30 Minutes to a Better Portfolio

Portfolio Construction in an Age of High Correlations

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Role of a Portfolio Manager

- A portfolio manager has two jobs:
  1. Alpha creation
  2. Portfolio construction

- In our opinion, most managers focus too heavily on alpha generation at the expense of constructing a truly diversified portfolio

- We believe that the performance of many portfolios can be improved by following two simple portfolio construction rules…

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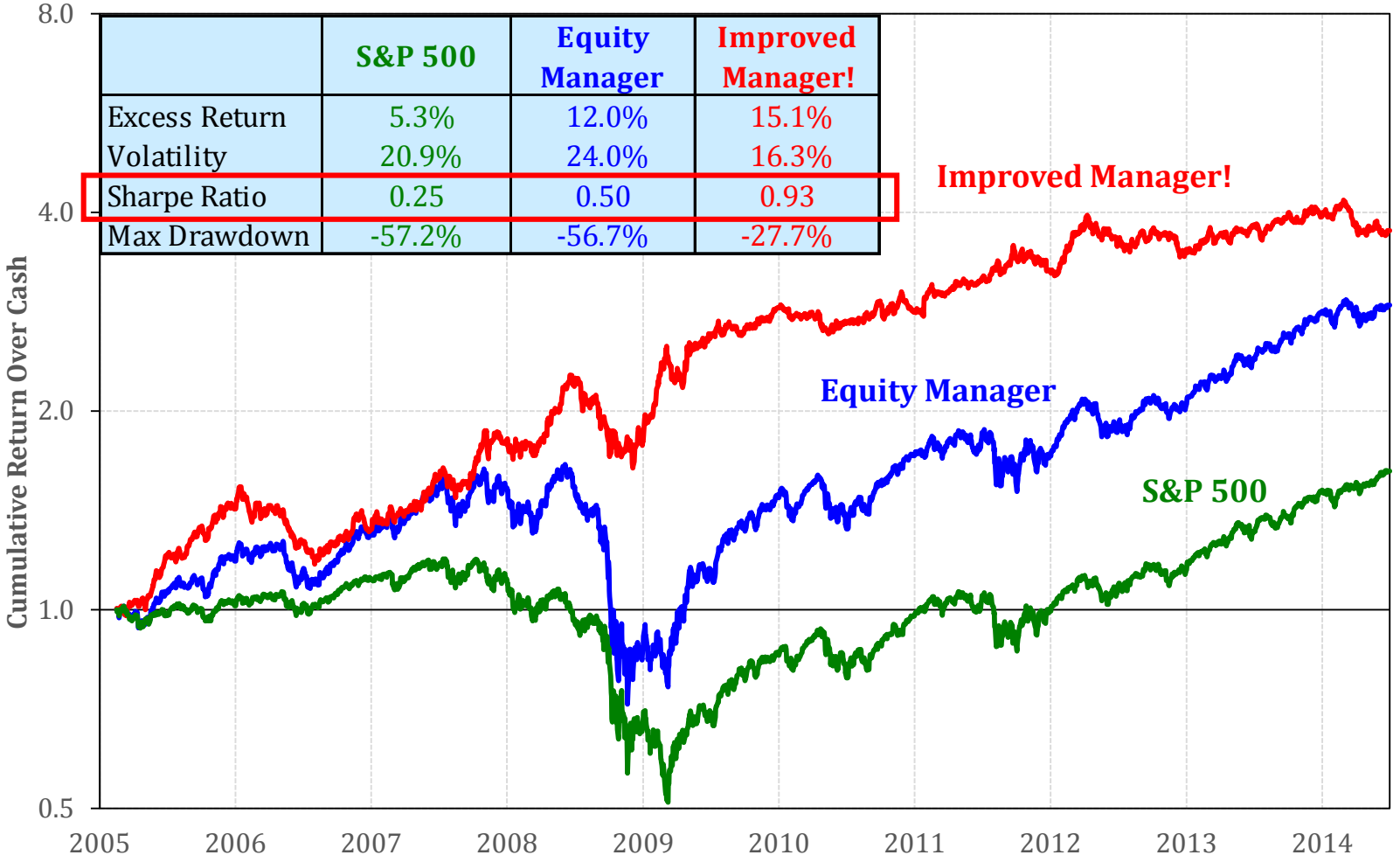
If It Ain't Broke, Fix It!

Simple portfolio construction techniques can vastly improve performance

	S&P 500	Equity Manager	Improved Manager!
Excess Return	5.3%	12.0%	15.1%
Volatility	20.9%	24.0%	16.3%
Sharpe Ratio	0.25	0.50	0.93
Max Drawdown	-57.2%	-56.7%	-27.7%



As of June 30, 2014

Source: SEC, Bloomberg

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Maximizing Sharpe Ratio

- A primary objective of investment management is to maximize risk-adjusted returns, commonly measured by Sharpe Ratio

- If your objective is to maximize Sharpe Ratio, you need only follow two simple rules:

1 Find many independent bets

2 Bet in proportion to expected Sharpe Ratio

- Any other approach will lead to a suboptimal Sharpe Ratio

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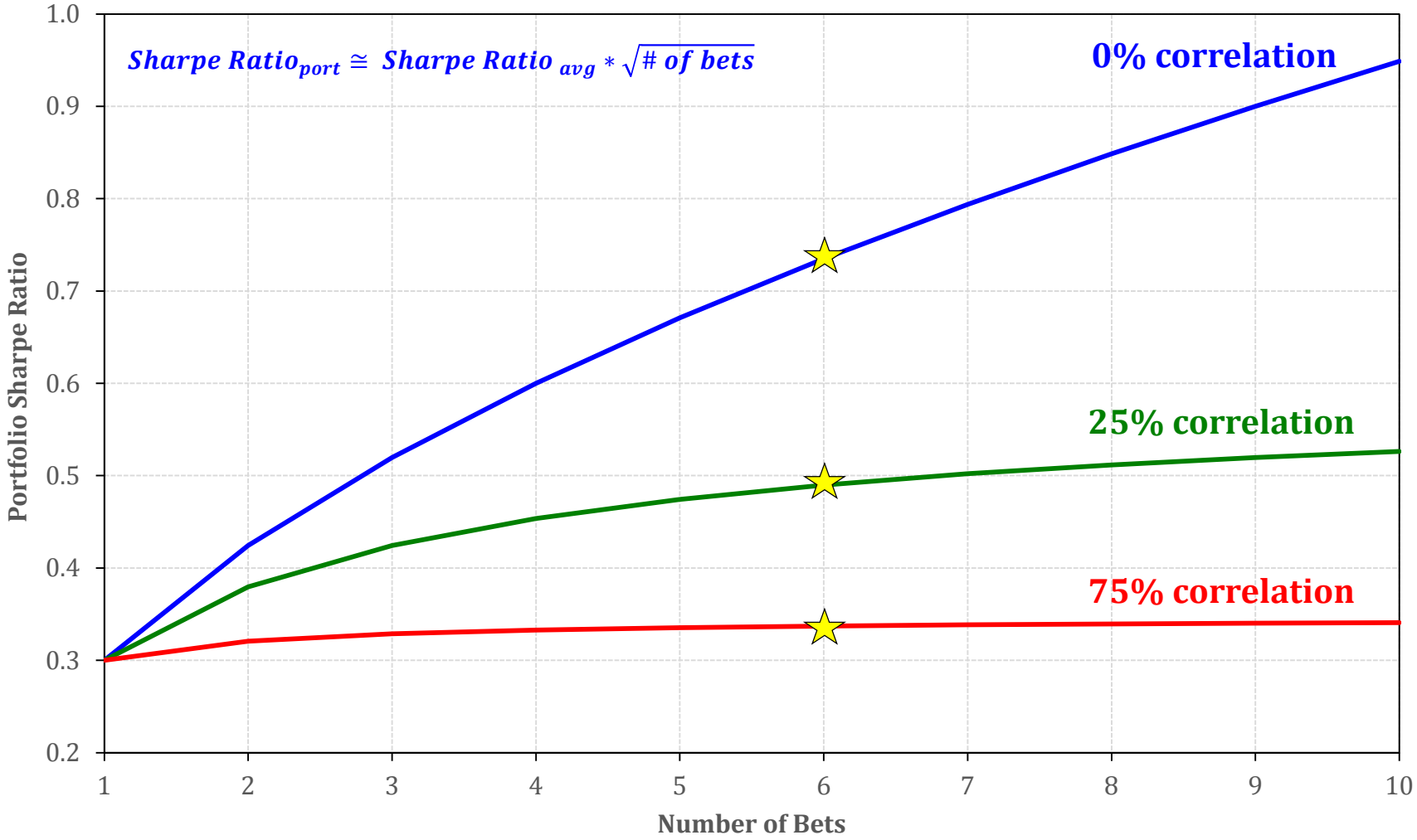
Find Many *Different* Return Streams

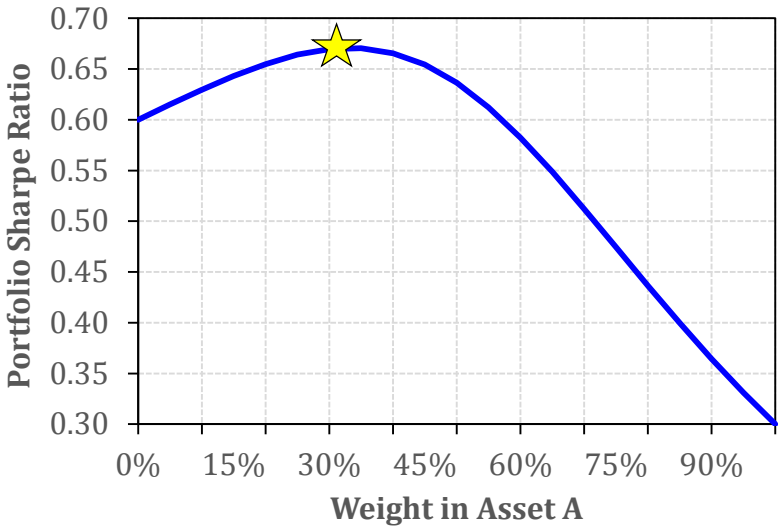
Holding many assets does not guarantee a diversified portfolio



Bet in Proportion to Sharpe Ratio

- Two asset example:
  - **Asset A**: 0.3 Sharpe Ratio, 10% volatility
  - **Asset B**: 0.6 Sharpe Ratio, 10% volatility

- How does varying the weight of Assets A and B affect portfolio Sharpe Ratio?



- Since Asset B has twice the Sharpe Ratio of Asset A, portfolio Sharpe Ratio is maximized when Asset B has twice the weight as Asset A (67% vs. 33%)

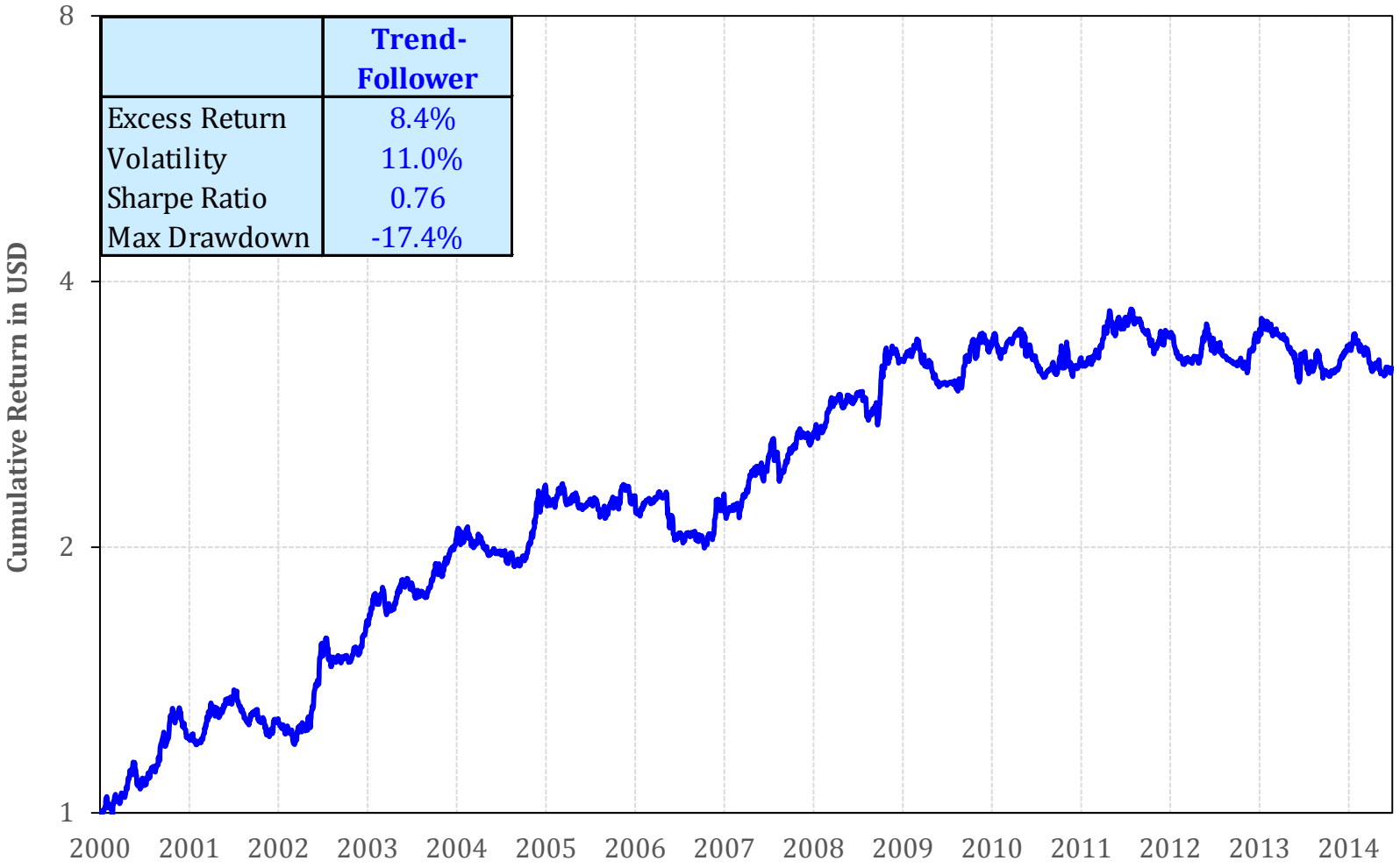
Trend-Following in FX

Trend-Following in FX

- Let's build a simple algorithm to trend-follow in FX
  - **Signal**: If 1-year change in spot FX is positive, go long. Otherwise, go short. Normalize by trailing volatility
  - **Rebalancing**: Hold for one month, rebalancing daily
  - **Weight**: Target constant 10% volatility

- We will run this model on 22 currencies against the US dollar
  - EUR, GBP, CHF, SEK, NOK, PLN, CZK, HUF, AUD, NZD, CAD, BRL, CLP, MXN, ZAR, IDR, INR, KRW, PHP, THB, TWD, and JPY

Trend-Follower Returns



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Source: Bloomberg

What Explains the Trend-Follower's Returns?

- The trend-follower's bets can be decomposed into two categories:

1. **Regional**
   - Europe
   - Commodity
   - Emerging
   - Japan
   - e.g., Net position in commodity currencies vs. US dollar
2. **Intra-Region**
   - Currencies vs. their respective regions
   - e.g., NZD vs. Commodity FX

Europe: EUR, GBP, CHF, SEK, NOK, PLN, CZK, HUF
Commodity: AUD, NZD, CAD, BRL, CLP, MXN, ZAR
Emerging: IDR, INR, KRW, PHP, THB, TWD
Japan: JPY
All regional baskets are equal-weighted and denominated in USD

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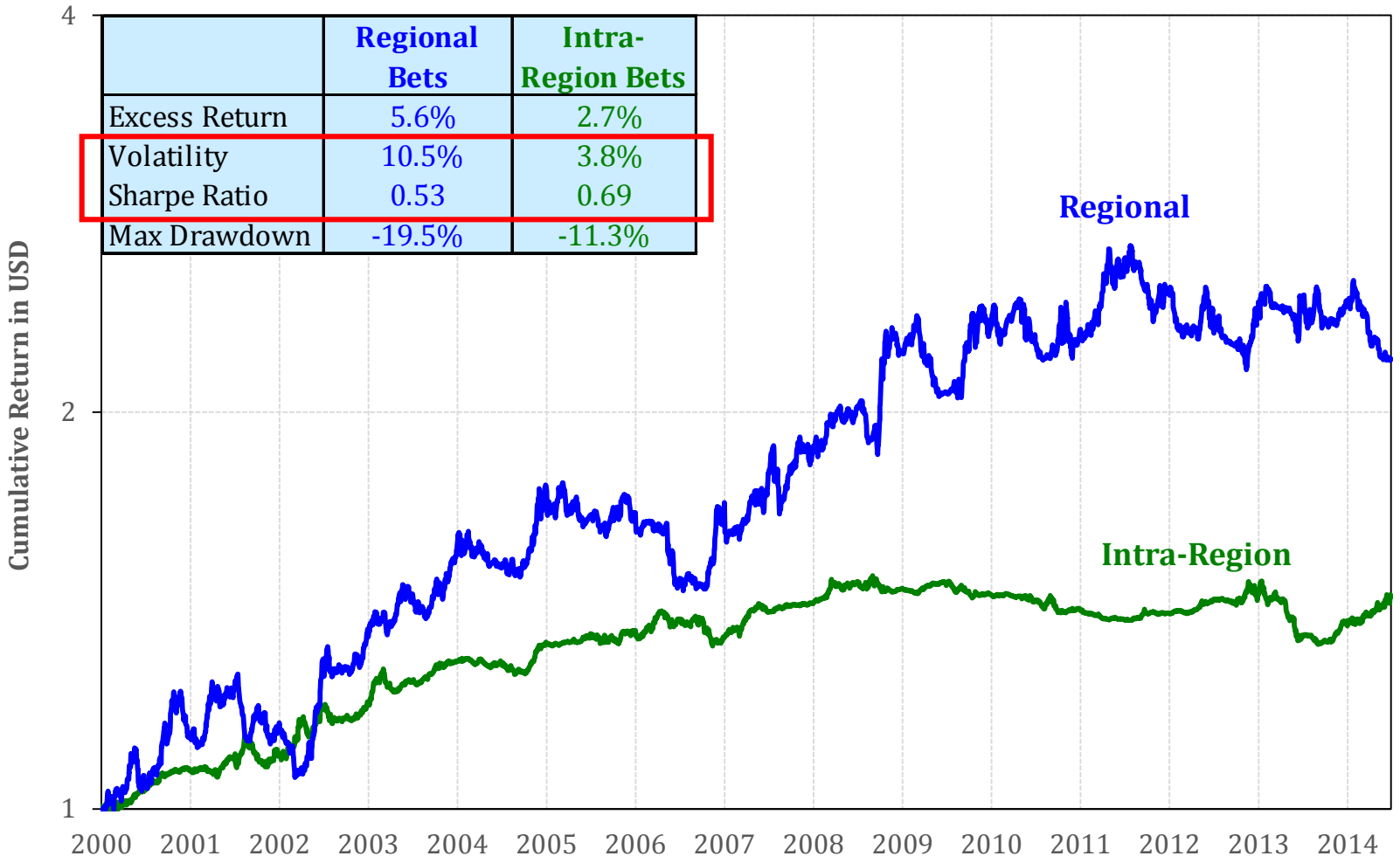
Performance of Each Driver

	Regional Bets	Intra-Region Bets
Excess Return	5.6%	2.7%
Volatility	10.5%	3.8%
Sharpe Ratio	0.53	0.69
Max Drawdown	-19.5%	-11.3%



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Source: Bloomberg 11

Balancing Weights

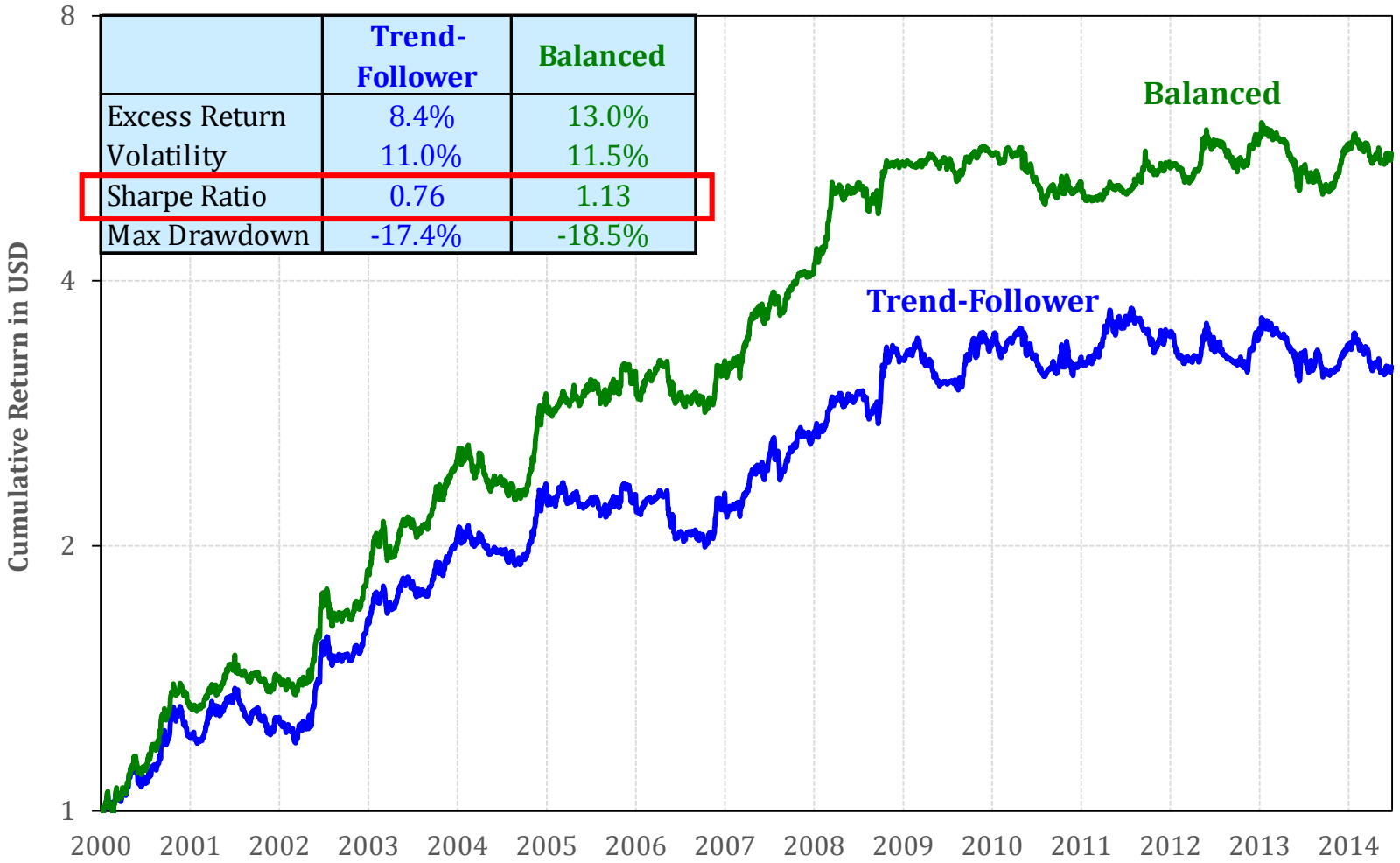
- Decomposing performance reveals a misalignment in betting:
  - The strategy takes significantly more risk (volatility) in regional bets (10.5%) than intra-region bets (3.8%)
  - However, the Sharpe Ratio of the intra-region bets (0.69) is at least as high as that of the regional bets (0.53)
- Without a prior to the contrary, we should assume (at least) equal ex-ante Sharpe Ratios of regional and intra-region bets
- Taking so much more risk in regional bets than intra-region bets violates the second rule of portfolio construction

  2 Bet in proportion to expected Sharpe Ratio

- Let's redesign the strategy so that it targets the same risk for regional and intra-region bets

Unsurprisingly, Balancing Risk Improves Performance

	Trend-Follower	Balanced
Excess Return	8.4%	13.0%
Volatility	11.0%	11.5%
Sharpe Ratio	0.76	1.13
Max Drawdown	-17.4%	-18.5%



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Source: Bloomberg 13

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How to Improve Our Equity Manager

Who is the Equity Manager?

- The Security and Exchange Commission requires many large US institutional investment managers to file Form 13Fs, disclosing information on their holdings of various equity securities

- Our manager is an attempt at replicating a well-known Tiger Cub, created by mimicking the positions in its quarterly 13F filings

- The strategy copies the manager's long equity positions from its 13F filings, rebalancing every quarter.

Source: Security and Exchange Commission

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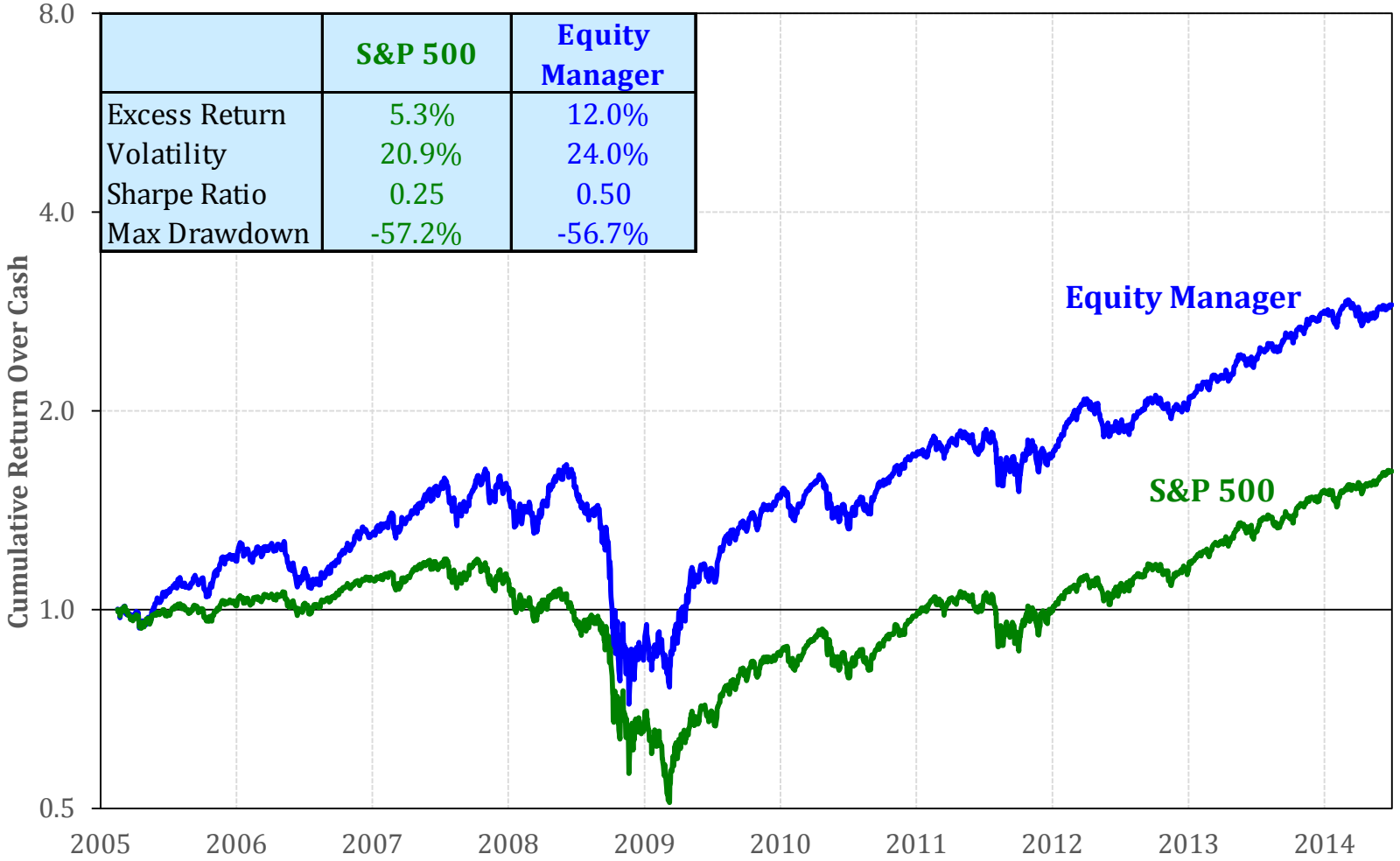
Performance of the 13F Strategy

	S&P 500	Equity Manager
Excess Return	5.3%	12.0%
Volatility	20.9%	24.0%
Sharpe Ratio	0.25	0.50
Max Drawdown	-57.2%	-56.7%



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Source: SEC, Bloomberg 16

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Decomposing the Strategy's Returns

- What drives the return to this strategy?
  1. Market exposure
     - 100% S&P 500
  2. Sector allocation
     - Sector ETFs – 100% S&P 500
     - e.g., Technology vs. S&P 500
  3. Stock alpha
     - Stock exposure – Sector ETFs
     - e.g., Microsoft vs. Technology

Sector ETFs are: XLY, XLP, XLE, XLF, XLV, XLI, XLK, XLU, and XTL

Performance of Each Driver

	Market Exposure	Sector Allocation	Stock Alpha
Excess Return	5.3%	-0.6%	7.7%
Volatility	20.9%	4.9%	8.2%
Sharpe Ratio	0.25	-0.12	0.93
Max Drawdown	-57.2%	-14.3%	-14.8%

As of June 30, 2014

Source: SEC, Bloomberg 18

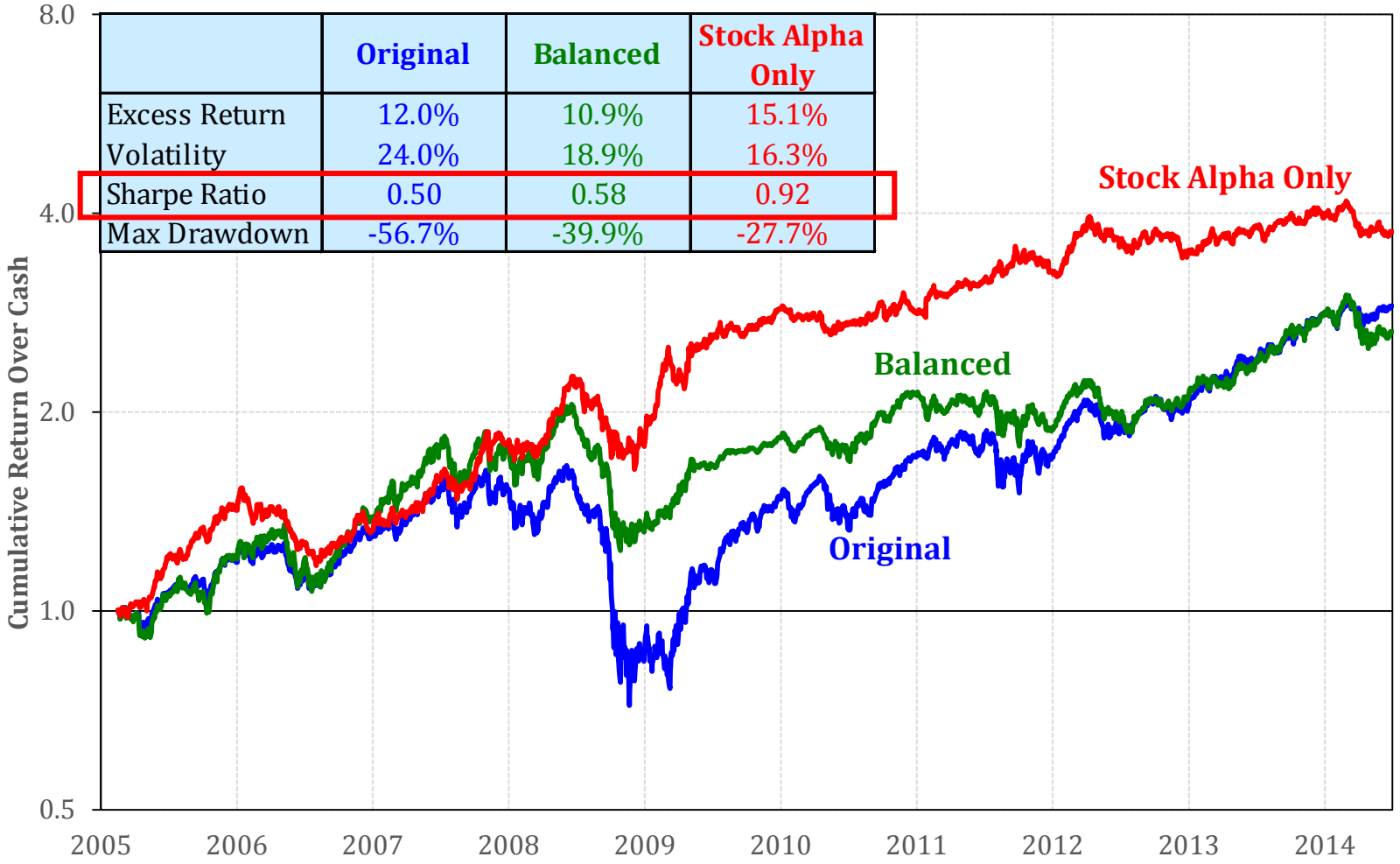
Realigning Bet Weights

- Decomposing performance reveals a misalignment in betting:
  - The strategy takes significantly more risk (volatility) in market exposure (20.9%) than sector (4.9%) and stock (8.2%) bets
  - However, the Sharpe Ratio of the stock alpha (0.93) is significantly higher than that of market exposure (0.25)

- Let's propose two strategies to improve the betting scheme:
  - **Balanced strategy:**
    - Assume no ex-ante difference in market, sector, and stock Sharpe Ratio
    - Allocate equal risk (10% volatility) to each of the three return streams
  - **Stock alpha only:**
    - Assume manager only has skill in stock bets
    - Hedge each stocks' exposure using its respective sector ETF
    - Apply 2x leverage

New Weights Improve Performance

	Original	Balanced	Stock Alpha Only
Excess Return	12.0%	10.9%	15.1%
Volatility	24.0%	18.9%	16.3%
Sharpe Ratio	0.50	0.58	0.92
Max Drawdown	-56.7%	-39.9%	-27.7%



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Source: SEC, Bloomberg 20

Relative Value Bets Benefit From High Correlation

- Today's high correlation regime is problematic for many investors
  - High correlations reduce the number of effective bets that directional traders can make (e.g., risk on/risk off)

- However, high correlations are actually beneficial for relative value traders
  - High correlations reduce the volatility of pair trades (e.g., AAPL vs. Tech)

- The steady increase in correlations over the last several years makes the adoption of relative value more important

- We believe that it is important for managers to flexibly allocate between directional and RV trades depending on the correlation environment

Kaleidoscope Capital

- We pay careful attention to both portfolio construction and alpha generation

- Our goal is to create as many independent bets as possible by:
  - Leveraging both directional and relative bets
  - Trading across stocks, bonds, currencies, commodities, and volatility

- In addition to creating breadth through long-short and multi-asset, we have access to a third dimension of diversification – time

- Predicting the future is hard. Small portfolio construction improvements can lead to outsized gains in performance.