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Introduction



Part 1* of MFE 230G

Course Outline

Tuesday August 10, 2021 10:00 am - noon, 1:00 pm - 3:00 pm F320

1. Introduction
2. Basic Mathematics for Portfolio Management
3. Framework (Chapters 2, 4-6)

Tuesday August 17, 2021 10:00 am - noon, 1:00 pm - 3:00 pm F320

4. Risk Modeling (Chapter 3)
5. Valuation (Chapter 9,7)
6. Behavioral Finance and Equity Investing

Tuesday August 24, 2021 10:00 am - noon, 1:00 pm - 3:00 pm F320

7. Forecasting (Chapters 10,11)
8. Information Analysis (Chapter 12)
9. Portfolio Construction (Chapters 14, 15)

Tuesday August 31, 2021 10:00 am - noon, 1:00 pm - 3:00 pm F320

10. Transactions Costs (Chapter 16)
11. Dynamic Portfolio Management
12. Performance Analysis (Chapter 17)

*This part will cover equity markets. Part 2 will cover currency markets plus some additional equity material.

Course Logistics

- Instructor: Ronald Kahn
 - Global Head of Systematic Equity Research, BlackRock
 - ron.kahn@blackrock.com
 - 415-806-2292
 - Office hour: before class
- GSI: Leo Drukker
 - Email: ldrukker@Berkeley.edu
 - Discussion section: Fridays 3-5 pm
 - Office hours: Tuesdays 6-8 pm
- Text: *Active Portfolio Management*, Grinold and Kahn. Also *The Future of Investment Management*, Kahn. Plus some additional papers posted on class website.
 - We also have a new book, *Advances in Active Portfolio Management*, for those who want to read about the latest advances and applications.
- Three homework assignments, final exam (combined with Currency part of course).

Grading

- Equity Half of the Course:
 - Homework (3): 50%
 - Final Exam: 50%
 - Homework assignments: some discussion with classmates allowed, but every student expected to turn in their own solutions.
 - Final exam will be take-home.
- Final course grade is average of the equity and currency grades.

Active Management

- Why believe in active management?
- Many arguments against it:
 - CAPM, Efficient market hypothesis, and accompanying academic studies.
 - Active managers face headwind of transactions costs, fees, taxes, etc.
 - Sharpe's arithmetic of active management.
 - Index funds consistently perform above the median.
- Arguments for active management:
 - Opportunity:
 - Excess volatility (Shiller, 1981)
 - Specifics:
 - Behavioral finance (Kahneman and Tversky, 1979)
 - Arbitrage Pricing Theory (Ross, 1976)
 - Informational Inefficiencies (Grossman and Stiglitz, 1980)
 - Constraints
 - Opportunistic trades
 - Examples of success: Warren Buffett, Renaissance Technology,...

Our perspective

- Successful active management is possible
- But it isn't easy.
- Consistent success requires the art of seeing what others miss.
- But it also requires the science of optimally investing based on those ideas.
- We can offer a process.
- Not a guarantee of success.

Quantitative versus Fundamental Investing

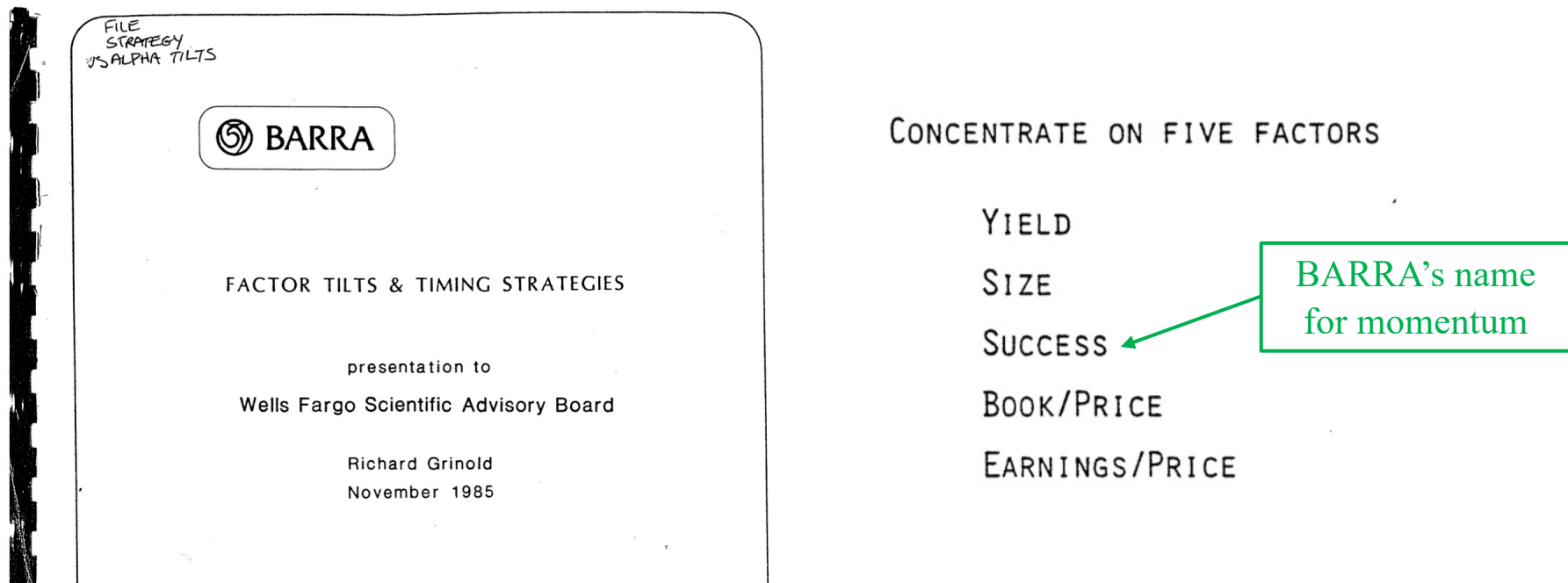
- Quantitative or scientific investing applies rigorous and systematic analysis—the scientific method—to investing. Scientific investors use the scientific method to develop return forecasts, and then construct portfolios by optimally trading off those expected returns against risk and trading costs.
- Quantitative investing differs from Fundamental investing in some important ways, but in other ways are closer than many investors believe:

	Quantitative Investing	Fundamental Investing
Investment Ideas	Limited only by imagination and data.	Limited only by imagination
Data gathering	Very large amount of numerical and text data.	Numerical and text data, company visits
Portfolios	Large number of assets, process-driven	Fairly concentrated portfolios
Management	Team-based	Manager-based

The Infancy of Quant Investing: 1960s – 1980s

- Investment Ideas and Influences:
 - Origins of Systematic Investing: Ben Graham, John B. Williams, Data disclosure requirements (1930s)
 - Birth of Modern Portfolio Theory: Markowitz, CAPM, Efficient Markets, Index Funds (1950s, 1960s)
 - Active Management Strikes Back: Treynor-Black, Barr Rosenberg (Factor models), APT, Behavioral Finance, Informational Inefficiency, Excess Volatility (1970s, early 1980s)
 - Risk Premia: Size and Value, backtested over ~20-year history
- Asset Levels
 - Slow growth up to ~\$3 -\$4 Billion
- Data
 - Long history of prices, volumes, fundamentals
- Technology
 - Mainframe time-sharing, slowly evolving to PC-based
 - Limited amounts of computation and storage (1987: 3 1/2 inch floppy, 2.88 MB capacity)
- Portfolios
 - Long-only
- Investment Products
 - Almost all investing is fundamental active.
 - Indexing began in the 1970's. Quant investing started around that time. Stat Arb (pairs trading) started by the mid-1980's.
 - By the end of the 1980's, quant investing had expanded from the US to Japan, US Smallcap, UK, Europe, Canada, Australia

Example: US Alpha Tilts 1985



- My group still runs this strategy today.
- In 1985, being able to calculate book-to-price ratios for 500 stocks was an edge. That is no longer true, and US Alpha Tilts has evolved considerably since then.
- This looks very much like today's Smart Beta strategies.

Teen Years (1990s) Through Early Adulthood (1998-2006)

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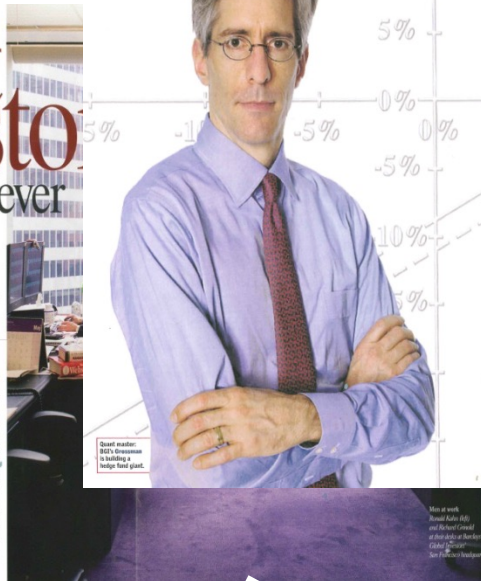
The Best Investor You've Never Heard of

Here's how Barclays Global beats the market—and why you can't.
by Justin Fox
Photographs by Howard Cao

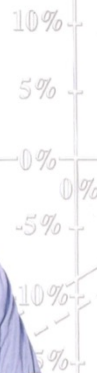
It's the kind of record that would do almost any team proud. For 14 of the past 17 years, the Alpha Ten hedge-up stock fund managed by Barclays Global Investors in San Francisco has beaten the S&P 500. Not impressive? Okay, check this out: The active management arm of Barclays Global also runs a credit-stock fund that has outperformed the Russell 2000 index over the past 12 years. Plus an international stock fund that has outperformed the MSCI Europe, Australia, and Far East index over the past 10 years. It keeps going like that on down the list: five more stock funds, a Chinese fund, a European fund, an American fund, a Canadian fund—all of which have outperformed their benchmarks on a regular basis.

The world's most money managers tell about the market over time, each consistent thinking of the market averages is essential, to say the least. But what truly matters is that the people doing it work at Barclays Global, a place that seems to have a knack for the market that you can't beat the market and are better off just trying to match it in a stock fund. In the process, the investment arm of Barclays Global has become the world's largest and the fourth-largest asset manager overall. If you've ever heard of it, that's because its main customers are pension funds, foundations, and endowments—not retail investors.

But while Barclays Global will always be linked to the academic belief in



Quest master: Blake Grossman is building a hedge fund giant.



Barclays Global Investors commands \$1.7 trillion in assets with a legion of computer-loving Ph.D.s. CEO Blake Grossman and his brainiacs have transformed the firm into one of the world's largest hedge fund managers.

Empire of the Quants

By Edward Robinson

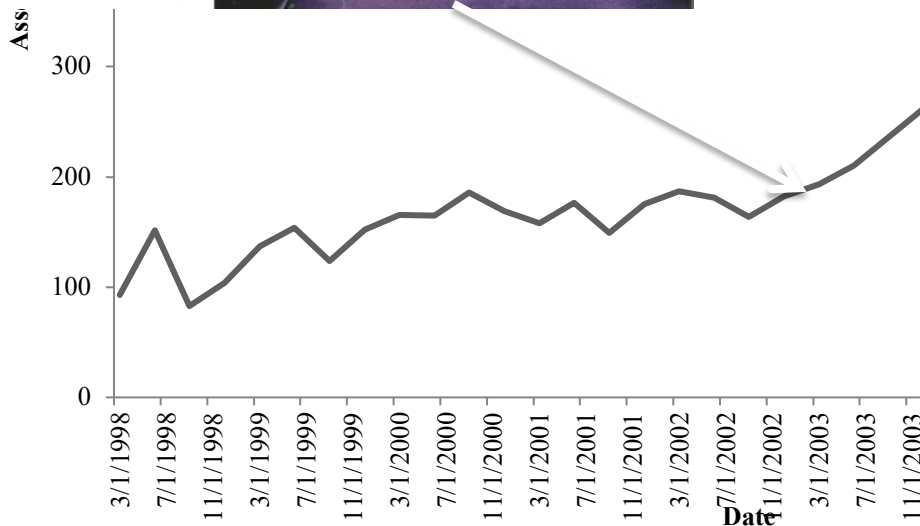
One morning in October, a money manager named Thomas Johnson flips on his computer and watches the screen fill with numbers. In front of him is a list of 100 Japanese stocks she should buy or sell.

The screen had been picked overnight by computer software at San Francisco-based Barclays Global Investors, where Johnson, 36, manages three hedge funds. BGI insiders call the program the Optimizer.

"Which stocks should I hold and which should I ditch?" Johnson asks. To find the answer, he turns to the Optimizer, which cravens corporate earnings data and dozens of other variables for almost every stock in the world.

BGI is one of the most powerful forces in money management today. It's a clan of finance Ph.D.s, mathematicians and other disciples of quantitative analysis, or quants. BGI designs investing strategies for thousands of stocks, bonds and currencies and then uses computers to pick which ones to buy and sell.

Filings



Special Report

Outsmarting the Market

Behind Barclays' quest to build a world-class team of academic quants that systematically does the impossible. By Anthony Bianco



IT CAN BE HARD TO BELIEVE THAT THE UNIVERSITY OF MICHIGAN's Thomas Johnson, 36, is one of the world's most powerful forces in money management. Johnson, who has spent his career at the University of Michigan's business school, has managed to build a world-class team of academic quants that systematically does the impossible. Behind Barclays' quest to build a world-class team of academic quants that systematically does the impossible. By Anthony Bianco

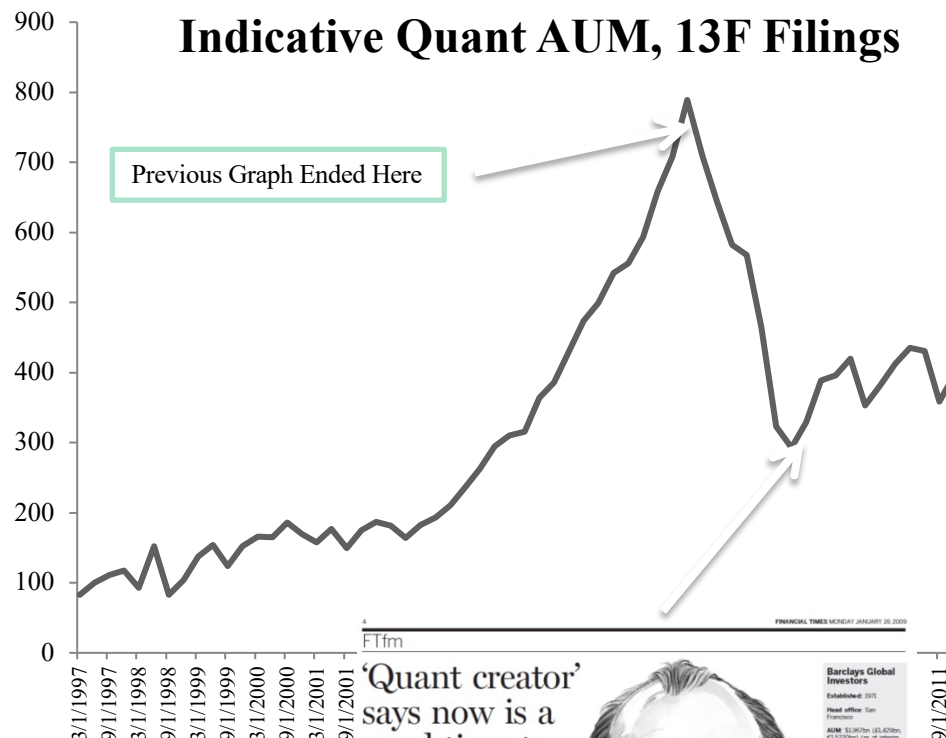
Hard Data vs. Heroics

In its own quiet, unassuming way, Barclays Global Investors (BGI) has become a world-class team of academic quants that systematically does the impossible. Behind Barclays' quest to build a world-class team of academic quants that systematically does the impossible. By Anthony Bianco

Mid-Life Crisis: Bursting the Bubble: 2007 - 2009

- Asset Levels
 - Asset levels / Exposures down ~75%
- Portfolios
 - Shrinking / Deleveraging
- Market Environments
 - Enormous outflows across correlated quant managers led to significant drag on all quant managers.
 - The impact extended beyond just quant to many value managers (e.g Bill Miller)
 - Dramatic increase in volatility, largely driven by macrofactors

Indicative Quant AUM, 13F Filings



‘Quant creator’ says now is a good time to be different

Face to Face
BGI's strategy guru Ronald Kahn tells Pauline Skypala current conditions should present opportunities

Cooperation with the author of a book called *Active Portfolio Management: Quantitative Theory and Applications* would like it could be hard work. As it turned out, Ronald Kahn, who is in charge of developing new active equity strategies for Barclays Global Investors, proved himself in plain English when we met at BGI's London office.

According to the review of the book in *Financial Times*, Mr Kahn and co-author Rob and Global Index to discuss of research at BGI: "Remarkably, the quantitative approach to investing in its modern form," and their book, first published in 1995, is "the bible of active quantitative portfolio management."

Such hot mail is flattering, but Mr Kahn, who is based in New Brunswick, says the

make money only from rising prices, he adds.

Asked about how BGI tests its ideas, he says it is tricky. "You can look at an idea and see how it would have done, but that is not the same as knowing it will work over the next five years."

"We look at the economic possibility of an idea and why the market doesn't implement it and we do it," he says. "The quality of money developed by BGI and Kahn in the 1990s when he was at the Wharton School (now on staff at BGI), the BGI team found the stock market was able to differentiate between outflows and inflows, such as speculation and changes in interest rates. "The economic idea was that cash flow was more persistent and it was more persistent than the market."

Barclays companies with high quality securities and sharing those most depend on an accurate picture of a good strategy "will be successful" he says, "but only with the quality" BGI over time. A strategy used to work for BGI in 1995, says



Barclays Global Investors
Established: 1972
Head office: San Francisco
AUM: \$1,367bn (US office: \$1,302bn) (as at 30th September 2008)
Number of employees: 3,700
Number of offices worldwide: 25

"What we've learned is that sometimes it's not people try to do the same things they will have continued performance. We focus on trying to do different things. We create in proprietary ideas and data and are trying to move away from standard ideas between them."

9/1/2011

Date

The GFC Fork in the Road



Need to Reinvent Quant:
Standard quant signals
now well-known and
generic.



Stay the Course:
Value has had many
drawdowns over the past
100 years. It will come
back.

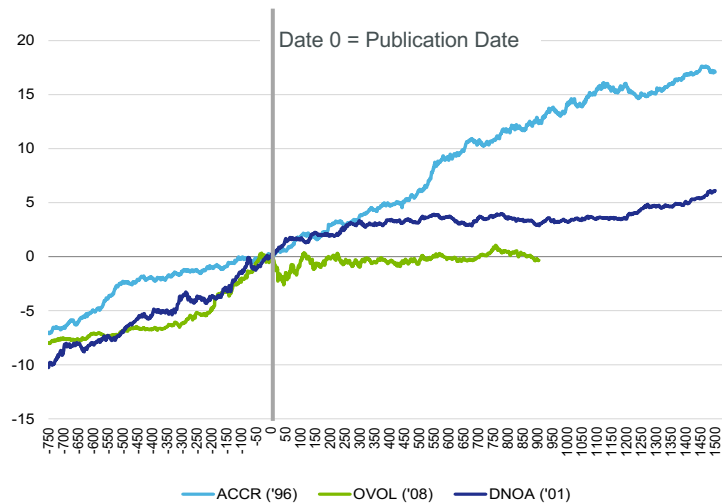
Does Academic Research Destroy Stock Return Predictability?

R. DAVID MCLEAN and JEFFREY PONTIFF*

ABSTRACT

We study the out-of-sample and post-publication return predictability of 97 variables shown to predict cross-sectional stock returns. Portfolio returns are 26% lower out-of-sample and 58% lower post-publication. The out-of-sample decline is an upper bound estimate of data mining effects. 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. Our findings suggest that investors learn about mispricing from academic publications.

Signal Returns Around Publication Dates

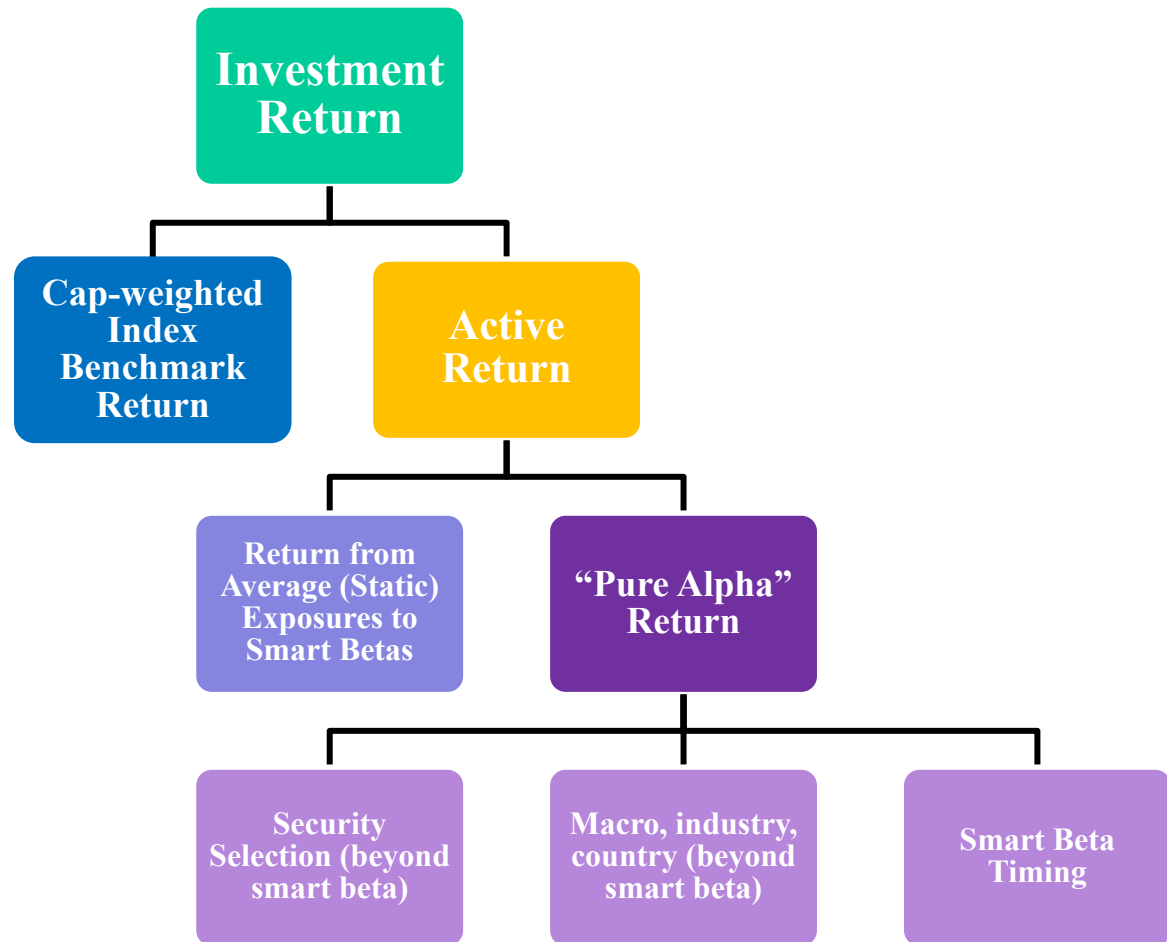


Mid '90's: Traditional, quality research could create a sustaining competitive advantage

Early '00's: Technology and access to information was decreasing the staying power of those advantages

Late '00's: Market incorporates information so rapidly that constant innovation is required to gain an edge

Future of Investing on 1 slide



The Future of Pure Alpha Quant Investing

- Not Simple Implementations of Academic Research
 - The next great investment idea will not come from SSRN
- Not Static Exposures to factors: value, size, momentum, quality, low volatility—that is now Smart Beta (as opposed to Pure Alpha investing).
 - Why pay active fees for generic ideas increasingly available in simple, rules-based, transparent, and low-cost vehicles?
 - (This will significantly impact asset management generally, not just quants.)
- Effective and orthogonal ideas, dynamic, supported by constant innovation. Alternative and unstructured data, and machine learning, can play big roles here.