

THE RISKS OF SEVERE, INFREQUENT EVENTS

Too little is made of the fact that financial market institutions have been underprepared to measure, manage and price high-impact risks; indeed decision makers are actively rewarded for underestimating risks associated with low-probability events. **Nassim Nicholas Taleb** and **George A Martin** explain

There are two classes of risk. The first is the risk of volatility, or fluctuations – think of Italy: in spite of the volatility of the political system, with close to 60 post-war governments, one can consider the country as extremely stable politically.

The other is a completely different animal: the risk of a large, severe and abrupt shock to the system. Think of many of the kingdoms of the Middle East: where countries exhibit no political volatility, but are exposed to the risk of a major upheaval. The problem is that the second type of risk, which we can call blow-up risk, is far more vicious, mainly because of its sinister, hidden nature. This creepy nature is behind the inability of institutions to handle it properly. And, worst of all, the two types of risks are not correlated and one is often mistaken for the other.

The recent subprime mortgage debacle illustrates the risks faced by low-probability, high-impact events. There has been a recent surge in the discussion of current sources of potential instability, such as the difficulties in the subprime mortgage sector, collateralised debt obligations (CDOs) and other sources of leverage in the leverage buyout market, dominance of carry-trades in currency and other markets, or the re-emergence of 'emerging' markets.

But there has been little mention of some of the ways in which financial market institutions have been underprepared to measure, manage and price the serious blow-up risks. This is particularly true for credit instruments



Nassim Nicholas Taleb

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that rely on the accurate estimation not only of low probability events (in this case bankruptcy), but the even harder to estimate quantification of the joint probability of multiple events.

Compounding these challenges are intra-organisational incentives that actively reward decision makers for underestimating risks associated with low-probability events.

Ratings agencies

Perhaps an easy way to illustrate the general point is to start with mention of those experts whom much of the marketplace looks to for the evaluation of low probability events – the ratings agencies. It is relatively common knowledge that the agencies' sovereign risk ratings are a function of a relatively few macroeconomic variables, such as foreign debt to exports and default history. A recent study by Norbert Gaillard has even suggested that these variables are key to the agencies' sovereign risk perception not only in recent years, but also, at least in the case of Moody's, for the period 1918-39.

The problem, however, is that these variables do not accurately forecast sovereign defaults, though they are associated with an environment in which default is imminent or has occurred. This effect is obscured by the fact that ratings agencies tend to chase changes in risk, altering ratings after events evidencing increases or decreases in risk have occurred. People seem to pay rating agencies for psychological comfort, or, more deceptively, to justify a certain class of risk taking – apparently not for any true empirical understanding of the risks involved.

And risk-chasing is not limited to rating agencies. Market participants like

to point to market-implied measures of risk, such as option 'implied volatility', as forecasts of future risk volatility.

However, empirical evidence suggests that, for example, the implied volatility imbedded in equity index option prices is more closely associated with immediate supply and demand conditions for hedge-related instruments than any estimation of future volatility.

To the extent that there is persistence in risk, implied volatilities may appear to forecast future risk. Furthermore, for many, sometimes for technical reasons, implied volatilities do not track or summarise the risk of a high-impact crash.

Hedge fund strategies

Even what appear to be the most sophisticated of participants in financial markets, namely hedge funds, engage in trading strategies that involve various forms of betting against the high impact rare event. Many hedge fund strategies, particularly those that fall under the rubric of 'relative value', emphasise incremental, spread-oriented returns that infrequently, but periodically, suffer substantial losses, such as levered investments in subprime mortgages, oversized bets on the spreads between natural gas contracts, or long positions in the equities of announced merger targets.

Further, within each hedge fund strategy, some managers are more inclined than their peers to trade current income against the likelihood of large losses at some point in the future. Particularly for the outside observer, distinguishing this current income from income produced by skillful investment ('alpha') is difficult.

Empirical evidence developed by one of the authors of this article (George A Martin) suggests, however, that a statistically significant portion of hedge fund managers deliver incremental returns relative to their peers by pursuing precisely this kind of risk.

The term pseudo-alpha is used for obvious reasons, to describe these incremental returns that appear to be from 'skill' but are in fact from the receipt of premia associated with low probability events; as a general tendency, actuarially speaking, such premia tend to be too thin in periods of market calm, and too rich in periods of market distress.

Why do these biases persist in the



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marketplace? In many cases, it is a function of the incentives of decision-makers. For example, with most hedge funds, the bulk of compensation comes from performance fees, which allocate 20% of the fund's profits to the manager, but none of the losses. Nor is there any clawback on incentive fees paid, should the manager subsequently lose money.

As such, the performance fee represents a call option extended to the manager, and paid for by the investor, the value of which increases with the level of risk chosen by the manager. (The manager does not have the incentive to increase risk arbitrarily, as a 'large', immediate loss would cause the investor to withdraw his assets.)

The manager thus has the incentive to pursue incremental returns with low frequency losses. Because of the low

frequency of large losses, events that prove catastrophic to the portfolio are often dismissed as unforeseeable and sound good in an artful apology letter, despite the fact that, while any one such event is itself unforeseeable, the strategy itself is dependent on compensation for bearing risks of the unforeseeable.

A portfolio manager that loses substantial sums of investor money is generally protected by limited liability (and hence not required to disgorge previous compensation), and may have the opportunity to start afresh – witness the fate of the principals of Long Term Capital Management – the hedge fund's founder John Meriwether now runs JWM Partners, a hedge fund.

Clearly the problem can be generalised to governance for banks and public companies: think of two of the primary banking problems in recent US history – the 1982-84 debt crisis and the savings and loans crises of the late 1980s. In both cases, arguably, the institutions had negative equity (should their inventory be marked to market) without it leading to a meaningful penalty for their managers. Past compensation was rarely at stake with managers claiming "it was a one-off accident". The fact that we have annual (or even quarterly) windows of evaluation of executives for strategies that blow up every one or two decades is a severe aberration of the system.

Until the legal environment and markets change to an extent that portfolio managers, directors and corporate officers receive not only the benefits of performance-based compensation and the broad shield of limited liability, but are required to more directly bear the significant consequences of the low probability risks that they take, their investors, shareholders and creditors, markets and institutions will continue to shift risks on to those that do not receive adequate compensation for bearing such risks, such as lenders of last resort, consumers and the investing public. **TB**

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