



A conversation with  
"Quant of the Year  
2019" Marcos López  
de Prado

Marcos López de Prado has been named “Quant of the Year 2019” by The Journal of Portfolio Management, for his numerous contributions to the field of financial machine learning. He has just launched “True Positive Technologies,” a firm that develops machine learning algorithms for institutional investors. We sat with him to discuss the state of quant.

### **Do quantitative investments work?**

Before I answer that question, we should differentiate between math-quant and econ-quant firms.

Math-quant firms are those founded and led by mathematicians, physicists, computer scientists, engineers, etc. They include the best performing hedge funds in history, with Sharpe ratios often in excess of 2: Renaissance Technologies, Two Sigma, DE Shaw, Capital Fund Management, TGS, PDT, Citadel, etc. They apply a wide range of cutting-edge statistical tools, including machine learning. Math-quants are empiricists, not dogmatists: they derive theories from their rigorous analysis of large amounts of data.

Econ-quant firms are those founded and led by

economists. Their quantitative toolkit is mostly comprised of econometric analysis and other classical statistical methods. Their studies often follow a familiar process: form a theory, select a dataset, run thousands of linear regressions, report the result with the lowest p-value. Their findings are prone to selection bias (reporting only positive outcomes, while not disclosing all failed experiments) and confirmation bias (testing only hypotheses suggested by theories). Because of these biases, most discoveries in financial economics are false. Their performance so far has disappointed investors in general, even when their goal was only to deliver Sharpe ratios between 0.5 and 1.

To learn more about the differences between math-quants and econ-quants, read [“Finance as](#)



What's the difference between machine learning and traditional econometric tools used in finance and why do some machine learning funds continue to fail? We asked Marcos López de Prado, CIO of True Positive Technologies, and Professor of Practice at Cornell University.

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[an industrial science](#)” and [“Who needs a Newtonian finance](#)” (with Prof. Frank Fabozzi).

### **Does factor investing work?**

Yes, but not in the way that it is often implemented by econ-quant firms. First, individual economic factors do not work equally well under all financial regimes. There are no all-weather factors, and it is important to weight factors according to their

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Prof. Marcos López de Prado, Cornell University

idoneity under the prevailing financial regime. Recognising those regimes requires machine learning techniques. Second, most of the alpha comes from unstructured datasets, precisely because they are hard to model. The complexity of these datasets is beyond the grasp of Econometrics. The most profitable economic factors are the ones uncovered through machine learning. See my presentation "[The 7 Reasons Most Econometric Investments Fail](#)" for additional examples of how econometric methods have led to false investment strategies.

### **Isn't it true that some econ-quant firms have started to experiment with machine learning?**

According to the press, yes. But I suspect that many of these public announcements are primarily a marketing ploy, in an attempt to appease investors after years of mediocre results and pressures to reduce fees. There are two reasons for this reluctance to modernise. First, for years some quant-econ firms have publicly criticised machine learning, based on their false belief that it is a black box. It is hard for them to acknowledge their obsolescence. Second, young economists are willing and eager to apply modern statistical tools, however the old guard within quant-econ

firms has an agency problem. They perceive modernity as a threat to their authority and status. In this internal struggle, the leadership may undermine or backpedal the modernisation effort, in order to preserve the balance of power.

### **What's the future of econ-quant firms then?**

Unattractive, unless they undergo a methodological revolution. I stress the need for a revolution, because an evolution is too little too late. Given the lackluster performance of econ-quant firms, investors will continue to drive management fees towards zero, which means that these firms have a shrinking budget for research. With diminishing revenue, they will not be able to attract and retain top talent, which will hinder their modernisation, leading to further underperformance and fee compression. It's very hard for them to escape this vicious circle. With external help from machine learning experts, a few econ-quant firms may be able to change course and succeed. The rest will go down the path of Kodak.

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## What should institutional investors do?

Given the above, institutional investors have three alternatives: First, invest in math-quant firms. This is not an ideal solution for all institutions, because their products can be expensive, shared among many clients, and opaque. Second, invest in strategy factories: firms that develop customised investment strategies and sell their signals. Because investors keep the custody of the assets, strategy factories are extremely cost-efficient, and they can offer good performance at very low fees. Customisation provides differentiation, and no-custody means full portfolio transparency. Third, insource investment processes. By this I mean running in-house processes that are typically outsourced to quant managers. For example, research typically consumes only a small fraction of the costs of quant asset managers, yet, when you think about it, everything else they offer is redundant. Firms that insource investment processes could achieve a 90% reduction in costs. I believe that's the future of finance for institutional investors: To disintermediate the industry by empowering firms through insourcing. Machine learning enables all of the above.

## Is that why you founded True Positive Technologies?

Yes. Beyond all the hype that surrounds AI, ML algorithms produce demonstrably better solutions than traditional quant approaches in 10 critical investment problems. For years, investors have asked me why I hadn't launched a firm to offer these state-of-the-art solutions to investors. Following the sale of some of my patents last April, I have finally accumulated the capital I needed to satisfy their demand. The feedback we've got so far is extremely encouraging, and we have a strong pipeline of projects involving some of the largest institutional investors worldwide. Traditional asset managers cannot compete with our fee structure, because research is our only cost: investors pay exactly for what they need, without redundancies. The mission of True Positive Technologies is to help bring asset management into the 21st century.

*Prof. Marcos López de Prado is the CIO of True Positive Technologies, and a professor of practice at Cornell University's School of Engineering. For more information about his research, visit [www.TruePositive.com](http://www.TruePositive.com) and [www.QuantResearch.org](http://www.QuantResearch.org)*

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