Risk.net

What quants can learn from the Covid crisis

More nowcasting, less backtesting, and strategies that adapt to new regimes

Alex Lipton, Marcos López de Prado
02 Apr 2020

Quantitative funds have flopped during the coronavirus crisis. True, there are mitigating factors, not least the one-third drop in the value of the S&P 500 and other equity indexes during the early days of the sell-off. But even equity market-neutral strategies – those that were meant to insulate investors against such plunges – have suffered losses.

Quant fund managers will be asking themselves what could they have done differently, and how can they learn from this period of market trauma? We offer three lessons.

One, quants should pivot from long-term forecasts to short-term 'nowcasts' by

harnessing the reams of data now available. Two, let's stop relying on backtests to produce trading ideas, and instead try to develop theories that are robust to overfitting. Three, the all-weather approach to investing has been found wanting; we need adaptive strategies that work under changing regimes.

Nowcasting over forecasting

Nowcasters use real-time data sources to predict up-to-the-minute changes in relevant financial variables. Like birds that flee an impending storm, nowcasting is an early-warning system.

Days before the coronavirus sell-off started, there were signs that the virus was disrupting critical supply chains in China. To market **nowcasters**, the ensuing slump was a predictable outcome. Market forecasters, meanwhile, were still waiting for the latest traditional data, such as quarterly accounting statements or GDP estimates.

Today, investors have access to all manner of alternative data to inform their predictions. **Satellite images** of parking lot occupancy provide nowcasts of earnings of retailers. Nowcast signals of inflation, based on web-scraping millions of online prices every day, have been found to be more accurate than the forecasts derived from complex econometric models. It's time for quants to pay less attention to crystal balls and add nowcasting to their arsenal.

Marcos López de Prado

Develop theories, not trading rules

There is a common fallacy in quant finance that backtesting is an effective way to develop investment strategies. It isn't. Backtesting can only tell you if a trading rule has economic value; it can't tell you whether the underlying theory is correct.

To develop theories without backtesting, we need analysis methods that demonstrate a stronger link between cause and effect. Microstructural theory is

one such method. Take, for example, the premise that liquidity imbalances precede panic-selling, as happened during the Covid-19 sell-off and the flash crash of 2010. Microstructural theory **tells us** that imbalanced order flow selects market-makers who initially maintain prices by providing liquidity in the form of bids, but eventually become sellers themselves, causing sharp price falls.

To test this theory, we can investigate which market-makers lost money during these panics, whether they monitored for order flow imbalance, and we can search for evidence of their sudden retreat in the Fix messages of those days. No historical simulation of a trading rule – in other words, a backtest – can provide us with this level of insight.

In science, testing plays a critical role in attempting to refute a false hypothesis. In finance, however, researchers have used backtesting for the opposite objective: namely, for building a hypothesis. This has led many to conclude – **wrongly** – that backtesting is part of the research process, instead of part of the validation process.

Avoid all-weather strategies

Academics and practitioners usually search for investment strategies that would have performed well across many different market regimes: during times of high rates or low rates, bear markets or bull markets. That search implies that such strategies exist. But why would that be the case? Why would that source of alpha exist continuously, regardless of underlying markets and economic conditions? To quote Napoleon Bonaparte: "One must change one's tactics every 10 years if one wishes to maintain one's superiority." We all know what happened to him when he stopped following this advice.

This "all-weather" assumption is not necessarily valid, as demonstrated by the fact that many hitherto successful funds have floundered in a zero-rate environment, and more recently, during the coronavirus crisis. Given that markets are constantly changing, and investors learn from mistakes, the likelihood that genuinely all-weather algorithms exist is rather slim – an argument often wielded by discretionary portfolio managers. Even if they did, they're likely to be a small subset of the algorithms that work across one or

more regimes.

Instead, asset managers should focus on searching for investment strategies that perform well under defined market regimes. We can define each regime using a particular data-generating process. We can nowcast the probability that current observations are being drawn from each process, and use those probabilities to **build** an ensemble portfolio of those optimal strategies. Think of it as a menu of strategies for suitable moments.

Alex Lipton

As these probabilities shift from one data-generating process to another over time, the ensemble portfolio is dynamically adjusted and adapts to prevailing market conditions. For example, during the coronavirus sell-off, the ensemble portfolio would have reduced allocations to models optimised for economic expansions and increased allocations to models optimised for economic recessions and market turmoil.

Adversity can sometimes breed opportunity. We hope the quant community will use the Covid crisis as a chance to rethink orthodox models. Perhaps tomorrow's strategies will better exploit data, align with scientific methods, and prove themselves adaptable to changing circumstances.

Alex Lipton is chief technical officer at Sila and visiting professor and Dean's fellow at the Jerusalem School of Business Administration, the Hebrew University of Jerusalem. Marcos López de Prado is chief investment officer at True Positive Technologies and professor of practice at Cornell University.