

**COMMITTEE ON SCIENCE AND TECHNOLOGY**  
**SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT**  
**U.S. HOUSE OF REPRESENTATIVES**

**HEARING CHARTER**

***The Risks of Financial Modeling:  
VaR and the Economic Meltdown***

Thursday, September 10, 2009

10:00 a.m. to 1:00 p.m.

2318 Rayburn House Office Building

**Purpose**

The Subcommittee on Investigations and Oversight on Sept. 10, 2009 convenes the first Congressional hearing to examine the role of risk modeling in the global financial meltdown. Risk models, and specifically a method of risk measurement known as Value-at-Risk, or VaR, are widely viewed as an important factor in the extreme risk-taking that financial institutions engaged in leading to last year's economic upheaval. That risk-taking has led to hundreds of billions of dollars in losses to financial firms, and to a global recession with trillions of dollars in direct and indirect costs imposed on U.S. taxpayers and working families.

Given the central role of credit in the economy, the ability of major financial institutions to operate without assuming undue risks that gamble with the stability of the financial system, thereby endangering the broader economy, is of the utmost importance to both business and the public at large. The recent behavior by financial firms that are deemed "too big to fail" suggests that the financial system as currently structured and regulated creates a "moral hazard" because firms can expect that they will be bailed out if their risk-taking fails to pay off. This is exactly what happened in the United States in October of 2008 with great consequences to the taxpayers, who have been called upon to shoulder much of the huge burden arising from financial firms' underestimation of risk, poor judgment, and profligate behavior. Relied on to guide the decisions of both financial firms and Federal regulators responsible for monitoring their soundness by ensuring that they have sufficient capital, the VaR, whether it was misused or not, was involved in inducing or allowing this situation to arise.

Given this dual function, it is critical that the Subcommittee examine: the role of the VaR and related risk-measurement methods in the current world financial crisis; the strengths and weaknesses of, and the limits to, the usefulness of the VaR; the degree to which the VaR is understood, and may be manipulated, within the institutions where it is

in use; and the capabilities and needs of federal supervisors who may be called upon to work with the VaR in carrying out their regulatory duties. From a policy perspective, the most important question is how regulators will use VaR numbers produced by firms and whether it is an appropriate guide to setting capital reserve requirements.

This is the second in a series of hearings on how economic thinking and methods have been used by policymakers both inside and outside of government.

### **The VaR's Origins and Use**

Risk assessment models in the financial industry are the product of advances in economic and statistical methods developed in the social sciences over the last fifty years. J.P. Morgan adopted these techniques in developing the VaR in the 1980s as a tool to measure the risk of loss to its traders' portfolios. The VaR could produce a single number rating a trader's (or, in aggregate, the firm's cumulative) risk of loss of portfolio value over a specific period of time at a given level of confidence. The VaR provided managers a tool that appeared to allow them to keep a handle on the risks they were taking as financial instruments became more varied and complex and as assets became more difficult to value. Morgan decided to give the methodology of the VaR away, forming the now-independent RiskMetrics Group; this resulted in the VaR rapidly becoming "so popular that it was considered the risk-model gold standard."<sup>1</sup>

To put it very simply, the VaR captures the probability of outcomes distributed along a curve—most commonly a “bell” or normal distribution. It provides an answer to the question of, “what is likely to happen tomorrow to the value of an asset?” by drawing from historical performance data. The highest probability of tomorrow's value is that it will be the same as today's value; the next highest probability is for a very small movement in value up or down, and so on. The more radical the movement in value, the lower the probability of that occurring. A manager may ask for a projection of the potential loss of an asset or portfolio at the 95% or even the 99% confidence level. At those levels, a complete loss of value is unlikely. The complete collapse of an asset or portfolio's value is not a 1-in-100 event; such a collapse is more likely a 1-in-500 or 1-in-10,000 or event. The VaR is unlikely to warn, then, of great shifts in value. The danger to the financial firm or the community comes at the extreme margins of the distribution curves produced by the VaR. As a map to day-to-day behavior, the VaR is probably pretty accurate for normal times, but for asset bubbles or other “non-normal” market conditions, the VaR is likely to misrepresent risks and dangers.

While the VaR was originally designed for financial institutions' use in-house, it has subsequently been given a key role in determining capital requirements for large banks under a major multilateral agreement, the Basel II Accord, published in 2004. That same year, the U.S. Securities and Exchange Commission adopted a capital regime

<sup>1</sup> "Risk Management," by Joe Nocera, *New York Times*, Jan. 4, 2009. J.P. Morgan was not the only firm to look for statistical tools to measure the risks of their portfolios, however Morgan's model became the most widely used. The model can be tweaked in many, many ways to meet the specific needs of a particular firm.

applying Basel II standards to the Nation's largest investment banks,<sup>2</sup> a move that has been viewed as playing a role in those institutions' subsequent over-leveraging and liquidity problems. Those financial institutions assured regulators that the VaR was a way to see the level of risk they were taking on and a low VaR justified lower reserve requirements. (The terms of Basel II are currently being re-evaluated in light of the global economic crisis.)

Along with extensive use, the VaR has come in for extensive criticism. Although its merits were debated at least as far back as 1997,<sup>3</sup> criticism of the VaR has mounted in the wake of last year's collapse of such major financial institutions as Bear Stearns and Lehman Brothers. Among the allegations: that the VaR is inadequate in capturing risks of extreme magnitude but low probability, to which an institution may be left vulnerable; that this shortcoming may open it to manipulation by traders taking positions that seem profitable but whose risks they know the VaR is unlikely to pick up, and that such "gaming" can increase extreme risk; and that use of the VaR, derided for "quantify[ing] the immeasurable with great precision,"<sup>4</sup> promotes an unfounded sense of security within financial institutions creating an environment where firms take on more risk than they would without the security-blanket of a VaR number.

Those who advocate for the VaR argue that any misuse of the model is not the model's fault and that it remains a useful management tool. VaR defenders' argue that its purpose is "not to describe the worst possible outcomes"<sup>5</sup>; that it is essential to the ability of a financial institution to arrive at an estimate of its overall risk; and that in "computing their VAR[, institutions] are forced to confront their exposure to financial risks and to set up a proper risk management function," so that "the process of getting to VAR may be as important as the number itself."<sup>6</sup> Some also argue that the VaR remains a useful tool for regulators to use as a baseline for establishing reserve requirements for "normal" times.

<sup>2</sup> "Alternative Net Capital Requirements for Broker-Dealers That are Part of Consolidated Supervised Entities; Supervised Investment Bank Holding Companies; Final Rules," Securities and Exchange Commission, June 21, 2004, 69 FR 34428-72. (According to Aswath Damodaran, professor of finance at the NYU Stern School of Business, "The first regulatory measures that evoke Value at Risk, though, were initiated in 1980, when the SEC tied the capital requirements of financial service firms to the losses that would be incurred, with 95% confidence over a thirty-day interval, in different security classes; historical returns were used to compute these potential losses. Although the measures were described as haircuts and not as Value or Capital at Risk, it was clear the SEC was requiring financial service firms to embark on the process of estimating one month 95% VaRs and hold enough capital to cover the potential losses." Damodaran, "Value at Risk (VAR)," found at <http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/VAR.pdf>.)

<sup>3</sup> "The Jorion-Taleb Debate," *DerivativesStrategy.com*, April 1997, <http://www.derivativesstrategy.com/magazine/archive/1997/0497fea2.asp>.

<sup>4</sup> "Against VAR," by Nassim Taleb, in "The Jorion-Taleb Debate," *ibid*.

<sup>5</sup> "In Defense of VAR," by Philippe Jorion, in "The Jorion-Taleb Debate," *ibid*.

<sup>6</sup> Jorion, *idem*.

**Witnesses**

*Panel 1*

**Dr. Nassim Nicholas Taleb**, Distinguished Professor of Risk Engineering,  
Polytechnic Institute of New York University.

**Dr. Richard Bookstaber**, Financial Author

*Panel 2*

**Dr. Gregg Berman**, Head of Risk Business, RiskMetrics Group

**Dr. James G. Rickards**, Senior Managing Director, Omnis Inc.

**Mr. Christopher Whalen**, Managing Director, Institutional Risk Analytics

**Dr. David Colander**, Christian A. Johnson Distinguished Professor of  
Economics, Middlebury College