Quant investing in hedge funds:
- Academic influence: Prof. Eugene Fama and his co-authors.
- Many of the early quant investors: Chicago GSB students in the 1970s.
- Success in late 1990s: attracts many institutional money managers to join force.

Crowded trades and over-used signals: factor investing creates unwanted quant risk.

Lessons from the 2007 quant meltdown:
- Cannot be too big: whale.
- Cannot be too crowded: every runs for the exit.
- Cannot be too transparent: front running.

Factor investing in mutual funds and ETF.
Quant Signals

Valuation
How is the company priced relative to fundamental accounting measures?
Sample Metric: Book-to-price ratio

Profitability
What are the company’s profit margins? How efficient are its operations?
Sample Metric: Earnings-to-sales ratio

Analyst Sentiment
Are analysts upgrading or downgrading their view of this company?
Sample Metric: Earnings forecast revisions

Earnings Quality
Were earnings derived from sustainable sources?
Sample Metric: Accruals-to-total-assets

Momentum
How has the market responded to the company’s changing fortunes?
Sample Metric: Price momentum

Management Impact
How is the company’s management employing its capital?
Sample Metric: Change in shares outstanding

XYZ Co. Alpha
Popular Quant Signals

- **Momentum**: price momentum, Jegadeesh and Titman 1993.
- **Earnings Quality**: accruals to total assets, Sloan, 1996.
- **Analysts Sentiment**: earnings forecast revisions, Stickel, 1991.
GSAM’s Global Equity Opportunities

- +1000 positions on individual stocks.
- Market neutral and industry neutral.
- +$24 billion and -$24 billion with 6$ billion AUM.
- The average holding period: in months.
- Correlation with different quant shops: very low.

Source: Prof. Kent Daniel and Bob Litterman
The Growth of the Hedge Fund Industry

Asset Under Management ($ Billion)

Long/Short Equity (right axis)

All Hedge Fund (left axis)
The Growth of the Hedge Fund Industry

![Asset Under Management ( Billion)](image)

- Long/Short
- Multi-Strategy
- Fixed-Income
- Macro

AUM ($billion)

- 1996
- 1998
- 2000
- 2002
- 2004
- 2006
- 2008
- 2010
- 2012
- 2014
- 2016
Up to June 2007, the average annual return was 15%, and volatility 10%.

10%/\sqrt{52}: 1.4% per week.

In July 2007, down by -15%.

From August 1 through 10, down by -30%.

Source: Prof. Kent Daniel and Bob Litterman
Disruptions outside of quant investing

- Sub-prime mortgage market disruption (ABX BBB-Tranch).
- Spillover to investment-grade credit markets.
- Spillover to yen carry trade (USD/Yen exchange rate).
Multi-strategy hedge funds, with losses in illiquid mortgage and credits, used the liquid holdings in their quant strategies to raise more cash.

The meltdown affected virtually all quant factors in every major region. A 20-sigma drawdown for GSAM’s Global Equity Opportunities Fund:
The search for new quant signals is still on, but this area is just not as exciting and creative as it was 10 or 15 years ago.

An alpha that looks good on paper does not necessarily translate to real alpha. Transaction costs: price impact, especially when trading an institutional-size portfolio; and short-sale constraints.

Some quant signals work only in small to medium stocks, but not large cap stocks. Some worked in the past, but have since disappeared.

The push to equity mutual funds and ETFs is on going. Since 200907, AQR offers momentum funds for large-cap (AUM: $1B) and small-cap (AUM: $432M); Since 201304, Blackrock offers iShares momentum factor ETF ($870M).

In this long-only space, a large portion of the risk exposure comes not from the quant signal, but from the market risk.
Main Takeaways