A Study on the Determinants of Operational Risk in Public Sector Banks

P.S. Subha Pradha,
Research Scholar, School of Management Studies,
University of Hyderabad, Hyderabad

&

J. Krishnaiah,
Research Scholar, School of Management Studies,
University of Hyderabad, Hyderabad

Abstract

Global financial industry has undergone tremendous changes owing to intense competition, growing customer expectations, increased regulatory requirements and proliferation of financial innovations. Integration of services across sectors owing to financial convergence became common blurring the boundaries across financial markets. One such sector that has undergone significant transformation is the global banking system.

In the past, banking environment in India was regulated and was having a limited risk exposure. However, present day banking is exposed to numerous risks because of its increased level of operations and diversified services the banks offer. Liberalization of banking services has brought to the fore a plethora of financial innovations. These financial innovations in terms of products and services in the banking industry as well as financial convergence with other sectors have created huge business opportunities for banks. At the same time, they have made the banks vulnerable to many risks that were not known of earlier. More importantly, these risks have a contagion effect and are capable of bringing down the entire financial system down as was evident in the 2008 global financial crisis.

The growing complexity of banking transactions and those of allied sectors have led to an increased probability of failures from the operations perspective. Operational risk losses have led to the debacle of many financial institutions, the prominent ones ranging from The Barings Bank, The Enron, Allied Irish Bank and our own Global Trust Bank. The regulators are enforcing greater awareness among top management and compliance to operational risk management measures as specified by Basel committee from time to time. The Basel norms require banks to specifically focus on operational risk by identifying, measuring, evaluating, controlling and managing this all pervasive risk. This mandates a sound operational risk management framework in banks.

The present paper studies the critical factors influencing operational risk among the public sector banks based in Hyderabad. A sample of 100 branch managers of public sector banks was surveyed to identify the factors contributing to operational disruptions and losses at branch levels. These were then consolidated to arrive at factors that critically influenced operational risk of banks. Nine factors were extracted from factor analysis that identified several variables related to people, processes, technology and external events as the major contributors of operational risk.

JEL Classification: E42, G32

Introduction

In the past, banking environment in India was regulated and was having a limited risk exposure. However, present day banking is exposed to numerous risks because of its increased level of operations and the diversified services the banks offer. Risk Management in banking allows a bank to identify and assess risks before they become a threat to the survival of the bank. It allows the banks to identify the credit risk, liquidity risk and other operational risks and take appropriate risk management measures to minimize the loss. It acts as an alert system that identifies risk indicators to identify the severity of risk and the urgency to attend to it.
Risk is defined broadly as the volatility of the value of the bank. Banks are constantly exposed to different kinds of risk like credit risk, market risk, operational risk etc in their business of offering financial services to customers. Though banks were initially acting as agents to lend money, the dynamic business environment and the intense competition owing to liberalization has compelled banks to add a plethora of innovations in their portfolio of services thereby exposing the banks to additional risks.

The prospect of new capital requirements following Basel II has led banks to greatly increase the resources they devote to measuring and monitoring risks especially operational risk. It is much more difficult to quantify operational risk than credit or market risk. Operational risk is also more difficult to manage. Financial institutions make a conscious decision to take a certain amount of credit and market risk, and there are many traded instruments that can be used to reduce these risks. Operational risk, by contrast is a necessary part of doing business. All the banks that are internationally active have to abide by the regulatory guidelines of the Basel and the RBI in order to avoid catastrophic banking failures.

Operational Risk

Financial institutions world-wide began to recognize operational risk in the 1990s and therefore is a recent phenomenon in the context of banking and financial institutions compared to other prominent risks like credit, market or liquidity risks. For the past two decades, operational risk has become more significant for the financial industry mainly because of the following:

- Greater dependence on technology and its advancement invariably expose banks to the risk of system failures, as well as to the risk of human errors in the programming and use of these systems.
- The growth of electronic dealing exposes banks to the risk of external frauds and to other risks linked to system security.
- The rising trend of mergers and acquisitions in the financial industry leading to problems and risks due to integration of information systems.
- The development of new and sophisticated financial instruments that are traded on ad-hoc OTC markets require specialized technical skills. This has created a risk that a small group of disloyal traders may cause significant losses to the bank, by creating risk positions whose value and risk implication are not fully understood by the bank's senior management.
- A significant boost to the development of measurement and management systems for operational risk came from the New Basel Capital Accord(2004) which introduced an ad-hoc capital requirement for this type of risk.

Increased regulatory interest in operational risk following a series of high profile incidents and losses (Barings, Allied Irish, Daiwa and others) finally culminated in an overt treatment of operational risk under the Basel Accord (2004).

Bank supervisors announced plans to assign capital for operational risk in the new Basel II regulations citing more than 100 operational risk losses by banks, each exceeding $100 mn Banks world-wide have incurred huge losses resulting from operational losses crossing several million dollars. The following table lists some of the high magnitude operational losses.

<table>
<thead>
<tr>
<th>Category of Operational Loss</th>
<th>Cause</th>
<th>Name of the Institution</th>
<th>Amount of Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Fraud</td>
<td>Fraudulent Trading</td>
<td>Allied Irish Bank</td>
<td>$700 mn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barings Bank</td>
<td>$1 bn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daiwa</td>
<td>$1.4 bn</td>
</tr>
</tbody>
</table>
External Fraud  |  Fraud by custodial client  |  Republic NewYork Corp  |  $611 mn

Employment Practices & Workplace Safety  |  Legal Settlement  |  Merrill Lynch  |  $250 mn

Clients, products and business practices  |  Improper lending practices  |  Household International  |  $484 mn

          |  Improper sales & billing process  |  Providian Financial Corp  |  $405 mn

Damage to physical assets  |  9/11 terrorist attack  |  Bank of NewYork  |  $140 mn

Business Disruption and system failures  |  Change in computing technology  |  Salomon Brothers  |  $303 mn

Execution delivery and Process Management  |  System Failures  |  Integration  |  Bank of America  |  $225 mn

          |  Transaction Failures  |  Processing  |  Wells Fargo Bank  |  $150 mn

Adapted from John C Hull, Risk Management and Financial Institutions, Wiley India, 2012

After Basel II, banks had some framework in place for managing operational risk. The prospect of new capital requirements has led banks to greatly increase the resources they devote to measuring and monitoring operational risk. The Basel II Accord mandates banks to hold adequate capital for risk absorption in eventualities. Also, the Basel Committee’s interest in making the New Basel Capital Accord more risk sensitive and the realization that risks other than credit and market could be substantial, led to the explicit recognition of operational risk in the capital adequacy framework.

**Definition**
Operational Risk is defined as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk,” [Basel Committee (2004)].

**Characteristics of OR**
- Operational Risk, contrary to market and credit risks is not taken on a voluntary basis but is a natural consequence of activities undertaken by a bank.
- OR, unlike interest risk or market risk is a pure risk and not a speculative risk. That is while for interest or market risk, risk originates from volatility of returns, which in turn might lead to either profits or losses, OR does not give rise to variability but simply to the possibility of losses.
- OR does not involve an increasing relationship between risk and expected returns. While higher risks are usually associated with higher returns, this cannot be applied in the case of OR.
- OR is complex as far as identification and understanding of risks are concerned.

Despite the increasing importance of Operational Risk, it is still lagging behind other types of risks like credit and market risks, as far as measurement systems and management models are concerned. In-fact, as of the early 2000s many large financial institutions had not yet developed either a precise measurement technology, or a clear management policy or an effective capital allocation system for this type of a risk. This delay is attributed partly to the difficulties experienced in achieving a correct
and universally-shared definition of Operational Risk. The standard definition used by banks today for regulatory purposes only dates back to 2004.

Some analysts believe that Operational Risk represents the risk category for which investments in technological and human resources will be most significant in the following years with a hope to achieve results that will be similar to the ones achieved in market and credit risk in terms of methodological rigor and accuracy. Studies indicate that Risk Management failure, the root cause of many financial crises, is mainly about people risk which is at the core of operational risk.

The Determinants of Operational Risk
From the literature and the definition of Operational Risk by Basel Committee on Banking Supervision, the major contributors to operational risk were identified to be people, processes, systems/technology associated with the bank and external events that affected the operations of the bank.

Review of literature
Basel Committee (2004) outlines the operational risk management other than the credit and market risks. The committee believes that a rigorous risk mitigation and control environment, appropriate risk measurement and pricing techniques, sound internal controls, audit assurance and disclosure would be the factors for effective operational risk management in banks. Some of the foreign and indigenous studies pertaining to risk management and operational risk management in the banking industry are as follows:

Pyle (1997) discusses why risk management is required. He outlines some of the theoretical underpinnings of contemporary bank risk management, with an emphasis on market and credit risks. He concludes that managers need reliable risk measures to direct capital to activities with the best risk/reward ratios. They need estimates of the size of potential losses to stay within the limits imposed by readily available liquidity, by creditors, customers and regulators. They need a mechanism to monitor positions and create incentives for prudent risk-taking by divisions and individuals.

Andrew (1999) found firm-wide risk management as a complex and multifaceted process, which varied among organizations. It is viewed as an ongoing process requiring continual observation, planning and even modifications if the need arises. The author concludes that current risk management practices focus almost on the statistical aspect of risk.

Pandey (2002) examined the importance of integrated risk management or enterprise risk management in the organization. He highlighted the various types or dimensions of risks such as market risk, liquidity risk, credit risk, settlement risk, operational risk, legal risk, strategic risk, regulatory risk, interest rate risk, currency risk, and commodity risk and the techniques of measurement of risk like value-at-risk by using variance-covariance method, historical method and Monte Carlo simulation method. His study concludes that enterprise resource management is the process of optimizing the manner of risk taking.

Raghavan (2003) finds that the objective of risk management is not to prohibit or prevent risk-taking activity, but to ensure that the risks are consciously taken with full knowledge, clear purpose and understanding so that they can be measured and mitigated. He expresses that the risk management techniques, like Risk Rating Models, i.e., Altman’s Z Score, Credit Matrics, Duration Gap Analysis, Simulation, Value at Risk, to anticipate and prevent the risk taking activity are of main consideration for banks.

Joint Forum’s Working Group (2003) conducted a survey of 31 firms (banking, insurance, and securities sector) from 12 countries to observe two important trends:
(i) Greater emphasis on the management of risk on an integrated firm-wide basis; and
(ii) Related efforts to ‘aggregate’ risk through mathematical risk models. The study concluded that the efforts firms had been making to develop more systematic and integrated firm-wide approaches to risk management should continue to be strongly encouraged by the regulatory and supervisory community.

Paul Embrechts, Hansjorg Furrer, Rofer Kaufmann (2003) review some actuarial techniques to find an overall model for loss severity. They model largest losses using Extreme Value Theory. They test the applicability of actuarial models and provide insight into number of observations needed to arrive at accurate quantile estimates.

Silvan Ebnöther, Paolo Vanini, Alexander McNeil Pierre Antolinez (2003) consider a number of issues of operational risk from a case study perspective and show that for a production unit of a bank with well-defined work flows operational risk can be unambiguously defined and modeled. The results of this modeling exercise are relevant for the implementation of a risk management framework, and the pertinent risk factors can be identified. They try to answer the following questions quantitatively: Definition and model OR for the work flow processes of a bank's production unit; Feasibility of portfolio view and the component assets; Important assessment errors matter; modeling OR such that both the risk exposure and the causes are identified; the crucial risk factors and the importance of comprehensiveness; and the work flows that significantly contribute to the operational risk of the business unit.

Hanc (2004) made an attempt to study the future of the US banking in order to project the likely trends in the structure and performance of banking industry over the next five to ten years and to anticipate the policy issues that would confront the industry and the regulatory community. The study also emphasized the need for financial and operational risk management system in today's competitive and complex environment. The author concludes that financial risk models are being implemented in response to both the business need for risk management and a presumption that Basel II will eventually be implemented.

Moscadelli (2004) conducted one of the most important studies by performing a detailed Extreme Value Theory analysis of complete Quantitative Impact Studies (QIS) data set of more than 47000 operational losses and concluded that loss distribution functions are well fitted by generalized Pareto distributions in upper tail area.

Leippold and Vanini (2005) developed a framework for qualification of operational risk-based on network with functional dependencies that represent workflows for business activities. The results of the study show that the usual intuition gained from market and credit risk does not apply to quantification of operational risk. The authors qualify the interdependent operational risk costs, impact of altering the network architecture. They are of the opinion that their model serve as a valuable decision tool for a bank’s operational risk management.

According to Alan Steif (2006), the Basel II Accord has generated urgency in the risk management community to model operational risk Value-at-Risk (VAR). The predominant methodology for computing operational risk VAR is the loss distribution approach. The author in the paper discusses the scaling behavior of VAR as a function of time horizon within the loss-distribution approach. In particular, it is shown that for sufficiently high frequency operational loss data VAR will scale linearly with time horizon. This fact allows the practitioner to optimize VAR computation.

Mohd Fhieli (2006) develops HR key risk indicators to be able to predict employee behavior and conduct so as to improve organizational effectiveness in managing people risk, a major component of operational risk by building a multiple level database that captures all relevant information about employees through “Know Your Staff“ principle.
Falko and Kalkbrener (2007) state that the Advanced Measurement Approach in the Basel II Accord permits an unprecedented amount of flexibility in the methodology used to assess operational risk capital requirements. Their study presents the capital model developed at Deutsche Bank and implemented in its official economic capital process. The model follows the Loss Distribution Approach (LDA). The authors presented the main quantitative components, i.e., use of loss data and scenarios, frequency and severity modeling, dependence concepts, risk mitigation and capital calculation and allocation.

Janakiraman Usha (2007) introduced the concept of operational risk, reviewed the quantitative framework for operational risk under Basel II and outlined the key challenges and varying practices in the development of an operational risk framework. The author concludes that operational risk is not well understood as a concept. The flexibility given to banks by the regulator under Basel II Accord for developing the measurement framework under the advanced approaches has resulted in varying practices followed by banks in managing and measuring operational risk.

Jobst (2007) provided a view of current regulatory framework of operational risk under the New Basel Capital Accord with a view to initiate a critical debate about the influence of varying loss profiles and different methods of data collection, loss reporting, model specification on the reliability of operational risk estimates and the consistency of risk sensitive capital rules. The author found that parameter uncertainty of different risk models as well as cross-sectional variation of timing and frequency of reported loss event could adversely affect the generation of consistent risk estimates. Thus, they provide insights for effective capital rules and prudential standards for operational risk measurement.

Anna Chernobai Philippe Jorion Fan Yu (2007) show that operational risk is driven by two types of economic forces: microeconomic forces that depend on a particular firm's characteristics including size, capital structure, and profitability, and macroeconomic forces that determine the healthiness of the U.S. banking sector. They use these contributory factors to help construct econometric models.

BS Bodla , Richa Verma (2008) studies the risk management framework & operational risk management framework by commercial banks through a primary survey. They study the implementation issues of Basel II in India by considering bank's risk management framework in general and operational risk management in particular. They also study the size & ownership impact on ORM practices Their findings conclude that the risk management policy of banks is aimed at serving several objectives such as survival, efficiency in operations, earning stability, uninterrupted operations, continued growth and preservation of reputation.

Delloitte Report (2008) suggests that HR personnel should collect information about people related governance, risk and compliance issues. HR director should present BoD with a complete report of HR compliance and operational risks along with recommended actions and accept responsibility to reduce them. The report asserts that “People and behavior are often the biggest sources of business risk” and hence it is necessary to ensure that a company’s risk management plan includes people risk.

Tomas Magnusson, Abha Prasad, Ian Storkey (2010) discuss operational risk concepts as applicable in government debt management and develop a six step process for development of operational risk framework in government debt management.

Marius Meyer, Gert Roodt, Michael Robbins (2011) discuss the importance of managing risk from a HR risk management perspective. They conclude that in addition to other factors in business, lack of proper HR risk management contributes to poor governance because businesses often use a reactive approach to HR management with little consideration for managing risk.
David Millar (2012) reviews the BIS Operational Risk perspective among the regulators and bankers and finds that while the regulators feel that capital allocated for operational risk is too low and does not reflect true operational risks while bankers feel that their staff see little obvious linkage between capital allocated to their departments and management of operational risks within these departments. He concludes that the Basic Indicator and The Standardized approaches are crude at best and have no link with the quality of risk management in an organization; and that Advanced Measurement Approaches are ultimately dependent on very sparse statistics.

**Objective of the Study**
The study aims to identify the critical factors influencing operational risk among public sector banks in Hyderabad, India.

**Sample of the Study**
The sample consisted of 100 branch managers of public sector banks namely State Bank of India, State Bank of Hyderabad and Andhra Bank in Hyderabad. Convenience Sampling was used for selecting the sample. Appropriate descriptive and inferential statistics were used to analyze the results which includes Factor Analysis.

**Sources of Data**
Structured questionnaire consisting of 43 items based on 5 point Likert scale and interviews were used to elicit information on the probable causes of operational losses among public sector banks.

**Data Analysis and Interpretation**
Factor analysis was performed to identify the underlying factor structure and reduce data set with a large number of variables into smaller number of factors. There are many different methods that can be used to conduct a factor analysis and the method adopted for this study is principal component method.

A principal component analysis with Varimax rotation was conducted on 43 items of the questionnaire concerning operational disruptions and losses associated with public sector banks filled in by the corresponding branch managers. The KMO Measure of Sampling Adequacy of 0.903 shows that the sample meets the adequacy criteria sufficiently and supports the application of factor analysis.

The 'Communalities' explains how much of the variance in each of the original variables is explained by the extracted components. The communalities varied from 0.802 to 0.495. If the communality for a variable is less than 50%, it is a candidate for exclusion from the analysis. Since the variable associated with the work environment has a communality of 0.495, it can be excluded. As no other variables have a communality of less than 50% all the other variables were retained.

The initial number of Components are 43, same as the number of original variables. The first factor accounts for the most variance and hence has the highest eigenvalue of 18.802. The other factors account for lesser variance. The % of variance represents the percent of total variance accounted for by each factor. The Extraction Sums of Squared Loadings indicate that 9 components that have Eigen values greater than 1 can be retained. Component 1 accounted for 43.72 % of the variance, while Component 2 accounted for 4.34%, Component 3 for 3.87%, Component 4 for 3.60%, Component 5 for 3.21% respectively while the other components accounted for about 2% of the variance.

While the variables representing Reputation Deterioration in minds of Customers, regulators, shareholders, political environment, natural calamities, employee fraud, insecure systems and customer claims loaded heavily on Component 1, the variables lack of training, people incompetence, technology failure, network hacking, product complexity loaded heavily on Component 2. The variables telecommunication failure, delay in technology upgrading and process loss variance loaded onto component 3, the variable model assumptions loaded onto component 4, external criminal
activities loaded onto component 5, regulatory compliance loaded onto component 6 and lack of motivation loaded onto component 7. Components 8 and 9 have variables that loaded onto other components better.

Conclusion
The study finds that the public sector banks have begun to place greater significance on operational risk and its management and are taking greater precautions in their day to day business. In spite of the emphasis, non-catastrophic operational losses (risk) do occur occasionally although with lesser severity. While it is not always possible to predict operational losses accurately, the major operational losses(risk) arise because of failure on the part of the people both internal and external to a bank, the way transactions are executed, the technological innovations used in banking and the happenings in the banking and economic environment. In line with the objective, the present study investigates the various determinants of operational risk (losses) in public sector banks and groups them accordingly. Fraud, people’s incompetence, reputation of banks, technology issues, regulatory compliance, natural calamities were found to be the main factors influencing operational risk of public sector banks.

References