Actuaries Institute

Wealth Management Sub-Committee Insight Session

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The Big Bang of Risk Premia

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Risk Premia

A brief history of Risk Premia investing

Reshuffling weights of securities within subsets of the market allows more effective spanning of states

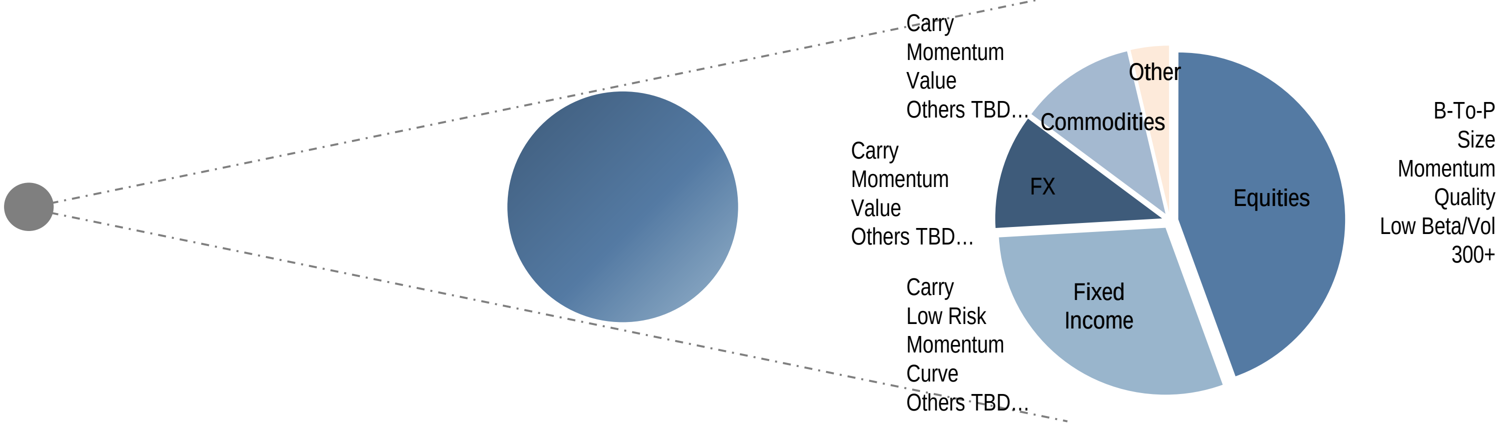
1950s	1960s	1970s – 2000s	2016

RISK — Fund Separation Theorem CAPM → MARKET PORTFOLIO — Fund Separation Theorem APT → MULTIPLE RISK PREMIA

Industry Offerings
- Entry Level
- More Efficient

Traditional Betas
- 1970s: Asset Class Indices; 60/40
- 2000s: Risk Parity

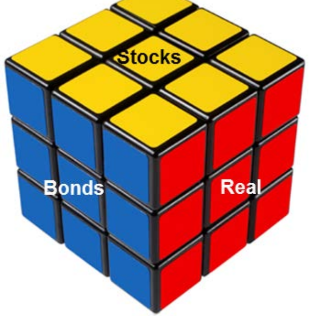
Alternative Betas/Risk Premia
- Long Only Smart Beta
- Alternative Risk Premia



Risk Premium = Risk + Premium

<u>Systematic</u> factor with economic meaning that can provide **<u>reward</u>** in the long term, is **<u>volatile</u>** and **<u>drives correlations</u>** of assets

TRADITIONAL



One-Factor Model: CAPM

- Equity
- Duration
- Inflation
- Other assets

ALTERNATIVE

Multi-Factor Model: APT, Fama-French

- Value
- Momentum
- Carry
- Quality
- Others

The Expansion of Risk Premia

What makes an asset/premium a “new” addition to the universe?

- An asset/risk premium is considered “new” if it can provide payoff under certain states that cannot be replicated by a combination of existing assets

- Example: The “Private Equity” in Franzoni, Nowak, and Phalippouis (2012)[1] is not a new asset class, as it can be closely proxied by a combination of traditional and alternative risk premia:

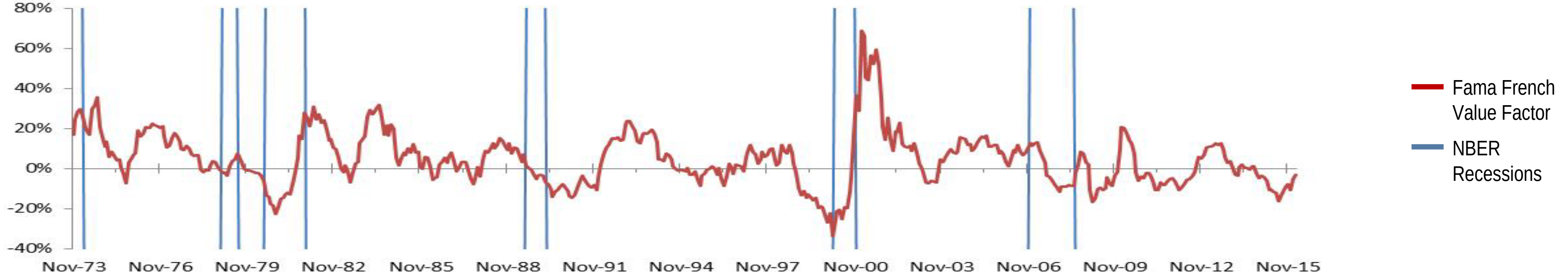
“Private Equity” = -0.002 + 0.638 Illiquidity + 1.294 Market
+ 1.020 Value – 0.040 Small Adj R-Sq 86.5%

Franzoni, Francesco, Eric Nowak, and Ludovic Phalippou, “Private Equity Performance and Liquidity Risk,” Journal of Finance, Dec 2012, pp. 2341 – 2373, Table VI

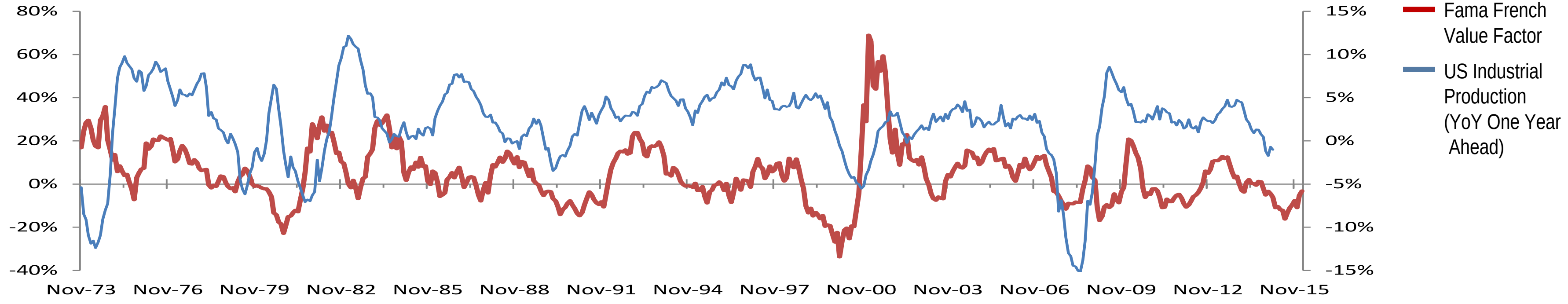
Volatility alone is not Risk: Look at Value Premium

The chance of losing money does not make noise a premium

FAMA-FRENCH VALUE FACTOR (HML) RETURN AND NBER RECESSIONS (1973 – 2015)



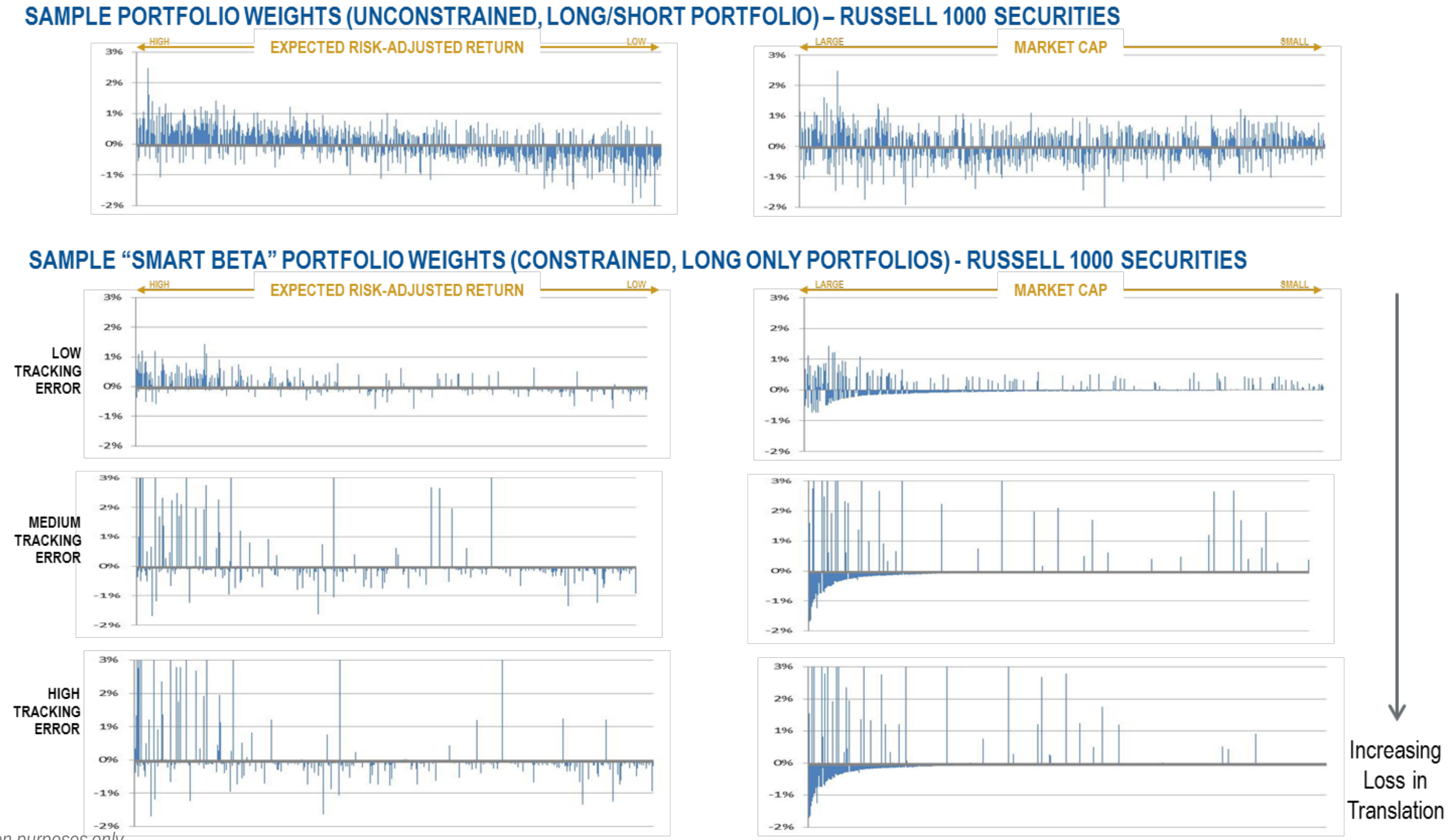
FAMA-FRENCH VALUE FACTOR (HML) RETURN AND US INDUSTRIAL PRODUCTION (1973 – 2015)



Sources: Kenneth R. French - Data Library, NBER, Federal Reserve Bank of St. Louis

Alternative Risk Premia versus Smart Beta

Risk premium forms allow more effective spanning of states with scalable risk



Hypothetical portfolio for discussion purposes only

Can Alternative Risk Premia reward Investors?

How concerning is Crowding?

"Risk premia arbitraged away …" "ETFs crowd and squeeze premia away"

- To begin: Why do these premia exist?
- Three schools of thought, not mutually exclusive:
  - Behavioural
  - Compensation of risks
  - Structural impediment

Behavioural

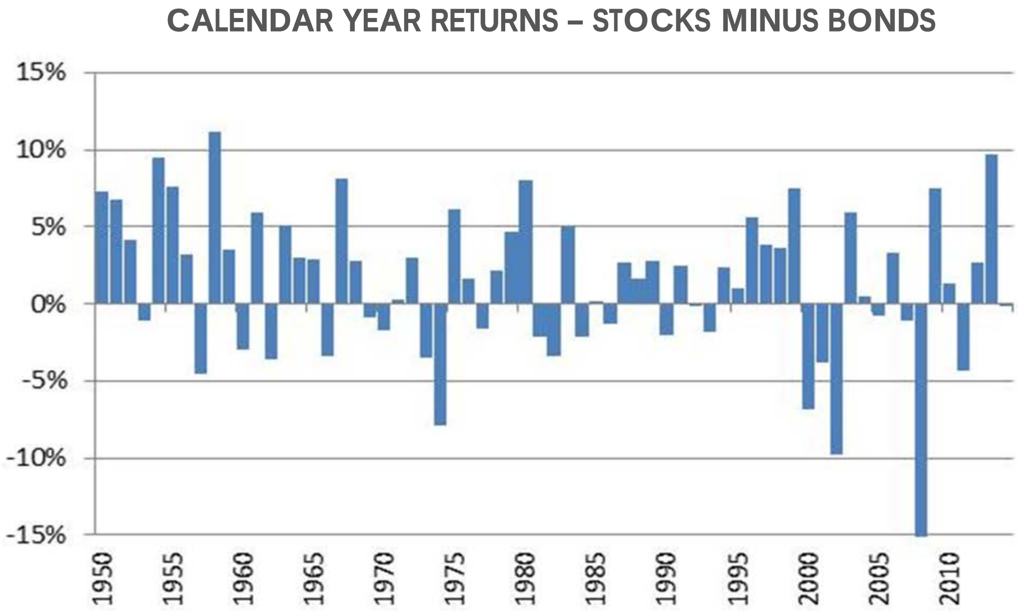
Persistent mistakes or mistakes being innate?

- Hirshleifer and Shumway (2003): stock returns on a sunny day were significantly higher than at other times across twenty six stock markets in the sample period from 1982 to 1997
- Cochrane (2014): *"Everyone thinks the other guy is "behavioral". Are you sure it's not you?"*

Sources: Hirshleifer, David, and Tyler Shumway, "Good Day Sunshine: Stock Returns and the Weather," Journal of Finance, June 2003, Vol. 58, No. 3, pp. 1009-1032. http://johnhcochrane.blogspot.com/2014/03/asness-and-liew-on-efficiency.html

Compensation of risks

Sorting securities based on security identifiers as “stocks” and “bonds”



- Are we concerned that the Equity Premium will be arbitraged/crowded away by baby boomers, index funds, ETFs ...?
- I am not at 100% equity. Am I “not smart?” Do I have a behavioural bias?

Source: Ibbotson. “Generic securities sorting methodology” simply subtracts US Bond calendar year return from US Stocks calendar year return, as determined by Ibbotson.

Does making a factor public destroy its efficacy?

Investors seem to have done their homework

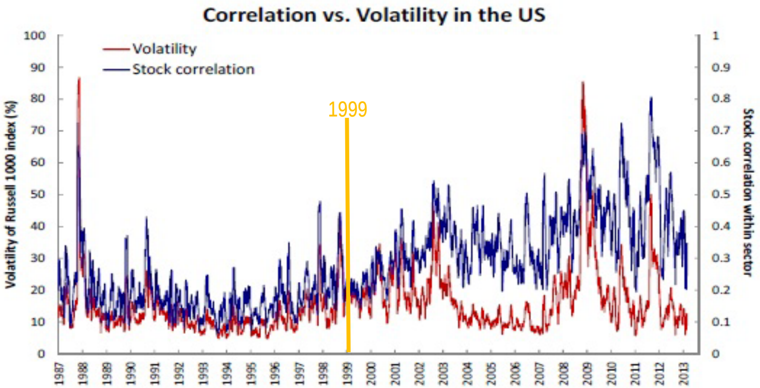
McLean and Pontiff (2016):

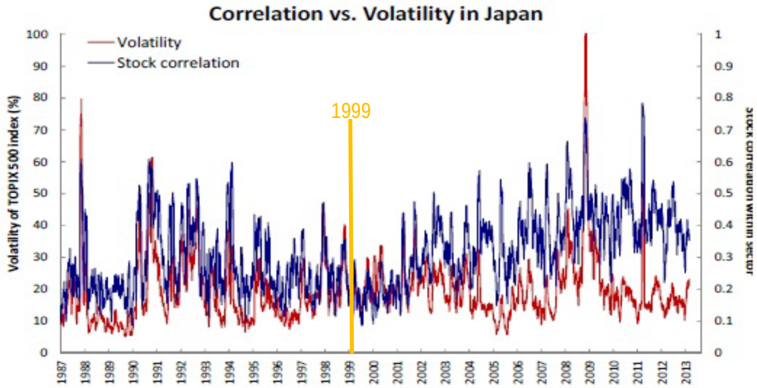
- Among 97 variables… *"Portfolio returns are 26% lower out-of-sample and 58% lower post-publication… We estimate a 32% (58% - 26%) lower return from publication-informed trading. Post-publication declines are greater for predictors with higher in-sample returns, and returns are higher for portfolios concentrated in stocks with high idiosyncratic risk and low liquidity. Predictor portfolios exhibit post-publication increases in correlations with other published-predictor portfolios."*

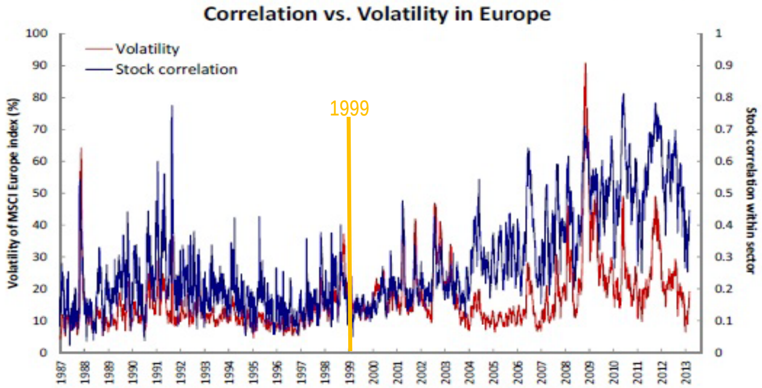
Source: McLean, R. David, and Jeffrey Pontiff, "Does Academic Research Destroy Stock Return Predictability," Journal of Finance, February 2016, pp. 5-32

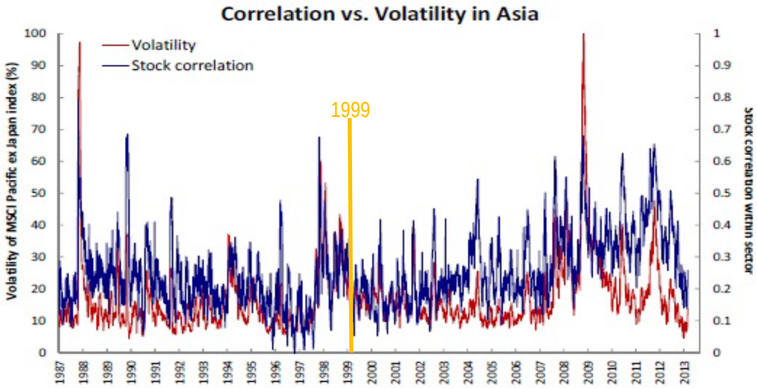
Clustering could lead to higher correlations

Since 1999, correlations of stocks within sectors started to move higher









Sources: Instinet, MSCI, Russell, Compustat, ID. Claessens, Stijn, and Yishay Yafeh, "Additions to Market Indices and the Comovement of Stock Returns Around the World," March 2011, IMF Working Paper. Barberis, Shleifer, and Wurgler, "Comovement," Journal of Financial Economics, 2005, Vol 75, pp. 283-317

What may happen to a crowded Risk Premium?

Popularity of a risk premium may decrease its long-term appeal

RISK PREMIUM = RETURN OF LONG LEG (L) – RETURN OF SHORT LEG (S)

$$\sigma = \sqrt{\sigma_L^2 + \sigma_S^2 - 2\,\rho_{LS}\sigma_L\sigma_S}$$

σ_L : constituents of the Long Leg (L) portfolio likely become more correlated

σ_S : constituents of the Short Leg (S) portfolio likely become more correlated

ρ_{LS} : L and S become more negatively correlated

Which means, σ will go: **HIGHER** or **LOWER**

... and unless future risk premium goes higher, its Sharpe ratio will go **HIGHER** or **LOWER**

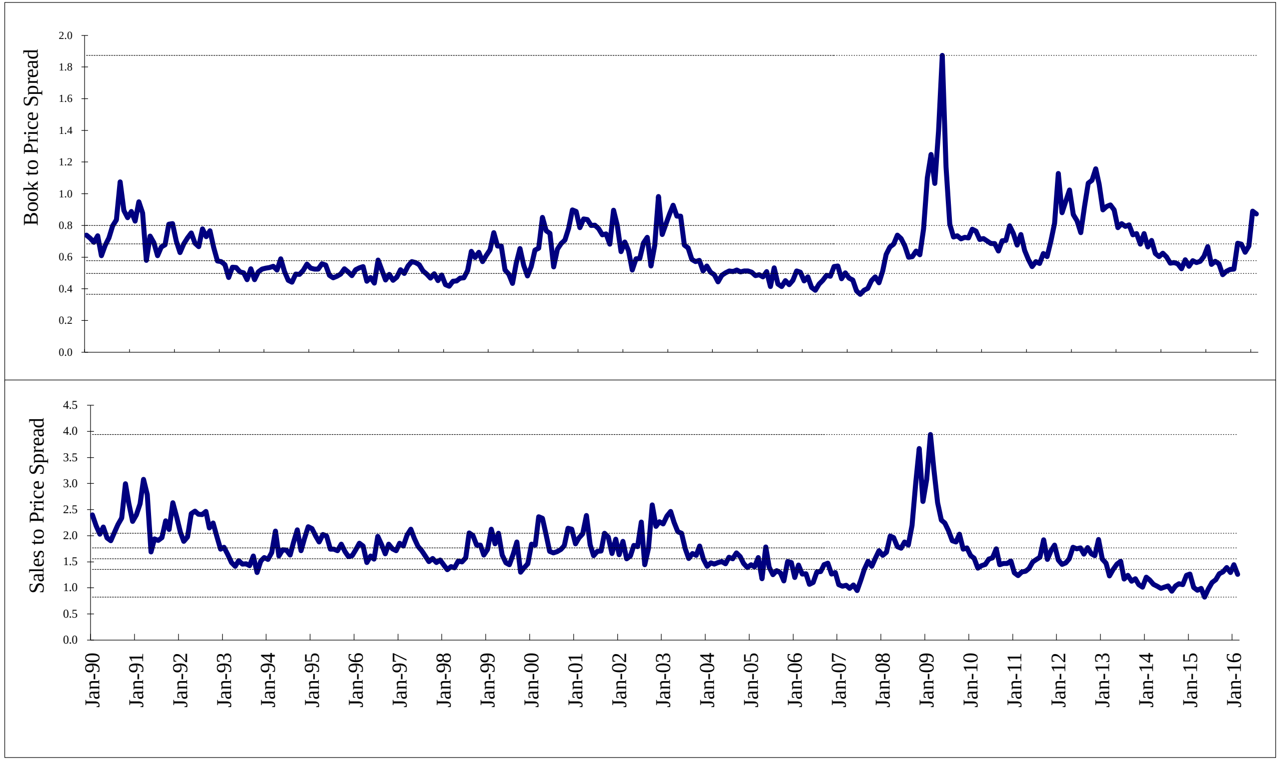
... and its optimal allocation in the future will go **HIGHER** or **LOWER**

Source: Lee, Wai, "Constraints and Innovations for Pension Investment: The Cases of Risk Parity and Risk Premia Investing", Journal of Portfolio Management, Vol. 40, No. 3, Spring 2014, pp. 12-20

Hopefully these ease some concerns

Selected valuation spreads do not appear to be stretched

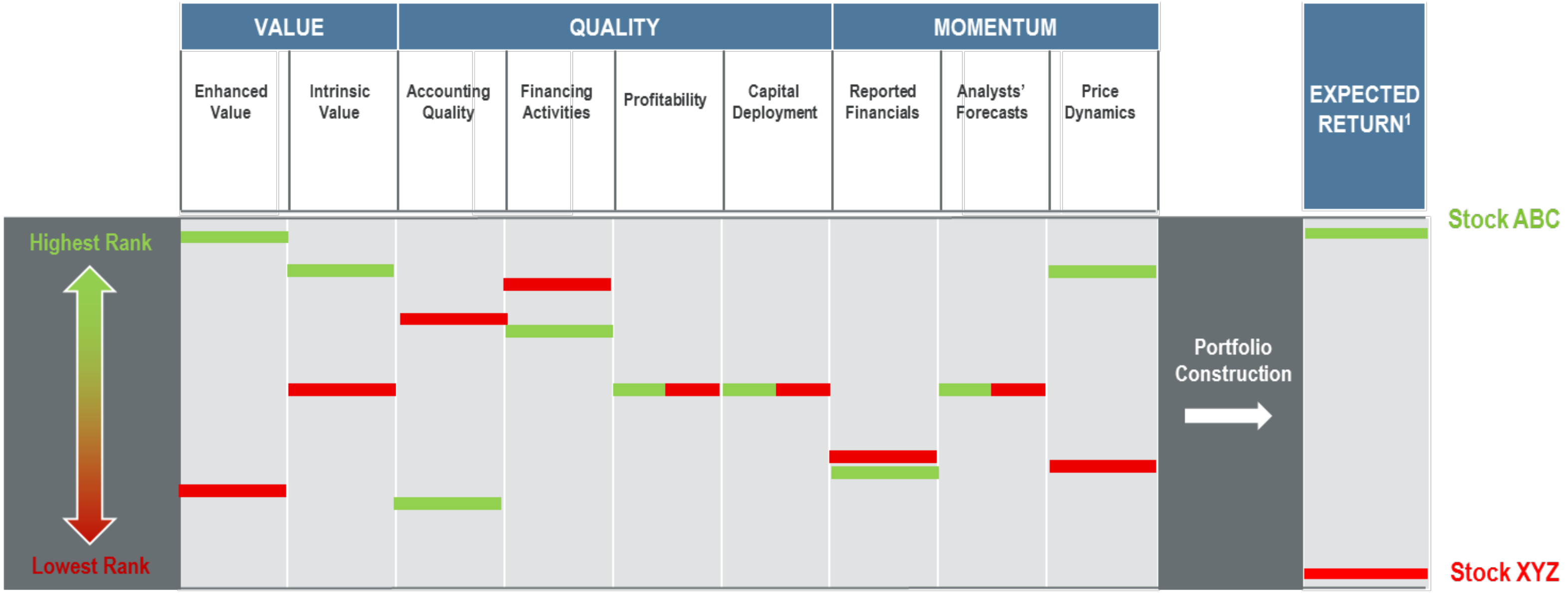
VALUATION SPREADS OF SELECTED "VALUE PREMIUM" OF US SECURITIES 1990 - 2016



Source: Market QA

The same assets can be included in multiple premia

... and investors have different definitions of, and allocations to, risk premia



- Whether a stock will be a net buy or sell depends on how one defines, and allocates to, the set of multiple risk premia
- It is entirely possible for the same stock to be traded between two investors in the same set of multiple risk premia

1. Expected Returns referenced represent model generated weighted average return estimates for each stock, given the estimate of the probability distribution of the return. Expected returns are solely for portfolio construction purposes and are not intended to represent the potential return of the strategy; security prices may decrease regardless of model generated expected returns. Use of tools cannot guarantee performance. Investing entails risks, including possible loss of principal.

Most studies found quant crowding overstated

Selected studies with different perspectives but similar conclusions …

- Bernstein Survey (2007): survey of 21 major quantitative funds revealed *“**vastly different rankings** and performance, despite similarity in factor exposure”*
- Gustafson and Halper (2010): 19 quant managers and 14 fundamental managers *“What is very clear is that there are distinct differences both in the factors used and in those emphasized by quantitative managers and that* ***these differences can be significant****”*
- Lakonishok and Swaminathan (2010): *“Average pair-wise correlations in the monthly excess returns (in excess of appropriate benchmarks) of quantitative managers are low and similar to that of the fundamental managers …* ***There is as much heterogeneity among quantitative managers as there is among fundamental managers****.”*
- Thurston (2011): *“… we review the correlations of quantitative managers across different geographies …* ***We find low correlations****, providing support for including multiple quantitative managers in investment structures.”*

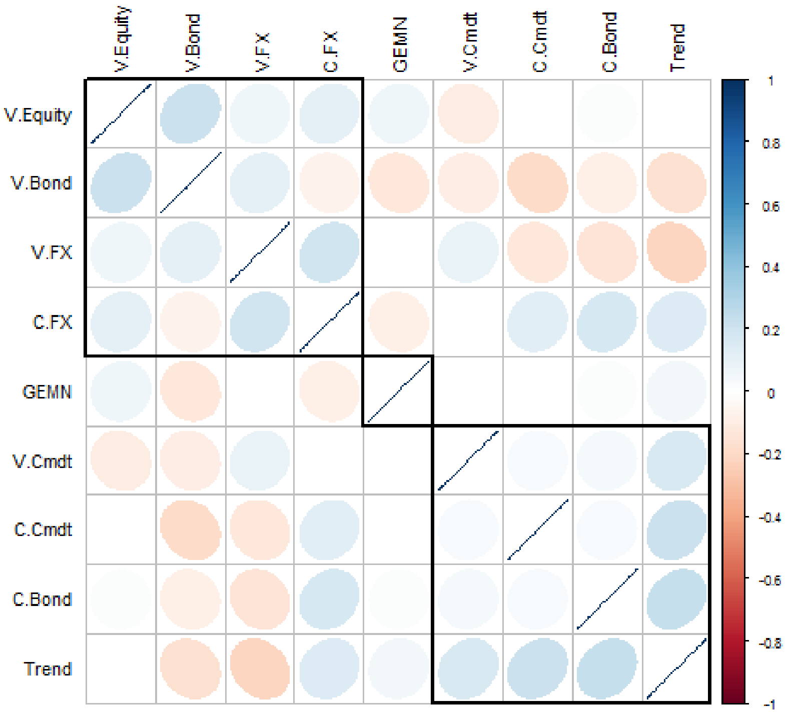
Sources: Zlotnikov, Vadim, Ann Marie Larson, Wally Cheung, Serdar Kalaycioglu, Ronna D. Lao, and Zachary A. Apoian, “Survey of Quantitative Models – Vastly Different Rankings and Performance, Despite Similarity in Factor Exposure,” Bernstein Research, January 2007; Gustafson, Keith, and Patricia Halper, “Are Quants All Fishing in the Same Small Pond with the Same Tackle Box?” Journal of Investing, Winter 2010; Lakonishok, Josef and Bhaskaran Swaminathan, “Quantitative vs Fundamental Institutional Money Managers: An Empirical Analysis, LSV working paper, May 2010; Thurston, Mark, “Quantitative Equity Management: Despite The Recent Lag, Quants Provide Diversification and Alpha Opportunities,” Russell Research, February 2011

Risk Premia Allocation

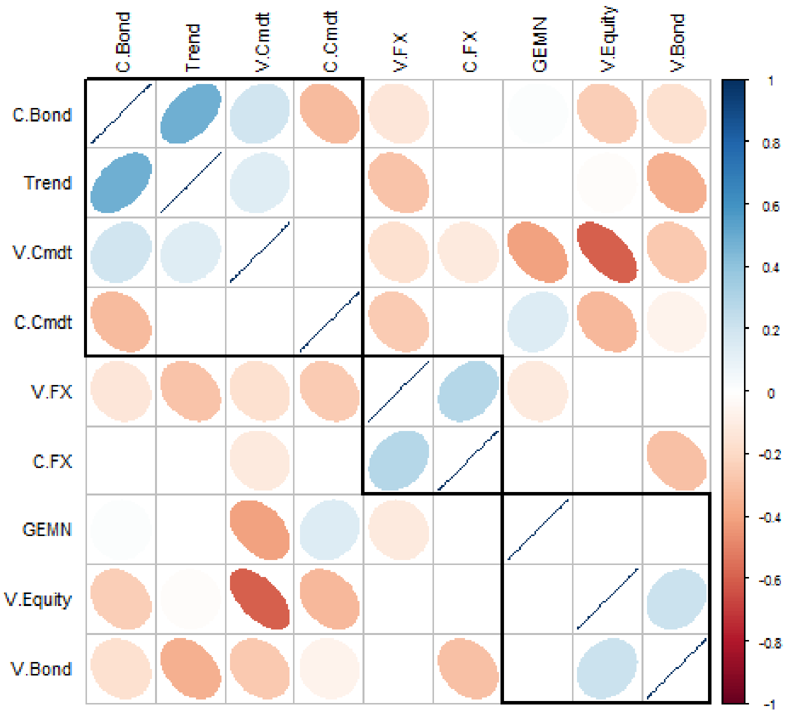
In search of diversification

Unlike traditional assets, diversification benefits of ARP are robust overall

CORRELATIONS IN FULL SAMPLE



CORRELATIONS IN DISTRESSED MONTHS



Source: Bloomberg, Neuberger Berman

How much Alternative Risk Premia?

If you don’t hold the Market portfolio, you must be different in certain ways and taking tracking error risk

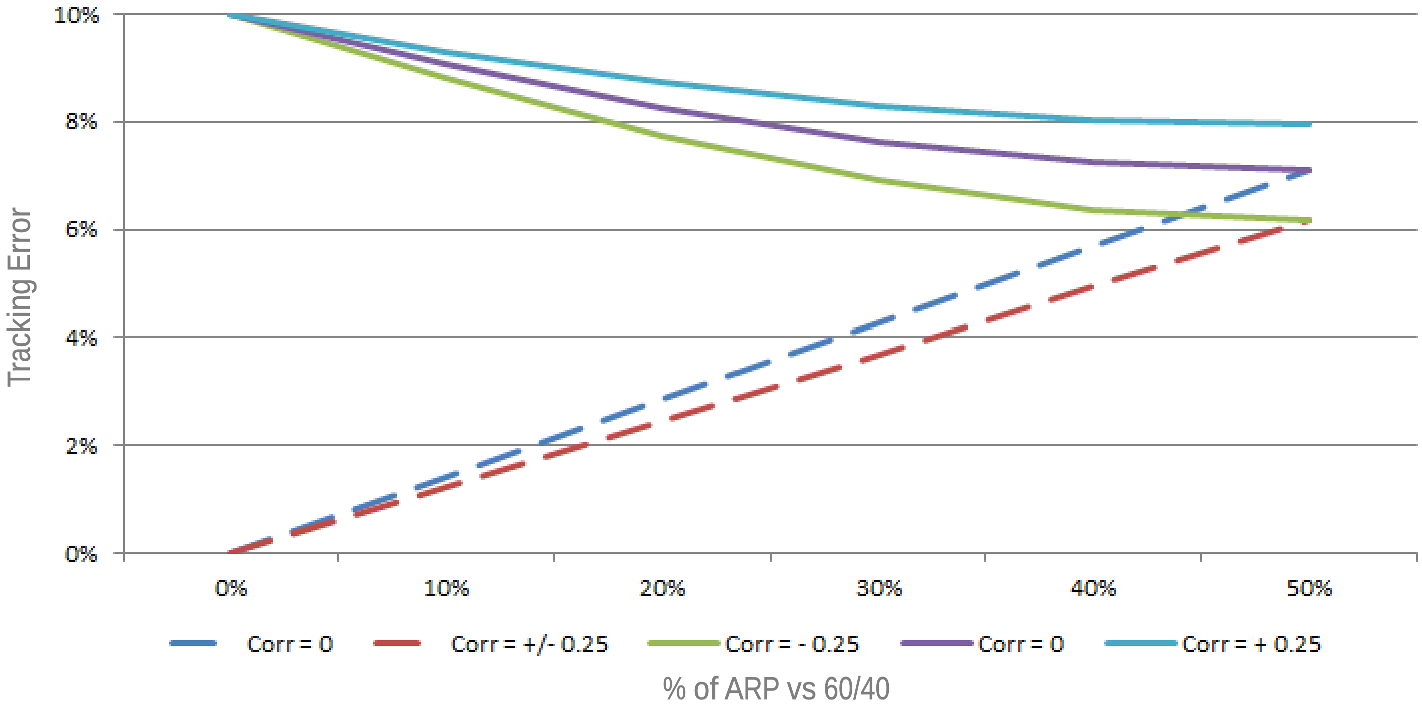
- Investment Objectives and Risk Appetite
- Career risks
- Constraints
  - Leverage: an ARP portfolio with 10% volatility can have 5x to 10x gross leverage
  - Shorts
- Completion portfolios versus ARP allocation
- Tracking Error example
  - Suppose volatility of 60/40 and ARP are 10%
  - Resulting tracking error and portfolio volatility vary with correlation between ARP and 60/40

Realistic assessment of how much Risk Premia

Adding ARP can lower total portfolio volatility but induce tracking error

- In a plan with 3% total tracking error budget, 20% of ARP seems to be the ceiling

PORTFOLIO VOLATILITY AND TRACKING ERROR AS FUNCTION OF CORRELATION BETWEEN 60/40 AND ARP



Source: Neuberger Berman

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