**Data Science in Finance**

Renaissance Technologies, Two Sigma and AQR are some of the most recognizable names when you think of AI-driven investors. These firms have been around for a while, but their assets have significantly grown, and their returns have caught the attention of the investment world in the past few years. These are firms that more often employ scientists and PHDs than CFA holders and traditional stock pickers, using machine learning and other data science techniques to explore market data and find trends that may predict future price movements.

Reports vary when determining how many investors are using AI in their investment process, with Morgan Stanley stating these firms manage around 5% of investable assets, while a study by the CFA Institute found that 10% of portfolio managers have used machine learning techniques in their investment process in the past 12 months. Many reports show, however, that most firms continue to use active, human-driven, strategies generally, while they are just starting to scratch the surface of incorporating AI into their processes. Many investors use data science strategies for idea generation, while a human portfolio manager is still the decision maker when executing trades. I currently work at IHS Markit and our data estimates that certain players that would qualify as truly AI-powered investors account for only 1% - 2% of total investable assets, though a few like the ones mentioned above have considerable assets under management, enough to become a top shareholder of an S&P 500 company.

One of the biggest factors impacting returns for these investors is the quality of the data they use as many say, “garbage in, garbage out”, meaning inaccurate or missing data will produce a poor model and the quality of a model is only as good as its data. AI investors like Ren Tech employ scientists with little or no market and financial knowledge as they can treat market data as any other piece of data, removing some of the emotional human judgement that can negatively affect portfolio management decisions. That being said, some investors suggest it’s important to understand what the models are producing and how they came to that decision, especially newer models, but this can be a big hurdle as models become more complicated. Knowing how to correct a model or intervene in an investment decision, in addition to knowing when to retire a certain strategy can save an investor millions. Many quant models look for price discrepancies or anomalies and often hold positions for very short periods of time, as some positions are only held for a couple days. Renaissance Technologies is famous for being right 51% of the time, which can produce large returns if you’re making thousands of trades per day.

While traditional investors look at company financials and speak with management teams about the current state of the company and future plans, AI investors scour and churn external data sources, looking at websites, social media, press releases and news sources to extract and import data into their models. An investor can see real time demand for products, inventory levels and customer reviews. A model can seek to discern the market’s sentiment towards a company and how it may be changing. A few notable strategies include using cell phone data to track foot traffic and looking at search data to determine demand. AI-powered firms will also use models to search company earnings calls for certain words with a positive or negative implication to determine management’s tone about the company’s future, something that may not be found in a financial statement or press release.

While some firms have become wildly successful using data science, others have failed to incorporate AI-powered strategies, with one of the biggest hurdles being the ability to afford and access the datasets necessary to find signals and trends in the markets. Many investors have built teams to start building and incorporating these techniques, though without plans to replace their human managers, as ‘hybrid’ investors become more popular. The continue rise of data science is something I expect moving forward as the finance industry is one of many that are ripe for change.