Assignment 4: Financial Risk Management

Robert Salter

Stockholm University

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Love Ekenberg

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1. Introduction

The collapse of Barings bank is a clear example of the impact uncontrolled operational risk can have on an organisation. The case study is by no means unique with similar "rogue trading" cases occurring after the Barings bank incident, in particular, Jérôme Kerviel in 2008 who lost Société Générale $7.22bn and Kweku Adoboli in 2011, losing UBS $2.3bn to name two high profile cases (Kantšukov and Medvedskaja, 2013, p.12). The paper will describe the case of Barings bank, including lessons learned before applying a financial risk management process to address the bank's failings.

2. Background

Barings bank was one of England's oldest merchant banks which, in February 1995, filed for bankruptcy due to the fraudulent actions of trader Nick Leeson. In the role of head-trader and general manager, Leeson accrued losses of £827 million through false accounting and reporting of losses incurred by unauthorised trading.

Leeson was responsible for implementing the bank's arbitrage trading strategy, which was designed to be low risk, low return. The strategy involved trading Nikkei 225 futures on the Singapore international monetary exchange (SIMEX) and Osaka Securities Exchange (OSE), with short and long positions offsetting each other, resulting in net exposure and profits only in the case of temporary mispricing. Leeson diverged from this strategy, producing supposed large profits and receiving large bonuses worth several times his basic salary.

The reason for Leeson's large profits is that losses were booked against an error account that was either not reported or falsified. A market shock in the form of the 1995 Kobe earthquake culminated in significant losses for Leeson. To recover the losses, he placed larger positions, resulting in even more significant losses. The losses mounted when Leeson requested the transfer of additional funds from the bank's London office, which managers did not correctly scrutinise due to Leeson's apparent profitability.

3. Risk Management Failures and Lessons Learned

The collapse of Barings bank is a lesson in the mismanagement of operational risks, particularly internal fraud, agency risk and bias. The failure was primarily due to the actions of one person. However, the absence of risk controls and correctly implemented processes allowed the employee to accrue the losses through a lack of oversight and weaknesses in the companies internal controls.

Sweeting (2017, p.537) states the lessons learned from the collapse as:

- Internal and external audits should have carried out their jobs more rigorously.
- A clearer and more direct reporting line should have been implemented with clear responsibility for all aspects of Leeson's.
- Business functions, namely trading and back-office, should have been separated from the outset.
- A more robust analysis of profits against trading strategies should have been implemented, highlighting Leeson's implausibly large profits.
- Managers should have questioned the reasons for a request for further funds rather than being blinded by profit.
- The bonus structure should have reflected profits over a more extended period and been closer to the employee's basic salary.

A risk management process will be developed based on the classification, analysis and control of the risks highlighted in the lessons learned before implementing a process to address market risk.

4. Risk management Process

4.1 Operational Risks

According to Sweeting (2017), many types of operational risks relating to issues such as fraud are categorised as unquantifiable. The nature of operational losses means their distribution is skewed to the right and fat-tailed in terms of amounts lost. Therefore, organisations must control risks that can significantly or terminally impact business operations regardless of how unlikely the loss is.

Many of the lessons learned were highlighted in the 1998 paper by the Basle Committee on Banking Supervision (BCBS), including adequate management oversight and accountability, segregation of duties, approvals and reviews, and effective audit programs and monitoring activities. BCBS later expanded upon these requirements in Core Principles for Effective Banking Supervision (2012) which stated that "the supervisor determines that banks have adequate internal controls to establish and maintain a properly controlled operating environment. These include clear arrangements for delegating authority and responsibility; separation of the functions that involve committing the bank, paying away its funds, and accounting for its assets and liabilities; reconciliation of these processes; safeguarding the bank's assets; and appropriate independent internal audit and compliance functions to test adherence to these controls as well as applicable laws and regulations."

The risk management of operational risks using the ISO 31000 framework has been described in previous assignments. A risk register for the organisation's operational risks can be used to classify, analyse, evaluate and treat operational risks. The register provides a structure for risk managers to review operational risks and, where necessary, apply further controls to residual risks.

Risk Index	Type of Operational Risk	Risk Description	Likelihood	Severity	Overall Risk	Action to be taken
1	Internal Fraud	An employee can misreport, or fail to correctly account trades.	Medium	High	High	Separation of trading and accounting/reporting functions.
2	Internal Fraud	An employee can misreport trades due to reporting lines for different subsidiaries.	Medium	High	High	The organisational structure should be clearly defined in the company handbook with reporting lines confined to one office
3	Internal fraud	Trading strategies are not in line with the organisation’s strategy.	High	High	High	Trading should be subject to mandatory internal audit above a certain amount
4	Agency Risk	Employees in pursuit of larger bonuses partake in high risk trading that are not in line with the organisation's goals	High	High	High	Bonuses are linked to longer term profitability as opposed to on a quarterly basis.
5	Bias	Managers fail to provide objective analysis of employee activities	Medium	Medium	Medium	Implementation of a capital approval framework that managers are required to submit prior to approving funds for trading. The framework should include approval from risk and compliance managers.

Table 4.1 Risk register for operational risks

4.2 Market Risks

At its core, the failure of Barings bank was due to insolvency as Leeson's losses accounted for £827 million, twice Baring's available trading capital. (Investopedia, 2020). Once operational risks are controlled, a bank is required to fulfil minimum capital requirements under Basel III regulations.

BCBS (2019, p.16) defines market risk as "the risk of losses arising from movements in market prices. The risks subject to market risk capital requirements include default risk, interest rate risk, credit spread risk, equity risk, foreign exchange (FX) risk and commodities risk." A commonly used measure for assessing market risks is Value at Risk (VaR) and will be implemented as part of the financial risk process.

4.2.1 Value At Risk

BCBS (2019 p.17) defines VaR as "a measure of the worst expected loss on a portfolio of instruments resulting from market movements over a given time horizon and a pre-defined confidence level." An obvious application of VaR to Barings bank is the measurement of risk concerning the positions held by traders and their alignment with minimum capital requirements.

There are three common approaches to calculating VaR: empirical, using historical data; parametric, which uses a statistical distribution; and stochastic, which uses simulated profits and losses, most commonly using a Monte Carlo simulation.

In explaining VaR using the parametric approach and its application to Barings bank, the profit/loss of a trading position or portfolio can be recorded over time, and it is assumed that the changes will follow a normal statistical distribution. As an example, if a trader holds a long position worth £10,000,000, the expected return is 0.0523% per day and volatility is 0.971.

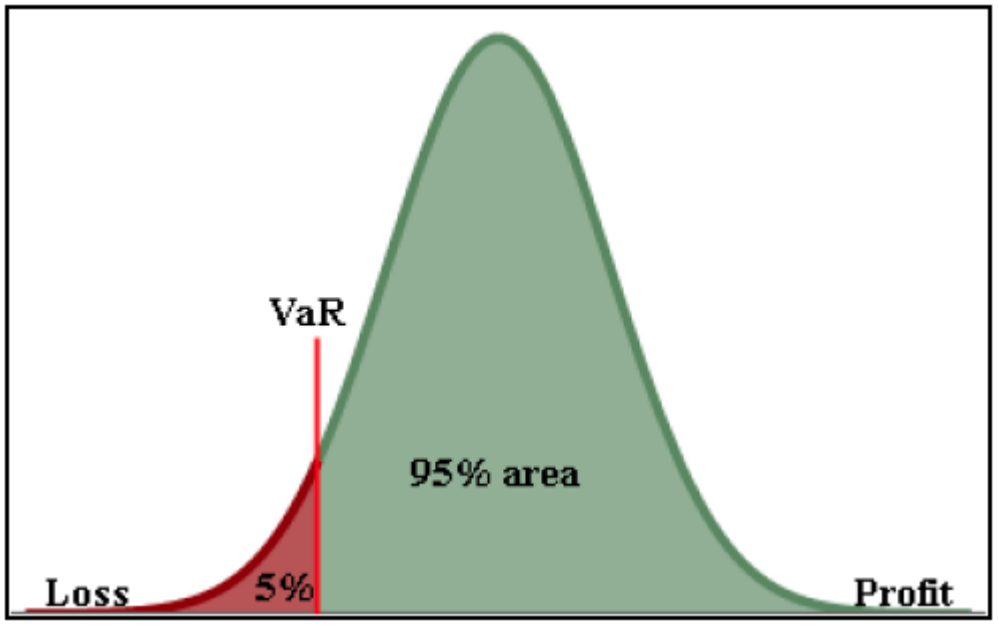

Figure 4.1 Parametric Value at Risk

VaR (parametric) is calculated as:

VaR = [Expected Weighted Return of the Portfolio − (z-score of the confidence interval × standard deviation of the portfolio)] × portfolio
Jassy (2021)

Example
VaR at 5% confidence interval = 0.0523 - 1.645(0.971) = -1.54%
The daily 5% VaR is 10,000,000 x (-1.54%) = £-154,000

VaR at 1% confidence interval = 0.0523 - 2.576(0.971) = -2.45%
The daily 1% confidence interval = 10,000,000 x (-2.45%) = £-245,000

The position is expected to lose more than £154,000 in one day 5% of the time and £245,000 1% of the time.

VaR is used not only to measure risk for single assets but can be applied across a portfolio of assets and to other risks such as interest rate risk, FX rates and operational risks. The time horizons may vary based on the application.

In the case of Barings bank, VaR should be applied to the bank's securities portfolio to ensure that minimum capital requirements are not exceeded, in line with Basel III requirements. VaR can also be used to manage internal control to ensure that internal limits for market risk are not exceeded and are in line with the organisation's risk appetite and tolerance levels.

5. Critique of the Methodology

The methodology has been designed based on the implementation of internal controls outlined in the lessons learned section of the case study. Without these controls, the VaR is redundant; as in the case of Barings Bank and Nick Leeson, the accuracy of any VaR measurement is called into question as it is undermined by fraudulent activity.

The methodology for operational risks is based on hindsight, making any subjective assessment of likelihood and severity challenging. It is straightforward to rate risk given that the event has already happened and the impacts are known; however, a risk methodology for operational risks must consider that likelihood and severity are subjective measures and susceptible to error. Operational risks should be controlled wherever the potential losses are more significant than the cost of control.

The applied methodology also lacks information on the cost of risk mitigation and, when recommending an alternative bonus structure, does not consider the industry's culture and the challenges this may present with recruiting and retaining employees.

The VaR model used in the assignment is based on price changes following a normal statistical distribution. If normality is assumed for skewed or fat-tailed distributions, the risks will be misrepresented with potentially hazardous consequences, such as incorrect allocation of capital buffers. A more suitable model would be to use an empirical approach based on historical data because there are no assumptions regarding the distribution of the variables or a stochastic model such as a Monte Carlo simulation.

6. Conclusion

The collapse of Barings bank highlighted the importance of internal control systems within financial enterprises. Unfortunately, the bank's downfall was not the final institution to succumb to internal fraud of this type, and the lessons of the past should not be forgotten when implementing stringent risk management processes. VaR is a measurement that enables organisations to estimate maximum losses and therefore mitigate risk through changes to strategy or changes to capital buffers. With these measures in place, it is unlikely that Barings bank would have succumbed to the actions of a rogue employee. This report has highlighted a risk management approach for controlling operational and market risks, including weaknesses and improvements that can be implemented.

7. References

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