Beyond distributional analysis

*In this third in a four-part series, **David Rowe** considers the need for financial risk management to move beyond distributional analysis to weigh more qualitative considerations*

Since the mid-1980s, financial risk management has developed many complex methods for summarising and aggregating risk. These widely applied techniques are useful for managing day-to-day fluctuations. Unfortunately, in too many organisations they have blinded management to the need for analysis of an array of structural issues that come to the fore in a severe systemic crisis. The following are two of the areas demanding increased attention in the future.

Self-referential risk

Human reactions to inertia can be strangely inconsistent. On the highway, most of us respond with caution when congestion reduces our available reaction time. In financial markets, we often have the opposite response. When markets are advancing rapidly, we can easily feel compelled to get on the bandwagon so as not to miss out on the profits everyone else seems to be making. We must realise some wildly successful products and strategies can become victims of their own success. These innovations may work well when first introduced in small volumes – market liquidity is plentiful, and executing the strategy or managing the risks of a new product do not alter basic market behaviour. When practiced widely, however, the dynamics of the market itself can be altered in a way that undermines the viability of the product or strategy. Many argue, for example, that the extensive spread of portfolio insurance in the 1980s and a prevailing assumption that out-of-the-money options could be priced with the same implied volatility as at-the-money options created a self-reinforcing behavioural loop that exacerbated the stock market decline in 1987.

The law of statistical entropy

Another concept financial risk managers need to keep clearly in mind is the law of statistical entropy. One does not have to look far to see an exposition that claims implicitly (although hardly ever explicitly) that some analytical technique can squeeze more information from a set of data than it contains in the first place. Such

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claims must be dismissed in the same way we would discount claims of someone inventing a perpetual motion machine. In truth, data can never deliver more information than it contains, just as water never naturally rises higher than its source without the input of additional energy.

Ignoring this fundamental law of data can lead to attributing greater significance to model results than is warranted. An excellent recent example is the case of risk assessments for subprime mortgage collateralised debt obligations. The senior tranches of these securities were viewed as far more secure than was justified. This was more than simplistic reliance on rating agency analysis – simulation of geographically diversified portfolios of subprime mortgages, based on data covering no more than the previous 15 years, indicated a high mean default rate, but also displayed a fairly modest variance around that mean rate. The analysis could be perfectly correct technically, but it was based on underlying data that did not reflect a period of declining housing prices. As such, there was no way the model results could exhibit the magnitude of losses that actually occurred – the data could not reveal the impact of circumstances it did not contain.

There was also an element of self-referential risk involved here. By creating dramatically greater amounts of subprime mortgage debt than at any time in history, the explosion in this market set up a dangerously reinforcing feedback loop. When housing prices did experience a correction, the default rate shot up and the resulting number of foreclosures was exacerbated by the high level of subprime debt. The larger number of foreclosed properties coming on to the market put further downward pressure on prices, leading to reinforcing feedback.

Blending judgement and models

The essential lesson for financial risk management from the recent crisis is the need to broaden our horizons and begin to incorporate additional, more qualitative input into strategic risk decisions. It is not sufficient to model narrowly focused data on prices of specific instruments in isolation – the perspectives of macroeconomists and country risk analysts need to be systematically incorporated into strategic risk deliberations. This will not be easy given the highly technical training and quantitative mental perspective of many in the profession. Nevertheless, it is a step that will give those organisations that achieve it a better chance of minimising the damage from future crises. ■