

The Quants

By Michael Edesess

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My history of trying – with almost, but not quite complete success – to keep my distance from the world of “quants” goes back almost 40 years, to my first job in the investment world.

But it might go back almost 50 years. As a 16-year-old freshman at MIT, I engaged frenetically in all manner of games of skill for money, letting off the steam generated by the highly stimulating process of learning physics, chemistry, literature, philosophy and even religion at that extraordinary institution.

We not only played hours upon hours of fiercely competitive bridge and poker, always for money, but also juiced-up cribbage – with 12 cards in a hand instead of six – and Monopoly, in which we discovered that by forming a conspiracy, two players can force out another, then go head-to-head for the jackpot.

This was merely an outlet, though, and a time-waster. You had to be careful to rein in the urge to do it or you would neglect your studies and flunk out.

If someone had told me I could keep on doing this and wind up in a respectable profession, it would probably have cut my world view out from under me.

In fact, that has happened.

The quants of *Wall Street Journal* writer Scott Patterson’s book, “The Quants”, are exactly those fiercely competitive poker and bridge players, of which I was one at age 16, gone on to make an unthinkably luxurious living at it, in a highly respectable (at least until just recently) profession.

The contrast between my studies in my courses at MIT and our games for money in the basement was stark. One activity was filled with meaning, every day an adventure in finding out things about the world – the derivation of the laws of general relativity one day, the next a demonstration in two small beakers in a gigantic lecture hall filled with 300 students of a chemical reaction so endothermic that everyone in the room suddenly felt chilled, and the next a revelation of the poems of Emily Dickinson, and of “Waiting for Godot.”





The other activity was utterly meaningless. It was rumored that a couple of the more close-vested poker players actually made their tuition each semester that way, but of course, the whole purpose was to attend school.

I still think these activities are meaningless. Not only that, but I think that, of the quants who engage in them, only a very, very few actually make money, in the sense that we would have made money back in that basement in college – by beating the other players. The rest of them, I believe, the overwhelming majority, make money because of the fees charged by their companies, and because of the arcane and sophisticated images they help their companies to project, the better to charge high fees.

Even the ones who make money by beating other players often make it through a kind of trickery, if admittedly, the kind I would have been proud of in that basement in college.

For example, one of the quants Patterson celebrates in his book “won a stock-picking contest sponsored by *Newsday*, beating out five thousand other contestants... His winning strategy was a primitive form of arbitrage: he shorted big gainers while picking beaten-down stocks he thought could rise sharply.”

In other words, he chose a strategy with the potential either to win bigger than any other contestant, or to lose bigger, thus upping his probability of winning the prize from one-in-five thousand to fifty-fifty.

This is the kind of genius that is lauded in the book. And certainly, it is a form of genius. But is it laudable, if it is only used to execute more of the same kinds of tricks? In all-out war perhaps it might be. But what if the purpose is only to purloin money from other poor pigeons who aren't as tricky because they are the staid managers of pension funds?

More than a few nits to pick

When I saw that a book had been published called “The Quants” I thought that I would have to read it. Perhaps it would be interesting to read about the more-or-less brief points of attachment I have had with the quant world over the last 40 years, and to find out more about what it has been doing lately.

It did help with that, though it is a flawed book. For one, it is laced with misplaced hyperbole, but moreover, it suffers from factual inaccuracies, as I will make clear.

Before reading it I even thought twice because I had first read an excerpt in a column in *The Wall Street Journal*. The column was drenched in the hyperbole that seems, for some reason, to be obligatory when talking about quants in the investment field: “brainy math whizzes”; “theoretical breakthroughs in the application of mathematics to financial markets”; “brain-twisting math”; “superpowered computers”; “advances that had earned their discoverers several shelves of Nobel Prizes”.



It's enough to make you want to rush off for a heart-to-heart conversation with Nassim Taleb. The book, nonetheless was initially interesting. In the end, it was still interesting, especially for one who knows the field, even though it was filled with errors, silly language, and poor explanations. For example, in one place Patterson confuses Benjamin Graham's (and Warren Buffett's) "[Mr. Market](#)" with his opposite, calling Mr. Market "that all-knowing wise man" when in fact Graham used him to depict the whimsical, and often wrong vagaries of public opinion. In another he gives a poor explanation of the so-called "Gaussian copula" used to estimate CDO prices and default probabilities, and even mischaracterizes Gauss himself.

In another place Patterson describes a telephone call in which the caller, Frank Meyer, says something, "his gruff, no-nonsense voice booming over the line." I know Frank Meyer, and he does not have a gruff voice and it does not boom.

There are larger errors. For example it says, "theoretical breakthroughs in the application of mathematics to financial markets, advances that had earned their discoverers several shelves of Nobel Prizes, [were applied] to the highly practical, massively profitable practice of calculating predictable patterns in how the market moved and worked."

This is essentially false. The Nobel Prize-winning theories pretty much all rest comfortably with a random walk model of the market, and can't be applied to calculate predictable patterns in how the market moves. Yet this misconception seems often to prevail.

It is belied especially by Patterson's statement about one of the most successful hedge fund managers at beating the market, Jim Simons' Renaissance Technologies. Patterson writes in a separate place that "Renaissance was also free of the theoretical baggage of modern portfolio theory or the efficient-market hypothesis or CAPM." So – surprise – the most successful manager didn't use Nobel Prize-winning theory at all.

But this brings us to the big question that everyone is so interested in – perhaps for good reason.

Is it possible for quants (or anyone else) to beat the market? Is there alpha?

Piranhas

Well of course there is. Everybody knows that – especially efficient-market theorists. For the market to become efficient, there have to be inefficiencies to arbitrage away. The question is not whether they exist, but whether they are large enough, persistent enough or predictable enough to make any real money, especially if you're not a market insider with nearly zero cost of capital and zero fees.



Patterson uses a good image to depict this problem: piranhas. “The process of injecting new information – a lousy earnings report, the departure of a CEO, a big new contract – is like tossing a juicy piece of fresh meat into a tank of piranhas. Before you know it, the meat has been devoured.”

The key is, of course, “before you know it.”

Well, not before you know it, if you’re a piranha.

Patterson identifies at least a couple of known piranhas. It is interesting that they’re both actual mathematicians.

One is Ed Thorp. Thorp was early in identifying a winning strategy, which came to be known as convertible bond arbitrage. He even publicized it, and it became the basis for a whole school of hedge fundery. Thorp also knew to quit doing something when there were too many others doing it.

The other is Renaissance Technologies. The key to its strategy, it appears – what can be known about it anyway, since, not surprisingly, they’re not talking – is diligent and intelligent data analysis. “You discern phenomena in the market. Are they for real? That’s the key question. You must make sure it’s not model error or just noise.”

But isn’t that what one supposes every hedge fund manager, every proprietary trader, is doing – diligent and intelligent data analysis?

No, I’m afraid not. Data analysis there is a-plenty. But intelligent, precious little.

One problem – aside from the problem that only so many piranhas can be fed by the available meat, not a thousand times that many – is that there are too many pseudo-mathematicians in the field.

Most of the people schooled in “financial engineering” know concepts such as Ito’s lemma and regression analysis and various other formulas. But they don’t know, or at least don’t know well, their underpinnings. They’ll throw regression analysis at a problem before they even think it through, often getting spurious results. Then if they get results, they don’t think those through to try and determine if there’s really a reason for them, or whether they’re just a statistical fluke. Then even if they conjure a reason for them they don’t think through whether and how long the phenomena can continue, and why.

Most of the pseudo-mathematicians don’t really know the difference between a discrete process and a continuous process, and when it is reasonable to believe that a continuous process can be assumed for theoretical purposes because the (real-world) discrete process converges to it, and when it is not.



And they don't know basic probability theory well enough to apply simple forms of it that don't rest on too many assumptions, and that would be more transparent to practical analysis. Instead, they revert rapidly to the more "sophisticated"-looking, but more opaque, techniques of regression analysis or Ito's lemma, or the like.

The field doesn't discipline this sloppiness. Even the "best" journals publish papers with mathematics that is poorly defined and in many cases outright wrong. The checks are not good enough to winnow out the sloppiness and errors, and there's no incentive to do it. In financial corporations quants have a fiefdom in which they can operate without a real quant ethical discipline. In fact they do things that they think professionally unethical all the time – like gaming the ratings systems, for example – because it is standard practice.

The most egregious example in recent history, among many, of quants using pseudo-mathematics to achieve a result that is impossible with real mathematics was its use to procure AAA ratings for the top tranches of "CDOs-squared." These were nothing but repackaged BBB-rated (low quality) mezzanine tranches from the original CDOs.

The BBB-rated mezzanine tranches of the original CDOs were deemed to have a much higher probability of default than a AAA rating requires. But by bundling many of these BBB-rated mezzanine tranches together, the quants went ahead and assumed they would get the benefit of "diversification," improving their quality because of the low correlation among the tranches being bundled.

But the trouble was, each mezzanine tranche in the package was already highly diversified, consisting of in some cases 10,000 loans. To take credit again for further diversification and low correlation was absurd – not just in practice, but mathematically absurd.

The problem is, I think, stated clearly in an [article](#) by *New York Times* business writer Joe Nocera about retiring hedge fund manager Neil Barsky, a former *Wall Street Journal* reporter:

One of the things that struck him when he first started working on Wall Street, he said, was "how compensation-oriented Wall Street is. When I was a journalist, I could get rewarded in 100 ways, including being on Page One. Wall Street is the other extreme. There is a singular focus on compensation that is simple, it is clean, but ultimately it is unhealthy."

Why should you do things right when you're making gobs of money anyway, and people – and books – think you are highly sophisticated and worship you with hyperbolic language?

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