Introduction:

This course will revolve around the topic of operational risk. As many different industries use the term operational risk and deploy techniques to identify and quantify such risk, the course will provide an overview of how this concept prevails in various industries today. Specific emphasis will be given to the consideration of operational risk in financial services, as motivated by the Basel II accords and the general Information Technology arena. A framework for identifying, assessing and managing operational risk will be presented.

The course will make use of examples and through a project, students will be required to apply an operational risk management framework to a real company and present the approach to the class on the last day of class. Students are asked to work in teams to complete this aspect of the course.

Course Outline:

1. Introduction and Definitions
   
   Summary: This section will provide a motivation for why understanding and managing operational risk is important to the successful manager. As many different definitions have been proposed for operational risk, many will be presented, which emphasis given to the most recognized. Specific activities and threats thereof are mentioned as operational risk in the context of the financial services and IT-driven industries. More generally, the risks are categorized in major pillars. Specific requirements and motivation from the Basel II accords are presented, along with clear examples of how numerous banks have failed due to operational risk.

   a. Motivation for studying Operational Risk
      i. Regulation
      ii. Business failures in operational risk
   b. Definition of Operational Risk and what it is not
      i. Recognized types
         1. Internal Fraud
         2. External Fraud
         3. Employment Practices and Workplace Safety
         4. Clients (Selection of and reactions)
         5. Products and Business Practices
         6. Damages to Physical Assets
         7. Business disruption and system failures. (This course will look specifically at information systems and data flows. Other courses are available for supply chain related topics).
         8. Execution, Delivery, and process management
         9. Legal Risk
      ii. New Types of Operational Risk
         1. E-commerce
         2. Mergers and Spin-offs
         3. Automation
         4. Outsourcing
         5. New relationships in marketplace (B2B relationships and B2C relationships)
      iii. Operational Risk Pillars
1. People
2. Processes
3. Systems
4. Basel II Accords
   1. Summary of needs for capital reserves
   2. Impact on international banking
   3. Examples of banks failing due to operational risk

2. Identification and Assessment or Operational Risk

Summary:

A significant part of managing and understanding any risk, including operational risk comes through the identification and assessment of the risk. In this section, various widely used approaches for identification and assessment are presented. Although most methods are quantitative, it is recognized that managers doing risk assessment generally do not have the needed data to build the most thorough and sophisticated models for risk assessment. Still, this section introduces the statistical methods most used to assess operational risk. Examples of how to apply each approach are provided along with guidance of when best and when best not to leverage specific approaches. The VAR (Value at Risk) concept is also presented, as it has been adopted as a framework for operational risk assessment by various parts of the financial industry.

a. Top of the house Approaches
   i. Financial Models to Measure Operational Risk
      1. Income Approach: explain market and credit risk on income, treating balance as impact on income of operational risk
      2. Expense Approach: looks at historical data and tries to explain all variance. That variance unexplained is treated as cost of operational risk
      3. Operating leverage models: looks at relationship between variance in costs and total assets. Assumes more leverage = more risk. Cost of operational risk is a function of the variance in cost and leverage.
   ii. Scenario Analysis: ask management, experts to determine risky outcomes
      1. Use to sensitize management
      2. Concerns with measurement and realization of risks
   iii. Risk Factors and Profiling Approach: measure and track key business metrics in order to observe and measure operational risk. This assumes direct relationship between symptoms and causes.

b. System Approaches (Also Bottom-up approaches)
   i. Process Modeling: model all operations and identify how/when/where/why operations fail. Emphasis is on prevention
      1. Casual maps
      2. Discrete Event and Continuous Simulation Models
      3. Event Trees
      4. Connectivity models
      5. Fault-tree analysis
      6. Reliability models as a means to predict failure
   ii. Statistical Modeling
      1. Operational Risk loss modeling
         a. Empirical distributions of historical losses
         b. Parametric distributions of historical losses
      2. VAR Concept
         a. Brief Presentation
3. Reduction of Operational Risk

Summary: After identification and assessment, the manager has a few general options in terms of reducing risk. Although the most prudent involves removing the risk, this is with a cost. Costs should be approached as investments against the probability and exposure of the operational risk. Additionally, for specific types of operational risk, it is now possible to hedge with derivatives and/or bonds. Also, insurance options have grown in the wake of large-scale operational disasters. Some options are presented.

   a. Risk reduction with investment. Investment model for level of investment
   b. Hedging options
      i. Catastrophe bonds
      ii. System redundancy
   c. Insurance options
      i. Information requirements
      ii. Corporate implications on management

4. IAFAR Framework for Operational Risk Management

Summary: The IAFAR (Identification, Assessment, Factors, Action, and Reaction) is presented allowing the manager to apply assessment methodology most appropriate to the risk, while enabling a process to track identify factors that contribute to the risk. More strongly, the manager has a tool to align actions against risks and prepare for the realization of identified risks.

   a. Identification – what risks face the enterprise?
      i. Industry standards
      ii. Experts
      iii. Unique circumstances
   b. Assessment
      i. Quantitative
      ii. Qualitative
   c. Factors
      i. What are the causes of the risk?
      ii. Reduce factor levels and occurrences to reduce risk
   d. Action
      i. Management Options to reduce, hedge, absorb the risk
      ii. Investment model to reduce risk
      iii. Build feedback loop to provide management learning to update identification and assessment
   e. Reaction
      i. Have plan in place if risk is realized
      ii. Is the enterprise ready?
      iii. What else can be impacted (collateral damage)?
      iv. Is this a crisis? Opportunity for Crisis Management (See Course ###)

5. Future Trends in Operational Risk Management

Summary: As operational risk continues to be a requirement in Basel II and as regulatory and legal scrutiny peer into manager decisions, we discuss some of the projected changes and opportunities that will face manager dealing with operational risk. New insurance offerings are changing how business own and deal with operational risk; however global operations make operational risk more reaching.

   a. Upcoming regulatory issues
b. Proper levels of due diligence  
c. Basel II and beyond  
d. Confounding of Market, Credit and Operational Risk  
e. Role of media and reports in broadcasting operational failures  
f. Global issues  
g. New insurance options, new costs

Proposed Course Schedule as per Class Outline

Lecture 1:
  • Section 1 and Section 2

Lecture 2:
  • Section 2

Lecture 3:
  • Section 2 and Section 3

Lecture 4:
  • Section 4

Lecture 5:
  • Section 5  
  • Group Presentations (can also be schedule with class agreement at another time)

Notes:

Section 2 includes the most substance in terms presented methodologies. This presentation also requires motivation with examples and will dominate the class in terms of class hours, rightfully so, as managing operational risk is largely about identifying the risk and quantifying it and understanding its drivers.

Assignments: As much of the course presents and develops methodologies, assignments are based on application of methodologies to real-world examples.

Exams: As this course is structured for a ½ term and as it is meant to provide an overview and framework for dealing with operational risk, thus in lieu of a final exam, a group project will be assigned that provides the students an opportunity to apply the lessons learned in the class. The group project requires a written report. Additionally, all groups will present their work in class. Students may form their own groups or be assigned into groups, as needed.

Grading:
  Participation: 20%
  Assignments: 30%
  Final Group Project: 50%

Policies and Procedures: Typical for MBA classes, including Honor Code. I have no specific requirements outside of strong attendance and participation.