



**2011 PORTFOLIO
MANAGEMENT CONFERENCE**

Quant Asset Management – Myths and Realities

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Equity Research | Quantitative Equity Strategies

Contents

- Innovate or Face Extinction?
- How Alike Are Quants?
- The Value of Orthogonal Alpha
- Revisiting Portfolio and Alpha Construction
- Key Points

Quantitative Funds Assets under Management

Total Quant assets grew from 2003 to 2007 at a 20.7% CAGR but declined markedly in 2008, as investors required liquidity in response to the sharp decline in market

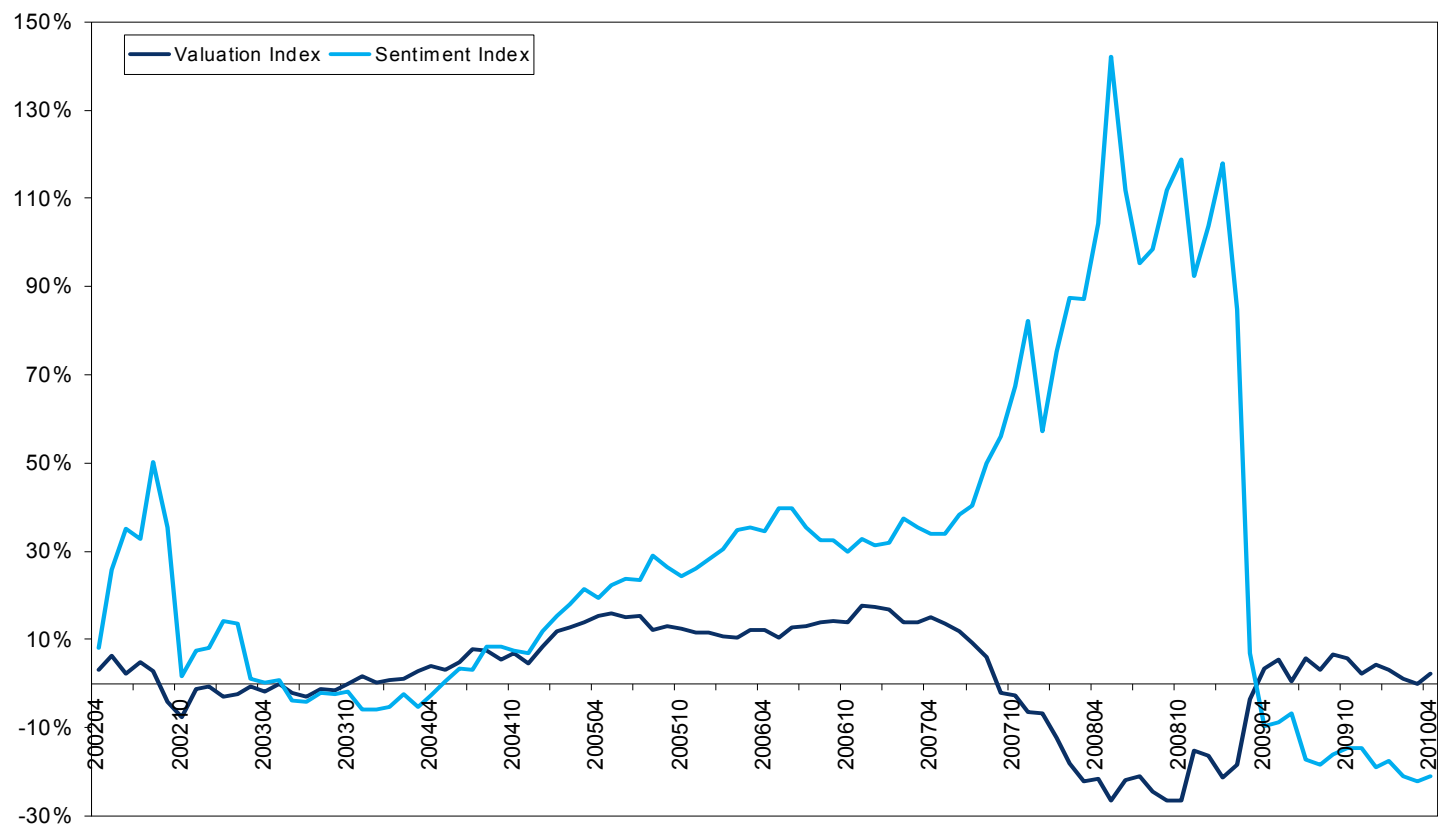
Quantitative Funds' Assets under Management			
	Number of Products	Assets under Management End of Year (bns)	Imputed Net Flow
2003	207	\$491	2.7%
2004	232	\$668	9.0%
2005	260	\$770	0.1%
2006	295	\$1,003	-2.2%
2007	323	\$1,015	-8.1%
2008	346	\$566	-18.4%
2009	224	\$483	-1.0%

Source: Barclays Capital Quantitative Equity Strategies.

Returns to Quantitative Factors

Returns to the two best known and widely used quantitative investment themes have been modest over the past eight years. Simulations show we get this result by chance 6% of the time for a strategy with a Sharpe ratio of 0.57

Cumulative Returns to Long/Short Value and Sentiment Strategies



Source: Barclays Capital Quantitative Equity Strategies. Past results are no guarantee of future performance.

Quant as Alternative Beta

- Dynamic portfolios may be created to provide exposure to a specific source of “alpha”
- There are a growing number of indices, ETFs and swaps that are providing exposure to quantitative factors and multi-factor models
- While these indices can be seen as completing markets and making risk management simpler, they are also having the effect of commoditizing quantitative alpha and factors
- Can traditional quantitative asset management, which seeks to provide investors with exposure to a series of factors (asset-pricing anomalies), not be seen as merely alternative beta exposure?
- Where are the sources of alpha for quant management in a world where factors are exchange-traded funds?

Quant as Alternative Beta

Barclays Capital Quantitative Equity Strategies offers an array of swaps designed to provide exposure to specific factors and “alpha” themes

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 14:24 BARCLAYS-US QUANTITATIVE RSCH PAGE 1 / 10

Description	Ticker	Quote Size	Bid	Ask	Last	Previous Close	% Chg	Time
1) MODELPORT ROQS	BCAX001		123.92	124.09	124.00	124.38	-0.31	14:24
2) MOMENT LONG	BCAX002		119.21	119.45	119.33	119.79	-0.39	14:24
3) MOMENT SHORT	BCAX003		217.14	217.58	217.36	218.51	-0.53	14:24
4) MKT NEUTRAL LG	BCAX004		133.06	133.33	133.20	133.87	-0.50	14:24
5) MKT NEUTRAL SS	BCAX005		178.32	178.77	178.54	180.54	-1.10	14:24
6) BK_TO_PRICE LG	BCAX006		259.26	260.17	259.71	263.18	-1.31	14:24
7) BK_TO_PRICE SS	BCAX007		134.74	135.05	134.90	135.94	-0.77	14:24
8) CHG_SHR_CNT LG	BCAX008		161.38	161.69	161.54	162.36	-0.51	14:24
9) CHG_SHR_CNT SS	BCAX009		173.46	173.94	173.70	175.53	-1.04	14:24
10) FCF_2_PRICE LG	BCAX010		215.10	215.66	215.38	216.91	-0.70	14:24
11) FCF_2_PRICE SS	BCAX011		168.88	169.45	169.17	171.53	-1.37	14:24
12) QUALITY_THM LG	BCAX012		155.76	156.13	155.95	157.05	-0.70	14:24
13) QUALITY_THM SS	BCAX013		174.41	174.92	174.66	177.05	-1.35	14:24
14) VALUE_THEME LG	BCAX014		209.35	209.94	209.64	210.78	-0.54	14:24
15) VALUE_THEME SS	BCAX015		160.91	161.43	161.17	162.54	-0.83	14:24
16) MKT_SENTIMENTL	BCAX016		128.12	128.46	128.29	129.07	-0.60	14:24
17) MKT_SENTIMENTS	BCAX017		256.90	257.61	257.25	258.75	-0.58	14:24

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Source: Barclays Capital Quantitative Equity Strategies. Past results are no guarantee of future performance.

Innovation and Differentiation

If Quants are to adapt, there are two main avenues that can be pursued

Factor Timing

- Quant managers can seek to time factors – dynamically adjust exposure to factors when they are expected to outperform or underperform
- The intuition is that because of static exposure, you get flat returns

New Factors

- Quant managers can search for orthogonal alpha
 - The objective is to find factors uncorrelated with Barra/APT/Northfield risk factors and unused by other Quants
-

The Need to Innovate?

- We agree innovation and differentiation is beneficial – it is beneficial to any business to establish and maintain a competitive advantage
- However, August 2007 is false evidence for the need to innovate, in our opinion

What is the evidence that quants are the same?

What is the evidence about the source (drivers) of our commonality?

- We do not believe that all quants are chasing the same alpha signals
- The problem for quants is more subtle – it goes beyond finding ways to time factors or discovering new factors

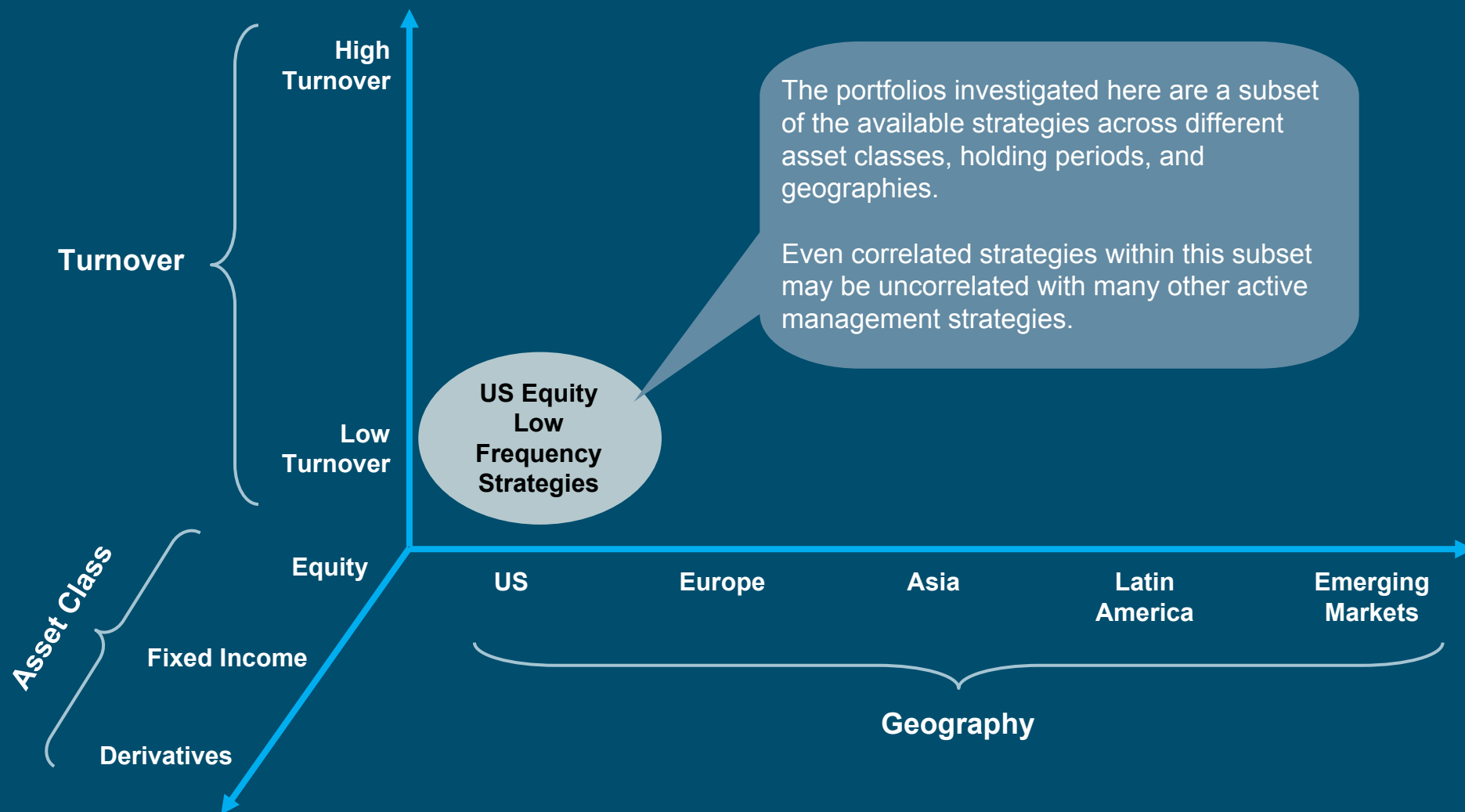
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How Alike Are Quants?

- 10 out of the largest 15 quantitative managers agreed to give us the rankings coming out of their Core models for 2006 Q1, 2006 Q2 and 2006 Q3
 - Top quintile stocks in S&P 500; bottom quintile ranked stocks in S&P 500
 - Top quintile stocks in R2000; bottom quintile ranked stocks in R2000
- We picked a small sample – we want homogeneity among managers
 - The sample is of pure quants – true quants
- Focus is on top and bottom quintiles in order to maximize agreement, plus this is where the models take their largest positions

How Alike Are Quants?



Source: Barclays Capital Quantitative Equity Strategies.

Agreement and Disagreement Across Funds

March 2006 – Average Percent of Fund's Holdings in Another Fund's Portfolio

Fund	Agreement		Disagreement		Net Agreement
	Longs	Shorts	Longs	Shorts	
A	34%	35%	8%	10%	26%
B	35%	34%	10%	7%	27%
C	35%	43%	8%	8%	31%
D	37%	45%	8%	9%	32%
E	36%	36%	7%	7%	29%
F	43%	38%	7%	5%	34%
G	34%	36%	12%	7%	25%
H	44%	40%	5%	5%	37%
I	37%	37%	7%	6%	30%
J	40%	39%	8%	6%	33%
Barclays Capital Model Portfolio	41%	34%	8%	6%	30%
Fundamental Revisions Portfolio	29%	23%	17%	14%	10%
Fundamental Analyst Recommendations	16%	26%	18%	18%	3%
Average across Quant Funds	38%	38%	8%	7%	30%

Source: Barclays Capital Quantitative Equity Strategies.

- 20% reflects independence for agreement and disagreement
- Net agreement is the average agreement minus the average disagreement; 0% reflects independence

Correlation of Funds' Daily Active Returns

Average Quant Long Portfolio Active Return Correlations: April–Dec. 2006

Fund	Equal-Weight Long Portfolios	Optimized Long Portfolios	Equal-Weight Long/Short Portfolios
A	38%	49%	39%
B	9%	45%	26%
C	41%	49%	48%
D	33%	34%	28%
E	40%	49%	53%
F	50%	49%	53%
G	23%	47%	28%
H	49%	55%	53%
I	40%	48%	51%
J	48%	53%	54%
Barclays Capital Model Portfolio	46%	55%	48%
Average	38%	48%	44%

Source: Barclays Capital Quantitative Equity Strategies. Past results are no guarantee of future performance.

Correlation of Funds' Daily Active Returns

Average Optimized Long Portfolio Active Return Correlations with Different Average Daily Volume (ADV) Constraints: April–Dec. 2006

Fund	15% ADV Constraint	30% ADV Constraint	50% ADV Constraint
A	66%	47%	45%
B	69%	36%	37%
C	67%	51%	45%
D	67%	32%	28%
E	72%	51%	48%
F	72%	59%	54%
G	59%	46%	45%
H	73%	58%	57%
I	74%	54%	49%
J	72%	57%	53%
Barclays Capital Model Portfolio	70%	57%	54%
Average	67%	49%	46%

Source: Barclays Capital Quantitative Equity Strategies. Past results are no guarantee of future performance.

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The Test

- Imagine you are able to go out and “discover” true orthogonal alpha – information that predicted returns that is uncorrelated with every other set of information you had for predicting returns today
- You blend this new alpha with your traditional alpha → blended alpha
- How correlated are the resulting portfolios you get from this blended alpha?
 - Construct optimized portfolios using the blended alpha and traditional alpha, with a variety of constraints
 - Long Only
 - Tracking error
 - Sector constraints
 - Position constraints
 - Liquidity constraints
 - Long/Short
 - Volatility constraints
 - Sector constraints
 - Position constraints
 - Liquidity constraints
- What will this tell us?
 - If they are lowly correlated – continue seeking innovation via new alpha sources
 - If they are highly correlated – revisit portfolio construction

Constructing “Orthogonal” Alpha

- To construct “orthogonal alpha”, we start by regressing our “traditional alphas” against future returns

$$R_d^s = \sum_i \beta_t^i * \text{Sector}_t^{s,i} + \sum_f \gamma_t^f * \text{Existing Factors}_t^{s,f} + \varepsilon_d^s$$

- In the above regression
 - Sector factors are 10 dummy variables based on the 2-digit GICS classifications
 - Existing factors are proprietary value, quality and market dynamic factors, along with sector beta and market capitalization
- Sector and Fundamental Factors from the start of month t are used for each day d
- The residuals give us the component of return unexplained by traditional factors
- At the end of month t , we use Principal Components Analysis to extract the first factor from the previous 12 months of return residuals. We get a scoring coefficient for each stock
- To ensure the new signals are truly orthogonal to our existing alpha, we estimate

$$\text{Scoring Coefficient}_t^s = \alpha_t + \beta_t * \text{Alpha}_t^s + \varepsilon_t^s$$

- ε_t^s is our orthogonal alpha signal for stock s at time t , Alpha is our traditional alpha signal, and Factor is the PCA extracted signal

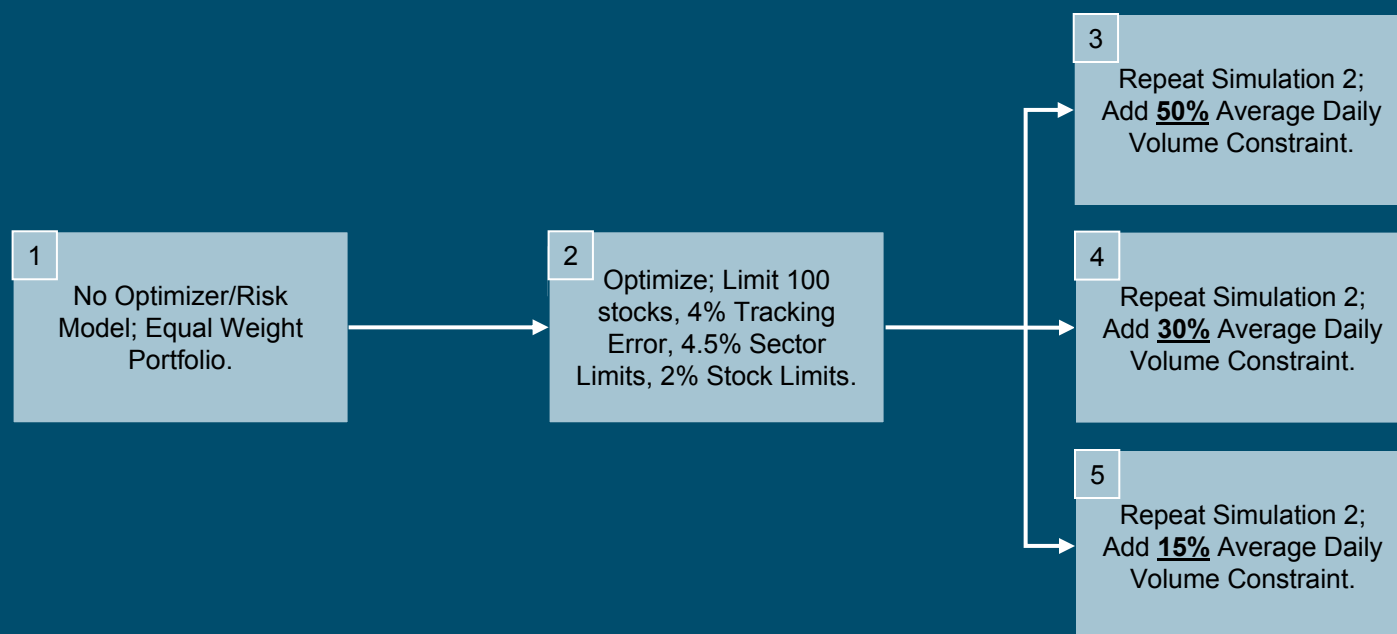
Performance Simulations

- Utilizing our newly constructed orthogonal alpha signal, we construct a “Blended” Alpha:

$$\text{Blended Alpha} = +(\omega) \times \text{Traditional Alpha} + (1 - \omega) \times \text{Orthogonal Alpha}, \text{ where } 0 \leq \omega \leq 1$$

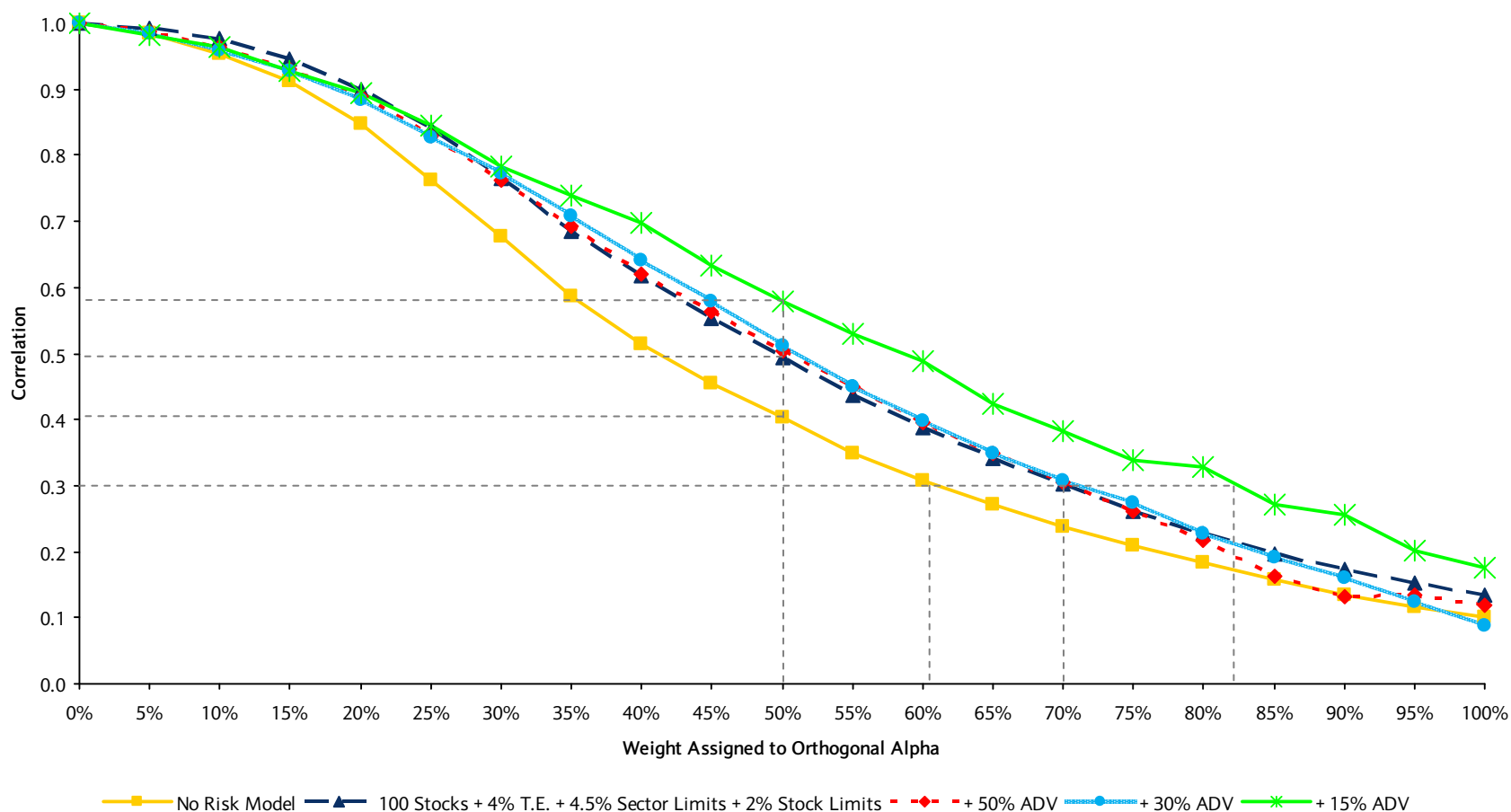
where Traditional Alpha is the Barclays Capital QES Alpha Score, and Orthogonal Alpha is our PCA derived signal

- We run five main simulations to compare the correlations of returns between the Traditional Alpha and Blended Alpha



Results – Long Only

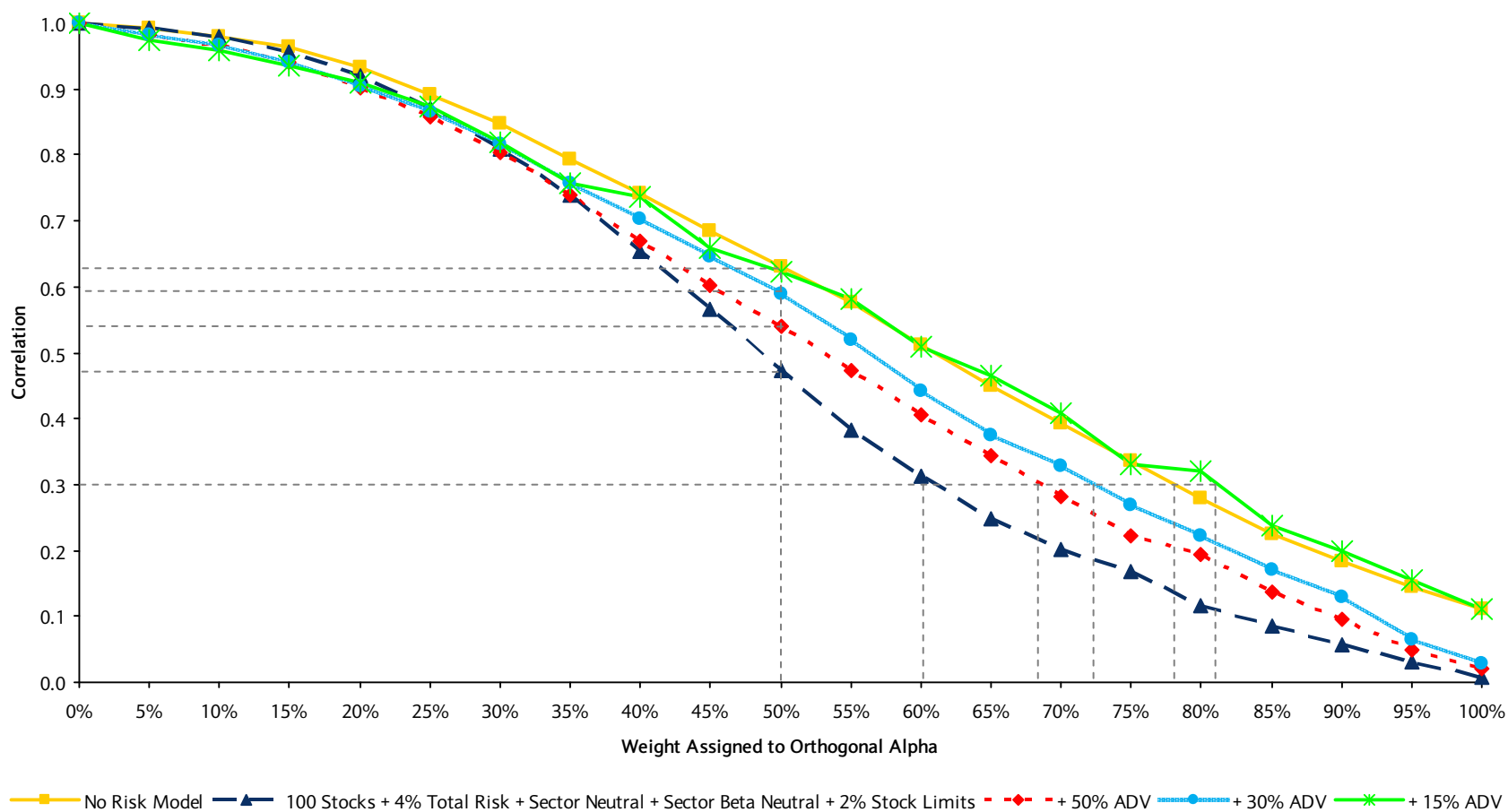
Active Return Correlation between Blended Alpha and Traditional Alpha – 1998 to 2010



Source: Barclays Capital Quantitative Equity Strategies.

Results – Long/Short Market Neutral

Active Return Correlation between Blended Alpha and Traditional Alpha – 1998 to 2010



Source: Barclays Capital Quantitative Equity Strategies.

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Revisiting Portfolio Construction

- Our previous analysis showed exposure to orthogonal alpha was reduced after optimizing and particularly after applying ADV constraints
- How much is the portfolio optimization process to blame? Specifically, how much is the non-linear constraint of tracking error or volatility targeting the cause here?

Non-Linear Constraints
(i.e., Tracking Error)

vs.

Linear Constraints
(i.e., Sector, Stock, Beta,
Style Exposures)

- In the future, we want to examine the layering of linear constraints with no specific targeted tracking error constraint as a way to achieve a risk-controlled portfolio with potentially more intuitive constituents and better exposure to our desired factors

Revisiting Alpha Construction

- Perhaps the issue lies with the construction of the alpha scores and has less to do with the portfolio construction process

$$\text{Blended Alpha} = +(\omega) \times \text{Traditional Alpha} + (1 - \omega) \times \text{Orthogonal Alpha}, \text{ where } 0 \leq \omega \leq 1$$

- Is the linear combination of different (uncorrelated) alpha signals really the best way to get exposure to these different return streams?
- Traditionally, quant models combine scores across factors into a single score for each stock and then combine the stocks into a portfolio
- Alternatively, one could create independent factor portfolios (return streams) and then optimize these different factor portfolios into a single portfolio that is constructed to handle issues of co-linearity, volatility/risk, liquidity, etc.

Revisiting Asset Management Contract

- The standard portfolio management contract seems to be broken. The traditional contract of compensating managers with a set fee for assets under management seems irreparably flawed
- When firms experience significant outflows (and prior to experiencing significant inflows) they have little ability to innovate
 - New alpha sources require significant R&D investment and expenditures pursuing multiple dead ends
 - New portfolio construction methodologies require considerable thought and time to develop
- Additionally, the call option of the provision of daily liquidity comes at a significant cost to the remaining shareholders of the fund. More than ever, the provision of the liquidity itself, it is the potentiality of the provision that requires fund managers to alter the composition of their portfolios. This leads to more crowding among managers and less exposure to unique factors
- Do we need a new contract between asset managers and the investors in mutual funds?

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Key Points

- The key takeaway points from this presentation are

Quants are not all the same

- Quants are not all the same, chasing the same alpha signals
- Quant manager signals exhibit relatively low correlation (prior to optimization + constraints)
- The problem for quants goes beyond factor timing and discovering new factors

Liquidity constraints are a problem

- Correlations between real quant manager performance increases after optimization and particularly once ADV constraints are imposed
- Correlations from simulated portfolios formed using traditional and orthogonal signals increase when ADV constraints are tightened

Portfolio and alpha construction may also be at issue

- Future research to focus on how to maximize exposure to orthogonal alpha when constructing portfolios and creating alpha scores
-

Questions?

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