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# Bank Quest

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## Risk Management



इस परिवर्तनशील समय में  
निर्यात के लिए दोहरा बीमा



निर्यातकों के लिए ऋण जोखिम बीमा

एवं

बैंकों के लिए ऋण जोखिम बीमा

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फैक्स: (022) 6659 0517 टोल फ्री नं. 1800-22-4500



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हम जोखिमों से रक्षा प्रदान करेंगे.

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Kohinoor City, Commercial-II, Tower-I, 2<sup>nd</sup> Floor, Kiro Road, Kurla (W), Mumbai - 400 070.

Tel.: 91-022-2503 9604 / 9746 / 9907 • Fax : 91-022-2503 7332

Telegram : INSTIEXAM • E-mail : iibgen@bom5.vsnl.net.in

Website : [www.iibf.org.in](http://www.iibf.org.in)

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**Dr. R. Bhaskaran**  
Chief Executive Officer,  
IIBF, Mumbai

***U**nderstanding and managing risks in banking business have acquired more significance in the recent years more particularly after the global financial crisis. Regulators have reacted sharply to the crisis by stipulating a more calibrated capital adequacy and laying emphasis on Governance and Compliance. Compliance has become an important task for banks, more particularly in India in recent years.*

*Going by the available literature on the subject the regulatory prescriptions for risk management revolve around, among other things, risk weighted and regulatory review driven capital adequacy, exposure norms, provisioning norms, valuation norms, credit rating, governance etc.,. Naturally these are inclined towards ensuring financial stability. Compliance to these aspects by itself does not, automatically assure a good bottom line or an appropriate share in banking business. On the contrary compliance has a cost and could constrain the business mix. Given this, banks will have to factor the regulatory prescriptions in their risk management to arrive at appropriate business mix, products and processes such that a bank is able to get a reasonable market share of business and a good bottom line while complying with the regulatory norms. This is, by no means, an easy task. Take for example the CRAR. There could be situations when the bank has good liquidity but is not able to lend or invest as the available capital does not permit the same. Similarly a bank with high CRAR but inadequate access to lendable resources will not be able to heed to a good lending or investing opportunity. In the circumstances, Board of a bank which has a key role in risk management and Governance becomes the centre piece in risk management. Normally governance is discussed in terms of 'good' and 'bad'. As against this it is time that Governance is evaluated in terms of 'efficiency' and ability to understand and manage risk. This is because boards should not be concerned, only with issues such as nomination, compensation, audit and ethics but should also be actively involved in business planning and ensuring delivery of results to all stake holders. Efficiency of Board will be manifest in the way it has been able to factor the risk management constraints and deliver good business results.*

*Going forward the most important factor that will determine the growth of Indian banks will be the ability to garner adequate capital. Risk management will be of equal importance. With this in view the current issue of Bank Quest is focused on 'Risk Management'.*

*The first article in this issue is by Smt. Vijayalakshmi R. Iyer, Executive Director, Central Bank of India. In her article on 'Efficacy of Stress Testing and Scenario Analysis in Risk Management', she underlines the need to focus on stress testing with a greater attention towards regulator's perception on systemic risk. The article also highlights that efficacy of stress testing will be a function of factors such as infrastructure, governance, strategic and capital decisions.*

*The second essay is by Mr. S. Srinivasaraghavan, Executive Vice President & Head Treasury, Dhanlaxmi Bank Ltd. In his article 'Basel III and its implication to Indian Banks-Introspection' he explains major features of Basel III and its implications on Indian Banks in terms of capital mobilization. He highlights that there is no choice but to augment capital to prepare for the implementation of Basel III.*

*The third article 'The Invisible Bottom - Line' is by Mr. A.J. D. Thangaraj, General Manager and Ms. Geethy Panicker, Senior Manager, Union Bank of India. The authors beside mentioning various factors contributing to the possible under investment and undermining of risk management in most banks allude that the contradicting human behavior pattern could be the fundamental reason for risk aversion. They opine that the risk management is no longer a cost centre but its new role is to enhance business strategy, identify opportunities and ultimately create long-term shareholder value.*

*The fourth article is on 'Payment & Settlement System Risk Management' by Mr. Siddhartha Roy, Chief Risk Officer, Clearing Corporation of India Ltd. He highlights the increasing importance of payment system to improve financial market efficiency and the risk management. A payment and settlement system can be successful only with efficient regulation and effective governance. The author explains how the Indian payment system has evolved over a time alongside financial derivative markets. The paper explains risk management at retail as well as wholesale levels of payment systems. It stresses on a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational and other risks.*

*The fifth article is by Mr. Abhay Gupte, Senior Director, Deloitte Touche Tohmatsu India Private Limited. The article titled 'Fraud Risk Management' says organizations have addressed fraud risk in a conventional way resulting in limited success in managing and mitigating the*

*incidence of frauds. Findings from a Deloitte survey indicate that a majority of the banks expect retail banking to be most vulnerable to fraud. The article examines various types of frauds such as accounting fraud, bribery and corruption, Cyber-crimes and Asset misappropriation. The article also explains Fraud Risk Regulations in India and critical elements in an effective Fraud Risk Management framework. The author also suggests banks to consider areas such as Corporate Governance, Employee Training & Culture, Data Analytics, Vendor Due Diligence, Customer Screening, Use of External Expertise / Consultants for better fraud management.*

*The sixth article is 'Judgement Calls in Risk Management' by Ms. M. Pavithra, Manager, Syndicate Bank. The article begins with the explanation of the scientific nature of risk management. Then the author takes the reader to situations with unquantifiable hazards where judgements are required. She has explained two such situations viz., a crisis situation and/or a situation where there is no adequate information / data to base one's decision. The article also highlights the issues involved in making judgment calls.*

*The seventh article is by Dr. Narinder Kumar Bhasin, Vice President & Retail Banking-Branch Head, Axix Bank on 'Managing Banking Risks through Ideal Technology'. It covers definition of risk, its components, processes involved in risk management, sources of risk, risks in banking, classification of risks, Basel-III implementation etc. The author has given various check lists to address three important risks viz., Operational Risk, Credit Risk and Reputational Risk in Banks. He also explains the role of technology in risk management and opines that the technology has to be treated as a tool rather than the solution in managing risk.*

*In the eighth article 'Role of Capital in Risk Management', Mr. D. P. Chatterjee, Former General Manager, UCO Bank, explores the reasons for the global financial crisis and also discusses the Basel Committee's response to this financial crisis. The paper explores the role of capital in risk management. He has also explained how banking sector issues such as excessive leverage, inadequate and low-quality capital and insufficient liquidity buffers were addressed through a series of measures.*

*This issue carries a book review on 'Credit Monitoring, Legal Aspects & Recovery of Bank Loan' written by Mr. D. D. Mukherjee. We hope it will be of great use to you.*

*We solicit your suggestions and feedback for improvement.*

*(Dr. R. Bhaskaran)*



## Efficacy of Stress Testing and Scenario Analysis in Risk Management

 Smt. Vijayalakshmi R. Iyer \*

### Introduction :

*"Stress testing is especially important after long periods of benign economic and financial conditions, when fading memory of negative conditions can lead to complacency and the under pricing of risk. It is also a key risk management tool during periods of expansion, when innovation leads to new products that grow rapidly and for which limited or no loss data is available."*

*- Basel Committee, May 2009*

What is commonly known as "Stress testing" could also be defined in terms of :

- **Sensitivity Analysis** : the identification of how risky portfolios respond to shifts in relevant economic variables or underlying risk parameters or;
- **Scenario Analysis** : an assessment of the resilience of a portfolio, financial institution or the financial system as a whole in this age of systemic-risk-awareness to severe but plausible scenarios.

**Sensitivity Analysis** has historically been the methodology used to quantify portfolio risk. It is however, a limited approach that might best be described as one-dimensional.

**Scenario Analysis** is a dynamic and systematic process for analyzing possible future events by considering various alternative outcomes. It is designed to allow improved decision-making, invoking consideration of negative outcomes and implications on business strategy, franchise, risks, and rewards.

Scenario Analysis is geared towards enabling decision making on risk appetite versus risk levels, asset allocation, client and product segmentation

strategies, implicit and explicit diversification tactics, and insurance / hedge considerations; institutions can also compute scenario-weighted expected returns, and improve their knowledge of the unknown i.e. potential unexpected losses and economic / regulatory capital adequacy. Scenario analysis can also be used to illuminate wild cards and "black swans".

Bankers and regulators worldwide have increasingly focused on enhanced stress testing as a risk management tool to help gauge and reduce vulnerability to unexpected external shocks. The attention being paid by regulators to systemic risk has increased the focus on stress testing. As techniques are improved and banks become more familiar with the processes required, enhanced stress testing is emerging as a standard supervisory tool, putting a premium on understanding what it involves and how it can best be used.

### **Stress Testing - A Practical Risk Management Tool**

Banks have long "stressed" at least parts of their portfolios for the impact of changes in financial factors on key capital, liquidity and profitability measures.

Global regulators have stepped up demands for an ever more consistent, aggressive and comprehensive approach to stress testing as part of the revised Internal Capital Adequacy Assessment Process (ICAAP) stipulated by Base II. An important element of the stress-testing regime is the adoption of a more thorough, enterprise wide approach, with stress test scenarios defined by anticipated future economic conditions rather than simpler historic scenarios. The UK's Financial Services Authority (FSA) had even introduced tougher scenarios namely reverse stress testing.

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\* Executive Director, Central Bank of India.



The efficacy of the stress testing revolve around the following factors :

- Developing the right infrastructure.
- Refining the governance framework.
- Covering the gamut of risks - from market and credit to operations, liquidity and other risks.
- Linking stress tests results to strategic and capital decisions.

#### **Infrastructure :**

One of the biggest challenges is to construct an enterprise-wide stress testing and risk management infrastructure that can cope with the job of running multiple scenarios. The scenarios often depend upon enormous quantities of differently sliced firm wide data that run through multiple models to generate stress tests results. The pressure on people, data and IT systems has often been significant but the costs not highly prohibitive.

#### **IT IS A CHALLENGE, AND IT CAN BE EXPENSIVE.**

#### **People :**

Assembling a team with the right mix of quantitative, financial, IT and / or economic skills demanded by stress testing does not come easily. Identification and retention of the skilled employees is a big challenge. The public sector set up have to bear the brunt of the attiriton as the remuneration is predefined with little or no scope for differentials. Banks with global presence and different divisions have to employ a separate team at the group level to monitor stress testing across all the business divisions and to focus on less standard risk categories such as business and operational risk.

In the near future, having dedicated staff is likely to become more common. A more consistent firm wide approach can provide management with a better foundation for capital decisions.

#### **Data and IT Systems :**

Collecting the appropriate data and having versatile systems in place to integrate massive volumes of information from disparate sources in an opportune and useful manner can be critical to the successful

completion of regulatory and internal stress testing and capital planning exercises. The strains on data and IT systems can be significant.

**DATA :** Getting the right data to calculate good loss estimates for different types of risks poses one set of problems, aggregating the information another. As with any aspect of regulatory oversight or risk management, careful analysis is crucial to ensure that the data make sense, are accurate, are not double counted, and perhaps most importantly, are easy to explain.

Data must be smoothened, checked for quality and refreshed periodically, duplication eliminated and revisions made, so that the potential for misleading end results can be reduced. Banks, especially the large and complex ones, may need to consider whether they have captured all the relevant data and made the right assumptions. Data gaps remain an obstacle, particularly in areas where there may be insufficient historical information (such as operational risk) to support reliable predicted loss calculations.

Despite a shift towards automation, the quick assessment of new stress scenarios is often impeded by the need to input manually thousands of risk factor shocks corresponding to views about how each variable would respond to the new scenario.

Perhaps the greatest hurdle is data aggregation. For example, for market risk this may require standardized valuations across businesses, geographies, products and risk types and across dissimilar, front-office collection systems. Legacy systems left from past investments and acquisitions can add further complications.

**SYSTEMS :** Some banks have been able to leverage stress testing off existing infrastructure. The upshot for many banks may be an ongoing need for substantial investment in data and IT systems. Platforms for data aggregation are likely to be a prime task for many banks but the degree and type of investment will vary for each bank.

Data must be presented in a manner that is valuable to the end user, which can be tough when regulators request a format that may not be useful to the bank

management. This may require customization of the systems, of course, with a cost tag added to it.

### **Governance**

Many banks have been pruning their management structures around risk management and stress testing. One of the goals is to have more consistent scenarios and assumptions across the organization in order to avoid duplication and the possibility that each group might run tests that are not integrated into the whole.

**Reporting structure :** Stress testing is generally run out of the risk - management group, with input from finance and business lines. It should typically run out of a separate cell with heads of individual risk as members. The cell should deliberate on scenarios, evaluate results and present to the top management. Outcomes should ultimately flow to the capital, risk and board audit committees.

**Scenario development :** Worst-case scenarios, in particular, must be credible and make sense. Running countless scenarios is time consuming and unless they are well chosen, the results may be irrelevant to managing capital or the business. The kind and the number of scenarios have to be balanced. The entire effort has to be institutionalized, done in a systemic manner, and well ingrained in the risk-management culture.

Banks might also keep in mind that Basel-driven ICAAP stress testing, with its focus on macro-economic shocks, is only one part of what comprises a comprehensive and integrated approach. The focus should be on having a broader range and greater frequency of directionally meaningful, and comprehensive tests on both enterprise-wide scenarios and business lines. The aim is to better understand pressure points in individual books based on the bank's own concentrations and vulnerabilities.

### **Frequency :**

For now, many banks run bank wide tests once or twice a year, along with daily stresses of trading portfolios, monthly *ad-hoc* tests of particular portfolios or risks, and periodic tests for one-off occurrences of operational

and other rarer risks. To add different stress tests for multiple regulatory jurisdictions, and it should be clear that producing results on schedule is a tall order.

As stress testing becomes a more entrenched risk-management tool that regulators rely on more heavily, demand for bank wide tests is likely to grow.

### **Stressing for Different Risks**

Firm wide stress testing should consider a broad range of risks, including market, credit, operational and liquidity risks. In each area, tests should consider capital allocation and planning. The key risk drivers and assumptions should be identified carefully.

**Market and credit risk :** Many of the banks actively deploying the technique spend the bulk of their time stress testing market and credit risk, partly because these are their main risks and quantification can be easier.

Even when risks can be easily quantified, qualitative judgments remain crucial. One cannot blindly rely on good models even if good data is available, because in estimation of loss, particularly on the credit side, and even on the trading side, there is a judgmental component that should not be neglected. It is very important to have very good quantitative modeling methods overlaid with good experience and judgment.

In credit-risk arena, data gaps are a major challenge to handle with. Further to match / map the existing business exposures on books with that of the classes as per regulator's requirement is another challenge. If these two challenges are met successfully, then the very purpose of the exercise is met.

**Operational risk :** This should include such risks as fraud, operations failure and one-time low probability disasters such as the recent Japanese earthquake, tsunami and nuclear impact - lends itself well to a scenario and stress testing approach. Although they are inherently difficult to quantify, these risks should be considered, as they have the potential to bring down the bank.

Even so, the task is not easy, given a lack of data and the difficulty of aggregation. It demands a mix of quantitative

and qualitative skills. Often, an operational risk itself might be used as the basis for a scenario for firm wide stress testing, although caution must be exercised in selecting realistic worst-case scenarios. Complications arise because this type of risk tends not to be linked in obvious ways to economic factors. In some cases it impacts or overlaps with other kinds of risk, which can create double counting.

Measuring the potential impact of operational risk is a process that includes the identification of key risk drivers and then an estimation of how operational risk losses might be incurred under certain scenarios. This can vary by bank, not least because banks look at operational risk differently. Different banks take different approaches, and notwithstanding progress in applying mathematical methodologies, subjective, qualitative judgments are unavoidable.

**Liquidity risk :** Regulators are taking a stricter view of liquidity risk and demanding that it become a more routine part of stress testing. The goal is to make sure that liquidity targets are met and, if not, then remedial action is taken.

Like operational risk, liquidity risk can be hard to quantify due to a lack of data and the difficulty of aggregation. According to one of an International bank, its Treasury group runs liquidity stress tests under which it looks at the impact on its net liquidity position under two scenarios - one lasting eight weeks in which Treasury continues to provide funding up to regularly assigned funding limits, and a second lasting one year in which, after the eight-week horizon, balance sheet reduction measures are undertaken. The bank says it assumes in both these scenarios that some sources of short-term funding might not roll in whole or in part, and also assumes that new liquidity drawdowns take place. The result of this analysis drives the size and composition of liquidity buffers that could be tapped into in extreme circumstances to provide liquidity for the two time periods.

### **Results from testing to Management**

To be useful as a tool for assessing a bank's capital needs, a stress testing process should carefully consider the plausibility of the chosen scenarios. It is

also important that the process is assessed for how well it is integrated with an institution's risk-management culture. It cannot be conducted in isolation from a bank's strategy and risk appetite, particularly if it is intended to help drive capital allocation and business decisions.

A particular bank's risk appetite can be crucial in responding to scenarios. The board ultimately decides if a scenario is within its tolerance for risk and therefore whether it might need to provide extra capital. That means banks need to be explicit about their risk appetite, which can be expressed qualitatively or quantitatively. Some banks specify a target credit rating. Risk appetite can also be identified through such measures as earnings-at-risk and economic capital and managed by setting limits on activities. Stress testing for these metrics can help monitor any divergence, prompt discussion and, if a limit is breached, compel action.

If stress tests results are to be actionable, then clear and consistent communications, including possible responses, should be considered by the board and management. The key around stress testing is to keep it simple. If you keep your definition of what stresses you're doing simple, then you will have a better discussion around, the outcomes, which should increasingly focus on being forward looking.

Reports generally are both qualitative and quantitative and list formalized mitigations, including such actions as hedging, cutting exposures, exiting businesses, boosting capital allocations, changing strategies, and / or building capital by cutting dividends and reducing buybacks. More relevant discussions, and greater executive team and board interest, tend to be prompted if the focus is not on an overly technical explanation.

Knowing what to do in response to stress tests results has several dimensions. It can be important to consider the impact of potential management actions in the context of both the economic environment under the stress scenario, and also in light of the expected actions implemented by peers in the scenario. Peer interactions can become critical variables in stressed environments, so anticipating peer behavior is an additional complexity in the process.

Good documentation of procedures can also be essential, so that senior teams know exactly what actions could be considered in potential future circumstances and what the desired impact of these management actions might be over what time frame. These actions also could be supported by a credible range of trigger points aligned to key leading risk indicators, for example delinquency rates or operating margins. This can help ensure that management actively reviews lead risk indicators and is therefore more likely to put actions in place in a timely manner. Further, senior management can review the efficacy of any documented actions, while the list of actions and associated triggers can be included explicitly in Executive Committee and board risk reporting.

**Conclusion**

Stress tests are here to stay as part of the regulatory tool. As they gain more traction, tests are likely to be performed with greater frequency and subjected to greater scrutiny. The approach to stress testing has evolved, with much greater use of enterprise-wide stress testing approaches and macro-economic inputs. Reverse stress testing is an additional approach to identify stress scenarios and events of concern. Regulators are likely to demand more data to develop loss estimates of their own and ask even more probing

questions about processes for developing internal models, scenarios, and stress tests.

To come up with a credible model and process, quantitative experts may need to take a more collaborative role as part of a team comprised of risk, finance, capital management, treasury and business lines. It is not just about modeling, it is about having a good risk-assessment estimation process keeping in view the fact that the assumptions, selection of scenario are purely judgmental and not necessarily precise. The goal is to get a decent balance between sophistication of analysis and variety of scenarios. Meaningful interpretations are important to incorporate into the business decisions.

Getting into the habit of having regular discussions between functions can help, but there is no magic formula to make this happen. A culture has to be fostered where people are open to changing their minds about things, where it is normal to challenge assumptions and think about, what the bank would look like if unthinkable things would really happen.

To succeed, stress testing cannot be done in a vacuum. A strong risk culture is crucial. And the messaging needs to come from the top.



**Desktop Virtualisation**

Virtualisation is a methodology for dividing the resources of a computer, using a variety of hardware and software abstraction techniques, into multiple execution environments by creating multiple isolated partitions - Virtual Machines (VM) or Virtual Environments (VEs) - on a single physical server. This separates the logical interface from the physical machine. Virtualisation originated in the 1960s as a technique to optimise the use of very expensive and relatively scarce computing resources. However with the advent of less-expensive computing technologies, such as Intel-based servers and PCs, the cost consideration was mitigated. As a result, servers and PCs proliferated, requiring new ways to better manage and use these resources.

Desktop virtualisation, often called client virtualisation, separates a computer desktop environment from the physical computer. The "virtualised" desktop is stored on a centralised, or remote, server and not on the physical machine. It allows users to interact with a virtual desktop (in the same way they would use a physical desktop) by letting the user log into their remote desktop from any location.

The key benefit of virtualisation is that Total Cost of Ownership (TCO) is reduced. Organisations can bring down overall TCO by

*Source : RBI, Annual Report, 2011-12.*

reducing individual desktop management and extending the lifecycle of hardware. Other benefits are the efficient use of CPU and memory resources, reduced energy costs, reduced desktop downtime, increased availability, centralised desktop security and data protection, support of 'Bring Your own Device', flexibility to add new users and a uniform computing environment across the organisation. Its drawbacks are non-availability if the network is not well managed, challenges in setting up and maintaining drivers for printers and other peripherals, difficulty in running certain complex applications, reliance on connectivity to the corporate or public network, and the complexity and high costs of deploying and managing the virtual desktop infrastructure (VDI).

The factors that need to be considered for VDI deployment are investment in technology, storage and network upgrades, training and software costs. Over time, the implementation of VDI saves costs. Overall, VDI can provide a better data sharing environment and access to data from anywhere, at any time. These features are expected to increase the overall efficiency and productivity of an organisation.



 S. Srinivasaraghavan \*

## BASEL III and its Implications to Indian Banks - Introspection

### BASEL III - Introduction

The Basel Committee on Banking Supervision (BCBS), issued a comprehensive reform package entitled “*Basel III : A global regulatory framework for more resilient banks and banking systems*” in December 2010. Based on these guidelines, Reserve Bank of India released a series of guidelines on the implementation of BASEL III Capital Regulations on May 2, 2012. These guidelines shall be implemented in phases commencing January 1, 2013 till March 31, 2018 for Indian Scheduled Commercial Banks.

According to Basel Committee on Banking Supervision “Basel III is a comprehensive set of reform measures, developed by the Basel Committee on Banking Supervision, to strengthen the regulation, supervision and risk management of the banking sector”. The main objective of Basel III is to make banks absorb the shocks from financial and economic stress, improve risk management and strengthen the banks' transparency and disclosures. Basel III is an improvement over Basel I and Basel II with more stringent requirements on capital and liquidity.

### BASEL - III : Major Features

- i. Banks required to maintain a minimum 5.5% in common equity by March 31, 2015.
- ii. Banks to create a capital conservation buffer in the form of common equity of 2.5% by March 31, 2018.
- iii. Banks to maintain a minimum overall capital adequacy of 11.5% by March 31, 2018.
- iv. Banks not to issue additional Tier-I capital to retail investors.
- v. Risk-based capital ratios to be supplemented with a leverage ratio of 4.5% during parallel run.

- vi. Banks allowed to add interim profits subject to conditions, for computation of core capital adequacy.
- vii. Banks to deduct the entire amount of unamortised pension and gratuity liability from common equity Tier-I capital for the purpose of capital adequacy ratios from January 1, 2013.
- viii. The major adjustments under Basel III shall be made from common equity including shortfall in provisions to expected losses under Internal Ratings Based approach, cumulative recognized unrealized gains or losses due to change in own credit risk on fair valued financial liabilities.
- ix. The transparency of capital base has been improved, with all elements of capital required to be disclosed along with a detailed reconciliation to the published accounts.
- x. Basel III also uses the three Pillars viz., Minimum Capital requirements, Supervisory review and Market Discipline, though with much more stringent norms.

### Major Changes in BASEL III

#### A. Capital

Banks are required to keep Capital to such an extent that they can absorb all shocks, stress and losses. Banks are asked to restrict Capital from retail investors.

#### B. Conservation Buffer Capital

Banks need to keep 2.5% extra Capital to provide for any calamities during the period of financial or economic disasters.

#### C. Counter Cyclical Buffer

This buffer ranges between 0.5% to 2.5% consisting of common equity or fully loss absorbing Capital. The Capital requirements shall increase in good times and reduce in bad times.

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\* Executive Vice President & Head Treasury, Dhanlaxmi Bank Ltd.



#### *D. Minimum Common Equity*

The minimum capital in the form of equity has been increased to 5.5%

#### *E. Tier-I and Total Capital Requirement*

Banks need to keep Tier-I Capital of 7% and Total Capital of 11.5% as against 9% as of now. This means that over and above common equity of 5.5%, another 1.5% has to be raised as Tier-I capital by banks.

#### *F. Leverage Ratio*

Banks to keep a leverage ratio of 4.5%. This is intended to regulate huge trading and off balance sheet derivative book.

#### *G. Liquidity Coverage Ratios*

Banks are required to maintain unencumbered liquid assets to cover expected outflows in a 30 day stress period. This is likely to be carved out of liquid assets in CRR/SLR.

### **Implications to Indian Banks**

Basel-III seeks to identify global systemically important banks and mandating them to maintain a higher level of capital dependent on their level of systemic importance. The list of global systemically important banks is to be reviewed annually. At present, no Indian bank appears in the list.

Dr. D. Subba Rao, Governor, Reserve Bank of India, recently opined that “effective implementation of Basel III was going to make Indian banks stronger, more stable and sound so that they could deliver value to the real sectors of the economy. By far, the most important reform is that there should be a radical change in banks' approach to risk management. Banks in India are currently operating on the Standardized Approaches of Basel II”.

As per the estimates of RBI, Indian banks might require ₹5 lakh crore of capital of which ₹3.25 lakh crore shall be non-equity and ₹1.75 lakh crore equity capital. The amount the market would have to provide would depend on how much of the recapitalization burden of public sector banks the government would meet. The current share in Public Sector banks is around 58%. Analysts feel capital mobilisation over 5 years shall be manageable going by the past trends, though the amount to be raised is huge. Another positive aspect

for mobilisation shall be the hitherto success of private banks in mobilizing funds. However loss absorption features in additional Tier-I instruments can create apprehensions on investors' minds.

Most of the Indian Banks are well capitalised and it is only the change in structure from Tier-II to Tier-I shall require the banks mobilize more funds. While there is increase in capital adequacy requirements under Basel III most of our sound banks are well above the threshold of 11.5% and some are even now, at 14% to 15%.

Increasing the Tier-I Capital shall result in reduced ROE and indirectly result in increased rates on loans. Banks may have to look at reduced cost of sourcing the deposits and increasing the fee based income so that profits are increased.

For the financial year ending March 31, 2013, as per RBI requirements, banks will have to disclose the capital ratios computed under the existing guidelines (Basel II) on capital adequacy as well as those computed under the Basel III capital adequacy framework. However the Total Capital Adequacy requirement shall be 9% in 2013, as hitherto maintained by banks.

### **Conclusion**

Indian Banks shall have to find additional sources of capital. Though there are articulations by experts that it shall not be a difficult task, mobilizing huge funds shall not be easy even though banks have been told to ensure compliance in a phased manner commencing January 2013 and ending January 2015. The government may have to dilute its stake down to the minimum desired levels in state owned banks so that other interested investors can step in. With increasing business every year, the need for capital is bound to increase so also the challenges. Another major challenge the Indian banks face is the deteriorating quality of assets and reduced profitability. The requirement of capital to mobilize can be reduced if more profits accrue to the Banks in the coming years. Since Basel III is a Universal compulsion, Indian Banks have no choice but to prepare themselves for achieving this herculian task of capital augmentation.





Mr. A. J. D. Thangaraj \*



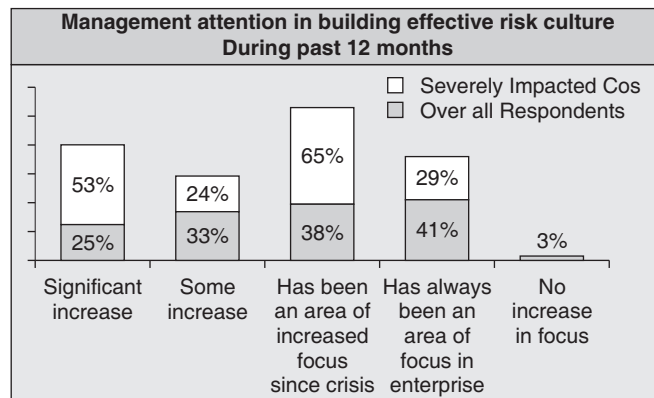
Ms. Geethy Panicker \*\*

## The Invisible Bottom-line

*“The purpose of computing is insight, not numbers.”*  
- Richard Hamming, Computer Scientist



banks recognized that their risk management capabilities significantly lag their creative investment ideas and product innovations. Only 52% of CFOs surveyed by IBM in CFO Study, 2008, confirmed having any defined risk management program. A mere 29% aligned risk with performance by creating risk-adjusted forecasts, plans and compensation. According to Crowe's Risk Consulting Practice survey in 2008, less than 25% of companies consider their performance on risk management as “excellent”. The lessons have been learnt, as pointed out in the most recent E&Y 2012 survey on progress in financial services risk management. The overall respondents and the firms severely impacted by the crisis report, substantial increase in focus for building effective risk culture, increased focus by Board in risk management, embedding risk appetite in operations and strengthening of risk teams.



Source : Progress in financial service risk management, A survey of major FIs by E&Y, 2012

The bumpy and dicey world of risk managers is often stress tested with pessimistic questions challenging their indispensability. “Will Risk Management lead to **maximization** of profits? “Isn't risk department a cost-centre, living at the expense of company's profits?” “Risk managers, even with their best of sophisticated arsenal, could not anticipate or even avert the Lehman doomsday!

Enough! Even the most successful risk manager's confidence may get doused for a moment, while facing these cynics' spiteful volley of criticisms.

Mercifully, these arguments are becoming less vociferous after the global crisis, which was a sobering reality check for the banking world. Many investors and

Several factors have contributed to the under-investment and undermining of risk management in most banks. General factors cited by enquiry commissions are

\* General Manager, Risk Management Department, Union Bank of India.

\*\* Senior Manager, Risk Management Department, Union Bank of India.

shoddy corporate governance, lack of senior management buy-in, corporate greed & fraud to augment business size, alluring bonus packages promoting aggressive risk taking by surmounting the already weak controls, regulatory arbitrage and human factors like operational errors, lack of expertise to gauge & manage risk etc.

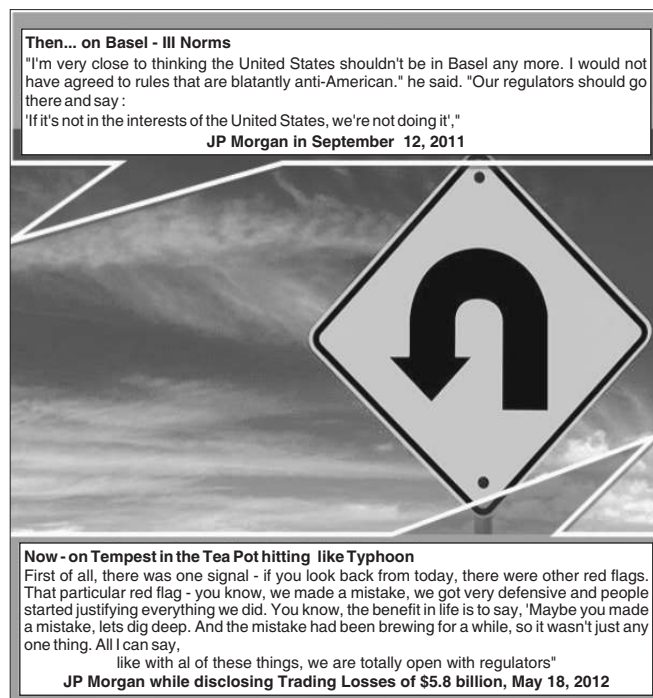
The fundamental reason for aversion to risk management is simple - views of risk management contradict human behavior. People are eager to brag about their successful events in past and future. But, they are reluctant to discuss actual or potential losses that may affect their business. They do not perceive or have not perceived any concrete or tangible value from risk management, demonstrated in dollars. Instead, risk management is still viewed as an impediment, a hurdle, blocking the fast lane of business.

### More Black swans in the pond

We no longer live in the world for which conventional risk-management textbooks prepare us. Recent economic crisis has put the successes and failures of risk management in the spot light. No forecasting model predicted the current economic crisis. Its consequences continue to take economists and business academics by surprise. Moreover, as we all know, the crisis was exacerbated by the usage of quantitative risk models based on assumptions which defied common sense. More black swans are flocking to the global financial system, which is ailing by resolving newer crises day by day.

### Pillars of Risk Management for Fortifying Banking Institutions

Risk management assumes pivotal role in financial institutions. Weaknesses at large financial institutions often play a central role in the triggering and propagation of systemic financial crises. The Basel Committee's long-term economic impact study found that banking crises result in losses in economic output equal to about 60% of pre-crisis GDP. Banks are highly leveraged institutions operating at the centre of the credit intermediation process. A destabilized banking system affects the availability of credit and liquidity to the broader economy, causing spillover effects in all sectors.

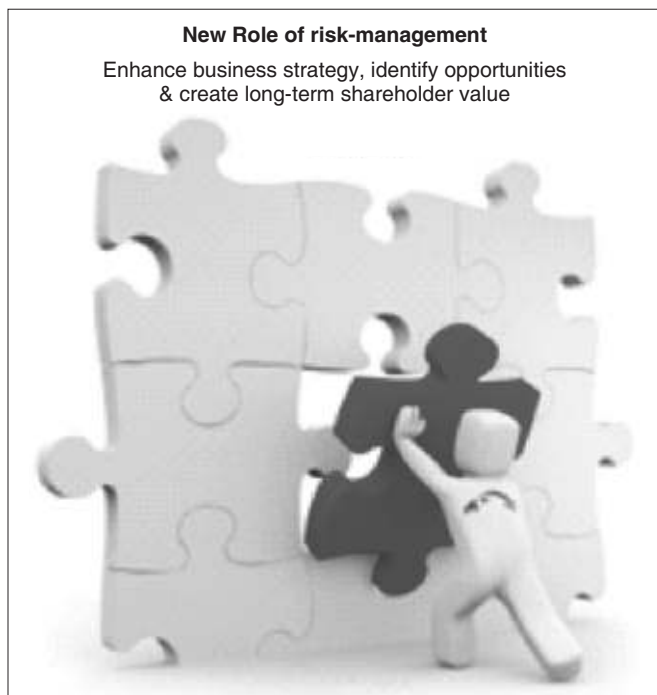


The tougher banking capital and liquidity rules are opposed by the world's banking industry. JP Morgan Chase Chief Executive Jamie Dimon, along with his national and international counterparts had decried Basel-III reform packages, calling it 'anti-American', arguing it would stifle the desperately needed global economic growth. BIS, Macroeconomic Assessment Group (MAG)- April, 2011 study released in Oct, 10, 2011 reported that implementation of Basel-III norms may cause a fall in GDP by 0.34% from baseline forecast over 8 years, followed by a recovery. However, the estimated annual benefits of averting crisis was **up to 2.5% of GDP, implying that benefits are many times the cost of the reforms.**

Banks are now compelled to revitalize their risk and capital architecture by the regulators and stakeholders. But beyond regulatory compliance, there is a significant and meaningful opportunity for banks to reinvent their risk management practices, opening up opportunities to do business smarter, faster and adding value. In fact, risk management is no longer a cost centre - its new role is to enhance business strategy, identify opportunities and ultimately create long-term shareholder value.

## Role of Risk Management in 'maximization' of profits

In most enterprises, risk governance and value creation are viewed as opposed or even as mutually exclusive, when in fact, they are indivisible. Every initiative aiming to create or protect value involves some degree of risk. **Risk Intelligent governance** seeks not to dodge appropriate risk-taking, but to embed adequate risk management procedures into enterprise's business operations, so that strategies don't fail in the end.

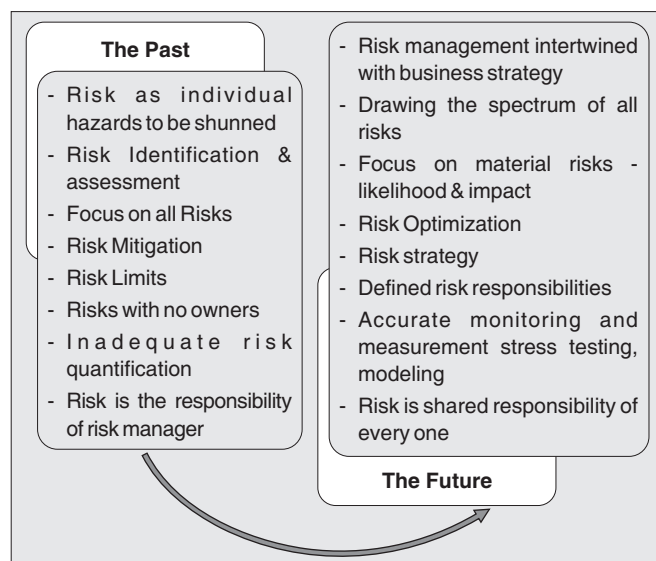


Risk Managers store two arrows in their quiver to deliver value, ensuring of the long term survival of the firm and making optimized utilization of available capital. Successful risk management may not always "Maximize" profits, as many at times, risk managers have to rein in the growth of profitable strategies and products to make them deliver risk adjusted returns. For those who chase absolute returns, risk prescriptions may sound antidote to business growth. But the timeline of chequered banking history is smeared with the blood of several such angels fallen like fireflies in their unmindful quest for glory of profits, bonus and fame.

Call to business Managers,  
"Please take more risk, but **Responsibly**"

Risk is packaged within the bread and butter activities of banks. As the famous footballer Mr. Jim McMahan once quipped "Yes, risk taking is inherently failure-prone. Otherwise, it would be called sure-thing-taking." While a company may die a quick death if it fails to manage its critical risks, it will certainly die a slow death if it does not take on enough risk. But taking the right risks of right amount, right pricing, with the adequate set of controls and integrated management of all such risks taken, can lead to "**Optimization of profits**" in the long run.

Risk management is an intangible asset for every organization, viewed from the context of adding value. Mere presence of the risk vertical for compliance per se may not inflate the profits but the absence of its pro-active interventions is a significant 'deflator' posing a perennial threat to the long term survival and sustainability of operations. Like salt ingrained in the food, effective risk management makes the organizational servings of profits palatable, predictable and delicious to the connoisseurs of corporate governance, transparency and regulations. Thus, risk management is moving up the value chain, graduating from the traditional "risk mitigating" strategies (setting risk limits, controls to reduce risk exposures) towards "portfolio optimization" (capitalizing on those risks aligned with organizational risk appetite to create value).



For effective risk management, there are three key themes successful CROs focus on, for creating long-term value for shareholders.

- Fostering a positive, responsible and conducive risk culture and risk governance.
- Setting up of an appropriate risk appetite and monitoring performance.
- Enterprise-wide integrated risk management.
- Optimization of Business Opportunities using risk intelligence.

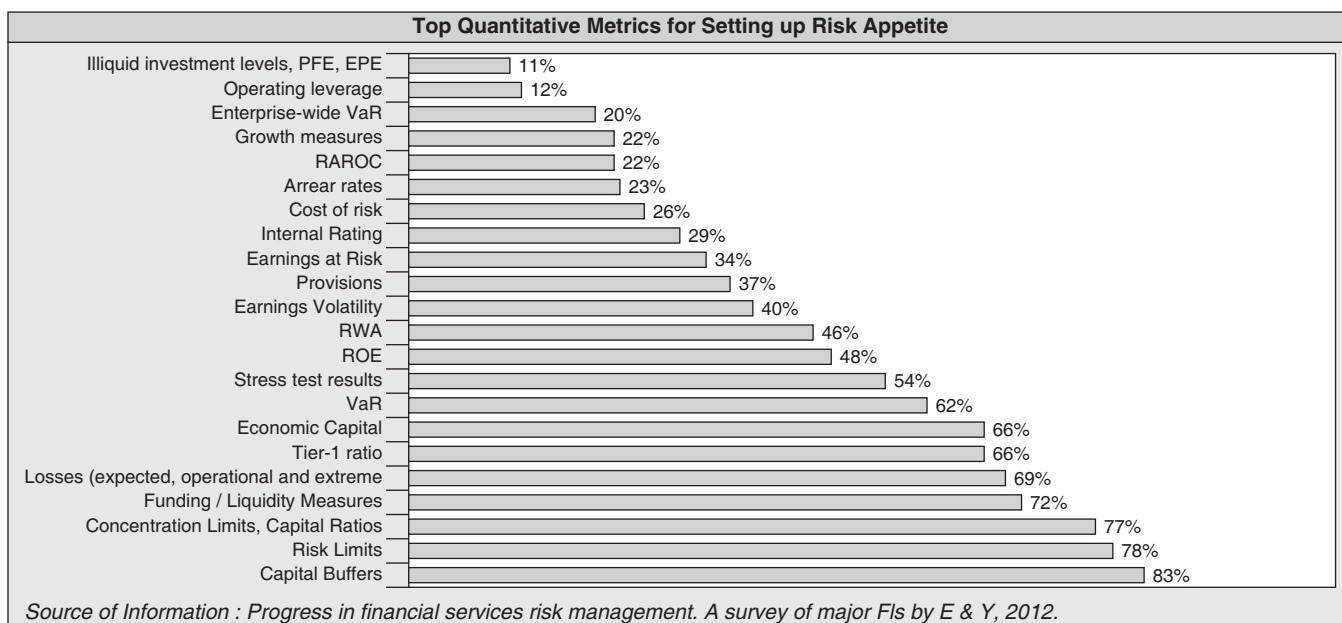
### DEFINING THE BOUNDARIES OF RISK TERRAIN

In every organization, there is a way in which management and employees know, perceive and feel about risk. This shared risk culture influences the risk-consciousness and actions of employees in their daily operations. Risk culture is the degree of significance which the management assigns to risk management competency and excellence within the organization. Risk culture encompasses an enterprise's appetite and tolerance for risk in its daily operating activities and decision-making processes. Risk appetite is the organizational desire to take on risk, ranging from risk-averse, risk-neutral, risk-taker to risk-seeker. Risk tolerance is the maximum quantum of risk acceptable to an enterprise.

Risk culture is an intangible control mechanism embedded in the soul, brain and arms of the business lines by the senior management and risk division. Without a demonstrated emphasis to risk-culture from the highest echelons of the organization, a culture of managerial invincibility will prevail, drilling cracks in the risk culture, which will eventually grow wide enough for disasters to seep in.

Companies that emerged resilient out of all the financial crises have one thing in common : they have robust, reliable risk management infrastructure and **risk intelligence**. They have a culture of risk taking with responsibility, strong governance, oversight and transparency. They leveraged on advanced quantitative techniques but blended it with practical wisdom. But, most notably, risk management was embedded into their business strategy as well as routine business decisions.

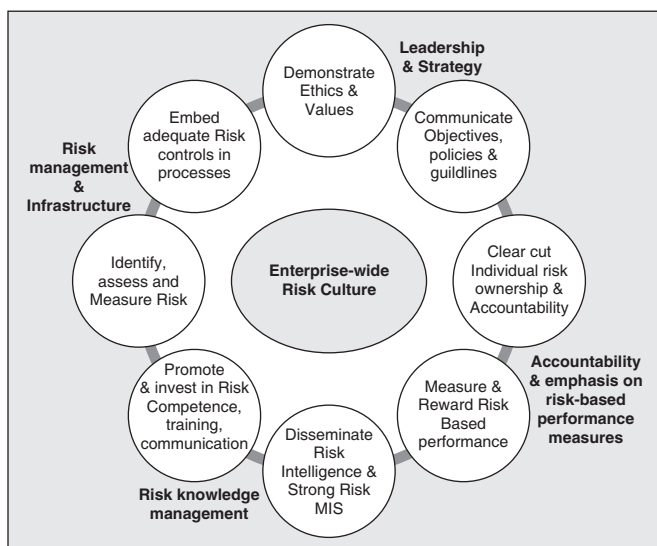
A weak risk culture increases the vulnerability of the organization to risk occurrences, "near-misses" and forgone opportunities. A strong risk culture needs to be embedded at the first line of defense, that is, the business units itself where risks are generated and processed. It will reduce the scope for frequent "interventions" and "disruptions" by the second and third lines of defense, the risk management department





and audit department respectively. On a lighter note, a robust risk culture shared by line managers can even send a “separate, stand-alone” risk management division out of job.

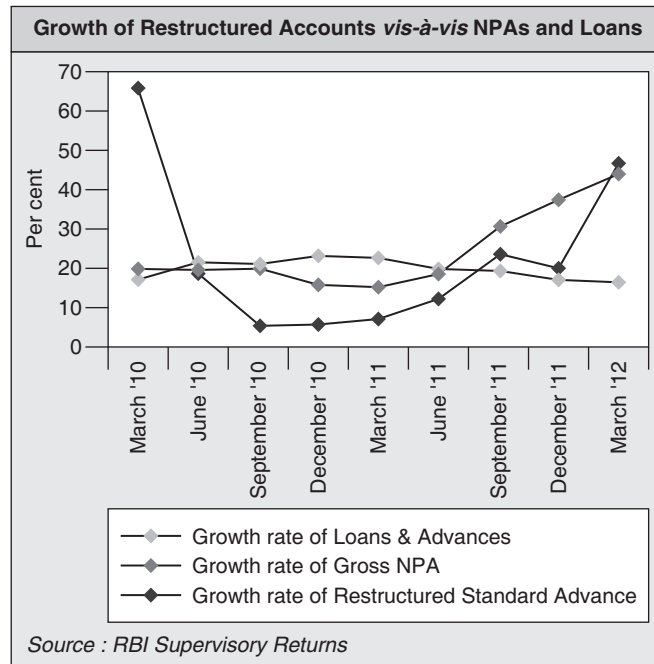
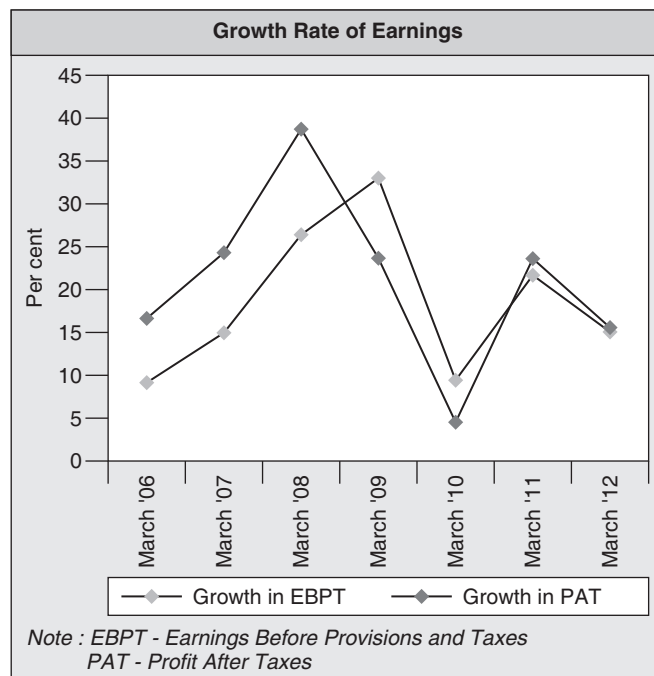
Most organizations, including banking organizations, have been following a “Business-size” linked performance measurement. An impartial assessment of this approach can be made by looking around at the non-performing assets in the Indian banking scenario. To add more blocks to business glory, banks have been gobbling assets which are perceived as well as inherently risky beyond the tolerance levels. Some of the social, regulatory, political, compulsions catalyzed this momentum. Risks were pursued with an “I know I’m gonna fail but I can’t back out of the race” kind of attitude.



Even the goliath got hit by a small stone aimed at the most vulnerable spot. At the risky game, ROEs, ROAs, NIMs and NPAs are falling even as the assets are rising at a brisk pace. Restructured assets are overshadowing the growth in standard assets.

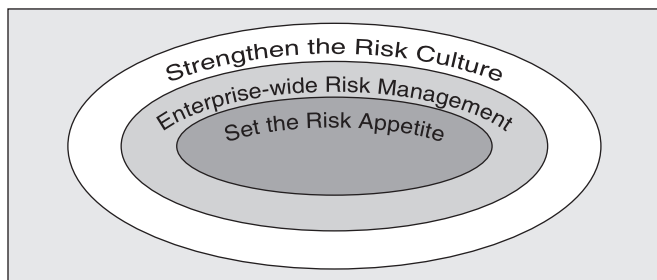
According to data from the Corporate Debt Restructuring Cell (CDR), Indian banks sought to restructure ₹64,530 crores worth of corporate loans in the fiscal year ended in March 2012, up 156% from a year earlier (Source : Hindustan Times, May, 2012). CDR cases continues to be unabated in the current fiscal, as nearly 3 dozen cases involving

nearly ₹20,000 crore were referred to CDR cell in the quarter ended June 30, 2012. As per RBI’s June, 2012, FSR report, NPAs grew at 43.9% as at end March 2012, far outpacing credit growth of 16.3%. The divergence in growth rate of credit and NPAs has widened in the recent period, which could put further pressure on asset quality in the near term.



Economic slowdown can be blamed for this dismal performance and eroding value. But banking industry could have derived and sustained value by learning to manage cyclical fluctuations on the balance sheet through risk-based planning and counter-cyclical strategies. There should be predictable and consistent growth in all financial metrics irrespective of the dynamism of business cycles. The verdict is obvious, this painful phase calls for a **cultural shift - a banking culture which promotes risk based decision making and performance measures. A business appetite aligned with risk appetite.** This attitudinal shift can reduce the volatility in financial performance and asset returns, thereby **optimizing the usage of capital.**

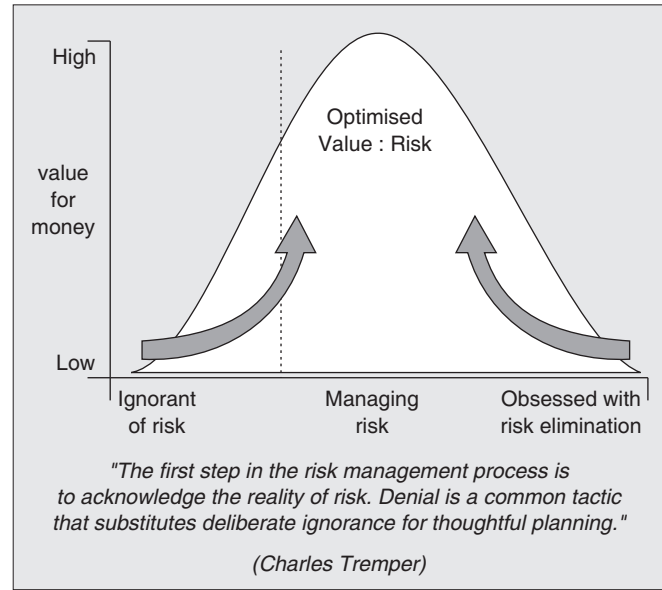
**FLAUNTING THE YELLOW AND RED CARDS - RISK GOVERNANCE**



It is often quipped that if business units become risk conscious and risk management becomes business conscious, the organization can run smoothly. A strong **Risk Governance architecture** backs the permeation of the risk culture across the organization. The new era of risk governance and strategic risk management is beyond mere box ticking, which is compliance driven. A risk organizational structure with the risk management roles and responsibilities clearly defined, including the written policies and other procedures underpins the risk culture. To ensure integrity and extract valuable insights, the risk management function and CRO should be enabled to work without fear or fervor, independent of business units, unburdened with business targets, directly reporting to the Board. Organizations with Boards which actively engages in setting risk policies, risk issues and governance by spending quality time on deliberations on risk matters ensure sustainable growth.

**Enterprise-wide integrated risk management**

Across industries, business leaders have taken cognizance of the fact that risks are not hazards which are to be kept at bay, but in many cases opportunities to be optimized. "Risk in itself is not bad" asserts Ms. Susan Labarge, CRO at Royal Bank of Canada, "*What is bad is risk that is mismanaged, misunderstood, mispriced or unintended*". Many organizations have embraced ERM but yet uncertain how ERM can be tied to value creation.



Enterprise Risk Management (ERM) concepts and techniques can help an organization to understand its material risks, measure them and manage its overall risk profile so as to maximize the enterprise's value to shareholders. There are optimal combinations of risk and capital i.e specifically, for a given level of risk there is a value-maximizing amount of capital. ERM therefore can add to a firm's value because, by measuring the firm's aggregate risk exposure, it enables the business managers to choose value-maximizing combinations of risk and capital.

**Extracting Value from ERM**

Many companies practice risk management in silos and live in risk ignorance with narrowly focused, functionally driven and disparate risk management activities oblivious of interactions between various risks. Banking institutions face not only credit and market risks but also

a host of other risks like operational risks, liquidity risks, interest rate risks, model risks, forex risks, compliance risks, reputational risks, strategic risks to quote a few. Threat to the business is exacerbated by aggregate risk exposure. Many organizations have grown an internal maze of various activities and associated risks while omitting or misaligning the strategic risk. In a 2008 Enterprise Risk Management Practices survey from Treasury and Risk magazine, only 32% of CFOs and risk managers were very confident that strategic / business risk are adequately identified, assessed and managed. Compared to this, 63% of respondents felt very confident about their financial risk management and while 52% had strong compliance or operational risk framework.

Enterprise Risk Management (ERM) models -such as COSO's 2004 Enterprise Risk Management- Integrated Framework, the 2006 Risk Maturity Model for ERM established by the Risk and Insurance Management Society and the 2009 ISO 31000 Standard on Principles and Guidelines on Risk Management Implementation- all describe an approach for identifying, analyzing, responding to and monitoring risks and opportunities. They can be the starting point to classify and manage mutually dependent risks and instill a common risk language within the enterprise.

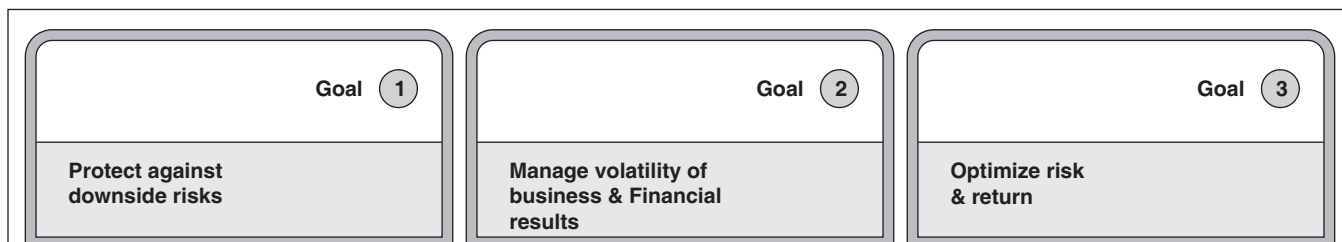
When corporate strategy, strategic planning and risk management come together, a more successful path to achieve business value and objectives is assured. If a bank fails to understand its risk profile and goals of risk management, sponsorship and ownership for risk management may be deficient, risk appetite undefined, risk prioritization vague and resources misallocated. There are three common goals for risk management, as the risk management evolves through various stages of maturity and a combination of these goals represents ERM.

Until now, banks followed a historical and static approach to risk, looking at the rear-view mirror. Evaluating potential future outcomes was often overlooked. For instance, when an innovative deposit or loan product is launched, risk management can facilitate scenario-based planning and stress testing. This pro-active step can yield insights on emerging risks (say interest rate, liquidity risks, competition risks etc) and implementing upfront mitigation strategies. In this dynamic financial system, the strongest banks would be the ones who are able and willing to adapt, who have actively integrated risk management with business processes. By establishing disciplined roles, processes and practices for managing enterprise risk, banks can improve the predictability of their business results and reduce share price volatility. Better managed risk earns better credit ratings, helping to take advantage of lower costs of capital.

The need for a deep understanding of enterprise risk and the interrelationships between credit, concentrations, products, markets, geographies, and other risk factors has never been greater. Knowledge of enterprise-wide risk, their correlations and interdependencies are prerequisites to define and maintain enterprise-wide Value at Risk (VaR) or economic capital to protect the firm. RAROC (Risk Adjusted Returns On Economic Capital) based capital allocation and product pricing would deliver sustainable and superior value to every penny invested in business-lines, weeding off the value guzzlers.

### **Risk Brain Mapping - Mining the Risk Intelligence**

Enterprise Risk Intelligence (ERI) is an emerging concept and business practice as organizations begin to realize the value of integrating the previously disparate functions of compliance, controls and risk management. In the future, firms with



agile risk management capabilities will outperform their peers who don't take concrete measures to improve their risk data infrastructure, analytics and reporting. The US business writer Mr. David Apgar, who authored "**Risk Intelligence : Learning to Manage What We Don't Know**" coined the term Risk Intelligence in 2006. Mr. Apgar defines risk intelligence **as the capacity to learn about risk from experience**. American Financial Executive and Author, Mr. Leo Titman has recently redefined risk intelligence as "*The organizational ability to think holistically about risk and uncertainty, speak a common risk language, and effectively use forward-looking risk concepts and tools in making better decisions, alleviating threats, capitalizing on opportunities and creating lasting value*".

In a risk-intelligent company- the risk function provides insights to support and optimize every project across every function. Risk intelligence is like a core competency of an individual, team and organization. It is derived from years of learning about the most likely outcome and solutions for risk problems, gained based on past experience. It can provide management with the knowledge about the likelihood, velocity and impact of risk events. It's not just data mining but comparable to brain mapping of the risk talent in the enterprise to harness on their expertise.

The risk landscape is stretching beyond our knowledge streams. To quote Mr. Apgar again, risks are not diminishing but multiplying with higher scrutiny. Risk managers are presented with a unique opportunity to rebuild, reunite and reform the failed systems, process and present a roadmap for a better tomorrow. Post crisis risk surveys carry the delightful news that CROs and risk managers are increasingly being given a dominant space and voice, right from the Board room to the front desk. A deserving laurel indeed but bestowed very late.

During those glitzy analyst meets to present financial results, what is never published, praised

or underlined is the quantum of those several small, medium and catastrophic losses which could have dragged the bottom-line, but averted or mitigated by the strategies of risk managers. That is, precisely, **the Invisible bottom-line (IBT) and Trust per share (TPS)**, contributed by risk intelligence.

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 Siddhartha Roy \*

## Payment & Settlement System Risk Management

### 1. Genesis of Payment & Settlement System development

1.1 As growth in Services Sector started outpacing that of Real Sector and human race started taking that as sure sign of development, financial services sector which was the main driver of this growth started getting more and more respectability. This feeling of upward sloping respectability graph attracted more attention to this sector. Alongside came competition which spurred innovations. With the growth of Information Technology (IT) in the last few decades, the pace of innovations quickened and broadened the depth of the sector.

1.2 As a result, finance which evolved initially as a discipline to help funding of real economic activity started getting used as another input for seeking increasingly higher returns. In the same way as Industrial Revolution helped in splitting jobs into areas of specialisation for increased productivity, large scale decentralisation of financial activities resulted from innovations and from availability of highly improved IT and communication capabilities.

1.3 With sophistication in finance increasing, markets developed for various financial products. Derivative products which allowed view taking on future values of products of mass consumptions like cereals, petroleum, metals etc. and even on various financial assets, started developing. Even usual financing transactions started getting converted into financial assets like bonds and securities which ultimately led to even development of markets for asset backed securities and credit derivatives. All these activities demanded a different type of skillsets that usual finance professionals did not possess. Treasury Professionals, a new specialisation developed to manage these activities.

1.4 These developments resulted in huge gain in efficiency and cost reduction. These also resulted into huge payment flows moving from one place to another, from one entity to another, many a times across the border. Increasing use of derivatives also started creating huge liability build up (exposures) between various entities in the market and interestingly, a large part of those were of medium to long term maturity. Most of these flows or liabilities (or assets) were accounted for and effected through IT systems.

1.5 Exposures on each other between market players create a form of inter-connectivity. Each is willing to take exposure on other based on its risk perception i.e. the possibility of the other entity failing to honour its commitments. Confidences that the other entities are unlikely to fail in honouring their commitments thus play a very important role in keeping the markets active and in shape. Funds flow between these entities also plays very important role in moving funds relating to day to day transactions including funds in foreign currencies and in keeping the exposures within limits.

1.6 As the market size increased and global markets became more integrated, cross border interactions between financial market players also increased manifold. Some financial market entities expanded their activities across countries. Even for financial entities in domestic market, exposures on each other have increased rapidly.

### 2. Payment and Settlement Systems in India

2.1 A system that enables payment to be effected between a payer and a beneficiary, involving clearing, payment or settlement service or all of them is termed as a Payment System. This is a definition provided

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\* Chief Risk Officer, The Clearing Corporation of India Ltd.



in the Indian Payment and Settlement Systems Act, 2007. The definition also adds that a “payment system” includes the systems enabling credit card operations, debit card operations, smart card operations, money transfer operations or similar operations. To be a payment system, the system must perform either the clearing or settlement or payment function or all of them. The above-mentioned Act, however, specifically excludes stock exchanges or clearing corporations set up under stock exchanges, as those are governed in India by separate Central Acts.

2.2 While payment is a known concept, there is usually some confusion around the words Clearing and Settlement. Clearing is *the process of transmitting, reconciling and, in some cases, confirming payment or securities, transfer orders prior to settlement, possibly including the netting of orders and the establishment of final positions for settlement*. Sometimes, the term is used (imprecisely) to include settlement. Settlement is *the completion of a transaction or of processing in a transfer system, such that participants meet their obligations through the transfer of securities and / or funds. A settlement may be final or provisional. With the exception of a zero net balance, settlement requires the opening of accounts by competent institutions*.<sup>1</sup>

2.3 In India, the most important payment system is Real Time Gross Settlement (RTGS) run by Reserve Bank of India. This was introduced in 2004 and in stages was extended to cover the whole country. Access to RTGS is allowed to banks and certain major financial institutions and to certain Financial Market Infrastructures (FMI) like The Clearing Corporation of India Ltd. (CCIL). Banks can put through customer payments beyond a threshold within customer transaction hours. The system currently handles about 200,000 transactions per day - average daily turnover is about ₹2,50,000 crore.

2.4 From retail payment perspective, retail electronic payment systems such as Electronic Clearing Service (ECS) and a National Electronic Funds Transfer system (NEFT) perhaps comes next in the importance to the users. After introduction of these systems, retail electronic payments market landscape in the country has changed

complexion beyond recognition. Cost of electronic funds transfer has come down to such a level that alongwith increased reach of telephone to almost every habitable location in the country, it is inspiring a behaviour change from paper based payments to electronic payments.

2.5 Paper based cheque clearing however continues to play an important role as paper-based payments still continue to be a preferred mode to many in India. MICR technology introduced in eighties stretched further by initiatives like Express Clearing, Cheque Truncation etc. is bringing speed in these processes as well.

2.6 Apart from this, payments through ATMs and Credit and Debit cards and even through mobile banking are becoming important component of this country's system.

2.7 However, from the perspective of importance to the country's financial system, Central Counter-party Clearing & Settlement Systems run by CCIL possibly gets a place immediately after RTGS. These clearings cover trade settlements for wholesale market entities i.e. for banks, institutions, mutual funds, insurance companies etc. in over the counter market. CCIL's foreign exchange clearing handles settlement of trades of about USD 16 billion (₹88,000 crore) per day on an average with month-end volumes reaching closer to USD 100 billion (₹5,50,000 crore). In Govt Securities market and in Collateralised Borrowing Lending Obligation (CBLO) market, the average daily settlement volumes are of the order of about ₹40,000 crores each. Apart from these, settlement of cross currency foreign exchange trades through Continuous Linked Settlement (CLS) bank by CCIL for domestic banks are now at an average of USD 2.6 billion (₹14,500 crores) in a day. In derivatives market, CCIL holds trades of notional principal of about USD 130 billion (₹7,15,000 crores) of market participants for risk management purposes.

2.8 RBI as regulator for Indian Financial market showed tremendous foresight in assessing early the importance of preserving the safety and integrity of the payment systems and of financial derivatives market in India. It worked with Government of India to get the Payment and Settlement Systems Act passed in 2007 which laid the foundation for secure growth with sophistication of the

1. Definition in Glossary of Terms related to Payment, Clearing and Settlement Systems of European Central Bank (ECB) available at [www.ecb.int/paym/.../glossarypaymentclearingsettlementsystems.pdf](http://www.ecb.int/paym/.../glossarypaymentclearingsettlementsystems.pdf)

Payment and Settlement systems in India. Clarity on issues like close-out netting, concepts of loss allocation etc. made derivatives clearing possible in India. In fact, CCIL could start its Forward Foreign Exchange CCP Clearing in 2009, a derivatives clearing, only because of the legal clarity brought through this act. This was the first such CCP clearing of forward forex trades anywhere in the world. RBI also worked with CCIL for developing a trade repository for interest rate swap trades which was also first such venture in the world. Role of RBI for such proactive but properly calibrated approach is globally recognised which is evidenced by its getting Dufrenoy Prize for Responsible Innovation in 2012 from Observatory for Responsible Innovation, a Paris based renowned think tank.

### **3. Risks for Users**

3.1 With so much at stake, the safety and soundness of Payment and Settlement system is of utmost importance for users of these systems. Users will usually have two worries - one that the payments they make through the system is safely delivered to the payee and they in turn get the payments meant for them. The other one which is more important for large market players are the assurance that the system will remain in place over a reasonable time so that their financial planning based on the ability to move funds or take new exposures or hedge for existing exposures remain viable. This part is very important if the market has to function efficiently as the continuous give and take between the market participants to manage their exposures is one of the important issues in this regard.

3.2 Another dimension that is assuming significant importance lately is the function that is increasingly being performed by entities like CCIL who offer Central Counterparty clearing to the market participants. Derivative markets are different from Spot market in a very important way that the exposures of a counterparty from a derivatives transaction on the other counterparty is normally of a long duration. The duration of forward foreign exchange trades usually extends to 12 month and of swaps trades up to 10 years in India. Even in India, derivatives are steadily becoming the instruments of choice for financial wholesale market

players for their trading and hedging activities. The derivatives transactions thus contribute significantly to bloated balance sheets for these entities through accumulation of outstanding trades. Derivatives are also instruments which help in taking leveraged positions to financial market entities. As a result, counterparty exposure management becomes complicated when portfolio of outstanding trades include derivative trades. Central Counterparties (CCP) came in to fill this need to facilitate exposure management. It became counterparty to the market participants for all of their derivative trades thus allowing them to get rid of their exposures on their counterparties on the one hand and replacing these exposures by a netted exposure on the Central counterparty on the other hand. This has worked wonders for the market by creating possibilities for the market entities to trade more as per their needs and thus providing liquidity and price stability in the market. The efficiency of this arrangement however can be quickly undermined if there is any failure by the CCP to manage the exposures it takes over. For the market entities with large exposures specially in derivatives market, safety of the CCP Clearing and Settlement system is therefore also of critical importance.

### **4. Risk management**

4.1 Risks in Retail Payment systems are minimal. Fraud prevention is one of the most important aspects so that the users of the systems do not get adversely impacted through any fraudulent transaction. This requires significant amount of investment in creating checks and balances in the system. Increasing use of electronic payment systems has not only brought in more challenges but also has provided more possibilities to control fraud. Fraud prevention is becoming a running battle between the fraudsters and the operators of the payment systems. User literacy in fighting fraud is expected to make a crucial difference in this regard. Another important aspect is the availability of the systems as per pre-specified time schedule and feasibility of quick recovery in case of any disaster.

4.2 Risks in Wholesale Payment systems like RTGS are of different order. While fraudulent transactions are extremely unlikely in such system, the possibility

that the system may fail to cope with the growth (in India, RTGS transactions have increased 500 times in about 8 years) or fail to perform with expected efficiency when it is expected to be up and running, could pose a serious risk to the country's financial system. The System should have mechanism to handle gridlock (processing failures when no viable solution could be reached to continue payment processing), especially for drawing automatically from credit lines available to system participants when needed. Ensuring availability of the system as per pre-specified time schedule and recovery in time in case of any disaster is much more critical here. Creating redundancy at all levels and capability to handle any disruption by invoking appropriate alternate strategy is an absolute necessity to take care of this requirement.

4.3 Risks in a Clearing and Settlement Systems are again of a different order. These systems operate on a very different basis. Central Counterparties (CCPs) assume responsibilities on the underlying trades by becoming counter-parties to the trades. Some of the trades like derivative trades are of relatively longer duration, many a times extending to years. Hence, the clearing and settlements of such trades through CCPs not only allow payment netting but allow liability netting as well. CCPs offer these benefits to the Clearing participants through a process of collection of margins from the clearing participants and by arranging for necessary resources / liquidity to ensure that it is able to discharge its responsibilities. However, if there is any failure of performance by a CCP, this can cause serious dislocation to the financial system of the country as a whole. The gravity of such a failure could be so severe that it is getting increasing notice at all levels. Moreover, a problem of this type is unlikely to remain restricted within the boundaries of a country. Regulators across the globe are therefore in active dialogue amongst themselves so that they could evolve a common approach towards management of risks in CCP run settlement systems. They work in close coordination with Committee of Payments & Settlement Systems (CPSS) of Basel Committee and International Organisations of Securities Commissions (IOSCO).

4.4 CPSS-IOSCO has laid down certain principles which should govern the approach to the risk management in case of CCPs. As per the principles, CCPs should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks. The approach is broadly to be as under :

- (i) Legal Risk : CCP's activities needs to have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions. Any legal uncertainty on the validity of netting, charges on collaterals received as margins and in its default handling processes can create disruption to the clearing and will have the potential to induce lack of confidence on the system. In a crisis, this can precipitate a systemic problem . The rules of CCP should therefore be fully supported legally by the country's regulations. In addition, it should be clearly articulated, so that there is no ambiguity in their interpretation.
- (ii) Credit Risk : Credit risk monitoring by a CCP is a very critical issue. It should be able to effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. In respect of exposures to clearing participants, a CCP needs to maintain sufficient financial resources to cover its credit exposure to each of the participant fully with a high degree of confidence. It should collect appropriate collaterals as margins to cover these exposures. These collaterals should be liquid i.e. easily realisable and ideally should not be subject to credit risk.  

Measuring credit risk efficiently requires sophisticated risk management and IT systems. Moreover, it is necessary that the models used for this purpose are kept under close watch through regular back-testing by highly skilled employee.
- (iii) Liquidity Risk : The role liquidity plays to effectively handle a crisis situation was acutely realised during the Global Financial Crisis of 2007. A CCP needs to maintain sufficient liquid resources to ensure that

settlement of payment obligations are carried out without any disruption. Liquidity in the market plays a very critical role when positions of a defaulter member is required to be closed out by a CCP for default handling purposes. An assessment of market liquidity under stress scenario needs to be assessed in a conservative manner and this assessment should be used as input to risk models to handle liquidity risk.

- (iv) Additional resources for tidying over stress scenario: In a stress scenario, markets behave differently. Values of financial products change and possibility of defaults increase significantly. Credit exposures on Clearing Participants are usually assessed under a high confidence level but even those are unlikely to provide full cover in case of a default in a stressed market. A CCP is expected to handle such default scenario without adversely impacting other surviving participants. As per standards for CCPs, a systemically important CCP or a CCP with complex risk profile (i.e. engaged in clearing of complex derivative instruments) is expected to maintain additional financial resource which should ensure that the default of two largest participants and their affiliates are met adequately.

If the defaults are by even larger number of participants, the CCP itself may default in honouring its obligations. A CCP therefore should have a clearly spelt out resolution mechanism so that surviving participants and the markets are not unduly impacted and they have reasonable certainty of the likely course of action should such scenario arises.

- (v) Risks from Settlement processes : A CCP is expected to provide finality of settlement to its Clearing Participants, preferably real-time or at least by the end of the day. Although this aspect is usually perceived as not very important, it becomes crucial when intra-day insolvency related issues are to be handled. Risk management on this count demands complete legal certainty about the point when settlement can be taken as final

(i.e. if a credit has been received in the account of a clearing participant, it should have certainty of appropriating the funds as per its choice without being under any obligation to honour any demand for recall). Moreover, when a CCP settles funds through commercial banks, it should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money. The participants settling in Commercial Bank money needs to have certainty as to the point of its discharge from any payment liability (i.e. if the settlement bank goes insolvent after receipt of money from a Clearing Participant, whether the loss will be attributed to the Clearing Participant).

- (vi) Default Management : A default by a Clearing Participant may have serious implication for the settlement participant and the system as a whole. It can also have a systemic implication. Transparency in handling a default is therefore critical. A CCP should have rules which will make it possible to contain losses and liquidity pressures and to continue to meet its obligations. There should be minimum uncertainty around such processes.
- (vii) Segregation and portability of client assets : It is often seen that when a Clearing Participant fails, the indirect participants suffer losses due to inappropriate appropriation of their collaterals by the Clearing Participants. This is a constraint for the small and medium size participants who, for economic reasons, avail the CCP services through another direct clearing participant. This risk is significant and it can have significant destabilisation impact on the market. To mitigate this risk, a CCP should have rules and procedures that enable the segregation and portability of positions of a Clearing Participant's customers and the collaterals provided to the CCP with respect to these positions. Recent instance of misappropriation of margins by M/s M F Global has again brought this issue to the fore.
- (viii) Investment risk : A CCP collects margins from its Clearing Participants. These margins are invested



or kept in custody by the CCP. CCP's own resources are also invested or kept likewise. In order to ensure that no loss is suffered from these investment operations so that these resources become available when needed, close control is required to be put in place in managing such investments.

(ix) Operational risk : For a CCP to perform efficiently, its processes need to run as required without any fail. It also has to recover in case of a disruption as quickly as possible (global standard - 2 hours). A CCP should identify the plausible sources of operational risks, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems operated by a CCP should have a high degree of security and operational reliability and should also have adequate scalable capacity.

(x) Interdependence : A CCP operates in close co-ordination with other major market infrastructures. It therefore faces risks from any failure by the linked entities. It can also pose similar risks to others. This aspect needs careful evaluation and the related risks need to be managed effectively.

4.5 Governance : Governance plays a very important role in ensuring that an organization runs on its desired course. A CCP's activities have become far more sophisticated and complex. Risk has also increased in proportion to this sophistication and complexity contributing to and amplifying systemic risk and consequent possibility of contagion from a crisis scenario. As observed during the global financial crisis, robust governance systems differentiated successful firms from others during the crisis. Organisations with good risk governance systems were able to respond with more flexibility. It is therefore necessary that the governance aspect for Payment and Settlement Systems is given more attention for effective and successful risk management.

4.6 Regulation : For risk management to remain efficient, regulators play an important role. A CCP should be subject to appropriate and effective regulation, supervision, and oversight by its regulator. For the sake of certainty, the regulators should clearly define and disclose their regulatory, supervisory, and oversight policies with respect to the CCPs. Regulators should co-operate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of Payment and Settlement Systems.

## 5. Conclusion

Payment systems are becoming important for having efficient financial markets. Criticality of those demands that robust and efficient systems with appropriate checks and balances are in place. It is also essential that users are fully aware about the risks that they are taking in using such systems. Importance of risk management from this perspective has assumed increased significance. Experience have however shown that only efficient regulation and effective governance can make the risk management in a payment and settlement system a success.







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**Abhay Gupte \***

# Fraud Risk Management

## 1. Introduction

Fraud is timeless. All organizations whether private, public or foreign, have at some time or the other faced the risk of fraud. The 'Report to the Nations on Occupational Fraud and Abuse (2012)' by Association of Fraud Examiners (ACFE) indicates that globally organizations lose approximately 5% of their revenues or more than \$3.5 trillion to fraud. To put this in perspective, India is considered to be a \$ 1.6 trillion economy as per economic data for 2011.

Fraud may be defined by a Bank as an 'act of knowingly executing or attempting to execute, a scheme or artifice to defraud a Financial Institution (FI) or to obtain property owned by, or under the control of a FI by means of false or fraudulent pretenses, representations, or promises.'

The growing threat of fraud risk to the banking industry has been articulated by Dr. Tarisa Watanagase, erstwhile Governor of the Bank of Thailand as : *"The globalization of the financial services industry, the increased sophistication and complexity of financial institutions and their services, and the ongoing advancement of technology continue to introduce new risks and opportunities for fraud...."*

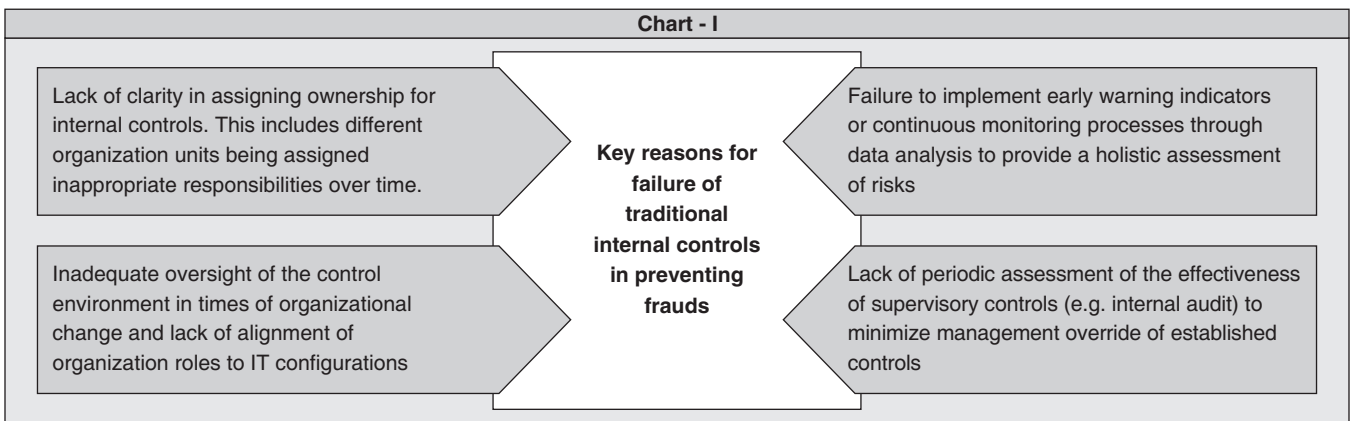
Organizations have addressed fraud risk in a conventional way resulting in limited success in managing and mitigating the incidence of frauds. A few key reasons are outlined in Chart-I :

Senior management recognizes that the threat of fraud presents a growing challenge and reputational risk to their business, apart from being a serious financial crime. In this context, Fraud Risk Management involves strategies and programs followed by banks / FIs to promote an anti-fraud culture and build a fraud resistant organization.

## 2. Emerging Trends - Types of Fraud

Reserve Bank of India (RBI) has observed that the trend in rising number of frauds and the amount involved in frauds is more alarming in the retail segment especially in housing and mortgage loans, credit card dues, internet banking, etc. Moreover, instances of frauds in the traditional areas of banking such as cash credit, export finance, guarantees, letters of credit etc. continue to remain unabated.

Findings from a Deloitte survey indicate that a majority of the banks expect retail banking to be



\* Senior Director, Deloitte Touche Tohmatsu India Pvt. Ltd.

the most vulnerable to fraud. Frauds in the priority sector are expected to increase while corporate banking sector frauds are expected to show a slow decline. A new area of expected vulnerability towards frauds in banks is administration and procurement functions which are not reflected in the current scenario.

A Bank may be defrauded by an internal or external individual or group. Internal frauds may be perpetrated by any employees or member of senior management. Knowledge of the organizational processes, strengths and weaknesses in internal controls make employees the most common perpetrators. External fraud may be perpetrated by third parties who are involved with the bank such as vendors or customers or remote parties such as hackers involved in cyber-crimes.

### 2.1 Accounting Fraud

In this case of fraud, accounting and financial statements or other related documents are falsified. This can involve accounting manipulations, fraudulent borrowings / raising of finance, fraudulent application for credit and unauthorized transactions / rogue trading. The various categories of accounting fraud are outlined in the graphic below :



### 2.2 Bribery and Corruption

Around 40% of the respondents of a recent survey on frauds in India are reported to have experienced bribery and corruption in the past one year. Lack of an effective regulatory and compliance mechanism and weak law enforcement provide incentives for facilitating corruption. Bribes in the form of cash or gifts are given to win or retain business, to obtain approvals and to influence people to make favorable or biased decisions.

The growing threat of bribery and corruption in mainstream banking has necessitated the introduction of international anti-fraud legislations such as US FCPA and UK Bribery Act.

### 2.3 Cyber Crimes

Cyber-crimes include spreading viruses, illegally downloading files, phishing (fraudsters send out legitimate looking emails in an attempt to gather personal and financial information) and pharming (fraudsters redirect website traffic with an aim to obtain personal and financial information), and stealing personal information like bank account details. One potential reason that may explain the sudden rise in cyber-crime is the rise in the volume of e-business, greater penetration of internet and e-commerce.

Within this category, data or information theft and Intellectual Property (IP) infringement is the area of highest concern. Anytime and anywhere accessibility of bank account details has led to increased vulnerability. Loss of confidential information due to external vulnerability, leakage of company and customers' confidential information by current or ex-employees and manipulation of procurement, accounting or other IT based process or systems are among the most risk prone areas of cyber-crime.

### 2.4 Asset Misappropriation

Asset misappropriation has become the most common type of economic crime in the recent past and covers a variety of offenses. Findings from a recent global survey on economic crime show a remarkable increase in asset misappropriation from

20% in 2007 to 68% in 2011. The primary examples of asset misappropriation are fraudulent disbursements such as billing schemes, payroll schemes, expense reimbursement schemes, cheque tampering and cash register disbursement schemes.

This type of fraud is most likely driven by the personal financial situation of the fraudster combined with weak controls in the bank resulting in greater opportunities to commit frauds. It is the hardest to prevent, but it is arguably the easiest to detect.

### 3. Fraud Risk Regulations in India

Government of India has responded to the growing threat by introducing various laws pertaining to vigilance, fraud, bribery and corruption :

- The Prevention of Bribery of Foreign Public Officials (FPO) and Officials of Public International Organizations (OPIO) Bill 2011 (India FCPA equivalent),
- The Prevention of Corruption Amendment Act 2011
- Public Interest Disclosure (Protection of Informers) Bill, 2010
- Other Data Privacy Laws

In an attempt to tackle rising incidents of frauds in the banking and financial services sector RBI has also issued various circulars and guidelines for Banks to implement comprehensive fraud risk management programs and systems and other controls to mitigate fraud risks. Stated explicitly within these guidelines is the need for controls for prevention, detection and deterrence of fraud and other roles and responsibilities of the senior management in the fraud prevention and management function.

The Central Vigilance Commission also had issued guidelines to Public Sector Banks on the appointment of a Chief Vigilance Officer in all public sector banks to ensure that the internal vigilance function to monitor frauds and malpractices is addressed in a structured and comprehensive manner.

### 4. Future of Fraud Risk Management in India

Fraud risk management should transition from the current “check the box” approach to a more cohesive

and broad based approach, aligned with the strategic business objectives of the organization. An effective Fraud Risk Management framework comprises critical elements listed in the graphic below :

Elements of an effective Fraud Risk Management Process		
Prevention	Detection	Response
<ul style="list-style-type: none"> <li>- Fraud and misconduct risk assessment</li> <li>- Code of conduct and related standards</li> <li>- Employee and third party due diligence</li> <li>- Communication and training</li> <li>- Process-specific fraud risk controls</li> </ul>	<ul style="list-style-type: none"> <li>- Hotlines for employees</li> <li>- Whistle-blower policies</li> <li>- Effective auditing processes</li> <li>- Monitoring processes</li> <li>- Forensic data analysis on a proactive basis</li> </ul>	<ul style="list-style-type: none"> <li>- Internal investigations protocol</li> <li>- Disclosure and reporting protocols</li> <li>- Remedial action protocols</li> <li>- Enforcement and accountability protocols</li> </ul>

Banks may also consider some of the below mentioned areas to help them better manage frauds :

#### 4.1 Corporate Governance

Bank Boards should create a broad program that manages and integrates fraud prevention, detection and response efforts. Audit Committee of the Board plays a key role in fraud risk management through oversight, implementing anti-fraud measures, recognizing and monitoring “red flags”.

In addition, enhancing corporate governance with respect to fraud risk management includes devising and implementing an anti-fraud policy which clearly outlines the bank's tolerance towards frauds and sets out the responsibilities for their prevention and detection. The purpose of such a policy is to encourage an anti-fraud culture, create awareness, reduce exposure to frauds, act as a deterrent for fraudulent activities and set out responsibilities of managers and staff. An effective anti-fraud framework includes a robust whistle blower policy. Employees need to be trained in the reporting of frauds or misconduct.



#### 4.2 Employee Training & Culture

One of the primary steps that banks need to take to build a fraud resistant organization is to train its employees and promote a culture that does not tolerate fraud. Banks must clearly define the ethical guidelines for their employees, customers and other third parties. Deterrent punishment e.g. disciplinary action is a must to clearly communicate intolerance to fraud.

#### 4.3 Data Analytics

Banks can employ analytical techniques in their efforts of fraud risk management. Data analytics helps bring to light hidden relationships between people and events and particular transactions. This improves the ability to assess the effectiveness on internal controls. Data proactively analyzed will help banks to identify control weaknesses and strengthen controls even before these weaknesses open the gates to fraud or misconduct.

#### 4.4 Vendor Due Diligence

Performing vendor due diligence helps minimize disruptions and avoid late surprises in the course of transactions with the vendor. A comprehensive vendor evaluation and oversight program may be set up to ensure that the management is able to identify, manage and mitigate the risk of vendor frauds. In addition, due diligence should address fraud risk management from an end-to-end perspective, including the establishment of the service contract, annual maintenance requirements, renewal conditions, monitoring and discontinuation of the vendor relationship.

#### 4.5 Customer Screening

Customer screening should be performed in line with regulatory requirements such as Anti-Money

Laundering (AML) and Know Your Customer (KYC) norms. Customer screening should be conducted on an ongoing basis and should have the ability to identify potential risks, politically exposed persons, adverse media effects, end to end transaction connections, etc. Continuous screening of individuals will help assess, mitigate and manage frauds in a systematic manner.

#### 4.6 Use of External Expertise / Consultants

Most banks in India do not currently engage experts to manage fraud risk until an incident has occurred. Banks should adopt a more proactive approach to the management of fraud risks. It will not only reduce their susceptibility to frauds but also bring down the time taken to investigate, and recover from the impact of frauds.

### 5. Conclusion

Fraud risk is inherent in the operating environment of an organization. Many recent surveys indicate that incidents of frauds are expected to rise. Therefore, extensive senior management's active involvement in fraud prevention and detection is essential. Banks must ensure relevance and effectiveness of internal controls and processes. Bank management need to consider focusing their anti-fraud efforts on the most cost-effective control mechanisms while developing an internal culture of transparency and honesty. Well-targeted and comprehensive fraud awareness training for all employees including senior management is a critical component for anti-fraud programs.



### Corrigendum

Article "Need for strategic shift in the Management of Non-Performing Assets in the Indian Banking Industry" April-June 2012 issue, page 52, para 2 (iii) - The sentence to be read as "The instalment of principal or interest thereon remains over due for two crop season for short duration crops."





## Judgement calls in Risk Management

 Ms. M. Pavithra \*

*Most discussions of decision making assume that only senior executives make decisions or that only senior executive's decisions matter. This is a dangerous mistake.*

*- Peter F. Drucker (1909-2005).*

Even though day to day management is scientific, there will be occasions where you need to navigate unquantifiable hazards by making judgement calls.

### **What should a person / institution do in such a situation?**

“A lady enters your branch and is in tears. She says that her husband has expired and was working in Indian Army. She desperately needs money for his funeral and she has brought a crossed cheque from the Army to encash. She says that the only person she knows is her husband's boss, who is a Colonel in the Army and is an esteemed customer of your branch. Since the lady does not have an account, you would need to open an account and credit it to her newly opened account. However, she is not in a position to give any documents at that particular moment. You call up the Colonel who confirms her story and requests you to open the account and assures you that she can provide the required documents at a later date after things settle down. What do you do? Do you open the account by taking the word of the Colonel and risk non-compliance of KYC norms at that moment? Or do you send the grieving lady away and repent for not helping a poor soul in desperate need of help?”

### **This needs a real-life judgement call.**

#### **Why is day to day Risk Management scientific?**

The basic premise of Risk Management is to quantify risk as “what you cannot measure cannot be managed”. The basic steps involved in the management of risk are :

1. Identifying the risk
2. Assessing the risk
3. Monitor the risk and
4. then Control the risk

Under normal circumstances a risk is well thought of, perceived, prioritized and dealt with. In a nutshell the day to day management of risk is more scientific as it involves the above.

Risk management has always been an explicit or implicit fundamental management process in financial services with maximisation of share holder value as the ultimate objective. Today, however, there is more pressure to avoid things going wrong while continuing to improve corporate performance in the new environment. Good risk management is a decisive competitive advantage. It helps to maintain stability, continuity and supports revenue and earnings growth.

#### **There are situations where this is not possible :**

- a) Where there is an emergency that warrants a judgement call to be taken i.e. essentially a crisis situation and/or
- b) Where there is no adequate information / data to base your decision on

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\* Manager, Syndicate Bank.

The very purpose of following the scientific steps for risk management is to ensure that the risks are quantified and measured. Every time this may not be the scenario.

Routine risks like worker safety and even some day-to-day trading hazards can thus be managed successfully with a mechanistic, scientific approach; but the kind of big-ticket bets that JP Morgan's chief investment office made could never be tested, or managed, in that way. Decisions either worked out or they didn't; given the small sample size it was impossible to test what the true probabilities were.

To navigate such unquantifiable hazards, then, you need to make judgement calls. And that's where argument (or discussion, or conversation, if you prefer) comes in. You want diverse, even opposing viewpoints. You want to manage their interactions in a way that allows the quieter, less-senior, less-predictable voices to be heard. You probably want to accord different weights to the arguments of different people, although deciding how to do so (past track record, clarity of argument) is hard.

#### **Unquantifiable Hazards :**

Quantification of risk is possible when there is sufficient time to follow the steps scientifically. There are many occasions where the quantification is next to impossible for want of time and data. Those situations pose an unquantifiable hazard i.e. a risk that cannot be measured and quantified. The only way to tackle those hazards where no informed decision can be taken, is to make judgement calls.

Here we face the next question : **What is a Judgement Call?**

**A judgement call is essentially a decision based on one's and / or most of the time group's opinion.**

Such judgements can make or break the individual or organization. The best leaders make a high percentage of good calls (like whom to hire, what strategy to implement, or how to handle a crisis) at times when it counts the most; but practising good judgement isn't easy, because the concept is murky.

Judgement calls are important decisions made all the time, about things like what stock to buy, when to perform a surgery, and whether a potentially game-winning basketball shot made it through the hoop before the buzzer; but these decisions do have a number of things in common. For instance :

- the stakes are high
- the information you need is incomplete or ambiguous
- knowledgeable people disagree about them
- there are often ethical dilemmas and / or conflicting values involved

How can you make a judgement call with so much uncertainty surrounding the issue? Remember that these types of decisions, however difficult, are made all the time. Each one has an outcome that is both subjective and debatable. That is, judgement calls are not made purely on facts because the facts are not completely available. They are debatable because another person, who knows as much as you do about the decision and the situation surrounding it, could come up with a strong argument as to why your decision might be wrong (or another option is right). Accepting the nature of judgement calls before you make them can help take some of the stress out of the decision-making process.

When a judgement call has to be made at the time of crisis situation, the basic steps involved in the management of risk as detailed above cannot be carried out for want of time. These are all situations that are occasional but inevitable. It is this nature of judgement call that poses an organization to unquantifiable hazards in turn. So it can be said that to navigate "unquantifiable hazards" we need to make "judgement calls" and "judgement calls" in turn could result in "unquantifiable hazards" if not made properly.

The second situation warranting a judgement call is slightly different. Here there is enough time to carry out the process of risk management barring the fact that there is insufficient rather no information / data to base the decision on. This can be handled in a three step process as explained under :

1. **Preparing for the call** : Identifying and framing the issue that would demand a judgement call, ensuring that the team members understand why the decision is important, and tapping ideas from stakeholders.
2. **Making the call** : Arriving at the decision and explaining it. At this phase, in case any important considerations have been left out during the preparation phase, those can be considered.
3. **Executing the call** : Mobilising the resources, people, information, and technology needed to execute the action.

### Evaluate the Risks

Look at each option in terms of risk. How much risk are you willing to take, and are you willing to suffer the consequences if you make the wrong choice? For example, you are considering buying shares of a stock. The choice is to buy, or not to buy. The best-case scenario is that you buy and the price skyrockets. The worst-case scenario is you buy and the price plummets. Notice that the risk occurs only if you make the purchase. Therefore, in this case, you need to decide if you can tolerate the risk of having the worst-case scenario occur. If you can't, you should not buy. Ask yourself if you take the risk, how much money can you afford to lose?

“You are a manager who must hire two new employees. When you advertise the openings, you get dozens of resumes. Two of them belong to your own organisation, who wish to move up to higher paying jobs with more responsibility. You know them and are impressed with their job performance. The top two resumes from the rest of the batch are graduates from prestigious business schools. However, they have no relevant work experience. Who do you hire?”

Evaluate the decision in terms of risk. The current employees are known to you. If you hire them, there is little risk that they will not be able to perform well on the job. Based on your own observations, they are both conscientious individuals who are more than capable of doing well in the new positions. The other candidates are a riskier choice. Although they have the education, they

lack experience. Will you have to spend countless hours training them? Will they be able to handle the job requirements successfully? You can only guess at the answers. If you want to make a judgement call based on what will be the least risk, you will hire the current employees.”

### Is there a special skill set required to make good judgement calls?

The answer is obviously “yes”. One of the significant roles of a team leader is to make good judgements that produce the desired outcomes. When a leader shows consistently good judgement, little else matters. Of course, every judgement cannot be a perfect judgement.

Throughout life we may have to make numerous judgement calls. From a trivial call as to which fridge to buy to a monumental call as to whom to marry in case of an individual and in case of an organization “whether to go for a takeover or merger”.

The ability to make right judgement calls will speak on the quality of one's own life; for leaders, the significance and consequences of judgement calls are magnified exponentially, because they influence the lives and livelihoods of others. In the end, it is a leader's judgement that determines an organisation's success or failure. So is the case with an individual.

“Beena, an employee of a large accounting firm, notices that her company is falsifying the financial records of a client, a multinational corporation. Should she report the action and risk losing her job, or say nothing and allow unethical behaviour to continue? This may seem like a black-and-white, right-or-wrong situation, but in essence it's a moral dilemma. Beena supports her family, including an ailing grandmother, and needs the job. Let's explore her options.

She understands that whistle-blowing could result in possible short-term negative effects for herself (unemployment). Of course, the other consequence is that the wrongdoing would stop and the culprits who falsified the records would probably be punished. In effect, she might save shareholders of the client's company millions of dollars.

Though this is a case of a judgement call by an individual, here the organization's interest should override the personal interest."

**Dangers in making judgement calls :**

The danger in making judgement calls is that in case the judgement goes wrong, the risks that the organisation has to face is not quantifiable i.e., immeasurable. These are areas that are both harder to measure and more sudden and severe in their impact.

Judgement calls are subjective, not simply a distillation of facts and explore the "what if" scenarios, the final decision is still your opinion. So to make judgement calls, people need to acknowledge and check their natural biases. For example, someone might have lost a large part of his or her savings due to a drop in the stock market and become leery of investing. Or, perhaps the person grew up in a family that was never in debt and stressed the evils of credit. Such experiences could cloud a person's ability to make an effective judgement call about buying stock.

Any pre-existing biases or attitudes reduce the ability to evaluate information objectively. Be aware of them. You can't eliminate them, but you can make sure they don't get in the way of a good judgement call.

**Sum up :**

1. Situations warranting judgement calls are a "fact of life and reality".
2. Not necessarily all judgement calls should yield negative results. Judgement calls taken after proper precautions can yield a positive result too.
3. To avoid negative outcomes, judgement calls are to be taken
  - a. After analysing the pros and cons of the call.
  - b. Except for situations with time constraint, judgement calls are to be based on a team's discussion and not on an individual's decision.
  - c. The team members are to be groomed in such a way that they are capable of making such calls. HR trainings should be designed to include such soft skills.

While in normal situations risks may be quantified and managed, in less than normal situations you need to make judgement calls to navigate unquantifiable hazards.



**Payment Systems : Emerging Messaging Standards**

The existing RTGS system uses a proprietary message format whereas NEFT uses the SFMS format, which is a secure messaging standard developed to serve as a platform for intra-bank and inter-bank applications. SFMS is an Indian standard similar to that used by SWIFT, which is used globally for financial messaging. Launched in December 2001 at the IDRBT, SFMS has the potential to be used for all secure communication within the bank and between banks.

Most central banks currently use SWIFT-MT standards for payment transactions. The International Standards Organisation (ISO) has devised new standards (ISO 20022) for the financial sector based on Extensible Mark-up Language (XML) that are easy to maintain and use Java technology. These messages (MX messages) permit better flexibility in monitoring the message content and details, and thus, help reduce costs and simplify information gathering, monitoring and surveillance activities for various purposes such as anti-money laundering.

From a system point of view, XML messages are easier to work with. It is the default format for exporting data in most contemporary systems, and is hence, optimal for a new system. Also, XML offers the lowest implementation cost. However, it involves the cost of migration for the banking sector as a whole due to the higher network bandwidth and disk space required at the central site. There would be an incremental cost for participant banks, especially medium and small banks, because the bandwidth requirements for MX are relatively higher. In addition, there will be a nominal increase in cost due to an increase in memory and CPU utilisation for  
*Source : RBI, Annual Report, 2011-12.*

the central banks and the community. Although there is some impact on disk space and network bandwidth, so far this has not constrained the market infrastructure in countries that are migrating to ISO 20022 standards. However, migration to new standards involves smooth communication among all existing applications systems, i.e., core banking systems at banks and various applications running at corporates that interact with the payments systems being run by the Reserve Bank.

The Reserve Bank has initiated steps to develop NG-RTGS. Among other things, the system will use an XML based messaging system that conforms to ISO 20022 standards. The ISO 20022 message standards (<http://www.iso20022.org>) for the financial sector are being examined by the ISO as well as the BIS. These standards aim at a "common language" for all financial communications, which would promote standardisation and save costs through improved transaction processing and better communication among various business domains, communication networks, and different stakeholders, such as financial institutions, clients and suppliers. Such initiatives are usually driven by communities of users looking for cost-effective measures to support specific financial business processes and interoperability with existing protocols.

To adopt and promote messaging standards appropriate for India, a working group has been set up, comprising representatives from select public and private sector commercial banks, the IDRBT, the CCIL, the NPCI and the Reserve Bank.



 **Dr. Narinder Kumar Bhasin \***

## Managing Banking Risks Through Ideal Technology

### Introduction

Though banks have always been concerned with risk management, the nature of risk has evolved. Risk management has been transformed by globalization, consolidation and real time information; its magnitude has by a complex set of regulatory and legislative rules. This includes the most notably upcoming Basel III accord targeted for implementation starting from 2013. The Basel II accord required international banks to show that they have sufficient capital set aside for emergencies and encourage safer banking practices through internal assessment processes and a transparent disclosure process. Basel III is a global regulatory standard on bank capital adequacy, stress testing and market liquidity risk agreed upon by the members of the Basel Committee on Banking Supervision in 2010-11.

Whereas risk management characterizes many of our activities in different spheres, from standard technological risk management embedded in almost all industrial goods and machinery, to worrying about climate change and global warming, it is in the world of finance that risk management is at the core of all activities. In addition, the banking industry has become more dependent on electronic transactions and more reliant on real time information to stay on top of its operations.

Payment systems are part of the foundation of a monetary economy. The importance of payment systems and control of risks involved has increased greatly in recent years because of remarkable growth in trading, volumes in currency, money and security markets. Payment systems have also become increasingly technically sophisticated and faster operating. Their management require expertise than

before as preparedness for disturbances. Institutions including those with negligible daylight overdrafts should be familiar with the risks associated with the various payment types and ways to mitigate those risks to better control their exposures. Any time an institution extends credit to a customer or permits a customer to use provisional funds to make a payment, the institution is exposed to credit risk. If the customer is unable or unwilling to repay the credit extension or the institution does not receive final payment for a provisional transfer, the institution could incur a financial loss. Institutions should establish internal risk controls that reflect the creditworthiness of their customers and payment system counterparties. Investing in security risk management program - with a solid, achievable process and defined roles and responsibilities - prepares an organization to articulate priorities, plan to mitigate threats and address critical business threats and vulnerabilities.

### Definition of Risk and Risk Management

Risk is defined as un-certainty, that is as the deviation from an expected outcome and what one achieves from what one has planned. This unpredictability of future is due to uncertainties associated with the steps that one undertake in the process or various external factors that influence the processes that are necessary to achieve planned objective. The word risk is derived from an Italian word *Risicare* which means to dare. Risk Management is a good management practice and the process that enables environment in decision making. Its a logical and systematic approach to identify opportunities to avoid or minimise the loss. Risk is a condition in which there is a possibility of an adverse deviation from a desired outcome that is expected or hoped for.

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\* Vice President & Retail Banking - Branch Head, Axis Bank Ltd.



Risk Management is the process of measuring or assessing the actual or potential dangers of a particular situation. An extension of this meaning further reveals that risk is not something to be faced but a set of opportunities open to choose.

With the generalized opening of trade and of capital movement across the world over the past decade and half, risk management has become all pervasive across the whole financial sector. Financial risks are uncertainties resulting in adverse variation of profitability or outright losses. Risk management begins by establishing the strategic and organizational context with identification and quantification and may be further subdivided into following five processes :

- Risk Identification
- Risk Measurement
- Risk Pricing
- Risk Monitoring and
- Risk Control

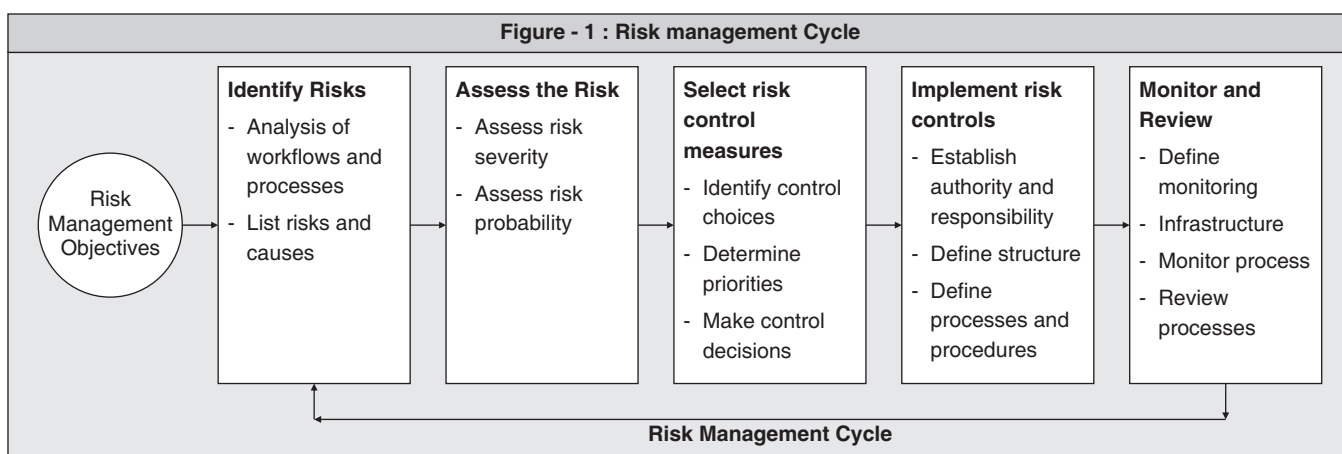
**Sources of Risk :** Sources of risk can be organized into categories such as customer risk, technical (product) risk, and delivery risk. Within each category, specific sources of risk can be identified and risk reduction techniques applied.

**1. Customer Risk** is related to the customer's key success factors for the project. A project is not successful if the customer is not successful with the system. The key success factors are found in both the customer's requirements and

the context or environment within which the system and its users will function. These will vary from customer to customer, even for similar systems.

- 2. Technical risk** arises from the capability of the technical solution to support the requirements of the customer. Until the system is actually constructed and tested every component of the architecture is a potential source of risk.
- 3. Delivery risk** is related to the ability of the complete team (including vendors and subcontractors) to deliver against the plan at the cost and schedules estimated.

**Risk in Banking Business :** The banking industry has a wide array of business lines like commercial banking, corporate finance, retail banking, trading, investment banking and various financial services from the main business lines of banks. Within each lines of business there are sub groups and each subgroup contains variety of financial activities. The banking book includes all advances, deposits and advances, deposits and borrowings which usually arise from commercial and retail banking operations. The trading book includes all the assets that are marketable i.e. they can be traded in the market. Off balance sheet exposures are contingent in nature as banks issue guarantees, committed or back up credit lines, letter of credit etc, and banks face payment obligations contingent upon some event such as failure to meet payment obligations. In carrying all such



banking operations, any mismatch between assets and liabilities results in different types of banking risk. They are listed below:

**Classification of Risks :**

The risks are classified as under and they are well known by now :

- 1) Liquidity Risks 2) Interest rate Risks / Pricing Risks
  - 3) Market Risk 4) Default or Credit Risk 5) Operational Risk
  - 6) Reputational Risk 7) Strategic Risk 8) Country Risk,
- Operational, Credit and Reputational risks are most important risks from banker's point of view.

have a unified view of operational risks and control across all business units and processes, as well as down through levels, a common risk assessment and measurement system and sound policies governing the risk management process.

The comprehensive approach can accommodate the integration of credit and market risk into operational risk metrics, which is not surprising, considering how the three are interrelated. Market volatility impacts the value of collateral which impacts the organization's credit risk. Market volatility can drive volumes, which in turn impacts operational risk. Managing the relationship

Figure - 2 : Risk Management Check List		
OPERATIONAL RISK	CREDIT RISK	REPUTATIONAL RISK
<ul style="list-style-type: none"> <li>1. Employee training.</li> <li>2. Close management oversight.</li> <li>3. Segregation of duties.</li> <li>4. Employee background checks.</li> <li>5. Procedures and process.</li> <li>6. Purchase of insurance.</li> <li>7. Exiting certain businesses.</li> <li>8. Capitalization of risks.</li> </ul>	<ul style="list-style-type: none"> <li>1. Stringent credit standards for borrowers and counterparties</li> <li>2. Strict Portfolio risk management</li> <li>3. Constant focus on changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank</li> </ul>	<ul style="list-style-type: none"> <li>1. Processes for crisis management are planned and documented</li> <li>2. External perceptions of the bank are regularly measured</li> <li>3. Reputational threats are systematically tracked.</li> <li>4. Employees are trained to identify and manage reputational risks</li> <li>5. Standards on environmental human rights, and labour practices are set publically</li> <li>6. Relationships and trust with pressure group and other potential critics are established.</li> </ul>

**Technology's role in Enterprise Risk management :  
The necessity of cultural change :**

Before we enter into a discussion of the technologies that make banks and enterprises wide risk management possible, it should be noted that the correct culture should be in place before such tools are implemented. In this day and age, the onus of responsibility needs to reside within the organization, where selected bank staff can manage risk in their own area of control and come together to create an accurate, comprehensive risk profile in real time. Certain changes in organizational structure, as well as functional roles to support the new governing structure are suggested to create the correct infrastructure. The overarching goal is to

between these risks and mitigating the exposure to them through a single, highly integrated risk management technology framework and can help ensure that banks meet the demands placed upon them by market factors and regulators. It is likely that an individual or small group of coordinators - one from each business unit - will be charged with evangelizing the operation in the short term and administering the technology in the long term. However, in no way does this diminish the necessity for the whole organization to buy into involvement - or at least those who are tangentially involved in the qualification of risk - as the new risk management is a democratic process.

The best technology is engineered to work on a distributed basis serving all key business unit owners, while at the same time being robust enough to meet the needs of the entire bank as it creates a comprehensive, standardized book of record for the institution's assessment.

### **The Ideal Technology**

A flexible infrastructure is a key given, if the bank is to achieve the high levels of integration needed to an enterprise wide approach to addressing risk. In the words of Mr. Gorrod, "Monitoring day to day risk, stress testing for improbable events and working with a technology environment, able to spot new and previously undefined risks are of critical concern." The system must accept and process information from all levels of the organization, including edit, and control of data flow from key personnel such as the Chief Information Officer, Security Director, Chief Financial Officer and Chief Risk Officer. Input should be accommodated on an ongoing, intraday basis to keep risk factors current and measurement upto date.

As input must be enabled from all key reporting areas, the aggregated data (risk assessment, risk scoring, corrective action, internal audit review etc.) must be made available back to appropriate personnel in an easily digested format using consistent terminology. Furthermore, delivered data must be organized - collated, perhaps, is a more accurate term - so that the individuals receive the information germane to their work functions and security levels. At the same time, the system must allow computerized areas of information to roll up together to allow horizontal views of risk across the organization and vertical views down through levels of functions. This flexibility is essential to modern risk management, as it allows the facilitation of communication between the executive, operational risk, and business functions while maintaining segregation of responsibilities, controls and oversight. Just as an ideal risk management system should support easy import of a wide variety of data, so should it be able to export data, a functionality that has to go beyond clean transfer of data into user friendly formats like Excel spreadsheets and word processing documents.

Last but not least, software should be scalable and built to stay on top of changing requirements, such as organizational change and evolving risk parameters. Any bank with aspirations to grow wants to manage risk effectively not just now, but in the future. Using a solution that runs the risk of being obsolete is simply not an option.

**Role for Technology :** There are four main areas where technology has to play an important role in risk management in banks :

1. Data Collection and Storage
2. Risk Analysis and modeling
3. Risk monitoring and control
4. Risk Information and Communication.

The starting point is good data, and lots of it - enough to provide a sound statistical basis for effective decision-making. Collecting data requires good front-end systems, an effective system and data architecture with limited human intervention, and good database and business intelligence technology. But, it also needs people - the right type of people with the right culture, attitude and processes to : (a) capture and log the data accurately, and (b) to analyze the data effectively.

Business processes have to balance the ability to capture data effectively with what it is used for. Companies operating call centers, for example, can miss the opportunity to capture useful business intelligence by the pressure they place on operators to handle a certain volume of calls. Data analysis can take many forms but actuarial techniques of stochastic modeling recognize that there is no single quantifiable answer to any risk. It is a combination of the probability of a risk occurring; the potential impact or impacts; and the mitigating effects of controls. At the extremes, any one risk or combination of risks, however seemingly unlikely, can bring a company down. Increase in computer power have meant that this type of modeling - often including hundreds of thousands of scenarios - is much more effective and efficient than it used to be and can be brought to bear more readily to assist business decision making.

It's easy to get carried away with technological capabilities but, also remember, the type - and complexity - of modeling should be appropriate, not only to the nature and materiality of the risk, but also to the amount and quality of data available. Otherwise, it risks giving an unrealistic view of the robustness of the model outputs and potentially will lead to a false sense of security.

Technology, and the access to information it affords, has made it far easier to monitor an organization's continuing risks. It would be almost inconceivable for risk management to work effectively without the storage and processing capabilities of modern computers and the almost instant ability to communicate data-rich material around the globe. Furthermore, computerized controls play an ever increasing part in reducing risk.

Let's be clear then. It's no time to throw the baby out with the bath water. The banking industry's risk models may have gathered a momentum of their own and not predicted the near global financial meltdown, but technology is an essential part of modern financial services risk management.

### **Risk Management in E-Banking Services**

Continuing technological innovation and competition among existing banking organizations and new entrants have allowed for a much wider array of banking products and services to become accessible and delivered to retail and wholesale customers through an electronic distribution channel collectively referred to as e-banking. However, the rapid development of e-banking capabilities carries risks as well as benefits.

**The Basel Committee on Banking Supervision** expects such risks to be recognized, addressed and managed by banking institutions in a prudent manner according to the fundamental characteristics and challenges of e-banking services. These characteristics include the unprecedented speed of change related to technological and customer service innovation, the ubiquitous and global nature of open electronic networks, the integration of e-banking applications with legacy computer systems and the increasing dependence of banks on third parties that provide the

necessary information technology. While not creating inherently new risks, the Committee noted that these characteristics increased and modified some of the traditional risks associated with banking activities, in particular strategic, operational, and legal and reputation risks, thereby influencing the overall risk profile of banking.

Based on these conclusions, the Committee considers that while existing risk management principles remain applicable to e-banking activities, such principles must be tailored, adapted and, in some cases, expanded to address the specific risk management challenges created by the characteristics of e-banking activities. To this end, the Committee believes that it is incumbent upon the Boards of Directors and banks' senior management to take steps to ensure that their institutions have reviewed and modified where necessary their existing risk management policies and processes to cover their current or planned e-banking activities. The Committee also believes that the integration of e-banking applications with legacy systems implies an integrated risk management approach for all banking activities of a banking institution.

### **Risk Management Principles for Electronic Banking**

To facilitate these developments, the Committee has identified 14 Risk Management Principles for Electronic Banking to help banking institutions expand their existing risk oversight policies and processes to cover their e-banking activities. These principles are not put forth as absolute requirements or even "best practice." The Committee believes that setting detailed risk management requirements in the area of e-banking might be counter-productive, if only because these would be likely to become rapidly outdated because of the speed of change related to technological and customer service innovation. The Committee has therefore preferred to express supervisory expectations and guidance in the form of *Risk Management Principles* in order to promote safety and soundness for e-banking activities, while preserving the necessary flexibility in implementation that derives in part from

the speed of change in this area. Further, the Committee recognizes that each bank's risk profile is different and requires a tailored risk mitigation approach appropriate for the scale of the e-banking operations, the materiality of the risks present, and the willingness and ability of the institution to manage these risks. This implies that a "one size fits all" approach to e-banking risk management issues may not be appropriate.

For a similar reason, the Risk Management Principles issued by the Committee do not attempt to set specific technical solutions or standards relating to e-banking. Technical solutions are to be addressed by institutions and standard setting bodies as technology evolves. However, this Report contains appendices that list some examples current and widespread risk mitigation practices in the e-banking area that are supportive of the Risk Management Principles.

Consequently, the Risk Management Principles and sound practices identified in this Report are expected to be used as tools by national supervisors and implemented with adaptations to reflect specific national requirements and individual risk profiles where necessary. In some areas, the Principles have been expressed by the Committee or by national supervisors in previous bank supervisory guidance. However, some issues, such as the management of outsourcing relationships, security controls and legal and reputation risk management, warrant more detailed principles than those expressed to date due to the unique characteristics and implications of the Internet distribution channel.

The *Risk Management Principles* fall into three broad, and often overlapping, categories of issues that are grouped to provide clarity : *Board and Management Oversight; Security Controls; and Legal and Reputation Risk Management.*

**Basel III - Risk Insights :** The Basel III rules are much tougher than Basel II which failed to ensure banks held enough capital to withstand the worst risk and financial crisis since the great depression.

Although Basel III more than triples the amount of top quality capital that banks will have to hold in reserve, there are several potential pitfalls in timing and content that could undermine the reforms effectiveness. The key aspects of completed package will not all be phased in until the start of 2019, presenting a challenge for supervisors at their political masters to maintain momentum in their supervision of the sector. Lobbying by banks or an eventful return to boom times could blunt the will to enforce Basel III as memories of the global credit crisis fade.

- The proposed Basel III regulation will raise capital requirements for banks thus strengthening the stability of the global financial system.
- The new rules will affect mostly smaller financial institutions and, as a result, credit conditions for small and medium sized companies.
- Countries such as the US and the UK could adopt tighter regulations than recommended by Basel III, which will impact on the availability of financing in these accounts.
- Non-Bank financial institutions, such as investment banks and hedge funds, will play an increasingly active role (as the new provisions do not concern them, raising the risks associated with this sector).
- New rules on trade financing are likely to result in tighter trade credit conditions, encouraging companies to use less secure investment.
- As trade credit conditions tighten, country risk in formation is set to become even more essential to companies dealing with foreign counterparties.
- The enhanced capital and liquidity buffers together with the focus on enhanced risk management standards and capability should lead to reduced risk of individual bank failure and also reduced interconnectivity between institutions.

Basel III has provided detailed timeline to reach the milestones on capital requirement, leverage ratio & liquidity requirements.



## Conclusion

To protect banks against business, legal and reputation risk, e-banking services must be delivered on a consistent and timely basis in accordance with high customer expectations for constant and rapid availability and potentially high transaction demand. The bank must have the ability to deliver e-banking services to all end-users and be able to maintain such availability in all circumstances. Effective incident response mechanisms are also critical to minimize operational, legal and reputation risks arising from unexpected events, including internal and external attacks that may affect the provision of e-banking systems and services. To meet customers' expectations, banks should therefore have effective capacity, business continuity and contingency planning. Banks should also develop appropriate incident response plans, including communication strategies that ensure business continuity, control reputation risk and limit liability associated with disruptions in their e-banking services.

We can all already see this in how automated risk management touches upon our personal lives through technology such as CCTV cameras, speed cameras and speed limiters. Often this means there is less

focus on human, 'intelligent' risk management. But to what extent does our reliance on technology drive behaviour? The reality is that we often learn to understand how technology works and how to manipulate or avoid disadvantageous outcomes - for instance, slowing down for a speed camera. Therefore, the technology itself can change behaviours and potentially lead to riskier, unexpected outcomes. That certainly seems partially at the root of the current financial crisis. How much did the existence of complex financial models allow bank executives to absolve themselves of risk management responsibilities?

What we all have to remember is that technology can be very effective in supporting the management of risk - as long as it is treated as a tool rather than the panacea. The most appropriate strategy generally involves a mix of risk management techniques that are driven by the bank's internal capabilities and risk tolerance. The bank's technology risk management process has to be intertwined with other risk management processes and overall business strategy.



### Electronic Benefit Transfer (EBT) and its convergence with Financial Inclusion Plan (FIP)

In accordance with its vision of inclusive growth, the Reserve Bank has been pursuing the objective of providing access to efficient banking services at an affordable cost to the hitherto unbanked population of the country. For this purpose, a technology based "bank-led" model of financial inclusion was adopted. In view of the effort taken by banks in spreading the banking network to the hitherto unbanked villages of the country under the financial inclusion plan, a need was felt to further scale up the EBT initiatives and thereby ensure a convergence between the EBT implementation and the FIP of banks. In this direction, the Reserve Bank, on August 12, 2011, issued "Operational guidelines for implementation of Electronic Benefit Transfer and its convergence with Financial Inclusion Plan". The Reserve Bank has advocated use of the "One District - Many Banks - One Leader Bank Model" for EBT Implementation.

In this model, all the banks present in the district would participate in EBT, though for administrative convenience the state government is required to deal only with one leader bank. State government shall designate the leader bank, in consultation with the regional office of the Reserve Bank and the SLBC, who will obtain the funds from the state government and in turn will arrange to transfer funds through inter-bank transfer to other banks for credit to the accounts of ultimate beneficiaries. State government shall designate a nodal department for administration of each of the social

*Source : RBI, Annual Report, 2011-12.*

benefit schemes. The nodal department shall provide the list of beneficiaries and banks shall arrange for enrolment and creation of their bank accounts. The nodal department shall maintain a savings account in its name with the leader bank. The department's account in the bank will be credited with a consolidated amount by the treasury bank of the state government. The department will send instructions to the leader bank each month containing the updated list of beneficiaries in electronic form. The bank will then debit the savings bank account of the nodal department and arrange for crediting the accounts of beneficiaries. The management information system as required by the state governments will be strengthened automatically as payment information will flow electronically and seamlessly from end to end so that a data-base is created for generating various types of reports.

As EBT scheme is a part of the overall FIP, EBT account holders will also be provided whole range of permissible banking services viz., a saving account with in-built overdraft, remittance and entrepreneurial credit products in the form of GCC / KCC. Thus, EBT implementation will enable the beneficiaries to get the social security benefits directly credited to their accounts and at the same time it will relieve the government functionaries of the cost and time involved in manually administering the high volume and low value payments.



 **D. P. Chatterjee \***

## Role of Capital in Risk Management - Is It A Substitute ?

The first financial crisis of the twenty first century has been ranked by several economists as second only to 'The Great Depression'. This crisis witnessed major financial players like Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, Washington Mutual, Wachovia, Citigroup, AIG and Bear Sterns who either failed, were acquired under duress, or were subject to government takeover. Large U.S. and European banks' losses on non-performing assets were estimated at around \$2.8 trillion by International Monetary Fund during the period 2007-10. And, yet they were not through with their losses.

In the words of the Economist Mr. Dean Baker

*"The problem with the economy is the loss of close to \$6 trillion in housing wealth and an even larger amount of stock wealth".*

He adds :

*"Economists, economic policy makers and economic reporters virtually all missed the housing bubble on the way up. If they still can't notice its impact as the collapse of the bubble throws into the worst recession in the post-war era, then they are in the wrong profession".<sup>1</sup>*

The post crisis period witnessed its impact. Economic growth stalled or even contracted as consumption and investment declined. This left only the government spending to keep the economic engine moving. Several governments responded that there is a limit on government spending, was soon realised as yields on government debts of several countries rose. This in turn affected banks as their investment portfolio of government securities lost value forcing them to seek for bail-out funds. Decline in economic activity affected tax revenues and this coupled with spending needs affected

rating of various countries. In the process some countries reached a stage where they became a candidate where they needed bail-out support.

### Why this crisis?

Mr. Dean Baker has held that the collapse of (housing) bubble is responsible for the recession. A brief note on build up and collapse of housing bubble appears in Exhibit-1.

There are other opinions as well. This has been summarised by Mr. Oscar Jorda, Mr. Moritz Schularick, and Mr. Alan M. Taylor in their paper "Financial Crises, Credit Booms, and External Imbalances : 140 Years of Lessons".

There is one school of thought which has held the policy that kept interest rates too low in the wake of the 2001 recession (Mr. J. B. Taylor 2007, 2009) and neglect of distortions and instabilities arising from bank (or non-bank) credit channels (Borio and White 2003; Goodhart 2007; Borio, 2008; Christiano *et al.* 2010) responsible for the crisis.

Another school of thought has identified international imbalances (Economic Report of the President of US - 2009). Among others, Ben Bernanke (2009) and Mervyn King (2010) have linked the crisis to capital flows from developing economies into developed economies mainly in the form of reserve accumulation by emerging markets. These reverse capital flows, the argument goes, opened up a Pandora's box of financial distortions. As foreign savings were predominantly channelled through government (or central bank) hands into treasuries, private investors turned elsewhere to look for higher yields, which contributed to the global mispricing of financial risks.

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\* Former General Manager, UCO Bank.

### **In the words of King (2010):**

*“The massive flows of capital from the new entrants into western financial markets pushed down interest rates and encouraged risk-taking on an extraordinary scale. . .”*

Capital flows provided the fuel which the developed world's inadequately designed and regulated financial system then ignited to produce a firestorm that engulfed us all.

Yet another school of thought takes an intermediate position stresses that global imbalances and financial crises are the product of the interaction of domestic and external factors prepared the ground for the boom that went bust in 2007 / 08. Lax monetary policy, low real interest rates, financial innovation, and credit market distortions created a dangerous cocktail, but international factors such as exchange rates and other economic policies pursued in emerging markets also played a critical role (Obstfeld and Rogo\_2009; Obstfeld 2010; Ferguson and Schularick 2010).

All these conclusions have identified one common factor, although expressed in different phrases be it “neglect of distortions and instabilities arising from bank (or non-bank) credit channels” or “developed world's inadequately designed and regulated financial system” or “and credit market distortions”.

If we take a closer look at the functioning of credit market in US (refer Exhibit-1), prior to the crisis, we may notice that it indulged in few distortions. They are :

- Financing overheated assets
- Financing less credit worthy buyers beyond prudential level
- Working with inadequate capacity to handle credit dispensation
- Incorrect risk assessment of innovative products

Investors erred in investing without proper risk assessment and based on information provided by third parties where conflict of interest was a distinct possibility.

These indulgences by credit underwriters were responsible for creating a product that was overpriced, risky and defective. Thus, innovative financial

instruments that emerged based on an overpriced, risky and defective underlying were themselves risky enough but neither its risk assessment nor its pricing was correctly done. It is not that such distortions in credit dispensation or risk assessment has been noticed for the first time. Matter of fact these distortions are common and may be noticed in isolated cases pretty often.

It is the abnormally high volume that mattered. Unparalleled fund flow into a particular sector in one country should have drawn the attention of regulators. There were others who noticed it and shared it.

For example, an article in the New York Times informs that Economist Nouriel Roubini warned of such crisis as early as September 2006, and the article goes on to state that the profession of economics is bad at predicting recessions.<sup>2</sup> According to The Guardian, Roubini was ridiculed for predicting a collapse of the housing market and worldwide recession, while The New York Times labelled him “Dr. Doom”.<sup>3</sup>

Mr. Shiller, an expert in housing markets, wrote an article a year before the collapse of Lehman Brothers in which he predicted that a slowing US housing market would cause the housing bubble to burst, leading to financial collapse.<sup>4</sup> Mr. Shiller regularly appeared on television in the years before the crisis and warned of the impending real estate collapse.<sup>5</sup>

The U.S. Financial Crisis Inquiry Commission reported its findings in January 2011. It concluded that

“the crisis was avoidable and was caused by : Widespread failures in financial regulation, including the Federal Reserve's failure to stem the tide of toxic mortgages; Dramatic breakdowns in corporate governance including too many financial firms acting recklessly and taking on too much risk; An explosive mix of excessive borrowing and risk by households and Wall Street that put the financial system on a collision course with crisis; Key policy makers ill prepared for the crisis, lacking a full understanding of the financial system they oversaw; and systemic breaches in accountability and ethics at all levels.”<sup>6,7</sup>

In the Final draft : 13 April 2011 Forthcoming, IMF Economic Review on the subject “Financial Crises, Credit Booms, and External Imbalances : 140 Years of Lessons”, Mr. Oscar Jorda, Mr. Moritz Schularick, and Mr. Alan M. Taylor took a look at the question - Do external imbalances increase the risk of financial crises?

In this paper, they studied the experience of 14 developed countries over 140 years (1870 - 2008) and used the long-run dataset in a number of different ways. They concluded the following :

“Yet overall, 140 years of crisis history show that credit growth is the dominant variable to watch from a policymaker's perspective. External imbalances do not seem to play as large a role in creating instability as credit booms. This prompts the worrisome thought that an obsession with global imbalances may in a world of scarce political capital unduly distract policymakers from giving due attention to mitigating credit instability via macro-prudential policies, systemic risk management, and regulation and reform of the financial sector”.

### **BASEL III response**

The Basel Committee's response to the financial crisis as it has been mentioned in its report to the G20 in October 2010 is to “seek to improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source, thus reducing the risk of spill over from the financial sector to the real economy” and they have addressed banking sector issues such as excessive leverage, inadequate and low-quality capital, and insufficient liquidity buffers through a series of measures. They are :

- Raising the quality of capital to ensure banks are better able to absorb losses on both a going concern and a gone concern basis;
- Increasing the risk coverage of the capital framework, in particular for trading activities, securitisations, exposures to off-balance sheet vehicles and counterparty credit exposures arising from derivatives;
- Raising the level of the minimum capital requirements, including an increase in the minimum

common equity requirement from 2% to 4.5% and a capital conservation buffer of 2.5%, bringing the total common equity requirement to 7%;

- Introducing an internationally harmonised leverage ratio to serve as a backstop to the risk-based capital measure and to contain the build-up of excessive leverage in the system;
- Raising standards for the supervisory review process (Pillar 2) and public disclosures (Pillar 3), together with additional guidance in the areas of sound valuation practices, stress testing, liquidity risk management, corporate governance and compensation;
- Introducing minimum global liquidity standards consisting of both a short term liquidity coverage ratio and a longer term, structural net stable funding ratio; and
- Promoting the build up of capital buffers in good times that can be drawn down in periods of stress, including both a capital conservation buffer and a countercyclical buffer to protect the banking sector from periods of excess credit growth.
- Address the risks of systemic banks..... systemically important banks should have loss absorbing capacity beyond the minimum standards of the Basel III framework.

Going forward, the Committee will concentrate its efforts on the implementation of the Basel III framework and related supervisory sound practice standards. It is also conducting work in the following areas :

- A fundamental review of the trading book;
- The use and impact of external ratings in the securitisation capital framework;
- Policy response to systemically important banks;
- The treatment of large exposures;
- Enhanced cross-border bank resolution;
- A review of the *Core Principles for Effective Banking Supervision* to reflect the lessons of the crisis; and

There is no doubt that additional capital by way of equity brought in to banking sector either in the

form of supervisory buffer or countercyclical buffer or through higher risk weights will add to the shock absorbing capacity of banking sector and add to the comfort level of users of banking services and also to that of the regulators, but that would add to costs also. The report admits it.

“This work concludes that the transition to stronger capital and liquidity standards is expected to have a modest impact on economic growth. Moreover, the long-run economic benefits substantially outweigh the costs associated with the higher standards”.

It is not discernible as to what the modest impact would come to. Higher capital ratio would lower the return on capital and hence its cost would be transferred to the consumers is one factor that would affect growth. But, more importantly it would affect emerging economies much more severely. Growth rate of emerging economies are high and financing growth will add to requirement of enormous amount of capital where this is scarce.

It is also not clear whether long run economic benefit would substantially outweigh the costs. The basic issue that had arisen in this financial crisis relates to consumer financing. While corporate exposures are rated periodically and therefore risks on such exposure gets assessed in a dynamic manner, this is not so in case of consumer finance. In case of consumer finance risk weight does not change to reflect changes in its risk content. Mortgage finance for housing is considered low risk finance as is evident from the risk weight assigned to it. But, risk associated with such exposure would change where prices have gone up beyond a limit or where exposure is on not so creditworthy borrowers or where mortgage is defective. This would be true for all types of consumer finance. And share of consumer finance is very significant and what more it is increasing. It is a fact that changing quality of housing exposure was not recognised and that led to under estimation of risk and price. This in turn affected the derivatives as well. The losses suffered were enormous. It would be a

moot point to assess if enhanced capital would suffice to meet such losses and yet leave banking sector to remain a going concern.

“One size fits all” is the reason that made it necessary to revise Basel-I norms for assessing credit risks. Raising capital standards for all banks, irrespective of their business models and type of risks contracted is difficult to justify. Banks dealing in well understood products and banks dealing in innovative products would stand on different platforms as to their risks because risk pattern on new products gets determined over time.

However, Basel III framework also provides for raising standards for the supervisory review process (Pillar 2) and public disclosures (Pillar 3), together with additional guidance in the areas of sound valuation practices, stress testing, liquidity risk management, corporate governance and compensation and that they are working for a review of the *Core Principles for Effective Banking Supervision* to reflect the lessons of the crisis may address some of these issues.

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## Exhibit - 1 : Housing Loan Bubble - Its Evolution

During 2000 to 2003 Federal Reserve reduced federal funds rate from 6.5% to 1.0% mainly to encourage growth in economic activities through credit growth in response to the possible risk of growth contraction arising out of dotcom bubble. The credit growth indeed picked up but not in business investment. The credit growth in fact fuelled housing finance, particularly residential housing. This was reflected in price of housing assets. In 2006, a typical American house was costing nearly 125% higher than its cost in 1997.

In addition to lower federal funds rate, the US economy experienced huge fund flow into its financial markets. Whether huge fund availability in US financial market was due to internal factors like lax monetary policy or external factors such as capital flows from developing economies by way of reserve accumulation or surplus of petroleum exporting countries particularly from Middle east countries accumulated due to high oil prices is debatable but, either of these factors might have played their role. In addition, worldwide fixed income investment pool, estimated around \$100 trillion, also found its way into US financial market. These funds found their way through securitised papers and derivatives generated by investment bankers on the back of mortgage loans.

Easy credit conditions and mortgage lenders' quest for revenue and market share created a market where creditworthy home buyers were difficult to find. Yet, the mortgage lenders had insatiable appetite for mortgage loans and they took to financing less creditworthy borrowers. It would be interesting to know that subprime mortgages reached a level of 20% of all housing mortgages in 2005/2006. This compares with the level of 10% of all housing mortgages until 2004.

In the process, not only credit standards were diluted, but due diligence in processing and documentation of loans were compromised resulting in defective mortgages. This would be evident if we examine testimonies given before inquiry commissions.

Testimony given to the Financial Crisis Inquiry Commission by Richard M. Bowen - III on events during his tenure as the Business Chief Underwriter for Correspondent Lending in the Consumer Lending Group for Citigroup (where he was responsible for over 220 professional underwriters) states that by 2006, 60% of mortgages purchased by Citi from some 1,600 mortgage companies were "defective" (were not underwritten to policy, or did not contain all policy-required documents) - this, despite the fact that each of these 1,600 originators were contractually responsible (certified via representations and warranties) that their mortgage originations met Citi's standards. Moreover, during 2007, "defective mortgages (from mortgage originators contractually bound to perform underwriting to Citi's standards) increased... to over 80% of production".

In separate testimony to Financial Crisis Inquiry Commission, officers of Clayton Holdings - the largest residential loan due diligence and securitization surveillance company in the United States and Europe - testified that Clayton's review of over 900,000 mortgages issued from January 2006 to June 2007 revealed that scarcely 54% of the loans met their originators' underwriting standards. The analysis (conducted on behalf of 23 investment and commercial banks, including 7 "too big to fail" banks) additionally showed that 28% of the sampled loans did not meet the minimal standards of any issuer. Clayton's analysis further showed that 39% of these loans (i.e. those not meeting *any* issuer's minimal underwriting standards) were subsequently securitized and sold to investors.

Thus easy credit environment coupled with very high appetite of mortgage lenders for financing housing loans resulted in increased share of sub-prime and defective mortgages in housing loan portfolio of mortgage lenders. The housing loan portfolio was also the source for funding mortgages. This was done through securitization of their portfolio where investment banks were instrumental in creating financial papers based on the security of mortgages and these financial papers were off-loaded to investors who were looking for safe investment opportunity that yielded higher returns.

A variety of financial papers were created to suit investors' appetite. Mortgage loans were bundled into mortgage-backed securities/ collateralised debt obligations and securitised papers were created having different characteristics of risk and return and were sold to investors. Credit default swaps were also created which transferred credit risk from its buyer to its seller. These papers were also bundled in a portfolio and synthetic CDOs were created. In this manner the housing loan portfolios generated in US got distributed all over. It may be mentioned that synthetic CDOs, formed by bundling MBSs, CDOs and CDSs, enabled a theoretically infinite amount to be wagered on the finite value of housing loans outstanding, provided that buyers and sellers of the derivatives could be found. CDO issuance grew from an estimated \$20 billion in Q1 2004 to its peak of over \$180 billion by Q1 2007, then declined back under \$20 billion by Q1 2008. Further, the credit quality of CDO's declined from 2000–2007, as the level of subprime and other non-prime mortgage debt increased from 5% to 36% of CDO assets.

The investors invested in assets relying on information that was made available to them by third parties such as mortgage brokers, investment bankers and their due diligence firms. Risk rating of these assets was outcome of computer models of rating agencies where these models were designed based on past data. The risk reward advice that the investors was victim of conflict of interest and incorrect models.

U.S. households and financial institutions became increasingly indebted or overleveraged during the years preceding the crisis. Free cash used by consumers from home equity extraction went up from \$627 billion in 2001 to a total of nearly \$5 trillion dollars over the period. U.S. home mortgage debt relative to GDP increased from an average of 46% during the 1990s to 73% during 2008, reaching \$10.5 trillion. USA household debt as a percentage of annual disposable personal income was 77% in 1990. By the third quarter of 2008, it was 290%. From 2004-07, the top five U.S. investment banks each significantly increased their financial leverage. These five institutions namely Lehman Brothers, Bear Stearns, Merrill Lynch, Goldman Sachs and Morgan Stanley together with Fannie Mae and Freddie Mac, two U.S. Government sponsored enterprises, had \$9 trillion in debt or guarantee obligations; yet they were not subject to the same regulation as depository banks.

It was a classic scenario where highly leveraged household and financial institutions and investors across the World were awaiting for defaults to trigger on home loan portfolio built on abnormally inflated home prices, significantly high level of non-creditworthy borrowers and defective mortgages.

Fed began raising Fed funds rate from July 2004. This contributed to an increase in 1-year and 5-year Adjustable-Rate Mortgage (ARM) rates, making ARM interest rate resets more expensive for homeowners. This may have also contributed to the deflating of the housing bubble, as asset prices generally move inversely to interest rates, and it became riskier to speculate in housing. By September 2008, average U.S. housing prices had declined by over 20% from their mid-2006 peak. As prices declined, borrowers with adjustable-rate mortgages could not refinance to avoid the higher payments associated with rising interest rates and began to default. During 2007, lenders began foreclosure proceedings on nearly 1.3 million properties, a 79% increase over 2006. This increased to 2.3 million in 2008, an 81% increase vs. 2007. By August 2008, 9.2% of all U.S. mortgages outstanding were either delinquent or in foreclosure. By September 2009, this had risen to 14.4%.

Source : 2007-2012 Global Financial Crisis, Wikipedia



**Name of Book : Credit Monitoring, Legal Aspects & Recovery of  
Bank Loan - the post - approval credit dynamics in banks**

**Author : D. D. Mukherjee**

**Publisher : Snow White Publications Pvt. Ltd., Jer Mahal, 532,  
Kalbadevi Road, Mumbai - 400 002.**

**Pages : 536**

**Reviewed by : Dr. T. C. G. Namboodiri**

The popular definition of banking is accepting deposits for the purpose of lending. A bank's primary function is lending based on the deposits accumulated from the depositors. Hence the importance of lending function is well established. Going by the failures of many banks nationally and internationally, it can be observed that problems in credit management contributed to their downfall. It is, therefore, essential that the people dealing with public funds in banks and financial institutions and in the area of lending operations be fully familiar with the entire gamut of credit management. Credit monitoring and recovery are important areas in the management of Credit Portfolio in a commercial bank. Maintaining the asset quality is a challenging task for the bankers demanding stringent credit monitoring and recovery management efforts. The understanding of the legal implication and significance of documentation in the loan department of banks can hardly be overemphasized. Banks take utmost care in monitoring the accounts and despite best efforts if the accounts turn non performing, then suitable recovery efforts are to be initiated on time. The book under review is an effort to blend monitoring and follow up & recovery and documentation - important areas for bankers - in one book. All these areas are inter- connected and complementary. Authored by the senior faculty of JNIDB, Hyderabad, the book consists of 18 chapters covering the three major areas in banking - legal aspects, credit monitoring and recovery.

Various types of securities and charges, different types of borrowers, and issues in documentation and interest application are discussed in the first part of the book. Both theoretical and practical issues like the precautions to be taken in documentation are covered. In the monitoring part, topics like physical and financial follow-up, insurance and review renewal are discussed. Each of these topics is very important in the day to day monitoring of the credit portfolio. In the recovery part, detailed discussions are made on DRT and SARFAESI Act. Recovery options through Lok Adalat and civil suits are also touched upon. Rehabilitation especially, SME rehabilitation is an area where much attention is not given unlike in the past. Discussion on industrial sickness and rehabilitation is rightly done in this work. Chapters like Compromise and Settlement and write off, Frauds and Accountability make the book a comprehensive one for the user.

The author has taken much efforts to include a large number of important topics in one book which made it a little heavy. Some additional topics like the loan restructuring other than CDR, revenue recovery measures, invoking Section 138 of NI Act, right of set off etc. and a discussion on monitoring of non fund based limits would have added further value to the book.

The human capital in banks is undergoing vast changes. A large number of senior bankers would be leaving the banks due to superannuation and they would be replaced by fresh hands either recruited from the Campus or selected through the conventional written tests and interviews. The new recruits essentially need more knowledge and skill in the area of credit management. Such books written from the point of view of a practical banker would be of great use especially to new comers and they are not much available in the market. Viewed from this angle, the above book is a timely publication. The book will be useful to the bank officials and banking students.



### Letters of Appreciation

'On behalf of the Office Bearers and members of the Alliance of African Institutes of Bankers, I hereby express our appreciation for your moderating the April / May 2010 examinations of member Institutes of the Alliance.

The Moderation report which you submitted was adopted as a working document by members at the Alliance's 2012 Annual General Meeting held September 9-10, 2012 in Abuja, Nigeria.

Please accept our gratitude while we look forward to continuing mutual beneficial co-operation and support.'

*Chairman, Alliance of African Institutes of Bankers, Lagos, (October 11, 2012)*

'We write to acknowledge with thanks, receipt of your letter and the books prescribed for level II CAIIB examination offered by the Indian Institute of Banking & Finance (IIBF).

The Bank of Zambia is impressed by your great achievements as the premier institute in banking and finance education in India and beyond. We also note the various initiatives that you are pursuing and e-learning in particular.

Bank of Zambia is committed to supporting the partnership between Zambia Institute of Banking and Financial Services (ZIBFS) and the IIBF in the area of banking education and training for our mutual benefit.

We look forward to collaboration between the two institutions.'

*Dr. Tukiya Kankasa-Mabula, Deputy Governor - Administration, Bank of Zambia,  
(November 21, 2011)*

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No.	Title	Author	Publisher & Year of Publication
1.	Alchemy of a Leader : Combining Western and Japanese Management skills to Transform Your Company	John E. Rehfeld	John Wiley & Sons, 1994
2.	Beyond Performance Management : Why, When, & How to use 40 tools and best practices for Superior Business Performance	Jeremy Hope & Steve Player	Harvard Business Review, 2012
3.	Business Law, 3 <sup>rd</sup> Revised Edition	R .S. N. Pillai & Bagavathi	S. Chand, 2010
4.	Business Statistics : A Self-study Textbook, 12 <sup>th</sup> Edition	P. C. Tulsian & Bharat Jhunjunwala	S. Chand, 2010
5.	Cyber Law and Cyber Crimes	Prashant Mali	Snow White, 2012
6.	Cyber Law : Indian & International Perspectives	Aparna Vishwanathan	LexisNexis Butterswoths, 2012
7.	Datt & Sundharam Indian Economy, 65 <sup>th</sup> Revised Edition	Gaurav Datt & Ashwani Mahajan	S. Chand, 2012
8.	Effective Manager : Skills & Strategies	V .R. K. Prasad	Viva Books, 2012
9.	Embrace the Struggle : Living Life on Life's Terms	Zig Ziglar	Howard Books, 2009
10.	Financial Accounting : Principles and Practices, 2 <sup>nd</sup> Revised Edition	Jawahar Lal & Seema Srivastava	S. Chand, 2009
11.	Financial Intelligence for HR Professionals : What you really need to know about the numbers	Karen Berman & others	Harvard Business Review, 2008
12.	Guide to Bank Loans & Processing Loan Proposals, 2 <sup>nd</sup> Edition	Tapan Kumar Bhattacharya	Baba Bholanath Book Stores, 2011
13.	Human Resource Champions : The Next Agenda for Adding Value and Delivering Results	David Ulrich	Harvard Business Review, 1997
14.	Human Resources Management : Text & Cases	S. S. Khanaka	S.Chand, 2003
15.	Introduction to Project Finance : An Analytical Perspective	H. R. Machiraju	Vikas, 2009
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19.	McGraw Hill 36 - Hour Course : Product Development	Andrea Belz	Tata McGraw Hill, 2011
20.	Nothing is Absolute	S. Balachandran	Shroff Publishers, 2010
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22.	Steve Jobs" the Man who thought Different - A Biography	Karen Blumenthal	Bloomsbury, 2012
23.	Technical Analysis for the Rest of us : What every investor needs to know to Increase Income, Minimize Risk & Advice Capital Gains	Clifford Pistoiese	Tata McGraw Hill, 2006
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