

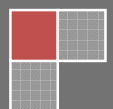
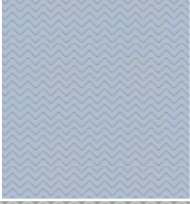
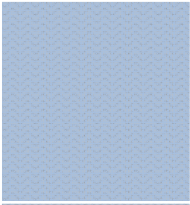
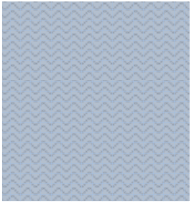
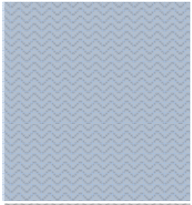
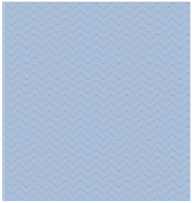
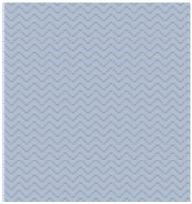


# ANALYZING CATAclysmic RISK

Debdipto Majumdar

[www.CaseStudy.co.in](http://www.CaseStudy.co.in)

Your Case Study Search Engine!



## ANALYZING CATAclySMIC RISK

We have recently experienced an unprecedented time in the global financial markets. Not surprisingly, risk managers and the techniques they employ are under fire from market participants, regulators, financial reporters, and shareholders alike. Ironically, over the last fifteen years we have witnessed significant advances in the risk management profession, from both the institutional and regulatory viewpoint.

Recent market turmoil has put risk management firmly in the spotlight, with regulators, lawmakers, industry practitioners, senior management, and the press all scrutinizing current risk management practices. Standard measures such as **value at risk (VaR)**, **sensitivity analysis**, and **historically based stress tests** have formed the backbone of risk management for a number of years, but have fallen short in terms of rigorously analyzing the extreme events that have swept through the global marketplace.

**The measures mentioned above – VaR, sensitivity analysis, historical scenario analysis and stress testing – are useful but have limitations:**

1. **Var** – It measures the minimum loss expected from a portfolio under evaluation, assuming relatively normal market conditions. Even the back testing around VaR is based upon testing that this minimum loss would indeed occur one day in a hundred (assuming 99th percentile). The problem is that the actual loss could be far deeper than the minimum, but these losses are buried deep within the ‘tail’ of the profile and go largely unobserved. A second problem with VaR is that it embeds correlations between risk factors that have shown themselves over the previous x years (typically 2 years worth of data is used). These correlations tend to break down in times of stress. The third issue is the use of normal distributions to create the scenarios. This is a huge topic in and of itself, but there is considerable evidence against the use of normal distributions for this analysis. Still, the jury is very much split on this point across the market. VaR has uses but its limitations must be taken into account. Unfortunately, many practitioners, senior managers, and regulators viewed the measurement of VaR as the cornerstone of prudent risk management practice. Risk reports offered a false sense of security with respect to knowledge of financial risks at the organization and system levels.

2. **Historical Scenarios** – This also has a similar problem. The analysis allows for the assessment of extreme events on the current portfolio composition. Unfortunately, factor correlations are consistent with the period in which the event occurred and are unlikely to have relevance to the current environment. The danger with such analysis is that it may give the risk managers and senior management undue comfort regarding the impact of extreme events and disturbances.
3. **Sensitivity analysis** – This is the final plank of standard analysis, but is inadequate as far as institutional risk management is concerned. The small movements modelled, typically one or ten basis points, are excellent measures to aid traders and portfolio managers with day to day decisions. However, they offer very little to the risk team in terms of understanding the broader risk profile when bad things happen. Why? Many instruments have built in break clauses, optionality, step ups/downs, variable FX rates and other features that remove the concept of linearity and limit the predictive power of sensitivity measures to assess portfolio behaviour under crisis.

Catastrophic Risk Analysis is designed to determine the movements required in individual and combined risk factors to generate unacceptable portfolio losses. Ideally, one would supplement this result with the pricing of deep out-of-the-money put (or call) options that would protect the firm in the event of such movements. In summary, when a market turns violently downwards, recently observed correlations disappear, with new unexpected correlations taking effect spontaneously. It is at these times of extreme stress that the focus is on the risk managers, but conversely, it is also at such times that the standard risk measures, and the assumptions on which they are based, are at their least effective. The problem of '**not knowing what is not known**' is at its most prominent. The lessons learned from such turbulence should be that risk management takes on a far more creative, investigative and experimental aspect, in addition to the standard risk measures that are designed to work under normal conditions.

**With Catastrophic Risk Analysis in place, the regular risk report would include:**

- VaR
- Sensitivities
- Historical Extreme Stresses

- Single risk factors which could cause catastrophic losses, along with the fall/rise required for such losses
- Matrixed risk factors which could cause catastrophic losses, along with the fall/rise required for such losses
- Insurance orientated option pricing designed to protect the portfolio from such losses

## **CONCLUSION**

Such a report would add extra dimensions and depth to the standard risk reporting. However, it requires systems that are able to extend beyond standard risk measures and calculate the laddered scenarios discussed above. Assuming access to these capabilities, the risk team would be able to add value and take a leadership role in times of extreme market turbulence.

www.CaseStudy.com