

# Op risk and Black Swans

Scarce data is a well-recognised problem for the assessment of operational risk. In such circumstances, David Rowe argues, it is necessary to blend professional judgement with the available data. In doing so, however, it is crucial to counter some well-documented psychological biases in our subjective estimates of probability – and a healthy dose of humility is also advisable

Nassim Nicholas Taleb (2004) makes an interesting distinction between what he calls type 1 and type 2 environments.<sup>1</sup> He defines a type 1 environment as one where most of the contribution to randomness<sup>2</sup> comes from the body of a distribution (let's say the middle 99.9%). This broadly characterises randomness in the physical world, where the normal distribution is common. A type 2 environment is one where most of the contribution to randomness comes from a small number of extreme events in the tails. Taleb argues that our social environment increasingly resembles his type 2 classification.

If this view is correct, it has some disconcerting implications for our ability to apply classical statistical methods to social and financial data. In particular, studying the bulk of observations in the 'body' of the distribution characterising a type 2 environment does little to illuminate the few extreme events in the tails, which Taleb calls Black Swans.<sup>3</sup> This takes us into the realm of what Frank Knight called 'uncertainty' as opposed to 'risk'.<sup>4</sup> In this realm, randomness is either intractable, in the sense that no amount of data will be sufficient to estimate its characteristics, or sufficiently ill-behaved that we are unable to assess the sufficiency of the available sample. To all this must be added the common perception that these underlying distributions are not stable through time, changing especially in response to advances in computing and communications technology.

In the context of financial risk management, we certainly see such Black Swans in the area of market risk. The stock market drop in October 1987 and the sudden fall of many Asian currencies in 1997–98 are two examples among many in recent years. In the credit arena, the sudden collapse of Enron and the broader implosion of the merchant energy sector come to mind. Nevertheless, it seems to me that the problem is most severe in the area of operational risk.

## Where Black Swans thrive

Of the three traditional classes of risk in financial institutions, the distribution of losses from operational risk exhibit the most extreme outliers. Thus, while there may be



David Rowe is group executive vice-president for risk management at SunGard Trading and Risk Systems  
Email: david.rowe@risk.sungard.com

plenty of data on small day-to-day losses due to operational lapses, these don't provide significant insight into the likelihood or potential magnitude of truly colossal losses. I would argue that some headway can be made by a rigorous process for blending the implications of experienced judgement with what data is available. The core concept for doing this was first articulated over 240 years ago by Thomas Bayes in a posthumous publication entitled *An essay towards solving a problem in the doctrine of chances*.<sup>5</sup>

That said, Taleb recaps psychological research that reveals the existence of a number of systematic biases in our subjective attempts to evaluate probabilities. These often flow from the use of what psychologists call heuristics. One such is the availability heuristic, where people judge the probability of an event based on the ease with which it comes to mind. This is why people's estimation of the likelihood of a plane crash is higher immediately after the occurrence of a major, widely reported accident. In effect, people are choosing from a biased mental sample that is shaped by recent events.

Another problem is hindsight bias. Taleb paraphrases Kirkegaard to the effect that "History runs forward but is seen backward". In retrospect, we tend to overestimate how much we should have known

before an event occurred. This fosters overconfidence in how much we actually do know looking forward. The result is a systematic tendency to underestimate the potential for extreme values to occur.

## Embrace humility

In the end, it is necessary to estimate a required capital amount on the best basis possible. One reasonable way to proceed is to use actual observed losses on an industry-wide basis as a starting point for the potential range of possible adverse outcomes. This means avoiding the temptation to accept the "It can't happen here" attitude. Certainly, people at Barings or Allied Irish Bank would have said the same thing before their well-publicised losses occurred. Where judgement may be useful is in assessing the quality of an organisation's control structure relative to circumstances surrounding observed large losses. Such differences in control quality may reduce the probability of a loss, while the impact on its potential severity is more questionable.

In the end, however, a healthy dose of humility is appropriate at all levels of an organisation. As Taleb points out, the essence of Black Swans is their very unthinkability before the fact. Allowing, even encouraging, 'thinking outside the box', rather than concentrating too much on the details of specific past events, may help. In the end, however, we should be candid about the likelihood of continuing large surprises and our limited ability to anticipate them in advance. We will never be able to prevent or even predict such events. The ability to recover effectively after the fact, when the details of a specific Black Swan are known, will be an enduring requirement of good risk management. ■

<sup>1</sup> See N Taleb, 2004, *The Black Swan: Why Don't We Learn that We Don't Learn?*, page 19. This is a draft paper available at [www.foolledbyrandomness.com/blackswan.pdf](http://www.foolledbyrandomness.com/blackswan.pdf) and cited with the kind permission of the author

<sup>2</sup> Here, 'randomness' can be treated as roughly synonymous with 'variance', where that parameter exists as a well-defined finite value

<sup>3</sup> Taleb coined this term based on the long-held belief in Europe that all swans were white until the unexpected discovery of black ones in Australia

<sup>4</sup> Risk December 1999, page 57

<sup>5</sup> *Philosophical Transactions of the Royal Society of London* 53(1763), pages 370–418