

RENAISSANCE TECHNOLOGIES: *MINING THE WORLD'S
FINANCIAL DATA ONE DAY AT A TIME*

Don't be surprised if you haven't heard of Renaissance Technologies or Jim Simmons, not many people have. Despite his lack of a reputation, Jim Simmons is changing the world of finance by using *supercrunching* techniques to predict short-term movements in global financial markets.

Fifty miles from the Empire State Building in the quiet Long Island town of East Setauket, Jim Simmons and his team of over 200 researchers comb the world's financial data looking for the slightest mispricings from which to profit. Their search for alpha, the extra return a manager makes above the market return due to proprietary strategies, has brought them all to Renaissance Technologies.

When stepping onto the tranquil 50-acre campus in East Setauket, one would never imagine that the world's best quantitative hedge fund lies within the nondescript buildings. And once inside, one is stunned by the silence of the trading floor. There is no stereotypical shouting, cursing, or annoying squawk box echoes to be heard.

The mood is one of intense diligence, devoid of Wall St. bravado and machismo. And seeing that no *human* decides what trade to put on or take off, emotions tend to run pretty low. That's right, no individual person or group of people decide what to purchase or divest; Renaissance lets its bank of supercomputers and servers implement statistical strategies created by one of the many astrophysicists or speech-recognition software specialists Renaissance employs. These supercomputers discover anomalies, choose strategies to profit off the anomaly, and execute hundreds of simultaneous trades in order

to hide their positions from other hedge funds and investment banks; all this without the slightest human intervention.

Known as one of the best funds in the industry, Renaissance is a shining example of the informed decision-making and predictive powers available to those who utilize data mining. Through regressions and complex statistical analysis, Renaissance is able to make optimal trading decisions, maximizing return while simultaneously minimizing risk. In the most competitive of landscapes, Jim Simmons and his team consistently beat the best and the brightest financial institutions around the world.

Of course...the first rule of Renaissance Technologies is: you do not talk about Renaissance Technologies. Why all the secrecy? For Renaissance, the proprietary strategies the firm uses are its brand, its product, and its livelihood. Thus, many speculate as to the strategies Renaissance uses to profit from market anomalies, but no one except insiders truly know the secrets to the firm's success.

To give you a sense of just how much Renaissance has learned from systematically sifting through financial time-series and how successful the fund's algorithms have become, we need look no further than Renaissance's own performance data. Over the past 15 years, Jim Simmons' flagship Medallion fund averaged over 33% per annum. In contrast, the S&P 500 averaged about 12% per annum over the same period. I think everyone would agree that those results are statistically significant. Once again, we see another application of the powerful predictive capabilities of data mining.

Until rather recently, sales and trading on Wall St. was conducted in open pits where instructions were shouted back and forth between brokers and traders. Now, in the digital age, the execution of the trades is almost always done electronically (except for

the NYSE, but they've realized they must play catch-up). And of course, with financial data now converted to binary code, the *supercrunchers* can work their magic. And that is just what Renaissance Technologies does.

Through complex algorithms, Jim Simmons has demonstrated that a computer is capable of outperforming a human in the world of asset management; however, Renaissance's success with quantitative computer strategies may not be the best model for everyone. In fact, we know that if everyone were to trade according to such rules, the financial system would become highly unstable. On October 19, 1987 that is exactly what happened – Black Monday hit Wall St. and the Dow dropped almost 23%.

On that day there were no dire news releases, no announced 'hot' wars (remember, we were still in the Cold War back then) and no hint of an economic collapse. The cause of the crash that seems most plausible is the feedback mechanism existent between stock prices and their respective put options. In the late eighties, portfolio insurance was sold as a way to hedge market exposure; however, with everyone using the same strategy, managers found it impossible to exit their trades as everyone else simultaneously tried to exit, causing the market to crash.

Thus, unlike in retail, where, in order to reduce waste and increase economic efficiency, data-informed decision-making is beneficial and readily embraced, society must be a little more cautious moving forward with computer automation and machine learning in the financial world. However, in the meantime, there are many opportunities for the *supercrunching*-inclined.