Risk Management

1. Significance

According to reports in the business press, several companies have lost substantial as a result of trading in derivative securities:

- P&G lost $195 million;
- Air Products, $105 million;
- Sandoz, $78 million;
- Gibson Greetings, $23 million;
- Paine Webber’s short-term bond fund, $268 million;
- Barings Securities, $1.4 billion;
- Metallgesellschaft Refining & Marketing, $1 billion;
- the State of Wisconsin Investment Board, $95 million;
- Orange County, California’s investment pool, $1.7 billion; and,
- Kidder Peabody, $350 million.

These losses prompt several important questions:

- Are these losses the result of calculated gambles undertaken with the full knowledge and consent of the affected parties, or do they indicate a failure of internal control mechanisms?
- If the latter is the case, what is the nature of the failures?
- Finally, what types of control systems are effective in preventing such failures?

2. Analysis

Several factors may contribute to financial failure occasioned by trading in derivatives.

2.1 Incentives

First, there may be a misalignment of the incentives faced by employees within the firm. Individuals may benefit disproportionately from the upside of a given gamble and have very little exposure to the downside, while the firm faces almost the full effect of the downside. Some limitations on the downside risk exposure of employees are inevitable. Since employees are usually more wealth-constrained than their employers, they may be unable to personally assume as much downside risk as the firm can tolerate. Moreover, employees typically are less risk-tolerant than the syndicate of shareholders who invest in the firm, so imposing downside risk on employees, (i.e., imposing substantial financial losses on employees when risky positions turn out to be losers) may only be accomplished by simultaneously offering employees uneconomically large risk premiums.

A further complication related to incentive compensation is the tension between individual incentives, which strongly motivate individual effort, and team incentives, which encourage cooperation and sharing of knowledge about profit-generating strategies. Strong individual incentives may actually discourage cooperation and sharing by top-performers because these activities erode the performance gap between top-performers and other employees. Thus, cooperation and sharing may be unattractive to talented employees who face strong individual incentives. Team incentives, while they foster sharing and cooperation, also lead to free-rider problems. When some organizations offer team incentives and other organizations offer individual incentives, top-performers may be attracted to the organization offering individual incentives and mediocre employees will be drawn to the organization offering team incentives. Thus, competition in the labor market for scarce talent may force all employers to offer individual incentives.

There may also be misalignment of incentives over time. A trader’s compensation usually includes an annual bonus based on the profit he earns for the firm. Sometimes the bonus is earned and paid before the transaction is unwound. This means the trader is rewarded for short term profits that may also generate longer-term losses.
2.2 Competence

A second factor contributing to financial failure may be incompetence. Perhaps superior returns can be earned from superior insight, but if the source of such insight is not apparent to top management, it may not exist. Inferences about of ability, particularly with regards to financial management, are often drawn from a manager’s record of past performance. Past performance may be driven by both luck and skill. In assessing skill from past performance, it is well to have some sense of the confidence interval surrounding the estimate. The competence of the risk manager, who evaluates the transactions of the trader, is also critical. If the risk manager cannot assess the impact of the transactions on risk and whether the profit projections are plausible, then the firm is open to unwarranted risk of loss.

2.3 Decision rights

A third cause of financial failure may be an inappropriate allocation of decision rights. There is a tension between allowing a manager leeway to undertake a trade before the opportunity to profit from the manager’s insight vanishes and the need to properly justify and approve transactions before the firm’s capital is committed. Allowing financial managers too much discretion may lead to excessively risky or otherwise inappropriate trades while lengthy approval processes can prevent profitable trades from being completed. Rapid analysis and approval of proposed transactions requires a substantial investment in information systems that rapidly quantify the incremental effect of transactions on the firm’s profit and exposure to risk.

3. Objectives of risk management systems

- Prevent errors and irregularities by a system of authorization for transactions, accurate recording of transactions, and safeguarding of assets,

- Detect errors and irregularities by reconciling accounting records with independently kept records and physical counts and reviewing accounts for possible reductions of values,

- Promote operating efficiency by examining policies and procedures for possible improvements.

- Quantify risks associated with operation of the business and particular assets positions.
Typically, transactions are constrained by various limits imposed on traders, such as limits on the maximum permissible position in a given security and a maximum permissible commitment of firm capital to all positions. After approved transactions are cleared, front office records are reconciled and validated by the back office. Transactions are aggregated and are summarized in reports to risk managers and top management. An important principal of internal control in all organizations is the separation of the stewardship of assets from record keeping for those same assets. That is, the employee who controls the use of an asset should never be same person who is responsible for record-keeping for that asset. In trading firms, the analogous rule is that front office (i.e., trading) activities should be strictly separated from back office (i.e, record-keeping) activities. A major challenge for all trading firms is developing the capacity of back offices to track and assess positions in new securities as they are created.

4. Summary

Risk assessments are often imprecise. Sources of imprecision include: the possibility of malfeasance by traders, the appropriateness of assumptions about the current value and future evolution of assets prices, and the liquidity of asset positions. Standardized classes of assets are essential to aggregating positions, but lead to imprecision stemming from differences among assets that fall in the same class.²

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² Consider for example, assessments of value at risk computed using J.P. Morgan’s RiskMetrics™, which provides estimates of asset volatilities and correlations. Volatilities and correlations for only a small subset of all possible assets are explicitly provided by RiskMetrics™. Either all assets must be assigned to this limited set of asset classes, or special approximations must be used.