

Managing Risk Communication:

Dynamic Risk Reporting (I)

By Carlos Blanco, Ph.D. and Robert Mark, Ph.D.

This is the first article in a three-part series on managing risk communication. The authors, both regular contributors to The Risk Desk, have extensive experience assisting organizations in improving their internal and external risk communication capabilities. This first article focuses on dynamic risk reporting. The second article will focus on formal (such as risk management committees) and informal risk communication channels, and the third and last article will address the crucial issue of risk education.

—the editor

In the last decade, many firms have formed highly focused and sophisticated risk management units and, more recently, have created enterprise-wide risk management (ERM) units. The effectiveness of the risk management function is often hampered by the quality of the “communication” among different risk management units, as well as with other internal (e.g. the CFO) and external stakeholders (e.g. rating agencies). If risk management is to be an integral part of the business decision-making process (encompassing both tactical and strategic issues), then a significantly greater emphasis needs to be placed on dramatically upgrading the active communication of risk.

The key to an optimal firm-wide management of risk is a professional “integrated” risk management communication program that brings all the elements of risk management together. “Integrated” refers to the need to avoid a fragmented and often inconsistent communication approach to risk management that may not be consistent with the firm’s business objectives. In an integrated risk management process, the policies and methodologies are consistent and congruent with the business goals of the firm. For example, if a policy goal is

to achieve a desired minimum risk-adjusted return for each business based on “apples-to-apples” risk measures, the communication scheme needs to carefully craft language that enables risk-adjusted returns to be compared across all business divisions and aggregated from the bottom to the top of the firm.

Advanced analytical techniques combined with the right infrastructure (e.g. IT systems) open up new value-added possibilities for management to achieve their risk-adjusted return goals. If (and only if) a firm achieves a sophisticated risk communication capability, it can positively influence the decision-making process toward reaching their risk-adjusted return goals. In a truly integrated risk management process, timely and action-oriented risk information should flow back and forth between the risk management function and the business units. The end product is best-practice communication of risk, where actions are consistent with desired risk-adjusted return goals.

A risk manager in the early days may have sat in a remote ivory tower, with limited interaction with the business units and no active participation in the execution of the firm’s business strategy. Risk managers in these firms were often perceived as bureaucratic and incapable of developing mutually beneficial partnerships with the business units. Today, risk managers are increasingly expected to partner with the business units while maintaining their independence in order to execute their risk

oversight role. In accomplishing that balance, communication is one of the critical issues that scream out for increasing sophistication.

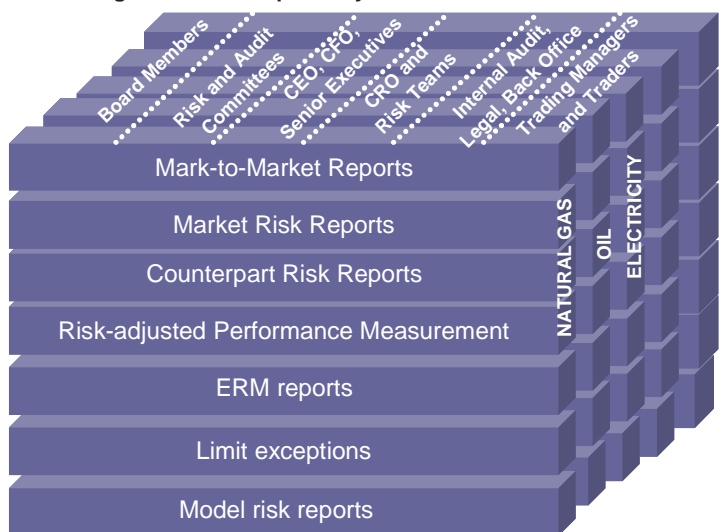
Dynamic Risk Reporting

Despite the significant resources devoted to developing and implementing increasingly sophisticated analytics to value and manage the risk of complex instruments (such as structured derivatives and physical assets), the outputs from these models don’t always make it into C-suite reports. The main reason is that the information produced from these models is not communicated in a user-friendly fashion to key decision-makers, so it often becomes relegated to a secondary role. The challenge is to achieve excellence in reporting.

Considering that most “consumers” of risk information are not “quants,” it’s surprising how little attention is paid to : 1) gauging the degree to which risk information is fully understood by decision-makers and 2) their ability to communicate and translate complex risk insights into actions to improve the risk-adjusted return profile of the firm. Many firms that have implemented sophisticated risk systems produce a variety of “risk reports” that are too lengthy, contain too much extraneous technical information and are difficult to decipher.

In order to meet risk-adjusted return goals, it is self-evident that several groups besides the risk management function (such as business managers) are ex-

Figure 1. Risk reports by end-user and business unit



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pected to fully understand the material risks, as well as the internal control system built to manage and mitigate those risks. It is particularly important that all personnel are presented with the right information, at the right level of technical detail and in the right context.

For example, Figure 1 shows that risk officers, the board and senior management need to analyze market risk and counterparty credit risk reports. But the level of detail of those reports, and the technical expertise required to decipher them, should be a function of which risk-adjusted return business decisions a specific group in the risk management process needs to make.

Panel I: The changing role of ‘Quants’ in the risk management communication process

Early-generation risk management departments mainly consisted of controllers and “quants” with limited ability to communicate. These quants were more concerned with the technical accuracy of their models than the decisions actually made with them.

By contrast, most decision-makers are not particularly concerned with “mathematical correctness” or how technical problems are solved, but how the models can help them make better risk-adjusted return decisions. Today, quants must work with decision-makers to produce highly user-friendly action-oriented risk management reports.

Ways to Improve the Risk Reporting Process

The depth and breadth of the quantitative and qualitative information in a risk report should be a function of the expected decisions that must be made, as well as the technical skills of the reader. If there is a gap between the information needed to make those decisions and the degree of “risk literacy” of the report’s end-user, it should be filled by educating the decision-maker in the specific areas they need to understand thoroughly in order to make those decisions. Risk managers should take an active role identifying those gaps and partnering with decision-makers to make sure that they can make the right decisions. The third piece in this series will explore the role of risk education to ensure the success of ERM programs.

A critical path to improving the risk communication flows is to establish a user-friendly, consistent reporting framework. For example, risk and P&L information could be produced in a visual framework using a

similar set of parameters and presentation tools. A good risk-reporting tool is essential for bringing the information to a common denominator. Web-based reports can replace the typical 20-page risk report distributed in many trading organizations.

The key to risk visualization is to allow decision-makers to see at a glance the top material risks and to identify problem areas. Risk is a multidimensional problem, so it’s important to ensure consistency when analyzing the different parts of the puzzle. A possible solution is to bring all the risk information into a central repository, which could range from a simple Excel spreadsheet to a sophisticated relational database, and then connect that information to a dynamic reporting tool that fits the needs of the firm.

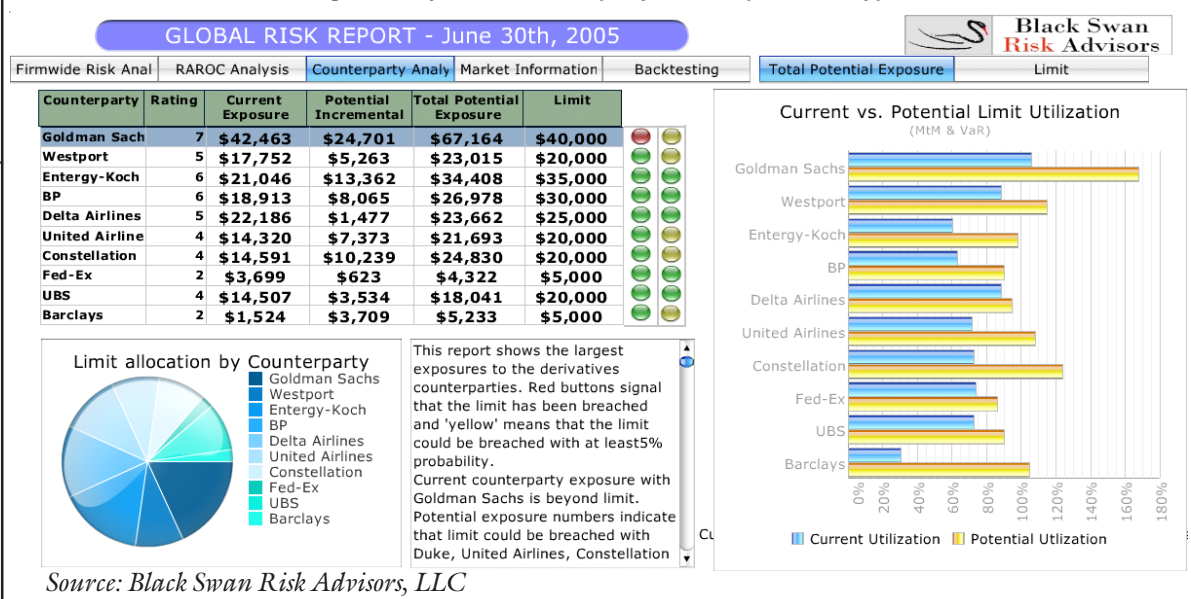
Context, Context, Context

As indicated above, being able to place the information in the right context is a crucial step to understanding a risk report. The context may call for a brief written commentary of the highlights in that report and a summary sheet that explains the variables and assumptions used to produce the information in that report. Another way to provide the information in context is to include changes over the prior periods.

But be cautious about interpreting the results from “black box” models that only provide highly summarized information. Several energy trading systems rely on external risk models to perform derivatives pricing and risk analysis. In many cases, the integration of highly useful third-party models is far from optimal and could result in significant model errors. We have seen many risk systems produce output that did not allow for any drill-down of the information or show any intermediate calculations that would add significant transparency to the process.

A sample dynamic prototype report is presented in Figure 2. The report displays current and potential counterparty exposures as well as limit utilization. The prototype report shows that the firm has breached the limit of \$40 million in current exposure with Goldman Sachs, reflected in the red traffic-light symbol. The yellow circles represent warning signals that the lim-

Figure 2. Dynamic Counterparty Risk Report Prototype



Source: Black Swan Risk Advisors, LLC

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its could be breached if the position moves beyond the chosen confidence level used in the potential exposure calculation.

Panel II. 'Pivot Tables' and 'OLAP' with unlimited drill-down capabilities: Proceed with Caution

Microsoft Excel Pivot tables and OLAP¹ technology allow for dynamic drill-down and slicing and dicing in multiple dimensions. This capability can be extremely powerful, but due to their large degree of flexibility, the potential for a user producing risk reports with erroneous information may be large. It is common for software vendors to conduct presentations using pivot tables to illustrate the "magic" drill-down functionality. But unless the information is carefully assembled, and in particular, diversification benefits are taking into account, the subtotals and totals in many pivot tables will be inaccurate. It's also useful to design a set of standard approaches to drill-down into the risk information that can be actively monitored in multiple dimensions. The K.I.S.S. principle² should be applied to the aggregation and dissection of the multiple dimensions of risk.

Actionable Dynamic Risk-Adjusted Return Information

In the absence of a clearly delineated set of actions expected to be taken from the analysis of the risk reports, the delivery of information is purely a passive exercise and in many cases just a waste of paper. One of the problems of circulating a set of "bad" risk reports that are not clearly understood by decision-makers is that they will be automatically ignored. All the investment of time and resources needed to generate these reports will be lost.

A dynamic risk report for management can integrate information on P&L, risk levels and risk-adjusted returns. Figure 3 shows a prototype energy-related risk-adjusted return report

that contains dynamic risk information for the largest business units and at the enterprise-wide level.

The report integrates summary P&L, risk and risk-adjusted return on capital (RAROC) information as well as limit breaches (sections 1&2). Section 3 presents a detailed analysis of limits by different categories (Value at Risk, stop loss and stress test). Section 4 presents an explanation of VaR changes from the previous period, broken down into several key risk-related categories (position changes, volatilities, correlations, etc.).

In the example, we can see that the Americas' Oil desk is the worst-performing unit year-to-date on an absolute and a risk-adjusted basis. The risk-adjusted return on capital for that unit is -23 percent and the only positive contribution to the firm is that it is currently acting as a natural hedge by reducing risk in 14 percent (see risk contribution column in section 1). In addition, the unit has breached one of the risk limits. Section 3 shows that the stress test limit has been breached. The report also shows VaR changes from the prior day. For the America's Oil desk, there was a 5 percent increase in VaR over the prior day due mainly to increased positions as well as higher market volatility.

Dynamically Performing Sensitivity Analysis

Risk reports tend to be static, so they don't allow for real-time "what-if" sensitivity analysis by the person or committee analyzing the information in the report. In many situations, the risk report may provide information on a particular set of conditions, but does not allow for slight changes in the assumptions behind the risk forecasts or projections.

Dynamic reports can allow for "what-if" analysis on the fly without the need for complex analytics. Those reports can also considerably reduce the amount of needless paperwork and/or present the information on a real-time basis.

Figure 4 presents a dynamic energy-related risk report

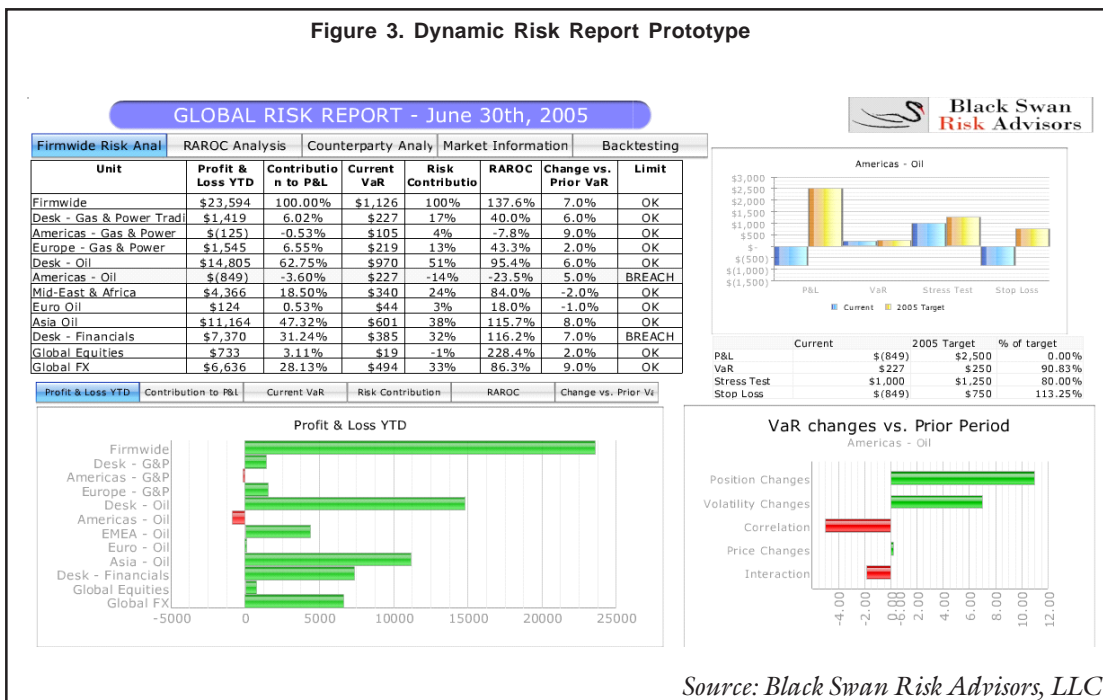
with the ability to perform on-the-fly analysis of the impact of changing portfolio positions and changes in the assumptions, such as the volatilities or correlations used in the calculations. The report also provides "best hedge" information that allows risk-takers to understand the minimum VaR position they could achieve under the current market circumstances.

The next article will introduce the role of the formal and informal risk communication channels.

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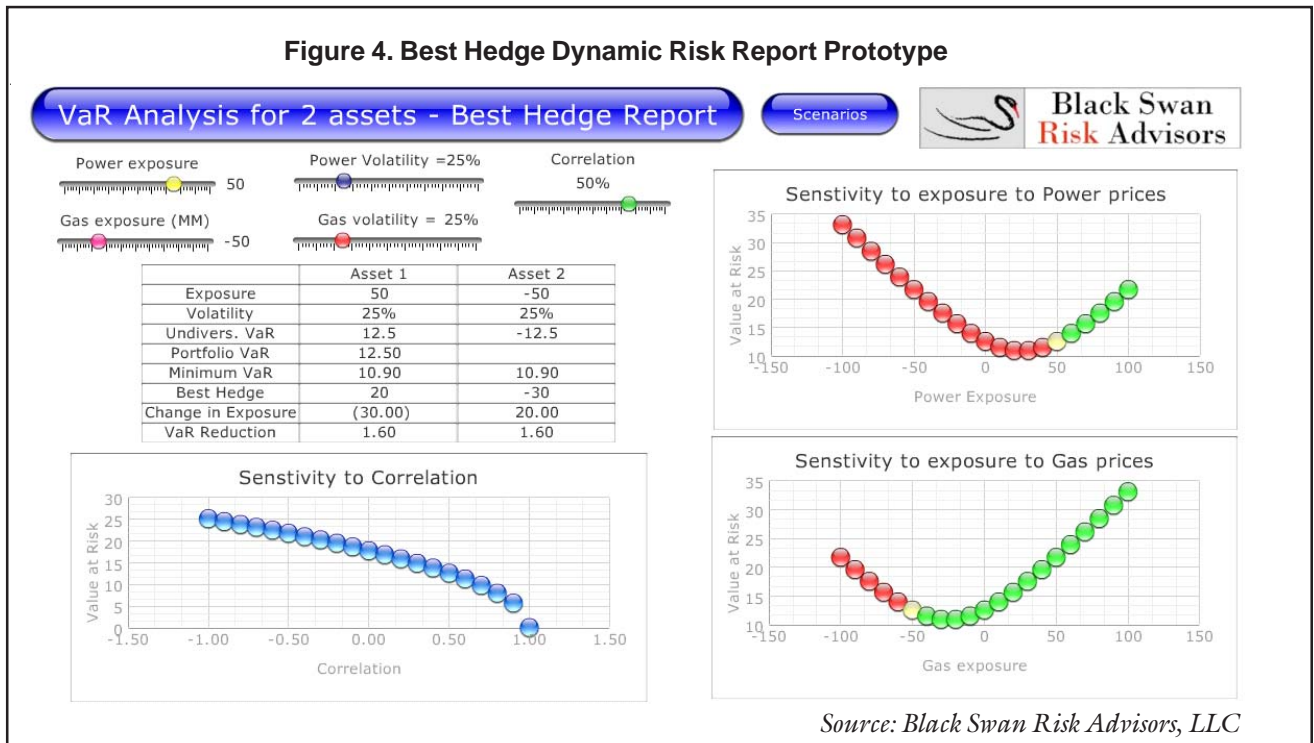
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Figure 3. Dynamic Risk Report Prototype



Source: Black Swan Risk Advisors, LLC

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(Footnotes)

¹ OLAP stands for On-Line Analytical Processing and allows for "slicing and dicing" of information in multiple dimensions.

² K.I.S.S. stands for Keep It Simple, Stupid.