The extent and timing of some events simply cannot be predicted. Instead, PROFESSOR KOSTAS I NIKOLOPOULOS and DR FOTIOS PETRUPOULOS believe we must recognise the limits of forecasting and foresight.

Predicting the *improbable*

Responding to Her Majesty The Queen's criticism of the failure to anticipate the financial crisis back in 2009, a group of influential economists from the British Academy, led by Professors Besley and Hennessy, apologised. "Many people did foresee the crisis. However, the exact form that it would take and the timing of its onset and ferocity were foreseen by nobody," the letter admitted. But what matters in such circumstances is not just to predict the nature of the problem but also its timing, it highlighted.

This brings us to the very nature of forecasting and foresight, and the much-discussed term 'black swans' coined by the controversial thinker Nassim Nicholas Taleb. Just as the discovery of the dark avian came as a shock that could not have been predicted by available data on its counterpart, Taleb's black swans are events or occurrences that deviate beyond what is normally expected of a situation. When it comes to black swans, impact and extent of damage is one thing, but timing is another; and it is quite essential.

FORECASTING VS FORESIGHT

In essence, forecasting is meant to be for the things that can be forecasted – oxymoron as it is. Foresight, therefore, refers to those events that are more long term, but to some extent can be forecasted or controlled. As the mathematician John von Neumann wisely put it: "All stable processes we shall predict. All unstable processes we shall control." We name what's left black swans and we learn to live with them, or just ignore them – that is a more reasonable way of living nowadays. But do we learn anything from those events?

To that end we tried to capture the lessons learned from the financial crisis, and provide a manual for the next one to come (Thomakos et al, 2015), but this relates to contingency planning and proactive regulations rather than forecasting per se.

In essence, if we admit we cannot forecast the timing of these major shocks, then at least let's try to learn as much as possible from them. Let's figure out the best possible countermeasures to survive their aftermath. To that end, recent developments in banking policy and regulation are more reassuring for the future to come then was the case a decade ago, when risk-management and uncertainty were taken much more lightly.

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In the short run, though, and for the day in day out needs of the organisation, there is much more that practitioners and policymakers could do on the forecasting front, starting with:

1. Preparing an accurate set of forecasts
2. Communicating the uncertainty around these forecasts, and
3. Efficiently employing 1. and 2. so as to make informed strategic decisions.

THE 'PERFECT FORECAST'

However, dear forecast-users – practitioners, policymakers, entrepreneurs, strategists, financiers, economists etc – all of you have to understand that there is no such thing as 'a perfect forecast'. Each forecast comes with an anticipated error – a proxy of the uncertainty around this forecast. You have to fully understand this uncertainty; in fact, you have to embrace and cherish this uncertainty. But more importantly, act proactively and strategically so as to take all those countermeasures in order to cope with the consequences of this unavoidable uncertainty.

Fifteen years ago, Professor Scott Armstrong (2001) – one of the most cited academics in the world, based in Wharton, Pennsylvania – offered up a list of more than 100 principles and practices for forecasters to follow. More recently, he and colleagues developed a "golden rule" checklist (2015) of 28 operational guidelines for "conservative" forecasting. Unfortunately most of this guidance has not been embedded in contemporary forecasting software – the (in) famous Forecasting (and Foresight) Support Systems – and, as such, much of this research is not translated into practice. To make things even worse, users are very often tinkering with software parameters and bypassing the forecasting system's recommendations.

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Still, as of today, we find that most forecasting systems fail to support the application of published forecasting principles, despite the considerable empirical evidence (Nikolopoulos and Petropoulos, 2016).

Noteworthy examples of non-adopted forecasting methods include the Theta method (Assimakopoulos and Nikolopoulos, 2000), which was the winner of the M3-Competition, the biggest empirical forecasting contest, and the 2001 bias correction of the Croston's method for intermittent demand data (Syntetos and Boylan Approximation, or SBA), which is so typical in spare-parts management. We expect that the inclusion of such methods would significantly increase the performance of the automatic selection methodologies and respective software systems and will make the task of forecasting and foresight in companies a much more straightforward task.

The bottom line is that forecasting is a very challenging task that should be taken seriously; and if the task seems to be impossible, strategy should instead lead the way. CB

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