

The relevance of risk and uncertainty

Their confidence in science leads some risk managers to ignore the uncertainty of markets. David Rowe argues that, in times of crisis, to be forewarned is to be forearmed

The thirst for certainty and aversion to risk are overriding themes of human history. The ancients consulted any number of oracles in an effort to know for certain what would happen in the future. In the end, though, they recognised that the gift of certainty is not granted to mere mortals.

Today we have help in the form of conceptual tools to analyse the randomness that surrounds us. In the light of such advances, it is all too easy to think that uncertainty becomes redundant. If we fall into this trap, even subconsciously, we show ourselves to be less sophisticated than the ancients. In the aftermath of the Asian crisis of 1997-98, I recall highly successful senior executives arguing for the need to analyse what went wrong so that they "will not be surprised the next time". While studying past crises cannot hurt, we need to be realistic about the potential fruits of such endeavours.

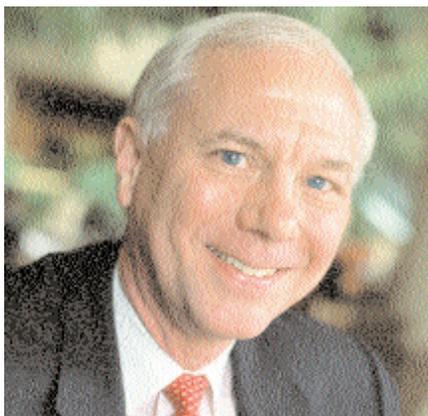
In this context, we can draw on an idea emphasised early this century by the Chicago economist Frank Knight. He drew a fundamental distinction between risk and uncertainty. Risk, in Knight's sense, is randomness that is sufficiently stable to be insurable, whereas uncertainty is not.

There is no litmus test to distinguish one from the other. Human mortality is random but clearly insurable, as the distribution of death rates within any reasonably large population is remarkably stable (barring war, plague or other calamities). Property and casualty losses are less statistically stable, but still display sufficient regularity to be insurable, albeit with greater capital requirements to cover the greater volatility of losses over short time periods.

Still less predictable contingencies, like political instability, are even more problematic. Some of these may only be insured by national governments or they simply remain uninsured.

Classic statistical methods are built on the assumption of stochastic stationarity – relative stability within random variables. A large enough sample from a stochastically stable universe will exhibit highly regular characteristics. As we move from obviously insurable contingencies to uninsurable ones, however, we move away from circumstances that fit this statistical model. Uninsurable events are non-recurring, rather than repeated fluctuations.

Not surprisingly, it is highly problematic trying to apply the statistical apparatus we use for daily risk measurement to such non-recurring events. We can tinker with the shapes of the distributions or apply some variant of extreme value theory – focusing on a worst-case scenario or tail event.



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This is likely to improve the performance of our value-at-risk models when we back-test them. But we must not lose sight of the irreducible core of unpredictable uncertainty (in Frank Knight's sense) that will not yield to statistical analysis.

So how should risk managers respond to unavoidable uncertainty? First, seasoned judgment of a mainly non-quantitative character must be introduced into our risk oversight process in a more systematic way. This means involving economists, industry analysts, country analysts and even political scientists in the discussion of contingencies and appropriate stress tests.

Such a process would see the arrival of a great deal of information that is artistic, subjective and personal. As such, the process will be uncomfortable for many risk managers steeped in rigorously quantitative methods. However, it would make a significant contribution to better risk management.

John Heimann, the former comptroller of the currency, has emphasized the importance of a strong judiciary and an independent banking oversight authority in limiting systemic risk. Yet gauging the effectiveness of such institutions is an inherently qualitative exercise. The same is true for other broad environmental issues such as political stability, the potential for exchange controls and retroactive enforcement or reinterpretation of regulations.

The potential for many crises can be recognised in advance even when the timing of such crises is unpredictable.

While the timing of the Russian default last year, for example, was certainly unpredictable, it was no secret the country was struggling to establish a stable political and legal environment. While major crises had been avoided for much of the time since the collapse of the Soviet Union, certainly the possibility of such a crisis had been present and had been recognized for many years.

Argentina has been remarkably successful in maintaining the currency peg to the US dollar by establishing a currency board. An equally impressive achievement has been the continued widespread support for this policy, apparently reflecting a deep public disgust with the instability bred by years of uncontrolled inflation. One hopes this success is sustained, but only a Pollyanna would assume it is assured. Furthermore, statistical methods will not contribute much to weighing the probabilities. Only seasoned insights into the political situation will have much to contribute.

For at least two decades, economic crises in Mexico have occurred within a year either side of presidential elections. Here is another country struggling to establish a stable multi-party democracy after some 80 years of one-party rule. It may well succeed. Nevertheless, reasonable judgment would say the potential for a crisis does exist as the next presidential election approaches, and it should not be a total surprise if one occurs.

Diversity

Second, we must realise that some crises will occur without even a reasonable basis to anticipate their possibility. In such cases, the surest source of protection is diversification. While history indicates that periodic crises are inevitable, it also indicates that they don't strike all markets and all regions at the same time. The key is to be sure that no one crisis event, no matter how unlikely, can do irreparable damage to one's institution. But be aware that correlations generally behave differently in a crisis than in day-to-day market fluctuations. Psychological contagion is a product of crisis and its behaviour is not well represented by data from more normal times. As a result, a critical eye is needed to assure that apparent diversification will hold up when markets experience extreme stress.

So, when markets are not normal:

- tinker with risk models to reflect fat tails;
- systematically incorporate judgemental inputs into analysis of potential crisis scenarios and model their impact on trading positions; and
- assure sufficient diversification, even in a crisis, to avoid irreparable damage from any one event, no matter how unlikely or unpredictable. ■