



The Black Swan Says We're Birdbrains

Investors spend a lot of time thinking about risk management, so it's a little unsettling to have a profound thinker tell you that everything you think you know about the topic is dead wrong. That's the basic storyline of a fascinating new book

by quantitative trader and erstwhile philosopher Nassim Nicholas Taleb called *The Black Swan: The Impact of the Highly Improbable*.

The title of the book refers to a classic problem in the theory of knowledge: millions of observations of white swans cannot prove the proposition that "all swans are white." However, the observation of just one rare bird – the Black Swan – can handily disprove it. The book argues that in many important areas of life – and especially in finance – supposedly rare Black Swan events occur far more frequently than we tend to expect. When they do, they are likely to have very large impacts. Consider October 19, 1987, or September 11, 2001.

More interestingly, Taleb argues that human beings are poorly equipped to think rationally about risk management in a Black Swan world. That's because we are wired to concoct explanations for shocking events after the fact, making them seem explainable and predictable. So we perennially underestimate risks because our minds trick us into thinking the world is far more predictable and understandable than it actually is.

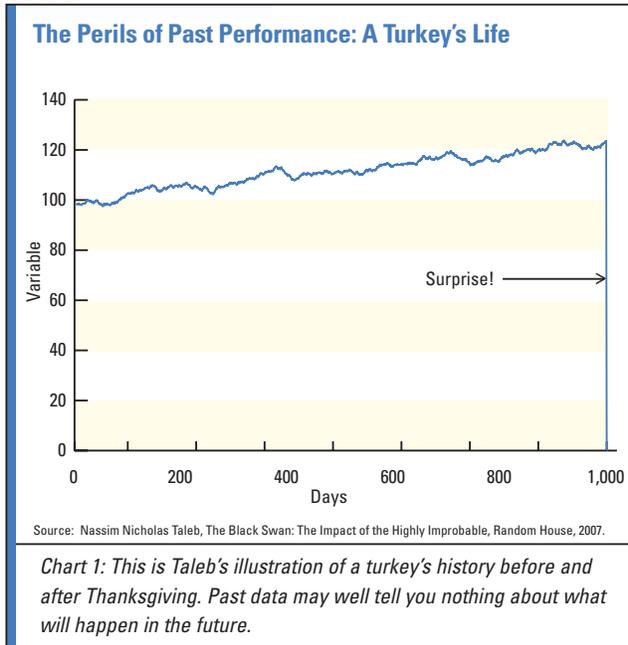
While those observations may not seem especially startling – everyone knows various unforeseen crises happen from time to time – Taleb uses them to launch a savage attack on the conceptual foundations of risk management in the financial industry. In the process, he heaps scorn not only on humble practitioners, but also on Nobel Prize winners ranging from Paul Samuelson, the dean of mathematical economics, to William Sharpe, whose financial theories have helped revolutionize the investment business.

The attitude of the author – which can be summed up as "I am brilliant and nearly everyone else is an idiot" – does grate after a while, though it helps to make for a lively read. However, one is tempted to cut Taleb some slack in this regard given that his critique of the way the financial industry analyzes risk is quite compelling. Alas, he does appear to be a very clever fellow even if it is not true that everyone else is a birdbrain.

Why Investors May Be Like Turkeys

As investors, everything we know about financial markets is based on looking out the rear-view mirror. Investors intensely study past data patterns and from such data draw inferences about the future. For example, since stocks have tended to go up two-thirds of the time in the past, it is highly tempting for investors to assume that the same pattern will hold in the future. This is basic learning by induction. Drawing conclusions from recent experience is almost certainly hard-wired into human beings because such a mindset probably helped many of our ancestors avoid being eaten by tigers.

However, in a world of Black Swans – that is, rare events with large consequences – such a mindset can set us up for disaster. Consider the case of a humble turkey. As shown in Chart 1, the short life of a turkey provides a pattern of very consistent data points followed by one very significant event. Every day, from the beginning of its life, the farmer feeds the turkey and the turkey tends to gain weight. After several weeks of this experience, the turkey might be forgiven for thinking, "The farmer is my friend; he brings me food every day." After several months, the turkey's belief can be expected to grow



even stronger – “The farmer is truly my friend; he brings me food every day and has never failed to deliver.” A backward look at the turkey’s cumulative feed (or weight) chart would certainly confirm the bird’s benign view of his keeper. With just a bit of random variation, the turkey’s weight progresses steadily – at least until the day before Thanksgiving. Then something surprising happens to the turkey.

Taleb argues that much of the financial industry’s obsession with using past performance data to justify expectations about the future is as misguided as the turkey’s warm feelings toward the farmer. For example, the new investor in a hedge fund might say to himself, “The hedge fund manager is my friend; he brings me extra returns every month.” After several years, the investor might say, “The hedge fund manager is truly my friend; he brings me extra returns every month and has rarely failed to deliver.” The risk, of course, is that something surprising happens to the hedge fund. And as we pointed out in our December 2006 World Report (“Dinosaurs and Derivatives”), there are many potential abuses of derivative securities that permit managers to provide relatively steady excess returns until a rare bout of volatility – a Black Swan event – wipes out the strategy.

Modern Portfolio Theory – Not Too Sharpe?

A key problem for investors is that backward-looking measures of risk versus return, such as the ubiquitous Sharpe ratio, will give absolutely no indication of the risk of a Black Swan event and may give investors a large degree of false comfort about their risk profile. In Taleb’s view, investors who rely on such risk measures are like turkeys ready to be plucked. This view leads him to absolutely scathing indictments of the process for selecting Nobel Prize winners in economics. Here are a few of his selected observations on this topic:

“But the committee has gotten into the habit of handing out Nobel Prizes to those who ‘bring rigor’ to the process with pseudo-science and phony mathematics. After the stock market crash, they rewarded two theoreticians, Harry Markowitz and William Sharpe, who built beautifully Platonic models on a Gaussian base, contributing to what is called Modern Portfolio Theory. Simply, if you remove their Gaussian assumptions...you are left with hot air.”

“So the Bank of Sweden and the Nobel Academy are largely responsible for giving credence to the use of Gaussian Modern Portfolio Theory as institutions have found it a great cover-your-behind approach. Software vendors have sold ‘Nobel-crowned’ methods for millions of dollars. Oddly enough, everyone in the business world knew that the idea was a fraud, but people get used to such methods.”

“So the Gaussian model pervaded our business and scientific cultures, and terms such as sigma, variance, standard deviation, correlation, R-square, and the eponymous Sharpe ratio, all directly linked to it, pervaded the lingo. If you read a mutual fund prospectus, or a description of a hedge fund’s exposure, odds are that it will supply you, among other information, with some quantitative summary claiming to measure ‘risk.’ That measure will be based on one of the above buzzwords derived from the bell curve and its kin. Today, for instance, pension funds’ investment policy and choice of funds are vetted by ‘consultants’ who rely on portfolio theory. If there is a problem, they can claim they relied on standard scientific method.”

In short, Taleb has gazed at the emperors of modern finance and observed a shocking degree of exposed flesh. In his not-so-humble opinion, the entire group stands buck naked.

Welcome to Extremistan – or the World of Harry Potter

Taleb's use of the word "Gaussian" as a pejorative term refers to the great mathematician – and father of the bell curve – Carl Friedrich Gauss (whose portrait and beloved bell curve used to appear on Germany's 10 deutschmark bills). Taleb devotes an entire chapter to "The Bell Curve, That Great Intellectual Fraud," but kindly exempts Gauss himself from his vitriol. It has been the misuse of the bell curve that is the target of his scorn, not the mathematical construct.

Indeed, Taleb will grant that in many circumstances, in the land he calls Mediocristan, the bell curve is a reasonably accurate description of reality. For example, consider the distribution of human beings by weight or height. In a room full of 50 people, if a particularly large person joins the crowd, the average height or weight (or its variation) will hardly change. In that circumstance, measures like the average weight or its standard deviation are quite good descriptions of reality.

However, consider other aspects of reality like the distribution of wealth or the distribution of book sales or Hollywood box office receipts. This is the land Taleb calls Extremistan. With respect to the distribution of wealth, for example, extreme individuals can make the concept of averages or standard deviations almost meaningless. In a room full of 50 people, the entrance of one large individual barely changes the average weight or height. However, the entrance of someone like Bill Gates will render the group's average income and its standard deviation quite meaningless. Likewise, among a group of 50 authors, the average book sales per author will become quite meaningless if billionaire author J.K. Rowling of Harry Potter fame joins the room. The same is true for the distribution of Hollywood box office receipts, if receipts from a blockbuster like Titanic are averaged into a group of otherwise run-of-the mill movies. No wonder screenwriter William Golding heaped scorn on Hollywood executives' attempts to

predict box office revenues by shouting, "Nobody Knows Anything." In the world of Extremistan, which certainly includes financial market return patterns, Golding may well have a point.

Is Taleb's vitriol toward Modern Portfolio Theory warranted? Theorists have been well aware of the importance of extreme events – sometimes called "fat tails" in bell curve parlance. And Taleb admits in a footnote that a great deal of thought has gone into trying to incorporate the influence of extreme events into the Modern Portfolio Theory framework, even if the results have been unsatisfying. In defence of the Nobel committee, it can certainly be argued that the move to explicitly model tradeoffs between risk and return, as pioneered by researchers like Markowitz and Sharpe, represented a great leap forward from the prior state of knowledge.

That said, we think Taleb is amply justified at pointing out some of the gaping conceptual deficiencies of much of modern thinking about financial risk management. Naive reliance on Sharpe ratios as the Holy Grail of risk-return thinking could easily become problematic if a Black Swan intersects with the complex world of derivative securities. Warren Buffet has been issuing stern warnings about this possibility for several years now and his views are not to be lightly dismissed.

What's the Average Citizen to Do?

After tearing down the edifice of modern finance, what does Taleb suggest to erect in its place? Aside from praising some of his intellectual heroes, like the mathematician Benoit Mandelbrot, whose models of fractal geometry may better describe the world we live in, Taleb limits his suggestions to a few practical tips on dealing with the uncertainty of the Extremistan world we live in (See Table 1). To avoid catastrophic investment risk from a Black Swan event, he encourages investors to adopt barbell strategies that mix hyper-conservative assets – like Treasury bills and inflation-protected securities – with hyper-aggressive investments like highly geared options or concentrated venture capital investments. He suggests 85% to 90% of assets be kept in safe



Table 1: Taleb's Tips

1. Be very skeptical of forecasts and be prepared to be surprised by the future.
2. Adopt a "barbell" strategy, which mixes hyper-conservative and hyper-aggressive investments (e.g. 90% conservative, 10% aggressive).
3. Try to maximize your exposure to potential positive Black Swan events – don't try to avoid risks entirely. Positive Black Swan businesses include some segments of publishing, entertainment, scientific and medical research, and venture capital.
4. Do not try to predict Black Swan events. Invest in preparedness, not in prediction.
5. Seize any opportunity, or anything that looks like an opportunity. They are rare, and much rarer than you think.
6. The bottom line: strive to put yourself in situations where favourable consequences are much larger than unfavourable ones.

investments and 10% to 15% in extremely speculative bets. "That way," he argues, "you do not depend on errors of risk management; no Black Swan can hurt you at all beyond your 'floor' – the nest egg you have in safe investments."

Taleb also counsels extreme caution about having strong forecasts as to what the future may hold. Instead, he urges his readers simply to focus on trying to identify and benefit from asymmetric bets, preferably positive Black Swan events with huge upside. His dictum in that respect is: Put yourself in situations where favourable consequences are much larger than unfavourable consequences. That certainly resonates with our own investment process of trying to explicitly model both the upside potential and downside risk of every stock investment we consider.

What are the odds that large numbers of financial advisors or institutional investors migrate toward his recommended strategies any time soon? Slim to none, in our view, and for reasons grounded in human nature that he identifies clearly in his book. In the first place, the financial industry is firmly in the grip of the Modern Portfolio Theory paradigm, with legions of new CFAs learning the standard bell curve lingo every year. It would probably take a major Black Swan event to dislodge that paradigm – and not just the publication of a book with that title.

Moreover, Taleb amply documents the "what have you done for me lately" nature of financial markets, with most investors wanting to feel good about making a little excess return every period even at the risk of encountering a nasty Black Swan event in the future. A barbell strategy that kept 90% of assets in very conservative investments would be likely to lag its peers for many years, even if it ended up winning in the long run. As John Maynard Keynes famously said, "In the long run, we are all dead."

In this author's humble opinion, *The Black Swan* is the most interesting book about financial risk since the 1996 publication of Peter Bernstein's *Against the Gods: The Remarkable Story of Risk*. It is also an excellent companion piece to Taleb's 2004 book *Foiled by Randomness: The Hidden Role of Chance in Life and the Markets*, which is also well worth reading.

Just don't take personally the fact that Taleb thinks we are all birdbrains. The good news in the latest issue of *Scientific American* is that researchers are now revising up their estimates of how intelligent some birds actually are!

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