Introduction to Quantitative Trading

Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Learning Objectives

- Distinguish between trading and investing
- Identify the main trading strategy categories in the Quant Universe
- Understand the function of each component of a quant strategy
- Identify the key strengths and weaknesses of quant strategies

Agenda

Trading vs Investing

Quant Universe

Strategies

Advantages and Disadvantages

Trading vs Investing

- Buy Side vs Sell Side
- Traders vs Portfolio Mgrs
- Alpha vs Outperformance

Trading vs Investing

- Buy Side vs Sell Side
- Traders vs Portfolio Mgrs
- Alpha vs Outperformance

Trading vs Investing

- Buy Side vs Sell Side
- Traders vs Portfolio Mgrs
- Alpha vs Outperformance

Trading vs Investing

- Frequent Transactions vs Portfolio Rebalancing
- Short-term vs Longer-term
- Buy-side quant methods vs Sell-side quant methods

Trading vs Investing

- Frequent Transactions vs Portfolio Rebalancing
- Short-term vs Longer-term
- Buy-side quant methods vs Sell-side quant methods

Trading vs Investing

- Frequent Transactions vs Portfolio Rebalancing
- Short-term vs Longer-term
- Buy-side quant methods vs Sell-side quant methods

Agenda

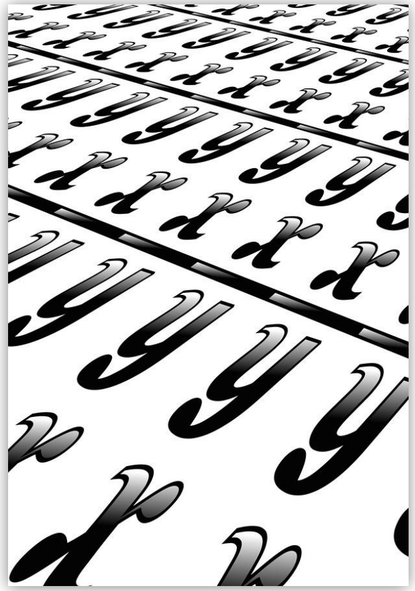
Trading vs Investing

Quant Universe

Strategies

Advantages and Disadvantages

Quant Universe



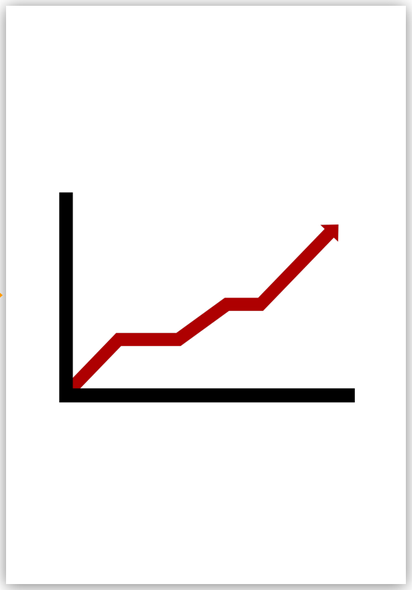
Data +

Quantitative Trading

Algorithmic Trading

High Frequency Trading

Complex Trading Strategies

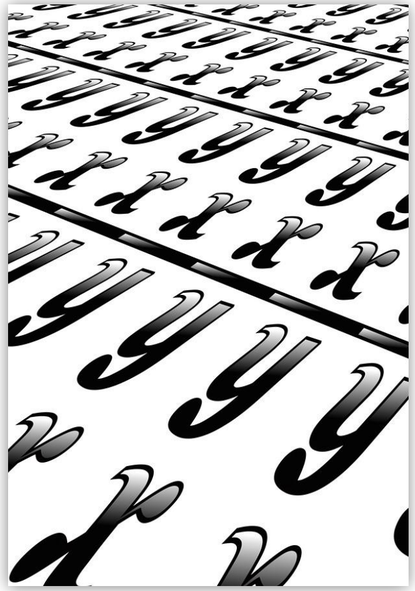


= Alpha

Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Universe



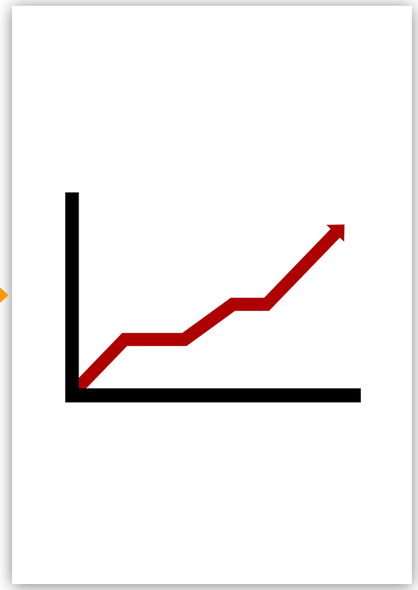
Data +

Quantitative Trading

Algorithmic Trading

High Frequency Trading

Complex Trading Strategies

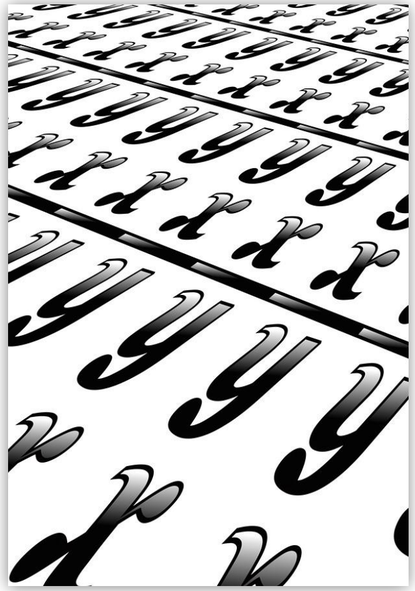


= Alpha

Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Universe



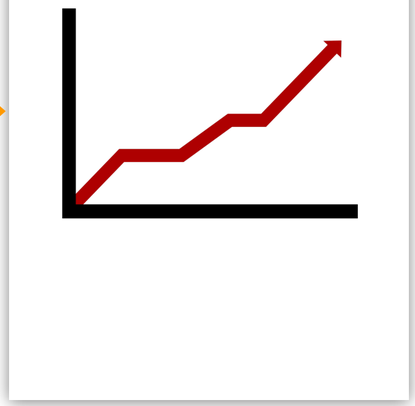
Data +

Quantitative Trading

Algorithmic Trading

High Frequency Trading

Complex Trading Strategies



= Alpha

Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Agenda

Trading vs Investing

Quant Universe

Strategies

Advantages and Disadvantages

Quant Strategies

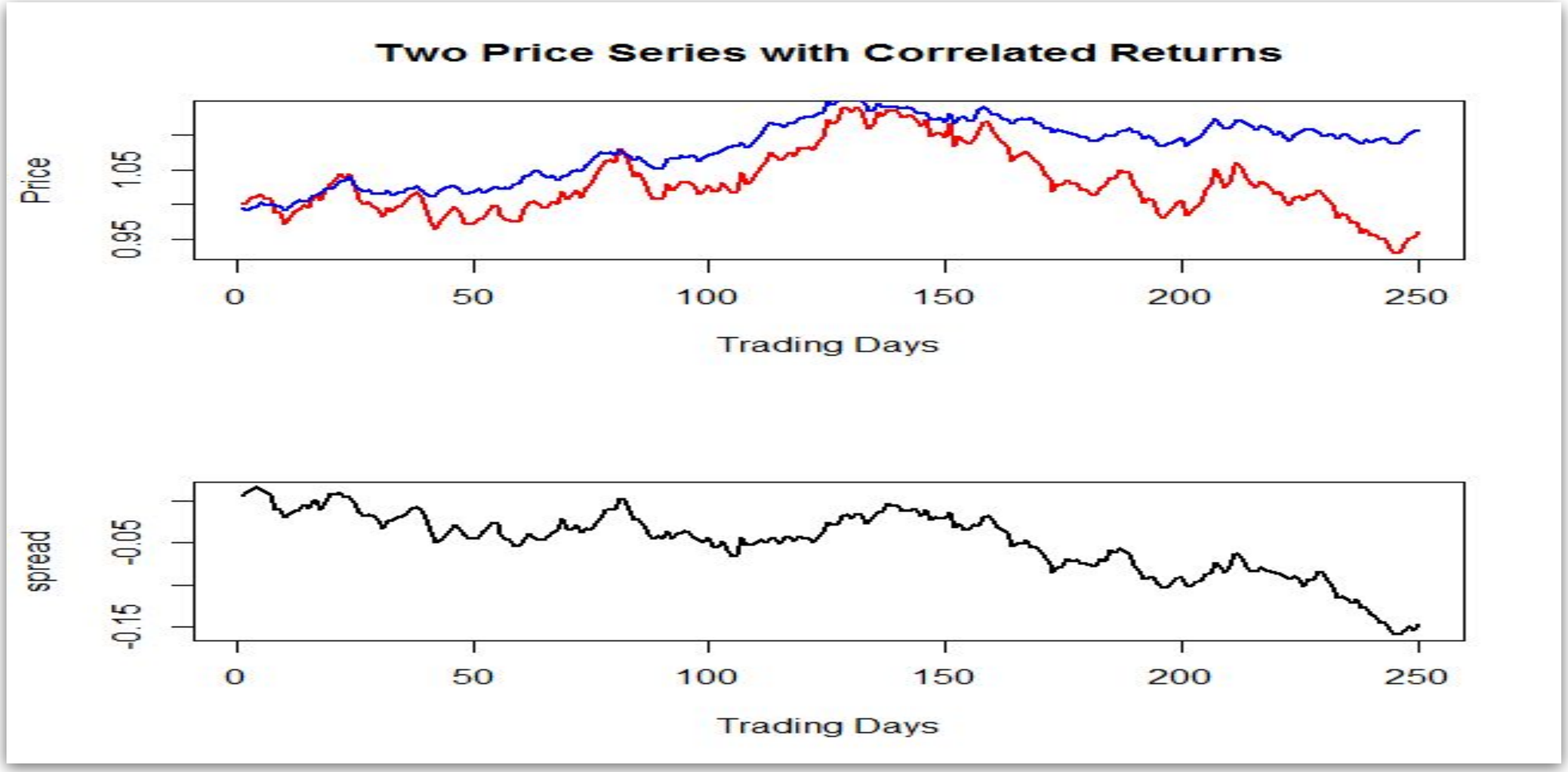
- Create a set of rules to generate trade orders and manage position risk with minimal intervention
- Identify statistically significant and repeatable market behavior and exploit it to generate profits.
- Can be low-frequency (weekly, daily) to high-frequency (seconds, milliseconds,...)

Quant Strategies

- Forecasting methods attempt to predict the future value of a financial instrument* or direction of a spread
- Mean Reversion trades on the deviation of a price spread between two or more financial instruments.
- Utilizes correlation and cointegration tests to identify significant mean reverting behavior.

* Stock, bond, index, future, interest rate,etc.

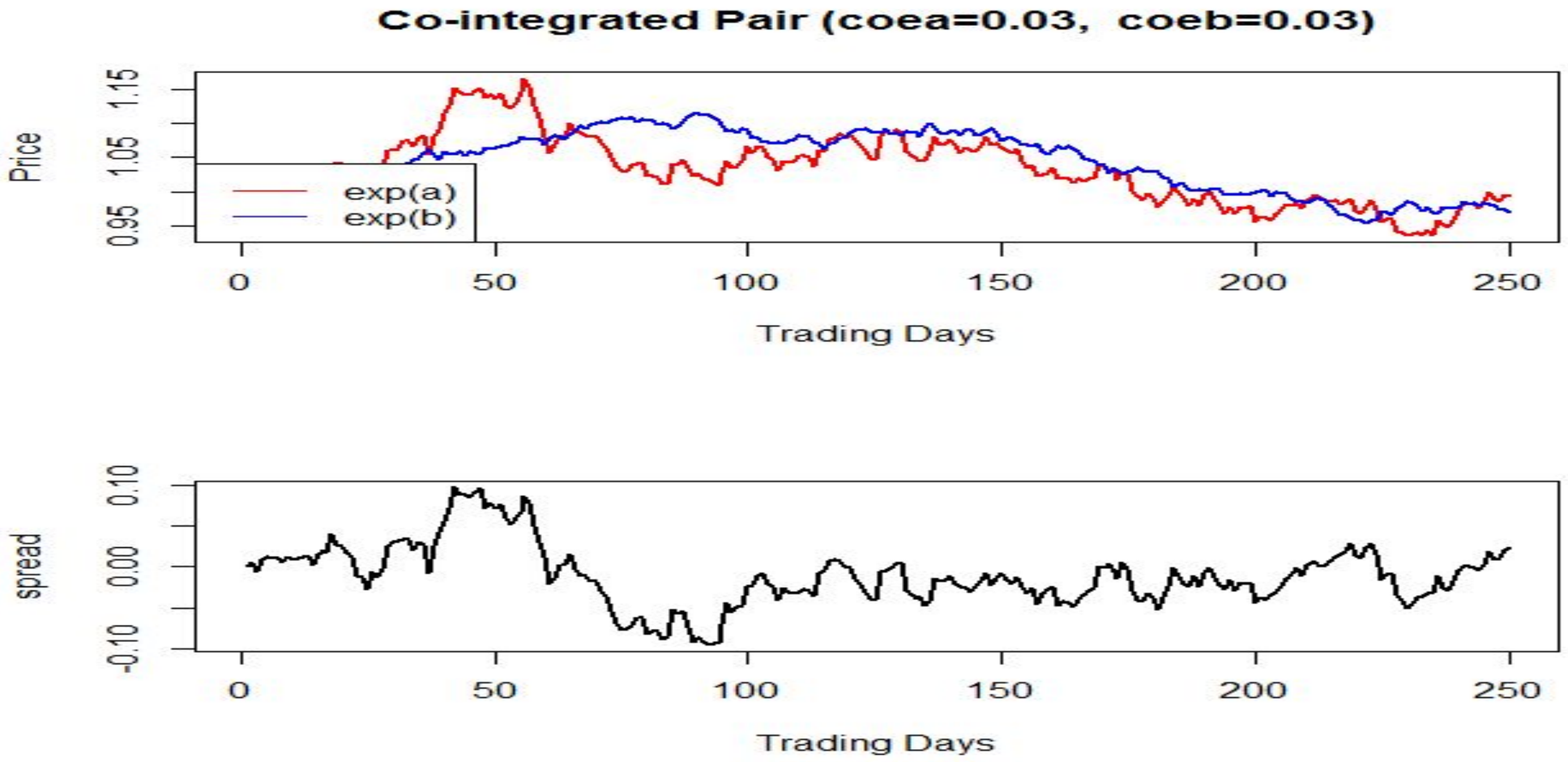
Quant Strategies: Correlation vs Cointegration



Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Strategies: Correlation vs Cointegration

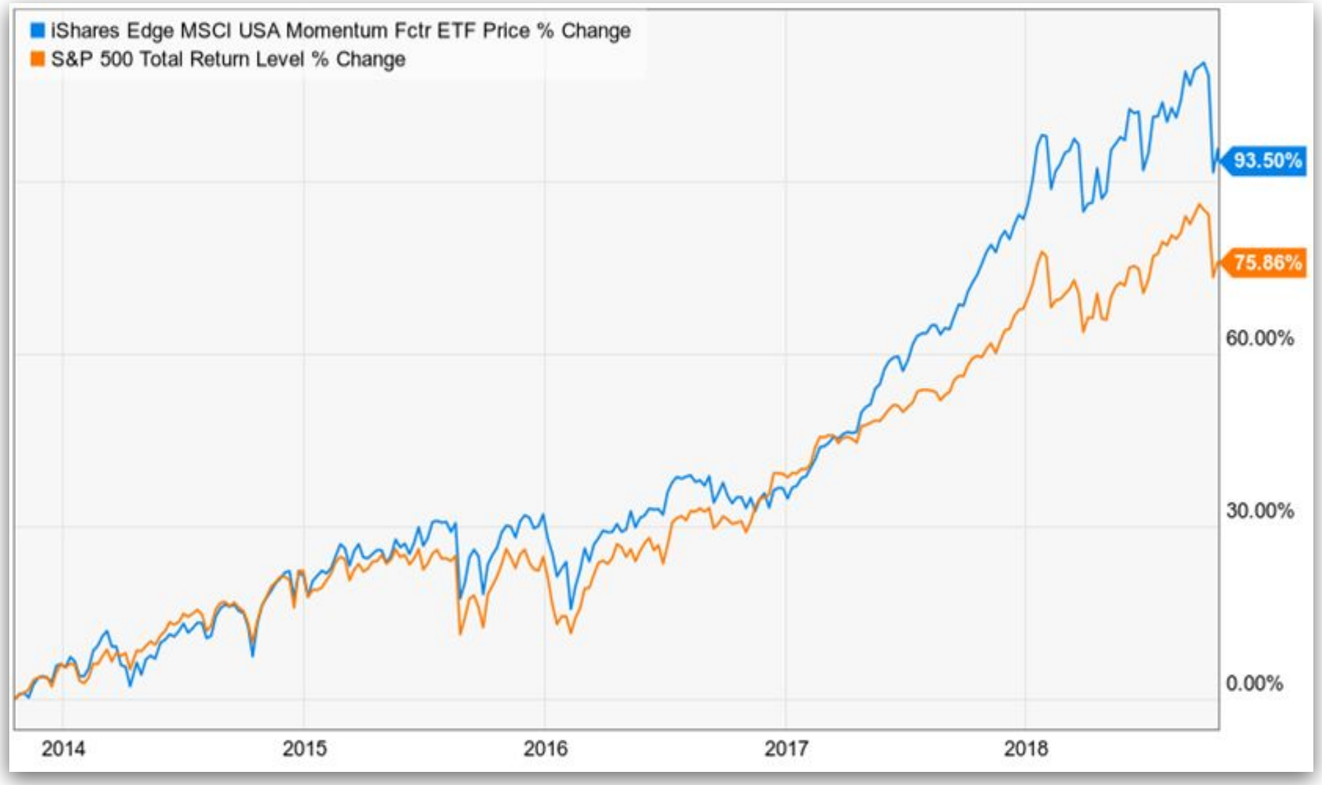


Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Strategies

Momentum or “trend following” depends on slow diffusion of information vs instantaneous diffusion assumed by the Efficient Market Hypothesis

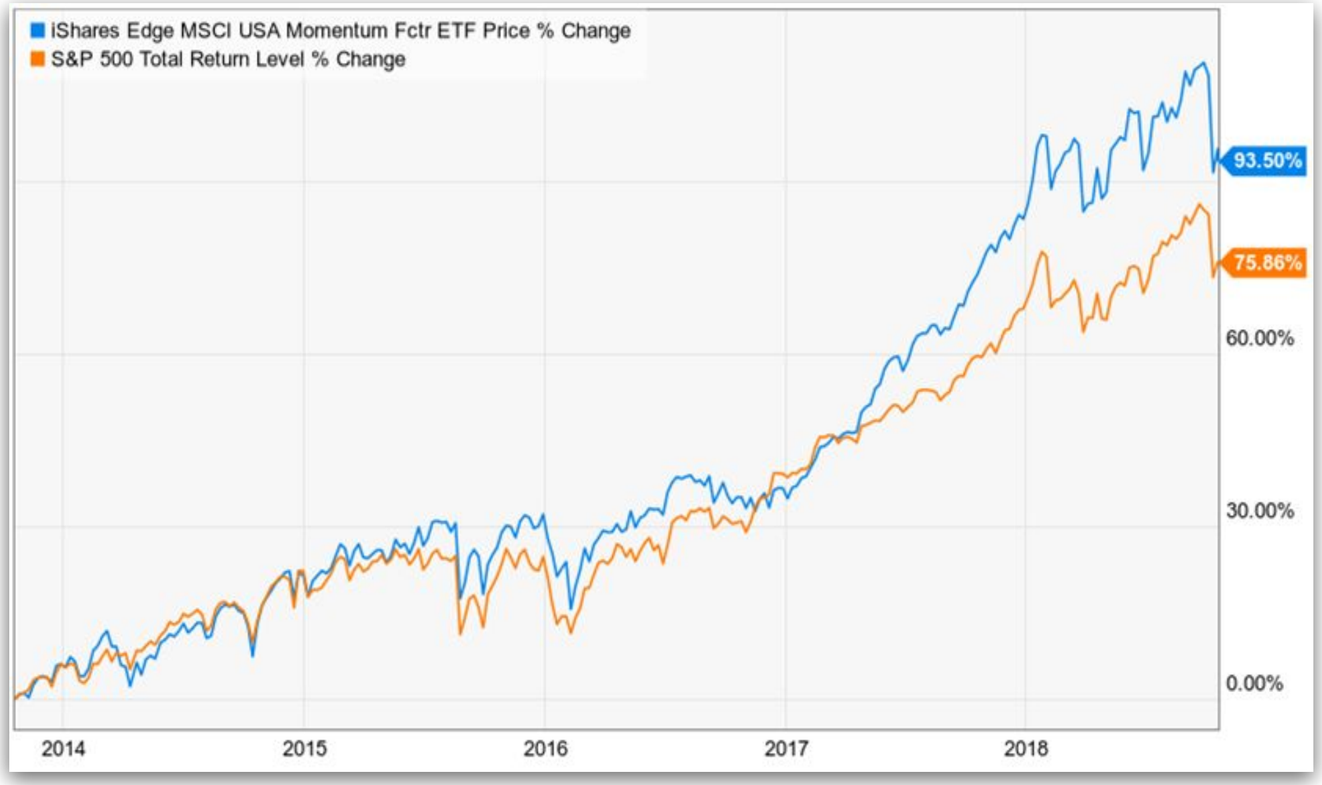


Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Strategies

1. Markets tend to underreact to news about a company
2. Markets tend to overreact
3. Momentum stock tend to be riskier
4. The outperformance of momentum stocks has drawn investors which has pushed up prices.



Google Cloud

ESTABLISHED 1922
NEW YORK INSTITUTE OF FINANCE

Quant Strategies

High Frequency Trading exploits millisecond and sub-millisecond market microstructure inefficiencies.

- Focuses on infrastructure flaws (uneven playing field) rather than longer term predictions of asset prices
- Models behavior patterns of major players in a market
- Seeks to uncover large orders hidden by stealth execution strategies

Quant Strategies

Examples of High Frequency Trading Strategies

- An investment fund wants to purchase a large block of stock.
- Uses stealth execution strategy to mask the order but not perfectly.
- Other market players detect the strategy and “jump ahead” of the order with their own buy orders
- Spoofing “fake” orders

Agenda

Trading vs Investing

Quant Universe

Strategies

Advantages and Disadvantages

Quant Trading Advantages

- Takes the emotion out
- Unambiguous path/strategy
- Mathematically optimal

Quant Trading Challenges

Trading is Risky

- Firms ‘blow up’ all the time
- Knight Capital lost ~$478M in less than one hour of trading and had to be sold to another trading firm