

To: "Dr. Baruch Fischhoff - Chair, National Academy Committee on Improving Intelligence" <baruch@cmu.edu>

From: Lloyd Etheredge <lloyd.etheredge@policyscience.net>

Subject: The Urgent Need to Apply Behavioral Science to International Security: New Evidence + 2 Examples

Dear Dr. Fischhoff and Colleagues:

As part of your **Report**, I hope that your National Academy panel will underscore the urgent need to apply behavioral science to problems of (and new opportunities for) international security. I write to forward relevant, recent evidence in two areas:

- **Misperception and the Failure to Deter 9/11**

The following news story concerns the extraordinary misperceptions and miscalculations by Osama bin-Laden about the US response to his 9/11 attack. <1> One interpretation - which I suggested in earlier messages - is that the US government, and the Bush Administration, failed to deter the 9/11 attack. And it probably did not recognize how problematic US deterrence had become, through complex mechanisms that we are only beginning to understand. It was the kind of costly US mistake - costly to the US and to many others - that we should learn how to prevent.

- **Miscalculating Risks in Complex Adaptive Systems**

I also attach a copy of Robert Rubin's recent testimony to the Financial Crisis Inquiry Commission (4/8/2010) about his 9 mistakes, misperceptions, and miscalculations related to the national and global financial crisis. My view - which I hope the National Academy also will express in its **Report** - is that we are moving into a world of complex, adaptive systems where the mathematical databases and analysis tools used for risk assessment must be rethought. We do not know if science will save us from future catastrophic problems, but we should have an urgent (and better) rapid-learning research program.

Assuming that Citigroup - with some of the smartest and most experienced

risk-assessors in the world, and access to the available public data systems, and with operations in 102 countries - truly and dangerously miscalculated risks for itself and especially for \$43 billion of "super senior CDO tranches" [rated AAA or above], there is a huge gap in knowledge. And Rubin's nine-factor model (which interprets these as cognitive errors) omits all of the institutional and systemic variables that behavioral scientists will want to explore to explain why the Citigroup system, and the US government, failed to learn sooner and more quickly about a changing world - that still is evolving, even before new theories of complex adaptive systems have yet entered most undergraduate textbooks.

As Rubin notes, the world is changing - in unrecognized and important ways, even since the US government's recent experience with the Mexican crisis and the Asian crisis. Science provides rapid, independent checks of reality and it can be especially valuable to test and update images and knowledge of complex linkages in a changing world. In these circumstances, R-squared can be a better investment than relying only upon the intuition or the moods and subjectivities/comfort levels with their current knowledge of actors, even - as Rubin represents - the smartest and most sophisticated and experienced public officials and corporate leaders that we have.

An Added Level of Theoretical Complexity: Through the Glass Darkly Behavior in Complex, Adaptive Systems

There is an added level of theoretical complexity, that I hope you will emphasize in your **Report**: Admiral Blair's \$75 billion/year system has the new responsibility for rethinking the mathematics of risk, and more accurately and independently forecasting the dangers and policy options in the evolving global financial system. The CIA, which began to place spies in the international financial world (although for other purposes) more than a decade ago, has been specifically tasked to develop better forecasting models and include realistic political+economic estimates for briefings to the President.

This means, however, that the next generation of models probably must be models of complex, adaptive systems in which many key players - like Robert Rubin and Citigroup and even many national governments - will try to act rationally *but with too many misperceptions and miscalculations and lagging images of reality*. [I do not know if this makes a system less stable or more stable - probably, less stable] This makes forecasting trickier.

best regards,
LE

Bin Laden had no clue about 9/11 retaliation: report

Last Updated: 3:05 PM, April 27, 2010. The New York Post

Posted: 3:01 PM, April 27, 2010

Osama bin Laden did not expect the United States to strike back at al Qaeda as hard as it has following the Sept. 11, 2001 attacks on the U.S., WTOP Radio in Washington, D.C. reported Tuesday, citing a former bin Laden associate.

"What happened after the 11th of September was beyond their imagination," Norman Benotman, who was the head of the Libyan Islamic Fighting Group in the summer of 2000, told WTOP in an interview.

Benotman said al Qaeda was overly confident based on the U.S. response to the terror group's attacks on embassies in Kenya and Tanzania in 1998.

"I'm 100 percent sure they had no clue about what was going to happen," Benotman said.

A former CIA official, on the condition of anonymity, backed up Bentoman's assertions.

"Several captured terrorists have said publicly that al Qaeda never expected the towers to fall. Their goal was to frighten people and impact the U.S. economy, so they really didn't plan for the massive response the U.S. launched," the official said.

Notes

<1> The longer story - online at www.wtopnews.com, the local all-news radio station in the Washington, DC area discusses - why some CIA analysts believe Benotman was well-informed. It also includes a dissent, from the former CIA analyst Michael Scheuer, who rejects a misperception hypothesis and believes conflicting evidence that Osama bin Laden wanted "exactly" the US response that he pro-

voked. The long-term task of sorting-out the evidence is one of the reasons to have a sustained research program. Osama apparently was warned by some associates about the possibility of a violent and highly public US response, but he may not have listened or believed them - which, as I understand it, is Bentoman's claim.

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Testimony by Robert E. Rubin
Before the Financial Crisis Inquiry Commission
April 8, 2010

Chairman Angelides, Vice Chairman Thomas, and distinguished members of the Commission.

I appreciate the opportunity to testify today. The financial crisis has taken a terrible toll on millions of Americans who lost their homes, their jobs, their savings, and their confidence in our economy. Better understanding the causes of the crisis is essential to protecting our nation's economic future and to effective financial reform.

I hope my experience – at Goldman Sachs, the National Economic Council, the Treasury Department, Citigroup, and as chair of LISC, our nation's largest inner city development organization – can be helpful to this inquiry.

Let me make two observations relevant to the Commission's work. First, examining problems with the benefit of hindsight can be highly useful. During my time at Treasury, we addressed two major economic crises: the Mexican crisis, and the Asian crisis. While our approaches worked on the whole, we still learned a lot from looking back at what happened.

Second, as policy makers address financial reform, it is important to remember that our national economic policies enormously affect all of us. For example, President Clinton undertook deficit reduction and made critical public investments, and those policies contributed to the longest economic expansion in American history. Simply put, policy matters.

With those thoughts in mind, let me turn to the causes of the financial crisis:

While I had thought for some time prior to the crisis that markets, including the market for credit, had gone to excess, and that those excesses would, at some unpredictable point, lead to a cyclical downturn, this is not what happened. Instead, we experienced the most severe financial and economic crisis since the Great Depression. In my view, the crisis was not the product of a single cause but of an extraordinary combination of powerful factors operating at the same time and feeding each other.

To name just a few of those factors: market excesses; low interest rates – due notably to large capital inflows from trade surplus countries – which contributed to excessive risk-taking by lenders and excessive borrowing by businesses and consumers; a sharp rise in housing prices, also contributing to increased consumer leverage; a subsequent, precipitous drop in housing prices; vast increases in the use and complexity of derivatives; misguided AAA ratings on subprime-mortgage based instruments; lax and abusive mortgage lending practices; shortfalls in regulation; high levels of leverage in financial institutions joined with deteriorating quality in asset purchases; and much else.

A few market participants or analysts saw the broad picture and the potential for a mega crisis. A larger number saw one or some of these factors but no more. Almost all of us involved in the financial system, including financial firms, regulators, rating agencies, analysts, and commentators, missed the powerful combination of forces at work and the serious possibility of a massive crisis. We all bear responsibility for not recognizing this, and I deeply regret that.

* * *

Let me now turn to Citigroup more specifically. My role at Citi, defined at the outset, was to engage with clients across the bank's businesses here and abroad; to meet with foreign public officials for a bank present in 102 countries; and to serve as a resource to the bank's senior executives on strategic and managerial issues.

Having spent my career in positions with significant operational responsibility – at Treasury and Goldman Sachs – I no longer wanted such a role at this stage of my life, and my agreement with Citi provided that I would have no management of personnel or operations.

I remained at Citi until January 2009, and so was present when Citi's problems occurred. In my view, there were two primary causes of those problems:

First, Citi, like other financial institutions, suffered large losses due to the financial crisis. I am told that Citi has subsequently analyzed data made public around the government's 2009 stress tests and estimated that its losses in its business—other than in CDOs—were roughly comparable to those of peer firms.

Second, Citi suffered distinctively high losses as a result of its retention of so-called super senior tranches of CDOs.

I first recall learning of these super senior positions in the Fall of 2007 during discussions convened by Chuck Prince with the most senior management of Citi to address issues arising out of pronounced market volatility. In a presentation on the fixed income business, including the subprime business, I learned that Citi's exposure included \$43 billion of super senior CDO tranches. The business and risk management personnel advised that these CDO tranches were rated AAA or above and had de minimis risk.

My view, which I expressed, was that the CDO business was an arbitrage activity, and I believed, perhaps because of my background in arbitrage, that these CDO transactions were not completed until the distribution was fully executed.

That said, it is important to remember that the view that the securities could be retained was developed at a time when AAA securities had always been considered money good. Moreover, these losses occurred in the context of a massive decline in the home real estate market that almost no financial models contemplated, including the ratings agencies' or Citi's.

While the Board required and received extensive financial and risk reporting, I do not recall knowing before September 2007 that these super senior tranches had been retained.

I feel confident that the relevant personnel believed in good faith that more senior level consideration of these particular positions was unnecessary because the positions were AAA rated and appeared to bear de minimis risk of default.

In October, the rating agencies substantially downgraded these securities, and subsequently Citi estimated a fourth quarter loss on its super senior positions of between \$8 and \$11 billion.

When these estimated losses were announced, Chuck Prince decided to step down. Win Bischoff became acting CEO, and I stepped in as Chairman of the Board, working with employees, clients, and others to stabilize the bank; assisting in raising billions of dollars in private capital for the bank during this difficult period; and serving on the CEO search committee that led to the selection of Vikram Pandit.

Ultimately Citi took nearly \$30 billion in losses on its super senior CDO positions. Those losses were a substantial cause of the bank's financial problems and led to the assistance from the U.S. government.

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The overriding lesson of the financial crisis was that the financial system is subject to more severe downside risk than almost anyone had foreseen. It is imperative that private institutions and the government act on that lesson.

Citi – first under Chuck Prince and then under Vikram Pandit – implemented major personnel changes, restructured and improved risk management, and raised huge amounts of private capital.

But private solutions are only part of the answer. Financial reform is imperative and should include: (1) substantially increased leverage constraints, with one tier based on risk models and a second tier based on simpler metrics because models cannot fully capture reality; (2) derivatives regulation, reflecting my strong view from my time at Goldman Sachs that derivatives can create serious systemic risk and require appropriate regulation, as discussed in my 2003 book; (3) resolution authority to avoid the moral hazard of “too big to fail;” and (4) consumer protection primarily to protect American consumers, but also to protect the financial system.

I will briefly expand on each of those areas.

First, leverage requirements must be increased and leverage metrics simplified. I support a two-tiered limitation on leverage for systemically important institutions, one defined by risk-based models and the second by much simpler measures, since mathematical models cannot capture the full range of real world possibilities. In addition, as part of constraining leverage, I believe institutions should retain some portion of their off-balance sheet assets on their books.

Second, derivatives should be subject to collateral and margin requirements, standardized derivatives should be exchange traded, and customized derivatives should have a clearinghouse or, at least, greater disclosure requirements. Increasing margin and capital

requirements serves the dual purpose of providing companies with a greater cushion in the event losses are taken on derivative instruments and of discouraging certain types of riskier behavior. Exchanges, clearinghouses, and enhanced disclosure requirements will also decrease risk by increasing transparency and allowing companies to better evaluate their overall exposure.

Third, a mechanism must be created for dealing with systemically important non-bank financial entities, including bank holding companies that get into trouble. We simply cannot have institutions that are “too big to fail” or “too interconnected to fail.” Having a resolution mechanism for allowing any financial institution to fail is critical to avoiding moral hazard, and will increase the stability of our financial system. Also, greatly increased capital requirements and the other proposed financial reforms will reduce the likelihood of institutions getting in trouble.

Fourth, we need strong consumer protection, both to protect consumers and to protect the financial system. Such protection should include understandable disclosures, suitability requirements, and prohibitions on abusive practices and instruments. I also support a mechanism for providing personalized advice to the most vulnerable consumers, though I understand that the costs of such a reform may be prohibitively high.

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I appreciate this opportunity to share my views, and would be happy to answer your questions.