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Wall Street Quants Are Turning Their Skills to the Virus Fight

- **Statistical methods in finance unleashed in the 'data crisis'**
- **Rotella Capital,** Coolabah**, ex-AQR AI chief ramp up research**

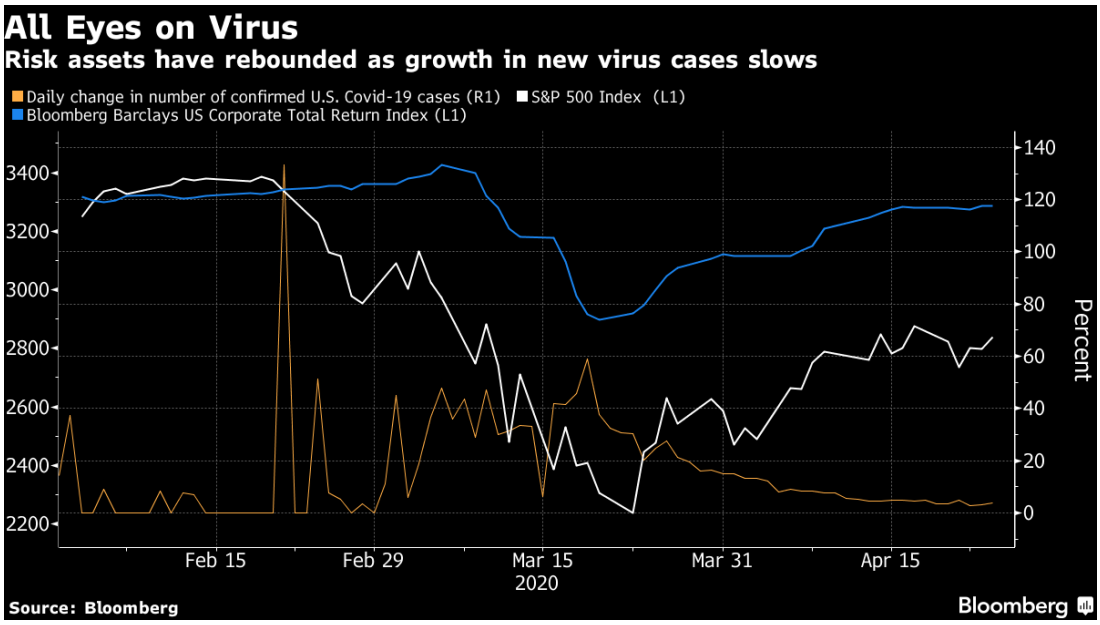
By Justina Lee

(Bloomberg) -- Everyone on Wall Street is an armchair epidemiologist these days, but a motley crew of quants is taking it to a whole new level.

Hedge fund managers, market academics and risk experts are channeling their data-mining smarts to the world of clinical sciences to model the trajectory of this once-in-a-century pandemic.

Some are doing so formally in their investing strategies, others are teaming up with non-profit organizations driven by a sense of civic duty.

There's no telling if their methods can break new ground. But the quantitative techniques that power high-octane finance are joining the effort to make sense of the virus-induced chaos.



Take Kai Lin at Coolabah Capital.

The senior data scientist's team at the Australian credit fund built a proprietary model mapping the infection path using a so-called linear mixed framework, a form of regression analysis also used in statistical finance.

After concluding that cases from the U.S. to Europe would largely peak this month, Coolabah duly poured about $580 million scooping up risk assets in March to catch the market rebound.

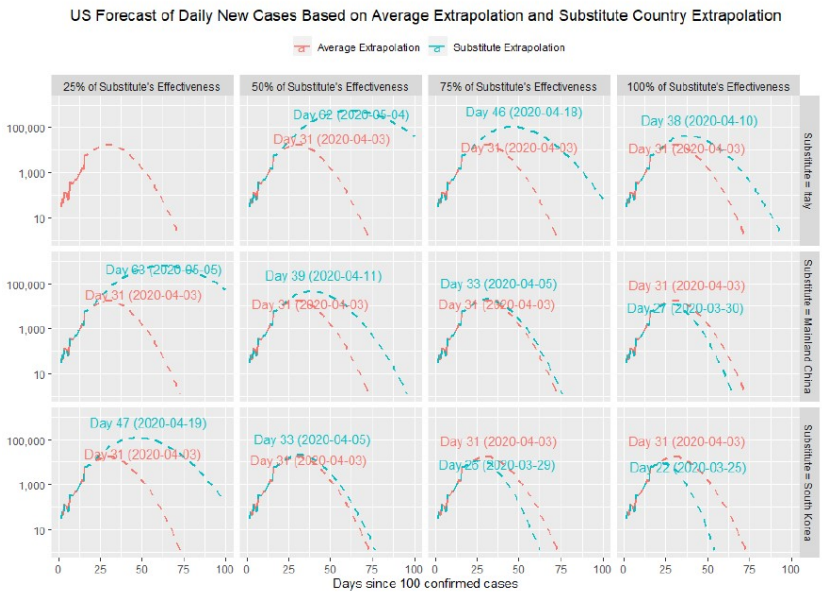
"Publicly available models were mostly, if not all, built for the purpose of informing government policies and were not suitable for the niche needs of financial market participants," Lin wrote in an email. "Coolabah decided to build its own Covid-19 forecasting models tailored to our needs."

Coolabah has publicly disclosed its methods and results in the hope it will help others both inside and outside the financial sphere.

They're among systematic players dissecting reams of statistics across population studies and health economics to divine complex infection trends -- seeking meaning where even the best-known data is questioned by experts.

While quants as a whole have far from excelled in their day jobs of beating the market of late, global cases now top 2.9 million and authorities are asking for all the constructive help they can get.

A consortium which includes the White House is calling for artificial intelligence experts to help unearth insights from the growing stockpile of Covid-19 research, according to Google's platform for data scientists known as Kaggle. Meanwhile the U.K.'s Royal Society says there are 1,800 responders to its first call for disease-modeling assistance.



Source: "Global Empirical Forecasts of COVID-19 Trajectories Under Limited Information on the Efficacy of Intervention Strategies" by Kai Lin, Christopher Joye, Nathan Giang, Adam Richardson

At hedge fund Atlas Ridge Capital, founder Christos Koutsoyannis is helping to launch the non-profit Covid Network, which uses advanced statistical techniques to match hospital demand with suppliers of personal protective equipment, or PPE.

He's calling on the financial industry to share data such as cell-phone usage or satellite imagery that might help estimate the effectiveness of social distancing. "Quants might not have epidemiological experience, but the mathematical challenges are similar," he said.

Plenty of his peers agree.

Rotella Capital Management, a 25-year-old systematic hedge fund, has developed models which parse publicly available data on virus fatalities. It's been in contact with government agencies about the methodology, according to global head of strategic business development Dean Crowder.

"All quant funds have knowledgeable data scientists who can get involved in providing our respective government agencies and the medical professionals actionable insights to control the spread," he said.

Data Crisis

Projections for the virus's trajectory are critical in deciding when to re-open the economy, how effective intervention has been and how best to allocate resources. Finance quants are trying to help on all three counts.

Like Marcos Lopez de Prado, who has built machine-learning algos for some of the biggest money managers including Guggenheim Partners and AQR Capital Management LLC. He's teamed up with an academic to propose a method to simulate more targeted lockdowns by breaking the population into different groups.

It's an effort that's all the more needed given the "data crisis" slowing down the pandemic response, according to Lopez de Prado and his co-author, Alex Lipton, a professor at the Hebrew University of Jerusalem.

For one, you don't know how many people are infected. Not everyone's tested. And some countries may have manipulated their figures.

These puzzles are all raising the intellectual curiosity of the systematic crowd.

Yang Liu started collecting data on China's outbreak in early February. The risk analyst at at HSBC Holdings Plc spent two weeks of his own time penning a paper on how to use the so-called Markov model to work out the true virus fatality rate.

In his view, the statistical challenge of working out the sequence of different scenarios isn't a world away from his regular gig modeling corporate insolvencies.

"It is after work hours but that's sort of a way to get myself occupied," Liu said. "By doing this I find myself still connected to the outside world."

--With assistance from Dani Burger.

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