

**BSM939**

# **Risk and Uncertainty in Business**

Lectures 5 & 6

Operational risk and governance risk

Sumon Bhaumik

<http://www.sumonbhaumik.net>

***Operational risk – importance***

# Operational risk

## Definition

- “[Operational risks include] a range of threats from loss of key personnel, settlement failure, and compliance failure, to theft, systems failure and building damage – operational risk management aims to ensure the integrity and quality of the operations of [the business] using a variety of tools including audit, recruitment policies, system controls, and business continuity planning.”
- “ORM covers a wide umbrella, often seen as covering everything except for market, liquidity and credit risks. Unlike market or credit risk, operational risk is mainly endogenous to the [business]. Apart from external events such as natural catastrophes, it is linked to the business environment, nature and complexity of [business] operations, the processes and systems in place, and the quality of the management and of the information flows.”

# Operational risk

## Types

- **People risk**
  - Incompetence, Fraud, etc
- **Process risk**
  - **Model risk**
    - Model/methodology error, Mark-to-model error, etc
  - **Transaction risk**
    - Execution error, Product complexity, Booking error, Settlement error, Documentation/contract risk, etc
  - **Operational control risk**
    - Exceeding limits, Security risks, Volume risk, etc
- **Systems and technology risk**
  - System failure, Programming error, Information risk, Telecom failure, etc

# Failure to manage operational risk

## Barings – I

- Nick Leeson's career growth:
  - Leeson joined the Singapore operations of Barings in April 1992
  - By the end of 1994, he is considered to be one of the main contributors to the bank's profits
- Oversight
  - Leeson is supposed to report to the local manager and the product managers in London
  - Local managers do not provide effective oversight, and London managers leave oversight to the local managers
- Recipe for trouble
  - Internal audit during Q3 of 1994 flags Leeson was both the Chief Trader and the Head of Settlements

# Failure to manage operational risk

## Barings – II

- “Baring Futures (Singapore) was a clearing member of the SIMEX in Singapore, but Barings’ proprietary trading was part of an omnibus account that included customer accounts. (When a broker clears another broker’s account on an omnibus basis, the identities of the other broker’s customers are not known.) Barings Securities (Japan) was a non-clearing member of the Tokyo International Financial Futures Exchange (TIFFE). The London operation, Barings Securities Limited, dealt with Barings Securities (Japan) on an omnibus basis. That is, on the books of Barings Securities (Japan), the accounts of Barings Securities Limited and its clients as well other clients of Barings Securities (Japan) could not be distinguished. The bottom line is that Barings’ proprietary trading and the extent of its risk taking were hidden from view.”
- “In Japan, firms margin on a net basis. Net margin means that the clearinghouse asks for margin on the aggregate net position of the firm over all accounts., including proprietary trading accounts. If the customers had been net short, the proprietary accounts could have gone long without providing any margin. Indeed, margin funds are freed up since the firm’s position is viewed as hedging the customer position.”

# Failure to manage operational risk

## Barings – III

- Collapse of Barings
  - January 27: SIMEX warns Barings of a £74 million shortfall
  - January 29 – February 23: Barings transfers £550 million to Singapore office to support Leeson's (unauthorised) SIMEX positions
  - Barings collapses by the end of February
- Operational issues
  - Flag raised by internal auditors about dual role of Leeson ignored (external auditors did not adequately recognise the shortcomings of the operation)
  - Neither external nor external auditors discovered in time how Leeson hid his losses
  - London office sent funds to Singapore to cover margin calls without asking too many questions
  - Management did not ensure adequate separation between proprietary and client trade

# Failure to manage operational risk

## Daiwa

- Toshihide Iguchi
  - Joins Daiwa's New York branch in 1977
  - Promoted to become a trader in 1984 but continues with his back office duties until 1995
- The problem
  - Daiwa's New York branch managed the custody of its own US T-bonds and those of its customers, through a sub-custody account at Bankers Trust
  - Daiwa and its customers received updates on transactions on this account through transactions reports from Bankers Trust that flowed through Iguchi's office
  - Iguchi sold off bonds in the sub-custody account to cover up losses on his own trading, and falsified Bankers Trust reports to cover it up
  - On July 13, 1995, Iguchi confessed to a loss of \$1.1 billion over 11 years

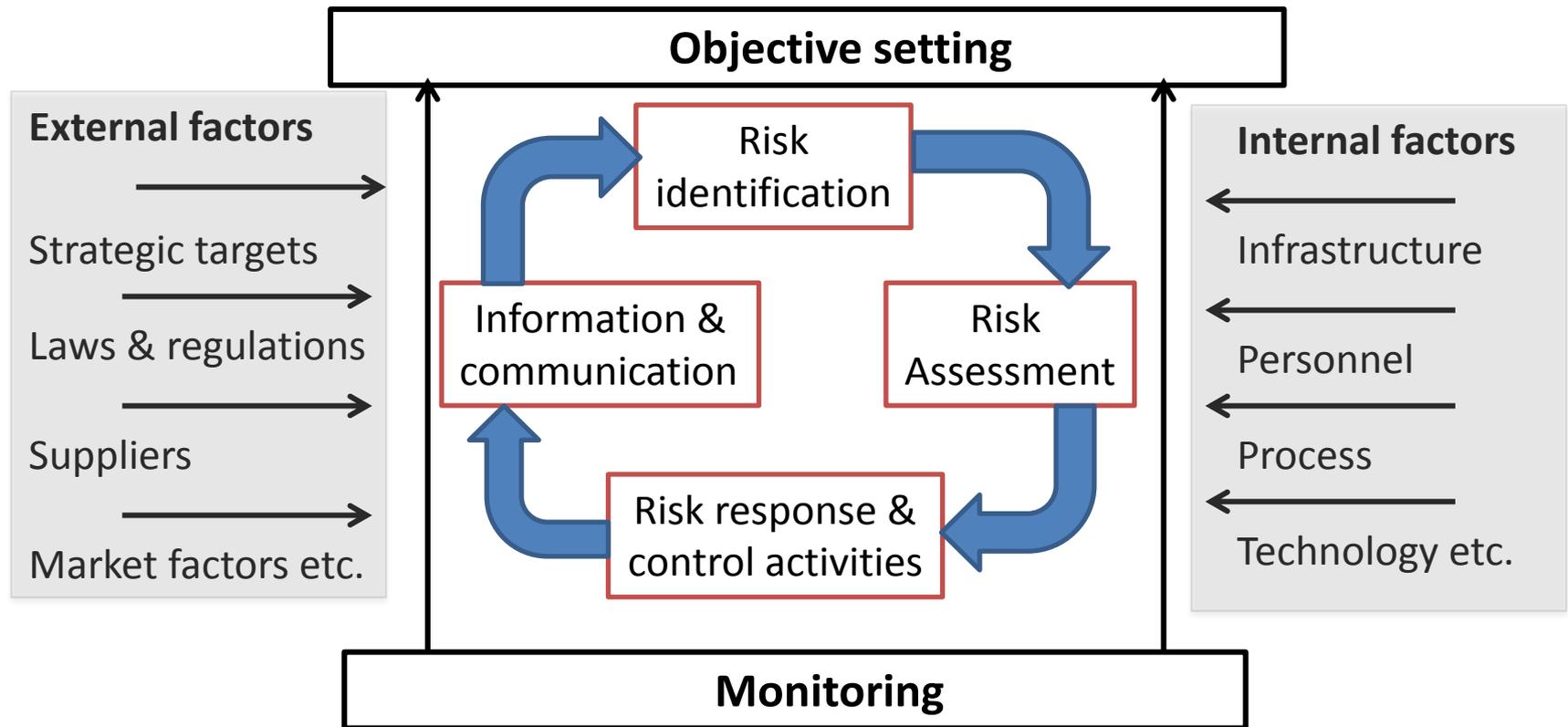
# ***Operational risk – management***

# Operational risk

## Asking the right questions

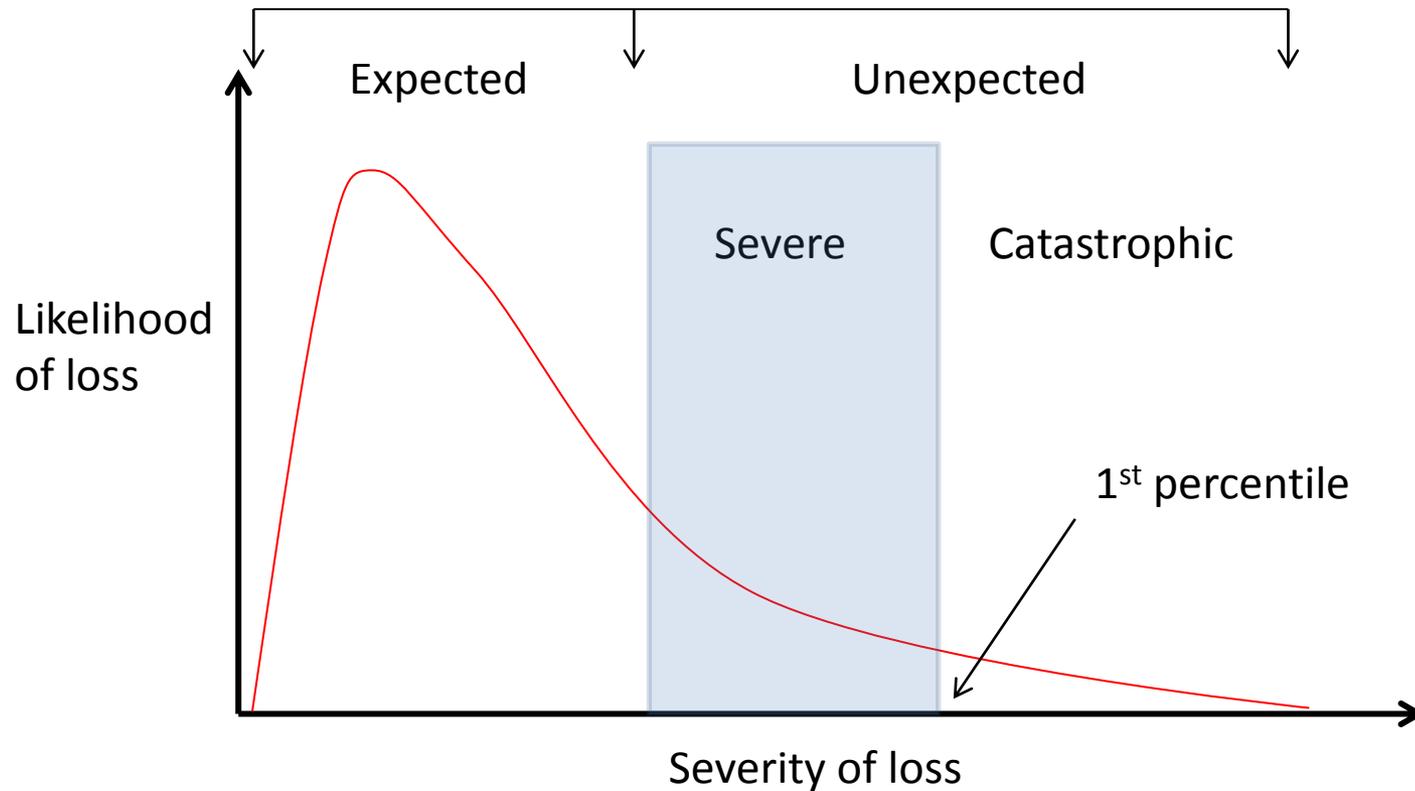
- What is the company's largest operational risks?
- Might the risks be large enough to threaten the company's solvency?
- What factors drive the risks?
- How are the risks changing over time?
- What risks are on the horizon?
- How do the company's risk level compare to that its peer group?

# Operational risk management Model



Source: Strokey, I. (2011). Operational risk management and business continuity planning for modern state treasuries, International Monetary Fund, Washington DC; Figure 2.

# Measuring operational risk Distribution



Catastrophic losses are rare and, because of their very nature, not captured by VaR models. Further, risk capital cannot cushion a firm against catastrophic risks.

# Measuring operational risk

## Regulatory approaches to modelling (e.g., banks)

- **Basic indicator approach**
  - Capital is a multiple of a single indicator, namely, annual gross income, for previous three years when annual gross income was positive
- **Standardised approach**
  - A bank's activities divided into 8 lines of business (LOB)
  - Each line of business has its own single indicator, namely, the annual gross income from that LOB, for previous three years when annual gross income was positive
  - Each business line has its own multiplier for capital
  - LOBs such as commercial and retail banking can be merged to avoid double counting of risk
- **Advanced measurement approach**
  - A bank uses its own internal model, subject to strict regulatory standards

# Measuring operational risk

## Examples

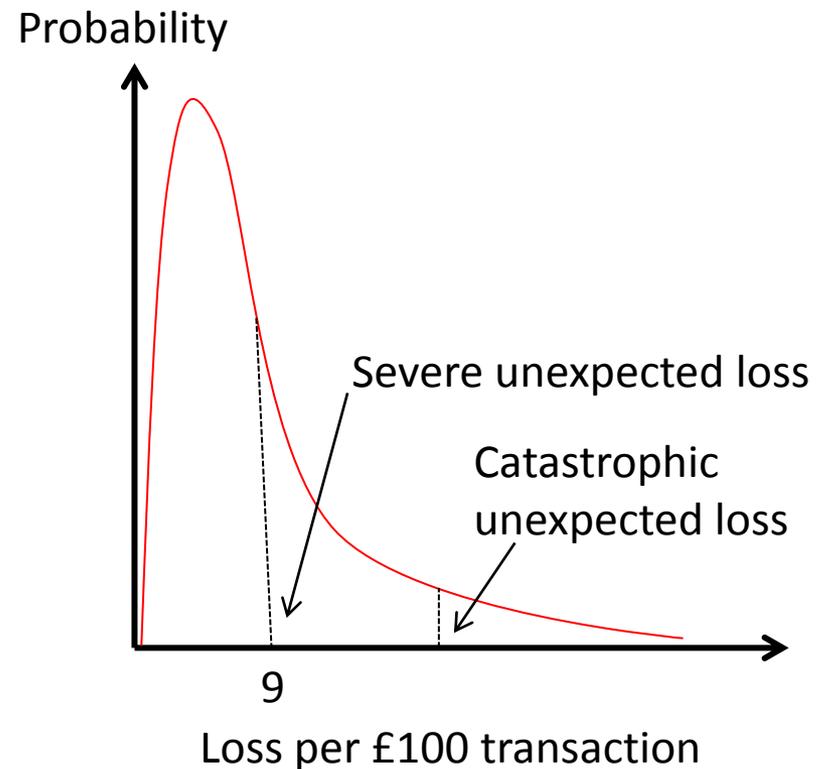
- “A measure of [exposure risk] EI for *legal liability* related to client exposure could be the number of clients multiplied by the average balance per client. The associated probability of an operational risk event (PE) would then be equal to the number of lawsuits divided by the number of clients. The loss given an event (LGE) would equal the average loss divided by the average balance per client.”
- “A measure of EI for *employee liability* could be the number of employees multiplied by the average compensation. The PE for employee liability would then be the number of lawsuits divided by the number of employees and the LGE would be the average loss divided by the average employee compensation.”
- “A measure of EI for *regulatory, compliance, and taxation penalties* could be the number of accounts multiplied by the balance per account. The PE would then be the number of penalties (including cost to comply) divided by the number of accounts, and the LGE would be the average loss divided by the average balance per account.”
- “A measure of EI for *transaction-processing risk* could be the number of transactions multiplied by the average value per transaction. The PE would then be the number of errors divided by the number of transactions. The LGE would be the average loss divided by the average value per transaction.”

# Measuring operational risk

## Numerical example

- Credit card fraud
  - EI = average dollar value of a transaction (say, £100) x number of transactions
  - PE = number of loss events due to fraud/number of transactions (= say, 1.3 per 1000, i.e., 0.13 percent)
  - Loss rate given a fraud event = £70
  - LGE = £70/£100 = 70 percent

- Loss rate (LR)  
= PE x LGE = 0.13% x £70 = 9 p



# Operational risk management

## Issues

- Key risk drivers (KRDs)
  - Linking changes in KRDs to changes on Operational VaR
- Joint consideration of severity and likelihood of a risk
  - Cost of risk mitigation
- Insuring against operational risk
  - Ability of insurers to generate sufficient risk premium and the extent of risk dispersion (implications for caps on insurance and co-payment)
  - Counterparty risk (of insurer failure)

# ***Enterprise risk management***

# Definition

- “Enterprise risk management [ERP] is a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”
- Fundamental concepts:
  - A process, ongoing and flowing through an entity
  - Effected by people at every level of an organisation
  - Applied in strategy setting
  - Applied across the enterprise, at every level and unit, and includes taking an entity-level portfolio view of risk
  - Designed to identify potential events that, if they occur, will affect the entity and to manage risk within its risk appetite
  - Able to provide reasonable assurance to an entity’s management and board of directors
  - Geared to achievement of objectives in one or more separate but overlapping categories

Source: *Enterprise Risk Management – Integrated Framework: Executive Summary*, © 2004 The Committee of Sponsoring Organizations of the Treadway Commission; pp. 2. Downloadable from

[http://www.coso.org/documents/coso\\_erm\\_executivesummary.pdf](http://www.coso.org/documents/coso_erm_executivesummary.pdf).

# ERM and value maximisation

- Alignment of risk appetite and strategy
- Enhancement of risk response decisions
- Reduction in operational surprises and losses
- Identification and management of multiple and cross-enterprise risks
- Ability to proactively seize opportunities
- Improvement in deployment of capital

# Objectives and components

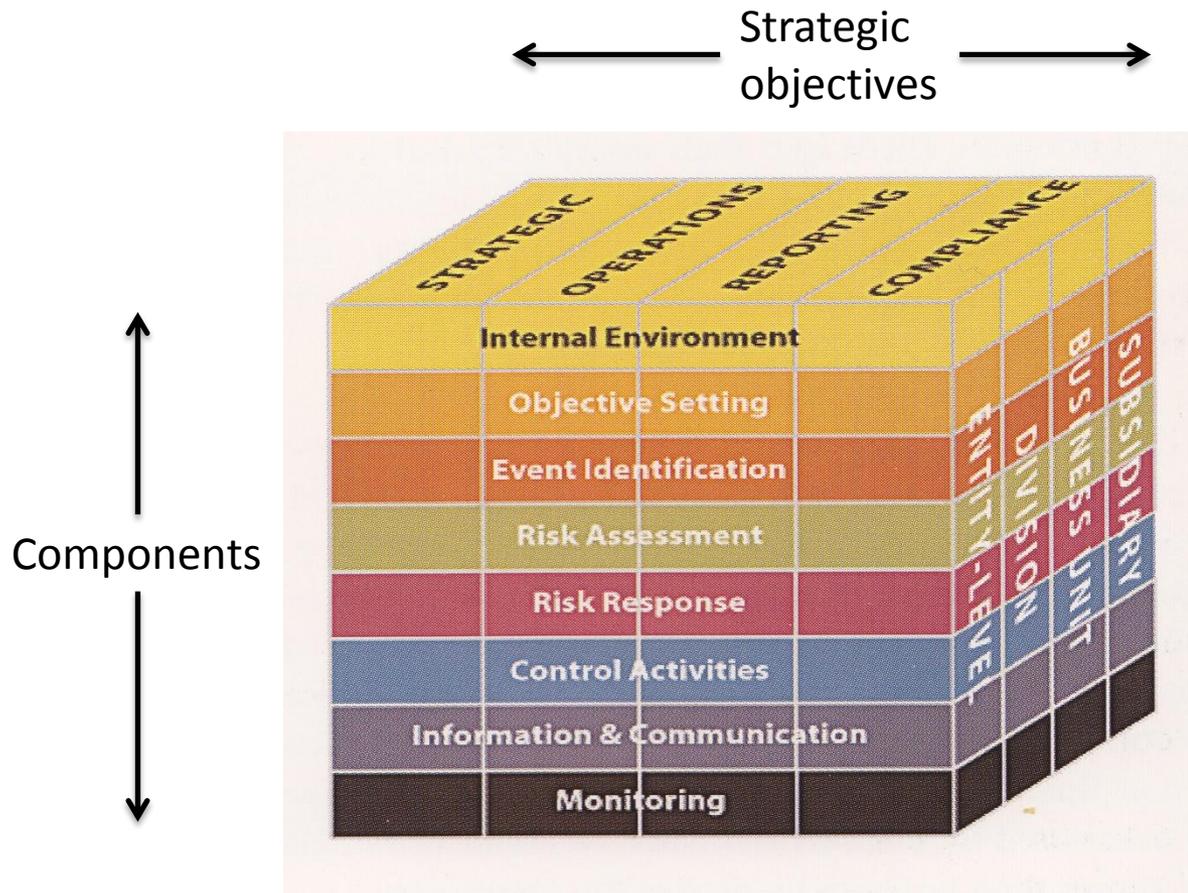
## Objectives

- Strategic
  - High-level goals, aligned with and supporting a company's mission
- Operations
  - Effective and efficient use of resources
- (Reliability of) reporting
- Compliance (with applicable laws and regulations)

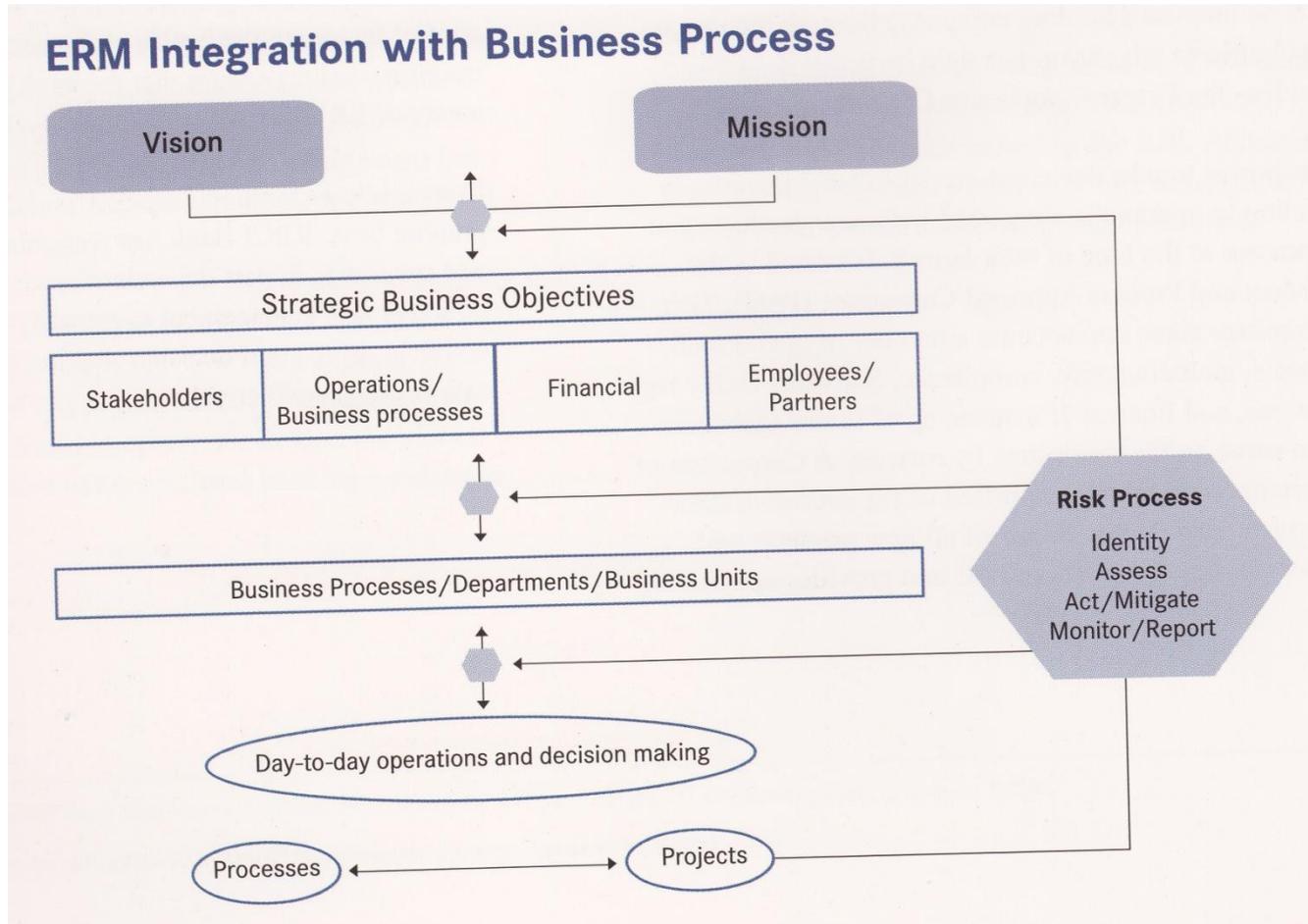
## Components

- Internal environment
- Objective setting
- Event identification
- Risk assessment
- Risk response
- Control activities
- Information and communication
- Monitoring

# Objectives and components – visual



# ERM at Tata Chemicals Limited – I

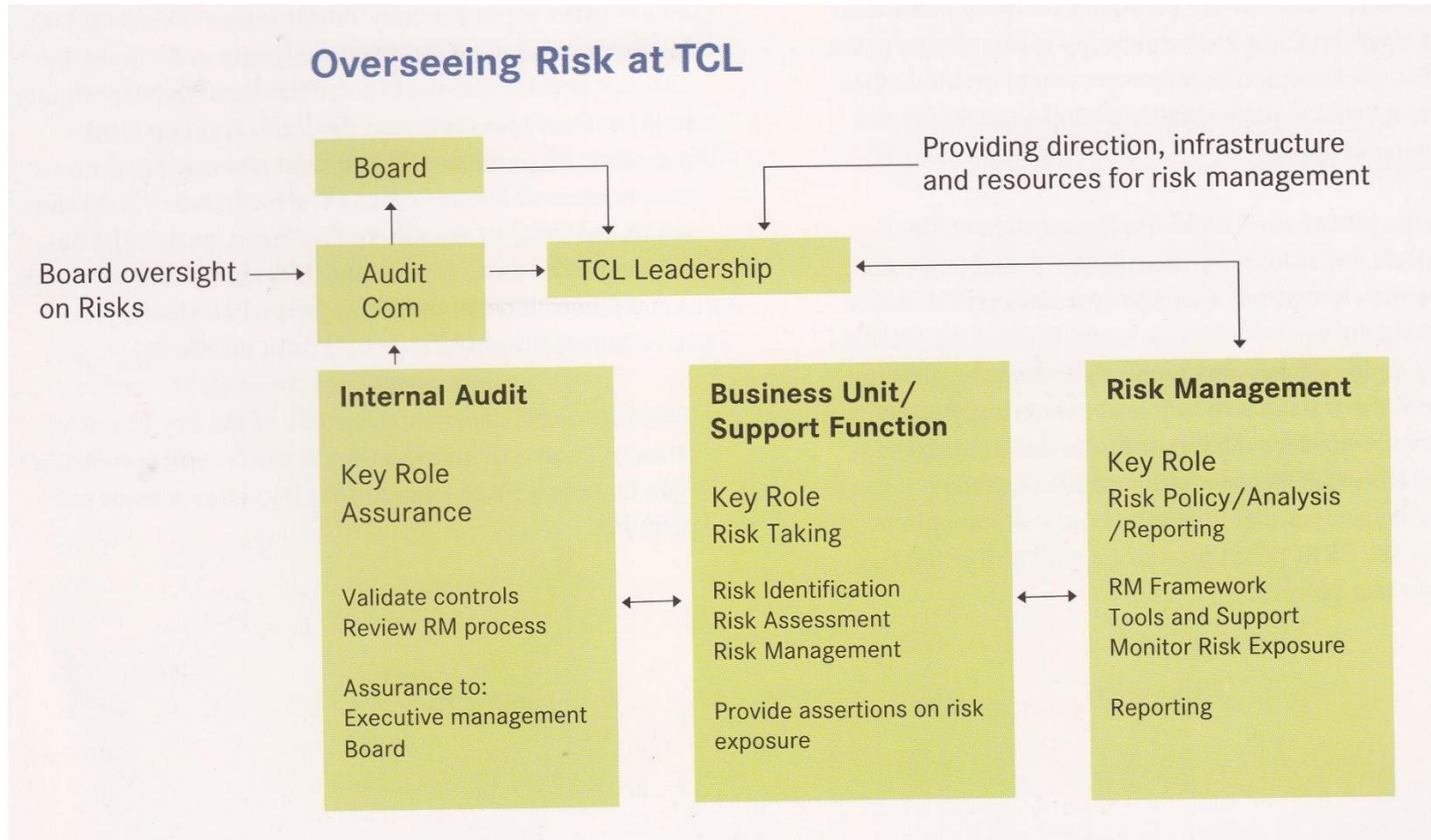


Source: Hexter, E., Tonello, M., Bhaumik, S.K. (2008). Assessing the climate for enterprise risk management in India, Research Report No. E-0016-08-RR, The Conference Board; pp. 20.

# ERM at Tata Chemicals Limited – II

- Two planning cycles: an annual business plan cycle, and a longer 3-5 year cycle
- Identification of 15-20 key enterprise wide risk
- Business unit leaders meet to undertake SWOT analysis with these key risks as part of the context
- Key assumptions are tracked; each business unit is reviewed at least one a year while high risk areas are monitored more frequently
- If a divergence between assumptions and actual business environment is noted, it is immediately taken up by the chief risk officer (CRO)
- Depending on the severity of the risks, CRO reports them to the audit committee; the rule is to manage operational risks conservatively

# ERM at Tata Chemicals Limited – III



***Agency risk –***

***Does management have an incentive to follow best practices for risk management?***

# Agency theory

- Two parties
  - Principal (e.g., shareholders) and agent (e.g., management)
- Problems
  - Agency problem
    - The principal and the agent have divergent objectives (e.g., shareholders want much of the profits to be returned to them in the form of dividends, but managers want to use profits to expand their business empires)
    - Principal cannot easily verify the actions of the agent
  - Principal and agent may have different attitudes towards risk, and this has implications for who bears more of the business risk

# Examples of agency conflict

- Mergers and acquisitions
  - A large proportion of M&As do not add value, and a dominant explanation for this phenomenon is agency conflict between managers and owners
  - Managers do not necessarily undertake M&As in the strategic interests of the shareholders; M&As may be a vehicle for empire building
  - Shareholders do not always have the full information about whether or not a particular M&A is necessary, nor about the specific reasons of a M&A's failure to add value
- Tunnelling
  - Majority shareholders use a number of methods to transfer profits from companies in which they have limited cash flow rights to those in which they have significant cash flow rights

# Specific example – WorldCom

- History
  - Business created in a coffee shop in Hattiesburg, Mississippi in 1983; WorldCom valued at \$64 billion in June 1999; company declared bankruptcy in the summer of 2002
  - Arthur Andersen, the auditors, voluntarily submitted their licence to practice as Certified Public Accountants in the USA
- Rapid growth
  - 65 acquisitions between 1991 and 1997, for a total of about \$60 billion, resulting in accumulated debt of \$41 billion
- Governance problems
  - Creative accounting: including expected future expenses in current charge for assets
  - Questionable assumptions about accounts receivables
  - Executives purchased WorldCom shares by borrowing against their existing WorldCom shares, and when WorldCom share price declined and margin calls were made, the company lent money to the executives to meet these margin payments

# Proposed solution – example

## Independent directors on key committee(s) – I

- Role of Audit Committee
  - to monitor the integrity of the financial statements of the company and any formal announcements relating to the company's financial performance, reviewing significant financial reporting judgements contained in them
  - to review the company's internal financial controls and, unless expressly addressed by a separate board risk committee composed of independent directors or by the board itself, the company's internal control and risk management systems
- Membership of Audit Committee
  - The board should establish an audit committee of at least three, or in the case of smaller companies two, independent non-executive directors. In smaller companies the company chairman may be a member of, but not chair, the committee in addition to the independent non-executive directors, provided he or she was considered independent on appointment as chairman. The board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience.

# Proposed solution – example

## Independent directors on key committee(s) – II

- How independent are “independent” members of Boards of Directors?
- Evidence
  - Firms with powerful CEOs are significantly more likely to add new outside board members with pre-existing ties with the CEOs
  - Independent directors earn positive and substantial abnormal returns when they purchase company stocks, and Independent directors earn significantly higher returns by way of sale of company stocks in windows when bad news and earnings restatements are announced
  - The odds of a CEO being lucky by way of opportunistically timed stock options is higher when independent directors receive grants on the same day
- While having independent directors on key committees is a step in the right direction, it may not be a panacea for corporate governance problems

***Where does that leave us?***