

QWAFAFEW Presentation

They Can't All Be That Smart

A Due Diligence Framework for Factor Strategies



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Overview

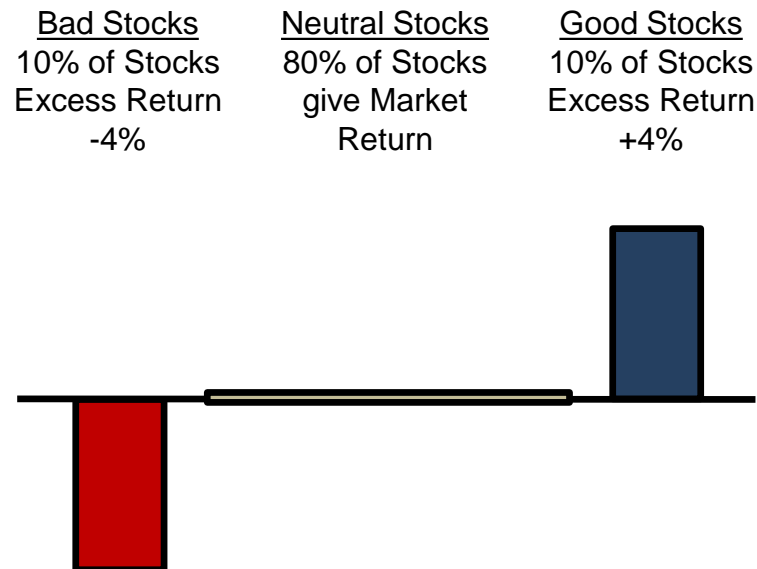
- **Factor Investing has been attracting assets while traditional fundamental active management has underperformed**
- **Product proliferation has followed the asset flow, with a wide array of investment options.**
- **The ability to perform due diligence on factor portfolios is becoming a critical skill for asset allocators.**
- **This presentation categorizes different portfolio construction methodologies, the features of each and how to evaluate those portfolios.**

Overview of Factors and Portfolio Construction Techniques

Hypothetical Stock Signal

Factors are Not Commodities. Quantitative managers have unique insights on how they approach themes such as Value, Momentum, Quality or Volatility.

For a discussion on portfolio construction, let's suspend that idea and use a hypothetical stock signal that is the same for all managers to build portfolios from.



How to Implement Hypothetical Stock Signal

Risk-Focused Investor: Smart Beta
Start with the Market Portfolio

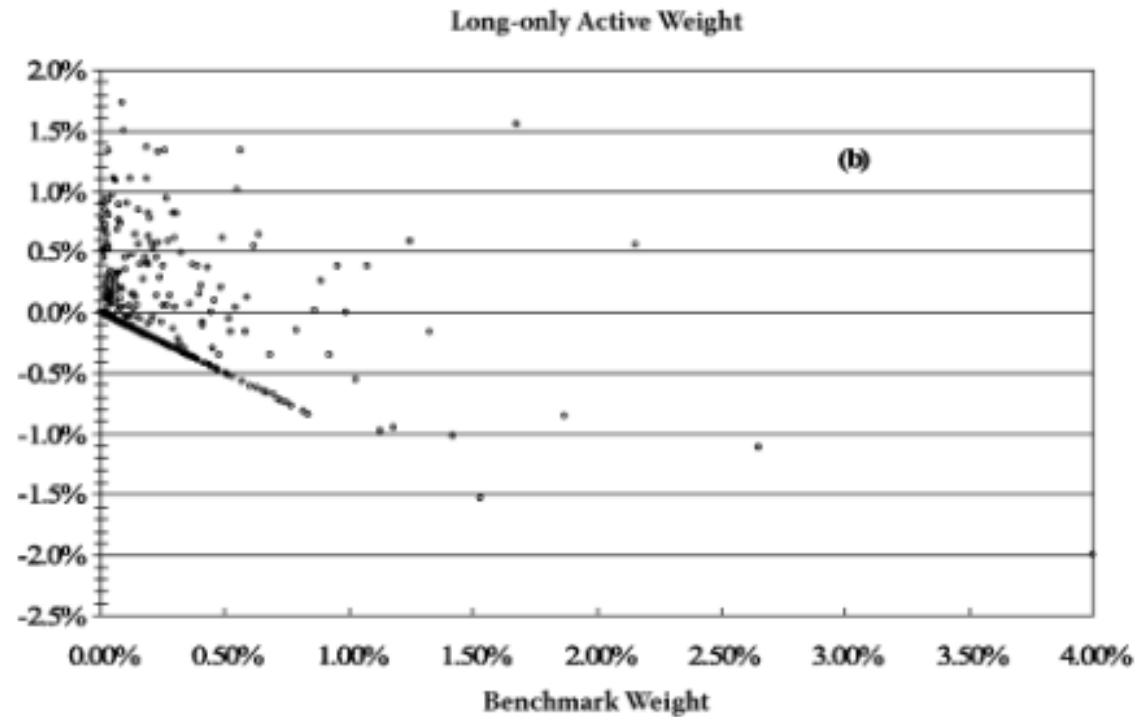


Return-Focused Investor: Factor Alpha
Start with Cash



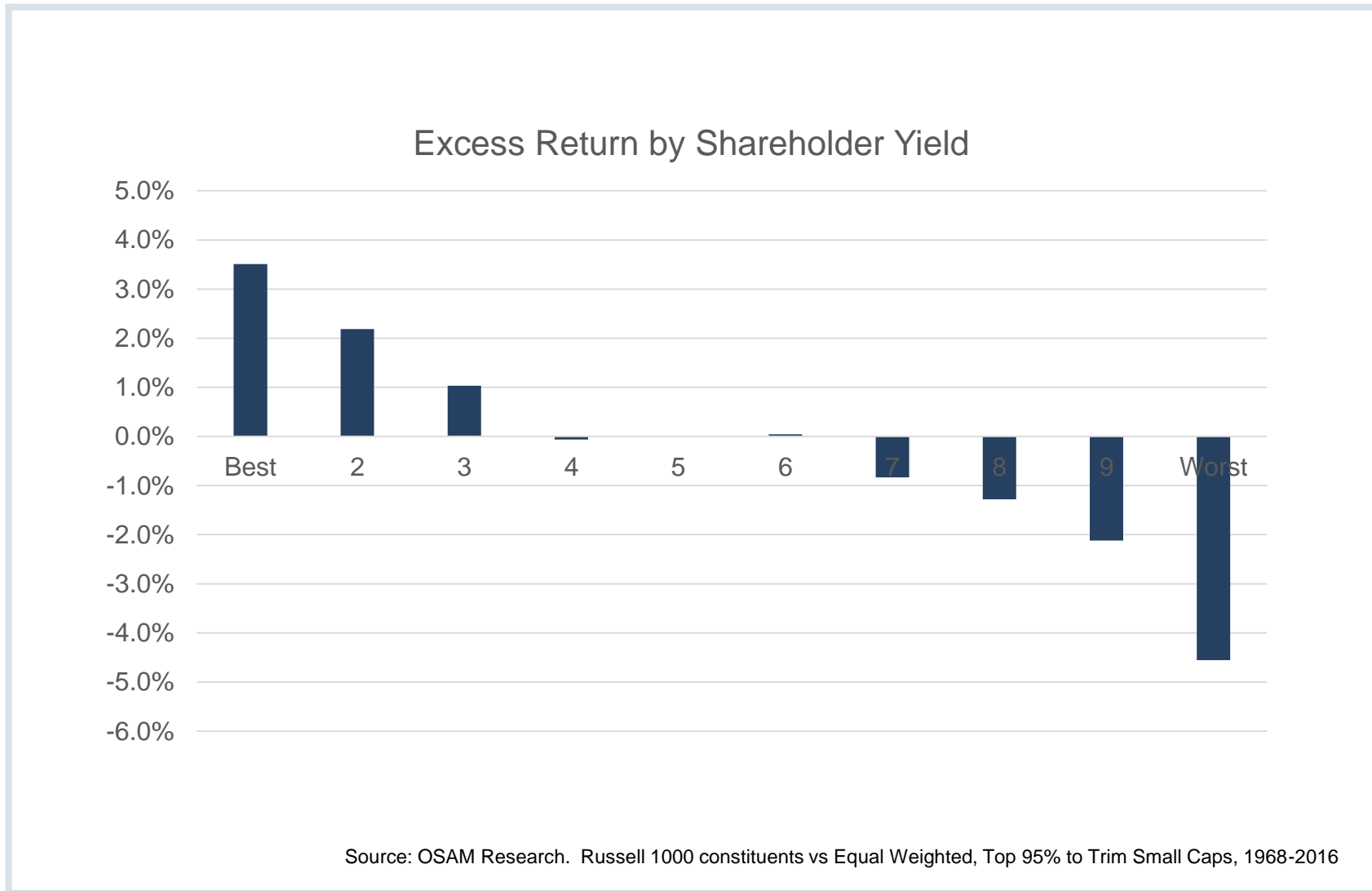
Limitations of Long-Only Environment

Long-Only portfolios have limitations on how much we can “short” the benchmark on negative alpha signals.



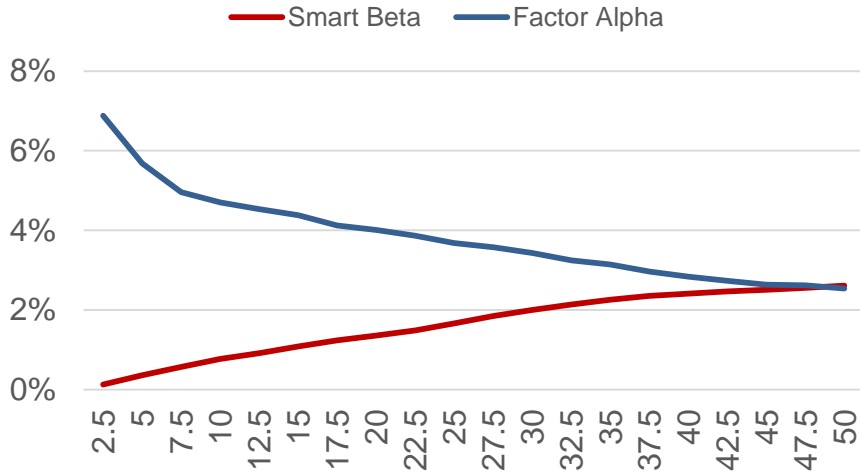
“Quantitative Equity Portfolio Management”, Sorensen, Qian, Hua.

Backtested Factor - Shareholder Yield

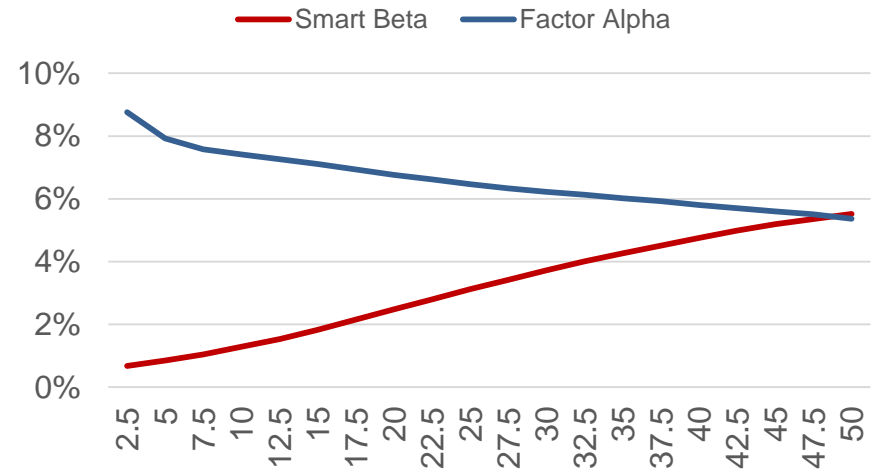


Sensitivity Analysis – Shareholder Yield

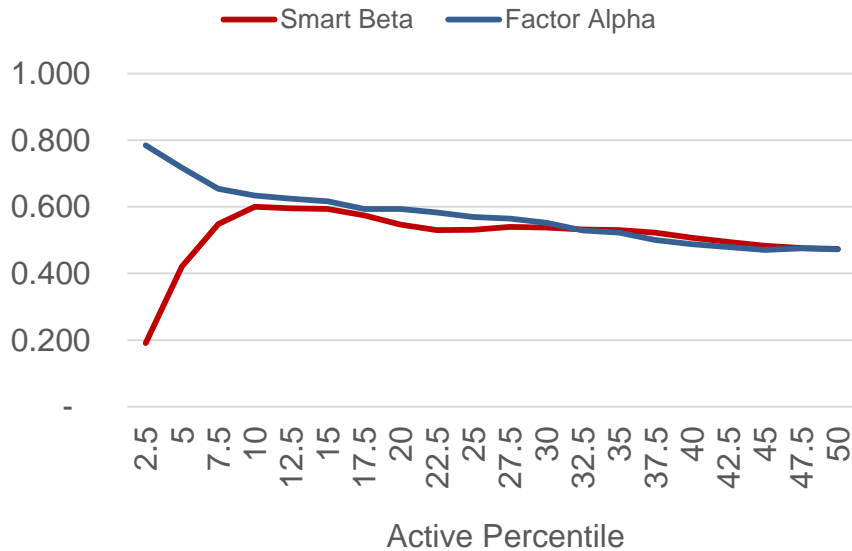
Excess Return



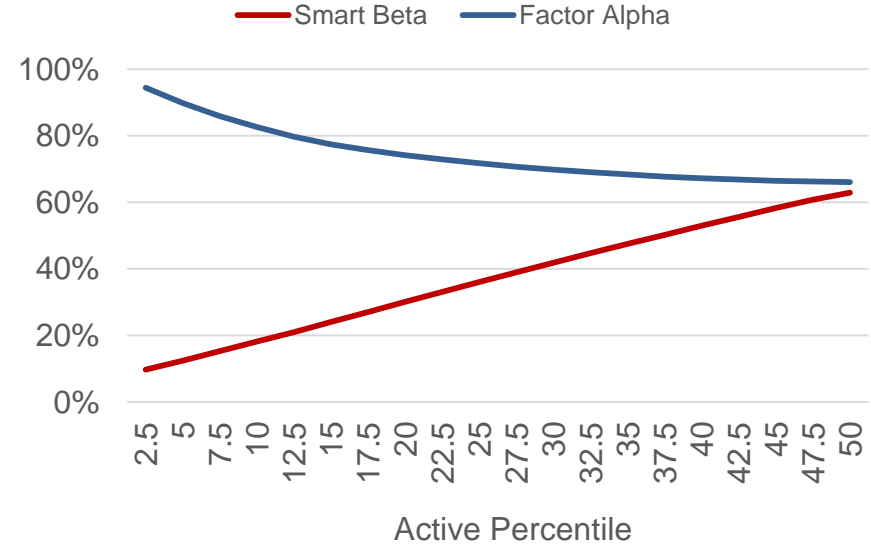
Tracking Error



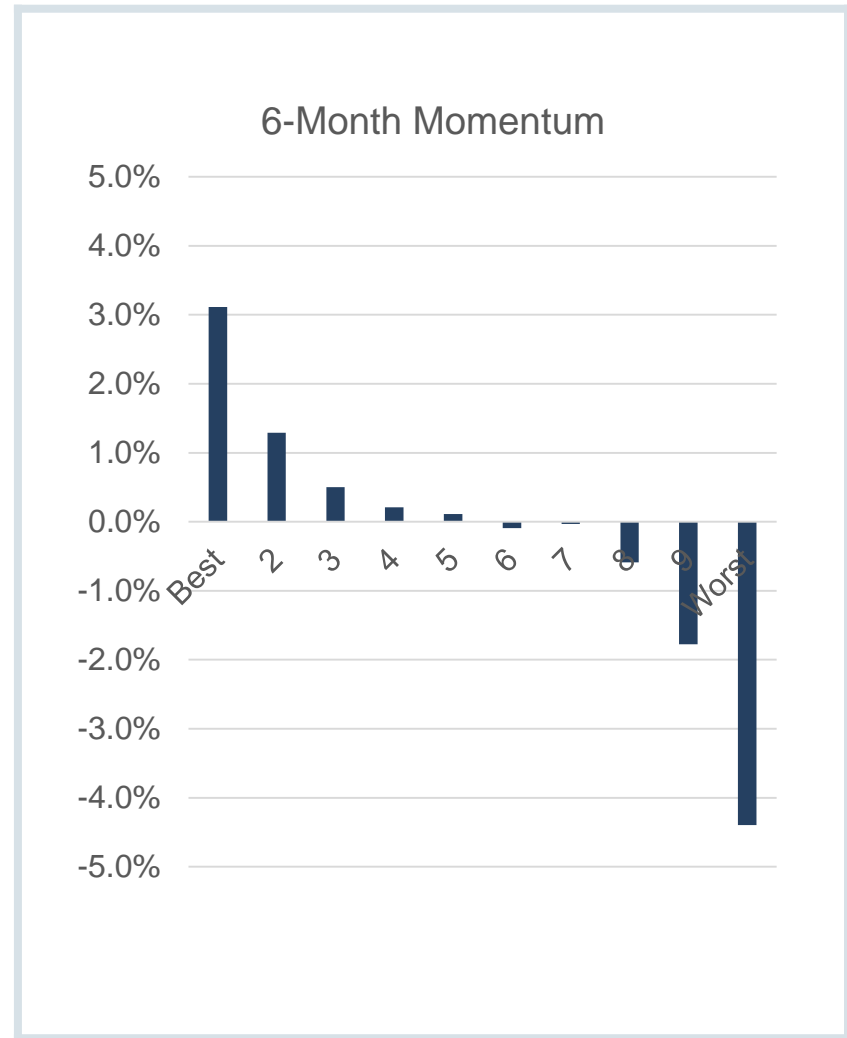
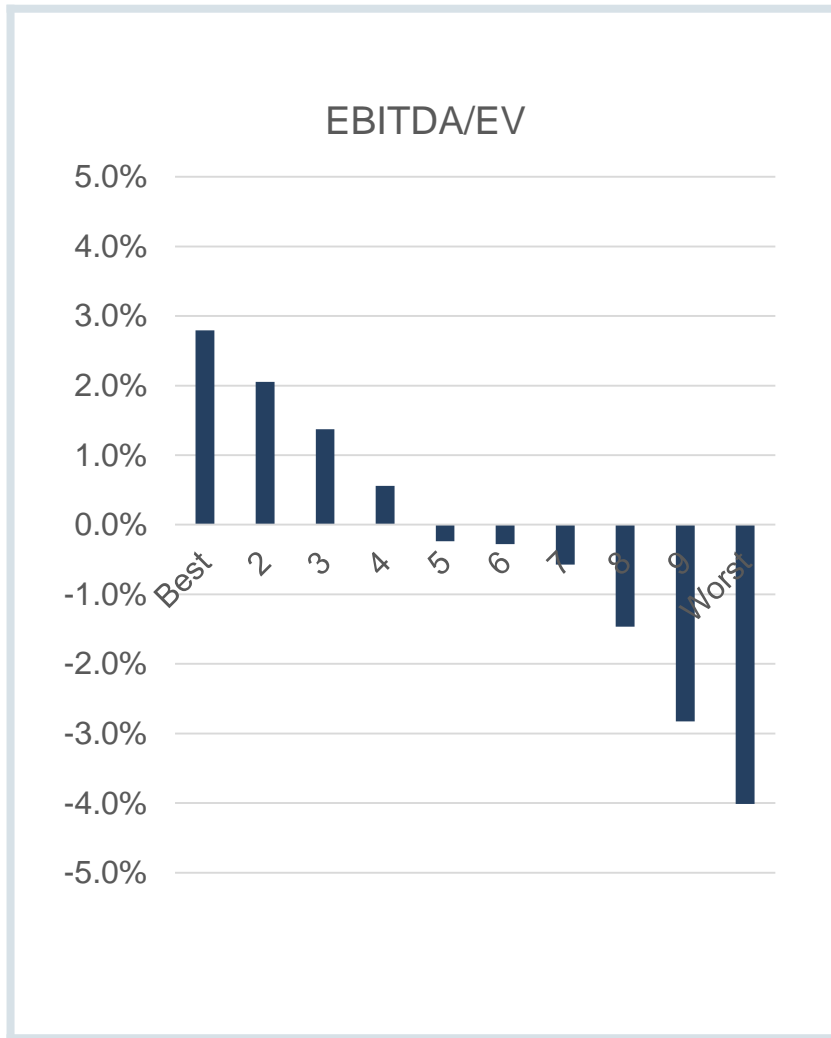
Information Ratio



Active Share

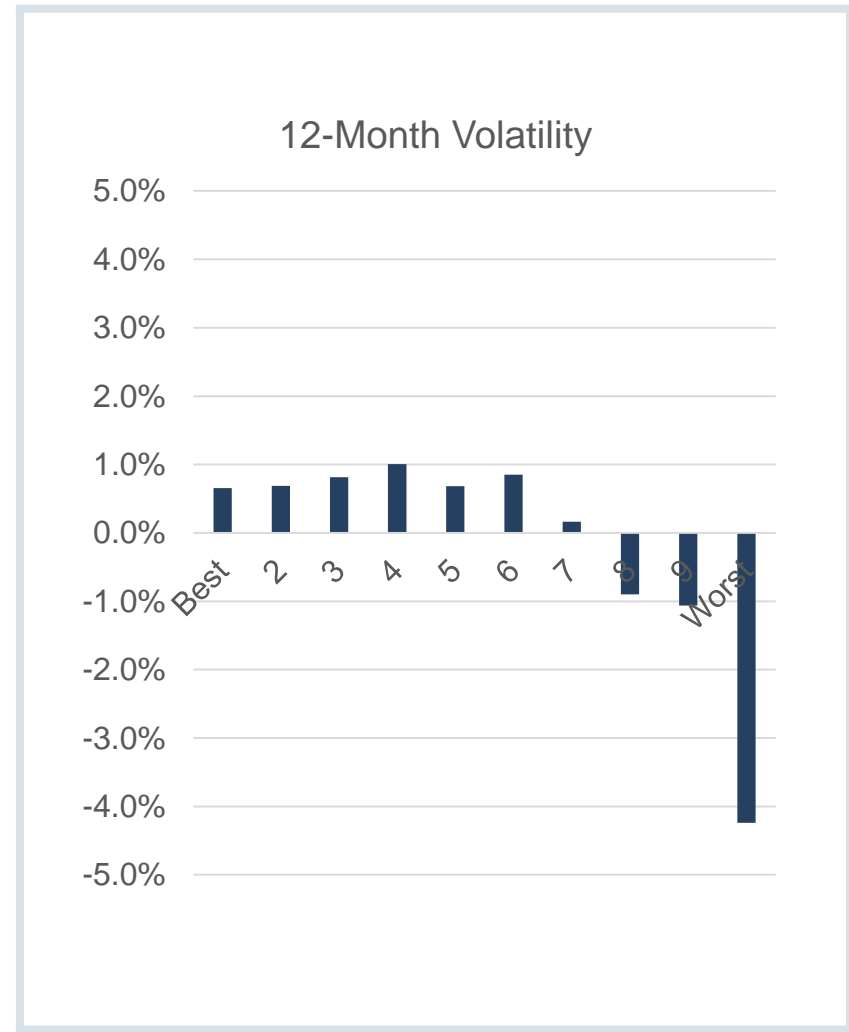
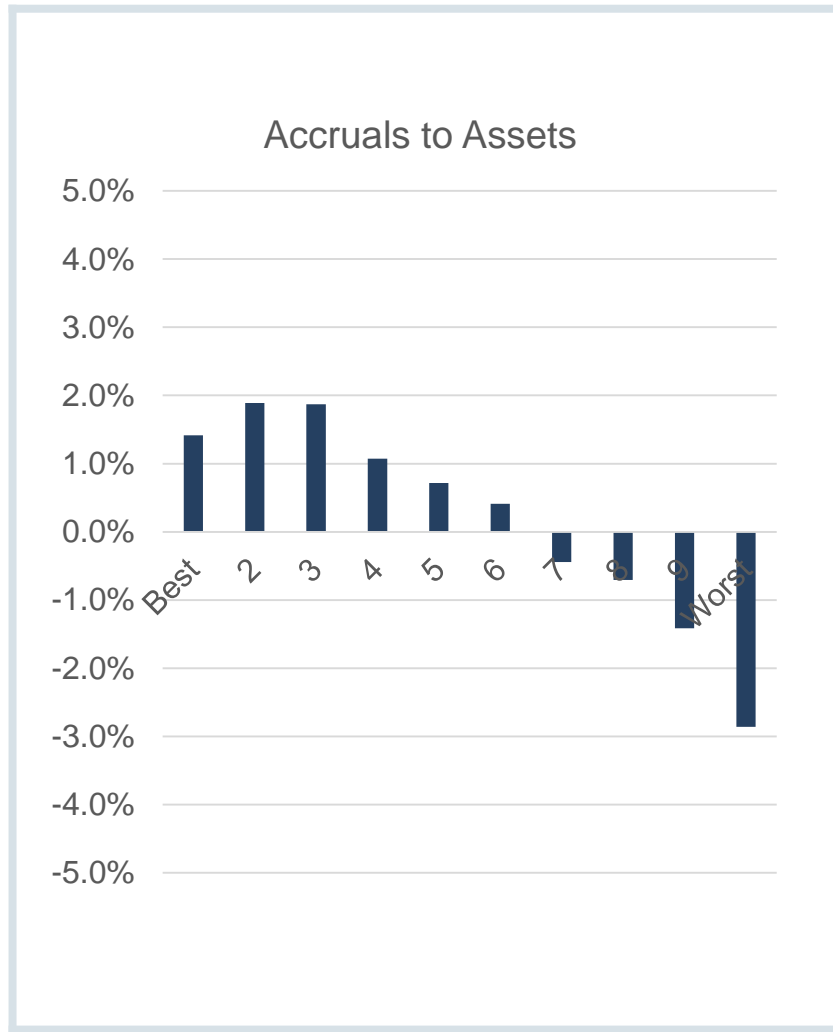


Decile Spread Value and Momentum



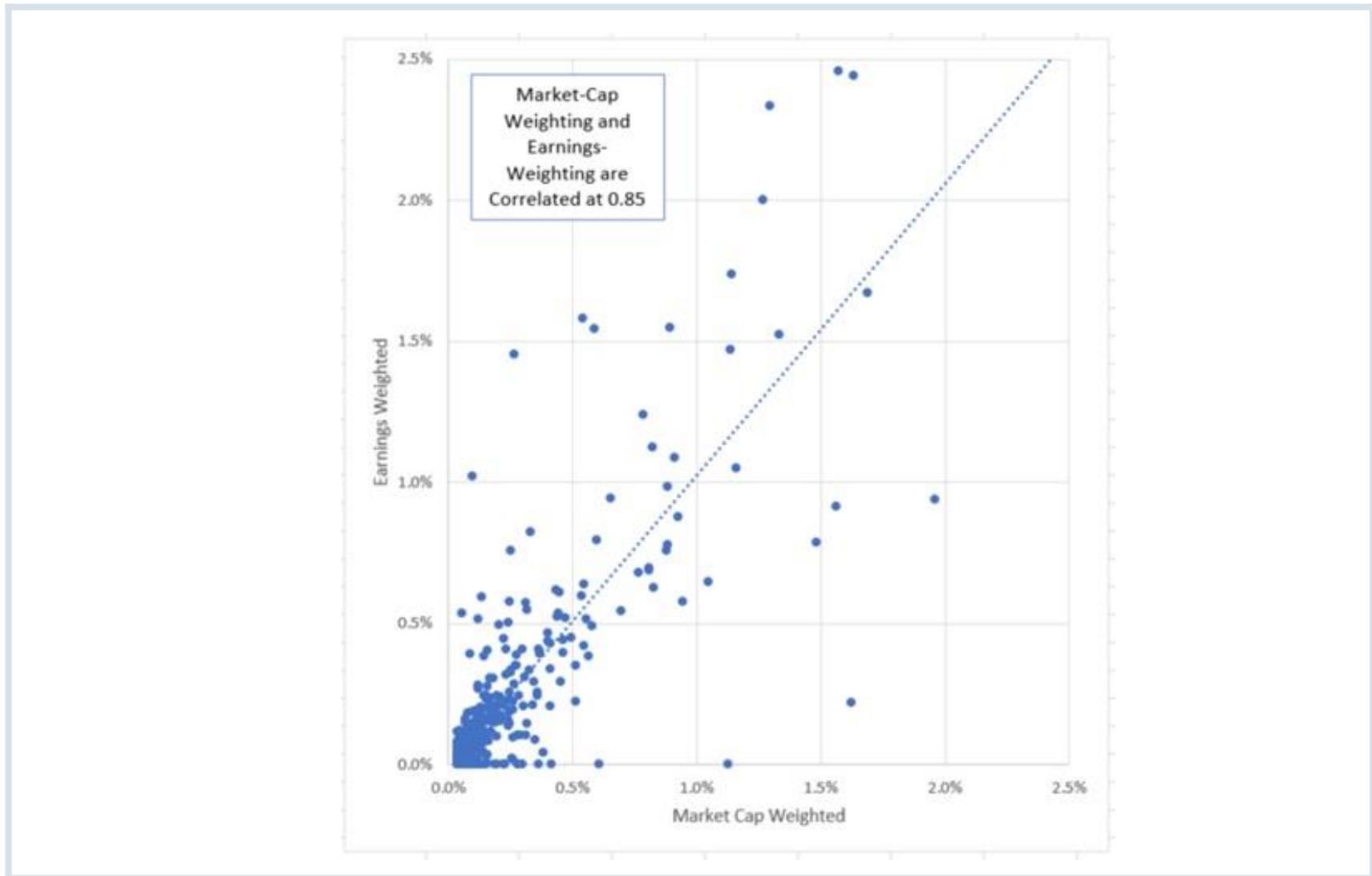
Source: OSAM Research. Russell 1000 constituents vs Equal Weighted, Top 95% to Trim Small Caps, 1968-2016

Volatility and Quality



Source: OSAM Research. Russell 1000 constituents vs Equal Weighted, Top 95% to Trim Small Caps, 1968-2016

Fundamental Weighting



Fundamental Weighting

Fundamental Weighting is an implicit Value portfolio, weighting the companies with the highest ranking fundamentals but agnostic to the market valuation of the company.

	Market Cap Weighted	Sales Weighted	Earnings Weighted	Book-Value Weighted	Dividend Weighted
Price/Sales	1.9	0.7	1.3	1.6	1.7
Price/Earnings	23.7	18.3	15.4	23.3	20.4
Book/Price	3.0	3.9	3.9	1.8	2.9
Dividend Yield	2.0	2.1	2.1	2.0	2.9
Active Share	0.0%	33.0%	23.5%	31.7%	27.3%

Annualized Return	10.37%	10.90%	11.05%	9.95%	10.83%
Annualized Vol	15.15%	15.65%	15.12%	15.74%	14.20%
Tracking Error		5.15%	4.54%	4.73%	5.83%
Information Ratio		0.10	0.15	(0.09)	0.08

Adding Risk Controls

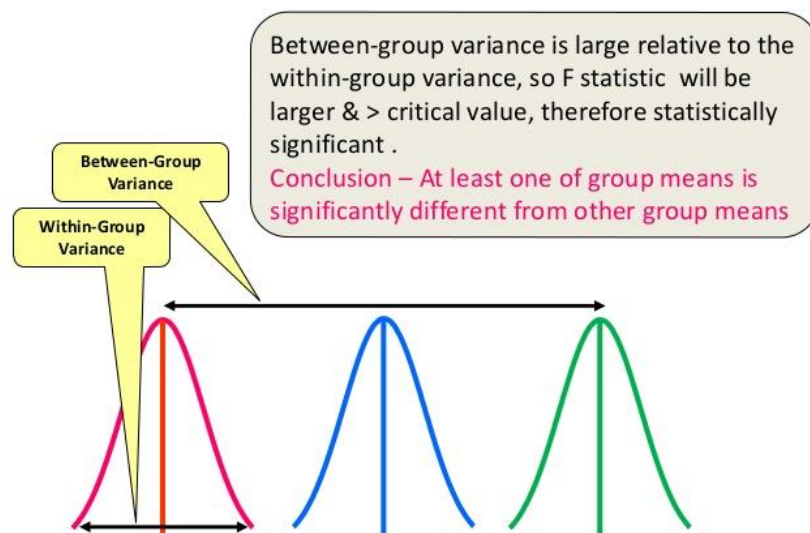
Risk Controls Overview

- **Factor Risks are necessary in order to generate excess returns. The previous sensitivity analysis shows how the concentration of the Factor Alpha or Smart Beta approach determines the broad risk-return profile.**
- **Risk Controls offer additional capabilities to shape the risk-return profile of the portfolio. The question is how much benefit can one get through risk controls, and can they be implemented in concentrated portfolios.**
- **In addition to Stock Selection through Factors, Risk Controls should be considered as an additional skill when evaluating a factor portfolio.**

ANOVA Analysis

As part of the analysis we wanted to see if GICS was the best grouping methodology for controlling groups for non-factor risk. In order to do that, we needed a framework for how effective a grouping is.

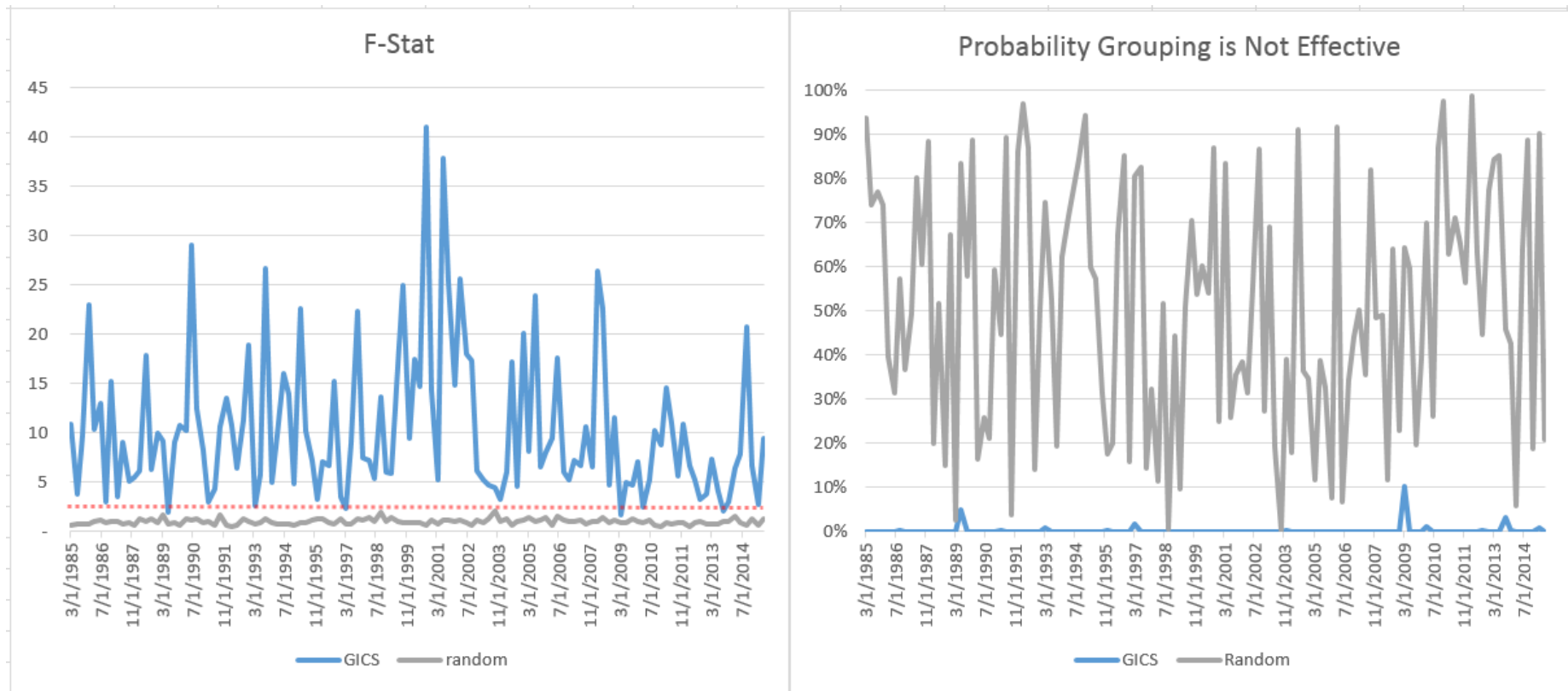
We performed an Analysis of Variance (ANOVA). ANOVA takes a look at the effectiveness of the grouping by comparing the between-group variance (the variance between the GICS sectors) to the within-group variance (the variance within Energy stocks, or Financials).



In order to test the effectiveness of the groupings, we ran the ANOVA on a quarterly basis for GICS Sectors, Industry Groups and Industries. There are two main statistics that we look at in the analysis: F-Stat and p-value.

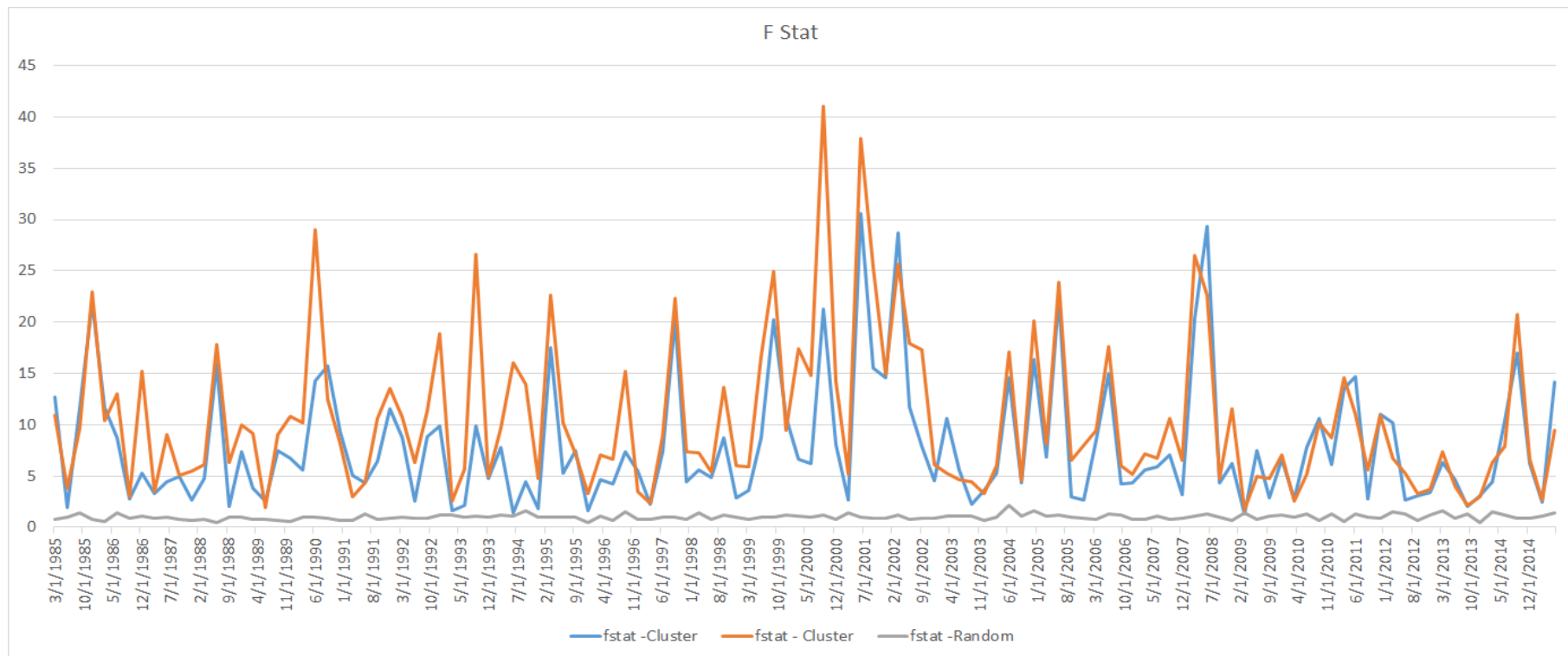
ANOVA Analysis – GICS Sectors

The analysis shows that GICS is very effective on controlling for groupings of risk. The F-stat is over the 5% confidence level only once in 122 quarters, and over the 1% confidence level only five times.



ANOVA Analysis – Cluster Analysis

As an alternative methodology, we looked to see if Cluster Analysis could help with building a better grouping. The first cluster analysis was looking at just trailing returns which, when using a combination of Euclidian distance and correlation clustering, was the most as effective:



Further cluster analysis showed little improvement. Integration of financial statement data, mixed analysis using categorical GICS plus continuous returns, all had negative effects on the clustering.

While the clustering analysis was nominally successful, in implementation, it was found to still not be as effective as GICS in controlling for risk.

Sector Relative Diminishes Factor Returns

When taking a look at the highest deciles of factors, selecting on a GICS relative basis gives lower excess returns, but does reduce the active risk of the portfolios, balancing out to a similar Information Ratio.

Top Decile by OSAM Value Composite in Large Stocks

	Active Returns		
	Excess Ret	TE	IR
Absolute	3.5%	6.2%	0.56
Sector Relative	2.7%	4.4%	0.61
Industry Group Relative	2.1%	3.9%	0.53

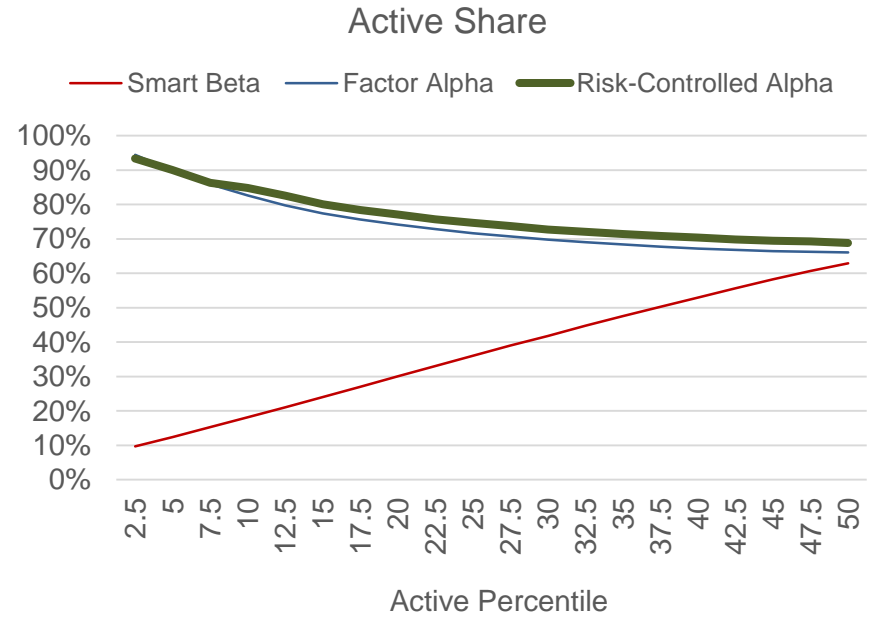
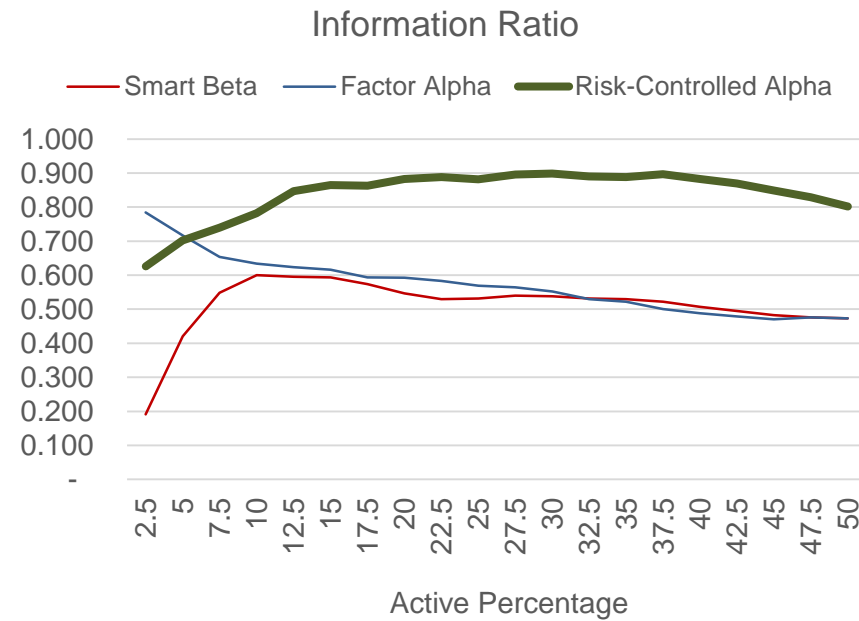
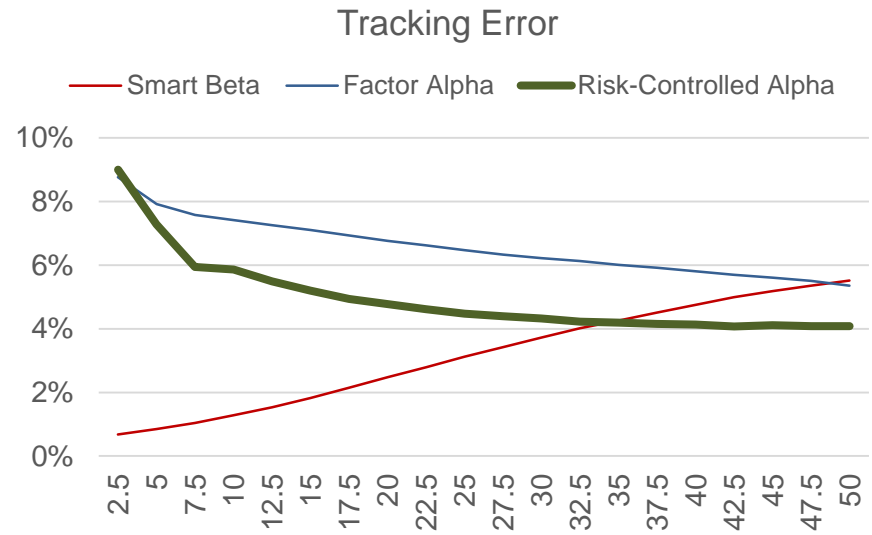
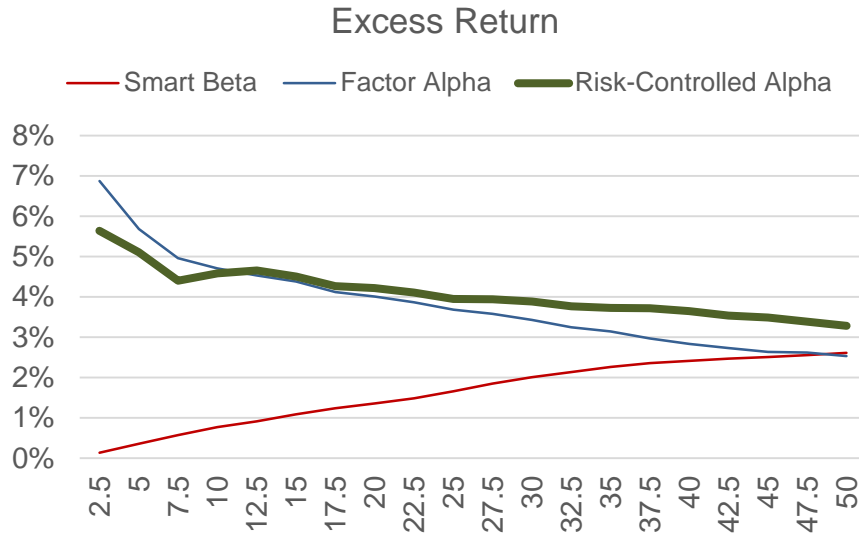
Top Decile by OSAM Momentum Composite in Large Stocks

	Active Returns		
	Excess Ret	TE	IR
Absolute	3.3%	8.0%	0.41
Sector Relative	2.3%	5.4%	0.43
Industry Group Relative	1.9%	4.7%	0.41

Top Decile by OSAM Shareholder Yield in Large Stocks

	Active Returns		
	Excess Ret	TE	IR
Absolute	4.0%	7.3%	0.55
Sector Relative	2.9%	5.5%	0.53
Industry Group Relative	2.7%	5.1%	0.54

Sensitivity Analysis – Shareholder Yield with Risk Controls

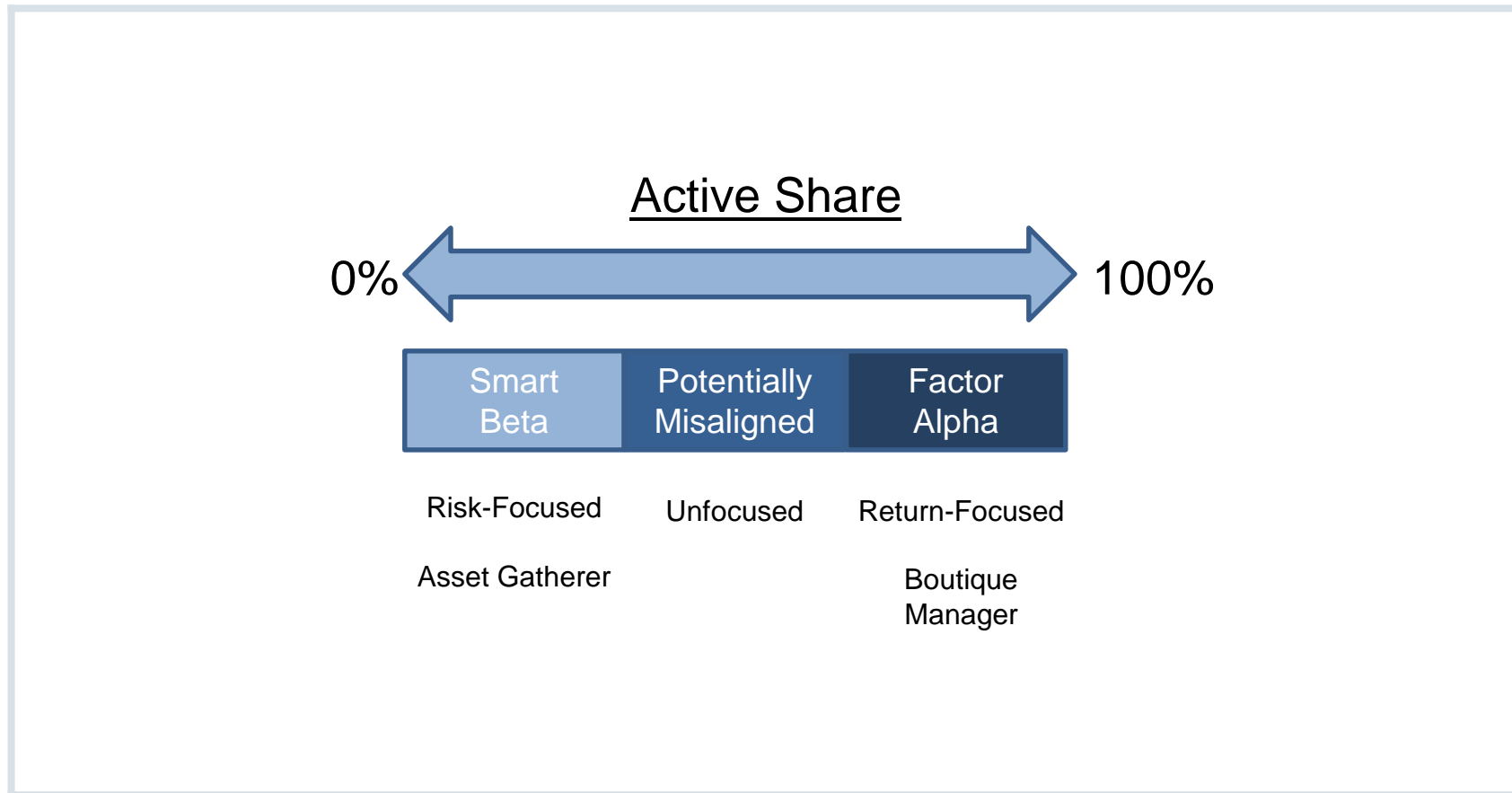


Using Active Share for Due Diligence

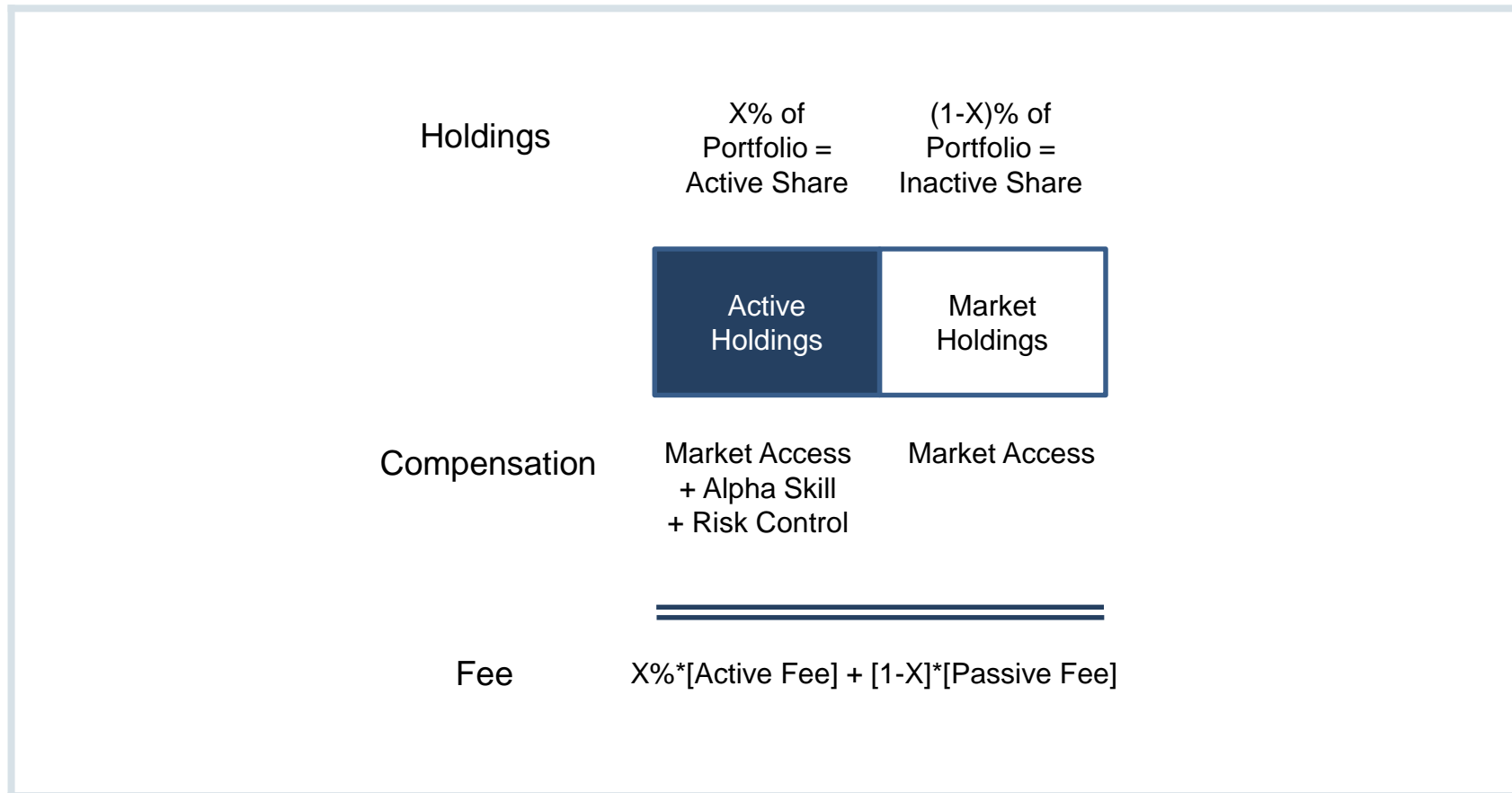
Active Share

- **Observable metric in the sensitivity analysis is Active Share, which decreases/increases as the breadth in the factor increases.**
- **If you know the Factor Signal (e.g. decile spreads), and the Portfolio Style (e.g. Factor Alpha or Smart Beta), the active share will tell you the breadth of the manager's conviction in that signal.**
- **Risk controls will move the active share margins, but the core conviction of the portfolio manager in their factor should be reflected in the metric.**
- **Active Share Also Helps Determine the Appropriate Fee for a Portfolio**

Active Share Indicates Alignment between Factors and Portfolios



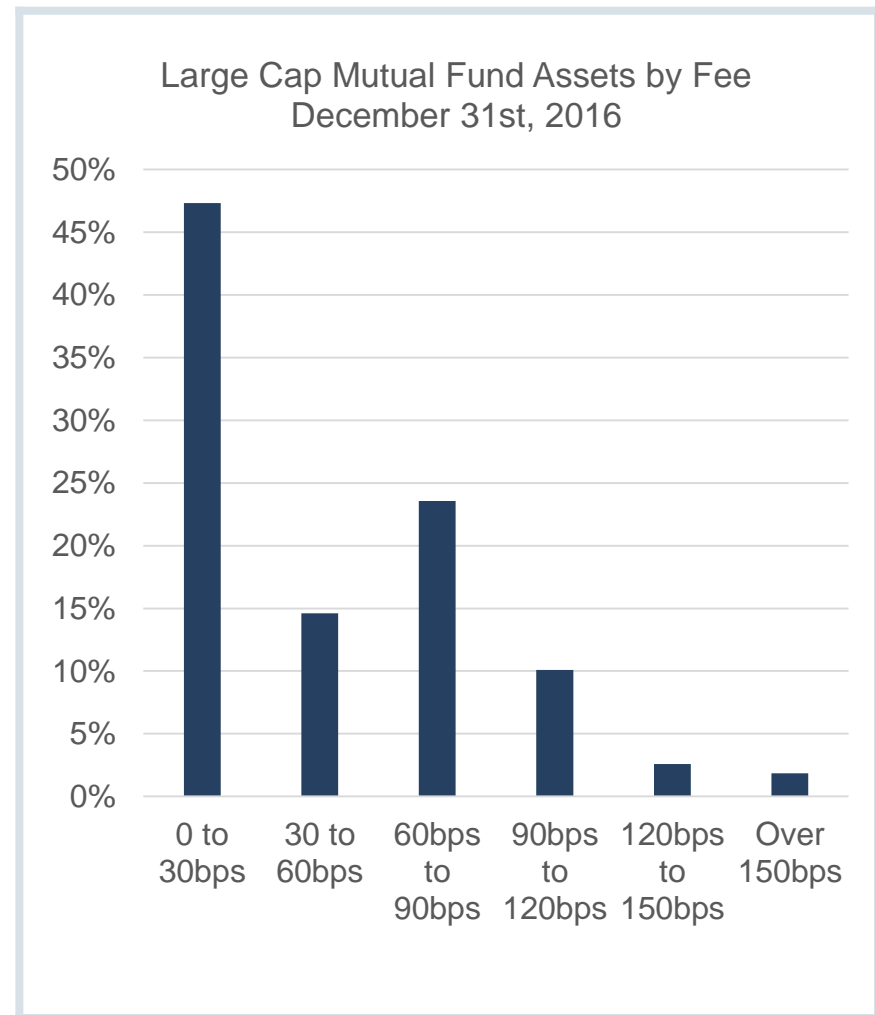
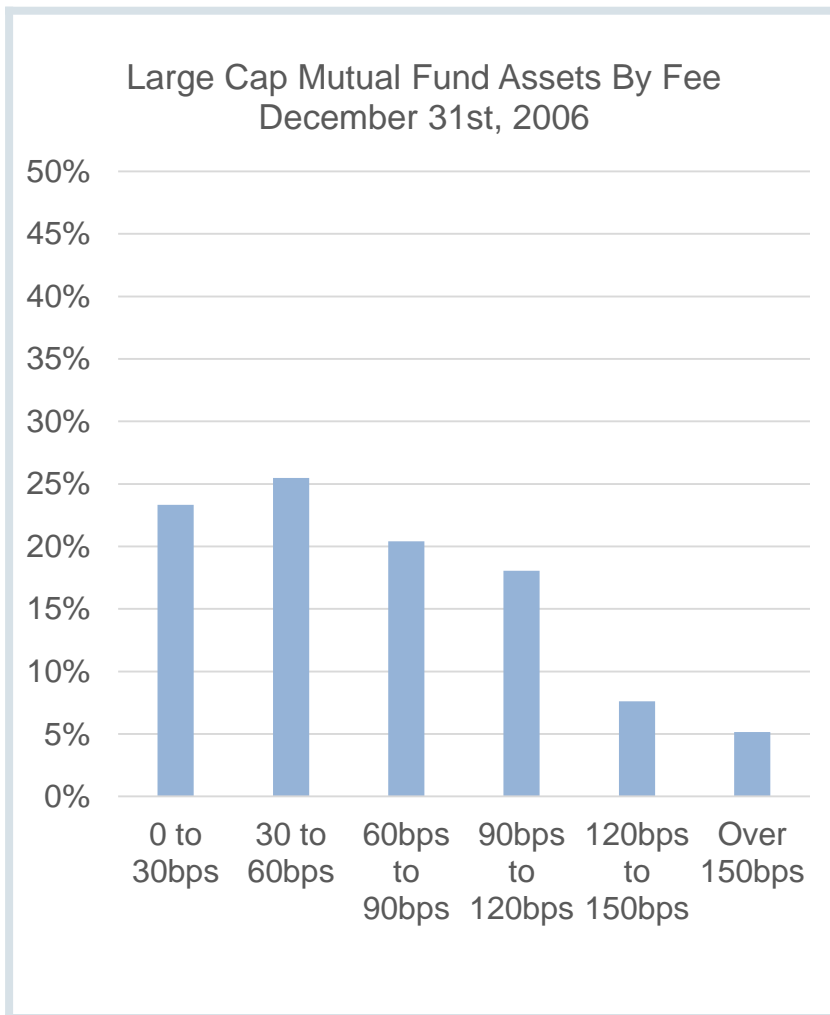
Active Share Also Indicates Appropriate Fees for Products



Active Share Also Indicates Appropriate Fees for Products

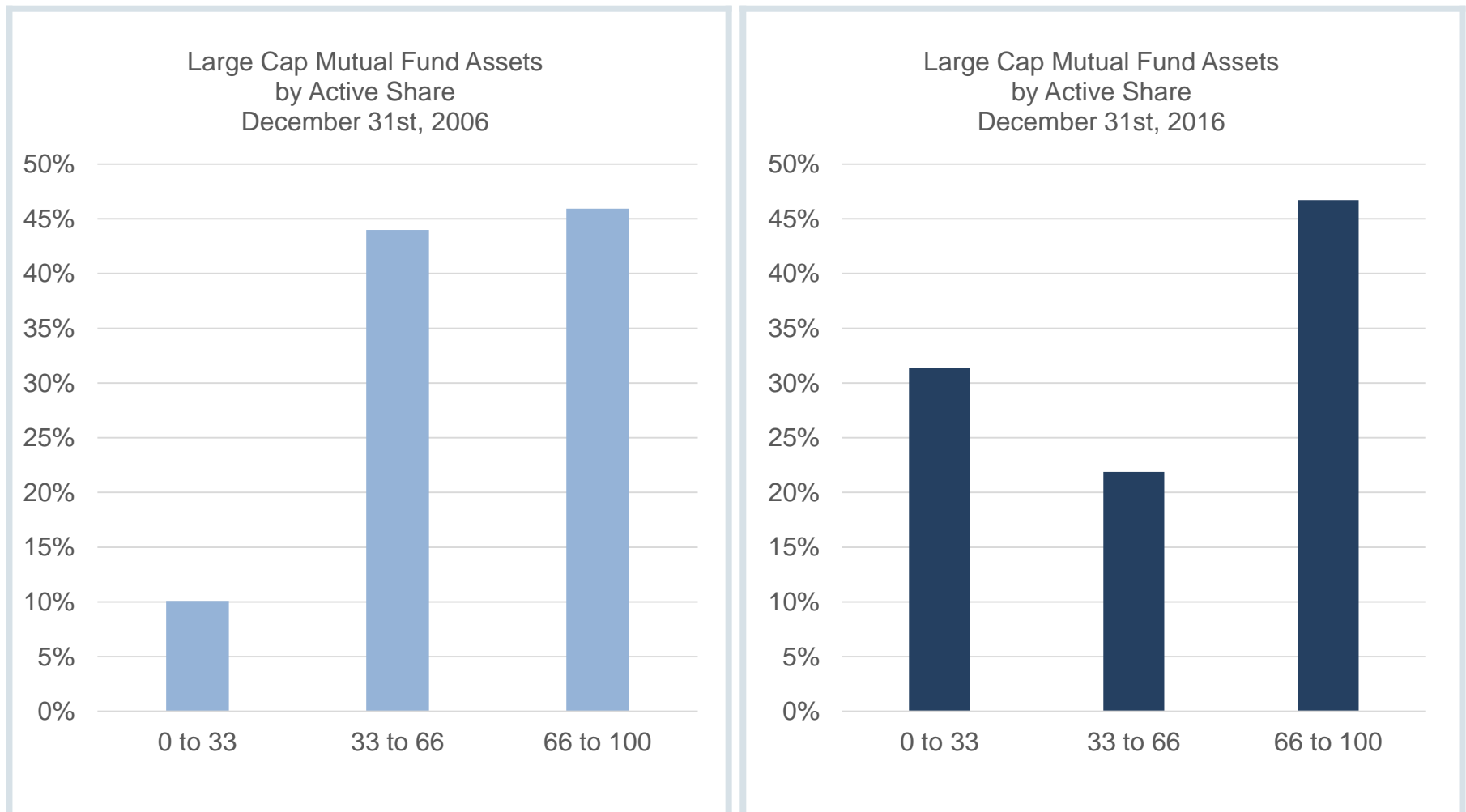
Smart Beta			
	% Portfolio	Skill	Proport Fee
Active Component	20%	4%	0.90%
Passive Component	80%	0%	0.10%
Total Fee	100%	0.80%	0.26%
Factor Alpha			
	% Portfolio	Skill	Proport Fee
Active Component	80%	4%	0.90%
Passive Component	20%	0%	0.10%
Total Fee	100%	3.20%	0.74%

Trends in the Market – Investors Moving to Lower Cost Funds



Source: WRDS, CRSP Mutual Fund Database, Large Cap Mutual Fund

Trends in the Market – Investors Clearing From Potentially Misaligned



Source: WRDS, CRSP Mutual Fund Database, Large Cap Mutual Fund

Trends in the Market – Investors Clearing From Potentially Misaligned

Table 4: U.S. Large Cap Equity Funds in 2006 – By Active Share and Expense Ratio

Active Share	Expense Ratio						All Fees
	0 to 30bps	30 to 60bps	60 to 90bps	90 to 120bps	120 to 150bps	Over 150bps	
0 to 33%	9.5%	0.4%	0.1%	0.0%	0.0%	0.0%	10.1%
33 to 66%	8.0%	13.8%	12.7%	4.3%	3.7%	1.5%	44.0%
66 to 100%	5.8%	11.3%	7.5%	13.7%	3.9%	3.6%	45.9%
All Active Share	23.3%	25.5%	20.4%	18.0%	7.6%	5.1%	

Table 5: U.S. Large Cap Equity Funds in 2016 – By Active Share and Expense Ratio

Active Share	Expense Ratio						All Fees
	0 to 30bps	30 to 60bps	60 to 90bps	90 to 120bps	120 to 150bps	Over 150bps	
0 to 33%	38.6%	2.2%	0.4%	0.0%	0.0%	0.0%	41.2%
33 to 66%	2.0%	4.6%	9.9%	1.9%	0.5%	0.3%	19.1%
66 to 100%	6.7%	7.9%	13.3%	8.2%	2.1%	1.6%	39.7%
All Active Share	47.3%	14.6%	23.6%	10.1%	2.6%	1.9%	

Source: WRDS, CRSP Mutual Fund Database, Large Cap Mutual Fund

Key Findings:

- ✓ **Factors are Not Commodities.**
- ✓ **Smart Beta and Factor Alpha Portfolio Construction are Delivering similar Active Risk-Return Profiles**
- ✓ **Risk Controls Boost the Risk-Return Profile at Even High Levels of Concentration**
- ✓ **Active Share Is Useful for Determining the Alignment of Factor and Portfolio, and Can Identify Potentially Misaligned Portfolios**
- ✓ **Investors Have Already Recognized and Begun to Abandon Portfolios with Middling Active Share**

For More Information

- ✓ <http://www.osam.com/commentary.aspx>
- ✓ <http://cuttingthroughnoise.com/>

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The risk-free rate used in the calculation of Sortino, Sharpe, and Treynor ratios is 5%, consistently applied across time.

The universe of All Stocks consists of all securities in the Chicago Research in Security Prices (CRSP) dataset or S&P Compustat Database (or other, as noted) with inflation-adjusted market capitalization greater than \$200 million as of most recent year-end. The universe of Large Stocks consists of all securities in the Chicago Research in Security Prices (CRSP) dataset or S&P Compustat Database (or other, as noted) with inflation-adjusted market capitalization greater than the universe average as of most recent year-end. The stocks are equally weighted and generally rebalanced annually.

Hypothetical performance results shown on the preceding pages are backtested and do not represent the performance of any account managed by OSAM, but were achieved by means of the retroactive application of each of the previously referenced models, certain aspects of which may have been designed with the benefit of hindsight.

The hypothetical backtested performance does not represent the results of actual trading using client assets nor decision-making during the period and does not and is not intended to indicate the past performance or future performance of any account or investment strategy managed by OSAM. If actual accounts had been managed throughout the period, ongoing research might have resulted in changes to the strategy which might have altered returns. The performance of any account or investment strategy managed by OSAM will differ from the hypothetical backtested performance results for each factor shown herein for a number of reasons, including without limitation the following:

- Although OSAM may consider from time to time one or more of the factors noted herein in managing any account, it may not consider all or any of such factors. OSAM may (and will) from time to time consider factors in addition to those noted herein in managing any account.
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