The Necessity of Risk Management Culture and Incentive Pay

by Etti Baranoff*

I. Introduction

Late in 2012, the press in Austin, Texas reported the death of a policeman, Houston McCoy,[1] who was known for climbing together with his fellow officer, Ramiro Martinez, the steps of the Tower at the University of Texas and killing the Tower Sniper.[2] Fourteen people were killed and 32 were wounded in the August 1, 1966 tragedy.

Over 46 years later, the December 14, 2012 shootings at Sandy Hook Elementary School took the lives of 26 children, teachers and administrators.[3]

Is history repeating itself? What has happened in the past 46 years to risk management and prevention? Has very little changed? In this essay I emphasize that in order to have success in the field of risk management, two basic fundamental steps are necessary:

1. Buy-in into a culture of risk management by all levels in the organization, and
2. Incentive pay for those who are able to contribute to reducing the potential loss from each identified risk.

The above man-made catastrophes are only two examples among a multitude that illustrate the importance of risk management in all aspects of our society. To prevent future tragedies, it is a necessity that this field becomes a core requirement in all management or related programs of study in educational systems globally. In order to ensure that it takes hold in business life once graduates move on, a positive reinforcement mechanism needs to be established; I recommend monetary rewards as an incentive in order to be effective.

In this essay I describe some devastating risk management failures to illuminate the need for a change in culture. Following is a proposal for incentive rewards for risk management actions using the well-known model of Value at Risk (VaR) and stress analysis. The essay concludes with a short summary.

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[1] http://www.statesman.com/news/news/local-obituaries/houston-mccoy-the-police-officer-who-shot-ut-tower/nTgcC/

[2] Charles Joseph Whitman was an engineering student and former Marine who killed 14 people and wounded 32 others in a shooting rampage located in and around the Tower of the University of Texas in Austin on the afternoon of August 1, 1966. Also see more coverage at: http://www.trutv.com/library/crime/notorious_murders/mass/whitman/index_1.html

[3] http://www.cnn.com/interactive/2012/12/us/sandy-hook-timeline/index.html

II. Catastrophic Risks

a. Man-made Risks and Devastation

The tragic devastations of 2012 which includes the movie theater shooting in Aurora, Colorado,[4] are only a few drops in a stream of horrible losses dating back to the September 11, 2001 terrorism act[5] and longer. All of these tragedies could have been reduced or even eliminated if the public was educated to adopt a risk mitigation mindset upfront with special monitory incentives. Heavy losses in human life and money have always translated into risk management actions after the fact, not as preventative methods.[6] Since a preventative mindset is not endemic to our educational system, we are only able to react.[7]

In the private business arena, we also see reactive or corrective actions instead of thoughtful, full-fledged identification of front-end risks, measurement and development of the necessary risk management tools.[8] The basic steps needed for risk management are: Risk identification; risk measurement and risk mitigation that include tools such as insurance, hedging and loss control techniques.

The two most known recent business disasters are the financial crisis of 2008 and the British Petroleum oil rig explosion in the Gulf and Mexico in 2010.[9] The 2008 financial crisis is a result of systemic risks that engulfed the whole global financial sector while the BP disaster is an example of a micro, one firm's lack of apparent risk management. For lack of space, I will focus only on the oil spill.[10] At BP, there is a reason to believe that if risk management culture had taken hold and become imperative to remuneration, the disaster could have been averted, or at least reduced.

b. Natural Catastrophes

The loss in dollars and lives are not always caused by man-made catastrophes; there are natural ones, too, such as the 2011 tsunami in Japan and the recent devastation in highly populated areas of the U.S. from Super-storm Sandy in October 2012. Only after much of lower Manhattan and coastal Queens and New

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[4] http://www.cnn.com/interactive/2012/07/us/aurora.shooting/index.html

[5] See: Etti G. Baranoff "Risk Management and Insurance after 9/11" Chapter 10 of "*The Impact of 9/11 on business and Economics: The Business of Terror -- The Day that Changed Everything?"* Edited by Matthew J. Morgan and Forwarded by James J. Heckman, Palgrave Macmmillan, 2009

[6] See Baranoff and Baranoff "Trends in Insurance Regulation" *Review of Business*, Fall 2003, pp. 11-20

[7] Each catastrophe has led to more regulation and governmental action. The aftermath of September 11 saw the creation of the Department of Homeland Security and long security lines at airports around the world. Unfortunately, many of the security steps were only reactions to publicized, known threats—bombs placed in fluids, shoes and the like—rather than an approach to identify risks systemically with a reward system.

[8] See Chapters 1, 2, 3 and 5 of the text book by Baranoff, Brockett and Kahane "Risk Management for enterprises and Individuals" 2009, Flat World Knowledge, Connecticut.

[9] http://www.cnn.com/2012/11/28/us/bp-suspension/index.html
Nov 28, 2012 – The U.S. government will block oil giant *BP* from new government **...** "lack of business integrity" stemming from the 2010 *explosion* and *oil spill*. It was a tragedy that *killed* 11 oil workers and dumped 205 million gallons of oil into the Gulf **....** " at: http://www.cnn.com/2012/11/28/us/bp-suspension/index

[10] For coverage of the need for risk management and actions to eliminate another financial crisis, see the work of The Geneva Association, the Financial Stability Board (FSB) and the Fed's actions in the U.S.

Jersey were flooded, did we begin listening to engineers who suggested building safety sea walls long before the catastrophe.[11]

In the 2005's Hurricane Katrina, the levies that broke and flooded New Orleans[12] had long been known to be vulnerable. Today the failed levies have been replaced with state-of-the art pumping stations that resemble fortresses. Why should resources only be applied to areas that have already sustained the worst damage? Where are the proactive solutions? Or the risk/award analysis – a topic that is covered regularly in risk management courses when and if they are taught.

III. Incentives for Practicing Risk Management up Front

Corporations create pay scales and bonuses. The question is how to measure the risks/rewards or, how to compensate for a virtually unknown and intangible success which contributes towards sustainability rather than profits. The risk management added value is in avoiding disasters and losses, not in creating gains.

In this essay, I am proposing the use of risk measurement such as Value at Risk (VaR) as a foundation model for incentive remuneration. The added value of the risk management techniques would be measured in the anticipated reduction in the VaR of simulated losses at the 5% level or other levels agreed upon by management. VaR is a model that uses the distributions of input variables to measure their impact on the output. Under this proposal for incentive rewards, risk management actions on the inputs and their statistical distributions would be the triggers that impact the output. If the VaR of output is lowered (as a result of the risk management action) at the 5% level, this can be a benchmark to compute incentive pay. For example, if the output is net income or net worth of a firm, the model would look at the most important inputs affecting the outputs at the 5% VaR. Through stress tests and sensitivity analyses, there is a way to glean those inputs that contribute more to the losses at the 5% VaR. Those are the areas that the risk management actions would be most effective in reducing the potential negative results on net income and net worth --- two critical areas of success or failure measurements.

More specific example is that of the contribution of "inventory" input on Boeing's net worth. Using only publicly available data of Boeing in the past few years to understand the situation with the grounding of the 787 Deamliner and the risk management implication, the stress analysis showed clearly the impact that the "inventory" has on the negative net worth. Following are quotes from the Risk Management study conducted by Christina Beeman[13] in 2013 on the Enterprise Risk Management of Boeing:

> "To keep public opinion from faltering too much, Boeing tried to down play the severity of the lithiumion battery incidents and emphasizing that safe flight of the

[11] http://www.bloomberg.com/news/2012-11-09/billions-on-flood-barriers-now-might-save-new-york-city-l.html Or http://www.pbs.org/newshour/rundown/2012/11/engineers-draw-barriers-to-protect-new-york-from-another-sandy.html among others.

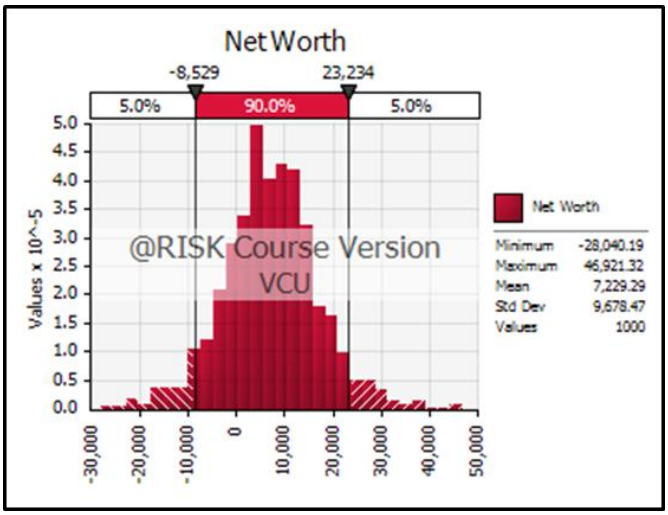
[12] http://www.reuters.com/article/2012/08/29/us-storm-isaac-idUSBRE87L0PH20120829

[13] Christina Beeman is a Financial Technology Student at Virginia Commonwealth University in the actuarial track. She passed her first exam and provided this elaborate study as part of the "Managing Financial Risk" course.

> plane was never endangered because other Boeing safety systems kicked in as planned…..The debacle with the Dreamliner also deals with one of Boeing's greatest risks, its supply chain risk. In the production of the 787 Dreamliner, Boeing enthusiastically embraced outsourcing, both locally and internationally, to a much larger extent than it ever had before. …. Outsourcing requires considerable additional up-front effort in planning to avoid the situation whereby major sub-assemblies do not fit together at final assembly, increasing the cost by orders of magnitude more than was saved by designing in isolation from the work-allocation activities. Given the extraordinary risks of the 787 project, it is surprising that the original leadership team for the 787 program did not include members with expertise on supply chain risk management. As a result, there was a lack of coordination with the production schedule of the numerous suppliers which resulted in major delays and billions in extra cost.[14]

The VaR, stress and sensitivity analyses based on recent years' financial reports (10K) show that mistakes in inventory could be detrimental to Boeing and thus, should be avoided. Based on statistical distributions determined by past data, Beeman's basic study shows the VaR model in Graph A below:

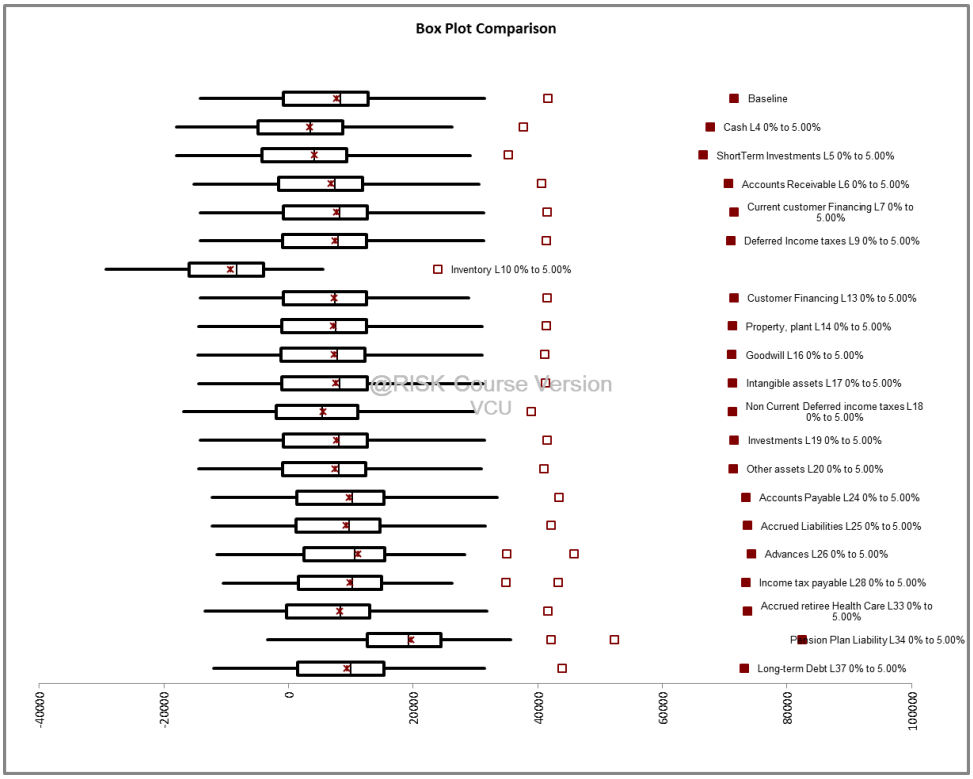
Graph A. Boeing Net Worth



And the stress analysis in Graph B below:

Graph B: Stress Analysis for the 5% VaR level

[14] The reader is invited to request a copy of the study.



Graph B for the stress analysis clearly show the major contributions of inventory to the net worth at the 5% VaR level. Prior modeling of this type could have led to change in supply chain actions to reduce the inventory levels that could lead to greater negative net worth. Analysis for net income is not provided here.

IV. Concluding Remarks - The Need for Risk Management Culture and Incentive Awards

As described above, two main actions can create greater sustainability on both the micro and macro level globally and in the US. Those are: 1. Creating a risk management culture, and 2. Providing rewards for pro-active risk management actions.

If the majority of the population had the risk/reward mind-set, much of the complacent attitudes would be shifted. Well educated people will see the potential disasters well in advance and find ways to reduce the impact of potential disaster. Rewards systems can be based on reduction in risks and losses via measurements such as VaR models and stress analysis.