# OPERATIONAL RISK MANAGEMENT IN INDIAN BANKS IN THE CONTEXT OF BASEL II: A SURVEY OF THE STATE OF PREPAREDNESS AND CHALLENGES IN DEVELOPING THE FRAMEWORK

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**ABSTRACT**
This paper assesses in detail the status of operational risk management in the Indian banking system in the context of Basel II. The expected coverage of banking assets and the approach adopted for operational risk capital computation is compared broadly with the position of the banking system in Asia, Africa and the Middle East. A survey conducted on twenty two Indian banks indicates insufficient internal data, difficulties in collection of external loss data and modelling complexities as significant impediments in the implementation of operational risk management framework in banks in India. The survey underscores the need to devote more time and resources if banks desire to implement the advanced approach under Basel II.

**Key Words:** operational risk; India; Asia; Africa; Middle East; risk management; Basel II; regulatory capital; banking assets; banks; loss data; internal audit; Gross Income; compliance

**JEL Classification:** N20, G21

## I. INTRODUCTION

Financial institutions world-wide began to recognise operational risk in the 1990s. In that sense, the term operational risk is a recent phenomenon in the context of banking and financial institutions. Heightened regulatory interest in operational risk, particularly since the late 1990s, after 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). 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. 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)]. The definition is a causative one, inasmuch as it talks about the causes of operational risk-- people, policies, procedures and systems and external events. The concept of credit and market risk is generally clearly understood. Therefore, perhaps, the need for a definition of operational risk in the Accord, while the other two risks for which Pillar I capital are to be earmarked, are not explicitly defined.[1] The Basel definition is clearly based on the causes of operational risk, rather than on the outcome of operational risk. Operational risk may materialise directly, as in the case of say, wire transfer (transfer of funds to the wrong person) or could result indirectly as a credit or market loss. For example, in the Barings case, operational risk events (fraud, lack of demarcation of responsibilities and inadequate oversight of dealer's activities) resulted in a market loss. Alternatively, not marking a lien on a fixed deposit in respect of a loan granted against the security of the deposit by the financial institution could result in a loss to the bank. The loss, though materialising as a loan loss, was actually caused by an operational risk event (non-marking of lien-an act of negligence). Buchelt and Unteregger (2004) have argued that whether or not a loss event is to be classified as an operational loss event is determined by the causes rather than the consequences of the event. Imad A. Moosa (2007) argues that the factor between pure market and credit losses and those linked to operational risk must be the cause. Moosa (2007) arguing that distinction should be made between the cause and the factor driving severity, states that the cause of the Barings disaster was an operational loss event but movements in the market aggravated the severity of the loss. Given the close linkage of operational risk with other risk types, it is very important for banks to first have a clear understanding of the concept of operational risk before designing the operational risk measurement and management framework.[2] The earliest Basel Committee publication on operational risk was simply titled "Operational Risk Management" (BCBS1998), wherein thirty major banks from different member countries were interviewed on the management of operational risk. The paper concluded that the process of operational risk measurement was

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[1] Basel II requires the implementation of three mutually reinforcing pillars: Pillar 1-minimum regulatory capital for credit, market and operational risks; Pillar 2- supervisory review process to assess and ensure the adequacy of capital to support the risks taken on by banks; Pillar 3-market discipline mandating a set of disclosures to allow market participants to assess key information related to Pillars 1 and 2.

[2] The Basel Accord stipulates that operational risk losses related to credit risk are treated as credit losses but operational risk losses related to market losses are treated as operational risk losses for the purpose of regulatory capital computation.

not sufficiently developed for the bank supervisors to mandate guidelines specifying particular measurement methodologies or quantitative limits on risk. What also emerged from the paper was that awareness of operational risk as a separate risk category was relatively recent in most of the banks surveyed at that point in time. While the major banks in advanced countries have made considerable progress in the area of operational risk management over the last decade, the awareness of operational risk is a recent phenomenon in the emerging markets.

## II. AN OVERVIEW OF THE OPERATIONAL RISK MEASUREMENT METHODOLOGIES IN BASEL II

The Basel framework (2004) proposes a range of approaches for setting aside regulatory capital for operational risk under Pillar 1: The Basic Indicator Approach (BIA), The Standardised Approach (TSA) and the Advanced Measurement Approach (AMA). All the three approaches differ in their complexity and the banks are encouraged to move along the spectrum of approaches as they obtain more sophistication in their risk management practices. The Basic Indicator Approach is the simplest approach for estimating regulatory capital, wherein banks are required to set apart an amount equal to the average over the previous three years of 15% of positive annual gross income. The Standardised Approach is a slightly modified version of the Basic Indicator Approach. In The Standardised Approach, banks' activities are divided into eight business lines: Corporate finance, Trading & Sales, Retail Banking, Commercial Banking, Payment & Settlement, Agency Services, Asset Management and Retail Brokerage. While gross income continues to be the main indicator of operational risk as under the Basic Indicator Approach, the specific amount to be set apart as a percentage of the gross income varies between business lines, ranging from 12 to 18% , as compared to the 15% overall under the Basic Indicator Approach. This approach is more refined than the Basic Indicator Approach as it takes into the account the fact that some business lines are riskier than others and therefore a higher proportion of capital has to be set apart for those business lines. The Advanced Measurement Approach (AMA) is based on the banks' internal models to quantify operational risk. The framework gives flexibility to the banks in the characteristics of the choice of internal models, though it requires banks to demonstrate that the operational risk measures meet a soundness standard comparable to a one-year holding period and a 99.9% confidence level, which means that a banks capital charge should be equal to at least 99.9% quantile of their annual aggregate loss distribution. Banks are required to factor in four key elements in designing their Advanced Measurement Approach framework: internal loss data, external loss data, scenario analysis and bank specific business environmental and internal control factors. The Accord also specifies the standard matrix of business lines and risk

types to facilitate validation across the Advanced Measurement Approaches. The methodologies under the advanced approach are evolving and there are a range of methods in practice in banks internationally (BCBS 2006).

## III. GLOBAL BASEL II IMPLEMENTATION PLANs

Much of the work done in operational risk in banks can be traced to the regulations under the new capital adequacy framework and is closely linked to Basel II implementation, although the Accord itself states that operational risk management should be closely linked to the business strategy of the bank and not end up as a mere compliance issue. In this context, it is essential to have an idea of the adoption and implementation of Basel II globally. Basel II is expected to be implemented widely around the world. Fifty four countries in Africa, Asia, Latin America, Caribbean and Middle East intend to adopt Basel II (BIS August 2004). This coupled with the thirteen Basel Committee member banks[3] and thirty four other European banks would mean that more than hundred countries worldwide will be implementing Basel II. A survey by the Financial Stability Institute, in coordination with the BCBS revealed that substantial progress in implementation of Basel II was likely in the MiddleEast, Asia and Africa (Table 1). The survey opined that 89% of the banking assets in the Middle East, 70% of the total banking assets in Asia and 65% of the banking assets in Africa were expected to be Basel II compliant by 2009 (Chart 1). The period up to 2009 is also crucial for the banking system in India in the context of Basel II implementation as in the rest of Asia, Africa and the Middle East. Under the revised capital adequacy guidelines drawn up by the regulator (RBI 2007a), all the commercial banks would be Basel II compliant in 2009.

## IV. REGULATORY APPROACH TO BASEL II IMPLEMENTATION IN INDIA AND STATE OF PREPAREDNESS OF THE INDIAN BANKING INDUSTRY IN OPERATIONAL RISK MANAGEMENT

The Reserve Bank of India is the regulator and supervisor of the banking system in India and is entrusted with the task of framing the capital adequacy guidelines for banks in India under Basel II. It would be essential here to understand the structure of the Indian banking system under the regulatory purview of Reserve Bank of India to put things in perspective. Commercial banks operating in India are eighty four in number, consisting of twenty eight banks in the public sector, twenty seven banks in the private sector and twenty nine foreign banks (RBI 2006). Public sector banks, where the Government of India is the major shareholder, dominate the Indian banking system, accounting

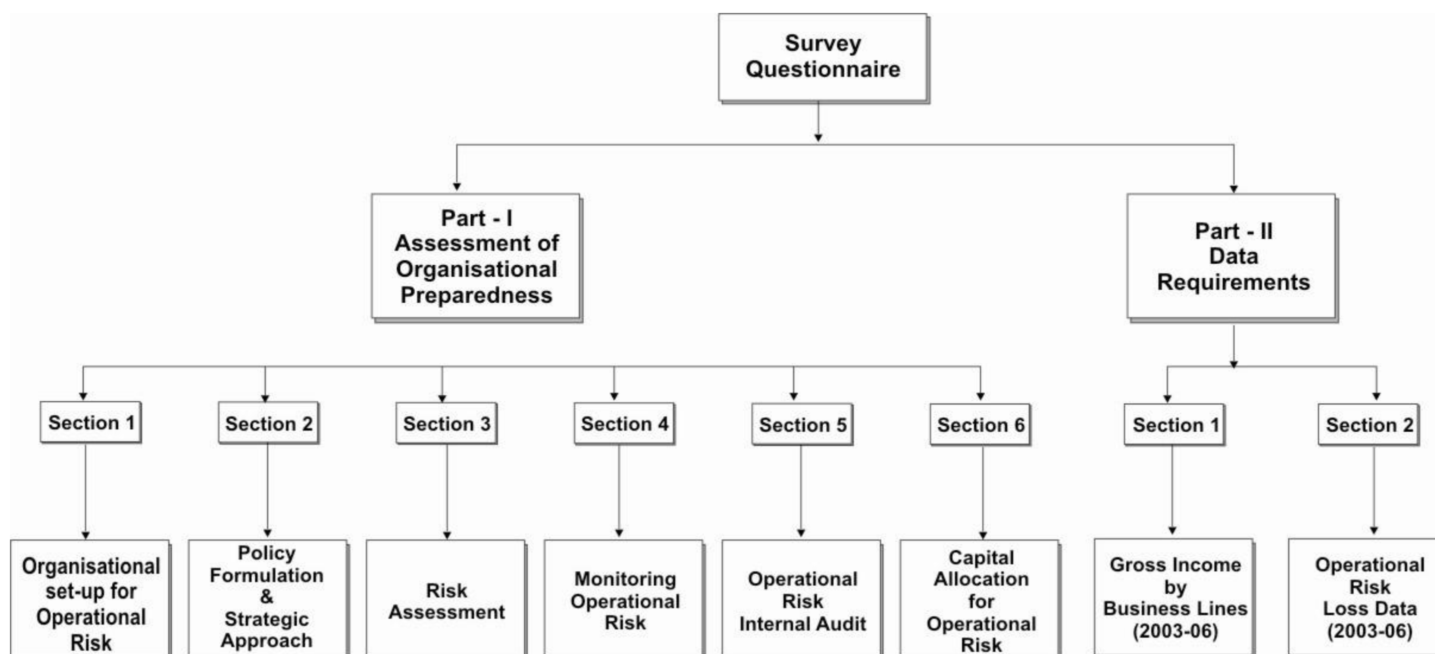
[3] The members of the Basel Committee of Banking Supervision established in 1974 and author of the Basel Accord are from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, United Kingdom and United States

for nearly three-fourths of total assets and income (RBI 2007b). These banks are large and very old banks, operating through thousands of branches spread all over the country. The private sector banks consist of nineteen old banks, which are small in size and scale and eight new private sector banks, which were set up in the mid-1990s with the onset of liberalization. The new private sector banks are fully automated from day-one and operate like other high-tech foreign banks. The private sector banks have grown rapidly since the onset of reforms and have increased their share in total assets of the banking industry from 7.7% in 1996 to 20.5% in 2006, whereas the public sector banks have witnessed a shrinkage in market share from 84.4% to 72..3% in the same period ( RBI 2007c). The public sector banks with large network of branches operates on the branch banking model and have only recently started automating their processes and operations. These banks are in the throes of transition from a manual/semi automated structure to a centralized, fully automated core banking structure. This transition is expected to pose significant challenges in the management of operational risk to the banks as introduction of new technology and complete overhauling of the existing systems requires a re-engineering of business processes, training of manpower, audit in a computerized environment and other related operational risk challenges. The public sector banks are in the throes of these challenges, having to grapple with legacy issues on the one hand and handling change and competition on the other. The new generation private sector banks on the other hand have to deal with the risks arising from growth at a scorching pace. With the reforms in the Indian banking sector and banks being allowed to access new markets and sophisticated products, the Reserve Bank of India has also been repeatedly advising the banks to have in place an effective and resilient control framework in place to manage the risks. The Reserve Bank of India has clearly articulated the approach for implementation of Basel II for commercial banks in India. (RBI 2007a) Under these guidelines, all commercial banks in India are required to adopt the Basic Indicator Approach (BIA) for operational risk to begin with, and the entire commercial banking sector is expected to be Basel II compliant latest by March 2009. Specific guidance on management of operational risk has also been issued as per which some banks; especially the larger and internationally active banks are expected to move along the range towards more sophisticated approaches as they develop more sophisticated operational risk management systems and practices which meet the prescribed qualifying criteria.

An analysis of the published annual reports of sixteen banks for the three years ending March 31, 2005[4] made to analyse the impact of operational risk capital under the Basic Indicator Approach- the immediate approach to be

[4] Banks in India close their books of accounts annually on March 31 of each year, as compared to the calendar year concept in many countries. Hence the figures taken are March-end figures.

adopted by banks in India, revealed that if the Basic Indicator Approach were to be applied to the banks on that date, the capital requirements for operational risks as a percentage to the total capital funds of the bank ranged from 4.9% to 10.9%. The impact of the operational risk capital requirement on the capital adequacy ratios of the banks analysed was found to be in the range of 0.70% to 1.77 %.( Table 2). The huge regulatory capital to be set apart for operational risk under the Basic Indicator Approach under Basel II coupled with the banks' own need to upgrade the systems and procedures for optimal use of resources is expected to incentivise some banks to progress to the advanced approaches. The



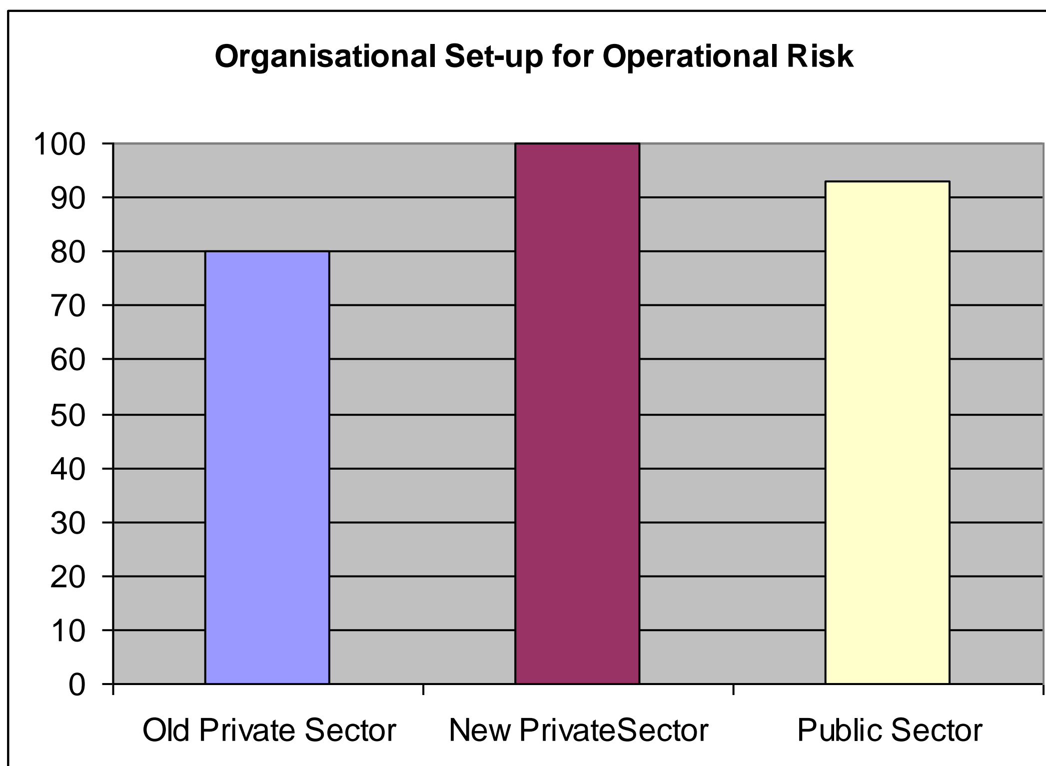

Reserve Bank of India has also made it very clear in its guidance that banks are expected to have clear policies and procedures to manage operational risk, notwithstanding the approach for regulatory capital computation. It is in this context that a survey was carried out to assess the position of Indian banks in the area of operational risk. The survey was administered by means of a questionnaire, containing fifty six questions, structured as below:

The survey questionnaires were addressed to the Head- Risk Management of the concerned banks and responses to the questionnaires were also received from the Risk Departments of the banks concerned. The survey questionnaires were sent to the commercial banks (public sector and private sector banks) on September 26, 2006. Foreign banks were not covered under the survey. The written responses to the questionnaires were received from a total of twenty-two banks on various dates between October 2006 and February 2007. These included

fourteen public sector banks, five old private sector banks and three new private sector banks. Data required in Part2 (Loss data for the years 2002 to 2006) was filled up by only two banks but was not sufficiently granular enough for any meaningful analysis to be made. None of the banks gave the data on Gross Income by business lines. As a result, no analysis on this aspect of the questionnaire could be made. The written responses were followed up by personal visits and phone calls to some banks, particularly where there were inconsistencies in the responses or where clarification on some further aspects was required. To the best of knowledge, this is the first such survey done on Indian banks on the status of implementation of banks in the area of operational risk with specific reference to the Basel Accord. The findings of the survey are detailed subject-wise as below:

*A. Organisational Set-up for Operational Risk:*

Most of the banks had a clear organsiational set-up for operational risk.



1. Out of the twenty two banks, only two banks stated that they did not have any organisational set-up for Operational Risk. The bank-group wise distribution is depicted in the graph above.

2. The organisational structure largely reflected the typical organisational chart for Operational Risk Management suggested in the Reserve Bank of India guidelines in thirteen banks. Clear involvement of operational risk functionaries at the operational levels (branches, units, regions, etc.) was observed in five banks.

3. Twenty banks stated that Operational Risk was managed as an independent function in the bank.

*B. Policy formulation & Strategic Approach*

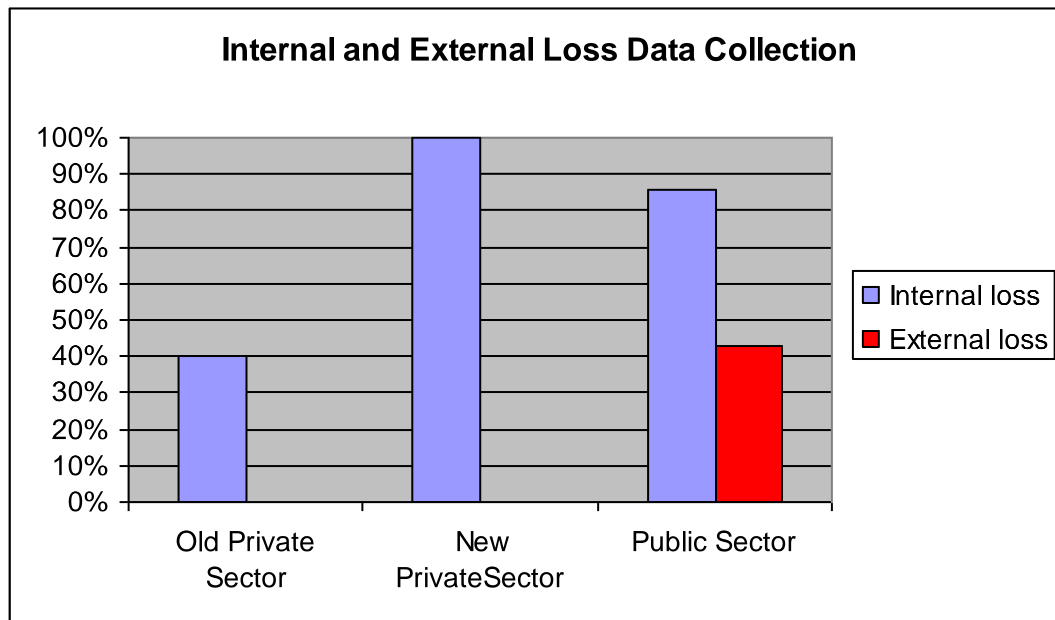
Banks were requested to respond to many questions on the subject-whether a Board approved policy was in place, whether external help was sought to draft the policy document, whether the policy detailed various aspects such as definitional issues, data capture and MIS, developing and incorporating Business Environment & Internal Control Factors (BEICFs) into the framework, risk assessment methodology, reviews & reporting, IT support, capacity building, etc. Responses to questions on data policy such as data collection & capture, storage & retrieval, etc. were sought from banks to assess the level of documentation of the procedural and process related aspects. Banks were also asked to identify the most critical driver for their operational risk programme.

1. As far as policy formulation on operational risk is concerned, all banks with the exception of one, had formulated policies on Operational Risk which was approved by the Board. Three banks had sought the help of external agencies/consultants for policy formulation.

2. While seventeen banks have stated that RBI Guidance on Operational Risk (RBI 2005) was sufficient to guide the banks in their policy formulation as well as on the approach to be adopted for Operational Risk Management, five banks have stated that the guidelines were not sufficient. However, lack of regulatory clarity was observed as a significant/highly significant obstacle in the implementation of Operational Risk Framework by seven banks; six banks have stated that lack of regulatory clarity was a moderately significant obstacle. Banks who felt that regulatory guidance was insufficient felt so mainly in the area of quantitative aspects for moving over to Advanced Measurement Approach.

3. Objectives and scope of the policies, roles and responsibilities of Operational Risk Management function, definitional issues on operational risk, data capture, periodical reviews, reporting to senior management/Board were all properly delineated in the policy documents in most banks. However, the specific assessment methodology, testing & verification, prescription of reporting levels/limits & breaches, capacity building, IT support required were largely not addressed.

4. Gaps in the data policy were observed. While five banks had not documented the internal loss data capture /collection mechanism, fourteen banks had not started/documented external loss data capture. During discussions with bankers, it was observed that banks who had responded as having an external data capture mechanism in place were in fact, having a system of building up files containing newspaper clippings, and other market intelligence, for external loss events. These were discussed in the operational risk committee meetings at various levels.




The graph above depicts the bank group-wise position of internal and external loss data collection exercise.

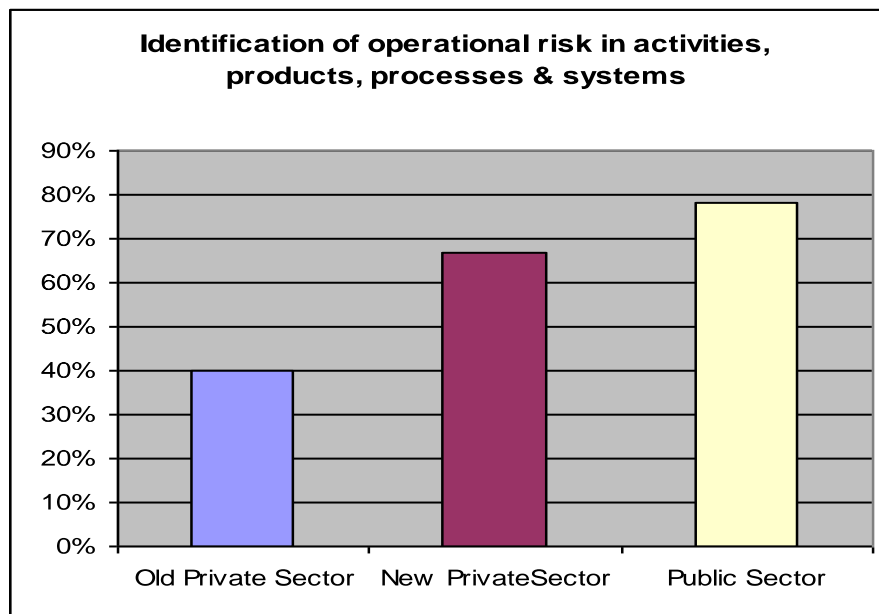
5. Basel II /Reserve Bank of India guidelines and the desire to establish and implement good controls were the key factors driving operational risk management in most of the banks. A few banks cited the impact of operational losses on profitability as a significant driver. Recent high - profile operational loss events in banks world-wide/accounting scandals

as well as natural disasters/terrorism were rated as of less significance in comparison.

*C. Risk Assessment*

A majority of the banks had completed the work of identifying/assessing the operational risk in their material activities, products, processes and systems. Banks had in their comments, expressed difficulties in designing the framework for measuring operational risk, given non-standardisation in approaches and difficulties in modelling. As a result, very few banks had a model for quantifying operational risk. Banks were largely making only a qualitative assessment of operational risk. Many banks had only begun the process of event identification and capture as well as loss data capture.

1. Fourteen banks had undertaken the process of identification of operational risk inherent in material activities, products, processes, systems and people. The graph above shows the bank-group wise position, based on the sample




banks surveyed.

2. Almost all the banks were using some sort of tool for assessing operational risk. One bank was yet to decide on the tool to be used. Self -assessment was the most commonly used tool. Twelve banks listed Key Risk Indicators (KRIs) as an important tool for assessment. Banks were also using inspection/audit report findings as an operational risk tool. Although designing loss data formats was in formative stage in many banks, it was evident that banks were

convinced that loss data collection was important in operational risk assessment.

3. Two banks had developed a framework/model for operational risk. One bank had developed it in-house and the other bank had appointed an external agency exclusively for operational risk management.

4. Seven banks have sought the help of consultants for their operational risk framework, either exclusively or as part of the overall risk management solution.

*D. Monitoring operational risk*

Most of the banks had some kind of monitoring for operational risk, relying on traditional methods of reporting. Many banks admitted that the monitoring system was in development stage but were of the opinion that the level of monitoring was adequate in the initial stage. The detailed analysis of the responses is as below:

**1.** Six banks had indicators/thresholds linked to indicators as part of monitoring

**2.** Two banks were yet to commence any kind of monitoring of operational risk. Most banks were in the process of putting in place monitoring mechanisms and expected to further streamline and strengthen it in due course. In many of the banks surveyed, the operational risk was monitored at monthly or higher frequency, with a number of banks mandating a quarterly frequency. Fourteen banks had included the results of monitoring in the regular Board/Management reports.

**3.** All banks, with the exception of one, had established Disaster Recovery and Business Continuity Plans. However, six banks had not had not tested these plans.

*E. Operational Risk and Internal Audit Function*

Banks were asked whether their internal audit/inspection covered the effective implementation of operating policies and procedures. Most banks replied in the affirmative. Banks were also asked about the linkage of internal audit to the operational risk framework. It was observed from the responses that almost all the banks were making use of the internal audit inputs in the management of operational risk. Risk Based Internal Audit has emerged as one of the important tools in the operational risk framework of banks. While the Reserve Bank of India guidelines on Risk Based Internal Audit states that the risk

management function itself should be subject to audit, operational risk framework was not subject to effective and comprehensive internal audit in some banks.

*F. Capital Allocation for Operational Risk and Implementation of the Basel II Framework*

While RBI guidelines make it mandatory for the banks in India to use the Basic Indicator Approach for regulatory capital to start with, many banks evinced a desire to move over to the advanced approaches. Some banks proposed to mover over to Total Standardised Approach as an interim measure, before moving over to Advanced Measurement Approach, while a few banks have not mentioned The Standardised Approach at all in their roadmap for an advanced operational risk framework. Some banks had not obtained the Board approval for their road map. On discussions with bankers, it was evident that many did not have a clear and realistic roadmap, with well-defined timelines and a structured approach for implementing the framework, taking into account their existing capacities, stage of development of risk management in their banks, IT support and infrastructure available, etc. Incidentally, it has been observed that business line wise allocation of gross income is itself a major issue, with many banks, particularly the public sector banks and the old private sector banks, not being in a position to demarcate the Gross Income (after netting off interest expenses) business-line wise at present. As a result, in addition to fulfilling the qualitative and other criteria for the use of the Total Standardised Approach, banks have to start looking into their data capture in this regard and coordinate with the IT department for such business-line-wise capture to enable them to move over to Total Standardised Approach, in the interim, pending switchover to Advanced Measurement Approach.

The detailed analysis of the capital allocation for operational risk is given below:

1. All banks were planning to use the Basic Indicator Approach for calculating capital for operational risk as per the Reserve Bank of India guidelines. Most of the banks were at the initial stage of implementation of the Basel framework for operational risk. Two banks stated that they had not started implementation. Nineteen banks planned to move along the spectrum to the advanced approaches. Eight banks intend to adopt a step-by-step approach to Basel II ORM framework: in the first instance The Standardised Approach and thereafter the Advanced Measurement Approach. Five banks have indicated a desire to switch over to Advanced Measurement Approach directly. Six banks were not clear about their road map.

2. Six banks have stated that their road map to move over to The Standardised Approach / Advanced Measurement Approach had the approval of their

respective Boards. In course of discussions with banks, it was gathered that the Board approvals were general in nature for moving over to the advanced approaches under Basel II and that the specific approvals for The Standardised Approach / Advanced Measurement Approach as the case may be, shall be obtained at the appropriate time, after putting in place the detailed framework, before approaching the regulator.

3. One bank stated that their implementation of the framework was almost complete in so far as the Total Standardised Approach is concerned and halfway through in respect of Advanced Measurement Approach implementation.

4. Sixteen banks had not undertaken /completed the Business Line mapping exercise. Only four banks had documented the mapping process and policy.

5. While two banks have stated that they expect no change in so far as operational risk losses are concerned as a result of implementation of the Basel II framework, the other banks expect a reduction in operational losses as a result of implementation.

6. Eight banks have stated that they plan to use all the factors (Internal data, external data, scenario analysis, business environment & internal control factors/KRIs) in measuring the operational risk capital. Most of the other banks listed internal data and internal control factors as the combination that they plan to use for Advanced Measurement Approach. It is thus evident that many banks did not have a clear idea of the factors required for the use of Advanced Measurement Approach under Basel II.

7. Regarding internal operational loss data, the availability of data varied widely between the banks. The number of years' loss data available with banks varied widely between two years and six years. Some banks stated that the data was not granular enough and that most of the loss data was related to frauds only.

8. A few banks stated that further directions/guidance from RBI on the Advanced Measurement Approach would be useful. Non-standardisation of models/modelling difficulties was listed by a few banks as a limiting factor in their efforts to move to Advanced Measurement Approach. Insufficient data, difficulty in gathering external data and modeling difficulties/non-standardisation of models were listed by a majority of the banks as very significant obstacles in the implementation of Advanced Measurement Approach. Lack of regulatory clarity, lack of expertise, difficulty in gathering external data, integrating quantitative and qualitative factors, and lack of

technological support were other limitations in designing and implementing an Operational Risk Framework

9. Most of the banks had not evaluated/estimated the expenditure for transition to advanced approaches. In the five banks which gave an estimate of the expenditure per annum for transition to advanced approaches, the range was wide (from Rs. 30 lakh to Rs. 3 crore).

10. "Better controls" was listed as the most significant benefit/gain from the successful implementation of operational risk management framework by many banks. Reduction in losses, improvement in performance and reduction in regulatory capital were considered the other significant benefits.

11. External frauds, internal frauds, and IT system failures ranked among the top operational risks for banks in terms of impact on the banks business.

## V. CONCLUSION

The results of the survey clearly indicate that the process of designing the framework for operational risk has just begun for Indian banks. Basel II /regulatory compliance and desire to establish and implement good controls emerged as two major drivers of operational risk management in banks. The positive features are that all banks have well defined organsiational structure and Board approved policies for operational risk management; a majority of the banks were using some for of self-assessment- a qualitative factor, as an important tool in their operational risk framework; many banks had started the operational risk loss data collection exercise for moving over to the advanced approaches though these were still in the formative stages. However, it also emerged that many banks did not have a clear idea about the elements/factors required for moving over to the Advanced Measurement Approach (AMA). Insufficient data, difficulties in gathering external data and modeling difficulties were cited as very significant obstacles in the implementation of the operational risk management (ORM) framework in banks. A majority of the banks have also cited lack of regulatory clarity as a moderately significant obstacle in moving over to the advanced approaches. Banks await regulatory guidance particularly on the quantification aspects. Regarding the approach to be adopted for regulatory capital under Basel II, all the banks expect to adopt the Basic Indicator Approach by 2008-09. A majority of the banks had a desire to move over to the advanced approaches, though no clear roadmap /Board approval for moving over to advanced approaches was evidenced. The entire commercial banking system in India, i.e. 100% of the commercial banking assets is expected to be Basel II compliant by 2009, albeit with the simpler approaches to start with. This position compares favorably to the coverage of Asia (70% of banking assets), Africa (65% of banking assets) and the Middle East (89% of banking assets). (BIS

August 2004). What has emerged as a common factor for all the three jurisdictions (Refer Table 1) in the implementation of Basel II is that on an average a majority of the banking assets is expected to be Basel II compliant by 2009; a majority of the banks are expected to adopt the Basic Indicator Approach and the Standardised Approach for operational risk; Advanced Measurement Approach is not expected to be adopted in the medium term. Form the perspective of the Indian banking industry, the operational risk management framework, has seen some progress in recent times. It is however, evident from the results of the survey that there is still much more to be done and banks will have to devote more time and resources if they wish to implement the advanced approaches.

**REFERENCES**

1. BCBS (1998). Operational Risk Management www. bis.org.
2. BCBS (2004). *Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework*. Bank for International Settlements, Basel. www. bis.org.
3. BCBS (2006). Observed range of practice in key elements of Advanced Measurement Approaches (AMA). www. bis.org.
4. BIS August (2004). Implementation of the new capital adequacy framework in non- Basel Committee member countries. www. bis.org
5. Buchelt, R. and Unteregger, S. (2004). Cultural risk and risk culture: operational risk after Basel II. Financial Stability Report 6. http://www.oenb.at/en/img/fsr_06_cultural_risk_tcm16-9495.pdf.
6. Moosa, I.A. (2007). Misconceptions about operational risk. *Journal of Operational Risk*, Vol. 1, No. 4, pp. 97-104.
7. RBI (2005). Reserve Bank of India Guidance Note on Operational Risk Management dated October 15, 2005. www.rbi.org.in.
8. RBI (2006). Report on Trend and Progress of Banking in India: 2005-06. www.rbi.org.in.
9. RBI (2007a). Prudential Guidelines on Capital Adequacy and Market Discipline- Implementation of the New Capital Adequacy Framework: Reserve Bank of India circular dated April 27, 2007. www.rbi.org.in.
10. RBI (2007b). Indian Financial Sector Reforms: Address by V Leeladhar Deputy Governor Reserve Bank of India at the Annual Washington Conference of the Institute of International Bankers on March 5, 2007 www.rbi.org.in.
11. RBI (2007c). Special Features of Financial Sector Reforms in India: Address by Shyamala Gopinath Deputy Governor Reserve Bank of India at the 18th Annual National Conference of Forex Association of India on April 6, 2007. www.rbi.org.in.

**APPENDIX**

***Basel II is all set to change the regulatory landscape of the banking industry worldwide, with more than hundred countries expecting to implement the revised Accord. More specifically, a major part of the banking system in Asia, Africa and the Middle East will be adopting Basel II between 2007 and 2009. One major feature of the Basel Accord is the explicit recognition of operational risk in the regulatory capital canvas. Given the distinctive nature of operational risk as compared to the other major risks faced by financial institutions such as credit, market and liquidity, the development of a framework for operational risk poses a major challenge for banks and regulators the world over. The main objective of this paper is to present a perspective of the state of preparedness of the banking system in India in the area of operational risk in the context of Basel II. This paper begins with an introduction of the concept of operational risk in banking industry , gives a brief overview of the operational risk measurement methodologies in Basel II, presents briefly the Basel II implementation plans from a global perspective, analyses in detail the results of the survey on the state of preparedness of the Indian banking system in the area of operational risk and concludes with the findings of the survey , comparing the results with the position of the banking system in Asia , Africa and the Middle East in general***

**Table: 1**

**Summary of responses:**[5]

| **Subject Matter** | **India** | **Asia** | **Africa** | **Middle East** |
|---|---|---|---|---|
| 1.Survey outreach | Twenty two banks in India | Eighteen jurisdictions[6] in Asia | Twenty two jurisdictions[7] in Africa | Nine jurisdictions[8] in the Middle East |
| 2. Basel II implementation: Coverage of banking assets | 100% of banking assets in India by 2009 as per regulatory instructions | 70% of banking assets in Asia by 2009 | 65% of banking assets by 2009 | 89% of banking assets by 2009 |
| 3. Adoption of approaches for operational risk capital computation | All commercial banks to compulsorily adopt Basic Indicator Approach to begin with as per regulatory instructions; Nineteen banks indicated an intention to move over to advanced approaches; majority had no clear road map for switching over to advanced approaches | Five jurisdictions plan to offer all options in Basel II ( Basic Indicator , The Standardised Approach and Advanced measurement Approach ); Eight jurisdictions to implement framework gradually between 2007 and 2009-the majority of assets will be subject to Basic Indicator Approach after January 2007; Five jurisdictions were still undecided | Basic Indicator Approach and Standardised Approach will be adopted by the majority of the banks in the region. | Most banks expected to use the Basic Indicator Approach or the standardised approach; Advanced Measurement Approach will not be adopted in the medium term. |

[5] The Indian position stated in the table is based on the survey of a sample of twenty two Indian banks conducted by the author. Regarding Asia, Africa and the Middle East, the responses have been taken form a Survey conducted by the Financial Stability Institute ( FSI) , in coordination with the Basel Committee on Banking Supervision ( BCBS) in August 2004. The publication titled "Implementation of the new capital adequacy framework in non- Basel Committee member countries" is available on the BIS website www. bis.org.

[6] Jurisdictions in Asia covered in the BIS Survey : Australia, Bangladesh, China, HongKong SAR, India, Indonesia, Korea, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Singapore, SriLanka, Taiwan, Thailand and Vietnam

[7] Jurisdictions in Africa covered in the BIS Survey: Angola, Botswana, COBAC, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Libya, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Sierra Leone, South Africa, Sudan, Tanzania, Uganda, WAEMU, Zambia and Zimbabwe

[8] Jurisdictions in Middle East covered in the BIS Survey: Bahrain, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, United Arab Emirates

**Table 2**

| Sr. No. | Name of Bank | Average Gross Inc | Cap reqd for or under BIA | Capital Funds$ as on March 31, 2005 | OR capital as a % of capital funds | Impact on capital adequacy ratio (%) |
|---|---|---|---|---|---|---|
| | | Rs.in crore* | Rs.in crore* | Rs.in crore* | | (approx) |
| 1 | Canara Bank | 4296.43 | 644.46 | 8624.25 | 7.47 | 1.23 |
| 2 | Syndicate Bank | 2050.59 | 307.59 | 2813.03 | 10.93 | 1.23 |
| 3 | Indian Overseas Bank | 2187.33 | 328.10 | 3629.92 | 9.04 | 1.77 |
| 4 | Bank of India | 3642.98 | 546.45 | 6024.77 | 9.07 | 1.20 |
| 5 | Union Bank of India | 2546.61 | 381.99 | 5323.19 | 7.18 | 1.06 |
| 6 | Federal Bank | 650.59 | 97.59 | 989.29 | 9.86 | 1.24 |
| 7 | City Union Bank | 139.07 | 20.86 | 240.72 | 8.67 | 1.28 |
| 8 | ICICI Bank | 5138.93 | 770.84 | 15902.93 | 4.85 | 0.70 |
| 9 | Vijaya Bank | 1227.35 | 184.1 | 2020.03 | 9.11 | 1.49 |
| 10 | State Bank of India | 18463.29 | 2769.49 | 27536.99 | 10.06 | 1.52 |
| 11 | Punjab National Bank | 5149.17 | 772.38 | 10332.28 | 7.48 | 1.62 |
| 12 | ING Vysya | 540.45 | 81.07 | 994.79 | 8.15 | 0.69 |
| 13 | HDFC Bank | 1844.30 | 276.65 | 5018.00 | 5.51 | 0.84 |
| 14 | Central Bank | 2944.39 | 441.66 | 4287.25 | 10.30 | 1.48 |
| 15 | Karur Vysya Bank | 347.44 | 52.12 | 760.88 | 6.85 | 1.75 |
| 16 | Jammu & Kashmir Bank | 796.10 | 119.42 | 1752.40 | 6.81 | 1.56 |

12. Rs. 1 crore= Rs. 10 million
13. US$ 1= Rs. 41.34

[i] *Usha Janakiraman is the Deputy General Manager Reserve Bank of India On Deputation to National Institute of Bank Management Faculty member, Finance Area Group. Usha Janakiraman has done her bachelor's in commerce form the University of Calcutta, India and is also a qualified Chartered Accountant. She is currently posted as Deputy General Manager, Reserve Bank of India, Department of Banking Supervision on deputation to National Institute of Bank Management, Pune, India. She has fourteen years of experience in the Reserve Bank of India, (central bank of the country and the regulator and supervisor of the banking system in India). Her deputation assignment spans teaching and research in the area of banking and finance, more specifically, bank regulation and supervision, audit & control, Basel II implementation.*