



**Asset  
Management**

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# **The Search for Alpha**

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**Robert Litterman**

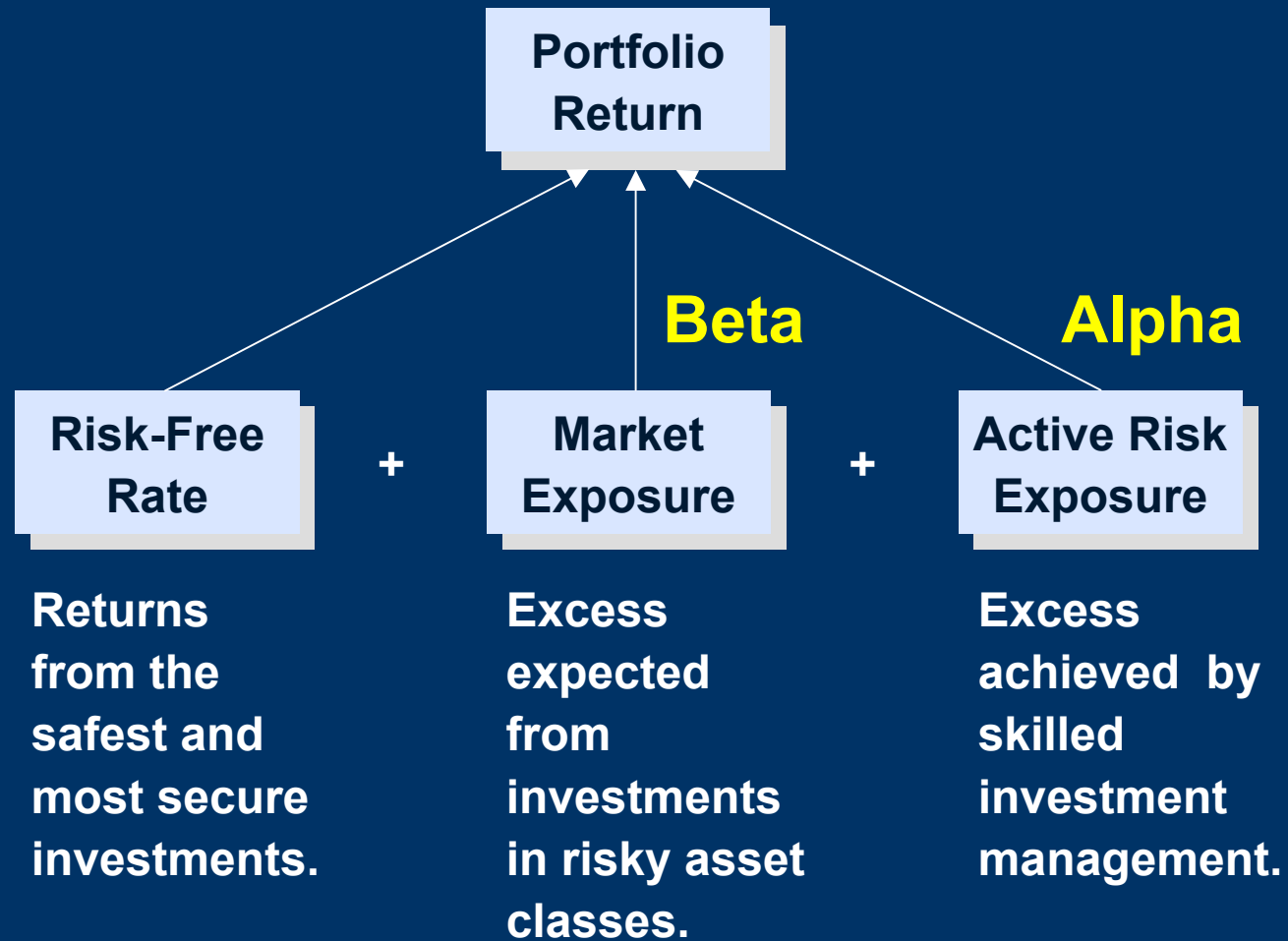
**Managing Director, Head of Quantitative Resources**

# Active Alpha Investing: Key Ideas

- Additional market risk increases portfolio volatility considerably in contrast to active risk.
- The optimal level of active risk in a portfolio is much higher than most investors currently consider.
- Finding alpha is hard – To be successful, active strategies must address the 5 C's:
  - Correlation, Consistency, Capacity, Capital, and Cost
- Hedge funds, active currency management, global tactical asset allocation, and portable alpha strategies are good sources of alpha
- Relaxing no-shorting constraints in traditional mandates can also add alpha

# Three Basic Sources of Return

Asset  
Management



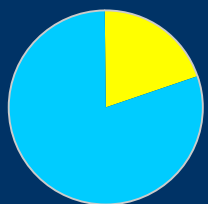
# Relative Contribution to a \$ 5 Billion Portfolio

\$ 225 Million

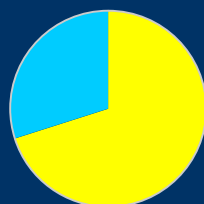
4.5% 10-year Govt. Bond Yield

Risk Free Returns

**Beta:** \$ 35 Million → to \$130 Million



20%  
Equity  
3.4% Risk



70%  
Equity  
12.0% Risk

Excess from  
Investments in  
Risky Things

**Alpha:** None → to \$ 90 Million

100% Passive  
(No Active Risk)

3% Active Risk  
(at 0.6 Information Ratio)

Excess from  
Investments with  
Skilled People

Note: Information ratio is a measure of the efficiency by which active managers convert active risk into excess returns.

Simulated performance results do not reflect actual trading and have certain inherent limitations.

For illustrative purposes only.

# Three Basic Sources of Risk

## Interest rate risk from liabilities:

- Uncompensated
- Can be hedged

## Market risk:

- Low cost, plentiful
- Low efficiency (low Sharpe ratio)

## Active risk:

- Uncorrelated
- Skill-based
- Requires deviations from equilibrium

# Equilibrium: Market-Capitalization-Weighted Portfolio

Asset Class	Weight	Gross Excess Return	Volatility	Sharpe Ratio <sup>1</sup>
U.S. Equity	28.5%	3.3%	16.2%	0.21
U.K. Equity	5.7%	2.9%	16.2%	0.18
Europe Equity, ex-U.K.	9.8%	3.6%	19.0%	0.19
Asia Pacific Equity	6.8%	2.3%	16.4%	0.14
Canada Equity	1.5%	2.9%	16.8%	0.17
Emerging Markets Equity	2.7%	3.8%	23.6%	0.16
Fixed Income	42.3%	0.05%	3.2%	0.01
High Yield	2.8%	1.0%	7.7%	0.12
<b>Total Portfolio</b>	<b>100.0%</b>	<b>1.8%</b>	<b>8.4%</b>	<b>0.22</b>

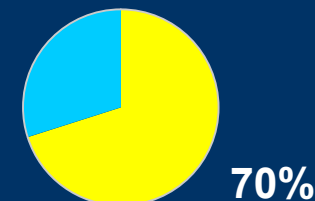
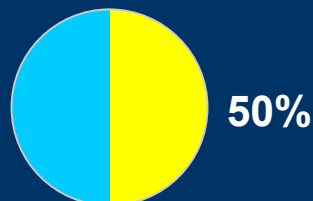
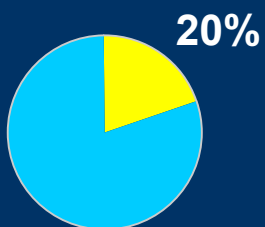
**Equilibrium Stock / Bond Split: 55% / 45%**

Note: (1) The Sharpe Ratio is the ratio of excess return to volatility and is a measure of the efficiency of return generation in a portfolio.

Simulated performance results do not reflect actual trading and have certain inherent limitations. Estimates reflect regional MSCI Indices for developed market equity portfolios, MSCI EMF for emerging markets equity, and regional JPM Global Government Bond Indices and the Lehman High Yield Index for fixed income portfolios. Long-term expected volatilities and correlations based on daily and monthly excess returns over cash for each asset class over the longest period of time for which data are available, from 31 Dec 1979 through 30 Sep 2004. Indices are unmanaged, the figures for the index reflect the reinvestment of dividends but do not reflect the deduction of any fees or expenses which would reduce returns. Investors cannot invest directly in indices. Please see additional disclosures.

# Equilibrium: Passive Efficient Frontier

The low ratio of expected return per unit of risk does not change as you move along the optimal frontier.



## 20% Equity Allocation

0.7% Excess Return  
3.4% Risk  
0.21 Sharpe Ratio<sup>1</sup>



## 50% Equity Allocation

1.8% Excess Return  
8.6% Risk  
0.21 Sharpe Ratio<sup>1</sup>



## 70% Equity Allocation

2.6% Excess Return  
12.0% Risk  
0.21 Sharpe Ratio<sup>1</sup>

Note: (1) The Sharpe Ratio is the ratio of excess return to volatility and is a measure of the efficiency of return generation in a portfolio.

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# Adding Active Risk Can Dramatically Improve Portfolio Performance

## Add Beta

	Excess Return	Volatility	Sharpe Ratio <sup>1</sup>
Original Portfolio (50% equity)	1.8%	8.6%	
Additional Market Risk (25% equity)	0.9%	4.4%	
Benefit from Diversification	–	(0.1%)	
<b>New Portfolio</b>	<b>2.7%</b>	<b>12.9%</b>	<b>0.21</b>

## Add Alpha

Original Portfolio (50% equity)	1.8%	8.6%	Sharpe Ratio <sup>1</sup> improves with the addition of market independent return
3% Active Risk <sup>2</sup> (assumed IR = 0.6)	1.8%	3.0%	
Benefit from Diversification	–	(2.5%)	
<b>New Portfolio</b>	<b>3.6%</b>	<b>9.1%</b>	<b>0.40</b>

Note: (1) The Sharpe Ratio is the ratio of excess return to volatility and is a measure of the efficiency of return generation in a portfolio. (2) Information Ratio (IR) is a measure of the efficiency by which active managers convert active risk into excess returns.

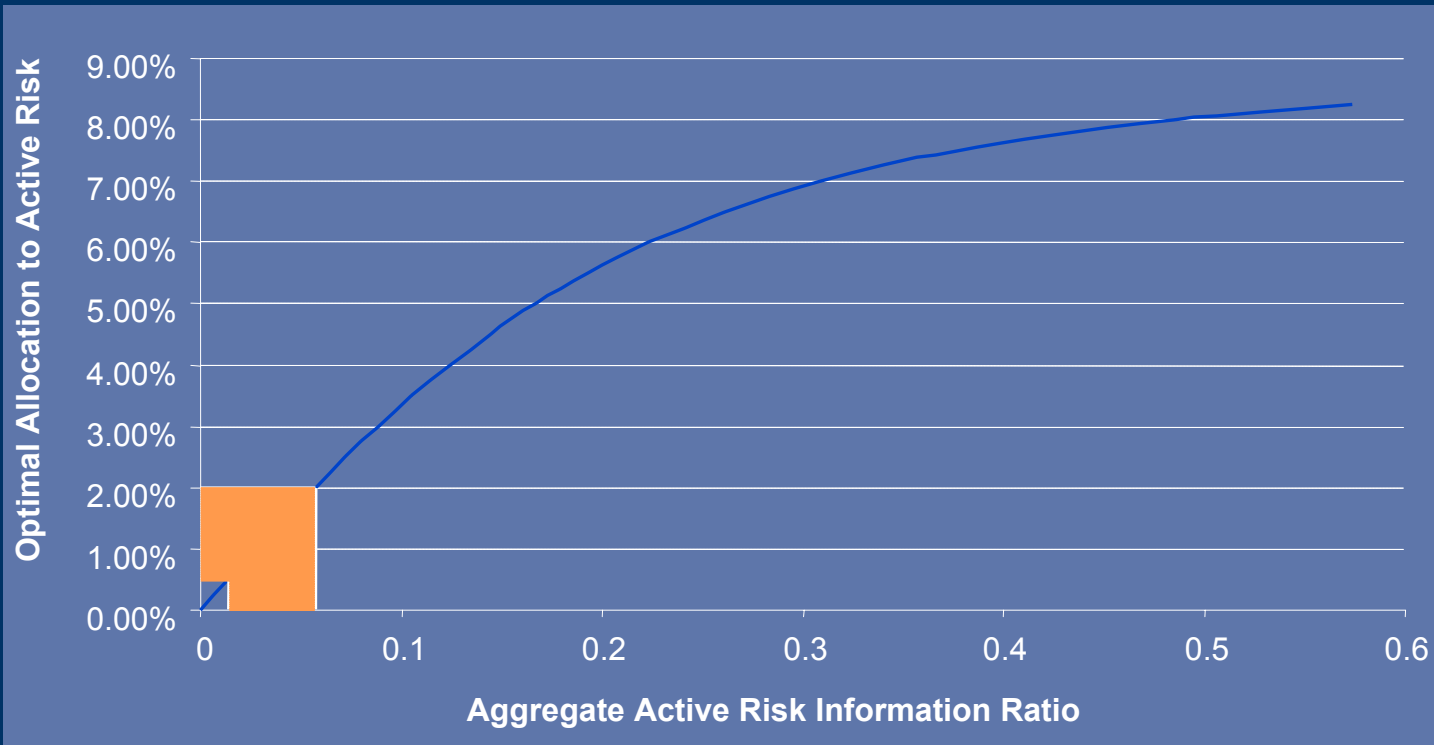
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# The Active Risk Puzzle:

## Why do funds have such modest expectations?

### Optimal Risk Allocations Reveal Modest IR Expectations

*Allocations to active risk of typical pension funds range between 50 and 200 basis points*



#### Possible Explanations:

- Funds may be unsure of their ability to select skilled managers
- Career risk
- Governance restrictions
- Active risk and strategic asset allocation have historically been linked
- It's hard to generate active risk – it takes a lot of capital

# The 5 C's: Finding More Alpha for Your Portfolio

- **Correlation:** uncorrelated across sources
- **Consistency:**
  - High alpha per unit of active risk
  - Sustainability
- **Capacity**
- **Capital:**
  - Alpha constrained by capital allocation
  - Active risk overlays require low capital
- **Cost**

# Potential Solutions

- **The most attractive alpha generation strategies:**
  - Target high return with minimal capital requirements
  - Have no beta and low correlations to other alpha sources
  - Have reasonable fees
  
- **Good examples are:**
  - Market-neutral absolute return strategies
  - Active risk overlay strategies (currency or GTAA)
  - Traditional mandates with the no-shorting constraint removed

Investments that may fall into the category of uncorrelated assets, such as absolute return strategies, may be regulated less stringently and can involve significant use of leverage, making them potentially riskier than the other investments shown. Investments in alternative investments may entail substantial risks. Please refer to the relevant offering and subscription documents for additional disclosures and information. Investment restrictions apply to many of Goldman Sachs' alternative investment products.

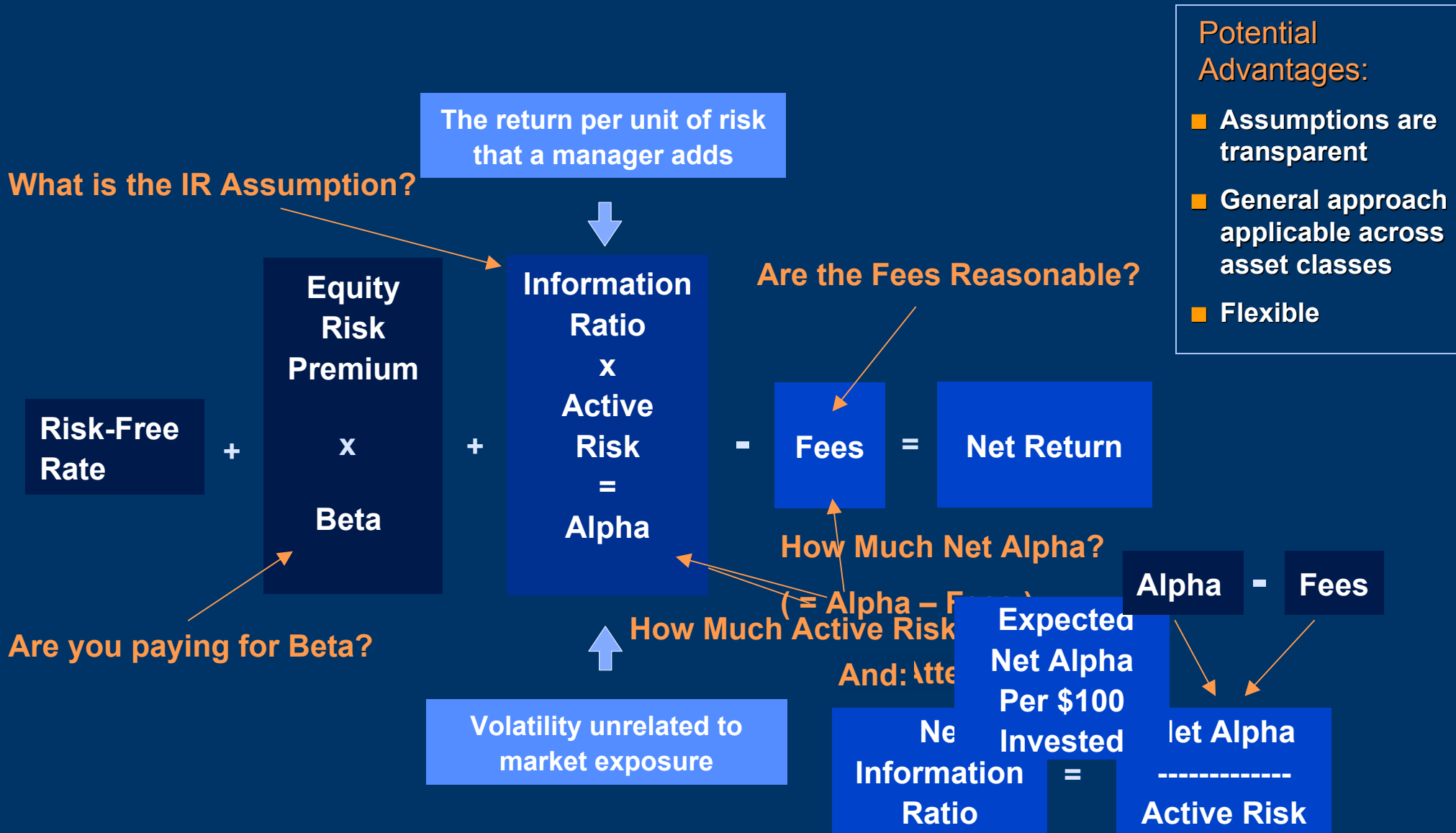
# Some Leading U.S. Endowments Already Pursue Active Alpha Investing

	Leading Endowments Target Allocation			NACUBO <sup>1</sup> Survey
	Harvard	Yale	Stanford	Average >US\$ 1B
<b>Traditional Asset Classes</b>	<b>52%</b>	<b>38%</b>	<b>52%</b>	<b>65%</b>
Public-Market Equity	30% <sup>2</sup>	30%	40%	47%
Fixed Income and Cash	22% <sup>3</sup>	8%	12%	18%
<b>Alternative Assets</b>	<b>48%</b>	<b>63%</b>	<b>48%</b>	<b>35%</b>
Absolute Return Strategies	12%	25%	15%	20%
Private Equity	13%	18%	10%	8%
Real Estate, Commodities	23%	20%	23%	7%
Total	100%	100%	100%	100%

Notes: (1) NACUBO is the National Association of College and University Business Officers. (2) Harvard's public-market equity classification includes internally-run long-short equity arbitrage strategies. Also allocates a 5% allocation to Emerging Markets. (3) Harvard's fixed income classification includes internally-run long-short bond arbitrage strategies. Also includes High-Yield and Inflation-Linked bonds.

Sources: 2004 Annual Reports of The Yale Endowment, Harvard Management Company, Stanford Management Company; NACUBO 2004 study of endowments.

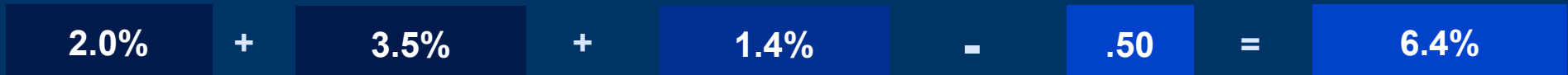
# We have a framework for decomposing Risk and Return



# Assessing Risk and Return: Hypothetical Traditional Actively-Managed US Equity Portfolio



**Expected Return**



Alpha  
↙

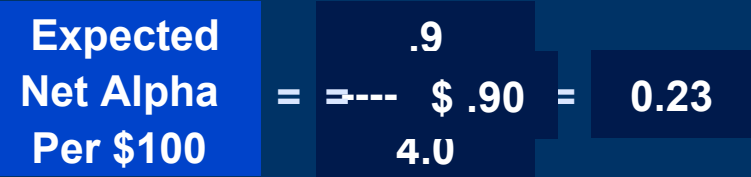
**Volatility**



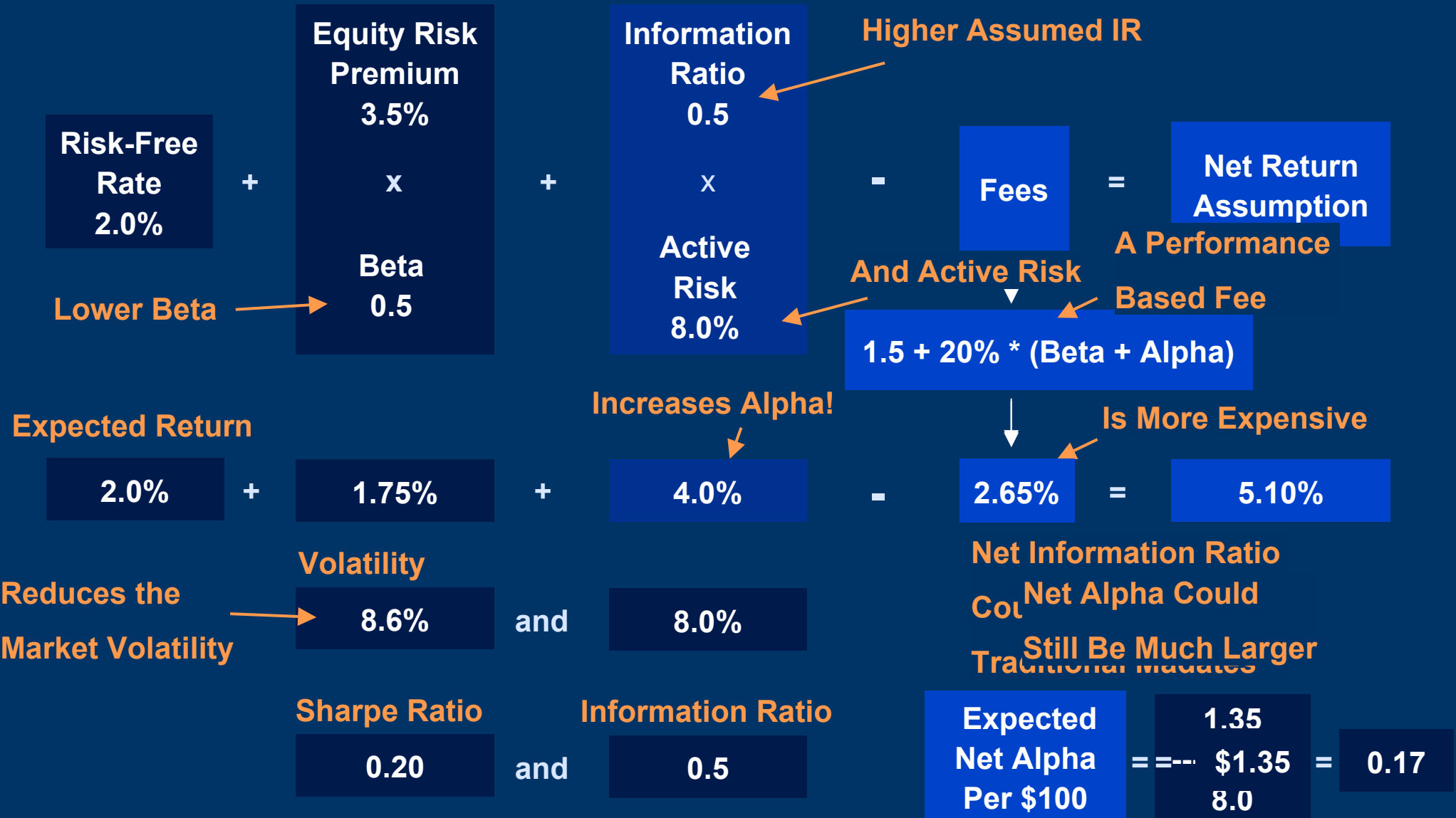
**Sharpe Ratio**



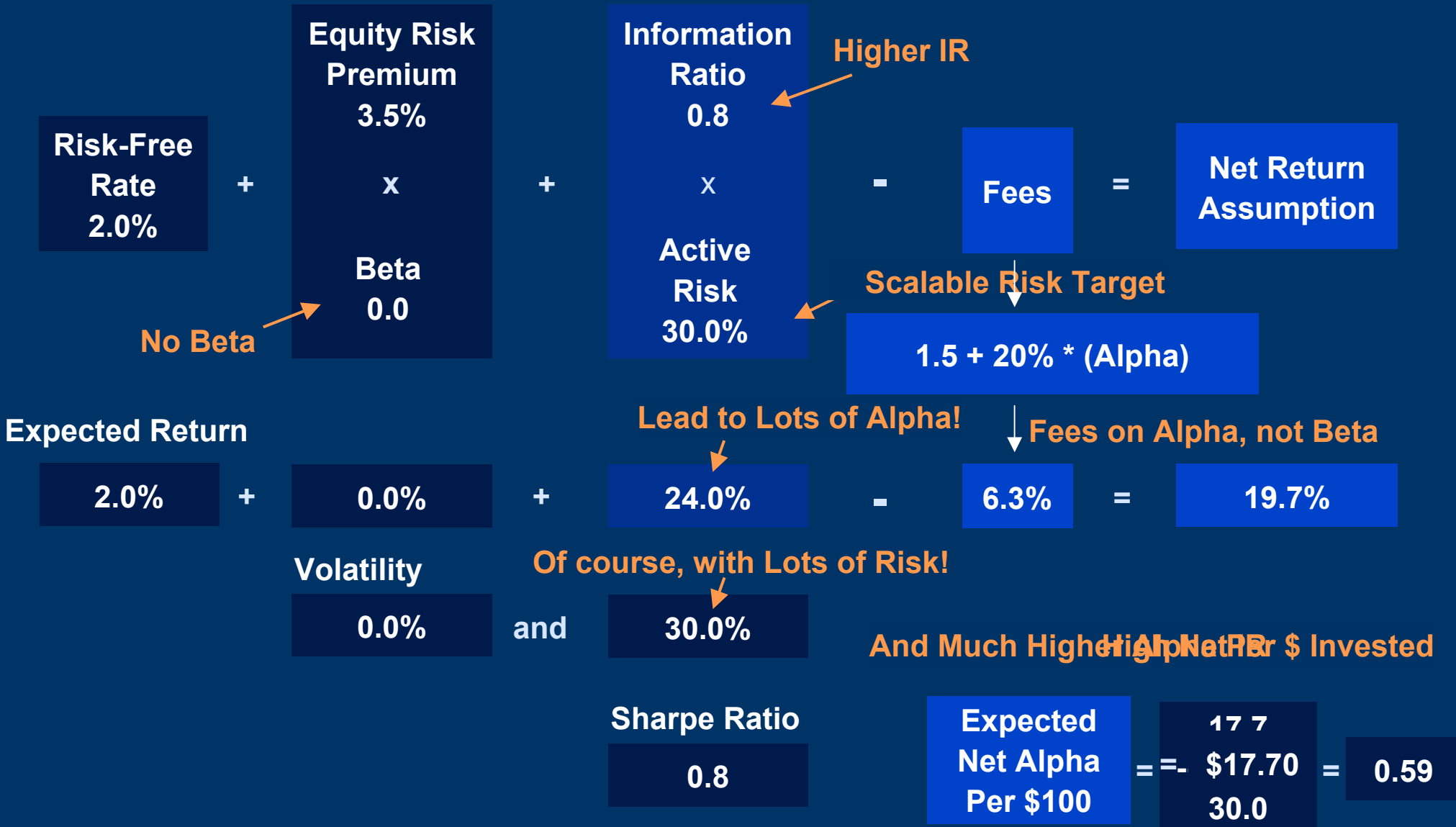
**Information Ratio**



# Assessing Risk and Return: Hypothetical Hedge Fund With More Alpha, Less Beta



# Assessing Risk and Return: Hypothetical GTAA Mandate Scalable Risk and Return



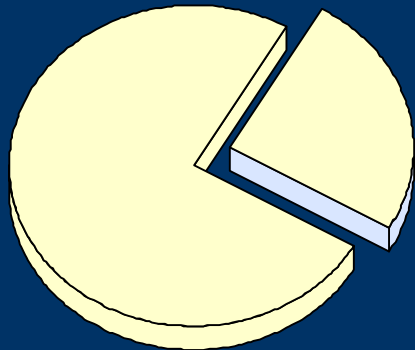
# Leverage your ACTIVE RISK: Portable Alpha Strategies Can Significantly Increase Total Alpha

## Asset Allocation Weights

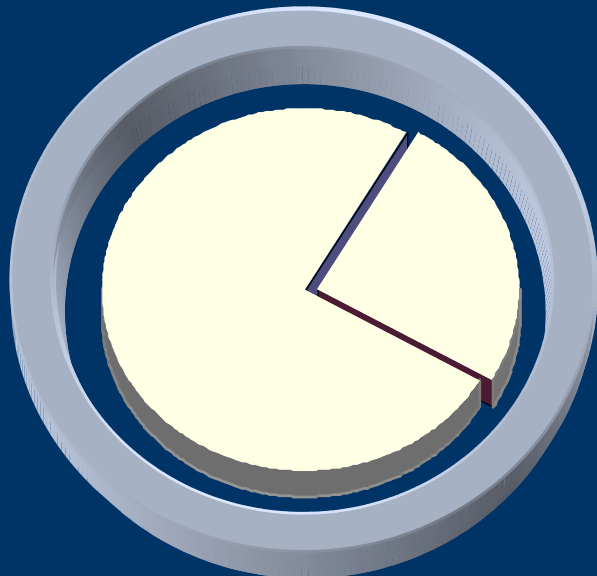
### Example: Terminate Manager

Remove \$100 MM of Fixed Income exposure  
With 50 basis points of tracking error

Expected loss of alpha:  
\$.25 MM assuming  
Core Bond net IR = 0.5

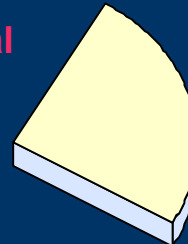


**Result:**  
Original Asset Allocation  
Plus \$13.25 MM additional alpha



Use \$10 MM to fund:

The  
Original  
Beta



\$10 MM margin to create  
\$100 MM Synthetic Bond  
Exposure Using Futures

**More Alpha  
From GTAA**  
**And \$90 MM to fund:**

A \$90 MM Investment in a  
30% Volatility GTAA vehicle

Expected alpha:  
\$13.5 MM  
at net IR = .5



# Another Approach: More alpha from traditional allocations

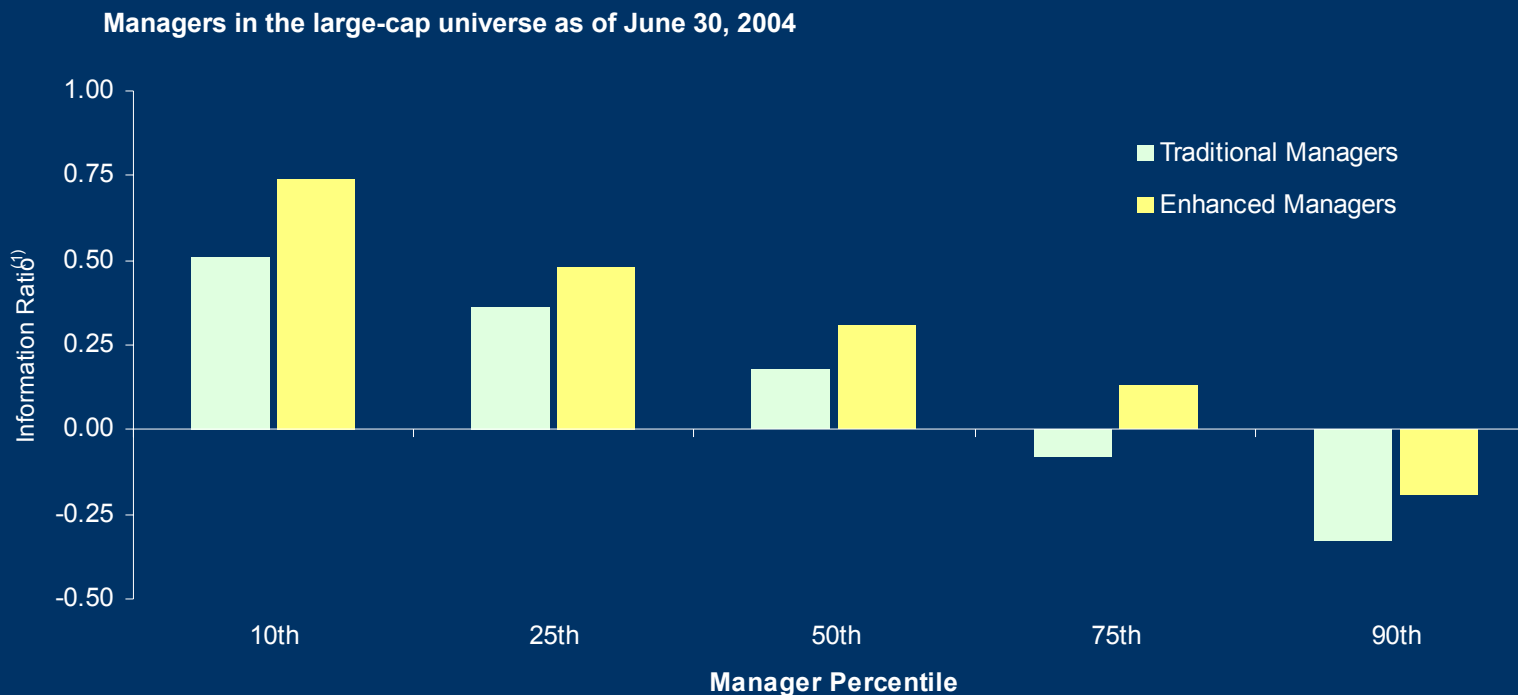
- Enhanced managers have historically achieved higher information ratios than traditional managers.
- Enhanced indexers construct diversified portfolios of over- and underweight positions relative to the stated benchmark.
- Constraints—in particular, the long-only constraint—prevent enhanced managers from hitting higher risk targets.

Relaxing constraints allows managers to create more efficient portfolios at higher levels of risk.

# Enhanced managers achieve higher information ratios

July 1, 1994 – June 30, 2004

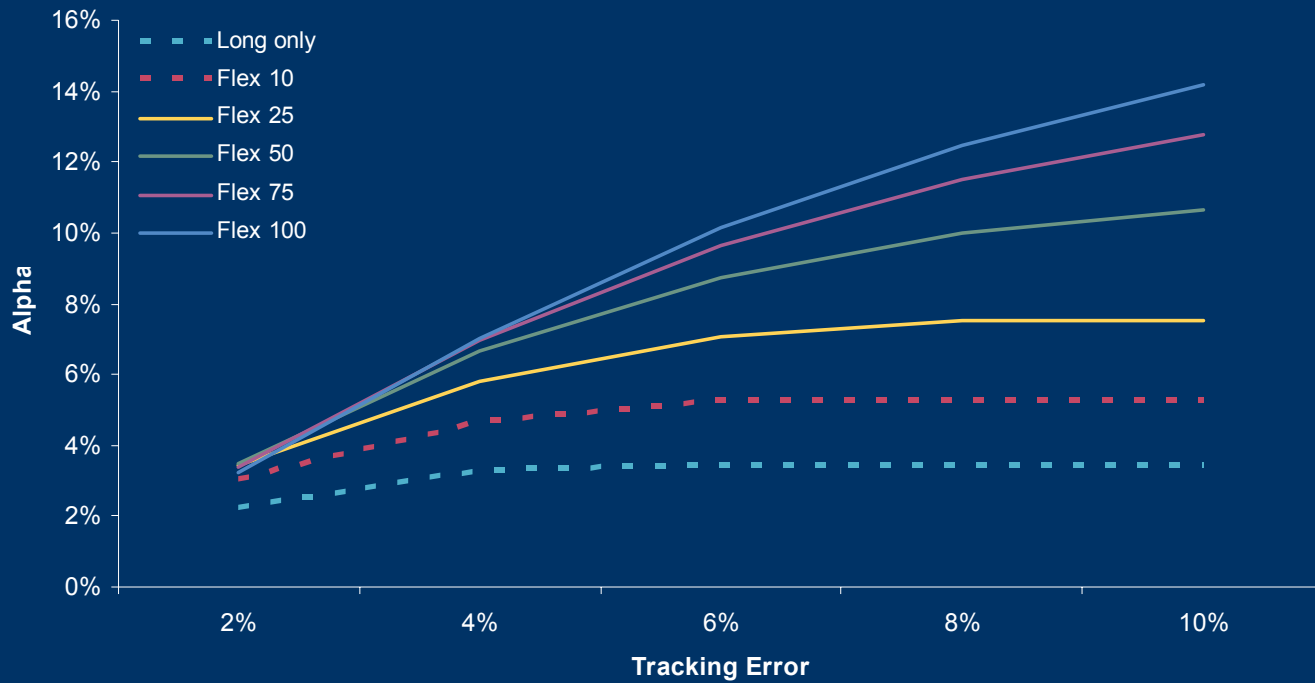
Over the last 10 years, structured managers have produced higher risk-adjusted returns at all skill levels.



(1) The information ratio is excess return divided by tracking error; a higher information ratio means a better risk/return trade-off. In the above, enhanced managers are defined as those with 10-year annualized tracking errors between 1.0% and 3.5%; Traditional managers are defined as those with a 10-year tracking error above 3.5%. This analysis was based on returns of 161 traditional and 48 enhanced managers. Past performance is not indicative of future results, which may vary. Source: PSN (Plan Sponsor Network). PSN is an independent provider of performance data to pension funds and asset managers. The data presented is monthly and gross of fees. Please see the appendix for additional information and disclosures.

# Portfolios can target higher risk levels with less loss in efficiency (information ratio)

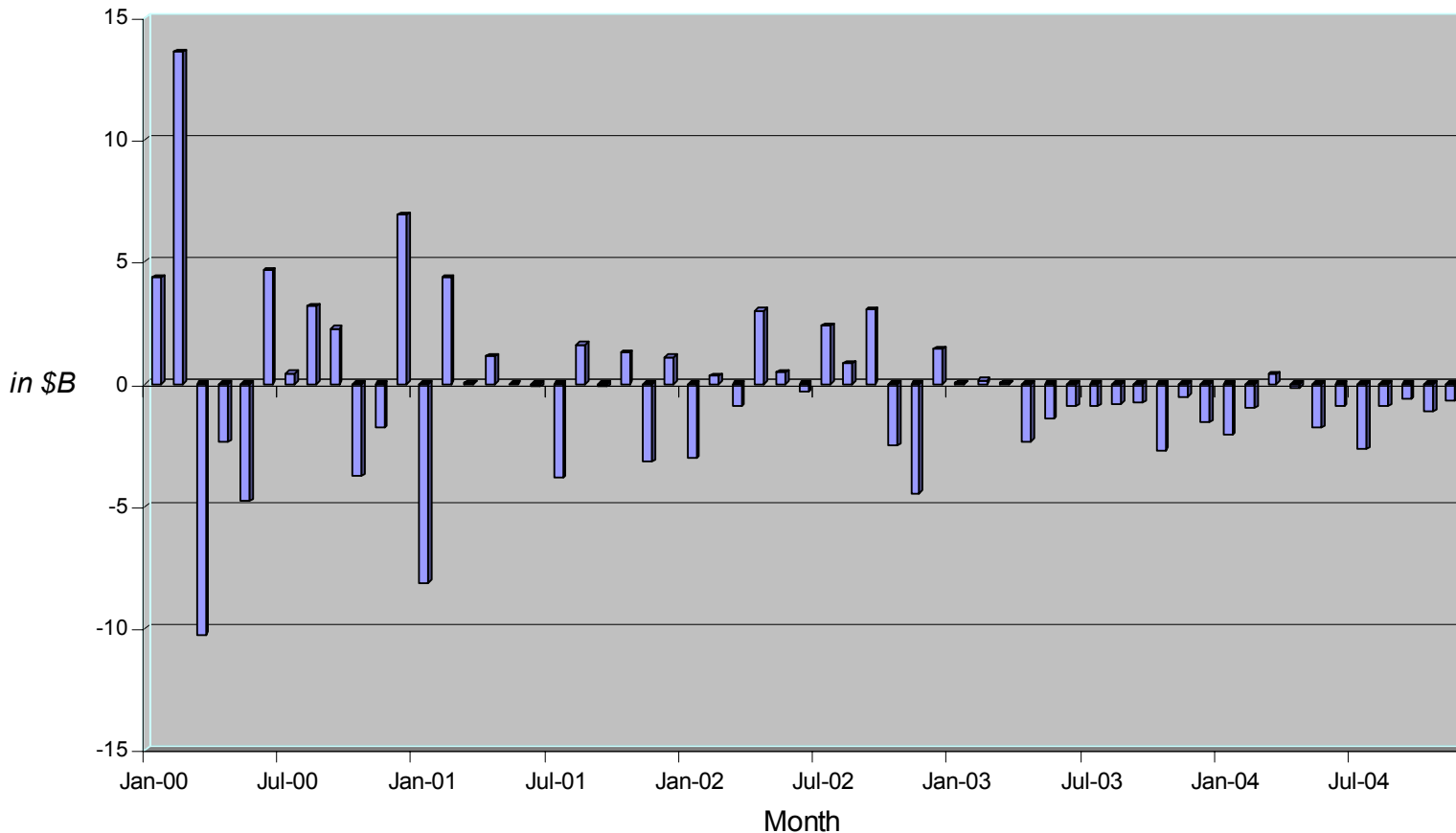
US Large Cap Expected Alpha



# Traditional Managers Have Been Taking Less Risk in Recent Years

Sector	AUM \$ Billions	Average Tracking Error		Average Decline
		2000	2004	
Large Cap Core	457.6	784	252	68%
Large Cap Growth	241.1	1168	365	69%
Large Cap Value	323.0	716	261	64%
Mid Cap Core	113.9	1414	389	72%
Mid Cap Growth	102.1	1760	442	75%
Mid Cap Value	96.7	1019	446	56%
Small Cap Core	146.4	1703	459	73%
Small Cap Growth	67.4	1662	529	68%
Small Cap Value	46.6	1174	453	61%
International Large Cap Core	53.3	652	233	64%

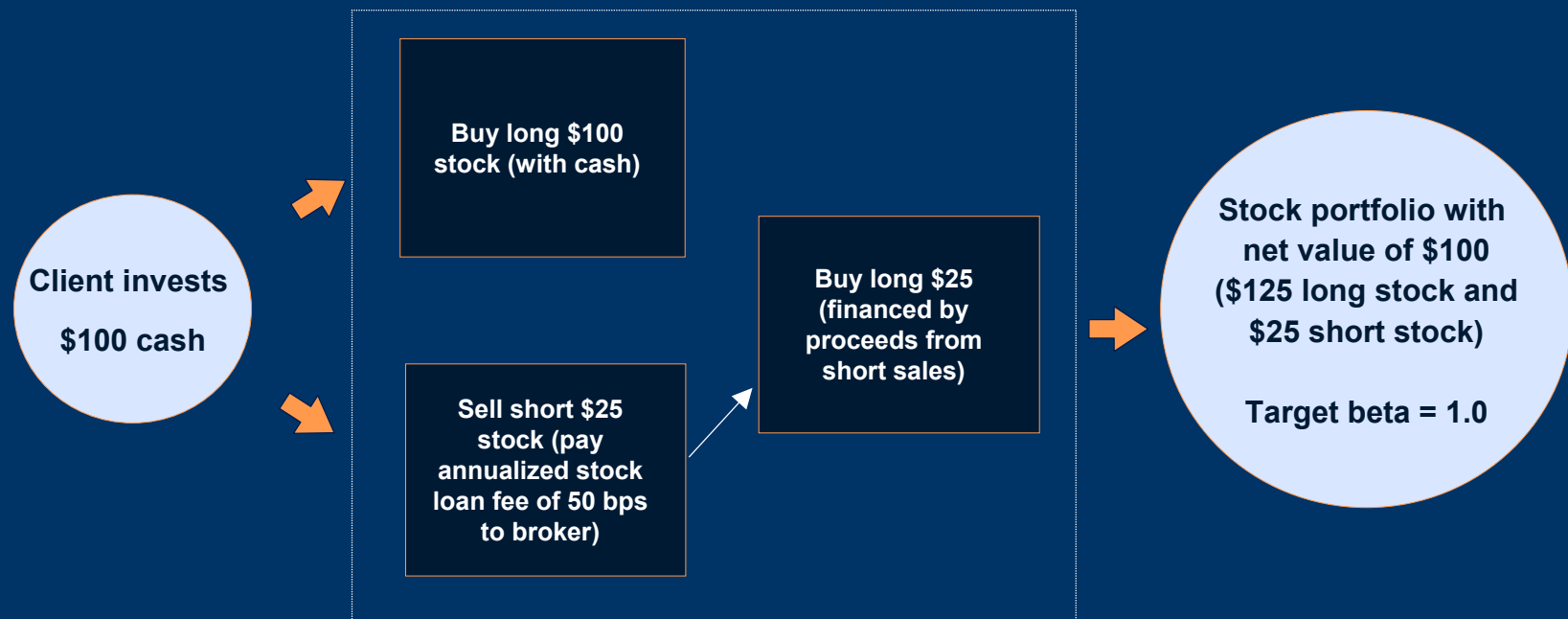
# Traditional Managers Have Been Creating Less Alpha in Recent Years



**Monthly Dollar Alpha Created in the US Mutual Funds In the Large Cap Core Sector ( Versus the S&P 500 )**

# Allow quantitative managers the flexibility to short

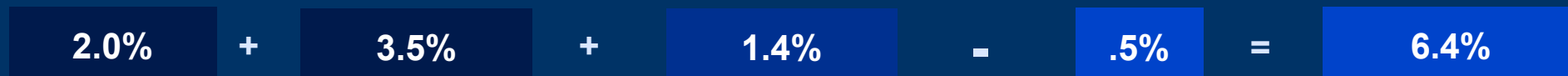
- Managers can better express their negative views
- Short sales finance additional buys, allowing larger overweight positions



# Start With the Hypothetical Traditional Actively-Managed US Equity Portfolio



## Expected Return



## Volatility



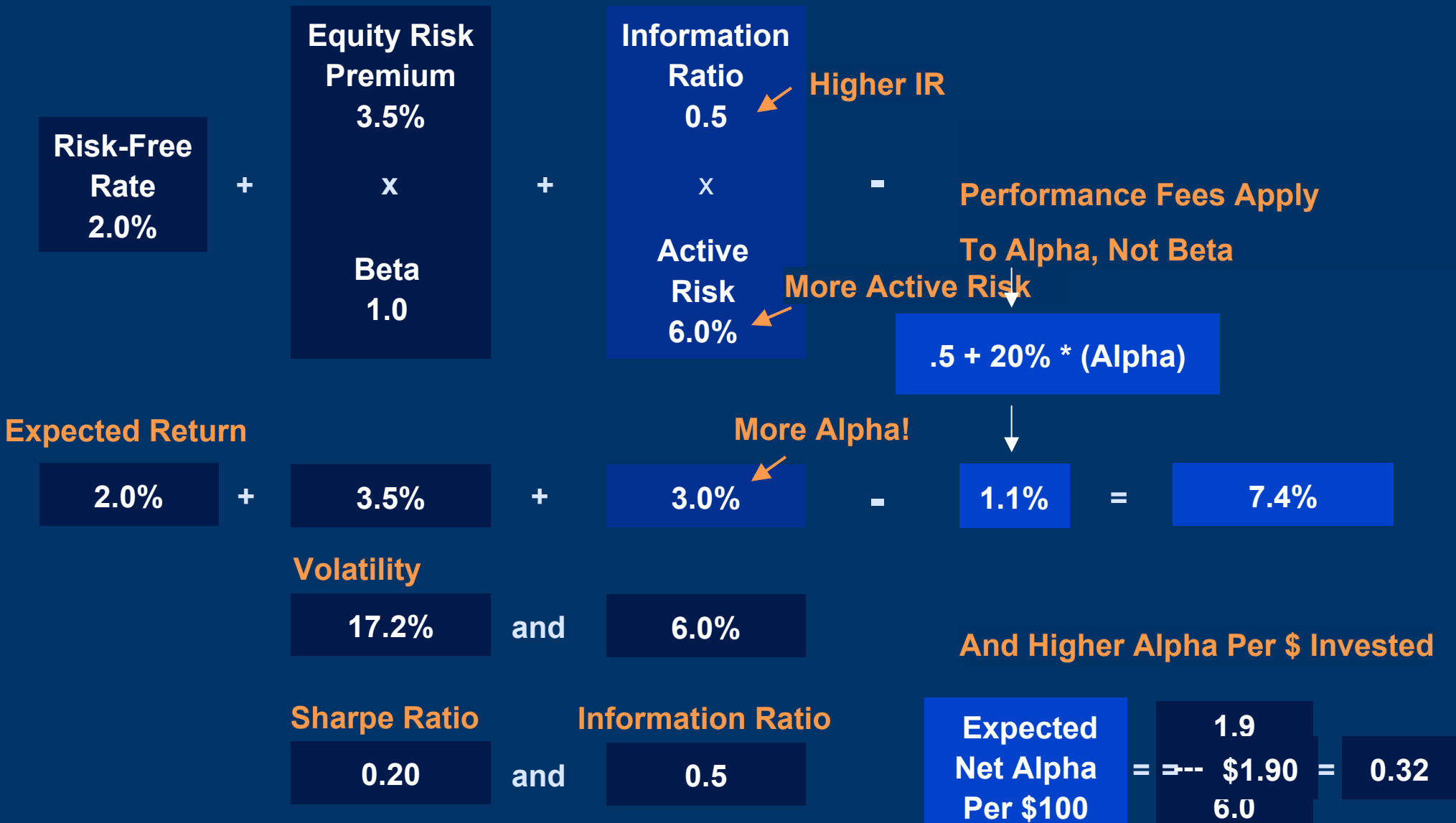
## Sharpe Ratio



## Information Ratio



# Flex! Add the Flexibility to Go Short Allow More Active Risk And a Higher Information Ratio



# Active Alpha Investing

- Active Alpha investing Separates Alpha from Beta
- Relies on skill-based active management to diversify risk and add return.
- Active strategies must address the 5 C's.
- Active Alpha portfolios differ from traditional portfolios:
  - Substantial absolute return investments, hedge funds, currency and GTAA overlay strategies
  - Increased use of financial engineering: portable alpha
  - Lower allocations to traditional public assets
  - Allow less constrained “Flex” mandates,

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