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# The Rise of the Machines in Investment Management

By **Daniel S. Kern** SEPTEMBER 30, 2016

> *"How iTunes Crushed Music Sales" (CNNMoney)*
> *"Five Ways That Amazon Is Shaking Up Retail" (Forbes)*
> *"Uber has pretty much destroyed regular taxis in San Francisco" (Time)*
> *"Extreme Moneyball: The Houston Astros Go All In On Data Analysis" (Bloomberg)*

The narrative is familiar: Technology innovation disrupts legacy business models, creating opportunities for insurgent competitors and existential threats for less nimble incumbents. The threat to investment management may be less obvious than to music stores, retailers and taxicabs, but the impact of technology is notable in a wide variety of investment activities.

Active stock-pickers dominated equity markets for decades, with star managers such as Peter Lynch, John Templeton, Michael Price and Bill Miller dominating headlines and asset flows. In recent years, however, active managers have been attacked from all sides, losing market share to index funds as well as quantitatively based strategies benefiting from advances in computing power.

'Quant' strategies may be loosely defined to include smart beta, factor-based and quantitative alpha strategies. *Smart beta* strategies use measures such as revenues or volatility to create rules-based alternatives to conventional capitalization-weighted indexes. *Factor-based* strategies draw from academic research, emphasizing factors that

have historically provided performance "premiums" relative to the market, such as style (value stocks), size (small company stocks), quality (high profitability stocks), and momentum. A*lpha-oriented quant* strategies resemble active stock-picking approaches, but replace human analysts with computer algorithms.

## Quantitative Investment Strategies

I've seen the *good, bad and ugly* of quantitative strategies over the past two decades. The *good* is represented by firms that demonstrate thought leadership and have delivered strong long-term track records. Quantitative strategies come in all shapes and sizes, and the best I've seen constantly test their assumptions, investment processes and rationale behind their investment strategy. Renaissance, Arrowstreet Capital, AQR, Dimensional Fund Advisors and Research Affiliates are among the most-admired firms in the quant world.

The *bad* was on display during the 'Quant Quake' of August 2007, when many alpha-oriented quant funds fell sharply. Quant funds were using common metrics of value and momentum to identify opportunities, leading to considerable 'crowding' of investments. As a liquidity driven selloff began, the race to the exit by quant funds started a slump for quant that lasted through 2009.

The *ugly* is represented by the near-collapse of Axa Rosenberg, a firm that shrank dramatically due to the combination of disappointing performance and the cover-up of a 'coding error' that compromised the firm's investment model.

I recall another revealing episode from a due diligence meeting with a large market-neutral hedge fund in 2001. The fund had performed poorly in the late 1990s, and the portfolio managers blamed the poor performance on shortcomings in the firm's risk model. The risk model considered technology stocks and traditional cyclical stocks to be equivalent in risk to one another.

Consequently, when the fund's investment selection model "loved" cheap cyclical stocks and "hated" expensive tech stocks, the risk model considered the long position in cyclicals to offset the short position in technology.

In reality, this positioning was far from market neutral and proved to be disastrous in 1998 and 1999 -- serving as a reminder that analytical models (and the humans that design them) aren't infallible.

## *Moneyball's* Relevance to Quant Investing

A book about baseball illustrates how innovators can disrupt established business practices; subsequent events in baseball show that gains from innovation may be short-lived as competitors copy successful strategies.

*Moneyball*, the Michael Lewis book about the Oakland Athletics ("A's") baseball team, examines the use of quantitative methods by A's general manager Billy Beane. Beane, memorably played by Brad Pitt in the movie adaptation of the book, is thought of as the first "quant" to run a baseball team. Beane's quantitatively based approach to running the A's deviated from nearly a century of conventional wisdom in baseball, and helped the A's to several playoff appearances despite a much lower budget for players than nearly every other team.

As I write this the A's are last in their division, and they've been unable to recapture the glory of their early years under Beane. What happened to the A's? In Boston, many would answer: Theo Epstein and John Henry happened! Epstein emulated Beane's quantitative approach and had the financial backing of billionaire owner and legendary commodity trader John Henry. Today, the use of quantitative methods is commonplace in baseball and provides less of an inherent edge.

There are parallels between baseball and investment management. Early quant managers had an advantage, but that advantage eroded as others mimicked their approach. Over time, the market was flooded with quant-oriented products that followed similar principles. The quant quake was a painful demonstration of how "crowded" certain trades had become.

## Using Tech in 'Traditional' Investment Portfolios

Traditional investment firms are incorporating "big data" analytics to supplement research provided by human analysts, seeking the ideal combination of human and technology.

In my early days as an equity investor it was challenging to obtain information about near-term business momentum and operating trends. Analysts would be creative in their search for insight — visiting stores to gauge sales momentum, driving by industrial plants to observe the level of activity and completing channel checks to identify trends in order flow.

Innovative firms are exploring systematic ways to gather information, replacing subjective, 'low-tech' approaches that are less reliable and more difficult given heightened sensitivity about disclosure of market-moving information. For example, satellite images are now available to provide insight into mall traffic, a more effective way to gather insight about retail trends than the informal store visits of my early days.

Big data analytics also provide insight into market sentiment. For example, the China Economic Policy Uncertainty Index measures trends in policy-related economic uncertainty, based on articles published in the *South China Morning Post*. There are also algorithms that evaluate the "tone" of social media conversation about individual companies — positive, negative or neutral.

Technology advances have dramatically enhanced the risk management capabilities used by investment managers. Analytical models help investors to understand their risks, going beyond the basics of stock, sector and country weightings to assess a wide variety of factor sensitivities. Firms such as MSCI, Hidden Levers and Kensho provide analytics that examine different scenarios, looking at historical relationships in order to provide actionable strategies in the event of major events such as Brexit, invasion of a major country or a rise in interest rates.

These 'What if?' scenarios that might take days or weeks for human analysts to analyze are evaluated within seconds by artificial intelligence-based risk models using big data.

## Concluding Thoughts

It's often said that technology offers both threat and opportunity, but the cliché fits the current state of the investment management industry. Advances in technology represent a threat to traditional investment managers, but successful firms will embrace the opportunity by combining the judgment and creativity of humans with the systematic analytical capability of computers.

In the words of renowned hedge fund investor Paul Tudor Jones, "No man is better than a machine, no machine is better than a man with a machine."