. The 'surplus cash' of 20 yen generated from selling the Japanese equities is used to fund the hedge fund portfolio, by definition the client's total active exposure.



A customized portfolio of hedge fund managers, constructed to have little beta to the policy portfolio, provides unconstrained active management exposure

Index plus result

The expected return of the hedge fund portfolio is 6.44%, or Libor plus 633 basis points of alpha. The Libor leg of the TRR swap is funded with the Libor return from the cash collateral plus the Libor portion of the return from the hedge fund portfolio. This leaves an addition 613 basis points of active return on 20% of the policy portfolio, or 1.23% of additional return on the total policy portfolio attributable to active exposure through ported alpha. The total portfolio, which originally had an expected return of 3.5%, now has a expected return of 4.7%.



Policy Portfolio **100%** **Exp. Return: 3.5%** **Exp. Stdev: 6.7%**

Policy + PA portfolio **100%** **Exp. Return: 4.7%** **Exp. Stdev: 7.0%**

Implementation of a portable alpha strategy adds 123 basis points of expected return to the total portfolio with only a small increase in volatility of 30 basis points

Current portfolio

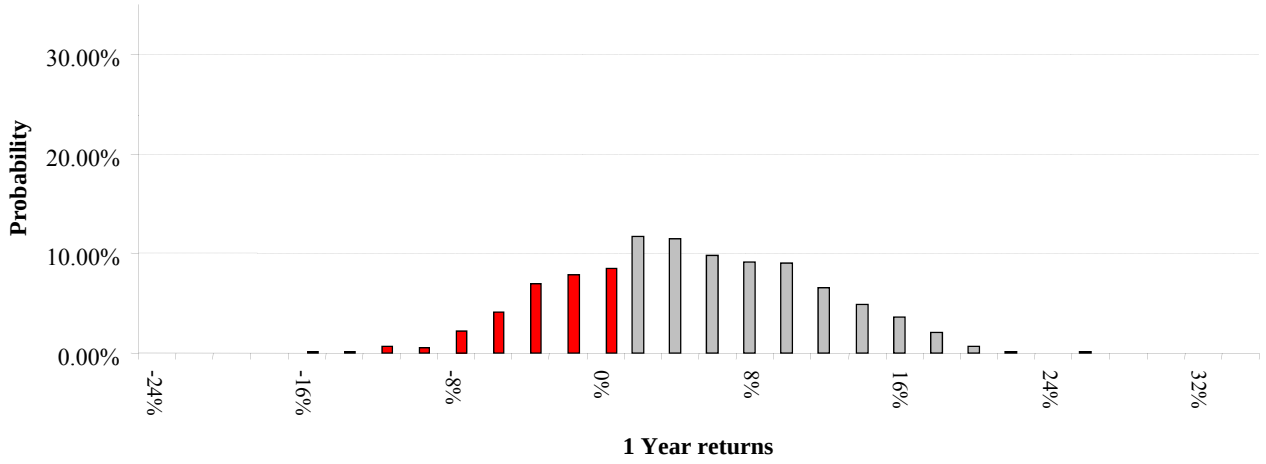
Yen-denominated risk and return expectations

	Expected Return	Expected Stdev	Skewness
Topix	6.0%	15.9%	0.12
MSCI World ex Japan	6.0%	17.2%	-0.29
Nomura BPI	1.0%	2.0%	-1.07
Citigroup World ex Japan Gvt	1.0%	9.5%	0.26
Equity	7.1%	4.6%	-0.21
Event driven	6.3%	6.2%	-0.55
Credit	5.9%	4.0%	-1.04
Fixed income	5.3%	2.4%	0.46
Volatility	4.3%	3.3%	-0.03
Tactical	8.6%	9.8%	0.90
Portable alpha	*6.4%*	*3.2%*	*0.19*

Forward-looking risk and return expectations were developed for the policy portfolio asset classes and each underlying manager in the hedge fund portfolios

Current portfolio

Yen-denominated statistics and distribution

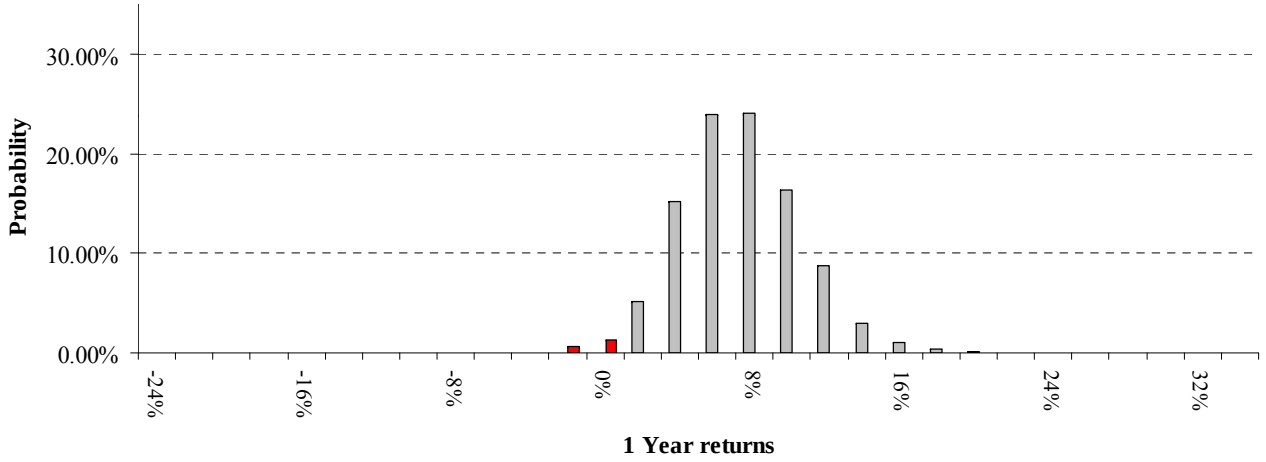


Expected Return	**3.5%**	Shortfall Threshold	0.0%
Standard Deviation	**6.7%**	Shortfall Probability	31.0%
Skewness	**0.0**	Average Shortfall	4.2%
Sharpe Ratio	**0.5**	**Shortfall Risk**	**1.30%**

A non-linear Monte Carlo simulation generates a non-normal distribution that characterizes the current portfolio's expected return and risk characteristics

Portable alpha portfolio

Yen-denominated statistics and distribution

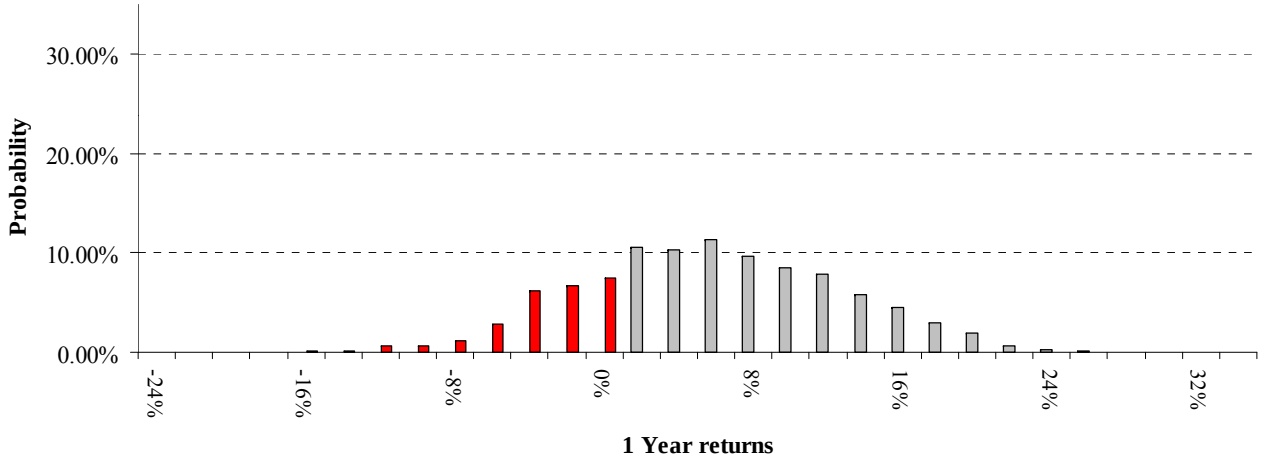


Expected Return	**6.4%**	Shortfall Threshold	0.0%
Standard Deviation	**3.2%**	Shortfall Probability	2.0%
Skewness	**0.2**	Average Shortfall	1.2%
Sharpe Ratio	**2.0**	**Shortfall Risk**	**0.02%**

A non-linear Monte Carlo simulation generates a non-normal distribution that characterizes the portable alpha portfolio's expected return and risk characteristics

Current plus portable alpha portfolio

Yen-denominated statistics



Expected Return	**4.7%**	Shortfall Threshold	0.0%
Standard Deviation	**7.0%**	Shortfall Probability	25.8%
Skewness	**0.0**	Average Shortfall	4.1%
Sharpe Ratio	**0.7**	**Shortfall Risk**	**1.05%**

The current portfolio combined with the portable alpha portfolio improves expected return by 123 basis, reduces shortfall risk by 25 basis points, and increases volatility by only 30 basis points

Summary statistics

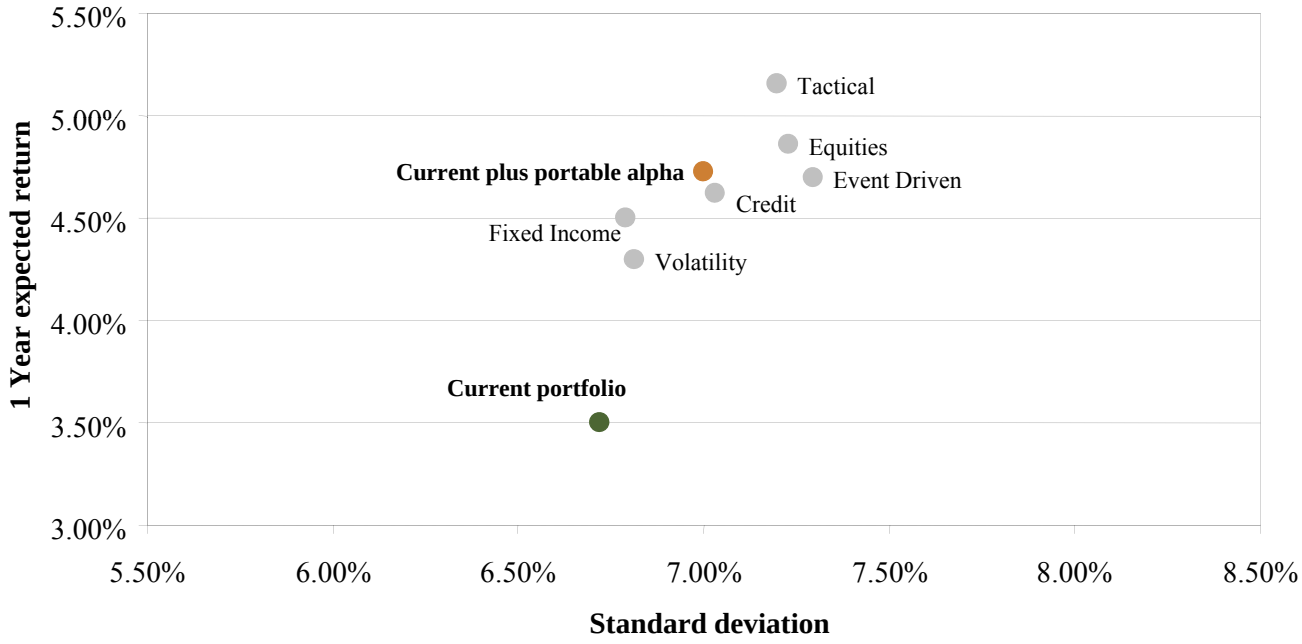
Marginal impact and portfolio statistics by APM strategy

	Current portfolio plus 20 yen portable alpha via:						
Marginal impact on:	***Equities***	***Event Driven***	***Credit***	***Fixed Income***	***Volatility***	***Tactical***	***Portable alpha portfolio***
Expected return	*1.4%*	*1.2%*	*1.1%*	*1.0%*	*0.8%*	*1.7%*	***1.2%***
Volatility	*0.5%*	*0.6%*	*0.3%*	*0.1%*	*0.1%*	*0.5%*	***0.3%***
Sharpe Ratio	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	***0.2***
Shortfall Probability	*-5.0%*	*-3.9%*	*-4.5%*	*-5.1%*	*-3.6%*	*-6.1%*	***-5.2%***
Average shortfall	*0.0%*	*0.1%*	*-0.1%*	*-0.2%*	*-0.2%*	*-0.2%*	***-0.1%***
Shortfall risk	*-0.21%*	*-0.14%*	*-0.20%*	*-0.26%*	*-0.20%*	*-0.32%*	***-0.2%***

		Current portfolio plus 20 yen portable alpha via:						
Resultant statistics:	**Current Portfolio**	***Equities***	***Event Driven***	***Credit***	***Fixed Income***	***Volatility***	***Tactical***	***Portable alpha portfolio***
Expected return	**3.5%**	4.9%	4.7%	4.6%	4.5%	4.3%	5.2%	**4.7%**
Volatility	**6.7%**	7.2%	7.3%	7.0%	6.8%	6.8%	7.2%	**7.0%**
Skewness	**0.0**	0.0	0.0	0.0	0.0	0.0	0.1	**0.0**
Sharpe Ratio	**0.5**	0.7	0.6	0.6	0.7	0.6	0.7	**0.7**
Shortfall Probability	**31.0%**	26.0%	27.1%	26.5%	25.9%	27.4%	24.9%	**25.8%**
Average shortfall	**4.2%**	4.2%	4.3%	4.1%	4.0%	4.0%	4.0%	**4.1%**
Shortfall risk	**1.30%**	1.09%	1.16%	1.10%	1.04%	1.10%	0.98%	**1.05%**

Summary statistics

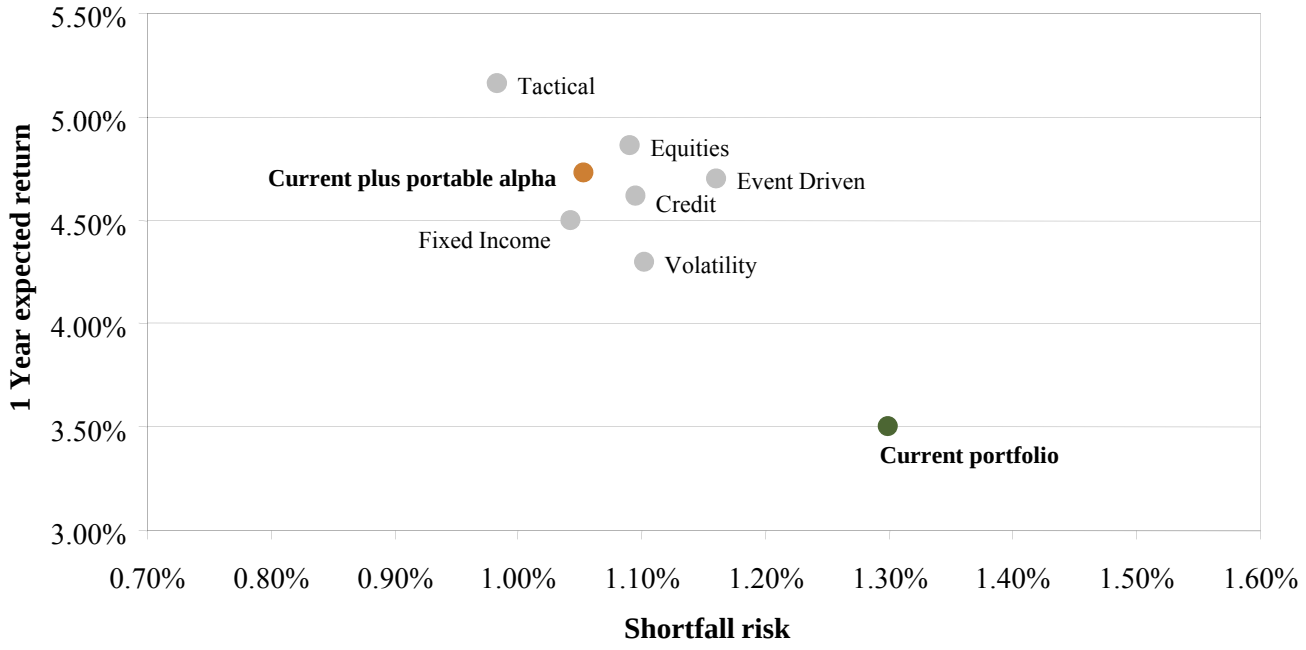
Impact on return and volatility



A combination of the current portfolio with each strategy portfolio and the portable alpha portfolio significantly improves expected return with only a small increase in volatility

Summary statistics

Impact on return and shortfall risk



A combination of the current portfolio with each strategy portfolio and the portable alpha portfolio significantly improves both expected return and shortfall risk

Current portfolio

Yen-denominated risk and return attribution

	Capital weight	Expected Return contribution	Variance contribution	SFR *(at 0%)* contribution
Topix	35.0%	60.0%	74.3%	85.3%
MSCI World ex Japan	15.0%	25.7%	26.5%	29.8%
Nomura BPI	40.0%	11.4%	-1.7%	-13.8%
Citigroup World ex Japan Gvt	10.0%	2.9%	0.9%	-1.3%
	100.0%	100.0%	100.00%	100.0%

Marginal risk and return attribution analysis for each asset class provides an important perspective on portfolio allocation

Current plus portable alpha

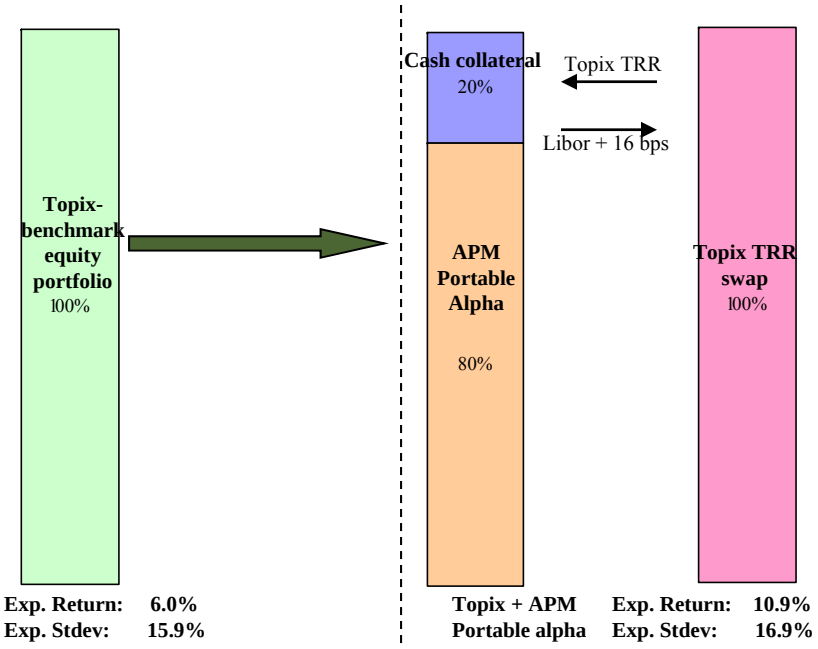
Yen-denominated hedged risk and return attribution

	Capital weight	Expected Return contribution	Variance contribution	SFR (at 0%) contribution
Topix	15.0%	19.0%	30.4%	41.5%
MSCI World ex Japan	15.0%	19.0%	25.5%	36.2%
Nomura BPI	40.0%	8.5%	-1.6%	-13.0%
Citigroup World ex Japan Gvt	10.0%	2.1%	0.9%	0.4%
	80.0%	48.7%	55.2%	65.1%
Topix plus:				
Equity	4.0%	10.8%	9.5%	7.6%
Event	2.0%	5.1%	4.8%	4.3%
Credit	4.0%	9.8%	9.0%	7.6%
Fixed income	4.0%	9.3%	8.3%	6.7%
Volatility	2.0%	4.2%	4.2%	3.9%
Tactical	4.0%	12.1%	9.0%	4.9%
Portable alpha	20.0%	51.3%	44.8%	34.9%
Asset allocation + Portable alpha	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Marginal risk and return attribution analysis for each asset class plus the hedge fund strategies illustrates the portfolio effects of the portable alpha strategy

Topix plus portable alpha Isolated from the policy portfolio

When measured relative to the Topix-benchmarked equity portfolio in isolation from the entire policy portfolio, the impact of the portable alpha strategy is of a significantly larger order of magnitude.



Isolated from the policy portfolio, the portable alpha with the Topix swap adds 490 basis points to expected return, substantially reduces shortfall risk with only a modest increase in volatility

Topix plus portable alpha Isolated from the policy portfolio

	Topix statistics	*Impact of APM Portable Alpha*	Resultant statistics
Expected return	**6.0%**	*4.9%*	**10.9%**
Volatility	**15.9%**	*1.0%*	**16.9%**
Sharpe ratio	**0.4**	*0.3*	**0.6**
Shortfall Probability	**37.5%**	*-9.9%*	**27.6%**
Average shortfall	**10.1%**	*-0.6%*	**9.4%**
Shortfall risk	**3.8%**	*-1.2%*	**2.6%**
Historical Performance: 2003 -2005			
Historical return	**26.3%**	*8.7%*	**37.4%**
Volatility	**13.6%**	*0.8%*	**14.5%**
Sharpe ratio	**1.8**	*0.5*	**2.3**

Back-testing the portable alpha strategy with the Topix index also results in significant increases in return, with minimal incremental volatility

Historical returns

Topix plus portable alpha strategy and APM strategy funds

		Topix plus							
Last 5 years	Topix	*APM Portable Alpha*	*APM Equity-linked*	*APM Event Driven*	*APM Credit-linked*	*APM Fixed Income*	*APM Volatility*	*APM Tactical*	*APM Energy*
Historical return	**6.1%**	***15.0%***	*17.9%*	*14.2%*	*16.2%*	*10.4%*	*10.6%*	*18.2%*	*20.1%*
Volatility	**15.9%**	***16.7%***	*17.3%*	*17.4%*	*16.5%*	*16.1%*	*16.1%*	*18.7%*	*20.4%*
Sharpe ratio	**0.5**	***0.9***	*1.0*	*0.9*	*1.0*	*0.7*	*0.7*	*1.0*	*1.0*

		Topix plus							
Last 3 years	Topix	*APM Portable Alpha*	*APM Equity-linked*	*APM Event Driven*	*APM Credit-linked*	*APM Fixed Income*	*APM Volatility*	*APM Tactical*	*APM Energy*
Historical return	**26.3%**	**37.4%**	37.1%	37.8%	39.1%	31.3%	29.9%	45.7%	53.1%
Volatility	**13.6%**	**14.5%**	15.1%	14.8%	13.7%	13.6%	13.8%	17.2%	17.5%
Sharpe ratio	**1.8**	**2.3**	2.2	2.3	2.5	2.1	2.0	2.3	2.6

		Topix plus							
Last 12 months	Topix	*APM Portable Alpha*	*APM Equity-linked*	*APM Event Driven*	*APM Credit-linked*	*APM Fixed Income*	*APM Volatility*	*APM Tactical*	*APM Energy*
Historical return	**44.9%**	**53.5%**	56.7%	49.4%	52.9%	45.8%	43.1%	66.4%	71.1%
Volatility	**13.5%**	**14.9%**	15.3%	15.5%	13.7%	13.9%	15.0%	16.8%	19.4%
Sharpe ratio	**2.9**	**3.0**	3.1	2.7	3.2	2.8	2.5	3.2	2.9

IMPACT OF PORTABLE ALPHA STRATEGY

Historical returns

Topix plus portable alpha strategy and APM strategy funds

		Topix plus							
	Topix	*APM Portable Alpha*	*APM Equity-linked*	*APM Event Driven*	*APM Credit-linked*	*APM Fixed Income*	*APM Volatility*	*APM Tactical*	*APM Energy*
Dec-05	**7.43%**	**7.95%**	8.62%	8.15%	7.79%	7.74%	7.29%	7.90%	9.04%
Nov-05	**6.34%**	**7.06%**	7.57%	6.96%	6.48%	6.20%	6.01%	8.54%	7.10%
Oct-05	**2.30%**	**1.84%**	1.44%	0.44%	2.45%	2.63%	2.32%	1.28%	-0.89%
Sep-05	**11.43%**	**12.68%**	12.63%	12.32%	12.07%	11.94%	12.57%	14.32%	14.92%
Aug-05	**5.52%**	**6.16%**	5.96%	6.50%	6.11%	5.12%	5.60%	7.53%	9.58%
Jul-05	**2.36%**	**3.28%**	3.39%	3.42%	3.17%	3.06%	3.06%	3.54%	5.51%
Jun-05	**2.90%**	**3.80%**	4.33%	3.90%	3.37%	2.44%	3.39%	5.20%	6.72%
May-05	**1.28%**	**1.84%**	2.11%	1.49%	1.37%	0.76%	0.77%	3.82%	1.84%
Apr-05	**-4.42%**	**-5.10%**	-5.32%	-5.60%	-4.32%	-4.63%	-5.35%	-5.77%	-7.23%
Mar-05	**0.92%**	**0.98%**	0.56%	0.57%	1.40%	0.77%	0.30%	1.72%	1.12%
Feb-05	**2.75%**	**4.19%**	4.94%	4.15%	3.76%	3.28%	2.74%	5.54%	7.96%
Jan-05	**-0.30%**	**0.03%**	0.67%	-0.27%	0.50%	-0.08%	-1.22%	-0.23%	1.09%
Dec-04	**4.67%**	**5.10%**	5.32%	6.69%	5.58%	4.85%	5.23%	3.80%	3.71%
Nov-04	**1.24%**	**2.70%**	3.26%	3.52%	2.29%	1.55%	1.92%	3.69%	4.81%
Oct-04	**-1.51%**	**-0.62%**	0.12%	-0.90%	-0.68%	-1.40%	-1.44%	0.05%	1.30%
Sep-04	**-2.13%**	**-1.04%**	-0.53%	-0.95%	-1.31%	-1.93%	-2.09%	0.11%	3.42%
Aug-04	**-0.84%**	**-0.74%**	-0.34%	-0.87%	-0.33%	-0.69%	-0.73%	-1.56%	-2.37%
Jul-04	**-4.23%**	**-4.01%**	-4.49%	-4.31%	-3.76%	-3.63%	-3.97%	-4.06%	-2.45%
Jun-04	**4.38%**	**4.67%**	4.98%	5.80%	4.91%	4.72%	3.49%	4.09%	7.07%
May-04	**-3.90%**	**-3.86%**	-4.68%	-4.20%	-3.84%	-3.84%	-4.02%	-2.84%	-3.17%
Apr-04	**0.60%**	**0.69%**	0.83%	0.18%	1.39%	1.20%	1.17%	-0.66%	0.72%
Mar-04	**9.52%**	**10.13%**	9.67%	9.62%	10.17%	9.55%	9.96%	11.47%	10.89%
Feb-04	**3.36%**	**4.54%**	4.92%	4.23%	4.63%	4.09%	3.01%	5.45%	6.20%
Jan-04	**0.37%**	**1.72%**	1.84%	2.54%	1.97%	1.31%	1.63%	1.38%	1.07%
Dec-03	**4.43%**	**5.59%**	5.49%	5.61%	5.31%	5.71%	4.87%	6.18%	7.94%
Nov-03	**-4.17%**	**-3.75%**	-3.53%	-3.27%	-3.18%	-3.95%	-3.39%	-4.79%	-2.40%
Oct-03	**2.41%**	**3.44%**	3.18%	3.77%	3.60%	2.62%	2.91%	4.47%	4.48%
Sep-03	**2.05%**	**3.34%**	2.76%	3.25%	3.59%	3.41%	3.22%	3.71%	2.79%
Aug-03	**6.68%**	**7.44%**	7.61%	7.00%	7.49%	7.02%	6.31%	8.42%	9.76%
Jul-03	**3.98%**	**4.12%**	4.53%	4.56%	4.80%	4.09%	4.48%	2.67%	1.64%
Jun-03	**7.87%**	**8.71%**	9.70%	9.38%	9.32%	8.04%	7.96%	7.81%	6.99%
May-03	**5.17%**	**7.65%**	7.40%	7.51%	6.57%	5.46%	6.00%	12.08%	12.45%
Apr-03	**1.09%**	**2.48%**	1.88%	3.62%	2.85%	2.21%	1.28%	2.99%	2.10%
Mar-03	**-3.22%**	**-3.64%**	-3.14%	-2.66%	-2.31%	-2.93%	-2.69%	-7.16%	-5.57%
Feb-03	**-0.27%**	**1.63%**	-1.52%	-0.16%	0.81%	-0.14%	0.23%	8.99%	7.69%
Jan-03	**-2.61%**	**-1.37%**	-2.96%	-1.38%	-0.88%	-1.24%	-0.78%	-0.70%	-1.30%

BIOGRAPHIES

Firm Profile

Advanced Portfolio Management (APM) is a specialty asset management company that constructs and manages customized portfolios of hedge funds and other financial instruments for endowments, foundations, pension funds, insurance companies, and other financial institutions in North America, Europe, and Asia.

Each APM product is designed to complement, enhance, and complete an existing asset allocation and investment portfolio. All products are managed to realize the client's unique investment objectives and risk parameters. APM products are currently utilized as active management overlays, alpha transport programs, completion funds, and stand-alone multi-manager hedge fund investments.

APM's investment process integrates experienced qualitative investment judgment with rigorous analytical structure. The professionals at APM have over 100 years of combined investment and capital markets experience providing a comprehensive understanding of the potential profit opportunities and the accompanying risks of active investing.

To complement this experience and judgment, APM has constructed a state-of-the-art analytical platform which comprises: (i) manager-level risk and return attribution analysis and risk budgeting, (ii) non-linear Monte Carlo simulation processes driven by forward-looking expectations of return and risk, and (iii) portfolio optimization and rebalancing in a shortfall risk framework.

By integrating experienced qualitative insights with robust analytical methods, APM delivers superior risk-adjusted returns with negligible correlation or beta to the major market factors or benchmarks. APM is a Registered Investment Advisor with the US Securities and Exchange Commission (SEC).

BIOGRAPHIES

Robert E. Kiernan III, Principal and Chief Executive Officer

Before forming Advanced Portfolio Management, Mr. Kiernan spent ten years at Lehman Brothers (1992-2002) where, as a Managing Director, he held a number of senior management positions including Head of European Debt Capital Markets and Syndicate, Global Head of Liability Management and Financial Engineering, Global Head of Private Placements, and Global Head of Technology and eCommerce for the Investment Banking and Private Equity Divisions. While in Europe, he served on the firm's Investment Banking Operating Committee, Fixed Income Operating Committee, and was a member of the Investment Banking Commitment Committee.

He started his investment banking career at Salomon Brothers (1986-1992) where he was responsible for the international and governmental Liability Management business. Before joining Salomon Brothers, he held several foreign policy positions in the executive branch of the US government including appointments at USIA, the National Security Council, and as a member of the US Delegation to the United Nations Human Rights Commission.

Educated at Boston College (AB and AM), the Fletcher School of Law and Diplomacy, and the University of Chicago (MBA), Mr. Kiernan is currently a Senior Fellow at the Kennedy School of Government at Harvard University. He has authored articles for a variety of professional publications including *Capital Market Strategies, The Treasurer*, and *Euromoney*, as well as academic journals such as *Studies in Soviet Thought, American Political Science Review*, and the *Journal of Contemporary Studies*.

Mr. Kiernan has been a member of the Publishing Board of the *World Policy Journal* and a member of the Board of Directors of the International Primary Dealers Association (London). He currently is member of the Board of Directors of Educate Girls Globally, the Research Foundation Review Board of the CFA Institute, the Liquidity Risk Committee of the International Association of Financial Engineers, and the Council on Foreign Relations.

Advanced Portfolio Management

HEDGEFUNDS, ACTIVE MANAGEMENT, AND THE ASSET ALLOCATION DECISION

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