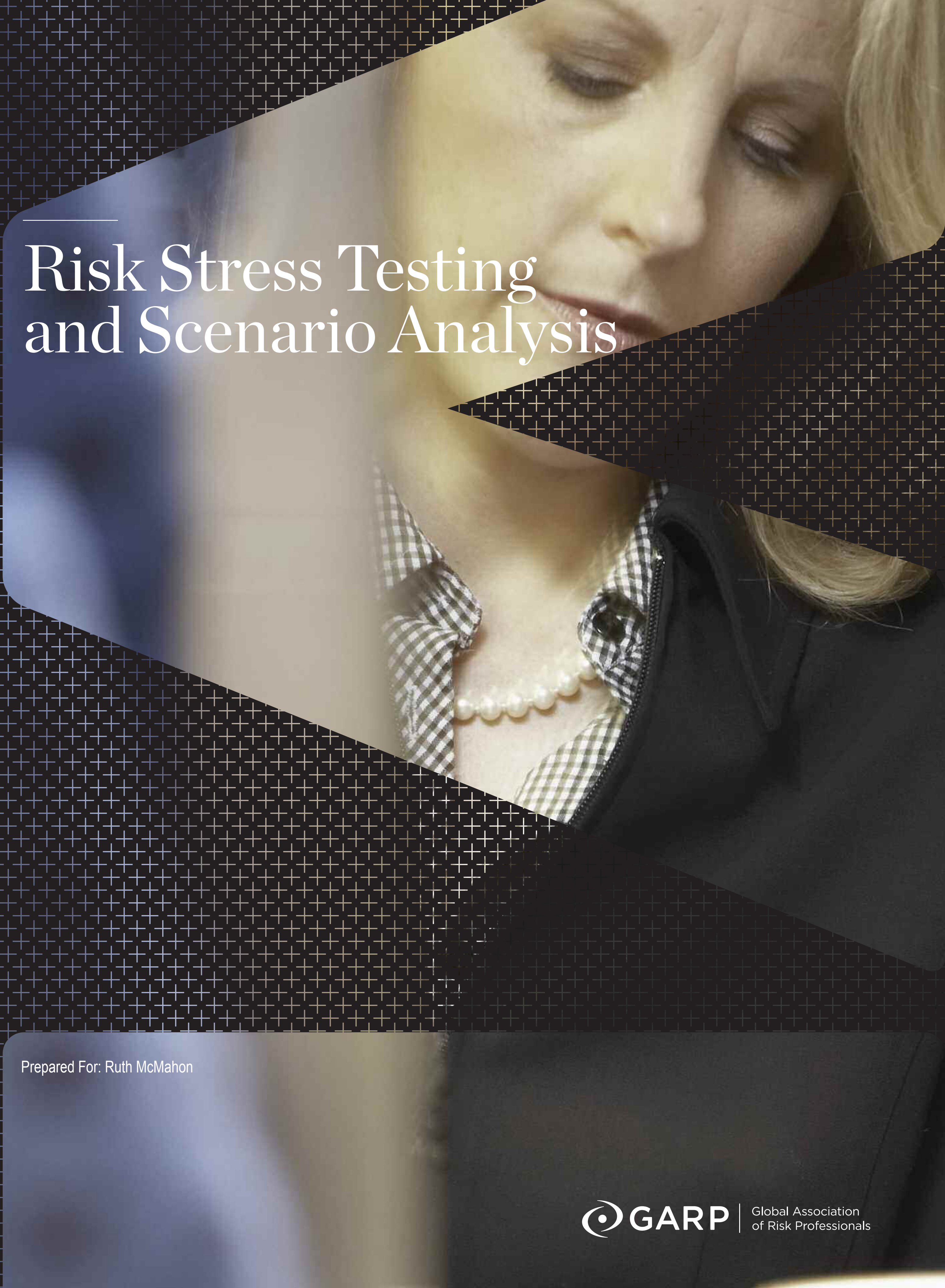
Risk Stress Testing and Scenario Analysis

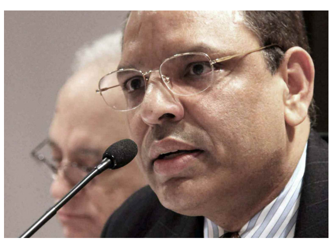


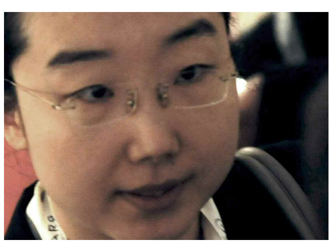
Prepared For: Ruth McMahon

GARP | Global Association of Risk Professionals

When all that could go wrong did go wrong, as in this crisis, risk managers re-evaluated the benefits of holistic stress testing of the entire financial system versus the Value at Risk (VaR) in individual portfolios.

The GARP Breakfast Briefing on Risk Stress Testing and Scenario Analysis in New York City on Wednesday, May 26, featured a wide-ranging discussion between panelists and audience members. Hosted by IBM Business Analytics, a new division of IBM Software that delivers clear, immediate and actionable insights into current performance and the ability to predict future outcomes, the briefing featured Om Arya, Senior Market Risk Specialist for the Federal Reserve Bank of New York, Peter Ciecka, Head of Risk Management for Jeffries Group, a global investment bank based in New York, Frank McKeon, Banking and Financial Markets Executive for IBM Business Analytics, and Evan Picoult, Managing Director, Risk Architecture for Citigroup. Jaidev Iyer, President and CEO of J-Risk Advisors, a consulting firm established in response to the crisis, moderated.





Several major themes emerged in the discussion, which featured extensive audience participation. Issues such as, the importance of senior management's attitude toward risk analysis, what actions risk professionals should pursue in the wake of the European debt crisis, the effectiveness of holistic stress testing versus portfolio level calculations of value at risk (VaR), the benefits of reverse stress testing, and the role of regulators, were all discussed.

Senior Management

A strong relationship between risk professionals and senior management was considered by many of the panelists and audience members as absolutely essential for stress testing, or indeed any form of risk management, to be truly effective.

"You could have the most brilliant analytics, but if neither the senior risk officer nor the CEO buys into this... you're just pushing on a string," Picoult said. "If your focus is [to] maximize revenue, and risk is just this annoyance that we have to comply with... there's not a lot that can be done." Firms with a culture of maximizing revenue independent of risk analysis will ultimately collapse, he said. Iyer referred to this attitude as the "Monday/Wednesday" syndrome. "Let's make money on Monday, let's talk about cost on Tuesday, and can you get me a risk report by Wednesday?" Speaking from the regulatory perspective, Arya saw this as one of the key problems in the last crisis. Many firms may have conducted stress tests, but failed to effectively communicate their findings to senior management, or the results were simply not considered credible by senior management, leading to situations where boards were unaware of the risks to which their firms were exposed.

"We concluded that the crisis of 2008, rather than it being one in a million, or even one in a thousand, was a one in fifty event."
—Evan Picoult, Managing Director, Risk Architecture, Citigroup

In the wake of the 2008 crisis, however, senior management may be much more willing to lend credence to stress testing scenarios, though questions remained about how best to communicate those findings with management. Picoult outlined the mechanisms employed by Citi, in which the Chief Risk Officer personally presents the results of stress tests to the board on a periodic basis. Citi also employs a risk committee for its wholesale banking business which is composed of the wholesale banking unit's head, the risk manager for the wholesale unit, and Citi's CRO, who run the stress tests on a weekly basis.

Infrastructure

McKeon emphasized the role that information infrastructure can play in communicating stress test results to senior management. "There's absolutely a need to make it easy for senior management to consume this information," McKeon said, adding that IBM is seeing demand from clients looking for ways to make access to risk information easier—"not just around the stress test, but other risk information that's critical in supporting the line of business and supporting the decision-making."

Arya agreed about the importance of infrastructure and saw its shortcomings as partly responsible for the crisis. "It was not flexible enough to quickly respond, to present the senior management with the results of the stress testing." Systems lacked the ability to accurately drill down to specific items critical to senior management's decision-making processes. "There was not enough granularity. It was not easy to trace back which business unit, which desk, which positions were contributing to the risk," Arya said. Because of this, once senior management did become engaged, many found it difficult to evaluate risk more than superficially. McKeon acknowledged the importance of data granularity, seeing it as another area in which information infrastructure can provide significant value to risk management teams. "Stress testing is obviously going to be something that you're going to be asked to do not just from a regulatory perspective but also [from] your internal management teams."

VaR vs. Stress Testing

Much of the discussion centered on comparisons between stress testing and VaR. Some participants argued that stress testing can be more effective for conveying risk to senior management. "We're asking questions of our stress test that talk about liquidity, that talk about profitability, that talk about risk, return, all of those. I think the sell becomes therefore much easier," Iyer said.

Ciecka agreed. "It's very transparent, and everybody in the firm can understand what's going on. Whereas if you look at VaR, a lot of people throw their hands up." Stress testing allows risk managers to ask hypothetical questions and enables risk professionals to run portfolios through various historical scenarios, he said. "The traction that I've gotten with the trading desk and with senior management is far, far superior."

Ciecka, though, was not in favor of abandoning VaR completely. It could

continued on back page

Current Hot Spot

Audience members were eager to discuss the implications of Europe's unfolding sovereign debt crisis. One participant asked what the appropriate protocols are for testing portfolios under current conditions. Picoult noted, "People naively assume sovereigns don't default, but any look at history shows they have and they can."

Ripple effects from the collapse of a single sovereign issuer was another aspect raised by panel members. "When you're looking at a European event or a Greek event, you have to look at it from a holistic perspective, including contagion," Arya said. This includes taking into consideration not just the immediate effects of a potential issuer default, but how such a default in one region could affect markets on the other side of the world. Market liquidity and equity prices can also be adversely affected by a sovereign debt event, such as the previous crisis in Greece, he noted. Having contingency plans prior to such a crisis is essential, Arya said. "How would you take action if the event which everybody is scared of and can happen does actually happen? Is your management fully informed in terms of where their vulnerabilities lie?"

"Even in the event that a sovereign does not default, the market can see interest rates increase dramatically, with effects on the wider economy, employment and consumer credit, panelists noted. "Then, you're also into the realm of counterparty risk," Ciecka said.

"Trying to pull that together [into] a stress test, that's a huge challenge," McKeon said. Firms will likely need to test multiple scenarios with a range of consequences, putting further demand on their information infrastructure.

be an excellent tool for evaluating risk at an interest rate desk, while stress testing works better for non-agency mortgages. Picoult agreed that risk professionals need more than one tool, and identified foreign exchange, equities and commodities as businesses that work well with VaR, while stress testing may work better in businesses more sensitive to credit spreads. Citi has designed its own metric that integrates the two methodologies into one.

Reverse Stress Testing

Reverse stress testing drew considerable attention from the audience and panel members. "While the term is new, essentially there's nothing new there at all," Arya said of reverse stress testing. In his view, firms are beginning to consider more reverse stress testing as they see other forms of analysis failing to fully capture risk.

Iyer agreed. He said he received a request for a reverse stress analysis from an executive over twenty years ago. "He really wanted the top-down story," Iyer recalled. "He didn't want 'dollar mark can go X and spot equity can go Y.' He really wanted the overall scenario, which included the political and economic considerations."

With regard to best practices for forward-looking stress testing, Picoult supported reviewing the frequency and nature of systemic breakdowns for the past hundred years, rather than confining analysis to the volatility and correlations of the past five years.

"When I first created the stress scenarios, I used recent history," Picoult said. His initial scenarios tested for situations similar to the 1987 stock market crash and the 1998 collapse of U.S. hedge fund Long Term Capital Management. "Once 2008 unfolded, we went back in history, we looked over 90 years. We concluded that the crisis of 2008, rather than it being one in a million, or even one in a thousand, was a one in fifty event. It's happened twice in the last 90 years." Citi now looks at five firm-wide scenarios: two based on severe systemic shocks, and three designed by an economist analyzing specific problems that could occur within the next 12 months. Ciecka recommended that risk managers begin by considering what can go wrong in the sectors in which they invest, which can often reveal risk in portfolios that had previously been considered safe. "We had a lot of 'Triple As,' and what this exercise really showed was that you can get hurt on your residuals, but where you're really going to take a bath is on your Triple As."

Regulatory Expectations

Panelists and audience members also discussed the role of regulators in the new environment. Arya said that regulators do not have specific scenarios mapped out for which firms would be expected to stress test. However, regulators do expect that stress scenarios should be reviewed periodically and that the responsibilities of transmitting stress tests to senior management be clearly delineated. "It's not enough for you to report the number in this and show it in an email to 15 or 20 different people. Somebody should be reviewing it and saying... what if this number became beyond what I'm really prepared to take? Can I realistically take that action? Is there enough liquidity in the market?" Arya asked.

Picoult argued that several of the safety nets that have been built into the financial system, including FDIC insurance and the Fed's monetary policy of predictably raising interest rates, have increased complacency when it comes to risk and significantly lowered capital reserve levels. Both agreed that it is ultimately the responsibility of banks to manage themselves. "Blaming a regulator... is like saying my son got hurt in a car accident because he was driving 96 miles an hour and there were no cops on the road," Arya said.

Conclusion

Many questions remain about the nature of stress testing: which methodology is best, how severe a stress one should consider, and how much capital reserve should be held against the possibility of systemic shocks. But there were several points of consensus among panelists and audience members: the importance of communication with and support from senior management, the need for robust and flexible systems infrastructures, and the value of frequent and thorough risk analysis. Although the future contains significant uncertainties, stress testing is sure to retain a significant role in risk assessment.

Creating a culture of risk awareness.™

Global Association of Risk Professionals
111 Town Square Place, Suite 1215 • Jersey City, New Jersey 07310, USA • + 1 201.719.7210
Minster House, 1st Floor, 42 Mincing Lane • London EC3R 7AE, UK • + 44 (0) 20 7397 9630
www.garp.org

GARP | Global Association of Risk Professionals